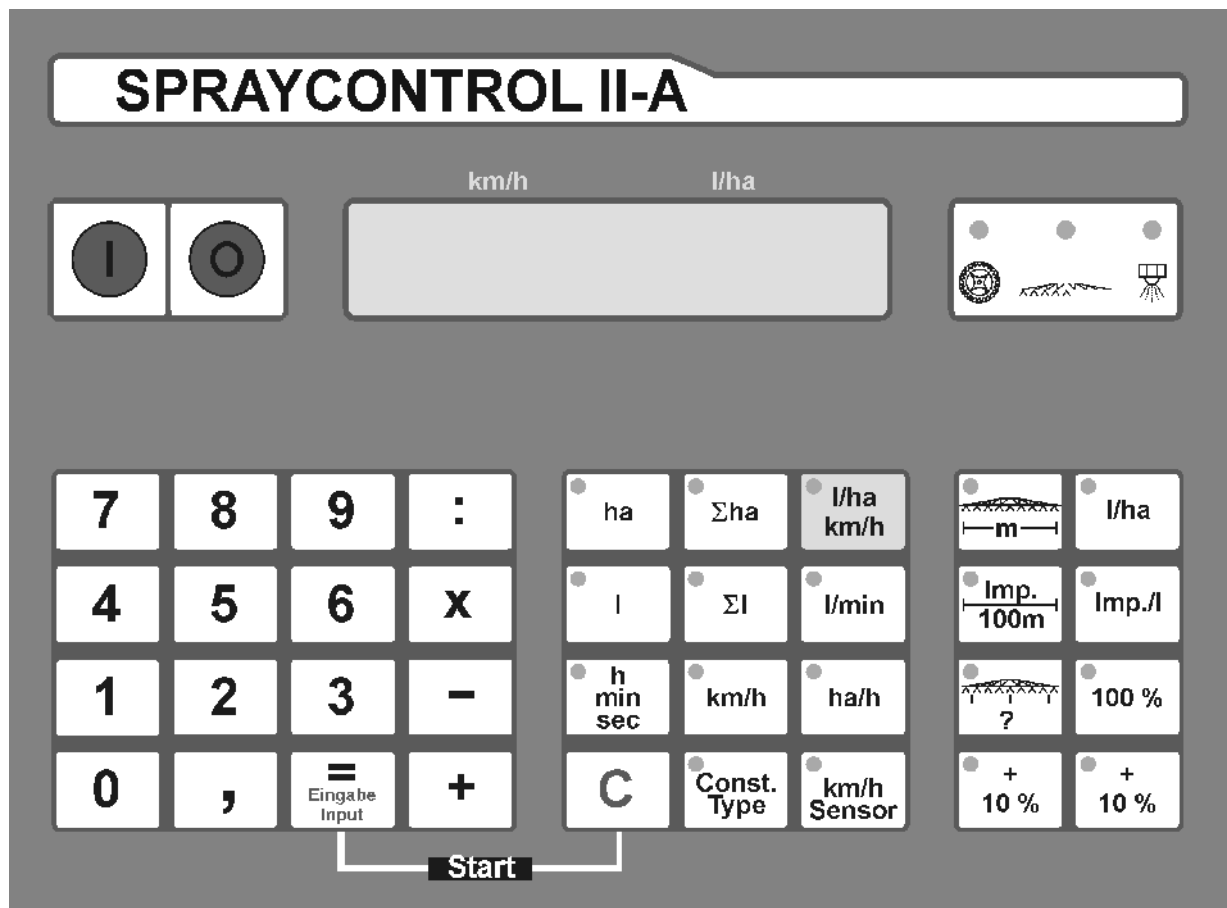


# Operation Manual

## On Board Computer

### SPRAYCONTROL



MG 759  
SB 235 (GB) 01.02  
Printed in Germany



Before starting to operate, please carefully read and adhere to this operation manual and safety advice.



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Germany  
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## **On receipt of the computer**

On receipt of the computer, please check for damage in transit and missing parts. Only immediate claim to be filed with the carrier may lead to replacement. Please check whether all parts mentioned in the following are provided.

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## 1. Information about the computer

### 1.1 Range of application

**SPRAYCONTROL II-A** can be connected with AMAZONE field boom sprayers UG, UF and all BBG boom field sprayers and can be used as a display-, monitoring- and controlling device.

### 1.2 Manufacturer

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

### 1.3 Conformity declaration

**SPRAYCONTROL II-A** fulfils the requirements of the EMV-guide line 89/336/EC.

### 1.4 On requesting after sales service and parts

When ordering spare parts, the implement number of the **SPRAYCONTROL II-A** has to be quoted.



**The safety technical requirements are only fulfilled if, in case of repair AMAZONE original spare parts are used. Using non-original spare parts will rule out the liability of AMAZONE for resulting damage.**

### 1.5 Type plate

Type plate on the implement.



**The entire type plate is of documentary value and should not be damaged or removed**

### 1.6 Designated use

**SPRAYCONTROL II-A** has exclusively been designed for the usual operation as a display-, monitoring- and controlling device for the use on AMAZONE field boom sprayers in agriculture. Any use beyond the one stipulated above is no longer considered as designated use. The manufacturer does not accept any responsibility for damage resulting from non-

compliance and therefore, the operator himself carries the full risk.

Under "designated use" also the manufacturer's prescribed operation, maintenance and repair conditions must be adhered to as well as the exclusive use of **original AMAZONE spare parts**.

**SPRAYCONTROL II-A** 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.

Always adhere to the relevant accident prevention advice and all applicable generally accepted safety -, working-, medical- and road-traffic regulations.

