Installation and User´s Guide

UNI-Control S

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January 1995

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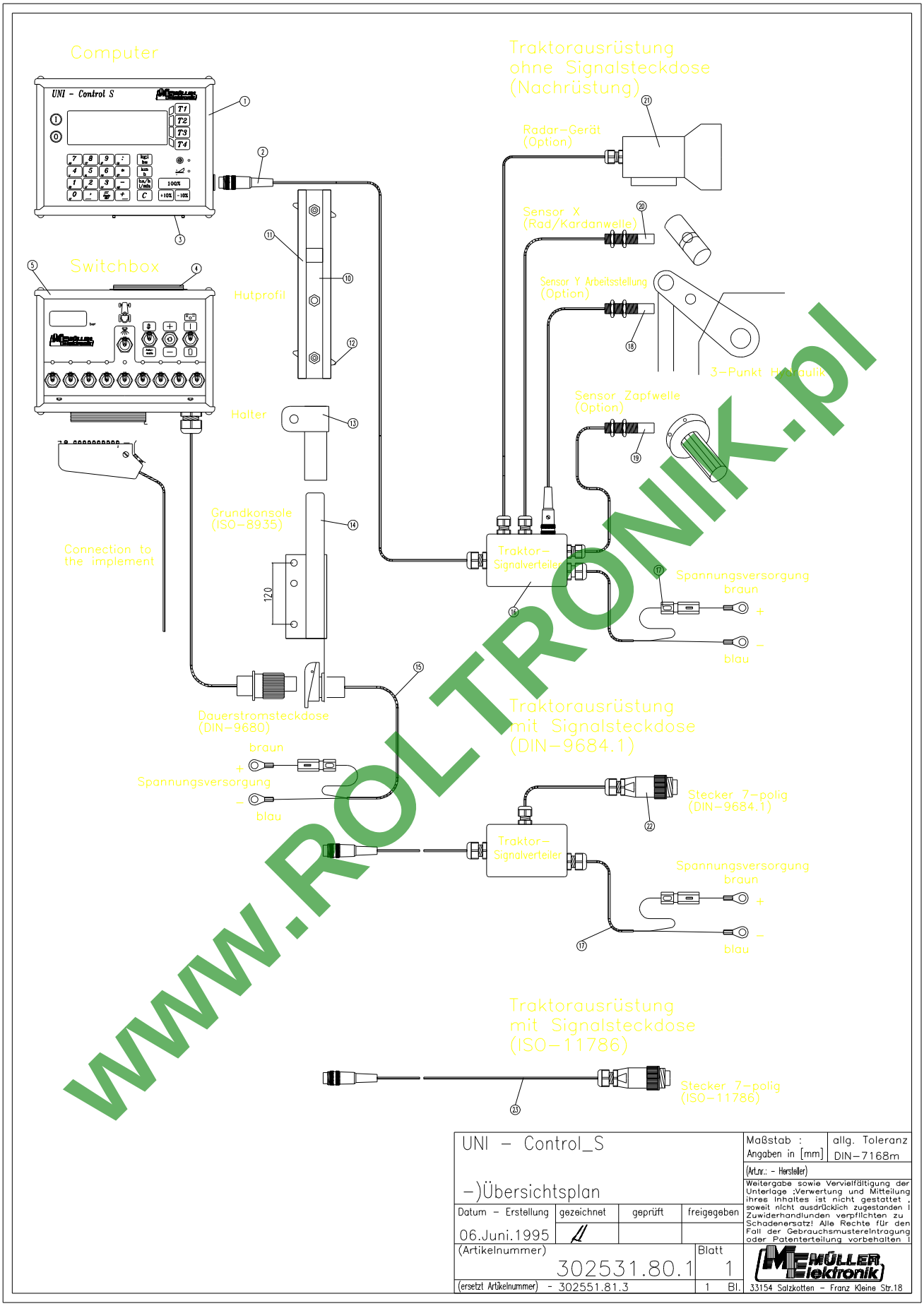

UNI - Control_S -)Übersichtsplan				Maßstab : Angaben in [mm]	allg. Toleranz DIN-7168m
				(Art.nr.: - Hersteller)	
				Weitergabe sowie Vervielfältigung der Unterlage ;Verwertung und Mitteilung ihres Inhaltes ist nicht gestattet , soweit nicht ausdrücklich zugestanden ! Zuwiderhandlungen verpflichten zu Schadenersatz! Alle Rechte für den Fall der Gebrauchsmustereintragung oder Patenterteilung vorbehalten !	
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1 Summary

[1] UNI-Control S computer (art. no.: 302531); with chip card (art. no.: 302532).

[2] Tractor plug (at the back)
Connects tractor signal distributor with the tractor-specific sensors.

[3] Machine plug on the UNI-Control S
Connects switch box to machine adapter.

[4] Machine plug on the switch box or on the machine adapter. Connection to UNI-Control S.

[5] Switch box (art. no.: see price list)
Operating panel of the attached machines (e.g. field sprayer) with connection to UNI-Control S.

[10] Bracket profile slide (art. no.: 312228)
Receiver for the UNI-Control S computer and the switch box or machine adapter.

[11] Leading channel
for UNI-Control S and the switch box or machine adapter.

[12] Binding screws
to secure the computer, the switch box or machine adapter.

[13] Bracket S (Art.-No.: 312226 (incl. profile slide [10]))
Holds die profile slide.

[14] Computer console (art. no.: 312227)
Mounted to the tractor cabin. Includes the bracket with profile slide and battery connection fo the switch box or the machine adapter.

[15] Battery connection cable (art. no.: 312155)
for the voltage supply to the switch box or machine adapter. Connection to the 12-volt battery.

[16] Tractor signal distributor S (art. no. see price list)
Junction box for the tractor-specific sensors and the battery connection cable.

[17] Battery connection cable for the voltage supply to the UNI-Control S.

[18] Sensor Y (Working position) (art. no.: 312089)
to record the working position (z. B. at the 3-point hydraulics).

[19] Power take-off shaft rotation sensor (art. no.: 302580)
to record shaft speeds at rpm.

[20] Sensor X (cardan shaft / wheel) (art. no.: 312580)
to record the forward speed, impulse taken from the cardan shaft or front wheel of the tractor.

[21] Radar device (art. no.: 302583)
for non-slip speed recording.

[22] Plug for tractor signal socket
Takes signals from the sensors already installed on the tractor.

[23] Plug for tractor signal socket
Takes signals from the sensors already installed on the tractor. (ISO -11786)

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1.1 Description of the system

The UNI-Control S can be used universally on many agricultural machines as a measuring, controlling and monitoring instrument. It consists of the **computer** (1), the **console** (10 - 14) and the **tractor signal distributor** (16) with the **cardan shaft/wheel** sensor (20) to establish the distance.

In addition a **radar sensor** (21) for the non-slip determination of the speed, a **working position** sensor (18) and a **power take-off shaft** sensor (19) for the input of the number of power take-off shaft revolutions can be installed.

The tractor signal distributor (16) with the connection to the **signal socket tractor** (22) has no sensors. The signals are picked up from the tractor´s signal socket.

The individual machine can be connected to the UNI-Control by means of the **switch box** (5) or the **machine adapter** .

The UNI-Control recognises the type of machine by a code on the switch box´s or machine adapter´s 48-pin **machine plug** (4). When the device is switched on, the program and the connected machine´s individual data are called up automatically.

The UNI-Control S can store machine data of up to 12 machines.

Technical data:

Voltage	:	10.5 - 16 volts DC
Power	:	0.4 amperes (12 volts DC)
Energy requirements	:	5.3 watts (12 volts DC)

The computer has an internal electronic backup device.

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1.2 "Tractor" program

The "tractor" program has the code 0 (no code)

If there is neither a switch box nor an adapter, the tractor program is called up automatically.

The UNI-Control can be used as a modern area meter when not connected to e.g. the field sprayer. In this case the area, total area, distance, working time and speed are determined. In addition the power take-off shaft revolutions can be displayed and monitored.

With the installation of a radar device, the UNI-Control displays the effective forward speed and the slip.

In addition it is possible to monitor a mounted or trailed machine of up to 16 shaft speeds in the region of 20 - 10,000 rpm. A counting device to record specific events is provided (e.g. round bales).

1.3 Machine programs

The UNI-Control S has the following programs:

- Field sprayer
- Pneumatic fertilizer spreader
- Single seed planter
- Manure cart
- Combine harvester
- Self-propelled harvester (e.g.turnip full harvester)
- Universal / Telescope spreader (sewage sludge)
- Seed machine

The UNI-Control S recognizes from the code on the **machine plug** (4**)**, which machine is attached at any specific time.The corresponding program and the individual machine data are called up automatically by the UNI-Control S.

1.3.1 Field sprayer

The UNI-Control S can be used as a fully automatic monitoring instrument on the field sprayer.

The device carries out an area related control of the spray rate in relation to the set rate.

The current spray rate, speed, the area being treated, total area, the quantity sprayed, as well as the total quantity, working time and the distance travelled are recorded continually.

With the installation of an electronic pressure sensor, the spray pressure is monitored and displayed.

The UNI-Control S can be operated with either the tank meter or with the TANK-Control.

During the filling process, the quantity filled is recorded by the tank meter. The contents are then calculated and displayed according to the measured quantity being sprayed.

With the TANK-Control the bin´s contents are continually measured and displayed. In conjunction with this device, the UNI-Control S can automatically switch off filling.

1.3.2 Pneumatic fertilizer spreader

Pneumatic fertilizer spreaders of the following firms can now be connected: ACCORD, AMAZONE, and RAUCH.

With regard to the computer the monitoring and the recording of the operation data are carried out as with the field sprayer.

Please consult our price list for the technical requirements.

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1.3.3 Single seed planter

There are two methods of linking up the UNI-Control S with single seed planters.

- **Optical sensor (grain checking)**

  With the machine adapter "Einzelkorn“ (art. no.: 302 601) the UNI-Control S can be connected to the optical control devices of the following firms: ACCORD, BECKER; GASPARDO, KLEINE, KONGSKILDE, NODET and SICAM. In this case the monitoring device of these firms is not required.

  The grains per row which are determined are projected to the seed rate/ha and compared to the pre set rate. If the established rate lies more than 15% below the pre-set rate an optical and acoustic alarm is set off.

- **Reed contact sensor**
  (Control of the sowing discs when idle)

  Behind the mechanical safety mechanism of the sowing disc drive (slip clutch / locking pin) the Reed contact sensors carry out a control during standstill. In the case of a defect (standstill) an alarm signal is set off.
  Up to 12 aggregates can be monitored using the machine distributor (art. no.: 302 591) 13 and more aggregates on request.

  In addition, both versions can control the following functions:
  - monitoring the fan rotation
  - monitoring the speed

  Variations of more than +/- 15% from the pre-set rate cause an alarm signal to be set off.

  Following data is determined:
  - Area, total area, distance and working times.

Attention!
When ordering please pay attention to the note "For single seed planters".

1.3.4 Manure cart

The spray rate from a pump and vacuum tank cart is controlled fully automatically. The current spread rate is measured by a magnetic inductive liquid flow meter.

The spread rate from a pump tank cart is controlled automatically by a bypass valve.

A cross-section control is carried out with the vacuum tank cart.

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1.3.5 Combine harvester

The area being treated, the working times and the speed are displayed.

In addition it is possible to monitor up to 8 shaft speeds from 20 to 10,000 rpm. As soon as the shaft speed drops by more than 10% from the pre-set speed, an alarm signal is set off.

For the seives and shaker grain loss can also be monitored. The loss which can be tolerated is programmed. If this value is exceeded an optical and acoustic alarm is released.

The equipment with art. no.: 302 621 is required for the monitoring of the combine harvester.

1.3.6 Self-propelled harvester

The program for the self-propelled harvester corresponds to that of the combine, however, instead of the grain loss display, the rpm of the main shaft is continually displayed.

1.3.7 Universal / Telescope spreader

The UNI-Control S can control the spray rate from sludge spreaders with a hydraulic driven scraper floor fully automatically. The rotation of the hydraulic motor as well as the spread rate can be controlled by a motor-adjustable power control valve.

The advantages which apply to the manure cart are also valid here. Sludge can only be classed as environmentally friendly when the permitted quantity is spread evenly on the field intended.

1.3.8 Seed machine

The UNI-Control S can be connected to the ACCORD seed machine monitor ESC by means of a machine adapter.

A large choice of rhythms is availble for switching the tram lines.

In addition the fan, the seed shaft and the tank contents are monitored. The one-sided switch and the quantity adjustment can be controlled with the UNI-Control S.

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2 Fitting instructions

2.1 Console and computer

The **computer console** (14) should be mounted on the cabin within view and reach of the driver on the right hand side and in such a way that it conducts electricity. The distance to the transmitter or antenna should be at least 1 m.

The **bracket** (13) is attached to the console´s tube.

The ***profil slide*** (10) is mounted on to the bracket. The UNI-Control S **computer** (1) is pushed on to the profile from above and secured with the wing-bolt.

The ideal angle for viewing the display from below lies between 45º and 90º. It can be adjusted by swiveling the console.

Attention!
The computer cabinet must be wired to the tractor chassis via the console. When assembling remove the color from the assembly points.

2.2 Tractor distributor for tractors without signal sockets

The **battery connection cable** - computer (17) and the sensors (18 - 21) are connected to the **tractor signal distributor** (16**)**. The sensor X (20) (cardan shaft/wheel) is supplied as standard.

The **sensor Y** (18) (working position), the **power take-off shaft rotation sensor** (19) and the **radar device** (21) can easily be retro-fitted.

