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## 1 Introduction

#### 1.1 Manufacturer

AMAZONEN-Werke H. Dreyer GmbH & Co. KG, P. O. Box 51, D-49202 Hasbergen-Gaste./ F. R. Germany

### 1.2 Declined use

AMACO is exclusively designed to function as displayand metering- and monitoring device for agricultural machinery. Any use beyond this is considered as not declined use. The manufacturer is not liable for any damage resulting from any not declined use. Any unauthorised change of the device excludes any liability by the manufacturer.

## 1.3 Technical data

AMACO
4 digits with floating- comma display
Liquid crystal ( L C D )
2x 1,5 Volt-AAA-batteries
0° C to + 45° C
69 (B) x 39 (T) x 120 (H) mm
0,75 kg (incl. fitting parts)
max. 167 Impulses/sec.
max. 360 ha/h = 0,1 ha/sec.

### 1.4 Control elements/Connection



On the back of the device you find access to the battery compartment for two Mignon (AAA) batteries, 1,5 volt each.

#### 1.5 Execution for seed drills with two-range setting gearbox

Figure 1.1 shows the mounting points of the sensor "ha" and of the magnet to the gearbox shaft.





#### 1.6 Execution for precision seeders ED 1

Figure 1.2 shows the fixing points of the sensor "ha" and of the magnet to the gearbox shaft.





#### 1.7 Execution for tyre packer precisionseeders RP-ED 1

Figure 1.3 shows the fixing points for the sensor "ha" and of the magnet at the gearbox shaft.





#### 1.8 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:

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

#### 1.9 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 para. 3) and exchange batteries.

## 2 First operation

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

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. Take the codes from the tables (2.1 and 2.2).

Note in the tables (Fig. 2.1 and 2.2) the number of crank turns on the side of the codes. If you conduct your calibration test with another number of crank turns than stated or when the sensor "ha" has not been fixed as shown in para. 6.2 and 6.3, calculate the data of your seed drill and enter the resulting data (see para. 2.3 and 2.4).

## 2.1 Coding

To every implement a code number (e. g. **F.13**) has been determined which you may take from the tables (Fig. 2.1 and 2.2).

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 para. 1.9) by pressing the F-key or the ha-key automatically the code F.13 appears:

Press F-key or ha-key, Display: F.13

-	D8 SPECIAL	Tyres 5.00-16	
	Working width	Number of crank turns at the wheel	
Code		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 cran 1/40 ha	k turns at the wheel 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 whe 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	
		Number of cran	k turns at the wheel
Code	Working width	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	
		Number of cran	k turns at the wheel
Code	Working width	1/40 ha	1/10 ha
F. 10	4,5 m	22,0	88,0
F. 11	6,0 m	16,5	66,0

t133gb01

Fig. 2.1

#### 2 - 3

	AD 2 AD-P 2	Pack Top Seed Drill with star wheel ø 1,18m	
		Number of crank turns at the wh	
Code	Working width	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	
	Wonding Widan	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 1 / RP-ED 1
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

Fig. 2.2

t133-d02

#### 2.2 Entering code

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

Press **F-key** for 2 seconds. Display: Code flicks.

Press **ha-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.

Press **F-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 F-key the displayed (flicking) code will be programmed automatically after 10 seconds.

## 2.3 Calculating the factor

If you conduct a calibration test with another number of wheel turns than shown in the tables (Fig. 2.1 and 2.2) or when the sensor for the magnet is fitted to your seed drill in another way than shown in para. 6.2 and 6.3, calculate the data of your seed drill and programme these data as follows:

Drive with your seed drill a calibration distance (L) of at least 100 m.

- Hereby count the number of turns (z) of the magnet on the gearbox shaft. (Drills equipped with the new vario-gearbox have a magnet already integrated

into the gearbox so that the turns of the gearbox shaft can be counted at the cross hole of the protruding shaft.)

- Calculate the factor from the values determined:

factor = 
$$\frac{100 \text{ (m) x } 100}{59,5}$$

Factor = 168,1

# 2.4 Programming (entering) factor and working width

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

- Press **F-Taste** for 2 seconds. Display: flicking code number
- Press **ha-key** until the code number "F.0" (flicking) appears.
- Press **F-key** until the symbol [ **o** ] appears Display: The factor of the code "F.0", which you may change as follows:

- Press **ha-key** until the comma is in the right place.
- Press **F-key**. Display: 1<sup>st</sup> figure flicks.

Press ha-key , until 1st figure is correct.

Press **F-key**. Display: 2<sup>nd</sup> figure flicks.

Press ha-key until 2<sup>nd</sup> figure is correct.

Continue this way until the factor (e.g. [168,1]) is set.

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

Press ha-key until 2<sup>nd</sup> figure is correct.

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

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".

#### 2.5 Starting to operate

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

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

The memory has been eradicated.

As soon as the magnet (Fig. 1.1 to Fig. 1.3) 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 m<sup>2</sup>.

## 3 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 "ha"-key and the F-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.

