

Installation and Operating Guide

UNI Control-S

on

Multi-purpose spreaders

July 1997

=====

Contents

1	Overview	3
1.1	Operating mode "multi-purpose sprayer"	3
1.2	System description	4
1.2.1	UNI Control S with switch box	4
1.2.2	Signal distributor – multi-purpose sprayer with sensors	5
2	Installation instructions	7
2.1	Console and computer	7
2.2	Sprayer equipment	7
2.3	Safety	10
2.4	Specified implementation	10
2.5	Safety instructions	10
3	Operation.....	11
3.1	Operating scheme	11
3.2	Operation procedure.....	12
3.3	Description of the order, machine and operation data of and the memory.....	13

1 Overview

This operating guide supplements the UNI Control S operating guide. The application on the multi-purpose sprayer is described here.

1.1 Operating mode "multi-purpose sprayer"

Used on multi-purpose sprayers with hydraulic driven scraper floors, the UNI Control S controls the spread rate fully automatically. The speed of the hydraulic motor and consequently the spread rate are controlled by a motor-adjustable current control valve.

The UNI Control S ensures exact dosage of the spraying liquid. Wrong dosage when conditions are difficult is impossible due to slip-free speed recording. Accurately spread sludge replaces commercial fertilizer and protects the environment.

1.2 System description

The system consists of the UNI Control S computer with switch box, and the multi-purpose sprayer signal distributor with sensors and current control valve.

1.2.1 UNI Control S with switch box

The multi-purpose sprayer program is included in every UNI Control S. The program is activated by coding in the machine plug of the switchbox.

The system is switched on and off at the switch box. Automatic or manual operation can be selected using the manual/auto switch. During manual operation the +/- keys can be used to adjust the scraper floor speed. The UNI Control S recognises the working position when the scraper floor drive is running and the working position switch is on. The recording of the area and the spread rate is interrupted when the scraper floor drive is switched off or when the working position switch is at off.

The dosage position and dosage position + lamps show the required slide valve position.

The LCD display in the switch box shows a value analogue to the scraper floor speed (= oil engine's rpm).

Before initial operation the following table should be filled out. .

Position of the current control valve	Switch box display
0	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

The display shows the valve position at any given time. This is absolutely essential for manual operation. In addition the display is used to monitor the fully automatic regulation.

1.2.2 Signal distributor – multi-purpose sprayer with sensors

Following sensors are connected in the switch box

- "Dosage" sensor (inductive sensor)

The drive's rpm is recorded at the gear wheel of the oil engine. The UNI Control S uses this to calculate the current spread rate in m³/min.

- "Speed" sensor (Hall element)

The sensor takes the actual rate from the wheel of the sprayer.

- "Dosage position" sensor and " Dosage position +" sensor (Hall element)

The slide valve position must be adhered to exactly for accurate dosage. The "dosage position " sensor displays the selected position during operation via a lamp in the switch box