The **tractor signal distributor** (16) is screwed on to the computer console or to another position on the tractor with the mounting plate.

The tractor signal distributor is not required when the UNI-Control S is only being operated on an attached field sprayer. The voltage supply is taken from the switch box. The distance impulse is taken from the wheel of the sprayer.

2.2.1 Battery connection cable - computer

The voltage supply must be taken directly from the battery or from the 12-volt starter. Care should be taken when laying the **cable** (17) and it should be shortened if necessary. The ***crimpon ring terminal*** for the ground line and the end sleeve for strands for the + line (brown) should be fitted with suitable pliers. The end sleeve for strands for the + line are in the connection clamp of the fuse holder. The battery connection cable has a 5- ampere fuse.

brown = + 12 volts
blue = ground

Attention!
The battery´s minus pole must be connected to the chassis of the tractor

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2.2.2 Battery connection cable for the switch box or machine adapter

The socket is mounted to the computer console with the screws supplied. The power connection is as described in 2.2.1. The battery cable has a 25-ampere fuse.

2.2.3 Sensor X (Establishing the distance) (20)

- **Fitting to a Unimog (Unimog without a signal socket)**
  A tacho adapter can be supplied with the Unimog. Dismantle the tachometer shaft from the gearbox and screw the adapter supplied in its place.
  Apply multi-purpose grease to the shaft with the magnets and insert it with the yoke showing downwards.
  Screw the tachometer shaft on to the free end of the adapter.

- **Fitting to a 4-wheel drive tractor and to a MB-Trac**

  Mount hose clamp with the magnet to the cardan shaft.

  The sensor should point towards the magnets from a distance of 5 - 10 mm. It should be fitted when no oscillation occurs.

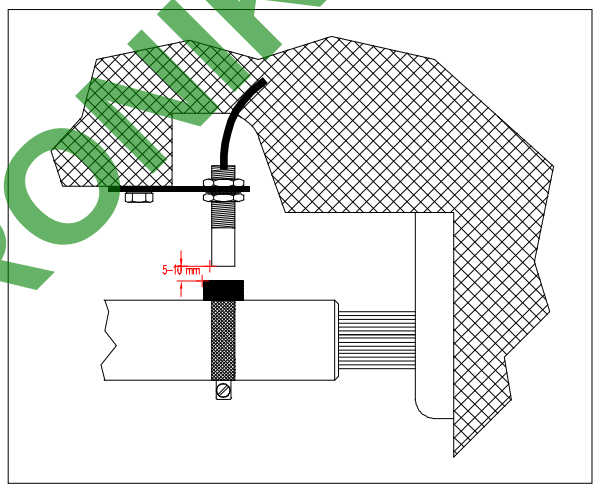

Diagram: 312084.85.1

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

  Fit the magnets to the shell of the wheel at an equal distance apart round the circumference with the V4A screws supplied.

  The number of magnets is determined by the size of the wheel.

  The distance travelled between two impulses should not exceed 60 cm.

  Calculation:
  Circumference of wheel ÷ 60 cm = number of magnets

  e.g.
  256 cm ÷ 60 cm = at least 4.27 = magnets

  Fit the sensor to the axle steering bearing with the brackets provided in such a way, that the end of the sensor points towards the magnets. The distance should be 5 - 10 mm.

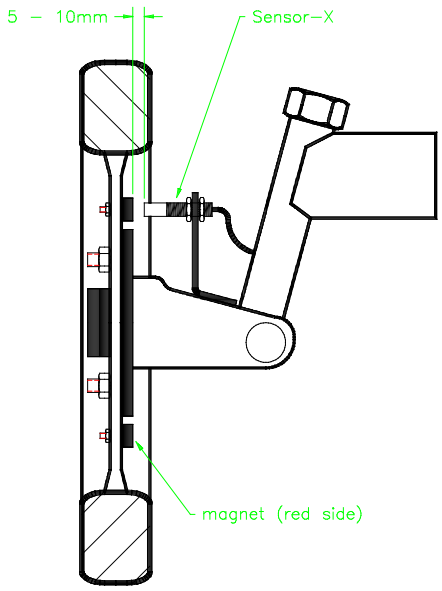

Diagram.: 312 084.83.1

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2.2.4 Sensor Y (Working position)

The sensor Y (18) is connected to the tractor signal distributor (16) via the 3-pin socket. From this sensor the working position of e.g. the three-point hydraulics on soil-tilling work or the ***lifter*** on beet-harvesters. If there is a switch box or a machine adapter (e.g. field sprayer) the computer receives its information about the working position via the machine plug (4); the sensor is in this case without significance.

The magnet is mounted with the V4A bolt supplied to a part of the machine, which changes its position from transport to working position. The sensor is then fixed to a static part of the tractor opposite to the magnet. When in operation, the magnet must be exactly in front of the sensor. The light diode „ACTION“ lights up on the computer.

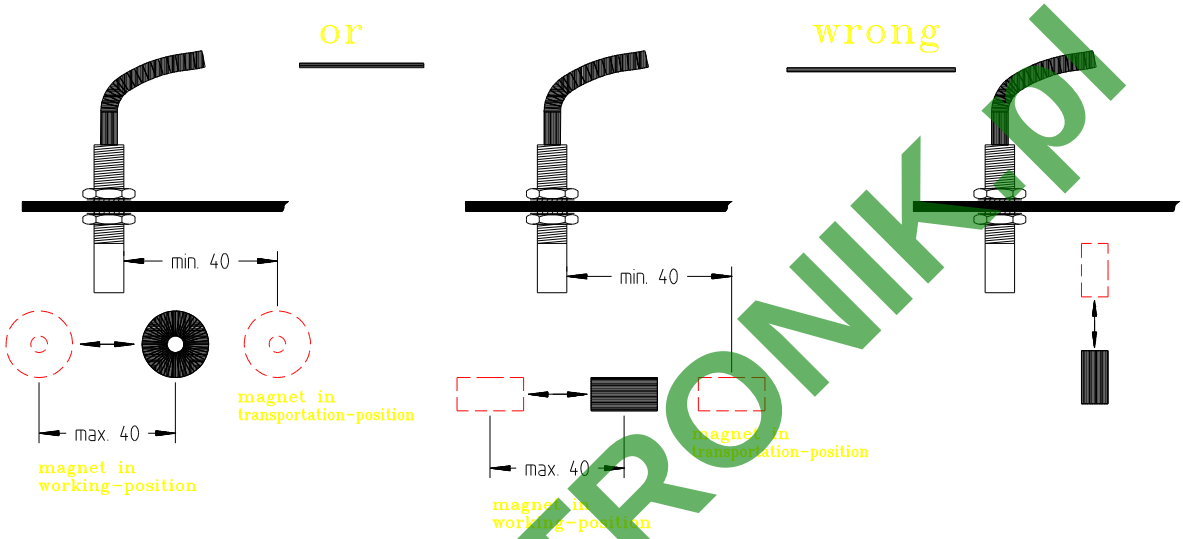

Diagram 312 090.81.1

Whenever the part of the machine which is being monitored varies in working position by more than 4 cm in front of the magnet sensor, a second is fitted in the direction of the movement of the magnet. When the machine is brought into transport position, the magnet should move at least 40 mm away from the magnet switch.

Example: Tractor - three-point hydraulics

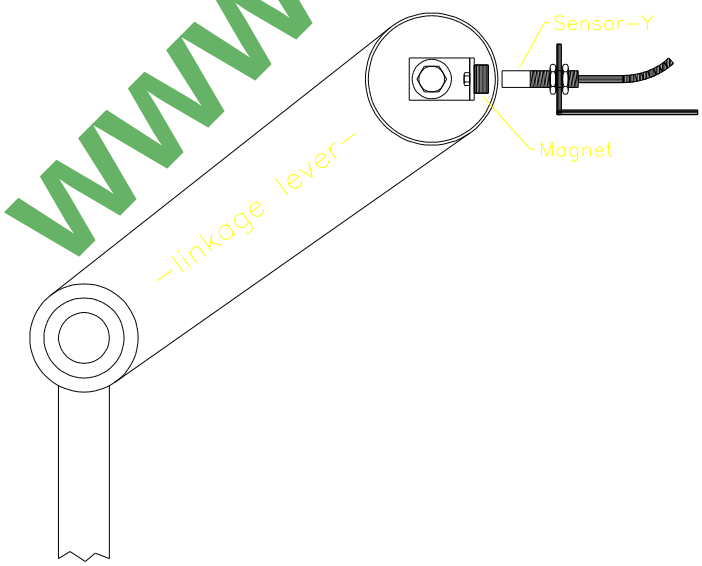

Diagram: 312090.82.1

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2.3 Tractor signal distributor for tractors with a signal socket

The fitting of the sensors is in this case not necessary. The plug from the tractor signal distributor (16) is plugged into the signal socket (20) on the tractor.

The cabinet is fitted to the computer console as described in paragraph 2.2.

The battery connecting cables are connected as described in the paragraphs 2.2.1 and 2.2.2.

The input Y (working position) is connected by the plug ”signal socket“. An additional sensor (working position) is required when

a) the signal "working position" is not provided by the tractor electronics

b) the working position is taken from a trailed machine (e.g. beet harvester)

With b) make sure that the working position is not switched on via the signal socket. The "working position" line from the plug - "tractor socket" should be interrupted in the tractor distributor.

Fitting is carried out as described in paragraph 2.2.2.

2.4 Connecting machines

Machines trailed or mounted to the tractor as well as a self-propelled machine (e.g. combine harvester, beet harvester etc.) are connected via the 48-pin machine plug (3,4). The computer receives information from the sensors, boom section switches and from the main switch via this plug. In addition the computer recognizes the type of machine linked up from a machine-specific code. The program allocated to the machine and the machine´s specific data are called up automatically. The control of the machine is also carried out via the machine plug. Two connection possibilities are provided.

2.4.1 Connecting machines with switch boxes

The switch box is pushed on to the ***profile slide***, connected to the computer and secured with the wing nut (12).

Attention!
The machine plug must be securely plugged in to the socket.

2.4.2 Connnecting machines with machine adapters

Securing the machine adapter to the console (10 - 14) is carried out as described in paragraph 2.4.1 (switch box).

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2.5 Safety

2.5.1 Specified implementation

The UNI-Control S is specified only for agricultural use. Use outwith this area is regarded as unspecified.

The manufacturer does not accept liability for damages to persons or property resulting from unspecified use. In such cases all risks are the responsibility of the user.

Specified implementation also includes adhering to the operation and maintenance conditions stipulated by the manufacturer.

The relevant accident prevention regulations as well as other recognized safety, industrial medical and road traffic rules must be adhered to. Neither does the manufacturer accept liability in cases where independent modifications have been made to the UNI-Control.

2.5.2 Safety instructions

Before working with electrical equipment or carrying out any welding operations at the tractor or the trailed machines, the battery connection must be interrupted.

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3 Operating instructions

3.1 Description of the functions

- **Display**

  The UNI-Control has an alphanumerical display of 4 x 20 characters, divided into two areas. The left-hand side with 4 x 12 characters is for operator guidance and the display of information.

  The right-hand side with 4 x 8 characters describes the softkeys. The function of the 4 softkey can be set via the display for various applications, resulting in a large number of possible functions.

  Contrast control - Display

  * Set contrast darker
    Press "C" key and „+10%“ simultaneously
  * Set contrast brighter
    Press "C" key and „-10%“ simultaneously

- **Decimal keyboard**

  The decimal keyboard is used to carry out the four basic calculating methods, to enter machine data and for text (e.g. customer´s name or plot)

  When entering text, the first time a key is pressed the first letter on the key is displayed, the second time the key is pressed the second letter on the key is displayed and the third time the key is pressed the number is displayed. Wait two seconds before the next input to allow the cursor (C) to jump ahead. The cursor can be moved in all directions using the arrow keys.

  The input is concluded when the enter key (=) is pressed.

- **Function keys**

  As well as the decimal keyboard there are also function keys. During operation other data required can be displayed by pressing a key. After approx. 10 seconds the display switches back automatically to the actual "operation display".

  Entered data can be deleted by pressing the "C" key.