# 3.1 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).

## 3.2 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 frostsafe room.

## 4 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.

## 4.1 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:

- Switch off calculator (press ha- and F-key simultaneously until [STOP] is displayed.
- Switch on calculator
  - if the display shows [-bl-] voltage is too low.
    - Switch off the calculator and insert new batteries (see para. 1.8).

### 4.2 Checking the functions of the calculator

- Unscrew sensor cable "ha" from the computer.
- Program code "F.1" and briefly press key "ha".
- Bridge over poles of the connecting bush several times with a small screw driver (see Fig. 4.1).





- The calculator processes the impulses simulated by the bridging over of the poles and shows this by adding in the display.
- If the calculator does not process the impulses properly it must be exchanged.

## 4.3 Checking sensor "ha" for function

After the computer has been checked as described in para. 4.1 and 4.2 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:

- Unbolt sensor "ha" and magnet from the seed drill.
- Connect sensor cable "ha" to the calculator.
- Enter code "F.1" and briefly press key "ha".
- 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.

## 5 Scope of delivery and spare parts list

#### 5 - 2

No.	Part-No.	Description	Quantity
1	954671	Electronic hectare meter AMACO	1
3 4 5		Mounting bracket for computer Hex. bolt M4 x 25 Self locking nut M4	<sup>.</sup> 2 4 4
6	NE253	Sensor with 7 m cable and plu	g 1
7	951857	Sensor mounting plate for two range gearbox	1
8 9		Cylindric screw M4 x 20 Self locking nut M4	2 2
10 11 12 13	3419310	Magnet, cpl. (with No. 11, No. 12 and No. 1 Retainer for magnet Self thread cutting screw M4x1 Spring washer	3) 1 1 0 2 1
14 15 16		Hole drill (ø 3,6 mm) Adhesive plate 29x29 Cable ties	1 15 20
17	MG585	Operating instructions, fitting instructions and spare parts list « AMACO	» 1

#### 5 - 3





## 6 Fitting instruction

## 6.1 Fitting the calculator

- Fix the mounting bracket (Fig. 6.1) of the calculator inside the tractor cab.



- Slide the calculator onto the mounting bracket.
- Fig. 6.1
- 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.

# 6.2 Fitting magnet and sensor "ha" to the two range gearbox

- Remove clip pin (Fig. 6.2/1, which connects agitator shaft with drive).
- Bolt magnet mounting bracket (Fig. 6.2/2) with self thread cutting bolt M4 x 10 (Fig. 6.2/3) and spring washer to the gearbox hollow shaft (Fig. 6.2/4).

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

- a hole has to be drilled (Ø 3,6 mm) into the hollow shaft (Fig. 6.3/1).
  - The hole should be drilled at an angle of 90° towards the existing hole provided for the clip pin.
    The distance A (see Fig. 6.3) 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.
- Bolt the magnet (Fig. 6.2/5) with a self thread cutting bolt M4 x 10 to the magnet mounting bracket.
- Bolt sensor (Fig. 6.2/6) on to the sensor bracket (Fig. 6.2/7).
- Bolt sensor bracket (Fig. 6.2/7) with two housing nuts (Fig. 6.2/8) on to the gearbox.
- Place sensor cable (Fig. 6.2/9) towards the tractor cab.

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

- Fix magnet cable to the seed drill with adhesive plates (Fig. 6.2/10) and with cable ties. The sticking areas must be clean and free of grease/oil.
- Re-insert clip pin (Fig. 6.2/1) into the gearbox hollow shaft.





Fig. 6.2



Fig. 6.3

#### 6.3 Fitting and magnet and sensor "ha" for precision airseeder/planter ED 1 / RP-ED 1

Mount sensor and magnet on **ED 1** (Fig. 6.4) or **RP-ED 1** (Fig. 6.5) to the input of the sprocket wheel setting gearbox:

- Bolt magnet (Fig. 6.4/1 or Fig. 6.5/1) with self thread cutting bolt M4 x 10 to the impulse disc of the gearbox input shaft.
- For fixing the sensor slacken impulse carrier (Fig. 6.4/3 or Fig. 6.5/3) and retighten afterwards.
- Bolt sensor (Fig. 6.4/2 or Fig. 6.5/2) to the impulse carrier (Fig. 6.4/3 or Fig. 6.5/3).
- 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.

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





Fig. 6.4



Fig. 6.5

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# 6.4 Fitting magnet and sensor "ha" to seed drills <u>without</u> two range gearboxes

If it is not possible to fit sensor and magnet to the two range gearbox as described in para. 6.2, the magnets (Fig. 6.6/1) should be attached to the drive shaft of your seed drill and the sensor (Fig. 6.6/2) be fitted to a suitable place at a distance of max. 12 mm (see Fig. 6.6). If required you may order an



additional sensor bracket (Fig. 6.6/3, Order No. 950725).

In any case, at this kind of fitting the factor should be calculated according to para. 2.3 and be programmed together with the working width according to para. 2.4.

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