Though machines have been manufactured with great care deviations in application cannot totally be excluded, even at a designated use. These deviations may be caused, e. g. by:

- Drifting.
- Blockage or drifting (e.g. by foreign particles, bag residue, damp fertiliser etc.).
- Undulated terrain.
- Wear of wearing parts
- Damage from external influence.
- Wrong drive R.P.M. and travelling speeds.
- Wrong setting of the machine (incorrect mounting).

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

Claims regarding damage not having occurred on **SPRAYCONTROL II-A** itself will be rejected. This also applies to damage due to application errors. Arbitrary modifications to the **SPRAYCONTROL II-A** may result in damage and therefore the manufacturer does not accept any liability for such damage.

## 2. Safety

This instruction manual contains basic advice, which has to be observed when mounting, operating and maintaining the machine. Thus, this instruction manual has implicitly to be read by the operator before starting to operate and this book must be made available to him/her.

All safety advice in this instruction manual must be strictly observed and adhered to.

### 2.1 Danger when not adhering to the safety advice

Not adhering to the safety advice

- may result in endangering persons, also the environment and also the machine itself.
- may result in the rejection of any claim for damage.

Not paying attention to the safety advice may cause the following risks:

- Danger to persons not excluded from operational areas.
- Failure of important functions within the machine.
- Failure of carrying out prescribed measures of maintenance and repair.
- Danger to persons through physical or chemical contact.
- Danger to persons, or the environment by leaking hydraulic oil.

### 2.2 Qualification of operator

The implement may only be operated, maintained and repaired by persons, who are acquainted with it and have been informed of the relevant dangers.

### 2.3 Identification of advice in this instruction manual

#### 2.3.1 General danger symbol

The safety advice in this operators manual, which may lead to a danger to persons if not being observed, are identified with the general danger symbol (Danger symbol according to DIN 4844-W9)



#### 2.3.2 Attention symbol

Attention symbols which may cause dangers to the machine and its function when not being adhered to, are identified with the attention symbol.



#### 2.3.3 Hint Symbol

This symbol marks machine's specific points that should be observed to ensure the correct function of the implement.



### 2.4 Safety advice for retrofitting electric and electronic devices and / or components

The function of the implement's electronic components and parts may be affected by the electromagnetic transmittance of other devices. Such affects may endanger people when the following safety advice will not be adhered to:

When retrofitting electric and electronic devices and/or components to the implement with connection to the on-board electric circuit, the user must ensure by himself that the installation will not cause any disturbance to the vehicle electronic or other components.

Note and ensure that the retrofitted electric and electronic components correspond to the applicable EMV guide line 89/336/EEG and that they bear the CE-sign.

When retrofitting mobile communication systems (e.g. radio, telephone) the following additional requirements should be fulfilled:

Only install devices which have officially been authorised in your country.

Firmly install the device .

The use of portable or mobile devices inside the vehicle cab is only permissible with a connection to a firmly installed external antenna.

Install the transmitter spaced apart from the vehicle's electronic.

When installing the antenna ensure an appropriate installation with proper earth connection between antenna and vehicle earth.

For cabling and installation as well as for the maximum permissible current supply in addition adhere to the fitting instructions of the implement manufacturer.

## 2.5 Safety advice for repair work



**Before carrying out any repair work on the electric system or arc welding on the tractor or the mounted implement, disconnect all connections of SPRAYCONTROL II-A.**

### 3. Description of product

#### 3.1 Description of the system

The **SPRAYCONTROL II-A** can be used on the field boom sprayer as a fully automatic controlling device. The unit allows an area related control of the application rate in dependence of the actual forward speed and working width.

The actual application rate, forward speed, worked area, sprayed quantity as well as total spray rate, operating time and the travelled distance are permanently determined.

The unit consists of the **computer** (1), the **console** (10 - 14), and the **tractor-signal distributor** (16) with the sensor **drive shaft/wheel** (20) for determination of the travelled distance.