  With the "+/-10%" keys it is possible to vary application rates in degrees of 10% in relation to the calibrated rate. The lamp beside the cutting tool symbol shows the working position, while the lamp above it flashes during operation (function display: DRIVE)

  (A) alphanumerical display = a display showing letters and numbers

  (B) Softkeys = keys with various functions controlled by the software (program)

  (C) Cursor = writing mark

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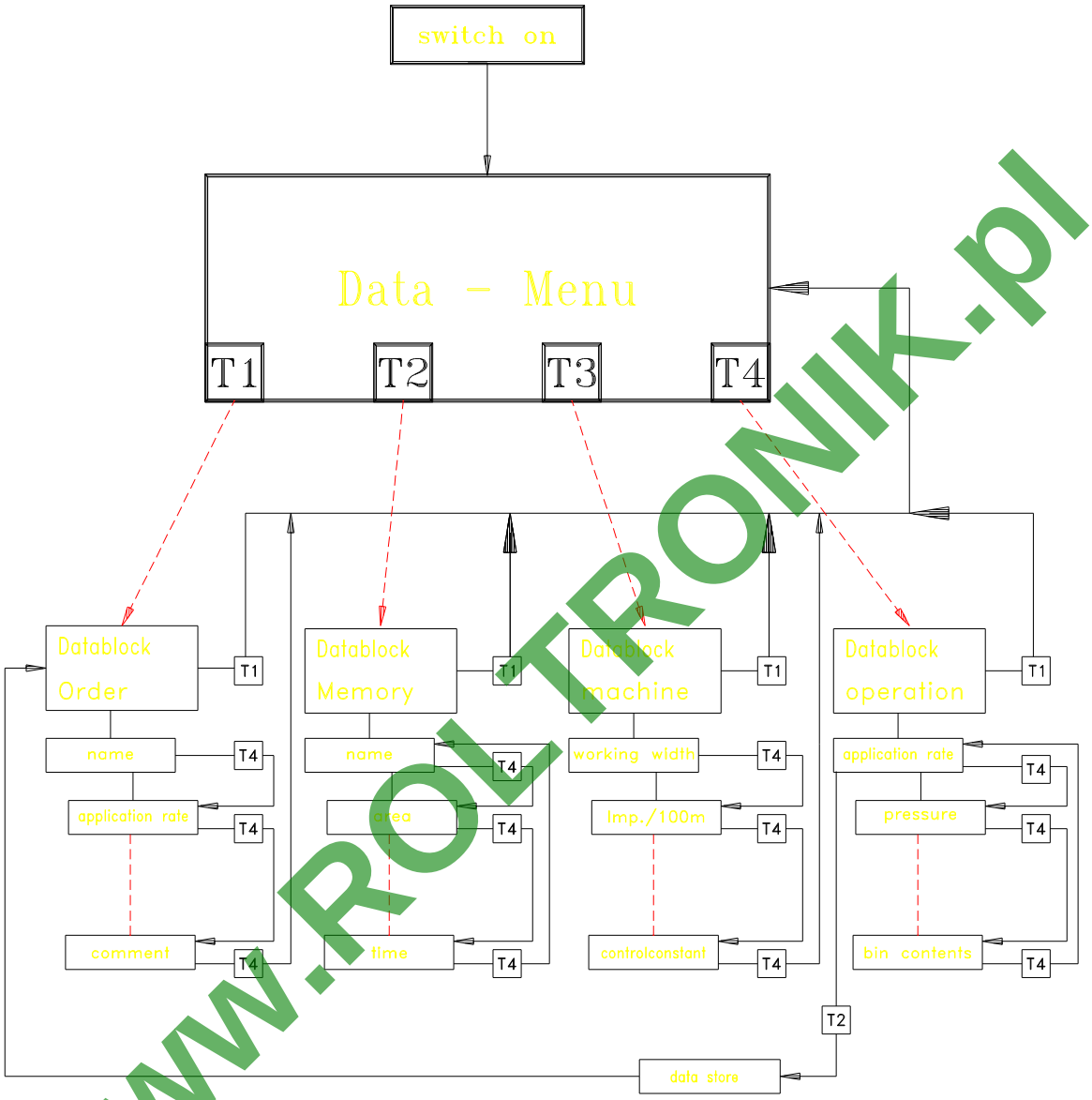
3.2 Operating scheme



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UNI - Control_S Bedienungs-Schema				Maßstab : Angaben in [mm] / allg. Toleranz DIN-7168m
				(Art.nr.: - Hersteller)
Datum - Erstellung	gezeichnet	geprüft	freigegeben	Weitergabe sowie Vervielfältigung der Unterlage ;Verwertung und Mitteilung ihres Inhaltes ist nicht gestattet , soweit nicht ausdrücklich zugestanden ! Zuwiderhandlungen verpflichten zu Schadenersatz! Alle Rechte für den Fall der Gebrauchsmustereintragung oder Patenterteilung vorbehalten !
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The operating scheme is organized like a book.

Book	Operating scheme UNI-Control
Contents	Menu selection
Chapter	Data block
Pages	Display

3.2.1 Menu selection

From each of the 4 data blocks the T1 key is used to go to the menu selection. From there the keys T1 to T4 are used to move directly to a the specific block.

3.2.2 Data blocks

The input and display are divided into 4 blocks.

After switching on the computer automatically displays the data block ORDER. If the machine is in working position, the data block OPERATION is displayed.

Within a data block it is possible to go on to the next display by pressing the T4 (next) key.

- **Data block ORDER**

  Here the order data is stored, e.g. name of customer, plot, pre-set rate, comments and the number of the machine. With the exception of the pre-set rate, this data together with the data recorded, such as worked area, working time etc is stored when the ordering process is finished. The T2 key is pressed to start the order. The working time is calculated from this time on. At the end of the data block the menu selection is reached automatically by pressing the T4 key.

- **Data block MACHINE**

  Here the machine-specific data is stored, such as working width, impulses/100 m etc. Once all data is entered, the menu selection is automatically displayed.

- **Data block OPERATION**

  Here the data, which is of interest during the operation process, is displayed. If the machine is in working position, the UNI-Control jumps to the data block OPERATION automatically after about 10 seconds. When implementing e.g. the field sprayer, the speed (km/h) and the current application rate (l/ha) are displayed. By pressing the T4 key (next) additional information is displayed, e.g. spray pressure.

  The order is concluded with the T2 key.

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- **Data block MEMORY**

  The data of up to 20 orders can be stored, i.e. order-specific data such as name, comments as well as the data recorded during operation such as worked area, operating time etc.

  An order which has been stored can be recalled by pressing the T3 key "next memory". The specific data concerning the order are displayed by pressing the T4 key (next).

  The data block MEMORY can only be exited with the T1 "Menu" key.

  With the T2 key "delete" the memory can be deleted.

3.3 Operating procedure

The UNI-Control is ready for operation once it has been installed and the machine-specific data have been entered.

The following operation procedure should now be followed:

- Connect the maschine to the tractor, connect the switch box or machine plug with the UNI-Control, making sure that it is set in "off" position.

- Switch on the UNI-Control S, the machine adapter identifies the machine automatically and the corresponding program together with the machine´s specific data are automatically called up.

- Enter the name (plot, customer description)

- Enter or check the pre-set rate

- Enter comments
  Name and comments are not compulsory.
  The pre-set rate should however always be checked

- Start the order (T2)

- During operation all functions, including those of the calculator pocket, can be selected. The +/- keys can be used to modify the application rate in degrees of 10% in relation to the pre-set rate.

- The order input is terminated by pressing the T2 key (end). An acknowledgement follows.

- The data which has been recorded - area, working time, applied quantity etc - is now stored.The order numbers are automatically reset to 0. New numbers are allocated automatically and the operating procedure can start from the beginning again.

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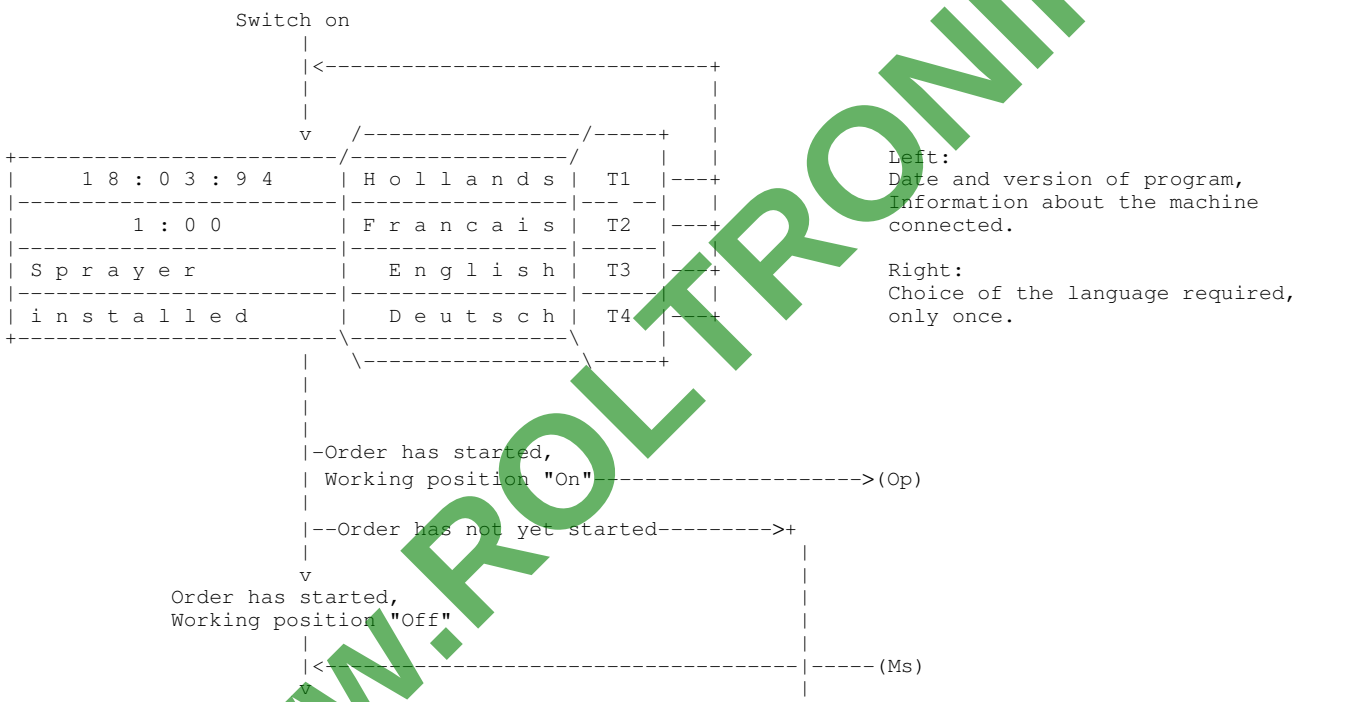
3.4 Operating examples

The following examples describe the operation procedure for the initial installation.
The LCD display with the adjacent softkeys are illustrated.
Left: Operator guidance and information display
Right: Description of the softkeys

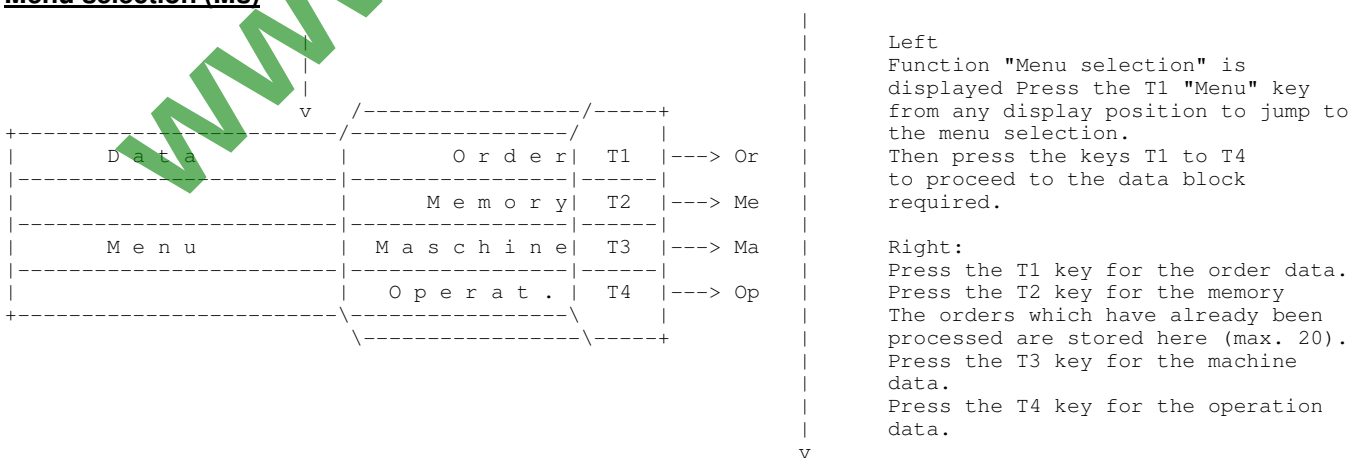
Data block abbreviations

Ms = Menu selection
Or = Data block ORDER
Me = Data block MEMORY
Ma = Data block MACHINE
Op = Data block OPERATION

3.4.1 Example 1: Program FIELD SPRAYER



Menu selection (Ms)