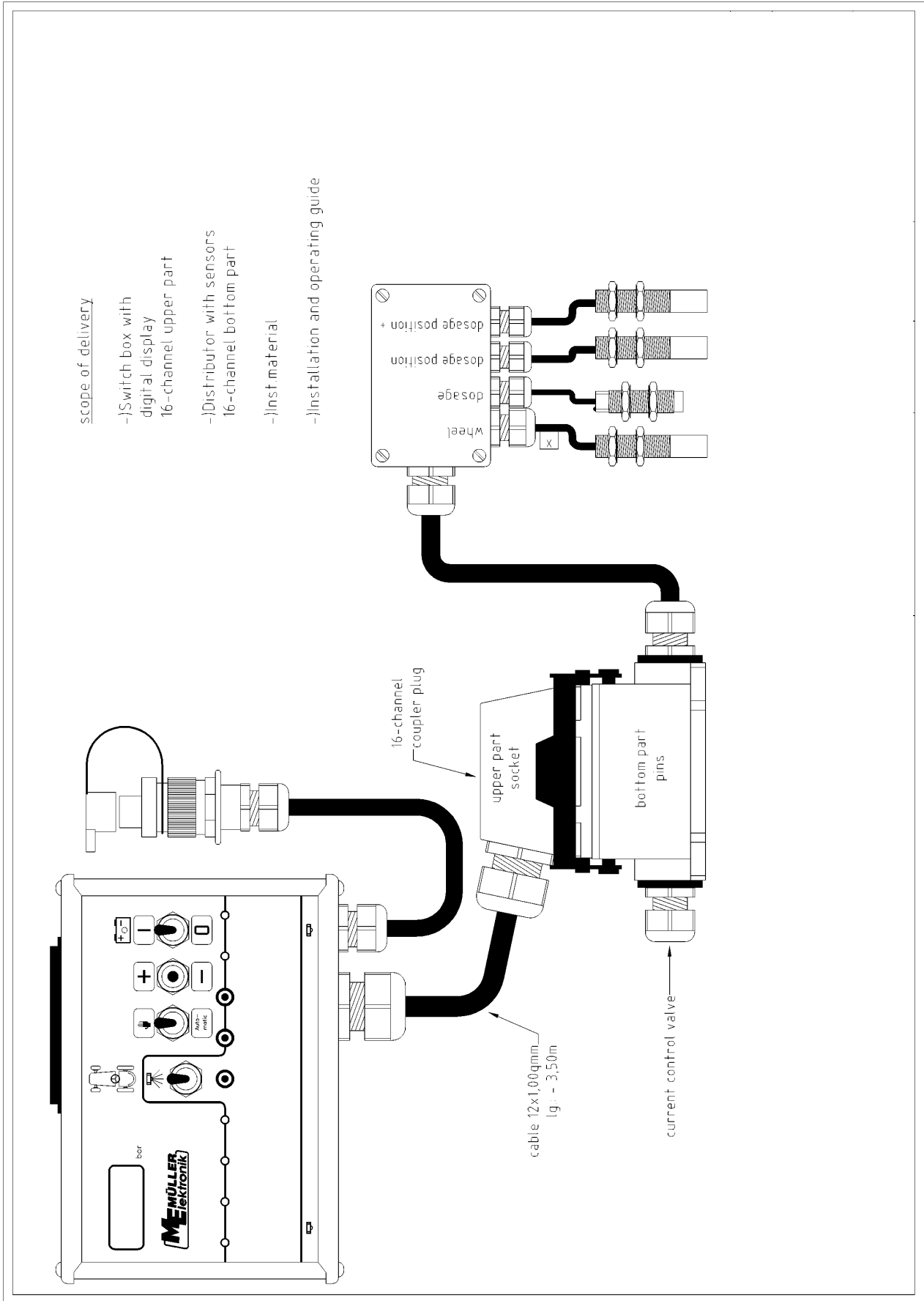
The "dosage position +" sensor displays the wider opened slide valve via a further lamp. A wider opening is required at the beginning of operation when the sludge has a low TS content

Varying slide valve positions are necessary depending on the spread rate and the spray liquid. This can be done by moving the magnets.

- Motor controlled current control valve.

The UNI Control S regulates the speed of the oil-motor propelled scraper floor by means of the valve.

The current control valve is connected to the bottom part of the 16-channel coupler plug.



2 Installation instructions

2.1 Console and computer

Please refer to the UNI Control S Operation and Installation Guide.

2.2 Sprayer equipment

- 16-channel coupler plug

The 16-channel coupler plug is mounted on the sprayer's drawbar using the enclosed screws

- Multi-purpose sprayer switch box

The signal distributor is mounted in a protected position on the rear part of the sprayer (e.g. on the bar underneath the floor.