**A radar sensor for a slip free determination of the speed may be installed.**

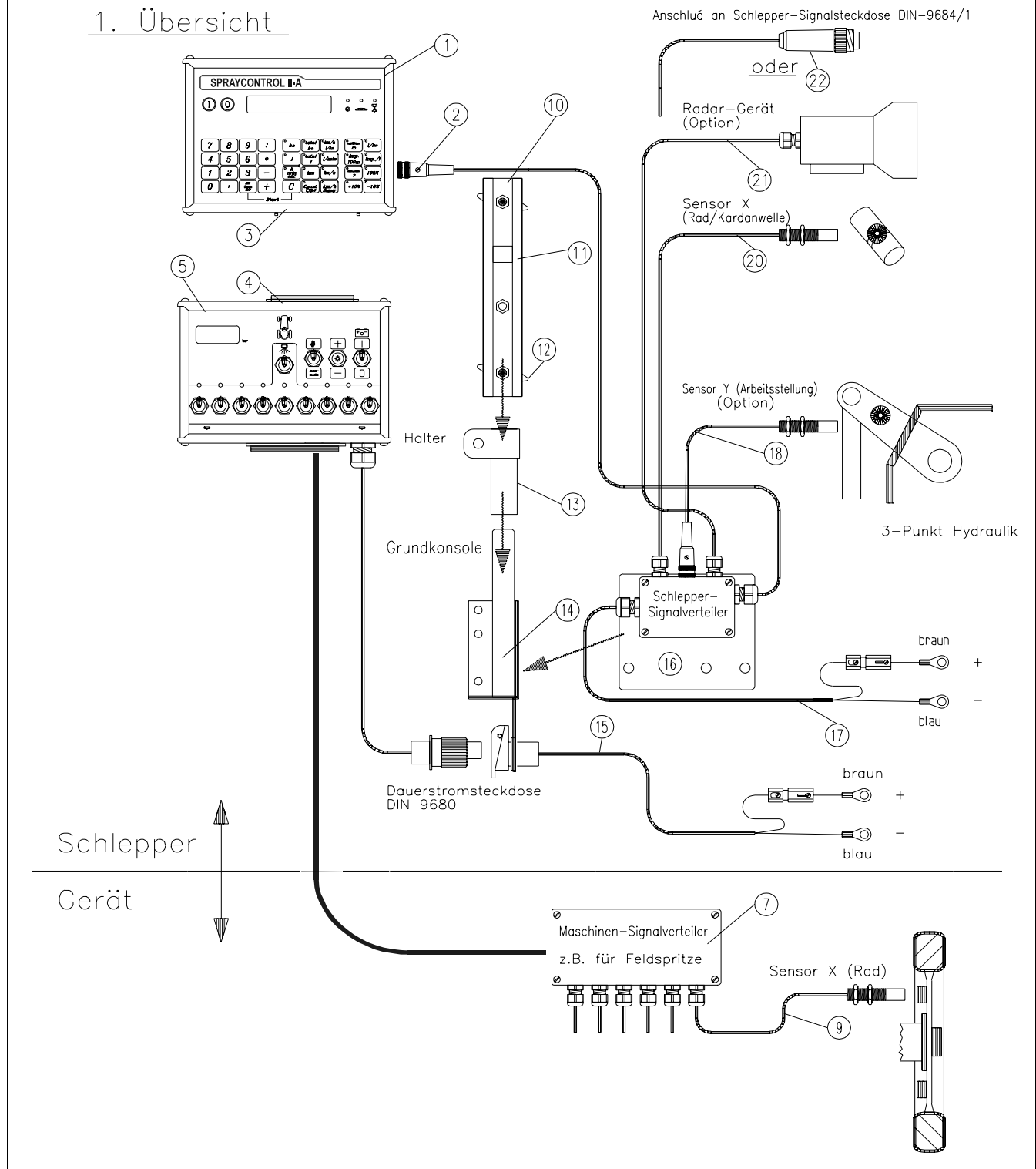
The **tractor signal distributor** (16) with its connection to the **signal socket tractor** (22) does not contain any sensors. The signals are taken from the signal socket tractor.

SPRAYCONTROL is connected with the field boom sprayer with the aid of the switch box via the implement plug.



**SPRAYCONTROL II-A can also be used as a hectare counter. The sensor Y (operating position) (18) is connected with the signal distributor (16) by using a 3-pole plug.**

## 1. Übersicht



## **3.2 Review**

- 1 SPRAYCONTROL II-A computer.
- 2 Tractor plug (on the back)  
Connection tractor signal distributor with the tractor specific sensors.
- 3 Implement plug on SPRAYCONTROL II-A. Connection switch box.
- 4 Implement plug on the switch box, connection with SPRAYCONTROL II-A
- 5 Switch box  
Operating unit of the trailed implement (e. g. field boom sprayer) with connection to SPRAYCONTROL II-A
- 7 Implement signal distributor / cable harness  
Combination of sensor- and actuator connections on the implement.
- 9 Sensor X (wheel) 6m  
Distance impulse acceptance on the trailed field boom sprayer.
- 10 Cap profile rail  
Retainer for computer SPRAYCONTROL II-A and the switch box.
- 11 Guide groove  
for SPRAYCONTROL II-A and switch box.
- 12 Clamping bolts  
to affix the computer and the switch box.
- 13 Carrier-S (incl. cap profile rail (10))  
Retaining part for the cap profile rail.
- 14 Basic console  
Is attached to the tractor cab. Retainer with cap profile rail and battery power supply cable for the switch box.
- 15 Battery cable  
for the power supply of the switch box, connection to the 12 volt battery.
- 16 Tractor signal distributor-S  
Joint box for tractor specific sensors and the battery power supply cable.
- 17 Battery cable for the power supply of SPRAYCONTROL.
- 18 Sensor Y (operating position)  
for registration of the operating position (e. g. on the 3-point hydraulic)
- 20 Sensor X (drive shaft / wheel)  
for determination of the forward speed, impulse acceptance on the drive shaft or on the tractor front wheel.
- 21 Radar set  
for a slip free forward speed determination.
- 22 Plug for tractor signal socket  
Acceptance of the signals from the sensors which have already been installed on the tractor.

## 4. Fitting instruction

### 4.1 Console and computer



Fit console (14) within reach and sight to the right hand of the operator. It must be free of vibrations and electrically conductive inside the tractor cab. The distance from Spraycontrol from a radio transmitter and an antenna should at least be 1 m.

The **retainer** (13) is pushed on to the tube of the basic console.

Fit the **cap profile rail** (10) on the retainer. The **Computer SPRAYCONTROL II-A** (1) is pushed from above on to the profile and fixed with the thumb bolt.

The optimum viewing angle of the display is between 45° and 90° seen from below. Bring into the desired position by swivelling the console.



Make sure that the computer housing (1) receives via the console (10 - 14) an electrically conductive connection to the tractor chassis. Scratch off all paint from the fitting surfaces.

### 4.2 Tractor signal distributor for tractors without signal socket

The **battery connection lead** (of the computer (17)) and the sensors (18 - 21) are connected with the **tractor signal distributor** (16). As standard available is the sensor X (20) (drive shaft / wheel).



The sensor Y (18) (operational position) and the radar set (21) can easily be retrofitted.

The **tractor signal distributor** (16) with its fixing plate is bolted directly on to the main console or on another place on the tractor.

If **SPRAYCONTROL II-A** is exclusively used on a trailed field boom sprayer the tractor signal distributor can be dropped. The power supply is then ensured via the switch box. The distance impulses are taken from the wheel of the field sprayer.