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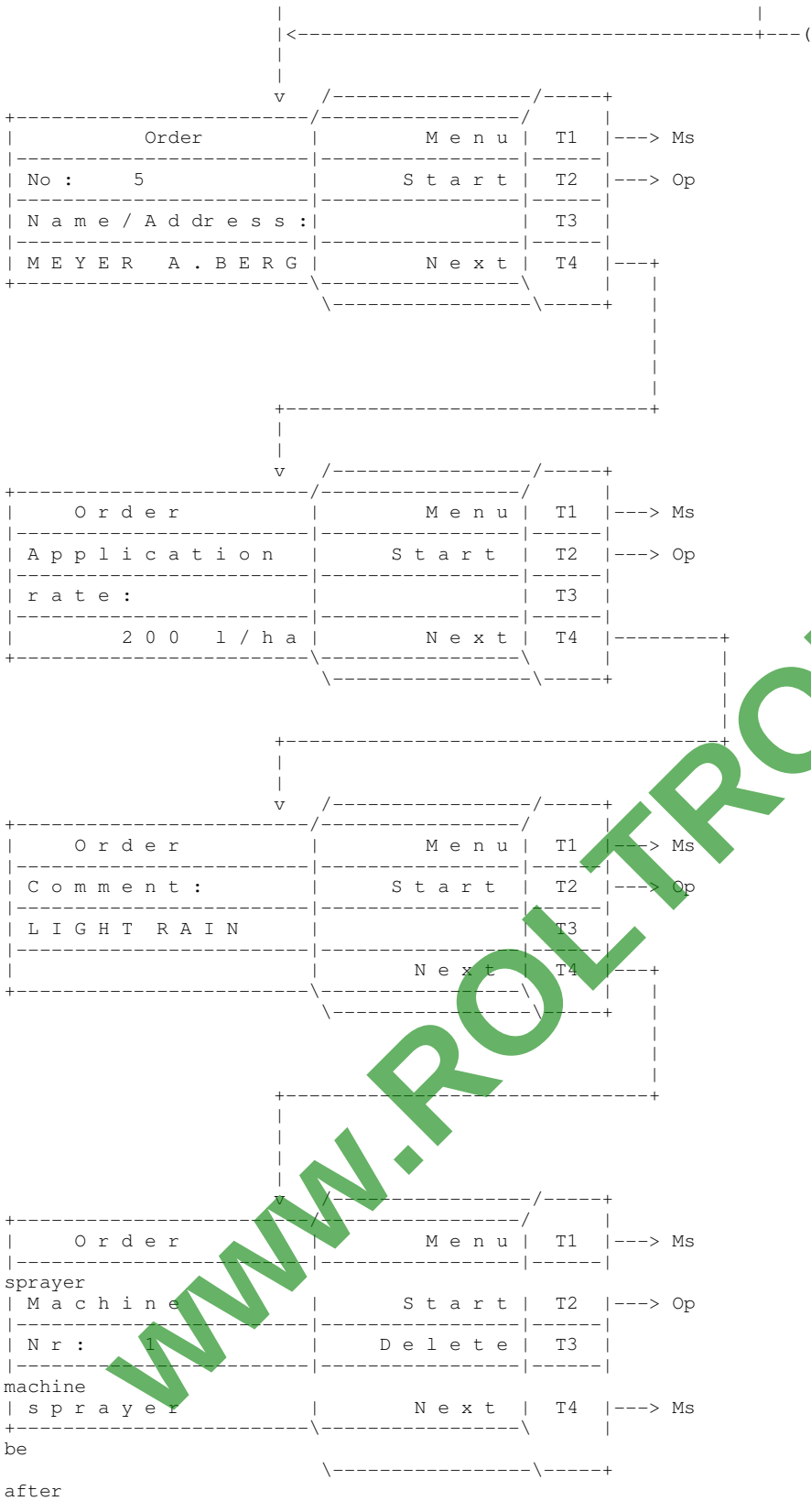
Data block ORDER (Or)



(Or)

Left:
The order number, which is automatically allocated by the board computer, is displayed. Enter the client´s name or plot via the alphabetic keys
Attention! always confirm input

Right:
Press the T1 key for menu selection.
Press the T2 key to start the order (without changing pre-set rate and comments),
proceeds to the operation data automatically.
Press the T4 key to proceed to the next display.

Left:
Enter the pre-set rate required via the decimal keyboard.

Right:
Press the T1 key for menu selection.
Press the T2 key to start the order (without changing pre-set rate and comments),
proceeds to the operation data automatically.
Press the T4 key to proceed to the next display.

Left:
Any text can be entered using the alphabetical keys.
It will be stored as comment.

Right
Press the T1 key for menu selection.
Press the T2 key to start the order,
Proceeds to the operation data automatically.
Press the T4 key to proceed to the next display.

Left:
The first time a machine is operated, the machine number is automatically allocated and later automatically recalled, i.e. no new input necessary
However if e.g. a second field sprayer with different machine data is to be connected, the next free machine number has to be entered for the second sprayer.To activate the machine data of the second field sprayer, the corresponding machine number has to be entered via the decimal keyboard after the link-up.

Right:
Press the T1 key for menu selection.
Press the T2 key to start the order,
proceeds to the operation data automatically
The T3 key (delete) deletes the machine data of the machine selected.
Press the T4 key for menu selection.

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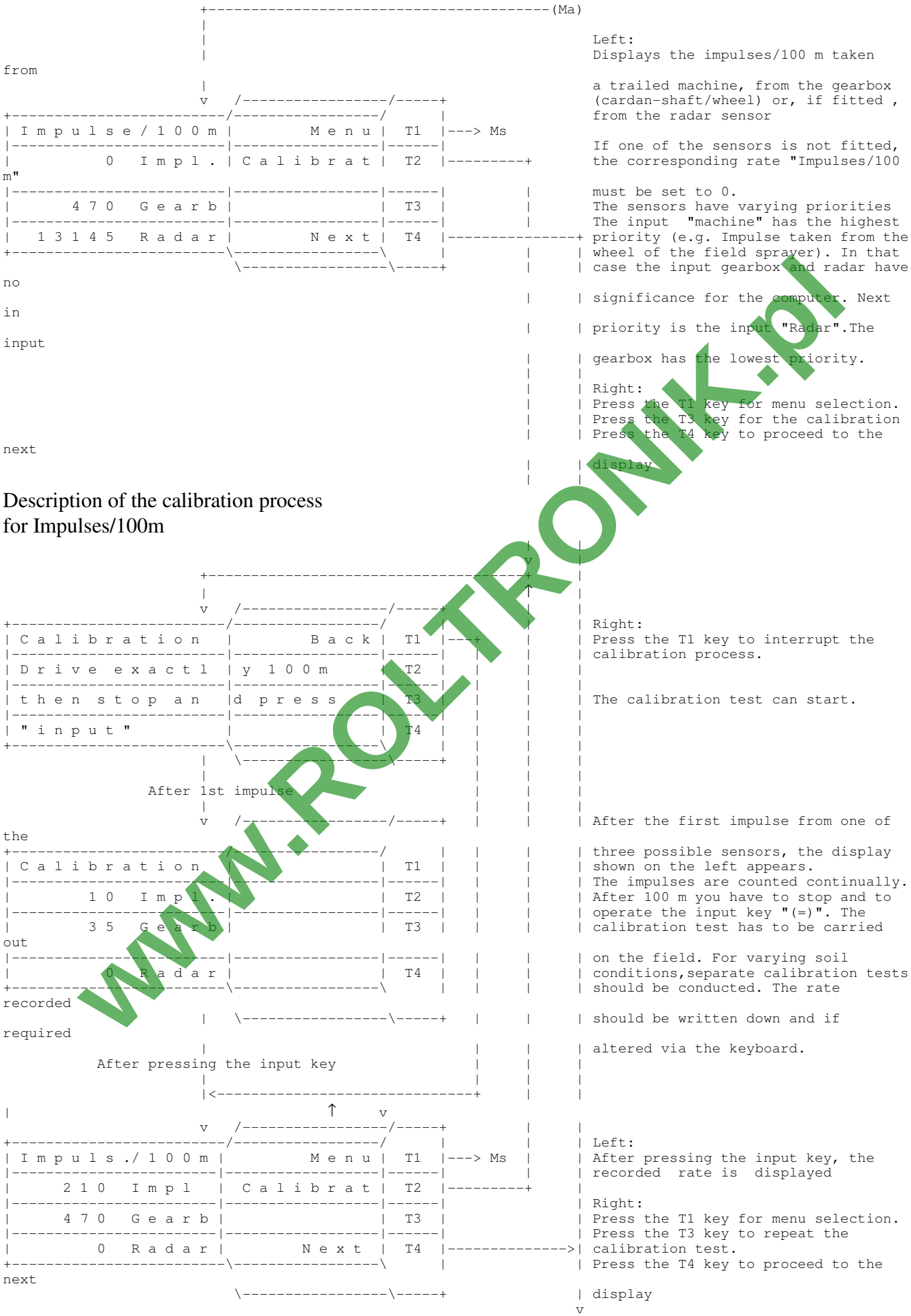
Data block MACHINE (Ma)



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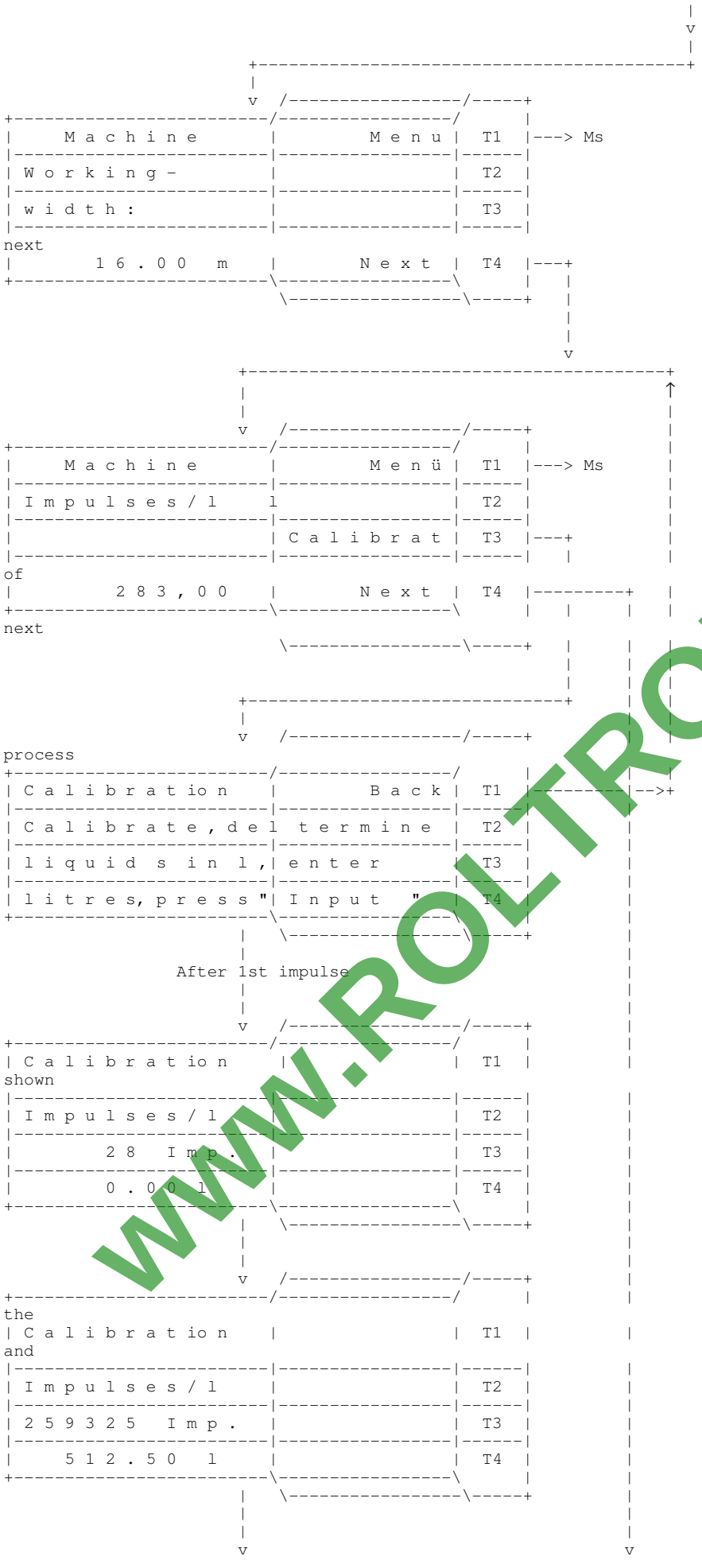

Left:
Enter the working width via the decimal keyboard

Right:
Press the T1 key for menu selection.
Press the T4 key to proceed to the next display.

Left:
Enter the impulses/l via the decimal keyboard

Right:
Press the T1 key for menu selection.
Press the T3 key for the calibration of the liquid flow meter, if required
Press the T4 key to proceed to the next display.

Description of the calibration process

Right:
Press the T1 key to interrupt the calibration process.

After switching on the field sprayer and after the 1st impulse from the liquid flow meter, the display as shown on the left is seen. The impulses are counted.At least 500 litres should be sprayed.

After about 500 l have been sprayed, the exact quantity should be determined and entered via the decimal keyboard.

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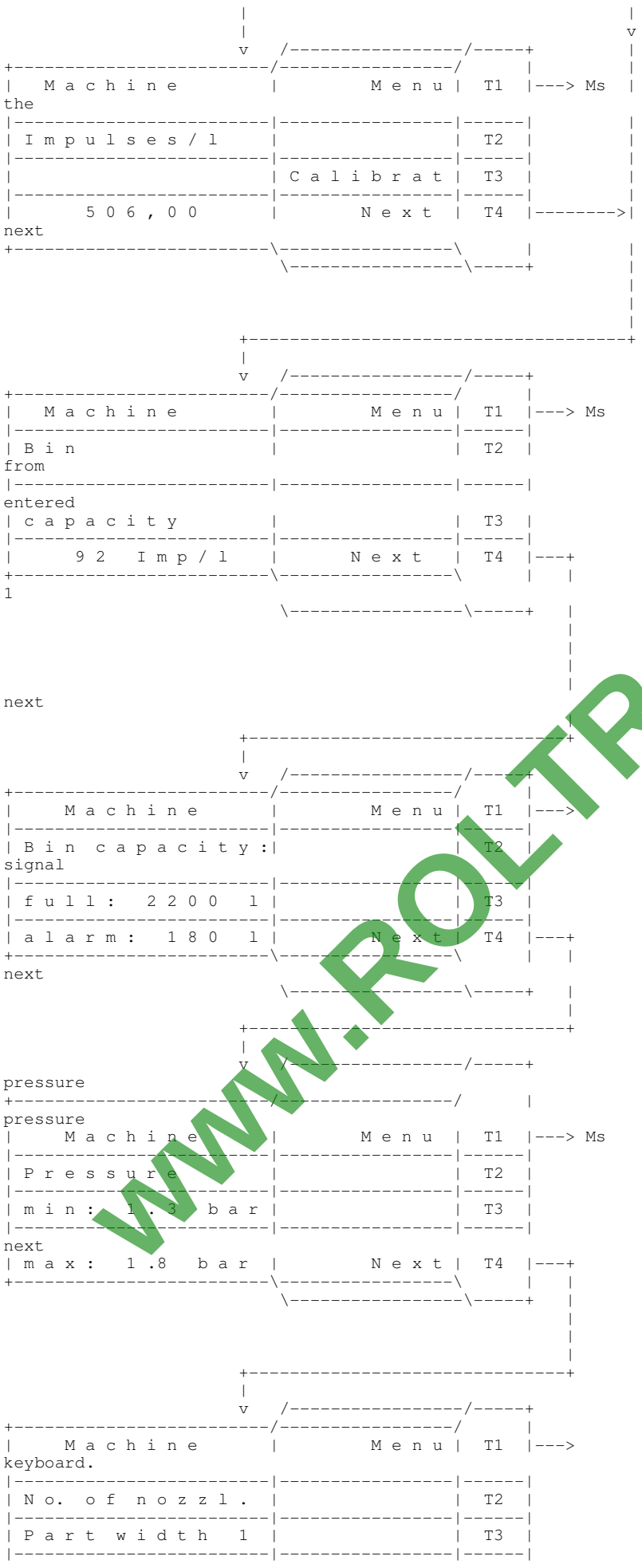

Left:
After pressing the input key "(=)", the computer calculates the "impulses/l" rate and shows it on the display.