- Current control valve

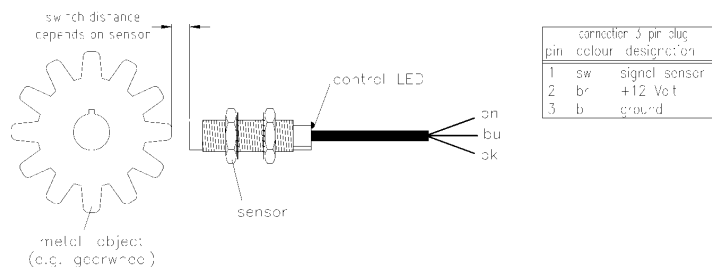
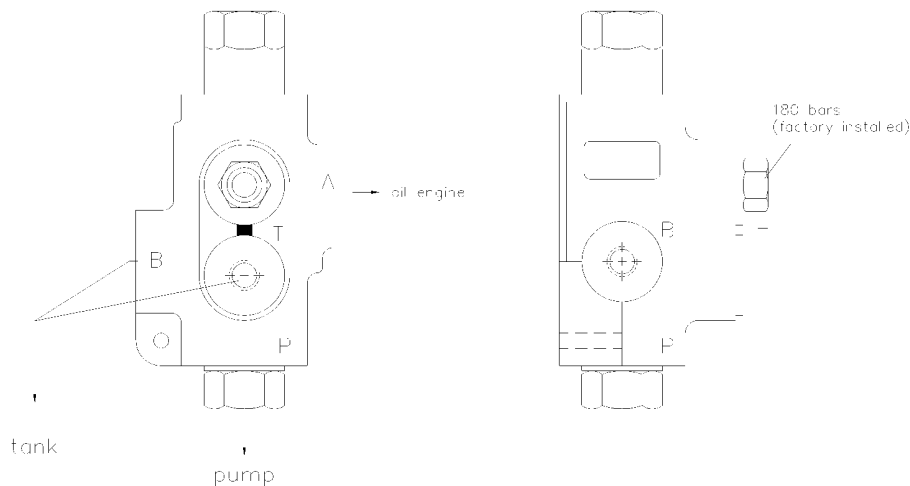
The current control valve is mounted near the 16-channel coupler plug and is connected directly to the coupler plug. Refer to the current control valve graphic to connect the hydraulics.

- Dosage sensor (inductive sensor)

The rpm is recorded at the gear wheel of the oil engine by means of this sensor. The distance between the tooth and the sensor should be approximately 2mm. A fully enclosed inductive sensor with the same electrical functions is supplied for oil bath drives. The sensor is screwed directly into the casing of the oil bath drive.

The switch distance in this case should also be 2mm.

The sensor has a screw thread of M12 x 1. The gear wheel with the highest rpm is best suited for impulse recording.



