Operating Instructions

for On-Board-Computer

AMADOS-II

AMADOS-II

km/h

↓ 123 : 3

< Error ⌐ ◎ 1/min >

AMAZONEN-WERKE
H. Dreyer GmbH&Co.KG

| I | 0 | km/h | |
+ 10%	⌐→)	ha / Σ ha	STOP
− 10%	100% kg/ha	MOD	
◎ 1/min	m	Imp. 100 m	Cal. kg/ 1/40 ha
↑ +	↓ −	Eingabe Input	C
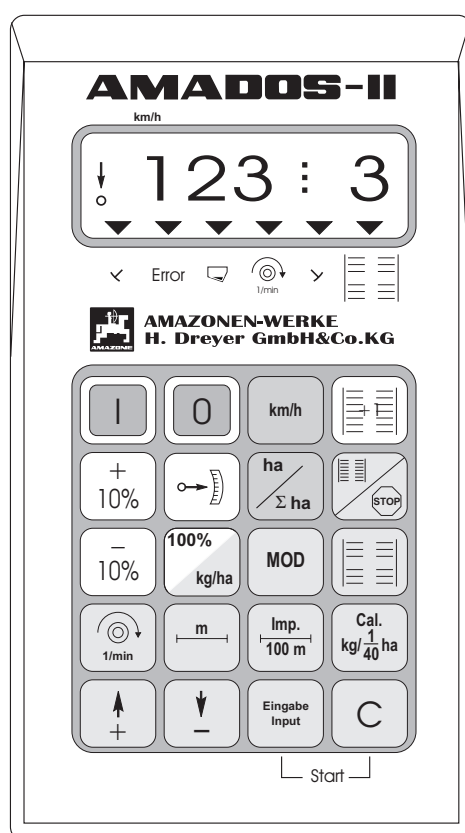
Start

⚠ **Before starting to operate, please carefully read and adhere to this operation manual and safety advice!**

CE

GB

AMAZONE

On receipt of the compouter

On receipt of the computer, please check whether transport damage has occured or whether any parts are missing! Only immediate claims to be filed with the forwarding agency may lead to replacement. Please check whether all parts mentioned in the following are provided.

1.
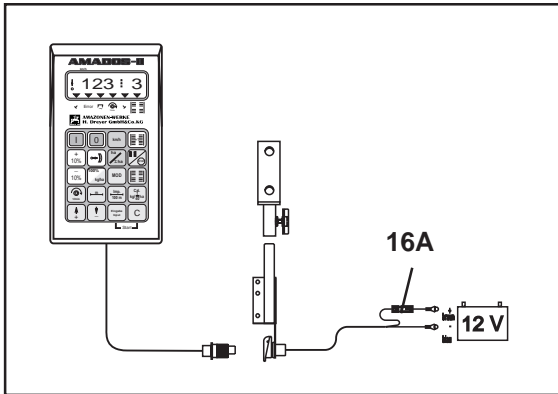
"AMADOS-II" the electronic monitoring-, controlling and regulating system consisting of:
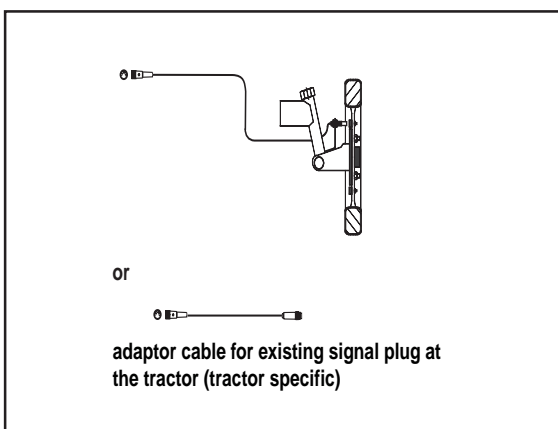
1. Basic unit "AMADOS-II",

consisting of:

Computer.
Console.
Battery connecting cable with plug and fuse (16A).

16A

at random:

2.

2. Sensor "X" for fitting to wheels- and cardan shafts

consisting of:

Sensor "X" cardan shaft/wheel
Universal mounting kit for Sensor "X" (cardan shaft/wheel).
Complete with
• 6 magnets, 6 brass bolts with nuts and washers.
• Mounting clamp with magnet 27/51.
• Mounting clamp with magnet 50/70.
• 10 cable strips.

or

or

adaptor cable for existing signal plug at the tractor (tractor specific)

2. Adaptor cable for "AMADOS-II" for existing signal-socket on tractors (tractor specific)

4 Contents

1.0 Informations about the computer

1.1 Manufacturer

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

1.2 AMADOS-II

The on-board computer **"AMADOS-II"** can be used as a display-, monitoring- and controlling device

• for centrifugal broadcasters AMAZONE ZA-M,

• for AMAZONE seed drills
• as well as an hectare meter.

The micro computer - the heart of the device - has been equipped with a memory and a lithium battery. All entered and determined values are stores for approx. 10 years even if the on-pord power supply is switched off. At the next switching on all data are available again.

1.3 Function description

"AMADOS-II" is supplied with a 6-digit display (1.1/1). In operationg position of the corresponding machine the display shows:

• at centrifugal broadcaster

 current forward speed, spread rate and shutter position "opened or shut".

• at the seed drill

 current seed rate, tramline counter and marker position

• as a pure hectare meter

 the forward speed.

At the left hand edge of the display additionally 2 symbols are shown. The vertical arrow (1.1/2) shows when the connected machine is in operating position. The circle below (1.1/3) should flick during operation and indicates that the sensor for counting the area or the travelled idstance is transmitting impulses to the **"AMADOS-II"**.

The key pad is offering 20 keys which are devided into the following areas:

Red = Implement on/off
Green = Function keys (display of the determined data).
Yellow = Input keys (entering the machine data)
White = Keys that inform the calculator about the change of entered orders
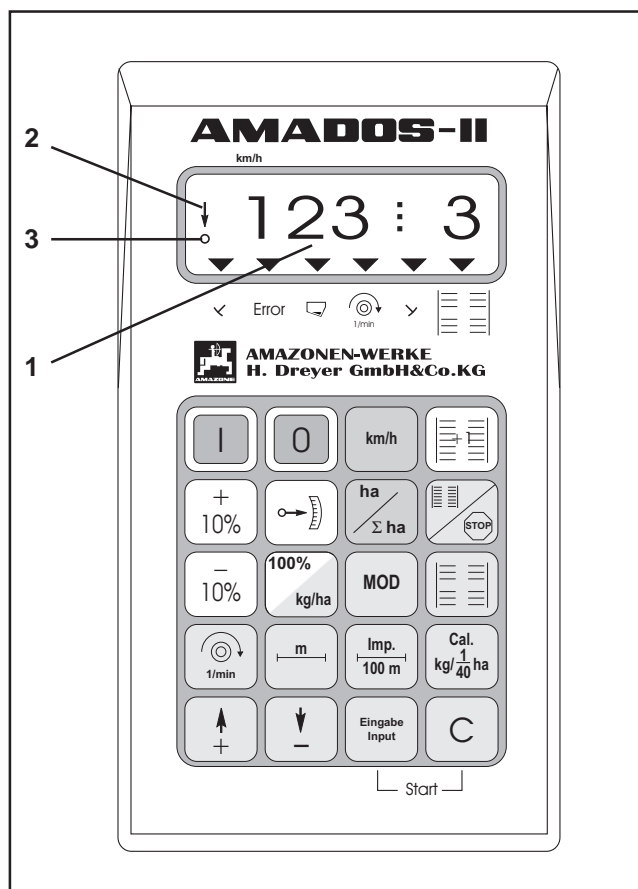
Fig. 1.1
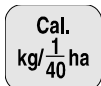
1.4   Keypad layout

The "**AMADOS-II**" on-board-computer can be used with a variety of different implements. Depending on the selected implement, the keypad assignment is as follows:

Key	**seed drill**	**fertiliser spreader**	**hectare meter**
I	ON key	ON key	ON key
0	OFF key	OFF key	OFF key
km/h	speed display [kph]	speed display [kph]	speed display [kph]
ha / Σha	area/section coverage	area/section coverage	area/section coverage
+1	advance tramline counter	the part distance counter will be activated	vacant position
STOP	display of the actual switching rhythm, and after having pressed this key, an automatic advance of the tramline counter is avoided.	vacant position	vacant position
	intermittent tramline ON	vacant position	vacant position
+ 10%	increase seed rate	increase seed rate	vacant position
— 10%	reduce seed rate	reduce seed rate	vacant position
100% kg/ha	return seed rate to rated value previously entered	return seed rate to rated value previously entered	vacant position
⟳	current position of geared motor	current position of geared motor	vacant position
MOD	dial implement specific data	dial implement specific data	dial implement specific data
1/min	current shaft speed [R.P.M.]	current shaft speed [R.P.M.]	current shaft speed [R.P.M.]
m	working width [m]	working width [m]	working width [m]

Imp. / **100 m**	sensor impulses over a distance of 100 metres	sensor impulses over a distance of 100 metres	sensor impulses over a distance of 100 metres
Cal. kg/ $\frac{1}{40}$ ha	seed rate calibration value	seed rate calibration value	vacant position
↑ +	input key for increasing the displayed value	input key for increasing the displayed value	input key for increasing the displayed value
↓ −	input key for decreasing the displayed value	input key for decreasing the displayed value	input key for decreasing the displayed value
Eingabe Input	key used to confirm all entries	key used to confirm all entries	key used to confirm all entries
C	correction key	correction key	correction key

2.0   Important Informations

2.1   Attention Symbol

This symbol will always be found in such places of this instruction book which should especially be adhered to in order to comply with rules, adivce, hints and the correct procedure of the operations as well as to prevent damage to the implement.

2.2   Hint-Symbol

This symbol marks machine's specific points which should be observed to ensure the correct operation.

2.3   Declined use of the machine

"AMADOS-II" has exclusively been designed for the usual operation as a display-, monitoring- and controlling device for agricultural machinery.

Any use beyond the one stipulated above is no longer considered as designed use. The manufacturer does not accept any responsibility for damage resulting from this; therefore the operator himself carries the full risk.

Under "declined use" also the adhering to the manufacturer's prescribed operation-, maintenance- and repair conditions as well the exclusive use of original **AMAZONE spare parts** is to be understood.

"AMADOS-II" may only be operated, maintained and repaired by such persons who have been made acquainted with it and who have been advised about the dangers.

All applicable accident preventive advice as well as any further generally accepted safety-, working-, medical- and road-traffic rules should be adhered ty.

Any damages resulting from arbitrary changes on the "AMADOS-II" rule out the responsibility of the manufacturer.

Before every operation and also during the operation check your device for proper function and for sufficient application accuracy of the machine.

Claims regarding damage not having occured on the **"AMADOS-II"** itself will be rejedcted. This also applies to damages due to application errors. Arbitrary modifications to the **"AMADOS-II"** may result in damage and therefore the manufacturer does not accept liability for such damage.

2.4   Safety advices

Before doing any repair work to the electrical installation in particular welding operations on the tractor or on the mounted machine disconnect all electric couplings to the "AMADOS-II".

2.5   Important hints for the use of the "AMADOS-II" with the centrifugal broadcaster or as a pure hectare counter.

If a signal socket according to DIN 9684 standards exists on the tractor no additional sensor "X" (cardan shaft/wheel) need to be fitted for determining the travelled distance. The sensor "X" will then be exchanged for a tractor specific adaptor-cable (option). In case of an existing radar sensor the signals can also be taken from this socket.

In case of operating with a Unimog without the on-board-computer "UNICOM I" the sensor "X" should be exchanged for the tacho adaptor (option).

When operating with a Unimog equipped with the on-board-computer "UNICOM I" the sensor "X" should be exchanged for an adaptor cable (option). Herewith "UNICOM I" and "AMADOS-II" will directly be connectly to one another.
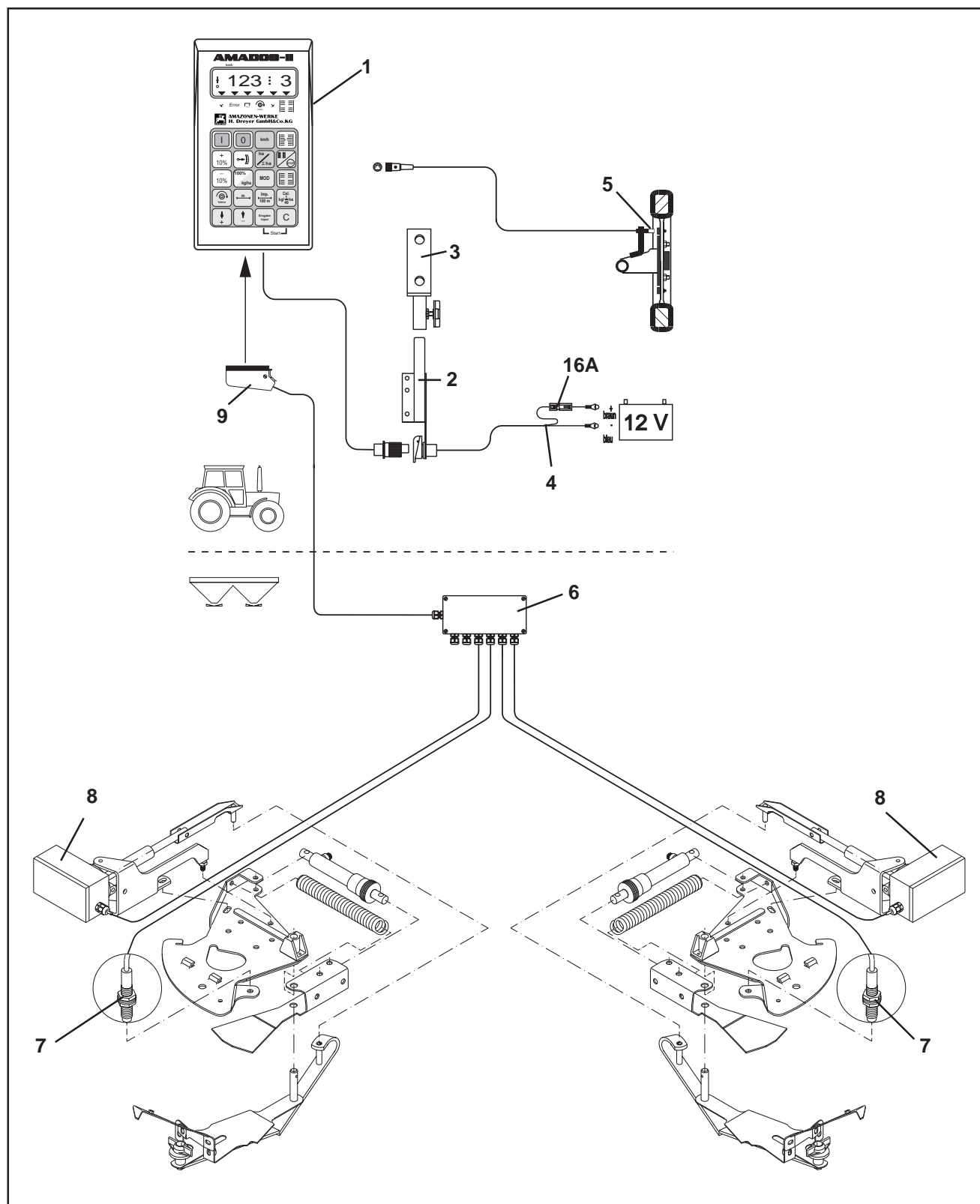
Fig. 3.1

3.0 Operating Instructions

3.1 Operation mode "centrifugal broadcaster"

"AMADOS-II" on centrifugal broadcaster:

- controls the spread rate [kg/ha] in dependence of the forward speed. For this the shutter slide positions are changeable by 2 setting drives.
- allows the change of the spread rate in 10 % steps.
- shows the current forward speed in [k.p.h.]
- functions as a hectare meter and
  - determines the finished part area in hectares [ha],
  - stores the finished total area in hectares [ha].
- monitores the speed of a drive shaft equipped with a rev. speed sensor. If the rated value is exceeded or undercut by more than 10 % an audible alarm sounds off and simultaneously the display changes alternatively from "operation display" to "fault display" (please see para. 3.1.4.3).

"AMADOS-II" in the main consists of:

Fig. 3.1/...

1 - Calculator .
2 - Base console with mounting bracket (3).
3 - Mounting bracket.
4 - Battery power supply cable.
5 - Sensor "X" (cardan shaft/wheel) for determination of the travelled distance.
6 - The implement signal distributor with the sensor "shutter slide position" (7) and the connecting possibility for the spindle motors (8).
7 - Sensor "shutter slide position".
8 - Spindle motor.
9 - Implement plug.

"AMADOS-II" is connected via the implement plug (Fig. 3.1/9) with the implement signal distributor (6) of the centrifugal broadcaster.

3.1.1 In General

3.1.1.1 AMADOS-II on/off switching

By pressing key $\boxed{\text{I}}$ **"AMADOS-II"** is switched

o and by pressing key $\boxed{0}$ it is switched off.

☞ **When switching on, the display briefly shows the creation date of the computer program.**

Always ensure that the servo motors set the setting levers nearly into the range of the zero-position (do not mind scales).

☞ **Whenever the supply voltage drops to below 10 volts, e. g. when starting the tractor, the computer automatically switches off. It has to be switched on again as described above.**

3.1.1.2 Dial implement-specific data (values)

$\boxed{\begin{array}{c}\uparrow\\+\end{array}}$ **or** $\boxed{\begin{array}{c}\downarrow\\-\end{array}}$

3.1.3 Preparations for starting the operation "DETAILED INSTRUCTION"

✋ **Before starting to operate enter the implement-specific data by pressing the corresponding keys in the mentioned order newly or check .**

☞ **Already entered implement-specific data remain stored.**

3.1.3.1 Enterings regarding the implement type (mode "1")

✋ **Conduct all enterings regarding the implement type (mode "1") only with a disconnected implement plug.**

1. While **implement plug is disconnected** (3.1/9) switch on **"AMADOS-II"** (pls. refer to para. 3.1.1.1).

✋ **Initially the display shows the program entering date. For the following period of approx. 10 sec. then no entry is possible. Thereafter automatically the error message "13" is shown. After a waiting time of approx. 15 seconds the mode „1" can be dialed.**

Display with wrong coding
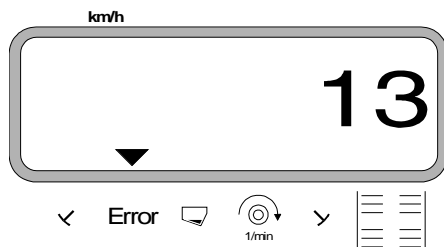
2. Mode "1", Choosing the machine type

- press [MOD] and dial "Mode 1". By actuating the MOD-key count up the mode.

Dipslay after MOD-key has been pressed
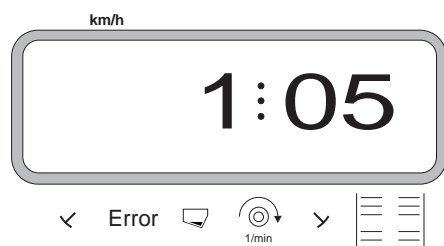
The first digit shows the chosen Mode "1", the second the coding for the chosen machine type ("0,5" for centrifugal broadcaster).

- via the keys [↑ +] or [↓ −] dial "code 05" on the display.

- press key [Eingabe Input] and thus store the chosen value "05".

- switch off **"AMADOS II"** and connect to implement plug.

3.1.3.2 Entering the implement-specific data

- Switch on "AMADOS-II".

3.1.3.2.1 Entering the spread rate

☞ **The value for the desired spread rate should be entered whild the tractor is not moving.**

- press [100% kg/ha] key

- Via the keys [↑+] or [↓−] dial the desired spread rate [kg/ha] on the display, e.g. "500" for the spread rate 500 kg/ha.

Display of the spread rate

km/h

500

⌄ Error ⬭ ◎↓ 1/min ⌄ ☰
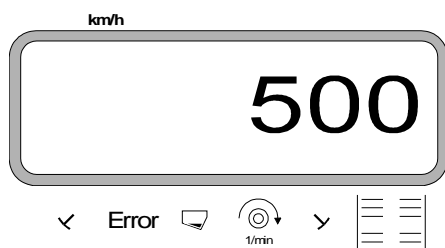
- press [Eingabe Input] key. The dialed value "500" will be stored.

- press once again [100% kg/ha] key to check the stored value. On the display then the figure "500" should appear.