#### 4.2.1 Battery connection lead-Computer (17)

The power supply is **12 V** and should be taken directly from the battery or from the 12 V-starter. Carefully lay the **cable** (17) and shorten if necessary. Fit the ring tongue for the earth cable (blue) and the wire end bushing for the + cable (brown) with appropriate pliers. The wire end bushing for the + cable is located in the connecting clamp of the fuse carrier.

brown = + 12 Volt

blue = earth



The minus pole of the battery must be connected with the chassis of the tractor.

#### 4.2.2 Battery connection lead for switch box or implement adapter (15)



Fit the socket to the main console by using the provided bolts. For the electric connection please follow description under 4.2.1.

### 4.2.3 Sensor X (determination of the travelled distance) (20)

- **Fitting on to Unimog (Unimog without signal socket)**



For the Unimog a tachometer adapter is available. Dismantle tachometer shaft from gearbox and fit provided adapter instead.

The shaft is provided with universal grease. The shaft and the magnets are inserted with the yoke facing downwards.

The tachometer shaft is bolted to the free end of the adapter.

- **Fitting to 4-wheel drive tractors MB-Trac:**

The hose clamp with magnet are fitted to the drive shaft.



The sensor should point towards the magnet with a gap of 5 – 10 mm. It should be fitted so that it cannot vibrate.

- **Fitting to tractors without 4-wheel drive:**



By using the provided V4A-steel bolts fit the magnets in the wheel rim. Evenly distribute the magnets around the circumference.

The number of magnets depends on the wheel size.

The travelled distance between 2 impulses must not exceed 60 cm.

Calculation:

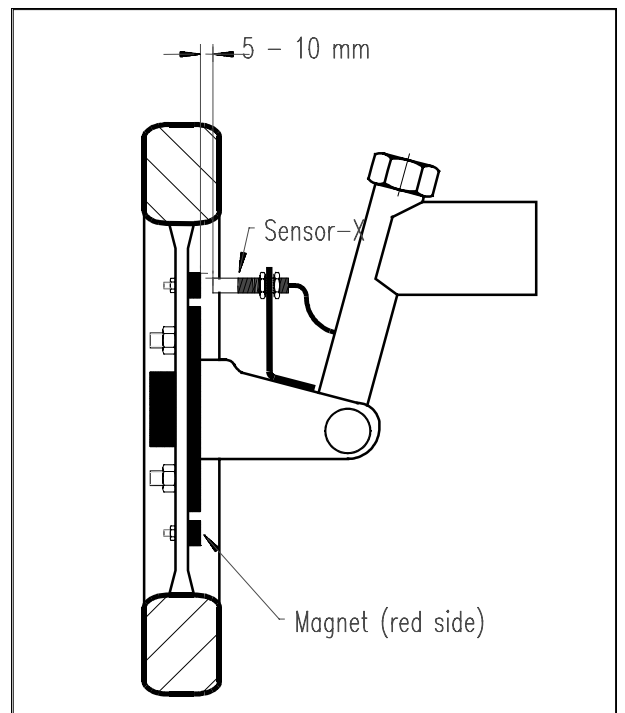
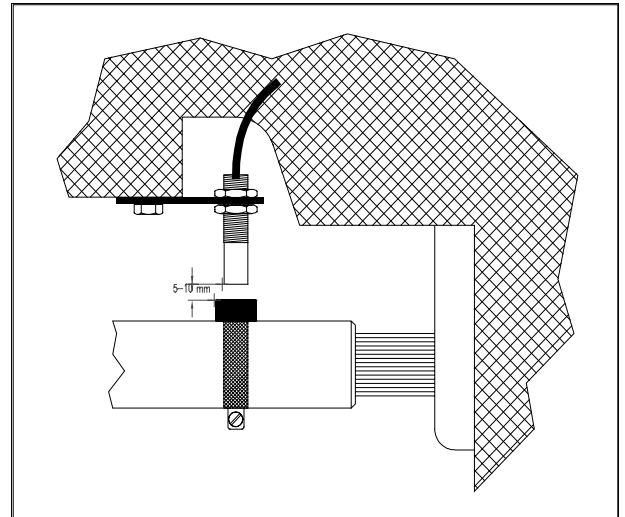
wheel circumference ÷ 60 cm = number of magnets

e.g.:

256 cm ÷ 60 cm = 4,27 = min. 5 magnets



Fit the sensor to the stub axle bearing by using the provided carrier in such a way that the end of the sensor points towards the magnets. The gap should be 5 – 10 mm.