Right:
Press the T1 key for menu selection.
Press the T4 key to proceed to the next display.
The impulse count of the volume indicator should be checked several times a year,especially before each season.

Left:
The UNI-Control S takes the tank meter and the TANK-Control into account. Tank meter:
The number of impulses/litre taken from the liquid flow meter have to be entered here

TANK-Control:
If the Tank -Control is installed, a 1 should be entered here.

Right:
Press the T1 key for menu selection.
Press the T4 key to proceed to the next display.

Left:
To calculate the residue in the bin / tank, enter the content and, if required, the limit for an alarm signal here.

Right:
Press the T1 key for menu selection.
Press the T4 key to proceed to the next display.

Left:
For the computer to monitor the pressure of the sprayer, enter the valid pressure limit for the nozzles here.

Right:
Press the T1 key for menu selection.
Press the T4 key to proceed to the next display.

Left:
Enter the number of nozzles per boom section via the decimal keyboard.

Seen from the direction of operation, the boom section 1 is on the outside left.

Right:

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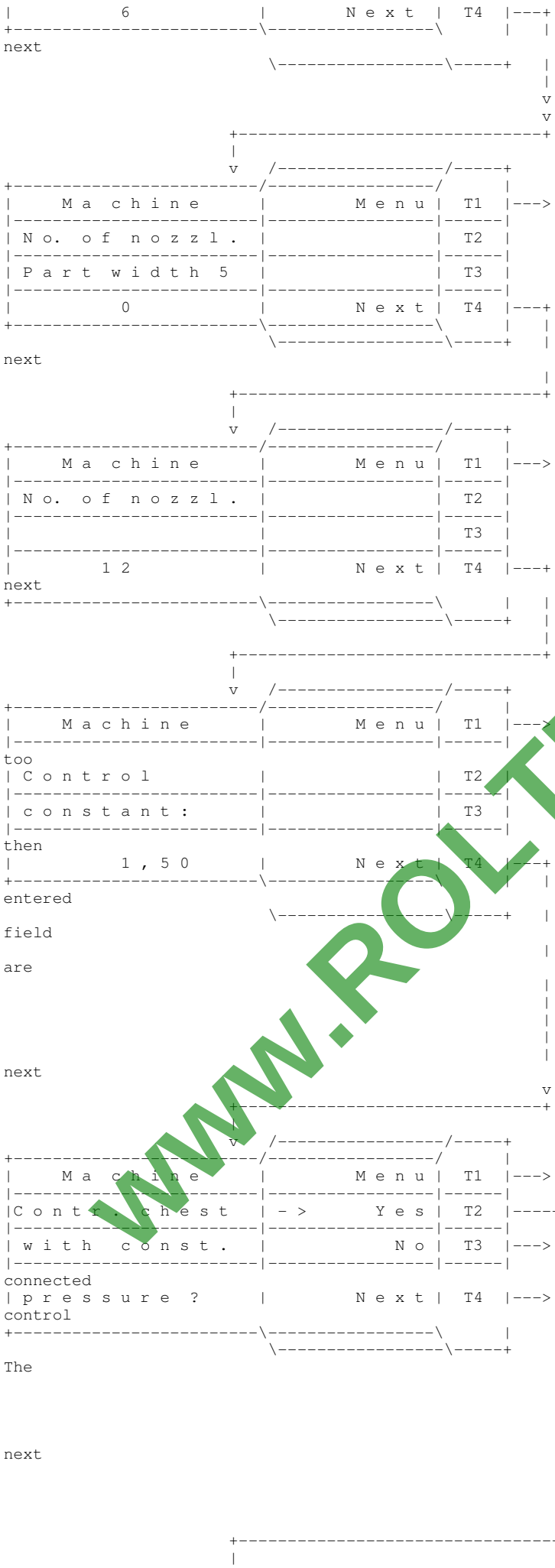

Press the T1 key for menu selection.
Press the T4 key to proceed to the next display

Left:
A maximum of 12 boom sections are allowed for.
If e.g. 4 boom sections exist, the 5th boom section is set to 0 via the decimal keyboard.

Right:
Press the T1 key for menu selection.
Press the T4 key to proceed to the next display.

Left:
To confirm the entered values the whole no of nozzles is shown here.

Right:
Press the T1 key for menu selection.
Press the T4 key to proceed to the next display.

Left:
Enter the control constant via the decimal keyboard. If the control is too slow the figure must be increased. In the case of over-control, i.e. with a pre-set rate of 200 l/ha the control goes from 160 l/ha to 230 l/ha and then to 180 l/ha etc.then the control constant is too high.The value entered must be reduced Depending on the field sprayer used, figures of 0.5 to 10 are feasible.

Right:
Press the T1 key for menu selection.
Press the T4 key to proceed to the next display.

Left:
Description of the control chest

Right:
Select the control chest
The T2 key confirms that a control chest with equal pressure is connected
The T3 key confirms that it is a control chest without equal pressure control (Müller-Elektronik control chest).
The arrow shows the type of control chest selected
Press the T1 key for menu selection.
Press the T4 key to proceed to the next display

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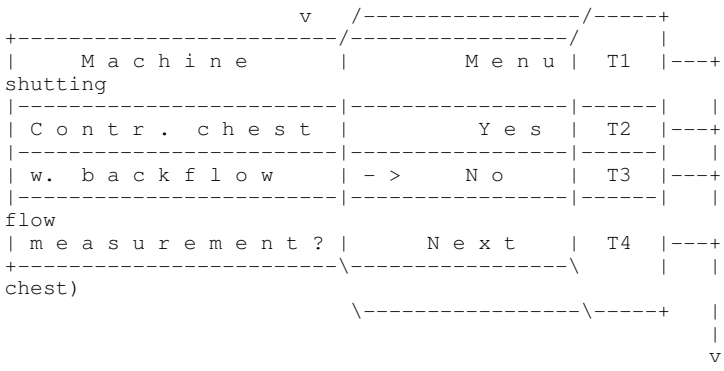

Right:
The T2 key confirms that, after shutting off one or more boom sections, the return flow is being measured via the liquid flow meter (e.g. Holder, Rau control chest)
The T3 key confirms that the return flow is not being measured via the liquid flow meter (e.g.. Tecnoma control chest)

Press the T2 key with a connection to the ball valve control chest from the firm Jacoby.

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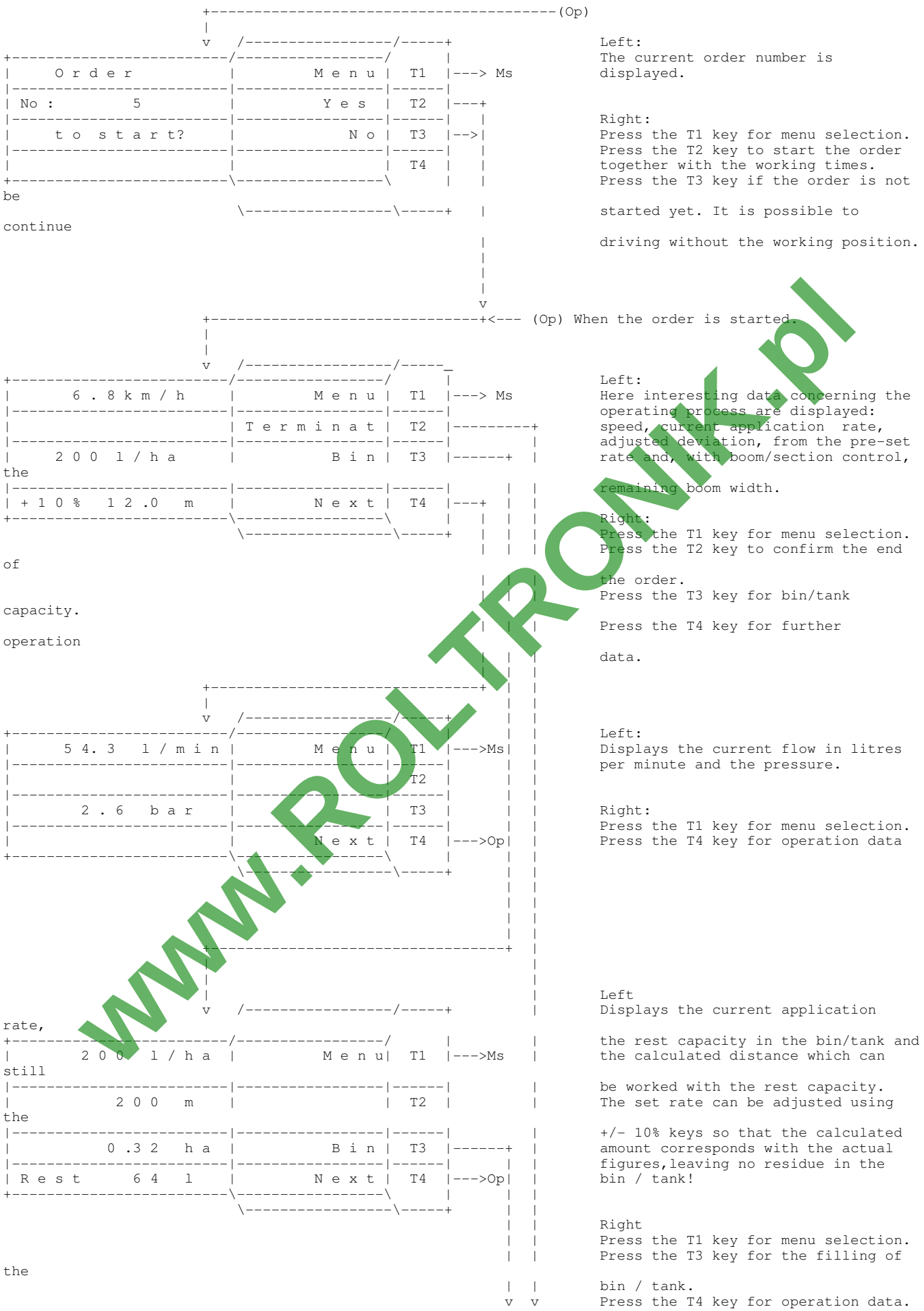
Datablock OPERATION (Op)



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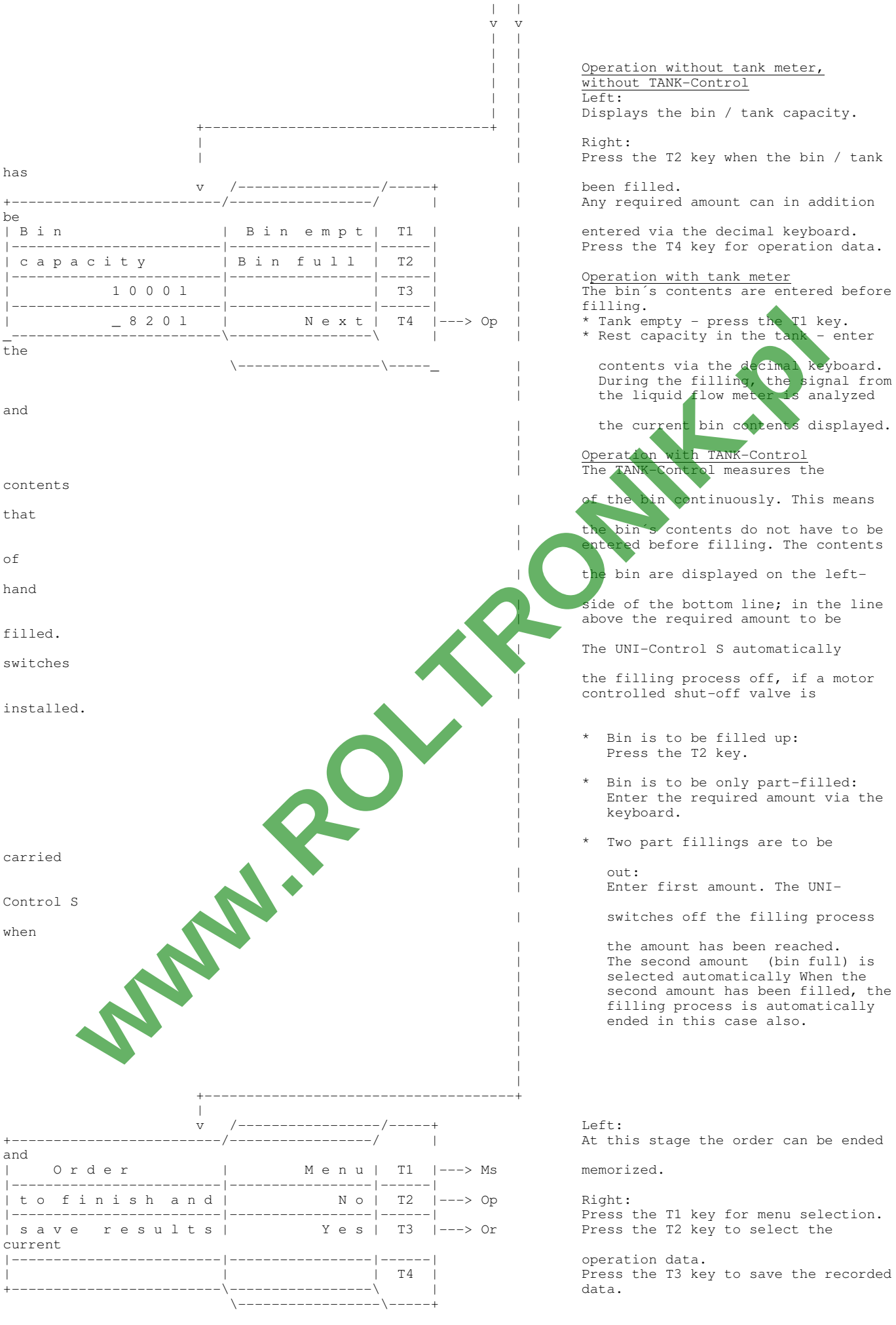