☞ **During fertilising operation the spread rate can be changed by the keys [+ 10%] or [− 10%] in +/-10% steps.**

☞ **At spread rates of more than 1000 kg the first digit is not shown.**

3.1.3.2.2 Enter working width

For determining the operated area **"AMADOS-II"** requires information about the working width. The working width should be entered as follows:

- press [⊢m⊣] key

- dia via **keys** [↑+] or [↓−] the desired working width [m] on the display, e. g. "18" for 18 m working width.

Display working width

km/h

18.00

⌄ Error ⬭ ◎↓ 1/min ⌄ ☰
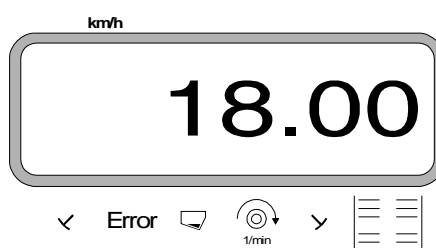
- press [Eingabe Input] key. The chosen value will be stored.

- press once more [⊢m⊣] key to check the stored value. On the display then the chosen figure, e.g. "18" should appear.

3.1.3.2.3 Calibrating the distance sensor

For determening the actual forward speed **"AMADOS-II"** required the value "Imp./100m", which sensor "X" releases to **"AMADOS-II"** when driving down a calibration distance of 100 m.

> **The figure "Imp./100m" may never be smaller than "250" sein, as otherwise "AMADOS-II" does not operate properly.**

For entering the calibration value "Imp./100 m" two possibilities are given:

- the value "Imp./100 m" is known and is dialed via the key board.
- the value "Imp./100 m" is not known and will be determined by driving down a pre-measured distance.

> **As the calibration figure "Imp./100m" is ground dependent it is, in case of soil types which are heavily deviating from one another, recommended to determine the calibration figure always newly.**

1.   The value "Imp./100 m" is known:

- press ⬚ Imp./100 m key (when tractor is stopped).

- Dial the known value "Imp./100m" by keys ⬚ ↑+ or ⬚ ↓− .

- Press key ⬚ Eingabe Input . The chosen value will be stored.

- press once again key ⬚ Imp./100 m to check the stored value. The display should then show the dialed value.

> **In case of deviations between**
> - **the actually spread rate and the actually worked area**
> - **the displayed area determined by AMADOS-II and the actual worked area**
>
> **newly determine the calibration figure by driving along a calibration distance of 100 m (please refer to para. 3.1.3.2.3 point 2).**

2.   The value "Imp./100 m" is unknown:

- Accurately measure out in the field a calibration distance of 100 m Mark the starting- and ending point of the calibration distance.
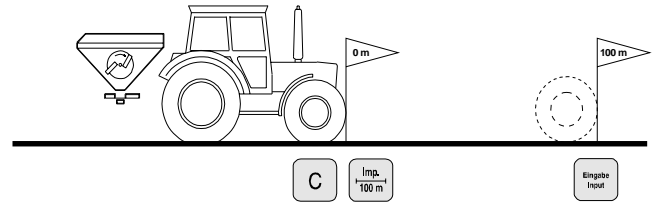
- Bring tractor in start position.

- Press ⬚ C and hold it pressed while pressing ⬚ Imp./100 m .

- Travel accurately along the calibration distance from the starting- till the ending point (when starting to move the counter returns to "0"). Hereby the continuously determined impulses are shown.

Display during the calibration test
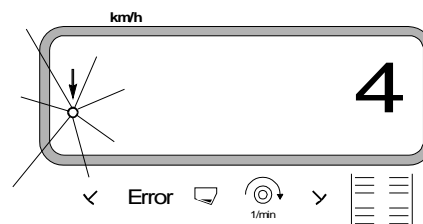
- Stop after 100 m. On the display now the number of the determined impulses is shown.

- Press key ⬚ Eingabe Input . The shown, determined value (Imp./100 m) will be stored.

- Press key ⬚ Imp./100 m once again to check the stored value. The display now should show the determined value (Imp./100 m).

3.1.3.2.4 Fertiliser calibration

The broadcaster can only then be set to spread accurately when the fertiliser properties, especially the flowing behaviour, are exactly known.

This flowing behaviour may already change after a brief storing of the fertiliser.

For this reason, conduct a fertiliser calibration test with the fertiliser to be spread before every operation.

In the event of a drastic change of application rate for more than 50 % it is advisable to carry out a fresh fertiliser calibration.

Preconditions for an accurate calibration are:

• **Before** starting the physical calibration process, **the required application rate and working width must be entered** into the computer.

• An adequate quantity of fertiliser in the hopper.

When calibrating the spread rate entered into the AMADOS-II may not exceed the value shown in column "max. spread rate to be entered for calibrating" in table 3.1 for the entered working widths.

Table 3.1:   "Max. spread rate to be entered for calibrating for the entered working width"

Working width [m]	max. spread rate [kg/ha] to be entered for calibrating
10	2400
12	2000
15	1600
16	1520
18	1350
20	1220
21	1160
24	1010
27	900
28	870
30	810
32	760
36	680

Procedure for the fertiliser calibration test:

The calibration of the application rate is carried out on the **left hand** discharge opening (seen in travel direction). For this

- remove left hand spreading disc.
- Place collecting bucket below the discharge opening (see ZA-M-Instructions!)

The fertiliser calibration test can be conducted stationary for the computer only needs to be informed of the fertiliser volume per secong passing through the discharge opening.

- Start the calibration procedure by pressing $\text{kg/}\frac{1}{40}\text{ ha}$ Cal.

and hold it pressed while pressing $\boxed{C}$.

The display shows a "0".

Display at the start of the fertiliser calibration test
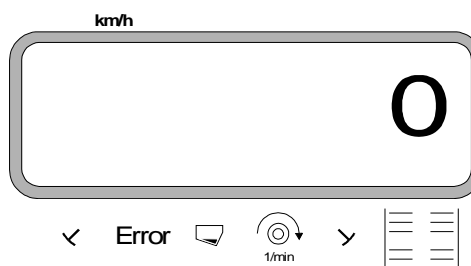
- With the pto engaged, rund the tractor at rated speed (540 U/min) and open the left hand shutter.

The display now shows the shutter opening time.

- After at least 30 seconds close the shutter.

After closing the shutter the display changes.

Display after closing the shutter
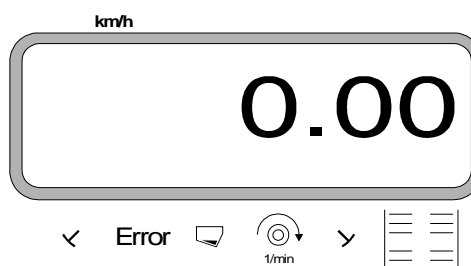
The shutter opening times may be selected at random, but should not be less than 30 seconds. At larger spread rates place larger bucket under the outlet opening.

- Weigh collected fertiliser (consider net weight of bucket).
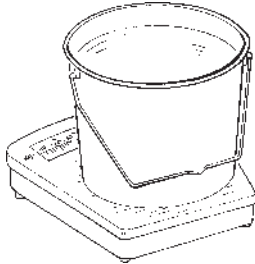
The scale used should be capable of weighing accurately to 100 g. Larger inaccuracies may result in deviations of the actually spread rate.

- Enter weight of the fertiliser via the keys

  [↑ +] or [↓ −] into the computer,

  e.g. "2.50" for 2,5 kg.

- then press key [Eingabe Input] to confirm.

  "AMADOS-II" now calculates a calibration factor characteristic for the fertiliser and working width used which can be called up on the display by pressing the

  key [Cal. kg/$\frac{1}{40}$ha] .

- After completing the calibration test reinstall the spreading disc.

How to conduct the calibration test when the entered spread rate exceeds the maximum spread rates mentioned in table 3.1:

Example:
Working width: 24 m
Wanted spread rate: 1300 kg/ha

Thus the maximum allowable spread rate for conducting the calibration test for 24 m working width of 1010 kg/ha will be exceeded.

- Prior to the calibration test change the figure for the entered spread rate of **1300 kg/ha** to the maximum spread rate mentioned in the table of **1010 kg/ha.**
- Continue with the calibration test as stated under "procedure for the fertiliser calibration test".
- After having conducted the calibration test, enter again the figure for the wanted spread rate, here **1300kg/ha**.

3.1.4 Putting into operation in the field

3.1.4.1 Conducting the start function

For starting the operation simultaneously press the

Eingabe Input / C keys.

└─ Start ─┘
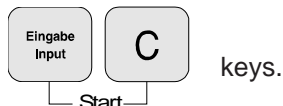
The memory for the hectare meter - part area [ha] returns automatically to "0".

As soon as a shutter slide is opened "AMADOS-II" recognises that the implement is in working position. The operation display now shows

• the momentary forward speed [k.p.h.].
• the current spread rate [kg/ha].

Operating display fertiliser broadcaster

shows up, when the machine is in operating position

forward speed　spread rate

km/h

6.9 : 500

vacant position

Error　1/min

vacant position
fault message
right hand shutter opened

left hand shutter opened

flashes in the event of speed sensor impulses

if an additional rev-monitoringsensor is installed an alarm is released when the preset rev's are exceed or undercut by 10%.
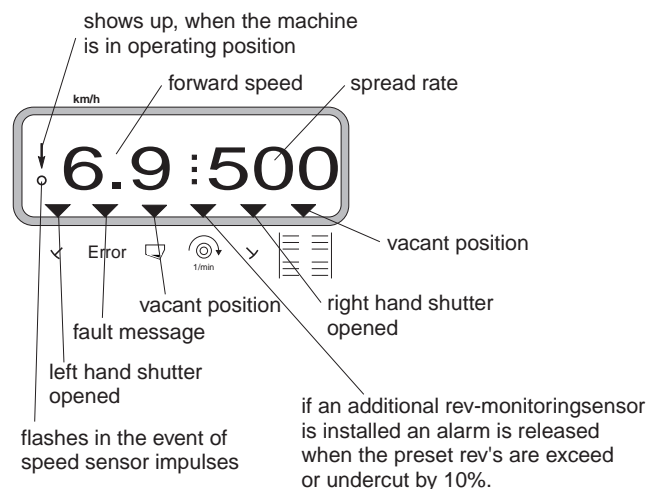
3.1.4.2 Changing the spread rate during fertilising operation

During fertilising operation the spread rate can be changed by the keys + 10% or − 10% in +/-10% steps.

✋ **In the event of a drastic change of application rate for more than 50 % it is advisable to carry out a fresh fertiliser calibration.**

3.1.4.3 Spreading extremely small spread rated, e. g. green manure seed and slug pellets

☞ **Spread rates below 50 kg/ha (smallest spread rates) will have an unfavourable flowing effect of the material due to the small diameter of the outlet opening and therefore may lead to deviations of the spread rate.**

3.1.4.3.1 Special case spreading rye grass

Exampel:

Rye grass
Spread rate:　　　　　　**34 kg/ha**
Working width:　　　　　12 m
Forward speed:　　　　　10 k.p.h.
From setting chart:　　　**shutter position "27"**

Table 3.2:　**"Spread rate for rye grass" excerpt from the setting chart**

rye grass														0,51 kg/l
Lever setting pos.	**10**			**12**										
	km/h			km/h			km/h			km/h			km/h	
	8	10	12	8	10	12	8	10	12	8	10	12	8	10	12
25	25	20	16	21	16	14									
26	39	31	26	33	26	22									
27	52	41	35	43	34	29									
28	64	51	43	53	42	35									
29	79	63	53	66	52	44									
30	96	77	64	80	64	53									

For broadcasting rye grass pleasse proceed with the calibration test in the following order:

1. In **setting chart** find page for the **spread rate setting** of **CAN 27 % N gran. BASF** .

Table 3.3: **"Spread rate setting CAN 27 % N gran. BASF" Extract from the setting chart**

CAN 27 % N Granular BASF; DSM; HYDRO	1,04 kg/l
HYDRO Super Grass NPK 25-5-5 Blend	1,01 kg/l
HYDRO Extra Grass NPK 29-5-5 Blend	0,92 kg/l
K+S Korn-Kali ® Granular 40 % K2O, 6 % MgO, 4 % S, 3 % Na	1,12 kg/l

| Lever setting pos.	20 km/h 8	20 km/h 10	20 km/h 12	21 km/h 8	21 km/h 10	21 km/h 12	24 km/h 8	24 km/h 10	24 km/h 12	27 km/h 8	27 km/h 10	27 km/h 12	28 km/h 8	28 km/h 10	28 km/h 12
25	135	108	90	128	103	86	112	90	75	100	80	67	96	77	64
26	150	120	100	143	115	95	125	100	84	111	89	74	107	86	72
27	167	133	111	159	127	106	139	111	93	124	99	82	119	95	79
28	184	147	123	175	140	117	154	123	102	136	109	91	132	105	88
29	203	162	135	193	154	129	169	135	113	150	120	100	145	116	96
30	222	178	148	211	169	141	185	148	123	164	131	110	158	127	106
31	242	194	161	231	184	154	202	161	134	179	143	120	173	138	115
32	263	210	175	251	200	167	219	175	146	195	156	130	188	150	125
33	285	228	190	271	217	181	237	190	158	211	169	141	203	163	136
34	307	246	205	293	234	195	256	205	171	228	182	152	220	176	146
35	331	265	220	315	252	210	276	220	184	245	196	163	236	189	157
36	355	284	236	338	270	225	296	236	197	263	210	175	253	203	169
37	379	303	253	361	289	241	316	253	211	281	225	187	271	217	181
38	404	323	270	385	308	257	337	270	225	299	240	200	289	231	193
39	430	344	287	409	328	273	358	287	239	318	255	212	307	246	205
40	456	365	304	434	348	290	380	304	253	338	270	225	326	261	217
41	483	386	322	460	368	306	402	322	268	358	286	238	345	276	230
42	510	408	340	485	388	324	425	340	283	377	302	252	364	291	243
43	537	429	358	511	409	341	447	358	298	398	318	265	383	307	256
44	564	451	376	537	430	358	470	376	313	418	334	279	403	322	269
45	592	473	395	564	451	376	493	395	329	438	351	292	423	338	282
46	620	496	413	590	472	393	516	413	344	459	367	306	443	354	295
47	647	518	432	617	493	411	540	432	360	480	384	320	462	370	308
48	675	540	450	643	514	429	563	450	375	500	400	333	482	386	322
49	703	562	469	670	536	446	586	469	391	521	417	347	502	402	335
50	731	584	487	696	557	464	609	487	406	541	433	361	522	417	348
51	758	606	505	722	578	481	632	505	421	561	449	374	541	433	361
52	785	628	523	748	598	498	654	523	436	582	465	388	561	449	374
53	812	650	541	773	619	515	677	541	451	601	481	401	580	464	387
54	838	671	559	798	639	532	699	559	466	621	497	414	599	479	399

m-kas12.xls

2. **Look for column 20 m working** width and **8 k.p.h.** In this column for the **setting lever position "27"** (shutter position "27" for rye grass spread rate 34 kg/ha) read off the **spread rate "167" [kg/ha]**.

3. Press key ⟦ m ⟧ and dial via keys ⟦↑+⟧ or ⟦↓−⟧ the figure "12" (for 12 m working width with rye grass) on the display.

   Press key ⟦Eingabe Input⟧ and store.

4. Stop vehicle, press key ⟦100% kg/ha⟧ and dial on the display the spread rate "167" [kg/ha] via the keys ⟦↑+⟧ or ⟦↓−⟧

   press key ⟦Eingabe Input⟧ and store entered value "167".

   Press once again key ⟦100% kg/ha⟧ and check the entered value. The display should then show the figure "167".

Conduct the calibration test with grass seed (refer to para. 3.1.3.2.4)**:**

5. Press ⟦Cal. kg/$\frac{1}{40}$ha⟧ and hold it pressed while pressing ⟦C⟧ and start the calibration test. The display now shows a "0".

6. Start the tractor engine and let pto shaft rotate at (540 R.P.M.) land open left hand shutter slide for at least 30 seconds.

7. Weigh the collected grass seed.

8. enter the weight of the collected grass seed via the keys ⟦↑+⟧ or ⟦↓−⟧ into the computer,e.g. "0.50" for 0,5 kg.

   Press key ⟦Eingabe Input⟧ and confirm.

   "AMADOS-II" now detemines a calibration factor characteristic for the grass seed and working width used which can be displayed by pressing key ⟦Cal. kg/$\frac{1}{40}$ha⟧ .

9. Enter the desired grass seed spread rate (34 kg/ha) as described before.

10. Refit left hand spreading disc.

3.1.4.4 Function-keys and their use during the spreading operation

By pressing one of the following function keys for approx. 10 seconds the wanted value will be displayed. Thereafter the computer automatically switches back into the "operation display".

3.1.4.4.1 Forward speed k.p.h.

After pressing key [km/h] the momentary forward speed is displayed in [k.p.h.].

Display after pressind key "km/h"

3.1.4.4.2 Hectare meter

1. **Hectare meter - Part area**

After **one-time** pressing key [ha / Σha] the covered part area in [ha] is displayed, which has been covered since actuating the "start function".

☞ **Only the covered area will be determined at which the fertiliser broadcaster had been in operating position.**

Display after **one-time** pressing the key

2. **Hectare meter - Total area**

After **two-times** pressing the key [ha / Σha] the total area in [ha], e.g. of one season, is displayed.

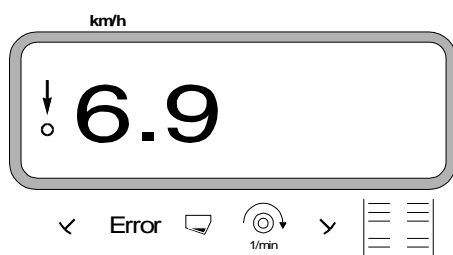Display after **two-times** pressing the key

2.1 **Set memory for hectare meter - total area to "0"**

Set memory for the hectare meter - total area via a reset to "0".

Press [C] and hold it pressed while pressing "0", release key.

✋ **A reset will eradicate all !!! memorised data from the AMADOS-II. Therefore, prior to resetting it is imperative to write down all important data.**

3.1.4.4.3 Part distance counter

The part distance counter determines the distance covered during the turning manoeuvre on the headlands.

The part distance counter will be activated by pressing key [≡+1≡].
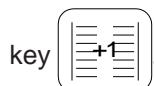
After pressing the key the display shows the covered distance in [m] continuously determined. After the transition into the operation position this display vanishes after approx. 10 seconds.

Display after pressing the key

3.1.4.3 Pto-speed monitor

By pressing key ⟲ 1/min the speed of a shaft which is equipped with a rev-sensor will be displayed.

Depending on the pre-set rated value **AMADOS-II** monitors the speed of a shaft which is equipped with a rev-sensor (special option). If **the wanted speed is exceeded or undercut by more than 10 %** an audible signal is given and in the display the black triangle above the rev-symbol blinks.

Display when exceeding or undercutting the rated speed

km/h

6.9 : 500

✓ Error ⌨ ⟲ 1/min ✗

For selecting the rated speed for the speed monitoring, two possibilities are provided:

• the actual speed becomed the rated speed.
• the rated speed is selected directly via the key-board.

☞ **The rev-speed monitoring is only active in operating position.**

☞ **If the rev-speed of the relevant shaft shall not be monitored any longer, the rev-speed monitoring should be switched off.**

1. The actual speed becomes the rated speed

Entering the rated speed

- Drive the shaft to be monitored with the desired rated speed (e. g. 540 min^{-1}).

- Press key ⟲ 1/min and the actual speed is shown in the display. If the shown speed is equal the rated speed, press key Eingabe Input and store this speed as rated value.

Switch off speed monitoring

Switch off monitoring of the speed at a **stand still of the shaft monitored** as follows:
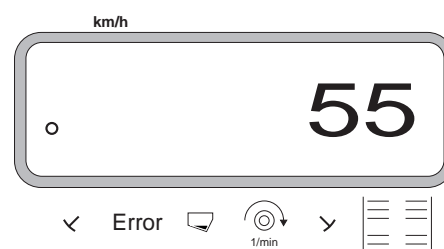
- First press key ⟲ 1/min and then key Eingabe Input .
The display shows a "0" for the actual speed which is stored as rated value.

2. Entering the rated speed via the key pad

Entering the rated speed

- Press key ⟲ 1/min and hold it pressed while pressing C . The display shows the set rated speed.

- Change the rated speed via the keys ↑ + or ↓ _ .

- Press key Eingabe Input and store the dialed rated speed.

Switching off the speed monitoring

- Press key ⟲ 1/min and hold it pressed while pressing C . The display shows the set rated speed.