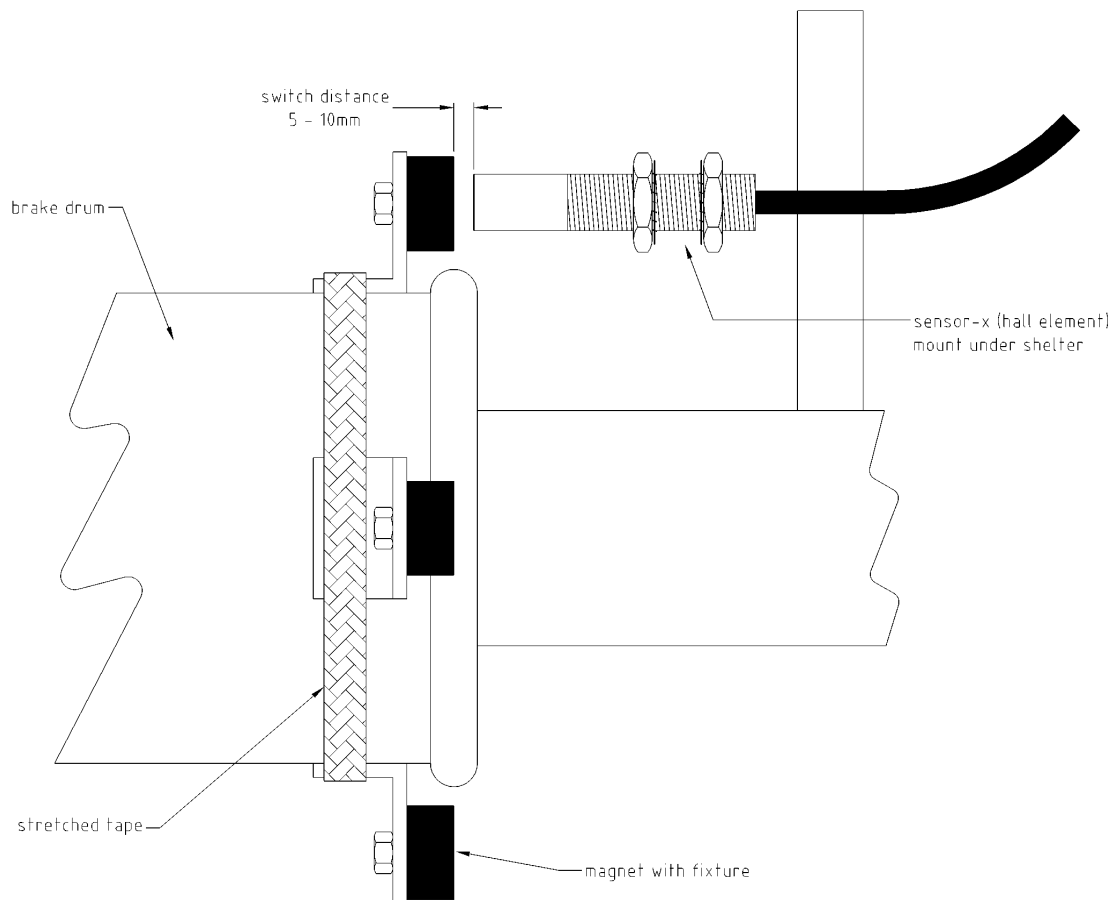
- Wheel sensor

The magnets are attached to a tape stretched round the brake drum. A Hall sensor is mounted opposite the magnets at a distance of 5 - 10 mm.

The number of magnets depends on the wheel circumference. An impulse should be delivered for every 60 cm distance covered.

Example: Wheel circumference 3.40 m
= 340 cm ÷ 60 cm = 5.66
= this means that 6 magnets are required.

Slip-free speed recording can also be carried out by a radar device on the tractor. In this case the wheel sensor on the sprayer is not required.



- Dosage position sensor and dosage position + sensor

As already described under section 1.2.1 and 1.2.2. the dosage position and dosage position + sensors are necessary in order to locate the dosage position easily.

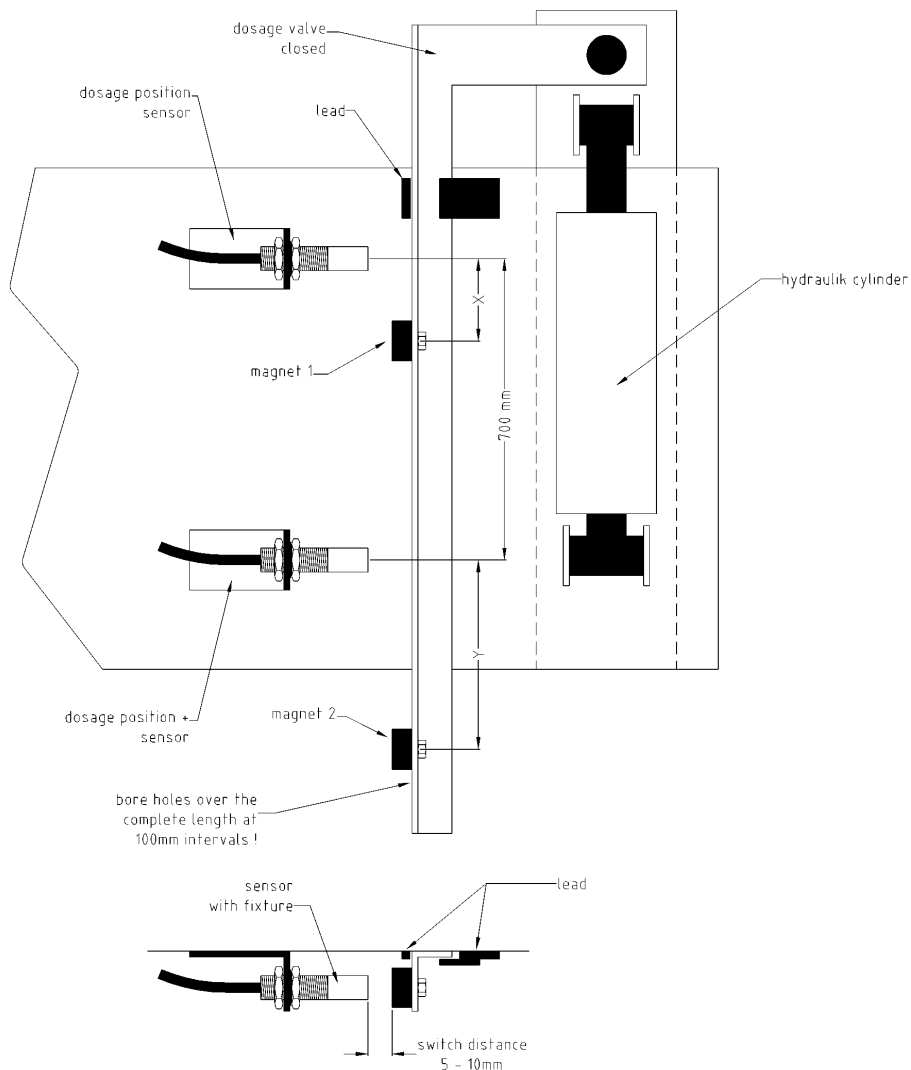
A corner bracket is mounted to the dosage slide valve.