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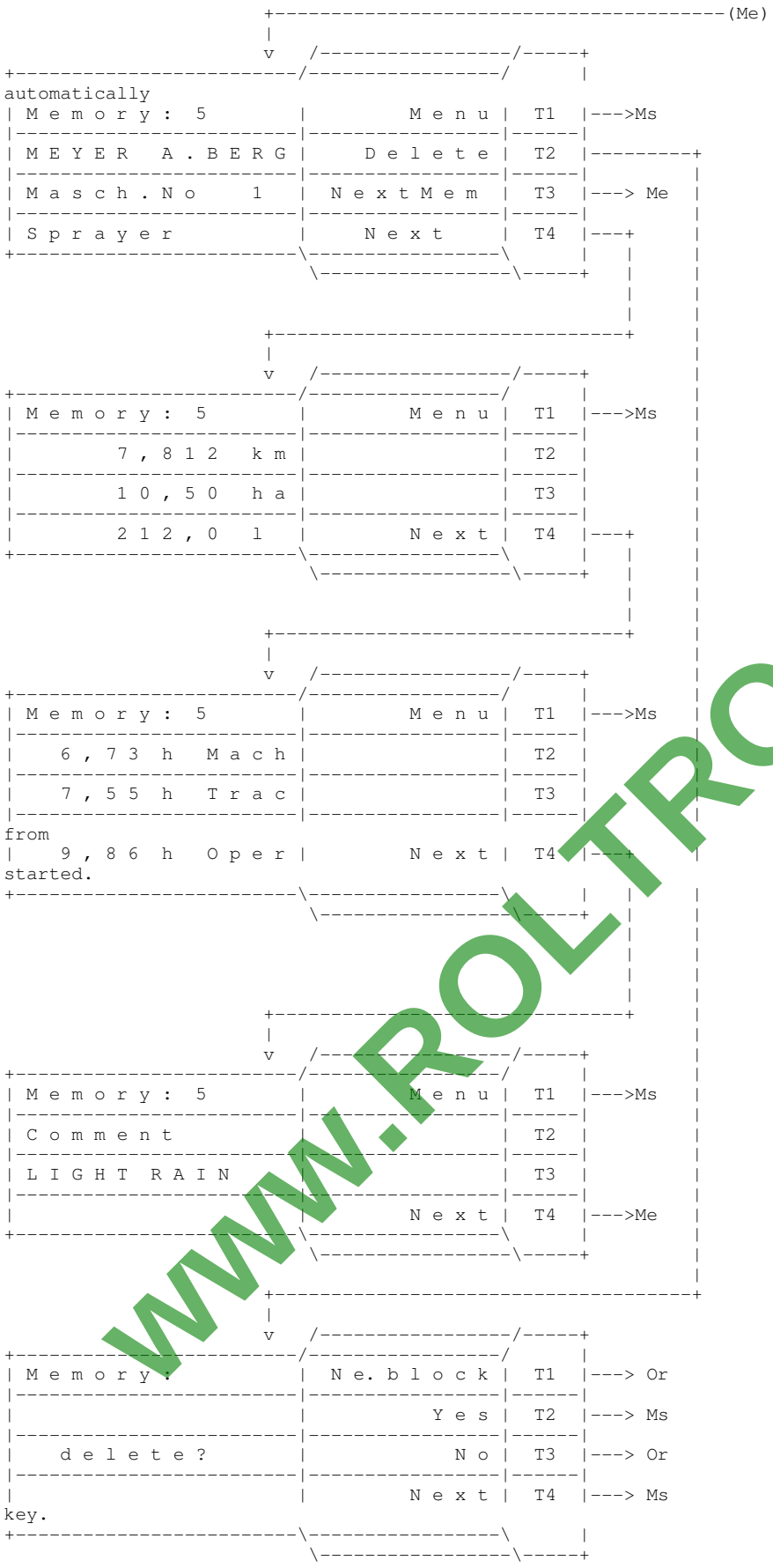
Data block MEMORY



Left:
The last order stored is automatically displayed.

Right:
Press the T1 key for menu selection.
Press the T2 key to delete all orders in the memory.
Press the T3 key to display the last order.
Press the T4 key to recall the machine and operation data of any individual order.

Left:
Data concerning the order number 5 is displayed.

Right:
Press the T1 key for menu selection.
Press the T4 key to recall the machine and operation data of any individual order.

Left:
Displays the working times
Working time "machine" runs if the machine is in working position.
Working time "tractor" runs if the speed exceeds 1 km/h.
Working time "operator" is counted from the time the board computer is started.

Right:
Press the T1 key for menu selection.
Press the T4 key to recall the machine and operation data of any individual order.

Left:
The comment entered is displayed.

Right:
Press the T1 key for menu selection.
Press the T4 key for memory 4.

Left:
All existing orders in the memory can be deleted.

Right:
Press the T2 key to delete the memory.
To move back to the order data press either the T1 key or the T3 key.

Press the T4 key for memory 4.

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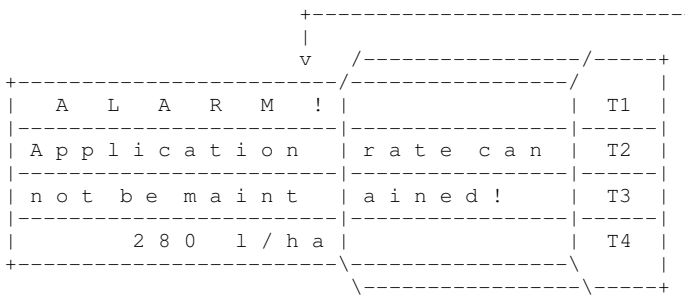
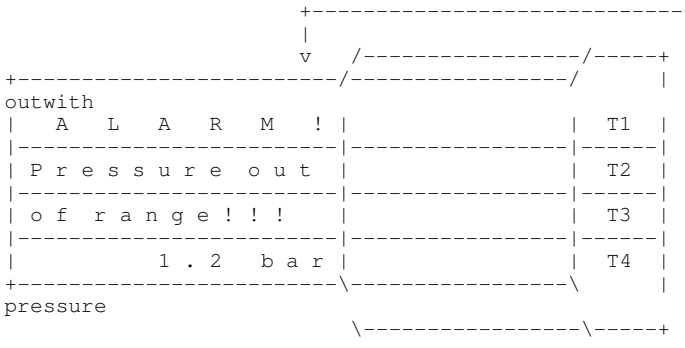
Alarm display



Alarm disply appears as soon as the required spray rate can no longer be maintained.

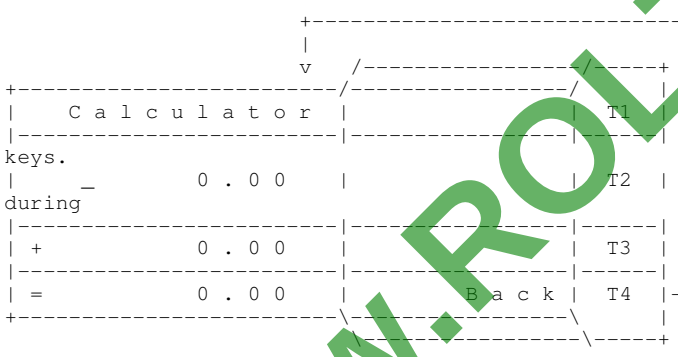


Alarm display appears as soon as the pressure of the spray system is outwith the range entered.

The computer can no longer adjust the pre set application rate within the valid pressure limit.

The operator has to vary the forward speed accordingly, so that the pressure remains within the valid limit.

Pocket calculator functions



Left:
The pocket calculator function is activated with the +, -, x or : keys.

The pocket calculator can be used during operation.

Right:
Press the T4 key to go back to the program

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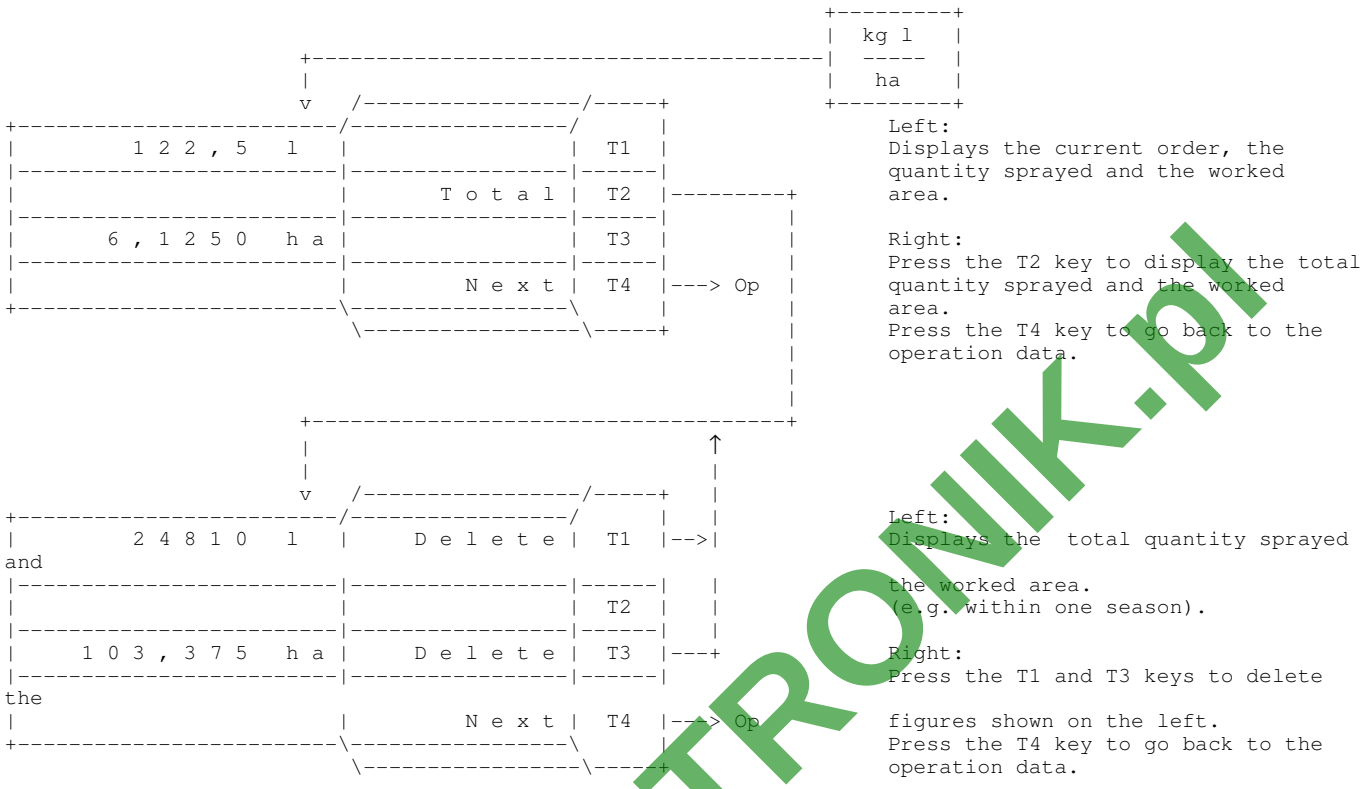
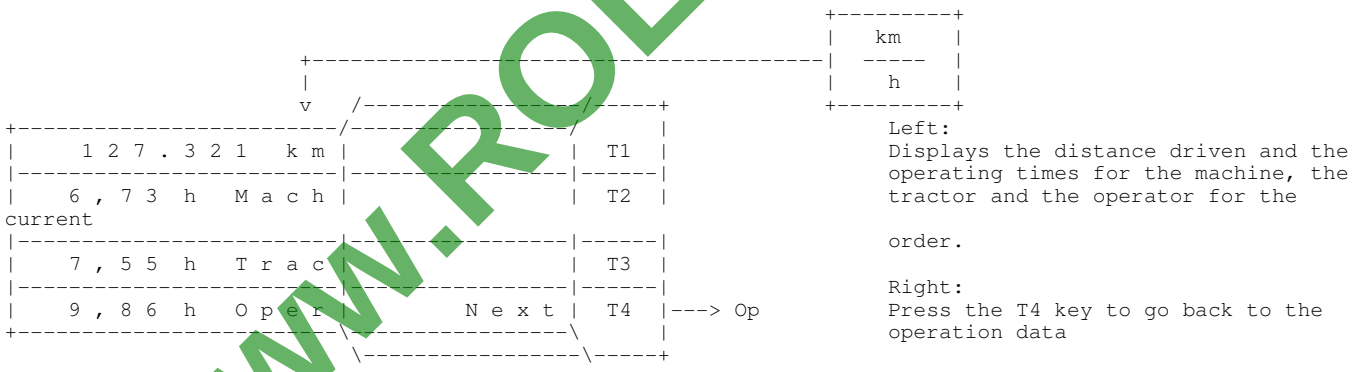
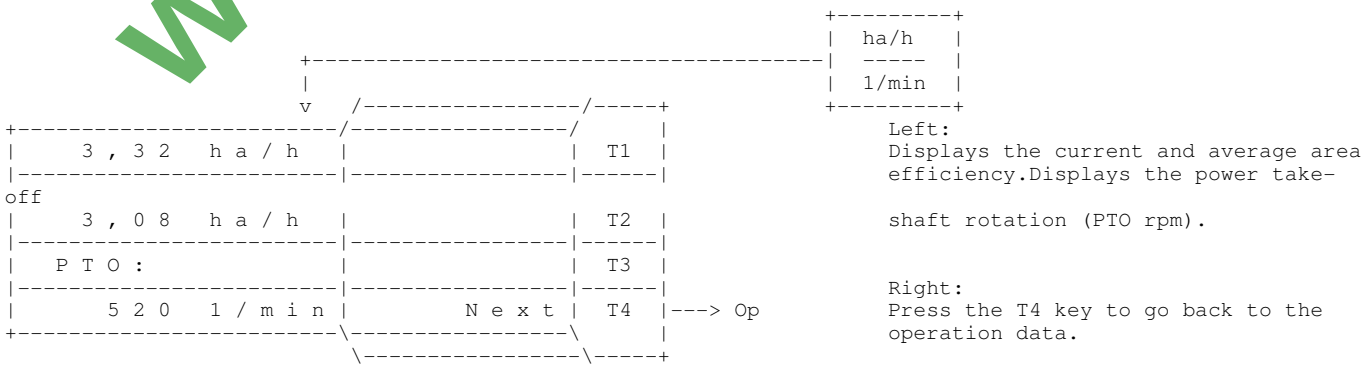
Function data