- Via key ↓ _ dial the rated speed "0".

- Press key Eingabe Input and store the new rated speed "0".

3.1.5 Emptying the hopper

- For emptying the hopper press

  keys [⊸⫶] and [↑ +] simultaneously until the shutter slides are fully open.

3.1.6 Maintenance and care

✋ **When cleaning the spreader with a high pressure cleaner, it is important to ensure that the water jet is not directed to cable inlets and sockets.**

- After cleaning it is advisable to apply a small amount of rease to the hinge connections of the metering levers.

The **"AMADOS-II"** computer is maintenance-free. During winter months it should be stored at room temperature. To guard against dust and damp all outlets not in use must be protected with caps.

✋ **When welding on tractor or implement the electric power supply should be disconnected!**

3.1.6.1 Calibrating the servo-motors

✋ **The servo-motors have been set by the manufacturer in such a way that the rate setting slide at closed hydraulic shutter slides return after switching on nearly to the 0-position on the scale.**

☞ **If an uneven emptying of the two hopper tips is noted, a new calibration of the servo motors is required. In this case, please contact our technical service department.**

3.1.7 Operation in the event of electrical failure

In the event of electrical faults occuring on the computer **"AMADOS-II"** or the electrical servo-motors, the operation can be continued even if the fault cannot be remedied straight away.

In this case

- turn out fully thumb nut (3.2/1), which connects the metering slide and the setting lever with one another.

Fig. 3.2 Metering slide and setting lever coupled
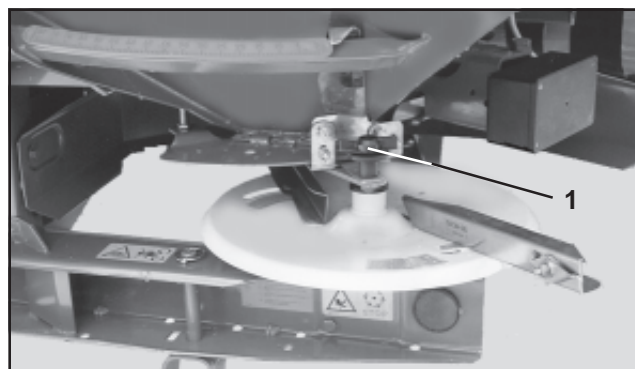
- Thereafter screw in thumb nut (3.3/1) with roller placed below into the pointer (3.3/2) .

Fig. 3.3 Metering slide and setting lever uncoupled
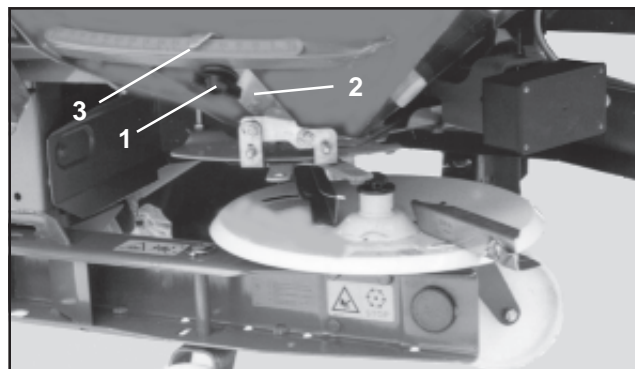
- Take the shutter slide position for the desired spread rate from the setting chart or determine by the supplied disc rule (please refer to the operationg instructions for ZA-M).

☞ **As the setting values of the setting chart can only be taken as a guide, conduct a spread rate check before starting the spreading operation.**

- The shutter slide position is read off the reading off edge (3.3/3) of the shutter lever pointer (3.3/2).

If ever the electric shutter slide acutation fails at a setting lever position bigger than "40", it should be considered that the outlet openings are partly covered by the setting lever. In such cases remove the servo-motor. The shutter slide can then be brought into the required position.

3.1.8   Fault messages

When using the **AMADOS-II** on-board-computer, the following fault messages (error messages) may occur:

fault message error code	Cause	Remedy
10	rated value cannot be maintained	- check rated value (see para. 3.1.3.2.1) - adapt speed - switch off "AMADOS", start fresh job (see para.3.1.4.1)
11	rated value not entered	- enter rated value (see para. 3.1.3.2.1)
12	working width not entered	- enter working width (see para.3.1.3.2.2)
13	no reaction by servo motor	- check mode" (see para. 3.1.3.1) - check servo motor function,e.g. by activating the "discharge container" functions (see para. 3.1.5)
no area determination	"working width" has not been entered "AMADOS" unable to recognise working position	- enter working width (see para. 3.1.3.2.2) - check "working position" sensor
no speed display	no impulses are received by "AMADOS" (symbol "speed impulse" is not illuminated) speed impulse sensor "Imp./100m" was not calibrated	- check sensor "X", cable ducting and wiring - enter impulse value resp. determine by driving a test distance (see para.3.1.3.2.3)
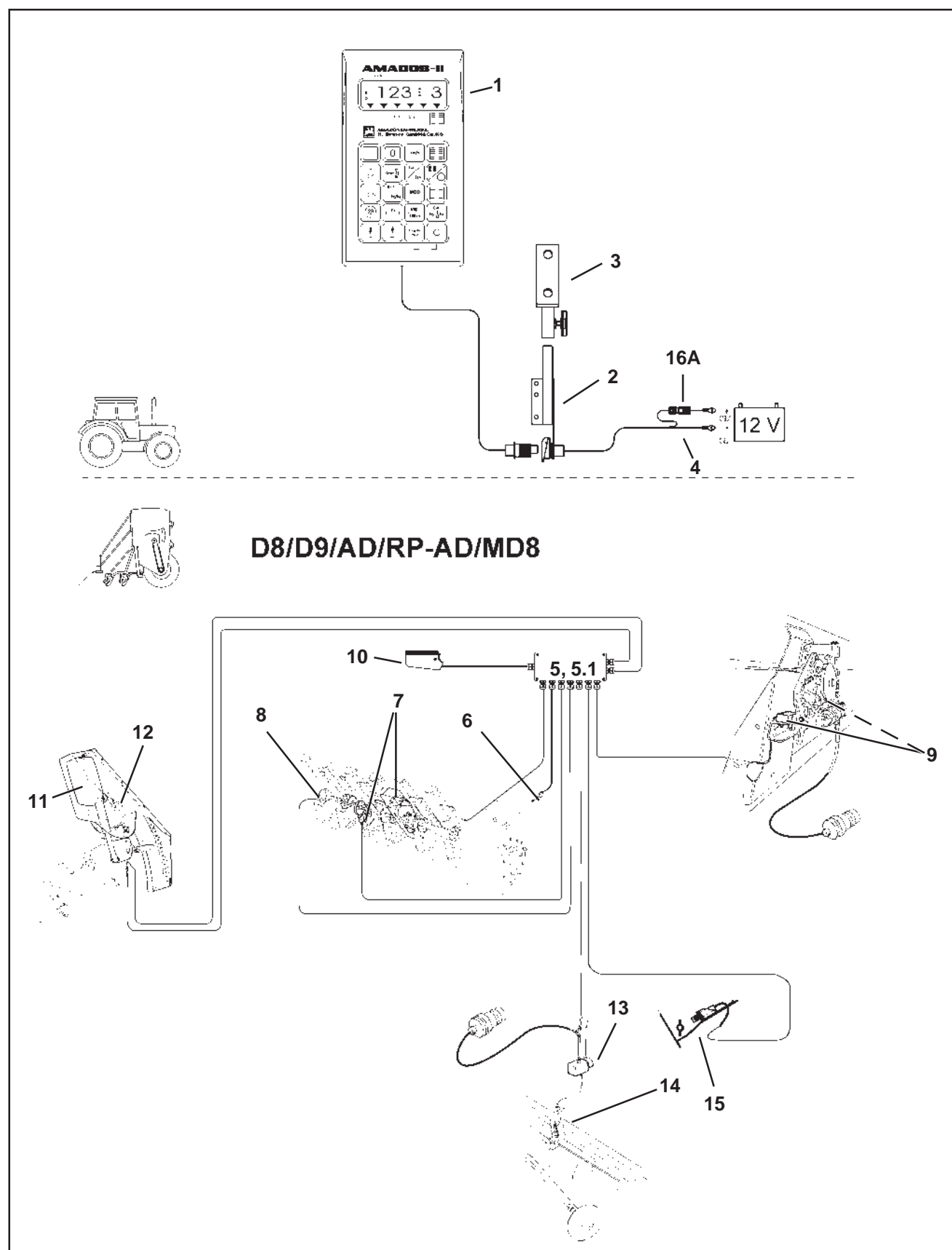
D8/D9/AD/RP-AD/MD8

Fig. 3.2

3.2 Operation mode "Seed drill"

1. "AMADOS-II" and its functions when in use with seed drills D8, D9, AD, RP-AD and MD8

"AMADOS-II" on the seed drills D8, D9, AD, RP-AD and MD8

- calculates automatically the necessary calibration rate for the actual calibration area (at least 1/40 ha) (exclusively at drills which are equipped with the electronic seed rate control).
- governs the tramlining control and the pre-emergence marker control (tramlining rhythm freely programmable, intermitted control for tramlines possible).
- monitors the drive of the tramlining control.
- displays the position of the hydraulically actuated markers.
- determines the momentary forward speed in [k.p.h.].
- monitors the drive of the metering shaft.
- monitors the drive of the tramlining control switch.
- monitors the seed level in the seed box.
- functions as a hectare meter and
  - determines the finished part area in hectares [ha],
  - stores the finished total area in hectares [ha].
- for seed rate change on varying soil conditions (+/- control) (chosable steps for the seed rate increment 1%, 10%, 20% and 30%) (only possible when the seed drill is equipped with electronic seed rate control).

"AMADOS-II" consists in the main of the following components:

Fig. 3.2/...

1 - Computer.
2 - Basic console with bracket (3).
3 - Bracket.
4 - Electric power cable.
5 - Small distributor "KII" with the movement-sensor (6) and with the connecting possibility of the sensoric for metering shaft, tramlining control, marker change over, pre-emergence markers and seed level indicator.
5.1- Large distributor "GII" with the movement-sensor (6) and with the connecting possibility of the sensoric for metering shaft, tramlining control, marker change over, pre-emergence markers, seed level indicator and seed rate control.
6 - Movement sensor (Sensor "X") for distance and area determination. This sensor provides at the same time the reference signal (implement operating "yes"/"no") for the monitoring sensors.
7 - Sensor s "tramlining control".
8 - Metering shaft sensor.
9 - Sensors "automatic marker" (hydraulical).
10 - Implement plug.

"AMADOS-II" is connected with the implement signal distributor of the seed drill via the implement plug (Fig. 3.2/10) .

At random:

Seed rate adjustment for "AMADOS-II", consisting of:

11 - electric setting motor for engaging and adjusting the gearbox setting lever position (seed rate) at the two-range oil bath gearbox.
12 - plug connection allowing simple fitting (when retrofitting) or dismantling the setting motor.

Pre-emergence marker, electro-solenoid hydraulical for "AMADOS-II", consisting of:

13 - electro-solenoid hydraulical valve
14 - hydraulical pre-emergence marker.

Seed level indicator, consisting of:

15 - a capacitive sensor (may be supplemented by **one** further sensor connected to distributor "GII") which releases visual and audible alarm signals on the **"AMADOS-II"**.
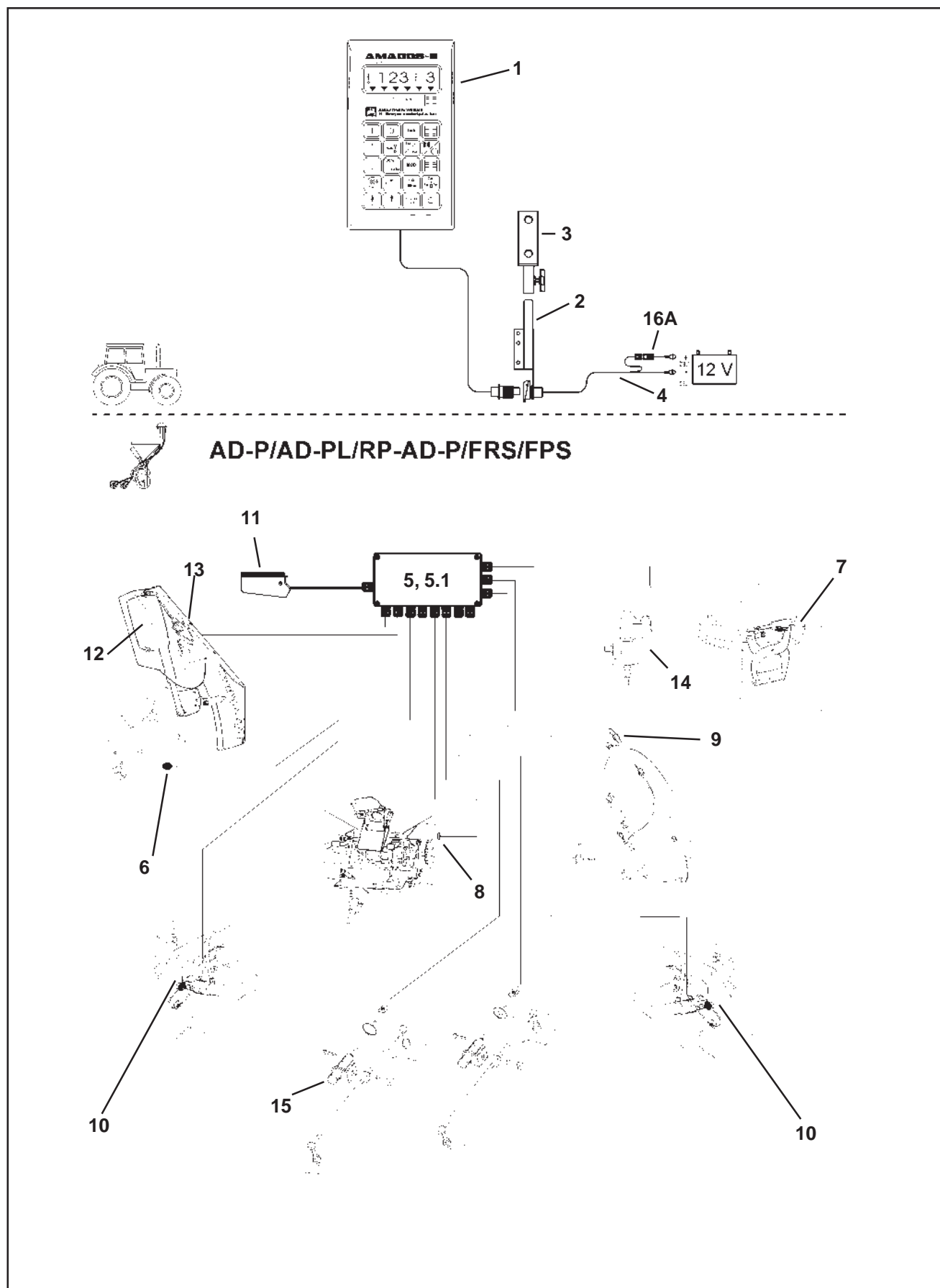
AD-P/AD-PL/RP-AD-P/FRS/FPS

Fig. 3.3

2. "AMADOS-II" and its functions when in use with seed drills AD-P, AD-PL, RP-AD-P, FRS or FPS

"AMADOS-II" on the seed drills AD-P, AD-PL, RP-AD-P, FRS or FPS

- calculates automatically the necessary calibration rate for the actual calibration area (at least 1/40 ha) (exclusively at drills which are equipped with the electronic seed rate control).
- governs the tramlining control and the pre-emergence marker control (tramlining rhythm freely programmable).
- reduces the seed rate when creating tramlines according to the number of tramline sowing coulters.
- determines the momentary forward speed in [k.p.h.].
- monitors the drive of the metering shaft.
- monitors the tramline control switch.
- monitors the seed level in the seed box.
- monitors the blower fan speed. If the pre-chosen rated value is exceeded or untercut by more than 10 % an audible alarm is released and simultaneously the intermitting with the "operating display" and "error message" is seen (please see para.3.2.3.3).
- functions as a hectare meter and
  - determines the finished part area in hectares [ha],
  - stores the finished total area in hectares [ha].
- for seed rate change on varying soil conditions (+/- control) (chosable steps for the seed rate increment 1%, 10%, 20% and 30%) (only possible when the seed drill is equipped with electronic seed rate control).

The equipment with **"AMADOS-II"** consists in the main of:

Fig. 3.3/...

1 - Computer.
2 - Basic console with bracket (3).
3 - Bracket.
4 - Electric battery connecting cable.
5 - Small distributor "KII-Profi" with the movement sensor (6) and with connecting possibilities of the sensoric for metering shaft, tramlining control, marker change over, pre-emergence marker and seed level indicator.
5.1- Large distributor "GII-Profi" with the movement sensor (6) and with connecting possibilities of the sensoric for metering shaft, tramlining control, marker change over, pre-emergence marker, seed level indicator and seed rate control.
6 - Movement-sensor (Sensor "X") for distance and area determination. This sensor provides at the same time the reference signal (implement in operdation "yes"/"no") for the monitoring sensors.
7 - Sensors "tramlining control".
8 - Metering shaft sensor.
9 - Blower fan speed sensor.
10 - Sensors "marker change over".
11 - Implement plug.

AMADOS-II is connected to the seed drill via the implement plug (Fig. 3.3/11) with the implement signal distributor.

At random:

Seed rate adjustment for "AMADOS-II", consisting of:

12 - electric setting motor for engaging and adjusting the gearbox setting lever position (seed rate) at the two-range oil bath gearbox.
13 - plug connection allowing simple fitting (when retrofitting) or dismantling the setting motor.

Pre-emergence marker, electro-solenoid hydraulical for "AMADOS-II", consisting of:

14 - electro-solenoid hydraulical valve for hydraulical pre-emergence marker.

Seed level indicator, consisting of:

15 - a capacitive sensor (may be supplemented by **one** further sensor connected to the distributor "GII-Profi"), releasing visual and audible alarm signals on the **"AMADOS-II".**

3.2.1   In General

3.2.1.1   AMADOS-II on/off switching

By pressing key [I]   **"AMADOS-II"** is switched

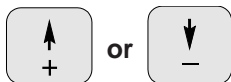o and by pressing key [0]   it is switched off.

☞   **When switching on, the display briefly shows the programing date of the computer program.**

☞   **Whenever the supply voltage drops to below 10 volts, e. g. when starting the tractor, the computer automatically switches off. It has to be switched on again as described above.**

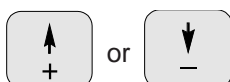#### 3.2.1.2   Dial implement-specific data (values)

[↑ +] **or** [↓ −]

By these keys the implement-specific data (values) which are required for the **"AMADOS-II"** can directly be dialed.

✋   **Always confirm dialed values by**

Key [Eingabe Input] **.**

By the 1st pressing of the [↑ +] or [↓ −]

the display advances by one position into the desired direction.

By renewed pressure onto the key the display continues to run until the key is released.

[Eingabe Input]

Confirm and store simultaneously all implement-specific data which are required for monitoring the connected

machine always by pressing key [Eingabe Input] .

3.2.2   Putting to operation (short instruction)

✋   **Before starting to operate enter the implement-specific data by pressing the corresponding keys in the mentioned order newly or check .**

✋   **All data regarding implement type and implement execution (Mode "1" to "6") may only be entered while the implement plug is disconnected.**

1. While **implement plug is disconnected** switch on **"AMADOS-II"** (pls. refer to para. 3.2.1.1).

☞   **Initially the display shows the program entering date. For the following period of approx. 10 sec. then no entry is possible. Thereafter automatically the error message "13" is shown. After a waiting time of approx. 15 seconds the mode "1" can be dialed.**

2. Mode "1"

   The prevailing **machine type** is selected via the **coding "machine type" in mode "1"**. **The coding depends on the seed drill type** (stud-metering wheel or pneumatic seed drill) **and on whether the seed drill is equipped with or without markers**.

   If the seed drill is equipped additionally with an **electric seed rate remote control** via "AMADOS-II", also the desired **step width** (1%, 10%, 20% or 30%), with which the seed rate shall be set when

   pressing the keys [+ 10%] or [− 10%] is pre-

   selected via the coding "machine type".

   The coding to be selected may be taken from table 3.4.