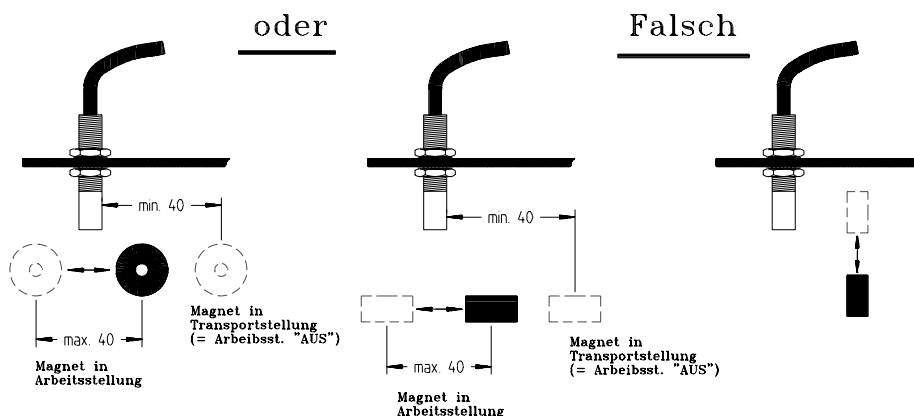


#### 4.2.4 Sensor Y (operational position)

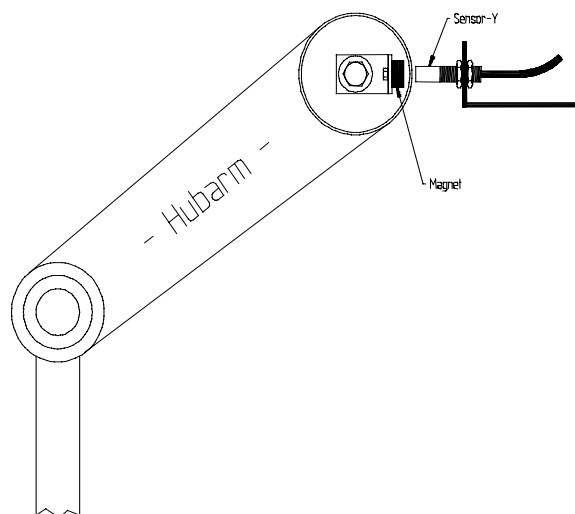
Connect sensor Y (18) via the 3-pole with the tractor signal distributor (16). Herewith information about the operational position is given e.g. on soil tillage implements by the three point hydraulic or on the beet puller by the breaker coulter. If a switch box is available the computer receives information about the operational position from the implement plug (4). In this case the solenoid is without any function.



By using the provided V4A-steel bolt the magnet is fitted to an implement part which does not change from transport into operational position. The sensor is installed on an opposite, fixed part of the vehicle. When in operational position the magnet must be in front of the sensor. The LED "operational position" lights up on the computer.



If the implement part to which the magnets are fitted is moving from the operational position by more than 4 cm from the sensor a second magnet should be fitted in the direction of movement of the magnet. If the machine is in transport position the magnet should have a minimum spacing of 40 mm from the solenoid.



Example: Tractor – three point hydraulic

### 4.3 Tractor signal distributor SPRAYCONTROL II-A for trac- tors with signal socket

In this case the fitting of sensor X is obsolete.  
**SPRAYCONTROL II-A** is connected with the aid of  
the **adapter cable** (22) with the tractor signal  
socket..



As described in para. 4.2. the housing  
is fitted to the basic console.



The battery cables are connected as  
described under para. 4.2.1. and 4.2.2.



The signal "operational position" of  
the tractor signal socket is only  
evaluated from the computer when no  
switch box is connected.

### 4.4 Connection of field sprayer

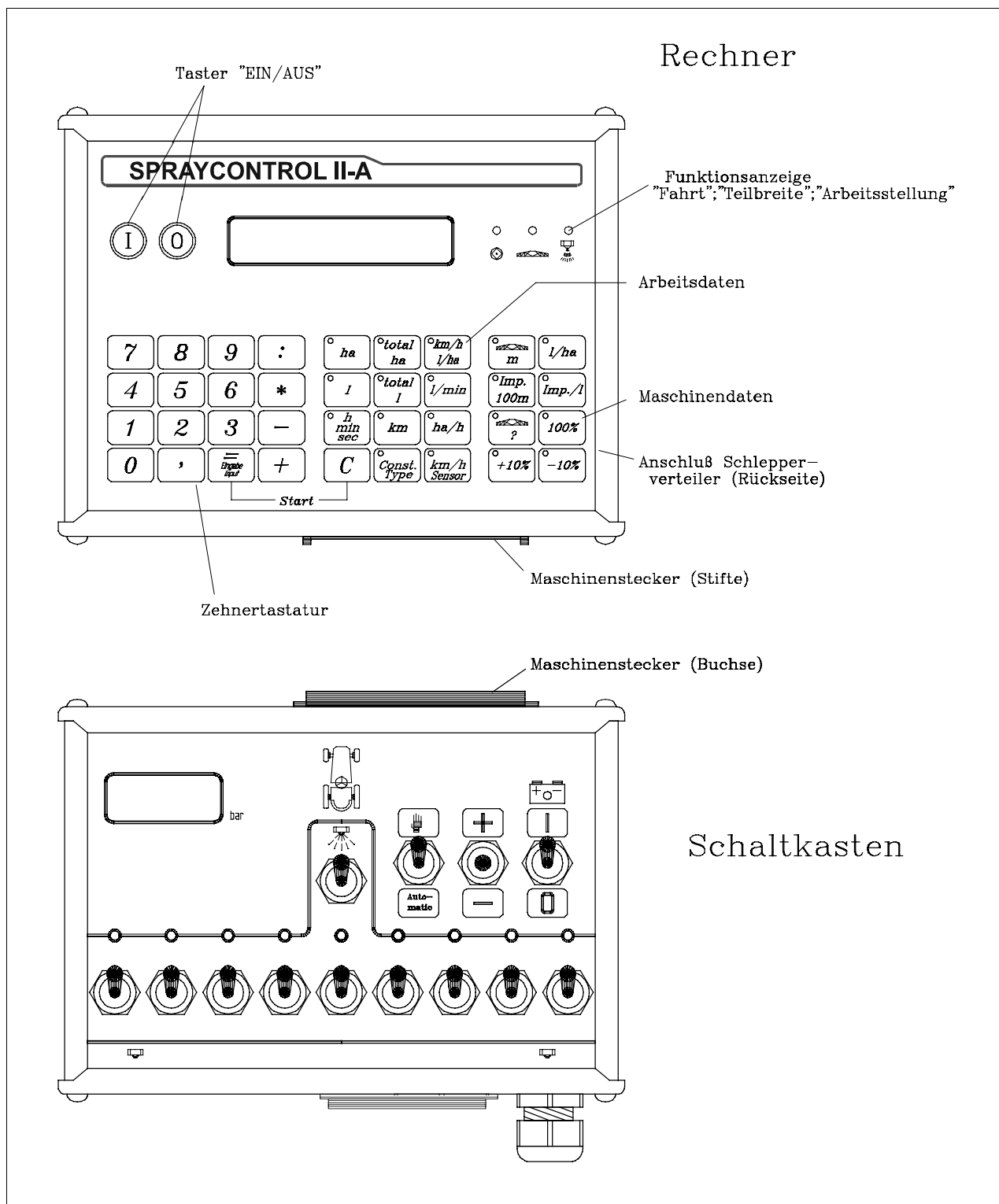
The field boom sprayer mounted to the tractor or  
trailed is connected via the **48-pole implement  
plug** (3 + 4). Via this plug the computer receives  
the information from sensors, boom part switches  
and the main switch. The implement itself is also  
controlled via this plug.