The dosage slide valve position and the dosage slide valve position + sensors are installed opposite the corner bracket. The distance should be 70 cm. Over the complete length of the corner bracket at 100mm intervals, holes (5mm) are to be bored to secure the magnets. The distance x when the slide valve is closed is equal to the opening during operation (in the diagram 30cm). The distance y is the slide valve position + (in the diagram 50cm).

2-3 positions are necessary for varying spread rates, e.g. sludge.

e.g. small opening (20 cm) 5 - 15 m³/ha
 medium-sized opening (30 cm) 15 - 30 m³/ha
 large opening (40 cm) over 30 m³/ha

With the altered scraper floor speed the required interim rates are achieved.



2.3 Safety

2.4 Specified implementation

Der UNI Control S is specified exclusively for use in agriculture. Any application outwith this area is regarded as unspecified.

The manufacturer does not accept liability for damage 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 in the operating instructions.

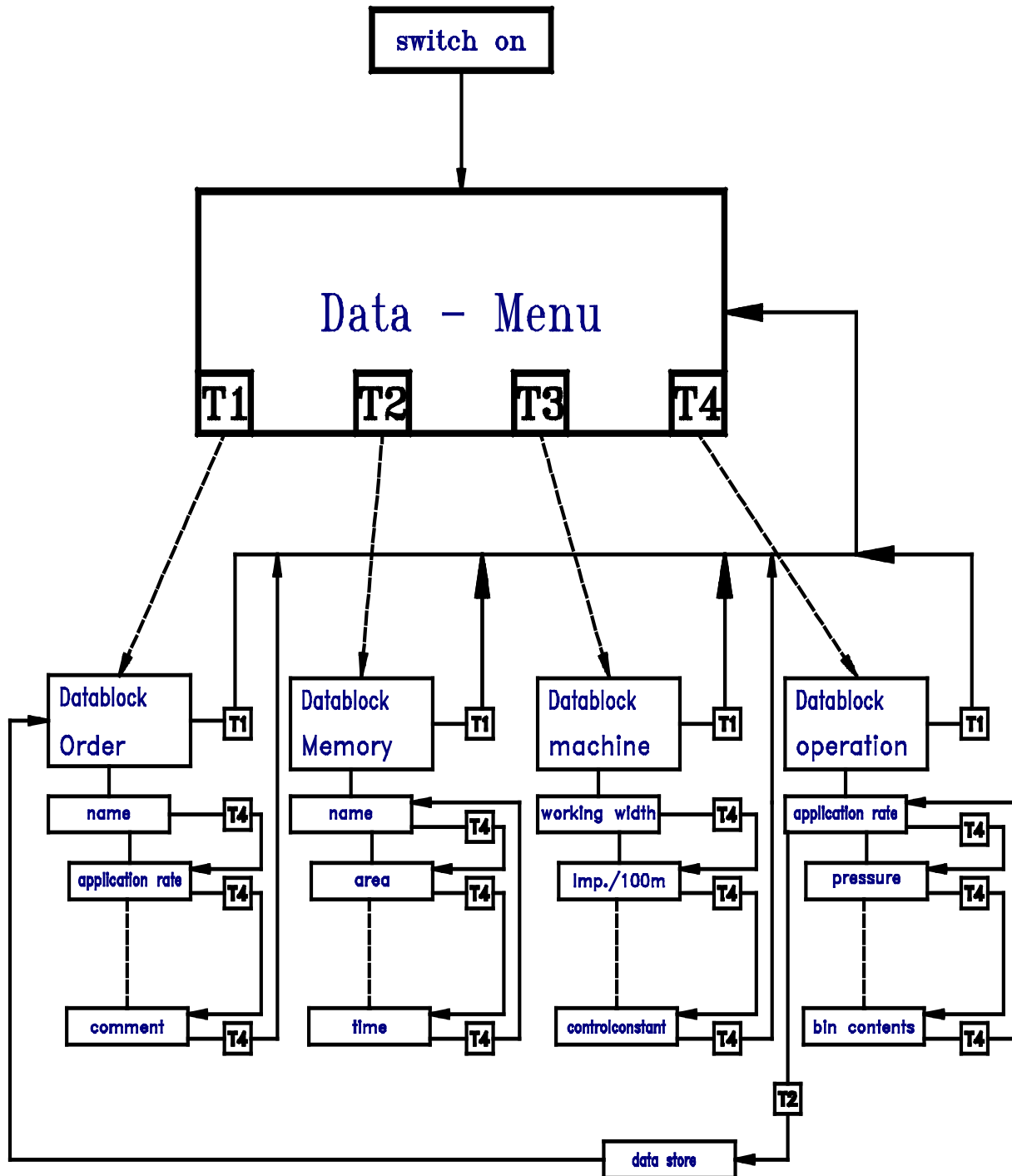
Relevant accident prevention regulations as well as other generally recognized safety, industrial-medical and road traffic rules are to be adhered to. In addition the manufacturer accepts no liability in cases where arbitrary modifications have been made to the UNI Control.