Table 3.4:   Mode "1", coding "Machinery type seed drill"

Step width for electric seed rate remote control by "AMADOS"	Coding Machinery type seed drill			
	Stud-wheel		Pneumatic	
	Marker change over			
	with	without	with	without
1%	00	10	20	30
10%	01	11	21	31
20%	02	12	22	32
30%	03	13	23	33

3. **Mode "2 bis 4"**

Do not change the indications given in Modus 2 to 4.

4. **Mode "5"**

Enter **"mode "5"** to instruct **"AMADOS-II"** whether while creating tramlines the seed rate adjustment should be reduced or not.

- Dial **Mode "5"** and

  • for seed drills **w i t h o u t** seed rate **reduction when creating tramlines** dial for the **second figure the value "00".**

  • pneumatic seed **drills w i t h** seed rate **reduction when creating tramlines** pre-dial via the **second figure** the desired **seed rate reduction** in [%] when creating tramlines. Regarding this, please refer to table 3.5.

Table 3.5: Mode "5", Seed rate reduction when creating tramlines by pneumatic seed drills with seed rate remote control

working-width [m]	Number of sowing coulters	Number of tramline-hoses	recommended seed rate reduction [%]
6	48	4	8
	60	4	7
	48	6	12
	60	6	10
4,5	36	4	11
	44	4	9
	36	6	17
	44	6	14
4	32	4	12
	40	4	10
	32	6	19
	40	6	15
3	24	4	17
	30	4	13
	24	6	25
	30	6	20

5. **Mode "6"**

Enter **"mode "6"** to instruct **"AMADOS-II"** whether the **seed drill has been equipped with** (=01) or **without** (=00) **a seed rate remote control.**

6. **Switch off „AMADOS-II"** and connect it to implement plug.

7. Switch on again **"AMADOS-II"**.

8. Compare the displayed and the actual gearbox setting lever position with one another **(only applicable for seed drills w i t h seed rate remote control)** (regarding this, please refer to para. 3.2.3.2).

9. Check "Imp./100m" and correct if necessary (by direct entering of by calibration test run; see para. 3.2.3.3.1).

10. Check the working width and correct if necessary (see para. 3.2.3.3.2).

11. Enter rated value for the seed rate **(only for seed drill <u>with</u> seed rate remote control)** (see para. 3.2.3.3.3).

12. Before starting the operation conduct a calibration test (see para. 3.2.3.3.4).

13. Program the tramlining rhythm (see para. 3.2.3.3.5).

14. When creating interval tramlines dial the lengths of the sown and not sown areas **(only for peg-wheel metering seed drills** (please refer to para. 3.2.3.3.6).

15. Conduct starting function. After having conducted the start function the hectare meter-part area is automatically returned to "0" (please refer to para. 3.2.4.1).

16. Advance tramline counter (see para.3.2.4.2).

17. Pre-dial the wanted speed for the blower fan monitoring **(only for pneumatic seed drills)** (please refer to para. 3.2.4.6.3).

18. Start sowing operation.

3.2.3 Preparations for starting the operation "DETAILED INSTRUCTION"

Before starting to operate enter the implement-specific data by pressing the corresponding keys in the mentioned order newly or check .

☞ **Already entered implement-specific data remain stored.**

#### 3.2.3.1 Enterings regarding the implement type and implement execution (Mode "1" to "6")

All data regarding implement type and implement execution (Mode "1" to "6") may only be entered while the implement plug is disconnected.

1. While **implement plug is disconnected** switch on **"AMADOS-II"** (pls. refer to para. 3.2.1.1).

☞ **Initially the display shows the program entering date. For the following period of approx. 10 sec. then no entry is possible. Thereafter automatically the error message "13" is shown. After a waiting time of approx. 15 seconds the mode „1" can be dialed.**

Display with wrong coding

13

✓ Error ⌷ ◎ ⟩
1/min
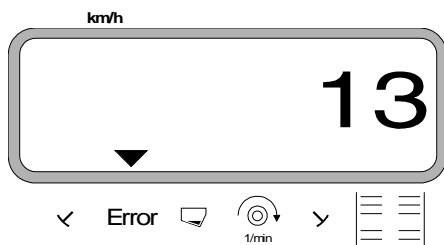
2. Mode "1", Choosing the machine type

The prevailing **machine type** is selected via the **coding "machine type" in mode "1"**. **The coding depends on the seed drill type** (stud-metering wheel or pneumatic seed drill) **and on whether the seed drill is equipped with or without markers**.

If the seed drill is equipped additionally with an **electric seed rate remote control** via "AMADOS-II", the seed rate can be changed during the sowing operation.

The desired increment by which the change of the seed

rate shall be conducted by pressing keys $\boxed{+\atop 10\%}$ or

$\boxed{-\atop 10\%}$, will be determined via the chosen coding "machinery type seed drill" under mode "1".

- Press $\boxed{\text{MOD}}$ and select mode "1". Count up the mode by actuating the MOD-key.

Display after selectting mode "1"

1:22

✓ Error ⌷ ◎ ⟩
1/min

The first figure shows the dialed Modus "1", the second the coding for the dialed implement type and the third figure shows the increment of the +10 % or – 10 % key for the seed rate adjustment. The necessary codings may be taken from table No. 3.4.

Example:

Machine type: pneumatic seed drill with track marker and seed rate remote control

Due to frequently changing soil conditions the seed rate

should be changeable by the keys $\boxed{+\atop 10\%}$ or $\boxed{-\atop 10\%}$

by a total of **± 20%** .

Table 3.4: Mode "1", coding "Machinery type seed drill"

Step width for electric seed rate remote control by "AMADOS"	Coding Machinery type seed drill			
	Stud-wheel		Pneumatic	
	Marker change over			
	with	without	with	without
1%	00	10	20	30
10%	01	11	21	31
20%	02	12	22	32
30%	03	13	23	33

For the mentioned example the coding "machinery type seed drill" is: **22**

- Via the keys $\boxed{\uparrow\atop+}$ or $\boxed{\downarrow\atop-}$ select the coding "22" in the display.
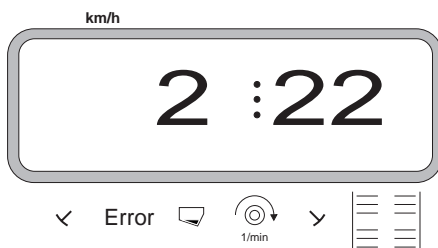
- Press key [Eingabe Input] and thus store the value "22".

3. **Mode "2", choose the period to elapse before an alarm is released when a permanent fault on the seed metering shaft occurs.**

- Press [MOD] and select mode "2".

  Count up the mode by actuating the MOD-key.

Display after selectring Mode "2"

```
km/h
┌─────────────────────┐
│                     │
│    2 :22            │
│                     │
└─────────────────────┘
  ✕  Error  ▭  ◎↓  ✕  ☰☰
              1/min
```

The first figure shows the chosen mode "2", the "22" says that at a permanent fault on the seed metering shaft a period of 22 seconds - set by the factory - will pass, before an alarm is released.

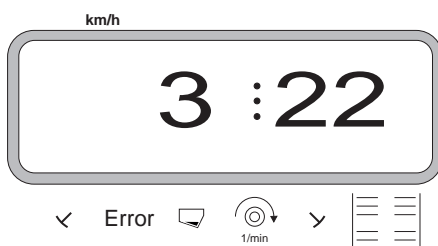✋ **Change this period only after having called on our technical field services.**

- Change wanted time via keys [↑+] or [↓−] .

- Press key [Eingabe Input] and thus store the selected value

4. **"Mode 3", choose period to elapse before an alarm is released when a permanent fault on the counter shaft occurs.**

- Press key [MOD] and select mode "3".

  Count up mode by actuating the MOD-key.

Display after selectring Mode "3"

```
km/h
┌─────────────────────┐
│                     │
│    3 :22            │
│                     │
└─────────────────────┘
  ✕  Error  ▭  ◎↓  ✕  ☰☰
              1/min
```

The first figure shows the selected Mode "3", the "22" says that at a permanent fault on the counter shaft a period of 22 seconds - set by the factory - will pass, before an alarm is released.

✋ **Change this period only after having called on our technical field services.**

- Change wanted time via keys [↑+] or [↓−] .

- Press key [Eingabe Input] and thus store the selected value

5. **"Mode 4", when creating tramlines choose period to elapse during which impulses possibly still given by the counter shaft sensor shall be ignored before these release an alarm.**

- Press key [MOD] and select mode "4".

  Count up the mode by actuating the MOD-key.

Display after selectring Mode "4"

```
km/h
┌─────────────────────┐
│                     │
│    4 :22            │
│                     │
└─────────────────────┘
  ✕  Error  ▭  ◎↓  ✕  ☰☰
              1/min
```

The first figure shows the chosen mode "4", the "22" says that at a permanent fault on the seed metering shaft a period of 22 seconds - set by the factory - will pass, before an alarm is released.

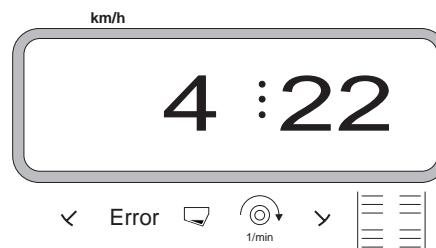✋ **Change this period only after having called on our technical field services.**

- Change wanted time via keys [↑+] or [↓−] .

- Press key [Eingabe Input] and thus store the selected value

6. Mode "5"

Enter **mode "5"** to instruct **"AMADOS-II"** whether while creating tramlines the seed rate adjustment should be reduced or not.

- Press key MOD and select mode "5". Count up the mode by actuating the MOD-key.

a) Procedure at seed drills **without seed rate reduction when creating tramlines**, i. e.

- **pneumatic** seed drills without seed rate adjustment.
- **pneumatic** seed drills **with** seed rate adjustment **and** seed return flow.
- **mechanical** seed drills.

- Via the keys ↑+ or ↓− dial for the **second figure the value "00"** (set by the factory) on the display.

Display with seed drills **without seed rate reduction when creating tramlines**.

km/h

$$5 : 00$$

∨ Error ▭ ◎↓ 1/min ∨ ☰☰
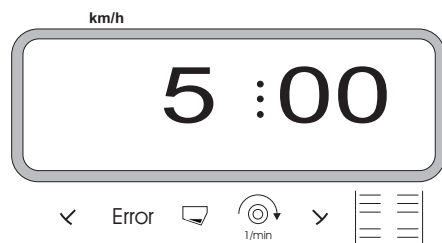
The first figure shows the dialed mode "5".

- Press Eingabe Input and thus store the dialed value "00".

b) Procedure with seed drills **with seed rate reduction when creating tramlines**, i. e.

- **pneumatic seed drills** with seed rate adjustment without seed return flow.

- Pre-dial via the **second figure** the recommended **seed rate reduction** in [%] **when creating tramlines**. The seed rate reduction depends on

- the working width of the seed drill
- the number of sowing coulters
- the number of tramline hoses

The value for the **second figure** may be taken from the column "**recommended seed rate reduction**" of the table 3.5.

Example:

Machine type: pneumatic seed drill with track marker and seed rate remote control
Working width: 4 m
Number of coulters: 32
Number of
tramline hoses: 4

Table 3.5: Mode "5", Seed rate reduction when creating tramlines by pneumatic seed drills with seed rate remote control

working-width [m]	Number of sowing coulters	Number of tramline-hoses	recommended seed rate reduction [%]
6	48	4	8
	60	4	7
	48	6	12
	60	6	10
4,5	36	4	11
	44	4	9
	36	6	17
	44	6	14
4	32	4	12
	40	4	10
	32	6	19
	40	6	15
3	24	4	17
	30	4	13
	24	6	25
	30	6	20

For the mentioned example the recommended seed rate reduction is **12 %**.

- Dial via keys [↑+] or [↓−] for the **second figure the value "12" for the recommended seed rate reduction when creating tramlines.**

Display for pneumatic **seed drills** with **seed rate reduction when creating tramlines with 12 % seed rate reduction**

km/h

$$5 : 12$$

✓ Error ⌨ ◎↓ ⌄ ≣≣
1/min
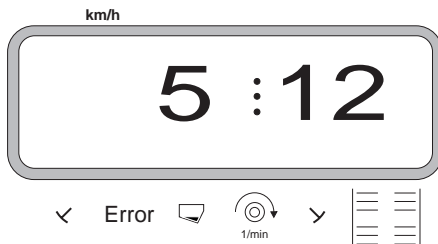
The first figure shows the selected Mode "5", the "12" says, that the seed rate is reduced by 12 % when creating tramlines.

- Press key [Eingabe Input] and thus store the selected value, e. g. "12".

7. Mode "6", Seed rate remote control yes=1 / no=0

Enter **"mode "6""** to instruct "AMADOS-II" whether the seed drill has been equipped with (=01) or without (=00) a seed rate remote control.

✋ **Whenever calling on and off the seed rate adjustment simultaneously a l l !!! data stored in the "AMADOS-II" are eradicated (implement-specific data, hectare meter etc.). This should especially be considered when retrofitting a seed rate adjustment or when calling off the seed rate adjustment. Before conducting a change imperatively write down all important data.**

- Press key [MOD] and select mode "6".

  Count up the mode by actuating the MOD-key.

Display after selecting Mode "6"

km/h

$$6 : 01$$

✓ Error ⌨ ◎↓ ⌄ ≣≣
1/min
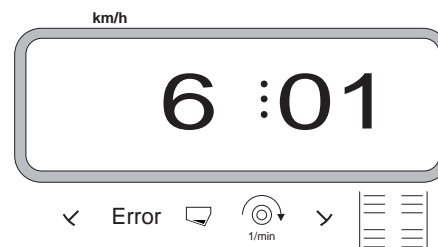
The first figure shows the selected Mode "6", the figure "01" says, that the seed drill is equipped with a seed rate remote control.

- Via the keys [↑+] or [↓−] select the coding "00" or "01" on the display.

- Press key [Eingabe Input] and thus store the selected value, e. g. "01".

☞ **After calling up the seed rate adjustment the setting motor drives the gearbox setting lever on the scale of the two range gearbox into position "0". Now the display shows for a few seconds the programming date.**

- After the programming date has vanished switch off "**AMADOS-II**" and connect to implement plug.

- Before entering a further implement-specific data first calibrate the setting motor (see para. 3.2.3.2).

3.2.3.2   Calibrating setting motor (only at seed drills w i t h seed rate adjustment)

☞   **For the calibration procedure "AMADOS-II" and the implement plug must be connected to one another.**

✋   **The calibration procedure should be conducted at the machine when stationary.**

Procedure for calibrating:

- Switch on **"AMADOS-II"** in order that the setting motor moves the gearbox setting lever to position „0" on the scale of the two-range gearbox.

✋   **When the gearbox setting lever is in Position „0" the light emitting diode (LED) has to light up on the zero-position sensor. If this is not the case, please proceed as described in para. 3.2.6.**

- Press key $\boxed{\circ\!\!\!-\!\!\!\rightharpoondown}$, hold it pressed and

  simultaneously press key $\boxed{C}$ thus starting the

  calibration procedure.

  The value „0" appears on the display. This value shows the gearbox setting lever position on the scale of the two range gearbox.

- $\boxed{\overset{\uparrow}{+}}$ keep pressed until on the display the gearbox

  setting lever position „**98**" will be shown.

- Press $\boxed{\text{Eingabe Input}}$ and the calibration procedure is

  terminated.

- Compare the gearbox setting position shown on the display with the gearbox setting position on the scale of the two-range gearbox (see para. 3.2.3.2.1).

3.2.3.2.1 Compare displayed and actual gearbox setting lever position (only on seed drills w i t h seed rate adjustment)

- Press key $\boxed{\circ\!\!\!-\!\!\!\rightharpoondown}$ and on the display the actual

  gearbox setting lever position can be read off.

- Pre-dial by the keys $\boxed{\overset{\uparrow}{+}}$ or $\boxed{\overset{\downarrow}{-}}$ the gearbox

  setting lever position "**50**" on the display.

- Press $\boxed{\text{Eingabe Input}}$ and thus store the pre-dialed value

  "**50**". Simultaneously the electric setting motor moves the gearbox setting lever onto this pre-selected position.

- The gearbox setting lever position "**50**" shown on the display and the actual gearbox setting leve r position shown on the scale of the two-range gearbox should be compared.

  In case of deviations between the shown and the actual gearbox setting lever position the electric setting motor should be newly calibrated. See para. 3.2.3.2.2.

3.2.3.2.2 Deviations between displayed and actual gearbox setting lever position

Example 1: **The value for the actual gearbox setting lever position is higher than the value shown on the display**

shown gearbox setting lever position: "**50**"
actual gearbox setting lever position: "**51**"

How to conduct a new calibration procedure:

- Switch off and on **"AMADOS-II"**. The setting motor drives the gearbox setting lever on the scale of the two range gearbox in position „0".

- Press key [⊶⟩] , hold it pressed and simultaneously press key [**C**] thus starting the calibration procedure.

  The value „0" appears on the display.

- [↑ +] keep pressed until on the display the gearbox setting lever position "**97**" will be shown.

- Press [Eingabe Input] and the calibration procedure is terminated.

- Compare the gearbox setting position shown on the display with the gearbox setting position on the scale of the two-range gearbox.

  If the shown and actual setting lever position still does not coincide, repeat correspondingly the calibration procedure.

Example 2: **The value for the actual gearbox setting lever position is smaller than that shown on the display**

shown gearbox setting lever position: "**50**"
actual gearbox setting lever position: "**49**"

How to conduct a new calibration procedure:

- Switch off and on **"AMADOS-II"**. The setting motor drives the gearbox setting lever on the scale of the two range gearbox in position „0".

- Press key [⊶⟩] , hold it pressed and simultaneously press key [**C**] thus starting the calibration procedure.

  The value „0" appears on the display.

- [↑ +] keep pressed until on the display the gearbox setting lever position „**99**" will be shown.

- Press [Eingabe Input] and the calibration procedure is terminated.

- Compare the gearbox setting position shown on the display with the gearbox setting position on the scale of the two-range gearbox.

  If the shown and actual setting lever position still does not coincide, repeat correspondingly the calibration procedure.

3.2.3.3   Entering the implement-specific data

3.2.3.3.1 Calibrating distance sensor

For determening the actual forward speed **"AMADOS-II"** required the value "Imp./100m", which sensor "X" releases to **"AMADOS-II"** when driving down a calibration distance of 100 m.

For entering the calibration value "Imp./100 m" two possibilities are given:

• the value "Impl./100 m" is known and is dialed via the key board.
• the value "Impl./100 m" is not known and will be determined by driving down a pre-measured distance.

> **As the calibration figure "Imp./100m" is ground dependent it is, in case of soil types which are heavily deviating from one another, recommended to determine the calibration figure always newly.**

1.   The value "Imp./100 m" is known

> **The calibration figure "Imp./100m" depends on:**
>
> • **the seed drill type used.**
> • **the place the sensor has been fixed to.**
> • **the prevailing soil conditions.**

Proceed as follows:

- Press | Imp. 100 m | (with stationary vehicle).

- Take the calibration figure "Imp./100m" from the adjacent table 3.6 and dial via key | ↑ + | or

| ↓ − | .

Display of the dialed calibration figure

km/h

1053

✓ Error ⌑ ◎ 1/min ❯ ☰☰
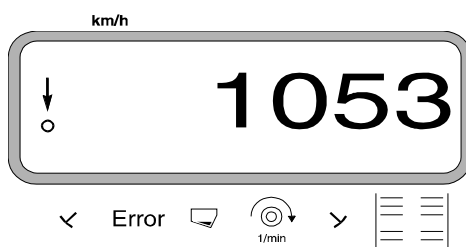
- Press | Eingabe Input | and this way store the dialed calibration figure.

- Press | Imp. 100 m | once again and check the stored calibration figure. On the display now the dialed calibration figure must show up.

> **The calibration figures as stated in table 3.6 are mean figures determined in practice.**
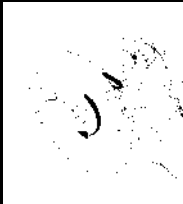
> **In case of deviations between**
>
> • **the sown seed rate and the actually worked area**
> • **the displayed area determined by AMADOS-II and the actual worked area**
>
> **newly determine the calibration figure by driving along a calibration distance of 100 m (please refer to para. 3.2.3.3.1 point 2).**
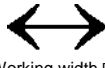
Table 3.6: Calibration figures "Imp./100m" determined in practice in dependence of the seed drill type and the place of the sensor fixing as well as the corresponding number of crank turns for conducting the calibration test.