#### 4.4.1 Connection switch box

The switch box (5) is slid on to the cap profile rail,  
fitted to the computer and fixed with the thumb bolt  
(12).



Implicitely ensure that the implement  
plug (3) is safely inserted in the  
bushing (4).



## 5. Operating instruction

### 5.1 Function description

#### • Display



**SPRAYCONTROL II-A is supplied with an 8 digit numerical display. During operation the actual forward speed (km/h) and the spray rate (l/ha) can be read off at first sight..**

The display shows the selected implement and operational data.

You will find the "Ein-"("On)- and "Aus-"("Off") key on the left hand side of the display.

On the right hand side you will find the control lights "distance impulses" (wheel / drive shaft / radar ), "Part width section" and "Operational position". On the right hand side you will find the control lights "Distance impulses".



**The light "part width section" lights up when one or more part width sections have been switched off. The light "operational position" should light up during spraying operation.**

#### • Key pad with 10 keys

With the ten digit key pad you can make use of the 4 basic rules of arithmetic. It can also be used for entering implement data.

#### • Operational data

Via this key set the desired date can be recalled.



**Start the job by simultaneously pressing the keys "Enter" and "C". All counters apart from  $\Sigma$ ha and  $\Sigma$ l are set to 0. The registration of the operational time is started.**

#### • Implement data

With this key set the computer receives the implement data.



**Via the "+/- 10% " keys the spray rate can be varied in 10 % steps, in relation to the required value**

## 5.2 Description of implement data

Before starting the implement, the implement specific data should be entered:

### 5.2.1 Key "working width"



With this key the working width is entered

- Press key "working width"
- Enter the value via the ten digit key pad
- Press key "Enter" (=)

### 5.2.2 Key "km/h-Sensor"



**SPRAYCONTROL II-A** provides 3 inputs for the determination of the travelled distance. The sensors X – wheel / drive shaft and radar – can be connected with the tractor signal distributor and the sensor X – wheel of the field sprayer – can be connected with the implement signal distributor.



**During operation SPRAYCONTROL II-A can evaluate only one sensor.**

Via the key "km/h - Sensor" you can make your choice.

- Input of one
  - 1 = Sensor wheel / drive shaft
  - 2 = Radar
  - 3 = Wheel – trailed field sprayer

For all three inputs the calibration figure "Impulses/100 m" can be stored.



**The selection of the sensor can be switched over while travelling.**

- Selection of the sensor (e.g. wheel / drive-shaft)
  - Press key "km/h - Sensor"
  - Press key "1"
  - Press key "Enter".

### 5.2.3 Key "Impulses / 100 m"



Hereby the number of impulses is entered which the installed sensor (please refer to 5.2.2) delivers to the computer.

There are two possibilities of entry:

1 - The value Impulses / 100 m is known

- Press key "Impulses / 100 m"
- Enter the value via the 10 digit key
- Press key "Enter" (=)



Select the desired sensor (please refer to 5.2.2) before entering the Impulses/100 m . !

2 - The value Impulses / 100 m is unknown

- Accurately measure out in the field a calibration distance of 100 m and mark the starting- and ending point of the calibration distance
- Bring vehicle in start position
- Simultaneously press key "Impulses/ 100 m" and "C"
- Travel along the calibration distance of 100 m, hereby the computer counts the impulses.
- Press key "Enter" (=)



**SPRAYCONTROL II-A automatically selects the input to which the sensor has been connected. If several sensors are installed (e. g. drive shaft and wheel-trailed field sprayer) the impulses/100 m of both sensors are registered. Hereby the sensor with the higher priority is automatically chosen. The sensor "wheel-trailed field sprayer" has the highest priority, followed by "Radar" and "Wheel/drive shaft".**

### 5.2.4 Key "number of part width sections"



Via this key the number of the part width sections (max. 12) and the number of nozzles of the relevant part width section can be entered.

The numbering is made from the left hand side to the right hand side, seen in driving direction.

During the entering procedure the part width is shown on the left hand side of the display and the number of nozzles on the right hand side.

Procedure:

- Press key "number of part width sections"  
On the left hand side a 1 appears (part width section 1) and on the right hand side the number of the entered nozzles.
- If you intend to alter the value, enter the new value via the ten digit key pad.
- Press key "Enter"  
Now the value is stored in the memory. A 2 (part width section 2) appears in the left hand part of the display. If the value – number of nozzles – in the right hand part of the display is alright, the part width section 3 is selected by pressing the key "Enter". This procedure can be continued until the 12<sup>th</sup> part width section. Then the total number of nozzles is shown.

If the field sprayer has e.g. 5 part width sections and the 6<sup>th</sup> part width section is shown, enter a 0. The computer automatically returns the part width sections 7 to 12 automatically to 0. In this case the computer assumes 5 part width sections.