2.5 Safety instructions

Before working on the electrical system or carrying out any welding operations on the tractor or on an attached implement, the battery connection must be interrupted.

3 Operation

3.1 Operating scheme



3.2 Operation procedure

After the UNI Control S has been installed and the machine specific data entered it is ready for operation.

The operation procedure is as follows:

- * Connect the sprayer to the tractor and the switch box to the UNI Control S, which must be switched off.
- * Switch on the UNI Control S; the type of machine is automatically detected via the machine plug and the corresponding program with the machine data entered is automatically selected.
- * Select data block "order" (Press the T1 key)
 - Enter the name (field name; customer name)
 - Enter or check the set rate
 - Enter commentsName and comments are not compulsory.
The set rate should always be checked.
- Start the order (T2)
- * Check magnets 1 and 2 on the dosage position and dosage position + sensors and if necessary reposition the required spread rate accordingly.
- * Check the impulses/m³ rate and if necessary adjust to the new slide valve position.
- * Operation can begin
 - All functions, including calculator functions, can be selected during operation. The spread rate can be altered in 10% degrees in relation to the set rate using the +/- keys.
 - If the hydraulic valve is switched off at the end of the field (scraper floor at standstill) the UNI Control S automatically recognises the working position "off". The working position switch on the switch box can remain switched on. The area will not be measured and not monitored.
 - If a small rest on the sprayer is to be spread in a high gear, the working position switch on the switch box is to be set at "off". The area and the spread rate will not be recorded. Monitoring is switched off.
 - By pressing the T2 key (end), the order and the following confirmation is concluded. The recorded data: area operation time, amount spread etc. are now stored. After this the counters of these data are automatically set to 0 . New numbers are automatically allocated and the operation procedure can begin again.

Order data block (Au)

Order	Menu	T1	--> Me
No : 5	Start	T2	--> Ar
Name / Address :		T3	
MEYER A. BERG	Continue	T4	--+

Left:

Order number, automatically allocated by the board computer, is displayed. Enter the customer's name or the field using the alphabetical keyboard.

Note: Press the enter key to end the entry

Right:

Press the T1 to go to menu selection. With the T2 key the order is started (without entry of the set rate and comment), automatic move to the operation data.

Order	Menu	T1	--> Me
Applic. rate	Start	T2	--> Ar
Set rate		T3	
20 c b m / h a	Continue	T4	--+

Left:

Enter the required set rate using the decimal keyboard.

Right:

Press the T1 key for menu selection. With the T2 key the order is started (without entry of the comment), automatic move to the operation data.