- **AD 2, AD 3, AD-P2, AD-PL2, RP-AD2/RP-AD-P2, RP-AD 3, RP-AD-PL2, FRS and FPS**

Working-width [m]	Pack Top - seed drills		Tyre packer pack top-seed drills		Front frame seed tank FRS / Front packer seed tank FPS		Pack Top - seed drills	Tyre packer pack top-seed drills
	AD 2 / AD-P 2	AD-PL 2	RP-AD 2 / RP-AD-P 2	RP-AD-PL 2			AD 3	RP-AD 3
	Number of crank turns							
	on the star wheel Ø 1,18	on the star wheel Ø 0,65	on the intermediate drive		on the gearbox		on the star wheel	on the intermediate drive
	1/40 ha							
2,5	27,0	-	59,0		-		27,0	59,0
3,0	22,5	38,5	49,0		67,5		22,5	49,0
4,0	17,0	-	37,0		50,5		17,0	37,0
4,5	15,0	-	33,0		45,0		15,0	33,0
6,0	-	-	24,5		34,0		-	-
Sensor-fixed to			**gearbox**					
					FPS	FRS		
AMADOS-Impulses / 100 m	1053	1331	1175	1410	326	326	617	672

Tab36.doc

- **D8 Special, D8 Super, MD 8, D9 Special and D9 Super**

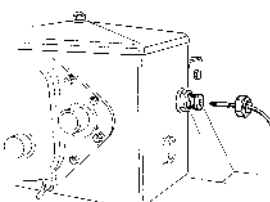| Tyres	Working width [m]	Crank turns on wheel		D9 Super, D9 Special	AMADOS Impulses / 100 m (mean value)
		D8 Special, D8 Super und MD 8			
		1/40 ha	1/10 ha	1/40 ha	
5.00 - 16	2,5	49,5	197,0	-	1733
	3,0	41,0	164,0	-	1723
6.00 - 16	2,5	46,0	185,0	-	1610
	2,5	-	-	46,0	740
	3,0	38,5	154,0	-	1618
	3,0	-	-	38,5	740
10.0/75 - 15	3,0	37,0	149,0	-	1555
	3,0	-	-	37,0	711
	4,0	28,0	112,0	-	1568
	4,0	-	-	28,0	711
31x15.50 - 15	3,0	36,0	144,0	-	1513
	4,0	27,0	108,0	-	1512
	6,0	18,0	72,0	-	1512
31x15.5 - 15 Mitas	3,0	-	-	37,0	711
	4,0	-	-	28,0	711
11.5/80 - 15	4,5	22,0	88,0	-	1366
	6,0	16,5	66,0	-	1386

2.   The value "Imp./100 m" is known

- Measure accurately a calibration distance of 100 m in the field. Mark the start- and ending point of the calibration distance.

- Bring the vehicle into starting position and the seed drill into working position (perhaps interrupt the seed metering).
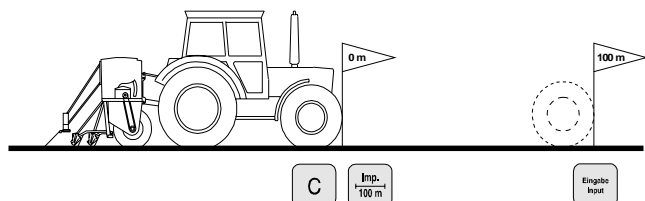
- Press key **C** and hold it by simultaneously pressing key **Imp. / 100 m** .

- Drive accurately along the calibration distance from the starting- to the end point (when starting to move the counter jumps back to "0"). Hereby the display shows the continuously determined impulses. (During the calibration run the keys "C" and "Imp./100m" should not be pressed.

Display during the calibration test

- Stop after 100 m. On the display now the number of impulses (e. g. 1005) is shown which had been determined while travelling the calibration distance (100 m).

- Press key **Eingabe Input** and this way store the displayed determined calibration figure (Imp./100 m).

- Press key **Imp. / 100 m** once again and check the calibration figure. The display should now show the determined calibration figure, e.g. 1005 Imp./100 m.

Display of the determined calibration figure
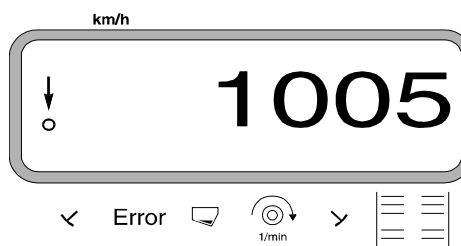
- Enter the determined calibration figure into table 3.7.

Table 3.7:   Ground dependent calibration figure "Imp./100m"

Type of soil	Impulses/100m	number of crank turns
soft soil		
medium soil		
hard soil		

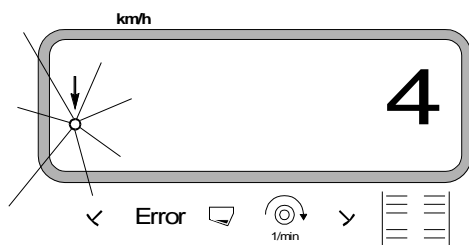✋   **If the calibration figure has been determined by travelling a calibration distance, imperatively convert accordingly the necessary numbers of crank turns mentioned in table 3.6.**

c) Conversion of the number of crank turns

Example:

Type of seed drill:	AD 2 / AD-P 2
Working width:	3 m
Imp./100m (actual):	1005
Imp./100m (table 3.6):	1053
Number of crank turns (Table 3.6):	22,5
Number of crank turns (actual):	?

Crank turns (actual) = crank turns (Tab. 2) x convers.factor

$$\text{Conversion factor} = \frac{\text{Imp./100m (actual)}}{\text{Imp./100m (table 3.6)}}$$

$$\text{Conversion factor} = \frac{1005}{1053} = 0{,}95$$

Number of crank turns (actual) = 22,5 x 0,95 = 21,4

3.2.3.3.2 Enter the working width

For determining the worked area **"AMADOS-II"** requires the information of the working width. To enable it enter the working width as follows:

- Press key ⌐m¬ **.**

- Dial the value by pressing keys ↑+ or ↓−

  e.g. "3.00" for 3 m working width.

Display working width

km/h

3.00

✓ Error ▭ ◎ 1/min ⟩ ☰☰☰
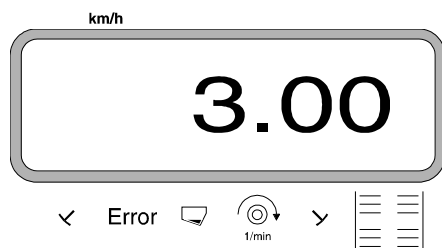
- Press key ┃Eingabe Input┃ and store the selected value.

- Press key ⌐m¬ once again and check stored

  value. The display must now show the chosen value, e. g. "3.00".

3.2.3.3.3 Enter the seed rate value
(only on seed drills <u>with</u> seed rate remote control)

✋ **The desired seed rate can only be entered on the machine stationary.**

- Press key ┃100% kg/ha┃ .

- Dial the desired seed rate value via the keys ↑+

  or ↓− on the display (e. g. 200 for 200 kg/ha).

- Press key ┃Eingabe Input┃ and store the dialed value (200).

- Press key ┃100% kg/ha┃ once again and theck the

  stored value. The display must then show the figure "200".

Display of the seed rate value

km/h

200.00

✓ Error ▭ ◎ 1/min ⟩ ☰☰☰
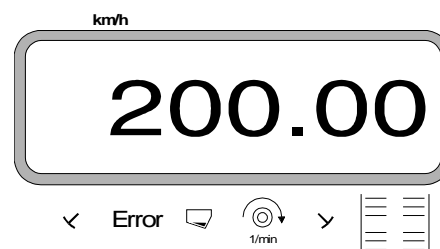
- Conduct a calibration test.

✋ **In case of changing the seed material conduct a new calibration test.**

✋ **In case of changing the seed rate by more than 50 % it is recommended to conduct a new calibration test.**

☞ **On seed drills with seed rate remote control the seed rate can be adjusted during**

  sowing by the keys ┃+ 10%┃ or ┃− 10%┃ in

  +/- 10% steps (depending on the selected coding, please refer to para. 3.2.4.3).

3.2.3.3.4 Conducting the calibration test

1.   Conducting the calibration test for seed drills without seed rate remote control

-   Converting the required amount of seed [kg/ha] for the desired seed rate [kg/ha].

$$\frac{\text{desired seed rate [kg/ha]}}{40} = \text{required calibration weight [kg]}$$

Example:
Desired seed rate: 200 kg/ha
Required calibrating amount: 5 kg

-   Determine as usual the necessary gearbox setting for the desired seed rate .
-   As usual calibrate the seed drill for 1/40 ha.

2.   Conducting the calibration test for seed drills with seed rate remote control

✋ **On pneumatic seed drills with seed rate reduction when creating tramlines ensure prior to the calibration test that the tramline counter does not stand on "0" (creating tramoines).**

Example:
entered seed rate nominal value: e.g. 200 kg/ha

-   Press key [○→⬚] .

-   Via the keye [↑ +] or [↓ −] pre-select a gearbox setting lever position (e.g. "50") on the display which is usual for the seed material to be sown (preferedly for grain "50" and for rape "10").

Display of the gearbox setting lever position

km/h

$$50$$

✕   Error   ⬚   ◎↓ 1/min   ⟩   ☰☰
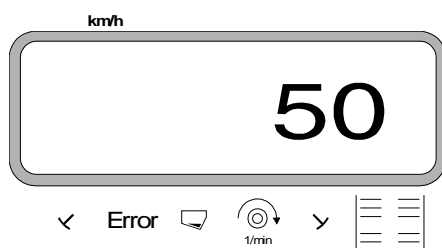
-   Press key [Eingabe Input] and store the entered value, e. g. "50". On the display it should continue to read the figure "50" and the electric setting motor moves the gearbox setting lever on the scale at the two-range gearbox into the position "50".

-   Newly start order - by pressing of the keys [Eingabe Input] , hold it pressed and simultaneously press key [C] . At the same time the hectare meter for the part area will be set to "0".

-   Start the **first calibration test** starten. For this press key [Cal. kg/ 1/40 ha] , keep pressed and simultaneously press key [C] .

-   As usual calibrate the seed drill for minimum 1/40 ha.
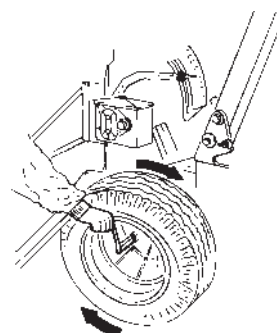
✋ **When calibrating, the calibration area will be determined. For this calibration area the required calibration rate will be automatically calculated and continuously displayed on the display. Even beyond 1/40 ha.**

When the calibrated area of 1/40 ha is achieved, honk signals sound.

-   Terminate the calibration test only after the audible signal.

Display after termination the calibration test

km/h

$$5.0000$$

✕   Error   ⬚   ◎↓ 1/min   ⟩   ☰☰
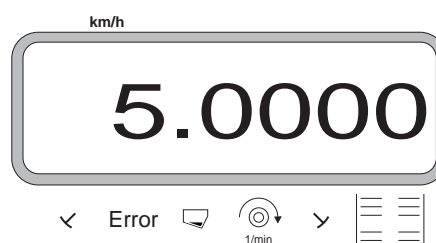
☞ **The display now shows the required calibration rate [kg] which has been automatically calculated for the calibration area and the entered seed rate.**

- Weigh the seed collected (e.g. 4,5 kg). (Consider the net weight of the bucket!).
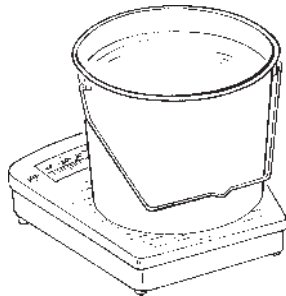
- Basing on the shown value, select the weight of the collected calibration rate by the keys ⬆+ or ⬇− .

  e.g., basing on the value "5.0000" for 5 kg (for nominal seed rate value 200 kg/ha), select the value "4.5000" for a collected calibration rate of 4,5 kg on the display.

Display of the collected, selected calibration rate

km/h

4.5000

⟨ Error ⬜ ◎↓ 1/min ⟩ ≣≣
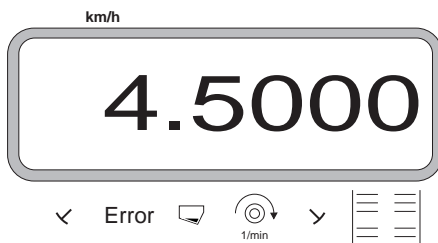
- Press key [Eingabe Input] and thus store. By this value **"AMADOS-II"** automatically calculates the new setting lever position. The electric setting motor moves the gearbox setting lever into this position.

☞ **If the fault message "ERROR 1" is shown, the desired seed rate is not achieved. By changing the pinions in the two range gearbox this fault can possibly be remedied.**

- **Check this new gearbox setting lever position by a new calibration test.** Repeat this procedure as long as the collected and the required calibration rate coincide.

Display after termination of the calibration test

km/h

5.0000

⟨ Error ⬜ ◎↓ 1/min ⟩ ≣≣
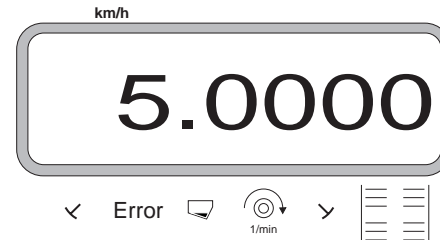
- **If the collected and the wanted calibration rate coincide,** press key [Eingabe Input] and thus store this value.

- **If the actual and the required calibration rate coincide**, wait at least 5 seconds and then press key [Eingabe Input] for storing this value.

✋ **For checking the calibration test repeat this test after 2 - 3 seed box fillings. In case of deviations of this calibration test, repeat until the collected and the required calibration amount coincide.**

3.2.3.3.5 Programming tramline rhythm

The spacing of the tramlines depends on the working width of the seed drill and of the later used machinery such as, e. g.

- fertiliser broadcaster and/or
- field sprayer.

Depending on the working widths of those machinery it is necessary to be able to create tramlines in varying spacings to one another.

The rhythm in which the seed drill creates tramlines is controlled by the switch box of the automatic marker change over. The various tramline systems are described in the seed drill's instruction book.

Example:

Seed drill:	**3 m** working width
Fertiliser broad-caster/Field sprayer:	**24 m** working width = **24 m** tramline spacing

- Please look up the chapter "metering wheel-tramlining control" of the seed drill's instruction book.

Table 3.8:   **Extract of the instruction book "seed drill"**

A	B	C	D
Working width of the seed drill	Tramline spacing	Switching rhythm	Tramline counter, controlled and displayed by "AMADOS-II"

- Look up in the mentioned tables the line in which the seed drill working width **(3 m)** and the tramline spacing **(24 m)** are mentioned side by side.

- Read off control-rhythmus **"8"** (table 3.8).

- Press key [STOP] and the display shows the

  present tramlining rhythm.

Display actual switching rhythm and tramline counter
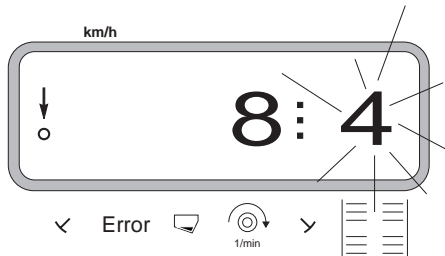
The first figure (8) shows the chosen switching rhythm.
The second, flicking figure (4) shows the actual position
of the tramline counter.

- Preselect the required switching rhythm (e.g. 8) via

  the keys [+] or [−] .

- Press key [Eingabe Input] and store the pre-selected value

  "8". Thereafter the following display is shown:

Display with newly entered switching rhythm
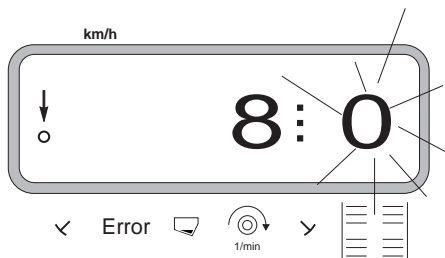
- Press key [STOP] once again so that the second

  figure (0) stops flicking.

☞ **Table 3.9 shows the switching rhythms
    possible with "AMADOS-II" .**

Table 3.9:   Possible tramline rhythms:

Switching rhythm	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Tramline counter, controlled and displayed by the on-board computer	0	0	0	0	0	0	0	0	0	1	1	0	0	0
	1	0	1	1	1	1	1	1	1	2	0	1	1	1
		1	2	2	2	2	2	2	2	3	3	2	2	2
		2		3	3	3	3	3	3	0	4	3	3	3
					4	4	4	4	4	5	5	4	4	4
						5	5	5	5	6	6	5	5	5
							6	6	6	0	7	6	6	6
								7	7	8	8	7	7	7
									8	9	0	8	8	8
										10	10	9	9	9
												10	10	10
												11	11	11
													12	12
														13

				Double tramlining system										
Switching rhythm	15*	16	17	18 r. h.	18 l. h.	19 r. h.	19 l. h.	20	21	22	23	24	25	26
Tramline counter, controlled and displayed by the on-board computer	1	0	0	1	1	1	1	0	0	0	0	1	1	0
	2	1	1	2	2	2	2	1	0	0	0	0 R	0 R	1
	3	2	2	3	0	0	3	2	1	1	1	3	3	2
	4	3	3	4	4	4	4	3	2	2	2	0 L	4	3
	5	4	4	5	5	5	5	4	3	3	3	5	5	4
	6	5	5	6	6	6	6	5	4	4	4	6	0 L	5
	7	6	6	0	0	0	0	6		5	5	0 L	7	6
	8	7	7	8	8	8	8	7		6	6	8	8	7
	9	8	8	9	9	9	9	8			7	0 R	0 L	8
	10	9	9	10	10	10	10	9			8	10	10	9
	11	10	10	11	11	11	11						11	10
	12	11	11	0	0	0	0						12	
	13	12	12	13	13	13	13						0 R	
	14	13	13	14	14	14	14						14	
	15	14	14	15	15	15	15							
		15	15	16	0	0	16							
			16	17	17	17	17							
				18	18	18	18							

*   no tramlines are created

Switching rhythm	27
Tramline counter, controlled and displayed by the on-board computer	1
	0 R
	3
	4
	0 L
	0 L
	7
	8
	0 R
	10

3.2.3.3.6 Creating interval tramlines
          (not possible with pneumatic seed drills)

Interval tramlines are tramlines in which sown and not sown areas alternates within the tramlines to be created. Select on the display the lengths of the sown and not sown areas in [m].

Switching on and off the interval tramlines is done by the key [⊟] .

Display after pressing key interval tramling
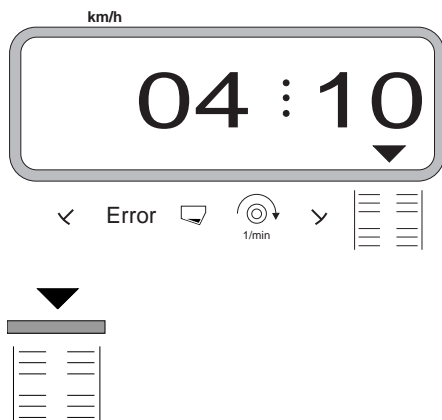
When the interval tramline had been switched on, the triangular symbol is shown above the interval-tramline symbol.

Procedure for creating interval tramlines:

- Press keys [≣] . Now the interval tramline switching has been switched on and on the display are shown two figure blocks, separated by three points, e. g. **4.10**. The figures say that when creating tramlines sown areas of **4 m** and areas not sown of **10 m** will alternate.

- Via the keys [↑+] or [↓−] select the lengths of the sown and not sown areas.

- Press key [Eingabe Input] and thus store the selected values.

☞ **When the interval switching has been switched on the monitoring of the counter shaft is switched off.**

3.2.4   Putting into operation in the field

3.2.4.1   Conducting the start function

For starting the operation simultaneously press the

[Eingabe Input] [C] keys.
Start

The memory for the hectare meter - part area [ha] returns automatically to "0".

While sowing the display shows the actual seed rate [kg/ha] or the actual travelling speed [km/h] and the actual tramline counter.

Operational display for seed drills **with** seed rate remote control

km/h

↓
o
180 : 3
▼

✓ Error ⟥ ⊚↓ ⋎ ☰
          1/min

• On seed drills **with** seed rate remote control the actual seed rate is shown in the display, e. g. 180 kg/ha.