The 3 function keys next to the decimal keyboard enable the required figures to be displayed simply by pressing a key.







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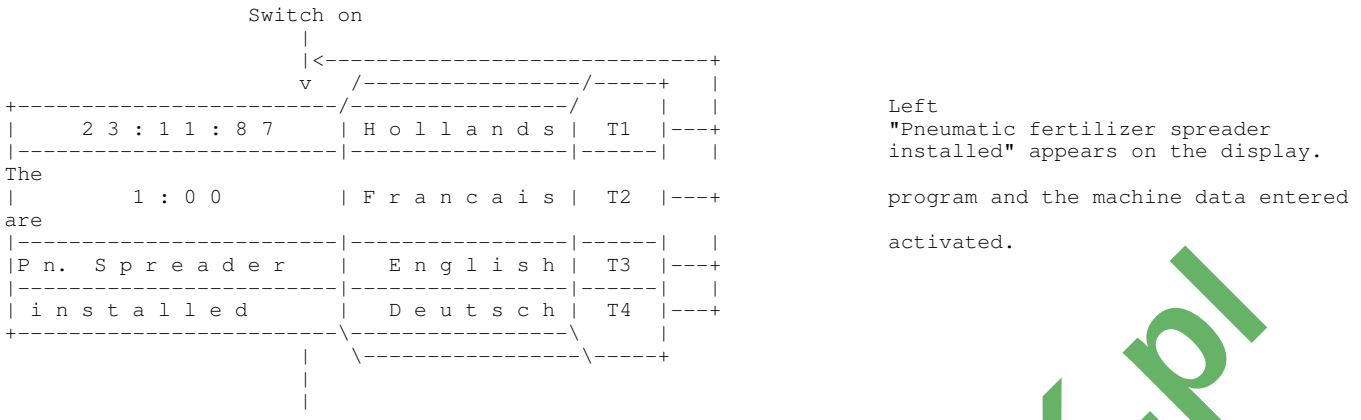
3.4.2 Example 2: Program PNEUMATIC FERTILIZER SPEADER

The features causing this program to be different to that of the field sprayer are described below :
Switching on routine

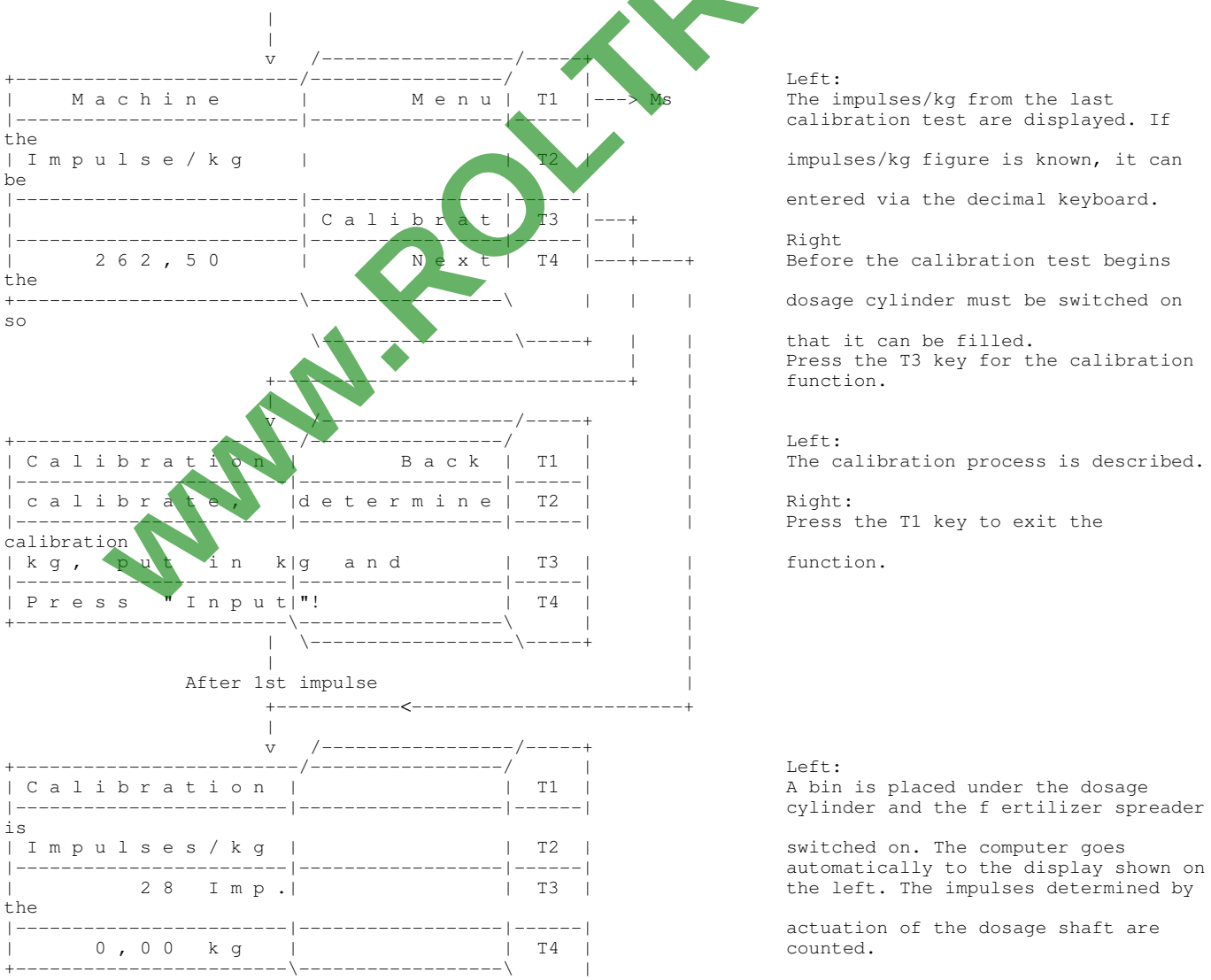


Data block ORDER

This block is identical to the field sprayer program.

Datenblock MACHINE

This block is to a large extent identical to the field sprayer program. The control chest type inquiry is omitted. Instead of impulses/l the figure impulses/kg is to be determined.



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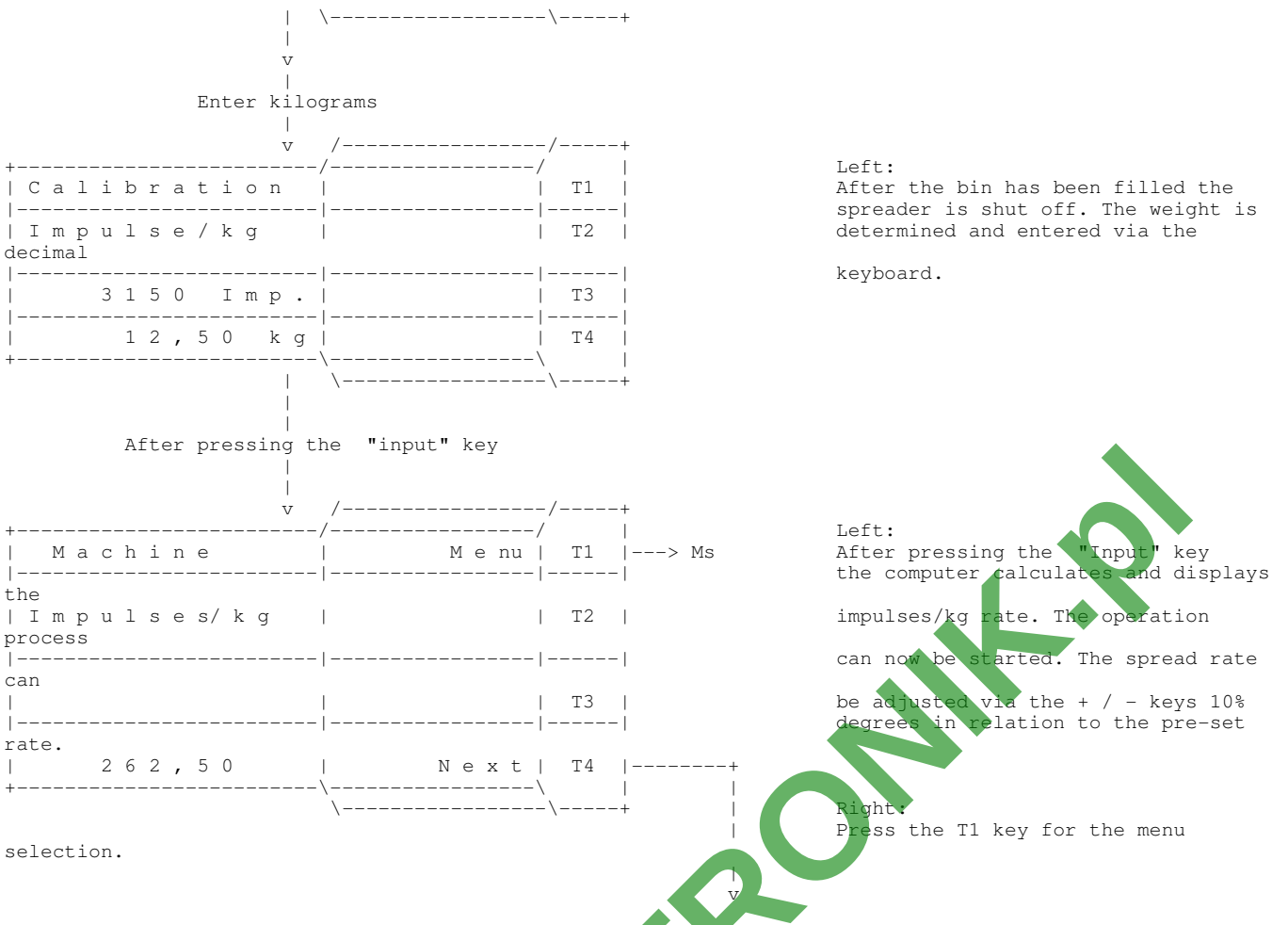
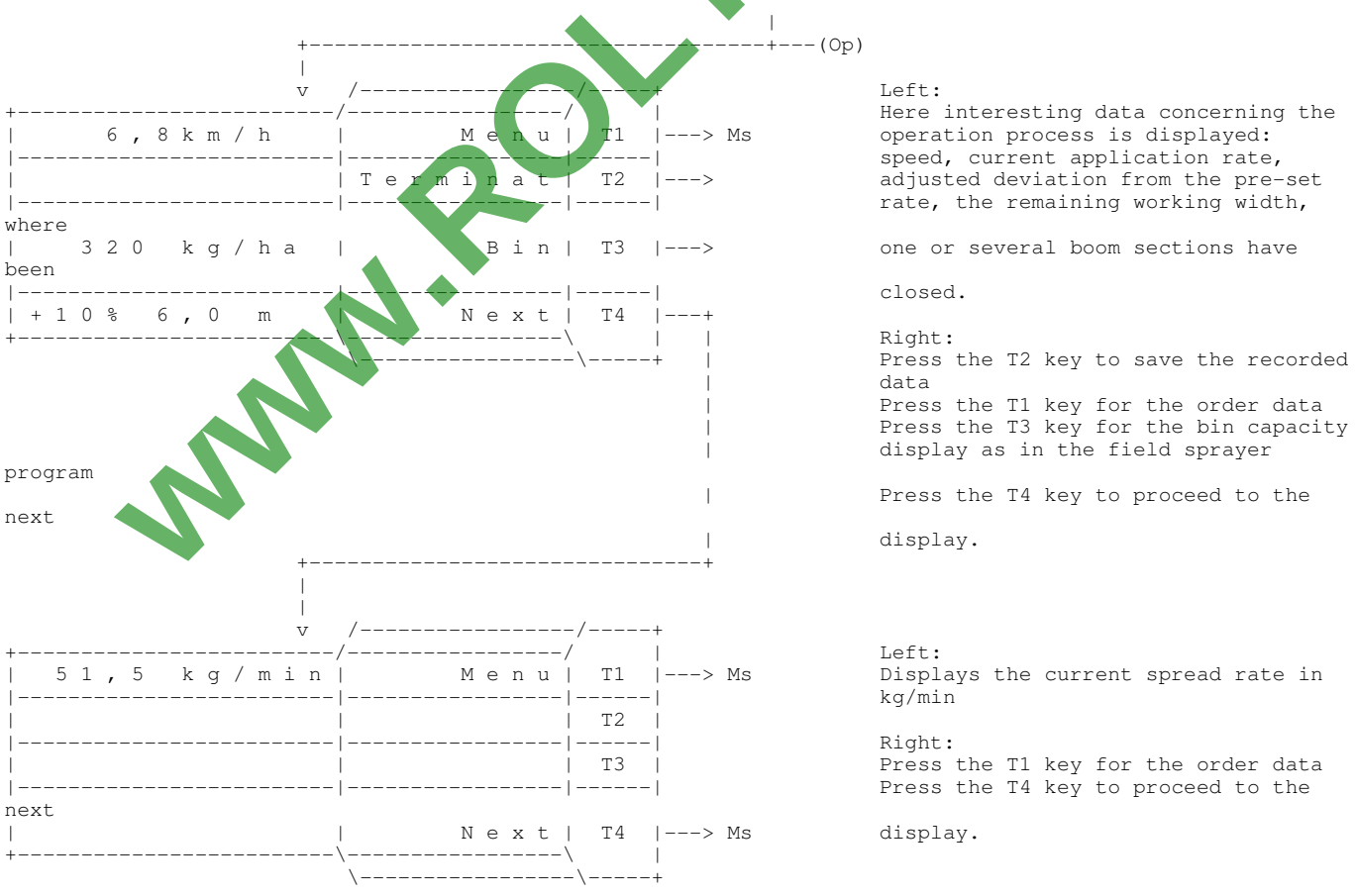