Order	Menu	T1	--> Me
Comment :	Start	T2	--> Ar
Light rain		T3	
EN	Continue	T4	--+

Left:

Any text can be entered using the alphabetical keyboard. It will be stored as comment.

Right:

Press the T1 key for menu selection. With the T2 key the order is started, automatic move to the operation data. Press the T4 key to proceed to the next display.

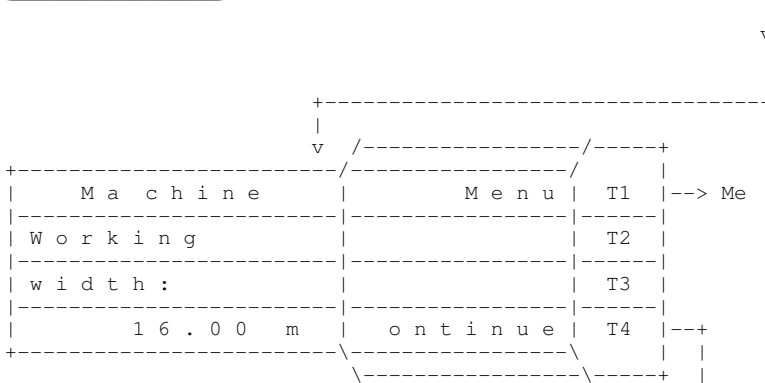
Order	Menu	T1	--> Me
Machine	Start	T2	--> Ar
Nr : 1	Delete	T3	
Gen. purp. spray	Continue	T4	--> Me

Left:

With the initial operation of each machine, the machine number is automatically allocated and also later automatically selected, i.e. no entry is needed! If however there is a 2nd multi-purpose sprayer with different machine data, the next free machine number is to be entered for the 2nd sprayer. In order to activate the 2nd multi-purpose sprayer's machine data, its number will be entered using the decimal keyboard after connecting.

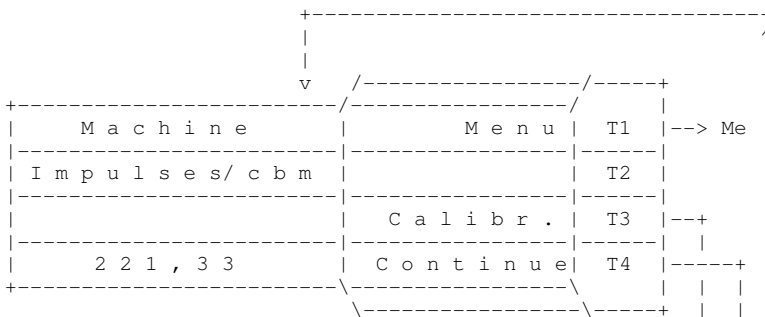
Right:

Press the T1 key for menu selection. With the T2 key the order is started, Automatic move to the operation data. With the T3 key (delete) the machine data of the selecte machine can be deleted. Press the T4 key to proceed to the next display.



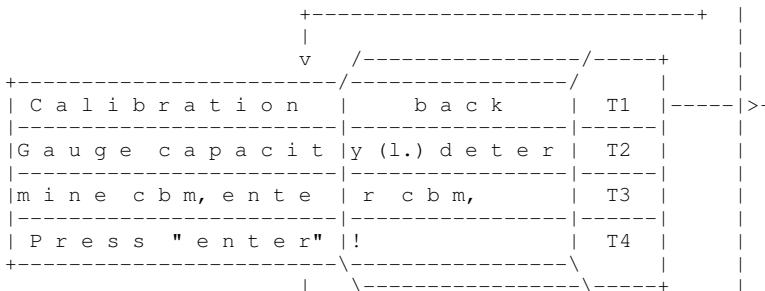
Left:
Enter the working width using the decimal keyboard

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



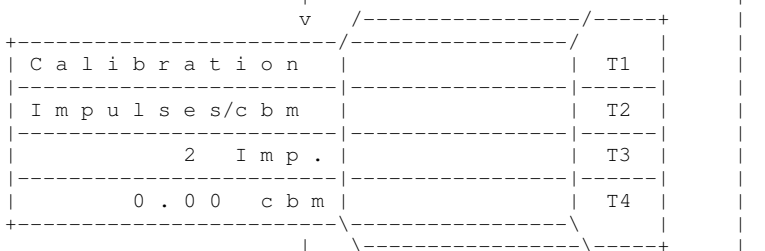
Left:
For each slide valve position there are a certain number of impulses/m³. The calibration process is to be carried out once for each slide valve position. If the impulses/m³ are known the value can be entered via the decimal keyboard.