Operational display for seed drills **without** seed rate remote control

km/h

↓
o
6.9 : 3
▼

✓ Error ⟥ ⊚↓ ⋎ ☰
          1/min

• On seed drills **without** seed rate remote control the actual travelling speed is shown in the display, e. g. 6.9 for 6.9 k.p.h.
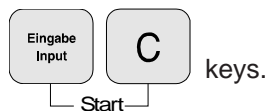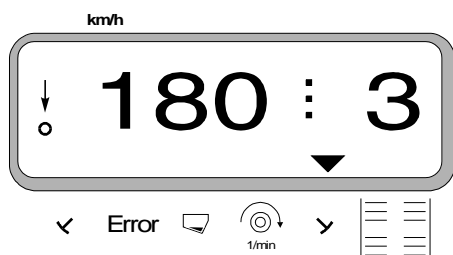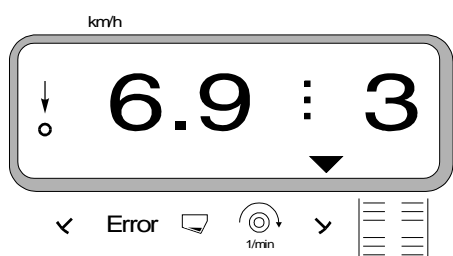
: 3

• Further the actual position of the tramline counter is shown in the display, e. g. 3.

✋   **Before starting the sowing operation check the position of the tramline counter (see para. 3.2.4.2).**

↓
o

The vertical arrow with the flicking circle below is shown when the gearbox sensor sends impulses to **"AMADOS-II",** i.e. the seed drill has been lowered into operational position and is being pulled across the field.

☞   **At every track marker change a honking signal sounds.**

3.2.4.2   Shifting on tramline counter

- For the correct creation of tramlines the tramline counter should be advanced prior to starting the

     operation via key [☰+1] and select this way the

     figure, which under the word **"START"** is shown (for this please see para. 3.2.3.3.5), e. g. **"4"**.

Display when advancing the tramline counter stationary

km/h

↓
o
8 : 4

✓ Error ⟥ ⊚↓ ⋎ ☰
          1/min
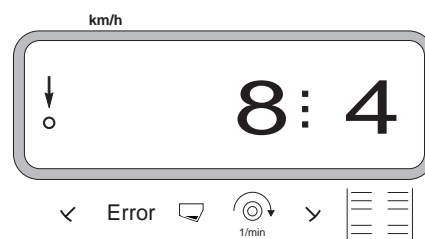
☞   **The hydraulically actuated marker change over for the markers is coupled with the sensor for the tramlining control. Pay attantion that the automatic marker change over lowers the desired marker disc when the tramline counter is set on the correct figure. If necessary, shift the automatic marker once more.**

Advancing the tramline counter is done on seed drills

• **with markers** via the hydraulically actuated automatic marker change over. The necessary informations for advancing receives "AMADOS-II" when changing the markers over from the sensor which is coupled to the automatic marker change over.

• **without marker** change over as soon as the forward speed sensor (gear box sensor) does not supply any further impulses any more. This is the case when lifting the seed drill at the head lands but also when stopping in the middle of a field.

3.2.4.3 Changing the seed rate during the sowing operation

At **seed drills w i t h seed rate adjustment** the seed rate can be changed according to changing soil conditions during the sowing operation in increments of +/- 1 %, 10 %, 20 % or 30 % via the keys $\boxed{\begin{array}{c}+\\10\%\end{array}}$ or $\boxed{\begin{array}{c}-\\10\%\end{array}}$ at the **"AMADOS-II".** In this case **"AMADOS-II"** sets/adjusts the seed rate by the electric setting motor on the two-range gearbox.

The desired increment by which the change of the seed rate shall be conducted by pressing keys $\boxed{\begin{array}{c}+\\10\%\end{array}}$ or

$\boxed{\begin{array}{c}-\\10\%\end{array}}$, will be determined via the chosen coding "implement type" under mode "1" (see para 3.2.3.1, point 2).

3.2.4.3 Important hints when the sowing operation is interrupted or when folding the track marker during the sowing operation (Stop-key)

If becomes necessary to **interrupt** the **sowing operation** on seed drills **without** track marker :

• because of stopping in the field,
• because the seed drill is lifted (e.g. when giving way to obstacles)

or

when it becomes necessary to **fold the track markers** on seed drills **with** track markers (e. g. for giving way obstacles),

unconditionally press key $\boxed{\text{STOP}}$ **before interrupting the sowing operation** or before **folding the track markers** in order to avoid an unintended switching on of the tramline counter.

Display after pressing stop key
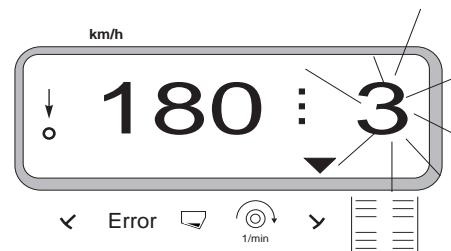
☞ **After pressing key** $\boxed{\text{STOP}}$ **the tramline counter blinks in the operational display.**

- Directly after continuing the sowing operation or after unfolding the track markers, again press key $\boxed{\text{STOP}}$ so that the tramline counter in the operational display does not blink any longer.

3.2.4.5 Commenting the possible situation displays

Situation display seed drill
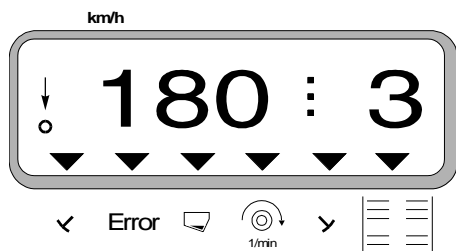
Interval tramlining control is switched on.

Marker "r. h." in operational position (only D8/AD/MD8).

The wanted rev's are exceeded or undercut by more than 10 %.

Seed box is empty.

Error

Error 1	means	error in gearbox position
Error 2	means	error metering shaft
Error 3	means	error counter shaft r.h.
Error 4	means	error counter shaft l.h.
Error 5	means	setting motor does not react

Marker "l.h." in operational position
(only D8/ AD/ MD8).

3.2.4.6 Function-keys and their use during the sowing operation

By pressing one of the following function keys for approx. 10 seconds the wanted value will be displayed. Thereafter the computer automatically switches back into the "operation display".
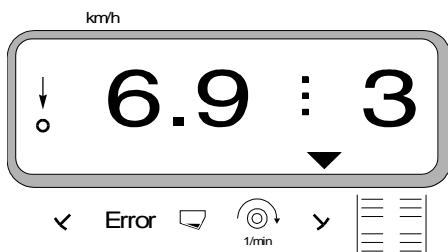
3.2.4.6.1 Forward speed k.p.h.

After pressing key [km/h] the momentary forward speed is displayed in [k.p.h.].

Display after pressind key "km/h"

km/h

$\downarrow$ $\circ$ 6.9 : 3 ▼

✓ Error ⬚ ◎↓ 1/min ⟩ ☰☰

3.2.4.6.2 Hectare meter

1. Hectare meter - Part area

After **one-time** pressing key [ha / Σha] the covered part area in [ha] is displayed, which has been covered since actuating the "start function".

☞ **Only the covered area will be determined at which the fertiliser broadcaster had been in operating position.**

Display after **one-time** pressing the key

km/h

$\downarrow$ $\circ$ 10.5116

✓ Error ⬚ ◎↓ 1/min ⟩ ☰☰

2. Hectare meter - Total area

After **two-times** pressing the key [ha / Σha] the total area in [ha], e.g. of one season, is displayed.

Display after **two-times** pressing the key

km/h

$\downarrow$ $\circ$ 105.11

✓ Error ⬚ ◎↓ 1/min ⟩ ☰☰

2.1 Set memory for hectare meter - total area to "0"

Set memory for the hectare meter - total area via a reset to "0".

Press [C] and hold it pressed while pressing "0", release key.

✋ **A reset will eradicate all !!! memorised data from the AMADOS-II. Therefore, prior to resetting it is imperative to write down all important data.**

3.2.4.6.3 Monitoring the blower fan speed

By pressing key [⊚ 1/min] the blower fan speed will be displayed.

Depending on the pre-chosen wanted speed **"AMADOS-II"** checks the blower fan speed. If **the wanted speed is exceeded or undercut by more than 10 %** an audible signal is given and in the display the black triangle above the rev-symbol blinks.

Display when exceeding or undercutting the rated speed

For selecting the rated speed for the speed monitoring, two possibilities are provided:

• the actual speed becomed the rated speed.
• the rated speed is selected directly via the key-board.

☞ **The rev-speed monitoring is only active in operating position.**

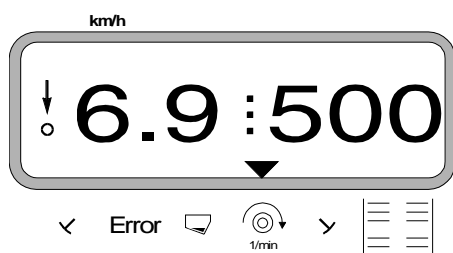☞ **If the rev-speed of the relevant shaft shall not be monitored any longer, the rev-speed monitoring should be switched off.**

1. The actual speed becomes the rated speed

Entering the rated speed

- Drive the shaft to be monitored with the desired rated speed (e. g. 540 min^{-1}).

- Press key [⊚ 1/min] and the actual speed is shown in the display. If the shown speed is equal the rated speed, press key [Eingabe Input] and store this speed as rated value.

Switch off speed monitoring

Switch off monitoring of the speed at a **stand still of the blower fan** as follows:

- First press key [⊚ 1/min] and then key [Eingabe Input] .
  The display shows a "0" for the actual speed which is stored as new rated value.

2. Entering the rated speed via the key pad

Entering the rated speed

- Press key [⊚ 1/min] and hold it pressed while pressing
  [C] . The display shows the set rated speed.

- Change the rated speed via the keys [↑ +] or
  [↓ _] .

- Press key [Eingabe Input] and store the dialed rated speed.

Switching off the speed monitoring

- Press key [⊚ 1/min] and hold it pressed while pressing
  [C] . The display shows the set rated speed.

- Via key [↓ _] dial the rated speed "0".

- Press key [Eingabe Input] and store the new rated speed "0".

3.2.5 Fault messages

When using the "AMADOS-II" on-board-computer, the following fault messages (error messages) may occur:

Table 3.10: Fault messages on the seed drill

Error code	Cause	Remedy
1	faulty gearbox setting/ rated value too high	- reduce rated value (see para. 3.2.3.3.3) - new calibration (see para. 3.2.3.2)
2	fault at metering wheel shaft	- check, whether the metering wheel shaft is rotating.
3	fault at countershaft, right	- check whether the countershaft (right) turns.
4	fault at countershaft, left	- check whether the countershaft (left) turns.
13	no reaction at servomotor	- check the mode (see para. 3.2.3.1 point 7). - check power supply for computer - check function of servo motor

3.2.6 Fault table - seed drill

Fault	Cause	Remedy

Computer failure	Inadequate power supply	- Plug on battery connection cable is not inserted far enough
		
		- Check plug or fuse for signs of corrosion
		  - Remove corrosion
		
		- Check tractor battery leads:
		  - Remove signs of corrosion
		  - Use terminal grease
		
		- Check battery lead for secure fit
		
		- Repair or replace damaged cables
		
		- Voltage drop of tractor battery whilst under load:
		  - Ensure computer has a constant supply of 12V d.c.

AMFÜME (special option) gives no warning for insufficient seed material	Sensor is incorrectly fitted	- Sensor is too close to a metal surface - Reset sensor. When the seed box is emtpy, the LED must not be illuminated

	Sensor is w. o. power	- LED does not light up when sensor is in contact with the seed
		  - Repair sensor cable or replace sensor.
		  - Check cable in distributor box for secure fit
		  - Clean corroded cable connections
		  - Check supply cables with test lamp (see cable diagram)

Sensor LED on the AMFÜME (special option) goes out when insufficient seed is available. The computer fails to give a warning.	The "AMADOS" supplies fault messages only during travel. Check "gearbox" sensor for possible mal-function.	- Check supply cables with test lamp (see cable diagram)
		
		- Repair sensor cable of replace sensor
		
		- Using the cable diagram, check whether "bridges" in "AMFÜME" distributor box are correctly connected.
		  - Check whether the signal wire in the distributor box is correctly connected
		  - Remove signs of corrosion from connections

Fault	Cause	Remedy

With tramline counter = [0] (create tramlines) no tramlines are being created
 	
Error "3" flashes
	Coupling is not drawn towards solenoid	- Check whether cable plug-in connections are correctly plugged into the solenoid?
		  - Ensure secure fit of plug-in connections. The choice of connections is arbitrary.
		
		- Remove corrosion from plugs.
		
		- Release jammed solenoids by hand or if necessary, replace.
		
		- Check connection leads with test lamp (see cable diagram)
		  - replace damaged cables.

	Coupling is drawn towards solenoid, but does not click into the ratchet of the clutch.	- Remove dirt or corrosion from solenoid. until solenoid makes an audible connection. - Move solenoid within the slots of the cartridge. - Straighten out bent coupling.

Despite tramline counter = [1] - [2] - [3] etc. tramlines are being created
 	
Error "3" flashes.
	Solenoid is drawn but does not move.	- Remove dirt and corrosion Release solenoid.
		
		- Check solenoid leads with test lamp
		
		  - cables must be without current
		  - straighten out bent coupling
		  - Readjust solenoid.

Error "3" flashes without apparent reason. During fast travel, this message occurs more frequently.	Layshaft sensor is too far from or too close to the gear wheel.
	
	The gear wheel may be running out of true.
		- Sensor LED does not light up during work process.
		  - Readjust distance between chain wheel and sensor (approx. 2 mm).
		  - Repair damaged sensor leads or replace sensor.
		  - Check cable in distributor box for secure fit.

| Fault	Cause	Remedy
Control rhythm is not automatically advanced.	Malfunctioning sensor on marker unit. Check "MOD" in AMADOS:: "01" means "marker unit exists" and 10 % increment when changing seed rate. "11" means "without marker unit" and 10 % increment when changing seed rate	- Check for correct fitting of sensor and magnets. - Repair damaged cables or replace sensor.
Display of gearbox setting (on scale) and display on "AMADOS" do not agree.	The zero-sensor for identifying zero-point of seed rate adjustment is out of position.	- Sensor must be adjusted so that the tip of the setting lever points to "0" (scale on the machine) and the LED of the zero-sensor just lights up.
Motor for seed rate adjustment uatomatically drifts from the value set for the calibration test. This happens at the precise moment when first starting to turn the crank handle.	At the start of the calibration test, set the motor at a position suitable for the seed used. Then commence the physical test without starting the calibration process.	- For the calibration test the motor is set on a suitable position. Press "Input" and "C" simultaneously (fresh start). Subsequently press "Cal" (kg per 1/40 ha) and "C" simultaneously. The calibration test can not commence.
The "AMADOS" fails to calculate the seed rate of 1/40 ha per kg/ha.	The "AMADOS" does this only once after a fresh start.	- This calculation is done by "AMADOS" computer only for the first time after starting a fresh job.
Engine speed monitor fails to give a warning if the preset revs fall short by 10 %.	Warnings are given only when movement can be identified (more than 1.1 kph).	- Check fault message once more whilst travelling.
"AMADOS" fails do accept distance impuses despite incoming signals.	Following a reset (after switching on the computer, press "0" and "C" simultaneously and keep depressed for approx. 21 secs) the computer displays "1800" as the number of impuses per 100 metres.	- Confirm this value (1800) with the "input" key. The number of impuses are best determined in a calibration drive.
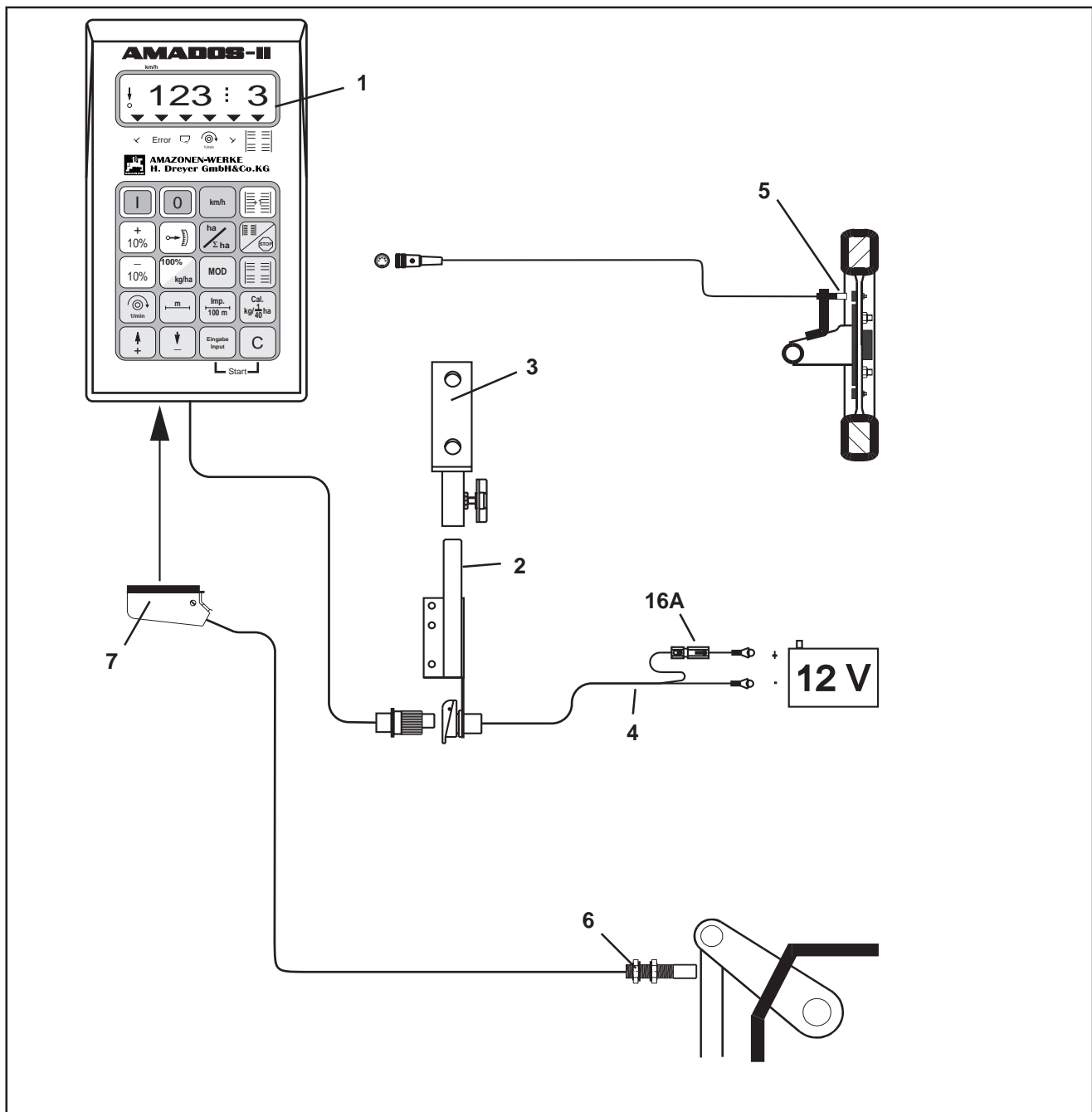
Fig. 3.4

3.3 Operation mode "Hectare meter"

Using **"AMADOS-II"** as a pure hectare meter, e. g. on soil tillage implements:

- shows the actual forward speed in [k.p.h.]
- functions as a hectare meter and
  - determines the finished part area in hectares [ha],
  - stores the finished total area in hectares [ha].
- monitores the speed of a drive shaft equipped with a rev. speed sensor. If the rated value is exceeded or undercut by more than 10 % an audible alarm sounds off and simultaneously the display changes alternatively from "operation display" to "fault display" (please see para. 3.3.4.2.3).

"AMADOS-II" consists in the main of:

Fig. 3.4/...

- 1 - Calculator
- 2 - Base console with bracket (3).
- 3 - Bracket.
- 4 - Battery power cable.
- 5 - Sensor "X" cardan shaft/wheel for the determination of the distance travelled.
- 6 - Sensor "Y" for determination of the operational position.
- 7 - Implement plug.

The **Sensor "Y"** for determination of the operational position will be connected directly with the **"AMADOS-II"** via the implement plug (3.4/7) .

3.3.1   In General

3.3.1.1   AMADOS-II on/off switching

By pressing key [**I**] **"AMADOS-II"** is switched

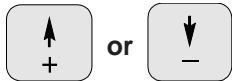o and by pressing key [**0**] it is switched off.