Data block OPERATION



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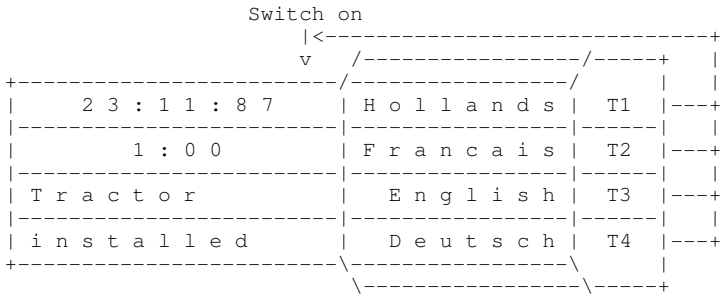
3.4.3 Example 3: Program TRACTOR

The tractor program is similar to the field sprayer program.
The diverging features are described below :

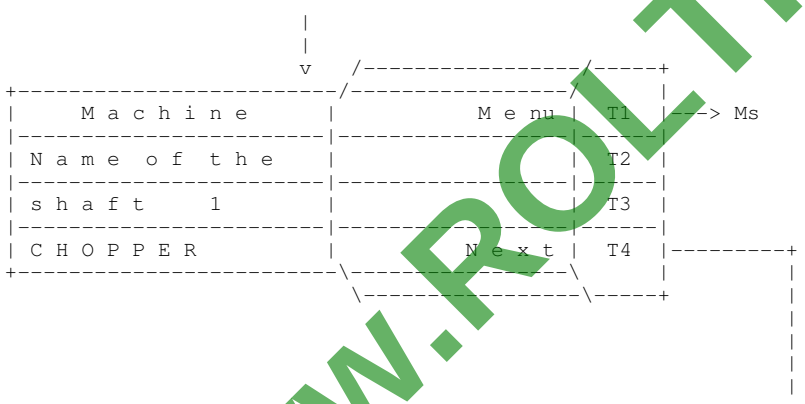
Switching on routine



Left:
"Tractor installed" appears on the left -hand side of the display

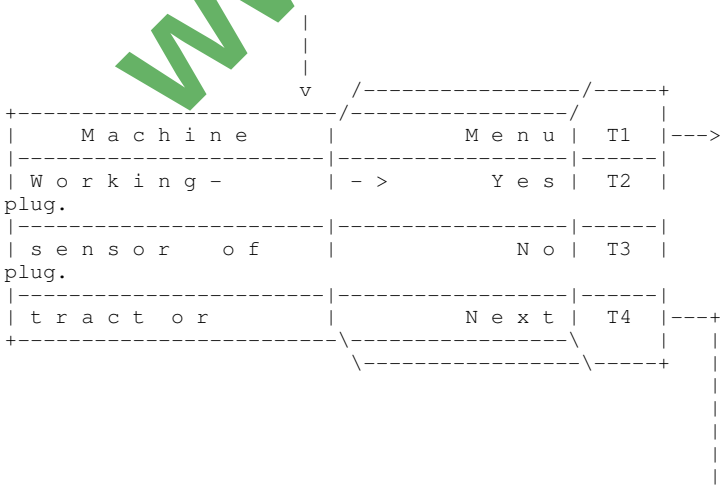
Data block ORDER
This block is identical to the field sprayer program.

Data block MACHINE
This block is to a large extent identical to the field sprayer program. The numberof nozzles/boom-sections, type of control chest and impulses/l do not have to be entered. Up to 16 additional shaft speeds in the region of 20 to 10,000 rpm can be monitored via the machine plug. The shaft speed input is activated by entering the name via the decimal keyboard (at least one letter or one number).



Left:
The shaft is specified (e.g. chopper)via the decimal keyboard

In the tractor program it is possible to retrieve the working position from the tractor distributor via the tractor plug or from the machine distibutor via the machine plug.



Right:
Press the T1 key for menu selection.
Press the T2 key to determine the working position via the tractor plug.

Press the T3 key to determine the working position via the tractor plug.

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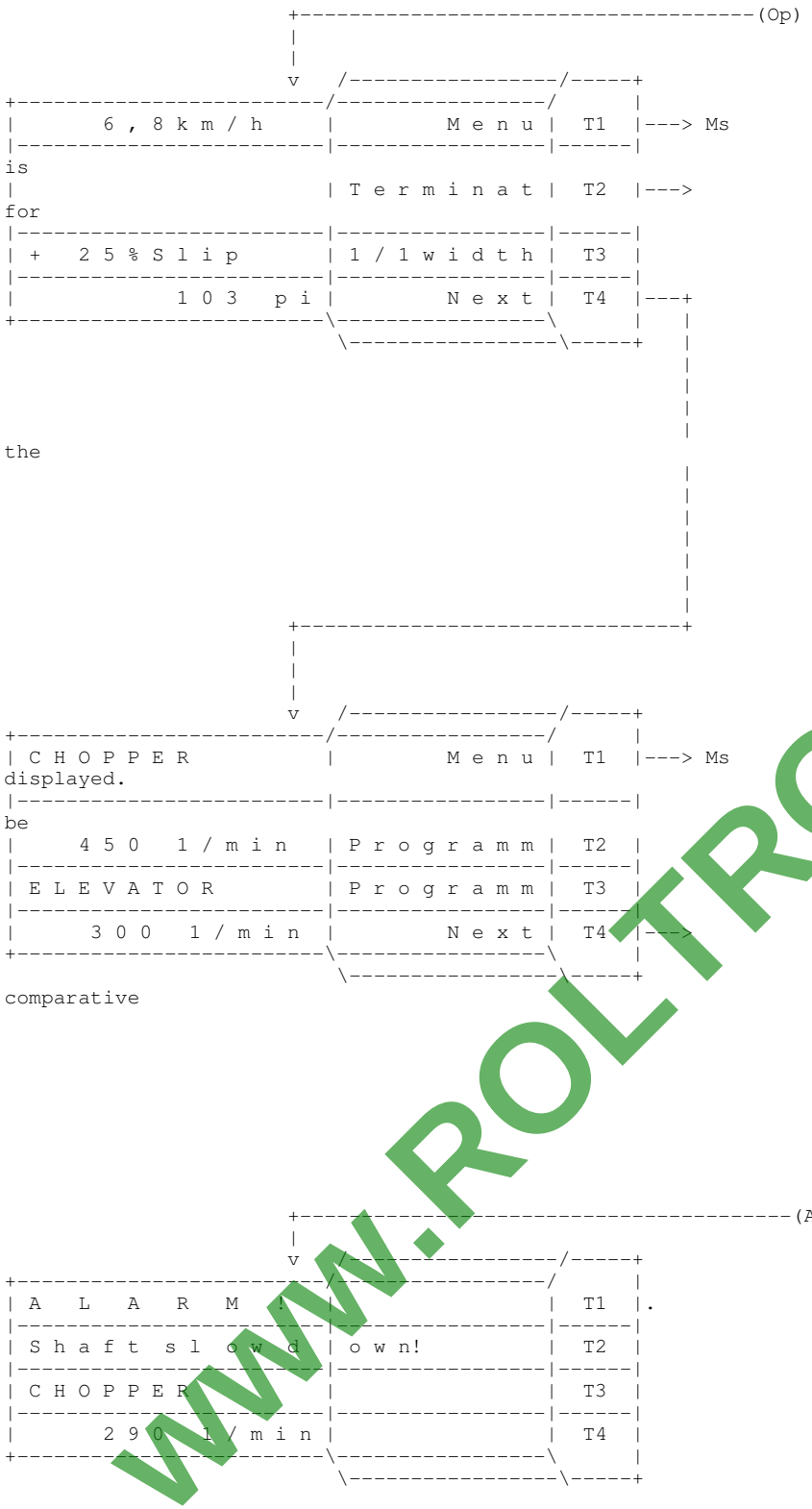
Data block OPERATION



Left:
The current forward speed and the wheel slip are displayed. A counter is provided via the machine plug e.g. for bales.

Right:
T1, T2 and T4 as in field sprayer program
Press the T3 key to call up ¼, ½ or ¾ depending on the working width.
If for example a long wedge is to be worked the width 1/2 can be selected by pressing the key twice, because the middle width is equivalent to 1/2 the working width.
To reset press the T3 key or exit the working position.

Left:
With the T4 key the curent rpm of the monitored shafts are displayed.
The third and fourth shaft speed can be called up by pressing the T4 key repeatedly.

Right:
Press the T1 key for menu selection.
With the T2 and T3 keys the current shaft speed is stored as a comparative speed.

If the speed drops by more than 10% an alarm signal is set off.

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4 Maintenance

4.1 Computer

The computer is maintenance-free. It has an internal electrical fuse. During winter it should be stored at room temperature.
If neither a switch box nor a machine plug is connected, the 48-pin plug on the computer should always be covered with the protective cap.

4.2 Switch box / machine plug

The switch box and machine plug are also maintenance-free.

The boxes should be protected against moisture. If the 48-pin plug is pulled out, it should be covered by the cap provided.

4.3 Note

When welding is being carried out the computer and switch box must be removed from the machine.

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5 Error recovery

Error	Cause	Remedy
The display shows two straight lines	Voltage too low	Check connection, take voltage directly from the battery or from the starter
Forward speed is not displayed	Signals are not reaching the computer (The "wheel“ lamp is not flashing)	Check sensors, cables and wiring
	The pulse input is not calibrated	Carry out calibration machine data
Area is not determined	Working width has not been entered	Enter working width (machine data)
	The working position is not recognized by the computer	Depending on the installation, check either the sensor or the working position
Spread rate is not displayed	The figure impulse/kg has not been entered	Enter impulse/l or impulse/kg
	No signals are reaching the computer from the corresponding sensor	Check sensor
The intended spread rate has not been reached. The current quantity is below the pre-set rate. The horn is sounding	The setting motor has been wrongly poled. The rate is controlled downwards instead of upwards	Repole the setting motor
	The machine cannot transport the pre-set amount	Change to a lower gear
The spread rate lies above the pre-set rate. The horn is sounding	The setting motor has been wrongly poled. The rate is controlled upwards instead of downwards	Repole the setting motor
After switching on, the message "memory error“ is displayed in several languages	The memory contents have been falsified, due to a faulty impulse	Switch the device on and off several times

No liability is accepted for damages resulting from wrong dosage.

==========

6 Maschine data

- Impulses/100 m (soft soil) _____
- Impulses/100m (medium soil) _____
- Impulses/100 m (firm soil) _____
- Working width. _____
- Factor impulses/litre _____
- Control constants _____

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