### 5.2.5 Key "Required value - l/ha"



Herewith the required spray rate is pre-stored in the computer. If the switch is in position "automatic" the electronic automatically controls the pressure and thus the spray rate. The control procedure can be monitored via the display "+" and "-"



**If, due to a fault (e.g. tank is empty) the pre-set value is not attained, the honk sounds and both lights "+" and "-" in the 10 %-keys light up.**

Entering the value "l/ha"

- Press key "Required value l/ha"
- Enter value via the ten digit key pad (e.g.260)
- Press key "Enter"

Check the entered value by pressing key "Required value l/ha" once more.

### 5.2.6 Key "Impulses / Litre"



Herewith the number of impulses per litre is entered which the flow meter delivers to the computer.

Two possibilities of entering are provided:

- 1 - The value impulses/litre is known:

- Press key "Impulses / Litre "
- Enter the value via the ten digit key pad
- Press key "Enter" (=)

2- The value Impulses / Litre is not known or shall be checked:

- Fill the tank with water and find out the quantity (by weighing).
- Simultaneously press keys "Impulses / Litre" and "C".
- Switch on the field sprayer when it is not moving and spray some hundred litres (the computer now counts the impulses from the flow meter).
- Determine the sprayed quantity (re-weigh ).
- Enter this value via the ten digit key pad.
- Press key "Enter" (=).
- Now the computer has determined the value "Impulses/Litre" by himself.



**Check the impulse figure of the flow meter several times a year, especially prior to any season.**

## 5.2.7 Key "Constant / Type"



Via this key 2 functions can be entered. The figure before the decimal point and the 1<sup>st</sup> digit behind determine the **control constant**.

The 2<sup>nd</sup> digit behind the decimal point determined the type of control unit

### 5.2.7.1 Control constant



In case of a particular deviation from the pre-set required value different control times are necessary depending on sprayer type and size.

The computer calculates this control time with which the control ball tap is selected. Via the control constant the control time is influenced.

- Control too slow -> enter bigger value
- Control overloaded -> enter smaller value



**The control constant has been optimally selected if in case of a deviation from the required value the computer gets with one control step near to the required value and finally with a few little control steps cares for the fine adjustment.**

The control behaviour can be recognised by the display l/ha and also by the switching noise of the relay circuit board in the switch box.



**Control constants from 0,5 to 10 are possible  
Pls. also refer to 5.2.7.2. "Type of control unit".**

### 5.2.7.2 Type of control unit



The 2<sup>nd</sup> digit behind the decimal point informs the computer about the type of control unit

Example:

Control constant 3.5 and control unit – Typ3 1 (solenoid valve without equal pressure function)

- Press key "Const./Type"
- Enter the value via the ten digit key pad (2.51)
- Press key "Enter" (=)

The following type of control units have been designated (in the example the control constant 3.5 has been):

| Type of control unit | With equal pressure | With return flow measuring | With control constant |
|----------------------|---------------------|----------------------------|-----------------------|
| TG                   | No                  | No                         | 3.51                  |
| NG                   | Yes                 | Yes                        | 3.52                  |
| G                    | Yes                 | Yes                        | 3.52                  |
| BBG                  | No                  | No                         | 3.51                  |

- **Engine valve without equal pressure function**

- The control unit is set up with solenoid valves.
- Even with switched off part width section the flow meter only gages the quantity sprayed via the sprayer boom.
- When at the end of the field one or more part width sections are switched off on the switched off sprayer, the computer carries out a pre-setting by the control ball tap. The fine adjustment is done after the field sprayer has been switched on.  
(UG, TG-control unit without equal pressure function).  
(All BBG-types).

- **Equal pressure gauge with return flow measurement:**

The unit can be set up with solenoid valves or with engine valves. When the part width section has been switched off the flow meter also measures the amount of liquid which is returned to the tank. The computer bears this in mind when determining the applied spray rate.

Example: Field sprayer with 4 part width sections

One part width section has been switched off, only 3/4 of the measured quantity is registered (1/4 returns to the tank).

(UF, G-control unit with equal pressure function)

(UG, NG-control unit with equal pressure function)



**Carefully and accurately set the valves of the equal pressure gauge.**

### 5.2.8 Key "+ 10 %" ,

"- 10 %" , 

"100 %" , 

Via the keys + 10 % and - 10 % the spray rate (e.g. liquid fertiliser) can be changed in 10 % steps related to the required value

Via the 100 % - key the pre-set required value is accessed again.

The control procedures are shown via the + 10 % or - 10 % light emitting diode.

### 5.3 Description of the function keys

#### 5.3.1 "Start function"



By simultaneous pressing of the keys "=" and "C" the start function is released. That means the memory for the area, time and distance is returned to "0". With this key pressure the time is automatically started. Carry out this function before starting to operate.

#### 5.3.2 Key "area"



Hereby the area is shown which has been worked after actuation of the start function (5.3.1). If the part width sections have been switched off, these are automatically considered. If the field sprayer had been switched off via the main switch (the light of the main switch is out) the area measuring is interrupted.

#### 5.3.3 Key "total area"



Herewith the total worked area of one season can be determined. Before starting season operation the memory is returned to "0" by simultaneously pressing the key "total worked area" and "C".

#### 5.3.4 Key "time"



By pressing this key the operational time is shown which has passed since actuating the "start function" (5.3.1).

When the computer has been switched off the time registration is stopped. When the computer has been switched on it is automatically started again.

The watch can also be stopped during operation. After having pressed key "Zeit" / "Time" the watch can be stopped by pressing the key once more. Start by pressing key "Zeit" / "Time" once more again.