☞ **When switching on, the display briefly shows the creation date of the computer program.**

☞ **Whenever the supply voltage drops to below 10 volts, e. g. when starting the tractor, the computer automatically switches off. It has to be switched on again as described above.**

3.3.1.2   Dial implement-specific data (values)

[↑ +] **or** [↓ −]

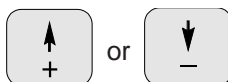By these keys the implement-specific data (values) which are required for the **"AMADOS-II"** can directly be dialed.

✋ **Always confirm dialed values by**

Key [Eingabe Input] **.**

By the 1st pressing of the [↑ +] or [↓ −]

the display advances by one position into the desired direction.

By renewed pressure onto the key the display continues to run until the key is released.

[Eingabe Input]

Confirm and store simultaneously all implement-specific data which are required for monitoring the connected

machine always by pressing key [Eingabe Input] .

3.3.2   Putting to operation (short instruction)

✋ **Before starting to operate enter the implement-specific data by pressing the corresponding keys in the mentioned order newly or check .**

✋ **Conduct all enterings regarding the implement type only with a disconnected implement plug.**

1. While **implement plug is disconnected** switch on **"AMADOS-II"** (pls. refer to para. 3.3.1.1).

☞ **Initially the display shows the program entering date. For the following period of approx. 10 sec. then no entry is possible. Thereafter automatically the error message "13" is shown. After a waiting time of approx. 15 seconds the mode „1" can be dialed.**

2. Dial **mode "1" and the coding "04"** for hectare meter (please refer to para. 3.3.3.1).

3. **Switch off "AMADOS-II"** and connect it to implement plug.

4. Switch on again **"AMADOS-II"**.

5. Check the working width and correct if necessary (see para. 3.3.3.2.1).

6. Check "Imp./100m" and correct if necessary (by direct entry or by a calibration test; see para. 3.3.3.2.2).

7. Release start function and start working operation (see para. 3.3.4.1).

3.3.3 Preparations for starting the operation "DETAILED INSTRUCTION"

✋ **Before starting to operate enter the implement-specific data by pressing the corresponding keys in the mentioned order newly or check .**

☞ **Already entered implement-specific data remain stored.**

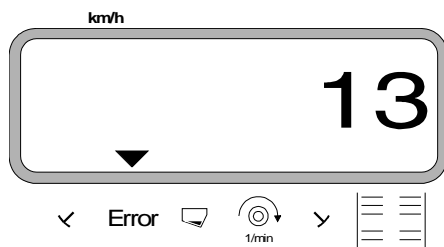#### 3.3.3.1 Enterings regarding the implement type (mode "1")

✋ **Conduct all enterings regarding the implement type (mode "1") only with a disconnected implement plug.**

1. While **implement plug is disconnected** switch on **"AMADOS-II"** (pls. refer to para. 3.3.1.1).

☞ **Initially the display shows the program entering date. For the following period of approx. 10 sec. then no entry is possible. Thereafter automatically the error message "13" is shown. After a waiting time of approx. 15 seconds the mode „1" can be dialed.**
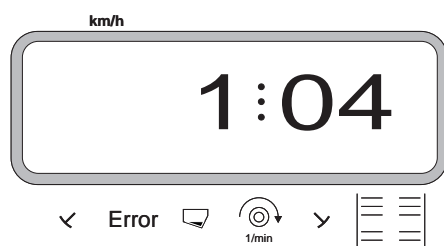
Display with wrong coding

km/h

13

∨ Error ▭ ◎ 1/min ∨

2. Mode "1", Choosing the machine type

- press **MOD** and dial "Mode 1". By actuating the MOD-key count up the mode.

Dipslay after MOD-key has been pressed

km/h

1:04

∨ Error ▭ ◎ 1/min ∨

The first digit shows the chosen Mode "1", the second the coding for the chosen machine type ("04" for hectare meter).

- via the keys [↑+] or [↓–] dial "code 04" on the display.

- press key **Eingabe Input** and thus store the chosen value "04".

- switch off **"AMADOS II"** and connect to implement plug.

3.3.3.2 Entering the implement-specific data

- Switch on "AMADOS-II".

3.3.3.2.1 Entering the working width

For determination of the worked are **"AMADOS-II"** requires the information of the working width. Therefore enter the working width as follows:

- press key [⊢m⊣] .

- via the keys [↑+] or [↓–] dial the required working width [m], e.g. "3.00" for 3.00 m working width.

Display working width
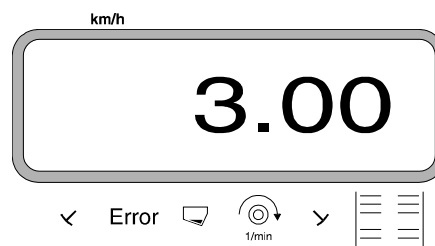
km/h

3.00

∨ Error ▭ ◎ 1/min ∨

- Press the key **Eingabe Input** . The dialed value will be stored.

- Press key [⊢m⊣] once again to check the stored value. The display should now show the dialed value, e. g. "3.00".

3.3.3.2.2 Calibrating distance sensor

For determening the actual forward speed **"AMADOS-II"** required the value "Imp./100m", which sensor "X" releases to **"AMADOS-II"** when driving down a calibration distance of 100 m.

For entering the calibration value "Imp./100 m" two possibilities are given:

• the value "Imp./100 m" is known and is dialed via the key board.
• the value "Imp./100 m" is not known and will be determined by driving down a pre-measured distance.

👉 **As the calibration figure "Imp./100m" is ground dependent it is, in case of soil types which are heavily deviating from one another, recommended to determine the calibration figure always newly.**

1. The value "Imp./100 m" is known

- Press [Imp. / 100 m] (with stationary vehicle).

- Dial the known value "Imp./100m" by keys

[↑ +] or [↓ −] .

- Dial the known value "Imp./100m" via the keys

[↑ +] or [↓ −] .

- Press key [Eingabe Input] . The dialed value will be stored.

- Press key [Imp. / 100 m] once again and check the stored value. The display should now show the dialed value.

2. The value "Imp./100 m" is unknown:

- Accurately measure a test distance of 100 m in the field. Mark start and end point of the test distance.
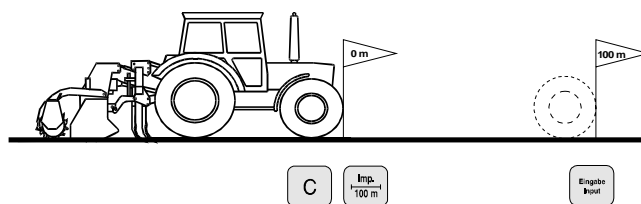
- Bring tractor with the implement to the start position.

- Simultaneously press keys [C] and [Imp. / 100 m]

- Drive accurately the test distance from the starting- to the end point (when starting the counter returns to "0"). During this the display will show continuously the determined number of impulses.

Display during calibrating
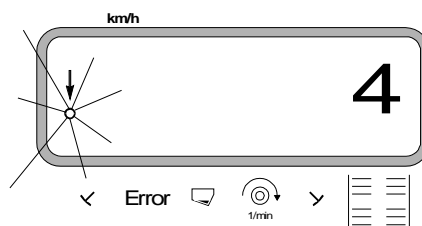
- Stop after 100 m. The display will now show the number of impulses, which were determined when driving the test distance (100 m) .

- Press key [Eingabe Input] . The displayed determined value (Imp./100 m) will be stored.

- Press key [Imp. / 100 m] once again and check the stored value. The display should now show the determined value (Imp./100 m).

3.3.4 Putting into operation in the field

3.3.4.1 Conducting the start function

For starting the operation simultaneously press the
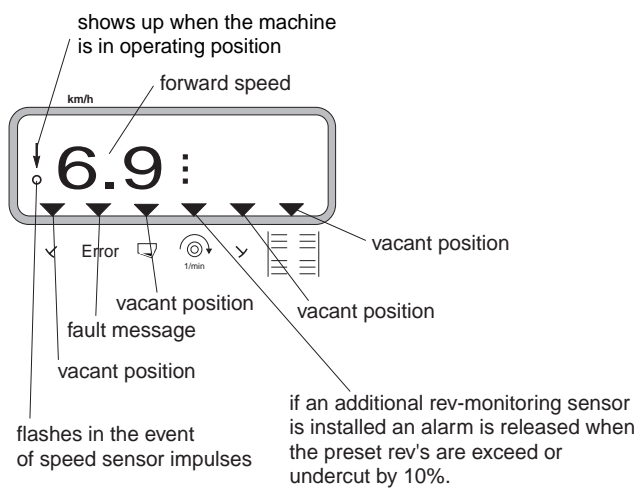
Eingabe
Input

C

└─ Start ─┘
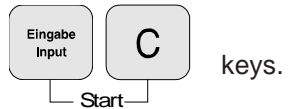
keys.

The memory for the hectare meter - part area [ha] returns automatically to "0".

If now the machine fitted to a tractor is being brought to the operation position, the displqay will show the present forward speed.

Operating display "Hectare meter"

shows up when the machine is in operating position

forward speed

km/h

6.9

vacant position

Error

1/min

vacant position

fault message

vacant position

vacant position

flashes in the event of speed sensor impulses

if an additional rev-monitoring sensor is installed an alarm is released when the preset rev's are exceed or undercut by 10%.
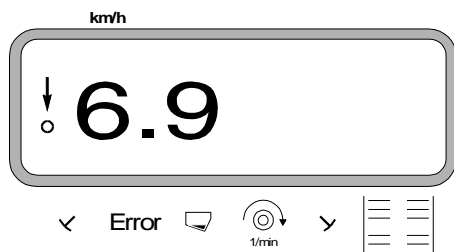
3.3.4.2 Function-keys and their use during the operation

By pressing one of the following function keys for approx. 10 seconds the wanted value will be displayed. Thereafter the computer automatically switches back into the "operation display".

3.3.4.2.1 Forward speed k.p.h.

After pressing key [km/h] the momentary forward speed is displayed in [k.p.h.].

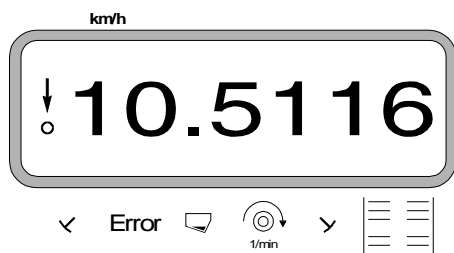Display after pressind key "km/h"

3.3.4.2.2 Hectare meter

1. Hectare meter - Part area

After **one-time** pressing key [ha / Σha] the covered part area in [ha] is displayed, which has been covered since actuating the "start function".

☞ **Only the covered area will be determined at which the fertiliser broadcaster had been in operating position.**
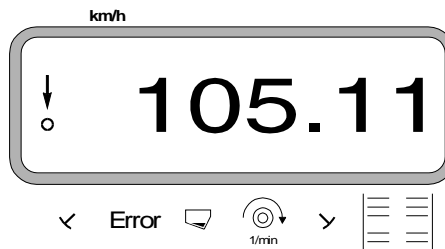
Display after **one-time** pressing the key

2. Hectare meter - Total area

After **two-times** pressing the key [ha / Σha] the total area in [ha], e.g. of one season, is displayed.

Display after **two-times** pressing the key

2.1 Set memory for hectare meter - total area to "0"

Set memory for the hectare meter - total area via a reset to "0".

Press [C] and hold it pressed while pressing "0", release key.

✋ **A reset will eradicate all !!! memorised data from the AMADOS-II. Therefore, prior to resetting it is imperative to write down all important data.**

3.3.4.2.3 Pto-speed monitor

By pressing key [⊚ 1/min] the speed of a shaft which is equipped with a rev-sensor will be displayed.
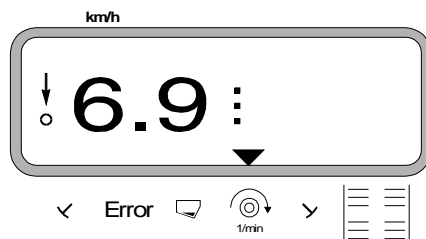
Depending on the pre-set rated value **AMADOS-II** monitors the speed of a shaft which is equipped with a rev-sensor (special option). If **the wanted speed is exceeded or undercut by more than 10 %** an audible signal is given and in the display the black triangle above the rev-symbol blinks.

Display when exceeding or undercutting the rated speed

For selecting the rated speed for the speed monitoring, two possibilities are provided:

• the actual speed becomed the rated speed.
• the rated speed is selected directly via the key-board.

☞ **The rev-speed monitoring is only active in operating position.**

☞ **If the rev-speed of the relevant shaft shall not be monitored any longer, the rev-speed monitoring should be switched off.**

1. The actual speed becomes the rated speed

Entering the rated speed

- Drive the shaft to be monitored with the desired rated speed (e. g. 540 min^{-1}).

- Press key [⊚ 1/min] and the actual speed is shown in the display. If the shown speed is equal the rated speed, press key [Eingabe Input] and store this speed as rated value.

Switch off speed monitoring

Switch off monitoring of the speed at a **stand still of the shaft monitored** as follows:

- First press key [⊚ 1/min] and then key [Eingabe Input] . The display shows a "0" for the actual speed which is stored as rated value.

2. Entering the rated speed via the key pad

Entering the rated speed

- Press key [⊚ 1/min] and hold it pressed while pressing [C] . The display shows the set rated speed.

- Change the rated speed via the keys [↑ +] or [↓ −] .

- Press key [Eingabe Input] and store the dialed rated speed.

Switching off the speed monitoring

- Press key [⊚ 1/min] and hold it pressed while pressing [C] . The display shows the set rated speed.

- Via key [↓ −] dial the rated speed "0".

- Press key [Eingabe Input] and store the new rated speed "0".

4.0 Fitting instructions

4.1 Console and "AMADOS-II"

- Fit console (4.1/1) within reach and sight to the right hand of the operator; it must be free of vibrations and electrically conductive (scratch off paint in the area of contact) inside the tractor cab.

🖐 **The distance of the "AMADOS-II" from a radio transmitter and an antenna should at least be 1 m.**

🖐 **For fitting the console, please ensure that the optimum viewing angle to the display lies between 45° and 90° .**

🖐 **Make sure that the "AMADOS-II" housing (4.1/2) receives via the console an electrically conductive connection to the tractor chassis. Scratch off all paint from the fitting surfaces.**

- Fit the bracket (4.1/3) fitted to the "AMADOS-II" onto the tube of the console, bring it to the desired position and fix by the thumb bolt there.

4.2 Battery connection lead

- Connect the battery connection lead (4.1/4) for the power supply directly with the tractor battery **(12 V)** and lay cable.
    - Connect cable connector (4.1/5) with fuse **(5A)** to **brown cable** and connect with the **plus pole** of the tractor battery.
    - Connect **blue cable** with the **minus pole** (earth).

🖐 **When connecting to the battery first connect plus cable to plus pole. Then connect earth cable to minus pole. When disconnecting battery, proceed in vice versa order.**

🖐 **Connect minus pole of the battery (earth) with frame or chassis of the tractor which is especially important with older American, Canadian or British tractor types. Tractors with a switch in the mass cable of the battery (e.g. Zetor 8011, 8045) connect blue mass cable directly with mass (earth) (frame or chassis).**

- Connect power supply cable (4.1/6) of the "**AMADOS-II**" with the socket (4.1/7) .
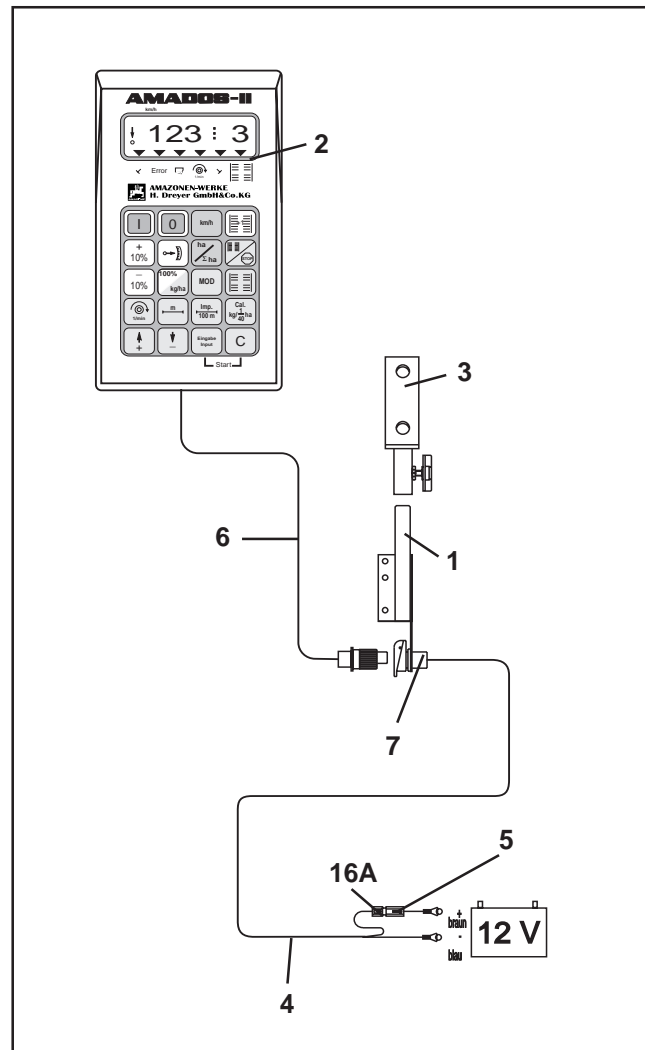
Fig. 4.1

At pneumatic seed drills it is imperative to make sure that the mass/ground cable is correctly placed for guiding off any static charge, see Fig. 4.1a and 4.1b.

Connecting example:
Tractor execution for **"AMADOS-II"**
Distributor G-II and K-II

Fig. 4.1a/ . . .

 1 - Battery connecting cable (power).
 2 - Implement socket DIN 9680.
 3 - Mass/ground cable, for guiding off any static charge.
 4 - Connector.
 5 - Plug, 36 poles.
 6 - Cable, leads to the distributor.
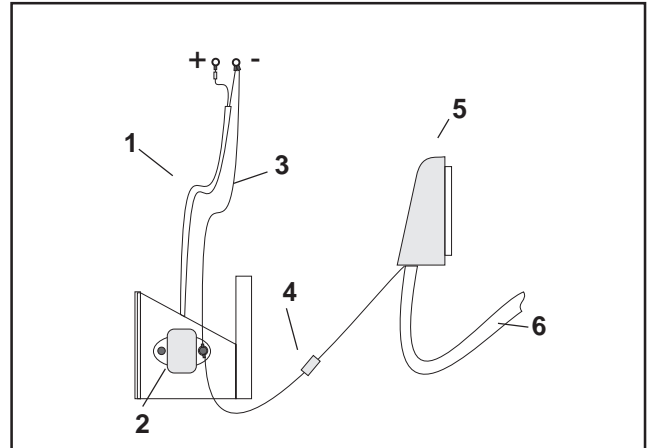
Connecting example:
Tractor execution for **"AMADOS-II"**
for *Airstar Avant*

Fig. 4.1b/ . . .

 1 - Battery connecting cable.
 2 - Distributor for providing **"AMADOS-II"** with two sockets DIN 9680 for "AMADOS-II" and light with switch with electric power
 3 - Switch for light. Position "O" = OFF (AUS) and "I" = ON (AN).
 4 - Console.
 5 - Mass cable for guiding off any static charge.
 6 - Connector.
 7 - Plug, 39 poles.
 8 - Cable leading to the distributor.

Fig. 4.1a

Fig. 4.1b

4.3 Fitting Sensor "X" for determination of the travelled distance or forward speed

For mode "centrifugal broadcaster" and "hectare meter"

The sensor "X" (4.2/1) is a solenoid (Reed -contact). If the solenoid is brought near enough to the sensor, the contacts ar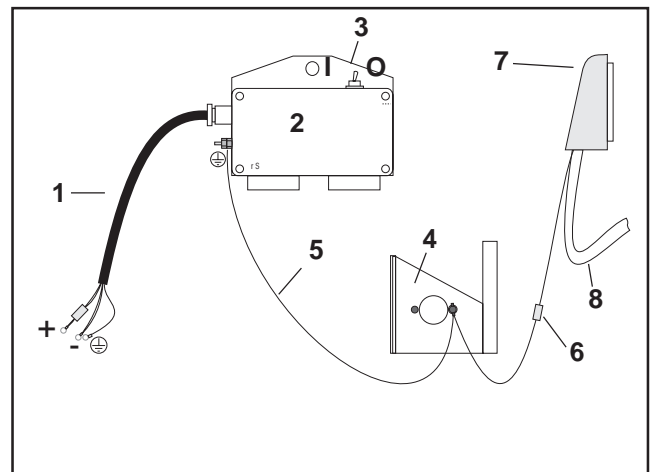e closing. This is being registered by **"AMADOS-II"**. When fitting this sensor, the following conditions should be adhered to:

• The fitting screw of the solenoid should be directed to the end of the sensor.
• The gap solenoid - sensor should be within 15 - 25 mm.
• The movement direction of the solenoid should be lateral towards the sensor.
• Fit the solenoid with the supplied stainless steel screws onto iron.
• The painted side of the solenoids should be visible.
• The sensor should in minimum protrude 25 mm above the bracket.