Right:
Press the T1 key for menu selection.
If required calibration can be selected by pressing the T3 key.
Press the T3 key to proceed to the next display.



Description of the calibration process
Right:
The calibration process can be interrupted by pressing the T1 key.

After the 1st impulse



When the multi-purpose sprayer has been switched on and the 1st impulse from the dosage sensor, the display opposite appears. The impulses are counted. A full cart must be spread. Attention must be paid to the fact that the working position switch is on.

Calibration		T1	
Impulses/cbm		T2	
2656 Imp.		T3	
12.00 cbm		T4	

Once the cart is empty the exact amount is determined and entered using the decimal keyboard. The most exact calculation of the spread rate is achieved by weighing, taking the specific weight into account.

Machine	Menu	T1	--> Me
Impulses/cbm		T2	
		T3	
221.33	Continue	T4	---->

Left:
After pressing the enter key "(=)" the computer calculates the rate "impulses/cbm" and displays it.

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

Machine	Menu	T1	--> Me
Tank content:		T2	
Full: 12.0 cbm		T3	
Alarm: 1.0 cbm	Continue	T4	---->

Left:
In order to determine the residue in the tank, the content and if required an alarm threshold can be entered here.

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

Machine	Menu	T1	--> Me
m ³ Weight		T2	
		T3	
0.0 kg	Continue	T4	---->

Left:
The cubic meter weight can be entered in kg using the decimal keyboard, if the value is not 1000 kg.

When entering a value, the spread rate is not displayed in kg/ha but in t/ha (tons/ha)

Right:
Press the T1 and T4 keys for menu selection.

Machine	Menu	T1	--> Me
Control		T2	
constant:		T3	
20.00	Continue	T4	

Left:
The control constant is entered using the decimal keyboard. If regulation is too sluggish, the rate has to be increased. In the case of saturation, i.e. with a set-rate of 20cbm/ha there is regulation from 16cbm/ha to 23cbm/ha then 18cbm/ha etc. then the control constant must be reduced. Depending on the multi-purpose sprayer, values varying from 10 to 40 are possible.

Right:
Press the T1 and T4 keys for menu selection.

Functional data

The 3 function keys beside the decimal keyboard enable required rates to be displayed at any time simply by pressing a key.

v /-----/-----/		+-----+	
		kg l	
-----		-----	
		ha	
+-----+		+-----+	
2 2 5 c b m	T1	Left:	Display of the spread rate and the area worked for the current order.
T o t a l	T2	Right:	By pressing the T2 key the total spread rate and area worked are displayed.
1 1 . 2 5 3 6 h a	T3		
C o n t i n u e	T4		Press the T4 key to return to the operation data.

v /-----/-----/		+-----+	
-----		-----	
+-----+		+-----+	
4 8 1 0 c b m	D e l e t e T1	Left:	Display of the total spread rate and the worked area (e.g. in one season).
	T2	Right:	The rates opposite are deleted when the T1 and T3 keys are pressed.
3 4 3 . 6 9 2 4 h a	D e l e t e T3		Press the T4 key to return to the operation data.
C o n t i n u e	T4		

v /-----/-----/		+-----+	
		km	
-----		-----	
		h	
+-----+		+-----+	
1 2 7 . 3 2 1 k m	T1	Left:	Display of the distance driven and the operation time for the machine, tractor and driver, valid for the current order.
6 . 7 3 h M a c .	T2	Right:	Press the T4 key to return to the operation data.
7 . 5 5 h T r a c	T3		
9 . 8 6 h D r i v	C o n t i n u e T4		

v /-----/-----/		+-----+	
		ha/h	
-----		-----	
		1/min	
+-----+		+-----+	
3 . 3 2 h a / h	T1	Left:	Display of the current and average area output.
3 . 0 8 h a / h	T2	Right:	Press the T4 key to return to the operation data.
P o w e r t.-o. s h a f t :	T3		
5 2 0 1 / m i n	C o n t i n u e T4		