#### 5.3.5 Key "distance"



Hereby the distance is shown which has been travelled after actuation the "Start function" (5.3.1).

#### 5.3.6 Key "Spray agent l/min"



When this key is pressed the spray rate in l/min. is shown.

#### 5.3.7 Key "Spray agent l/ha"



This function is shown during the operation. The operational speed and the actual spray rate in l/ha can be read off. This way, the procedure can be monitored.

#### 5.3.8 Key "Spray agent l"



With the start function (5.3.1) this counter is returned to "0", and also the counter for the area. This way the worked area and the spray rate which has been applied on this area can be read off after operation has been finished.

#### 5.3.9 Key "Total-l"



This counter is at free disposal. If this key and the "C" key are pressed simultaneously the counter will be erased.

With this counter you can e.g. monitor the tank content. After filling the counter is returned to "0". The applicated spray agent quantity can be read off during operation.

#### 5.3.10 Key "Capacity - ha/h"



By pressing this key the average capacity per hour is shown.

## 5.4 Operation

When the implement data have been entered (5.2.1 – 5.2.7), only the start function (5.3.1) need to be actuated before starting to operate. During operation any desired value can be recalled. The 4 basic arithmetical rules may also be used during operation.

The automatic control provides an accurate metering. Note: Maintain the pressure regarding the drop formation for the used kind of nozzle.



**When switching off and on the field sprayer maintain the same speed to prevent a short time under- or over application after switching on the field sprayer.**



**If a manual control is intended set the "Hand/Automatic" on the switch box on to "Hand". The spray rate can be controlled via the +/- key.**

After the operation has been finished all values may be recalled. A new operational procedure begins with the "Start function" (5.3.1).



**Before the initial operation fill the field sprayer with water (without spray agent). Start to operate the field sprayer. Then the measured and indicated values should be checked.**

## **6. Maintenance**

### **6.1 Computer**

The computer is maintenance-free. It is provided with an internal electronic securing. Over winter the computer should be stored in a room with appropriate temperature.

### **6.2 Flow meter**

After any operation clean the flow meter with water. After any season check the run of the impeller and exchange if necessary. Carry out a calibration before any season (please refer to para. 5.2.6.).

## 7. Remedy of faults

|      | Fault                                                                                              | Cause                                                                                           | Remedy                                                                                                                                                              |
|------|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7.1. | All lamps on the key pad light up, the honk sounds permanently                                     | Power supply voltage too low                                                                    | Take voltage directly from the battery.                                                                                                                             |
| 7.2. | Area is not measured                                                                               | Input "working width" or "impulses/100 m" is missing                                            | Enter values (see 5.2.1. to 5.2.3.).                                                                                                                                |
|      |                                                                                                    | No impulses from the distance sensor (red lamp "drive" does not flick while travelling).        | Check sensor X, check cable to sensor for damage, if necessary exchange the sensor                                                                                  |
|      |                                                                                                    | No operational position is recognised, lamp "main switch" does not light up                     | No contact in the implement plug, check connection (4.5.1). Main switch – switch box defective – exchange.                                                          |
| 7.3. | The spray rate l/ha is permanently shown with "0".                                                 | Entering "impulses/l" is missing.                                                               | For entering the impulses/l please refer to 5.2.6.                                                                                                                  |
|      |                                                                                                    | The flow meter does not deliver any impulses to the computer                                    | Check cabling, impeller inside the flow meter is blocked (see 6.2.).                                                                                                |
| 7.4. | Display spray rate l/ha is not correct                                                             | The flow meter does not operate properly.                                                       | see 6.2. and 5.2.6.                                                                                                                                                 |
|      |                                                                                                    | The area is not determined accurately (the display "sprayed amount/l" or "total l" is correct). | Check the working width and readjust if necessary (see 5.2.1.).<br>Check impulses/100 m, correct if necessary (see 5.2.2. and 5.2.3.)                               |
| 7.5. | The desired spray rate is not achieved. The actual rate is below the one pre-set. The honk sounds. | The setting motor has been wrongly polarised. The pressure is increased instead of reduced.     | Check control with the aid of the +/- button on the switch box. If necessary interchange the connections for the setting motor in the implement signal distributor. |
|      | (please also refer to 7.4.)                                                                        | The pump does not deliver the desired quantity.                                                 | Increase rev. speed, choose a lower gear.                                                                                                                           |
|      |                                                                                                    | Filters are choked.                                                                             | Clean filters.                                                                                                                                                      |
| 7.6. | The spread rate is above the pre-set rate. The honk sounds.                                        | Faulty polarisation of control ball tap. The pressure is increased instead reduced.             | Check control with the aid of the +/- button on the switch box. If necessary interchange the connections for the setting motor in the implement signal distributor. |
|      |                                                                                                    | The return flow from the control ball tap to the tank cannot absorb the surplus quantity        | Check tubings<br>Reduce pump capacity (lower rev. speed, higher gear)                                                                                               |

|      |                                                              |                                                           |                                                                                |
|------|--------------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------------------------|
| 7.7. | The implement shows chaotic data                             | The contents of the memory is distorted by a disturbance. | Implement related date will have to be newly entered.<br>(see 5.2.1. - 5.2.7.) |
| 7.8. | After switching on the display shows HALP 8888 or HALP 0000. | Memory fault                                              | Return computer to the factory.                                                |



**We do not accept any liability for damage resulting from wrong metering.**



8.      **Determined implement data**

|                                  |       |
|----------------------------------|-------|
| Impulses/100m (light soil) ..... | _____ |
| Impulses/100m (medium soil)..... | _____ |
| Impulses/100m (heavy soil) ..... | _____ |
| Working width .....              | _____ |
| Factor Impulses/Litre .....      | _____ |
| Control constant.....            | _____ |







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