4.3.1 Fitting - Sensor "X" (cardan shaft/wheel for recording the travelled distance

☞ **If the tractor electronics already offers the possibility of an on-board forward speed recording, the speed signals for "AMADOS-II" can be taken from the signal socket DIN 9684 provided. The standard sensor "X" (cardan shaft/wheel) then is to be exchanged for the tractor specific adaptor cable (4.2/2) (option).**

4.3.1.1 Fitting to tractors without 4-wheel drive

- Evenly distribute magnets (4.3/1) around a hole circle inside the wheel rim of the tractor's front wheel and affix with bolts (4.3/2) made of non-magnetic material (brass-screws or V4A -bolts) .

The number of the magnets depends on the size of the tractor wheel.

The covered distance between 2 impulses of adjacent magnets may not exceed 60 cm. The number of the magnets required is calculated as follows:
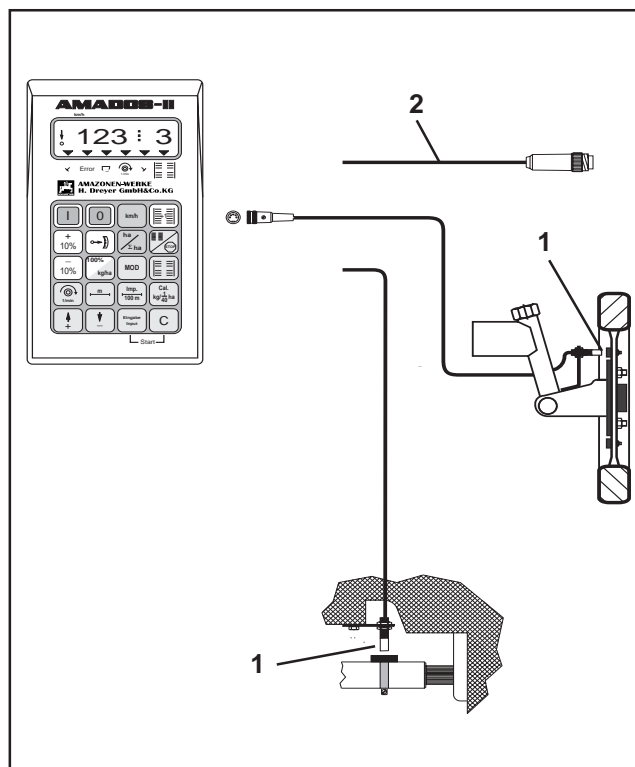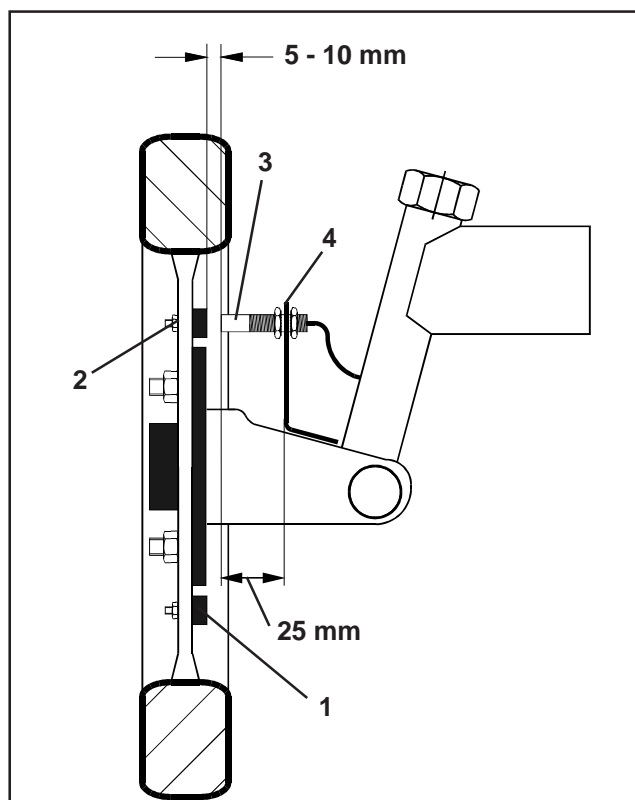

Fig. 4.2

Fig. 4.3

Calculation:

$$\frac{\text{wheel circumference [cm]}}{60 \text{ cm}} = \text{number of magnets}$$

Example:

$$\frac{256 \text{ cm}}{60 \text{ cm}} = 4,27 = \text{min. 5 magnetes}$$

- Mount sensor (4.3/3) with universal bracket (4.3/4) to the axle stud of the tractor's front wheel - in driving direction behind the axle.

🖐 **The end of the sensor has to show towards the painted side of the magnets (red).**

🖐 **Fit sensor in a spacing of 5 - 10 mm towards the magnet on the bracket. This spacing must not change even when making steering movemengs.**

🖐 **The sensor must at least protrude from the bracket by 25 mm.**

🖐 **Place sensor cable in such a way that it will not be damaged from steering movements.**
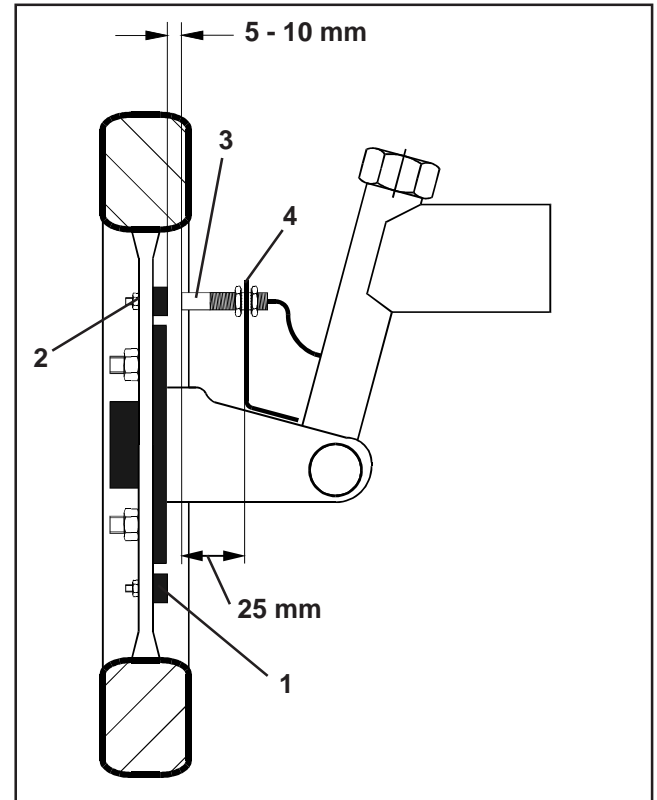
Fig. 4.3

4.3.1.2 Fitting to tractors with 4-wheel drive or MB-trac

- Fit magnet (4.4/1) with hose clamp (4.4/2)to cardan shaft.

🖐 **Fit magnet only to such a place on which no angle movements of the cardan shaft occur.**

- Fix sensor (4.4/3) with universal bracket (4.4/4) opposing magnet to the vehicle frame.

🖐 **Spacing between magnet and sensor to be set in the range between 5 and 10 mm.**

🖐 **The sensor should protrude from the bracket in minimum by 25 mm.**

Fig. 4.4

4.3.1.3 Fitting to Unimog

On Unimog's exchange standard sensor "X" (cardan shaft/wheel) for Tachometer-adaptor (option).

- Dismantle Tachometer shaft from gearbox.
- Fit Tachometer adaptor. Apply universal grease to tachometer-shaft with the magnets and insert with the yoke downwards.
- Screw on Tachometer-shaft to adaptor.

If the Unimog is equipped with the on-board-computer "UNICOM I" (see para. 2.5).

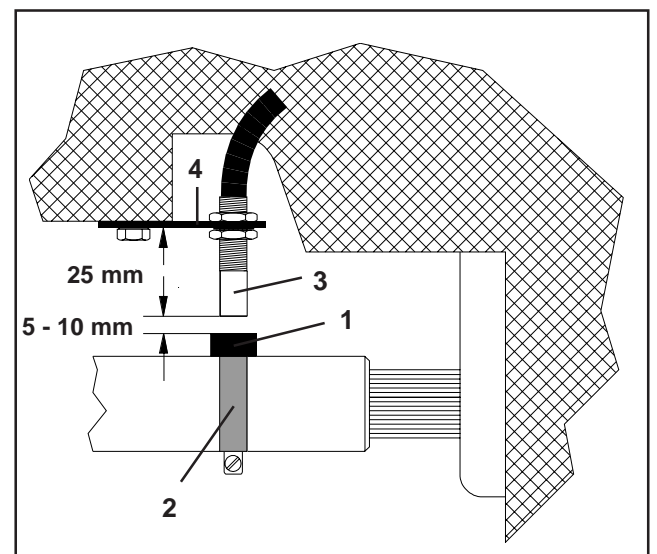## 4.4 Connecting unit for "AMADOS-II" as hectare meter with shaft speed monitoring

The connecting unit "AMADOS-II" as hectare meter with shaft speed monitoring, consists of:

- Sensor "Y" (4.5/1) (operating position), with cable "Y" (4.5/2) and 39- pole machine plug (4.5/3) and sensor "A" (4.5/4) (shaft speed) with cable "A" (4.5/5),
- 4 magnets incl. fixing material,
- hose clamp for fixing the magnets for the shaft speed monitoring,
- cable tie and
- 2 brackets for fixing sensor "Y" and sensor "A".

The connecting unit **"AMADOS-II" as a hectare meter with shaft speed monitoring** is required, when

• besides of the determination of the worked area also the speed of a shaft has to be monitored

and the needed information does not dome directly from the tractor mounted or trailed machine in working position.

"AMADOS-II" recognises over sensor "Y", whether the machine is in operational position or not. The signal for this information is being taken off a machine part which changes its position from transport- into operation position. At a soil tillage implements, e. g. from the three-point-hydraulic. In this case, the sensor "Y" is coacting with a magnet.
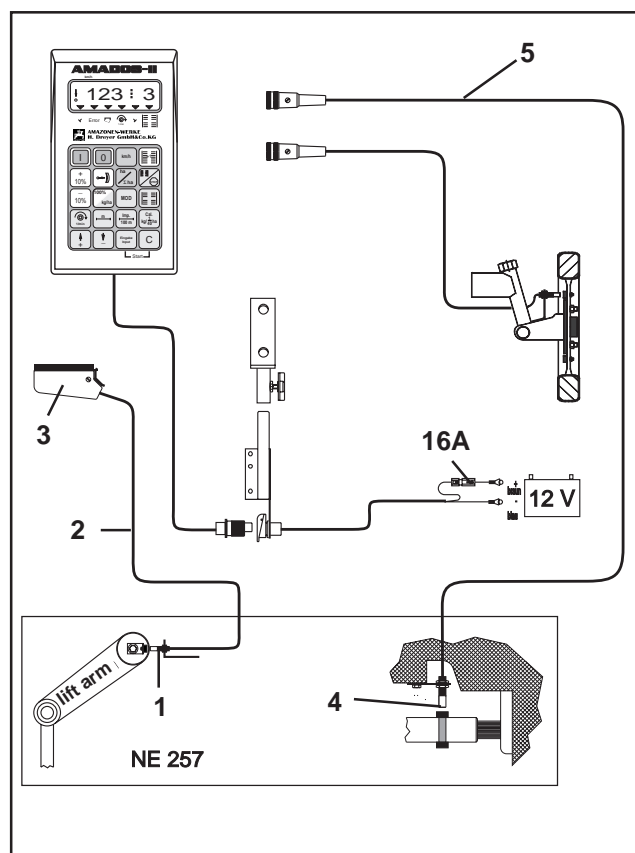

Fig. 4.5

4.4.1 Fitting Sensor "Y" (operational position)

- Fit magnet (4.6/1) with the included bolt from non-magnetic material, e. g. brass bolt or V4A, to a implement part which changes its position from transport- into operational position and vice versa, e. g. tractor three-point hydraulics.

✋ **The red painted side of the magnets should face in direction of the sensor.**

- Fit sensor (4.6/2) with the enclosed bracket to an opposite lying firmly staying part of the machine. In operational position of the machine the magnet should be situated directly in front of the sensor. If the machine is in operational position, the vertical arrow lights up in the left hand edge of the display.
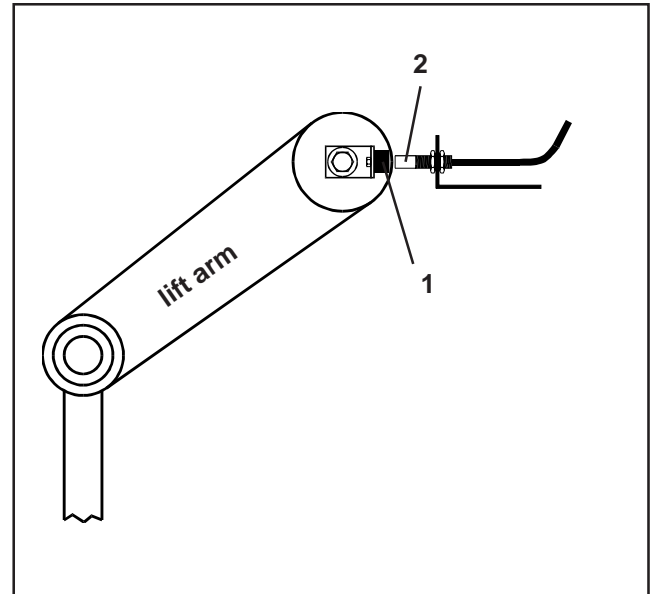
✋ **If the implement part to which the magnets are fitted is moving from the operational position by more than 40 mm from the sensor then for an unmistakeable recognition of the working position a second magnet should be fitted in the direction of movement of the magnet (Fig. 4.7).**

✋ **If the machine is in transport position the magnet should have a minimum spacing of 40 mm from the sensor to unmistakeably recognise that the machine is no longer in operation position (Fig. 4.7).**

Fig. 4.6

Fig. 4.7

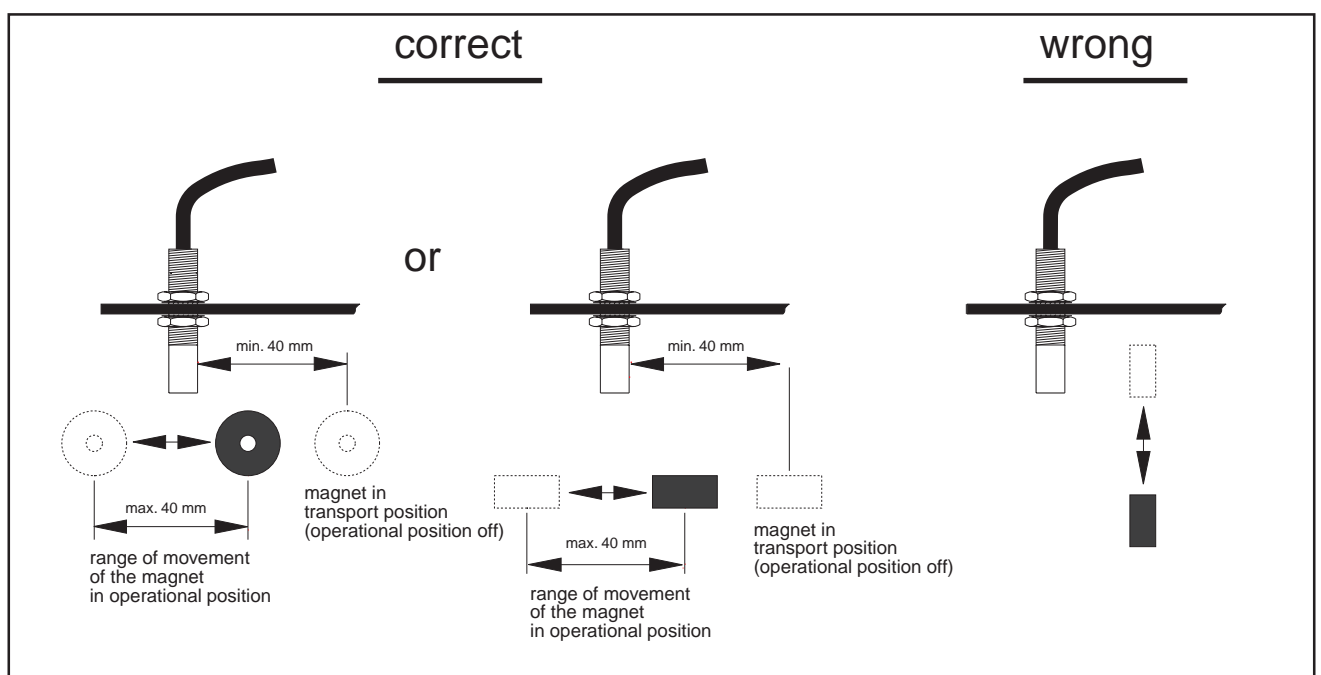## 4.4.2   Fitting Sensor "A" (shaft speed monitoring)

The sensor "A" (4.8/1) coacts with two magnets (4.8/2). These magnets have to be fitted opposingly to the shaft to be monitored. To do this, the magnets are either bolted

- directly with the aid of the enclosed screws and washers into the shaft or
- with the aid of the hose clamp (4.8/3) fixed to the shaft.

When fitting with the aid of the hose clamp both magnets with enclosed rivets and washers should be riveted onto the hose clamp. Place holes in such a way that the magnets are positioned opposingly.

Red painted sides of the magnets should face in direction of the sensor.

Fit sensor with enclosed bracket to a firm machinery part opposing the magnet.

The gap between the magnet and the sensor should be set within the range of 5 - 10 mm.

The sensor must protrude from the bracket by at least 25 mm.

Fig. 4.8

4.5 Personal Notes

Machine type "Centrifugal broadcaster"

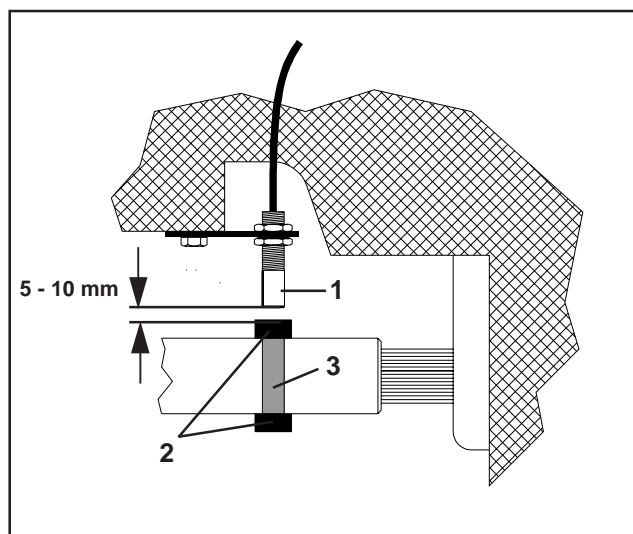Mode "1"   Coding "05"   _____

Working width [m]   _____

Imp./100 m   _____

Machine type "Seed drill"

Mode "1"   Coding   _____

Mode "2"   do not change (set by the factory on 22 seconds)   _____

Mode "3"   do not change (set by the factory on 22 seconds)   _____

Mode "4"   do not change (set by the fctory on 22 seconds)   _____

Mode "5"   Seed rate reduction when creating tramlines [%]
            for pneumatic seed drills **without** seed return flow.   _____

            For pneumatic seed drills **with** seed return flow or for
            mechanical seed drills dial for the second figure "00".   _____

Mode "6"   seed rate remote control yes = 01 / no = 00   _____

Working width [m]   _____

Switching rhythm   _____

Machine type "Hectare meter"

Mode "1"   Coding "04"   _____

Imp./100 m   _____

Working width [m]   _____