

K-BASIC 2

Control system



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We are constantly developing our products to offer our customers maximum convenience. Therefore, we ask for your understanding that the manual can deviate from the product in some regards.

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3 General information

This chapter gives you information on the following:

- Chapter 3.1 "*Service information*", page 5
- Chapter 3.2 "*EC Declaration of Conformity*", page 6

3.1 Service information

Customer service:

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3.2 EC Declaration of Conformity

in terms of the EC Machinery Directive 2006/42/EC and
the EMC Directive 2014/30/EU



We herewith declare that the control system designated below complies with the relevant essential health and safety requirements of the respective EC Machine Directives and the EMC Directive due to its design and construction, and in the version supplied by us.

If the control system is modified without our consent, this declaration shall cease to apply.

Designation: Control system k-basic 2

Relevant EC machinery directives:

DIN EN ISO 15431 / 16330/292-1 / 292-2 / 60204-1 / 12100 / 13849-1 / 13849-2

Rettenbach a.A., December 2016

Josef Kugelmann

4 Introduction

This chapter gives you information on the following:

- Chapter 4.1 "*Target group*", page 7
- Chapter 4.2 "*Application*", page 7
- Chapter 4.3 "*Conventions used*", page 8
- Chapter 4.4 "*Change history*", page 8

4.1 Target group

These operating instructions are intended for skilled persons who are responsible for the following work at the control system:

- Commissioning
- Control
- Operation
- Use

At least once a year, all personnel must be trained in the operation of the control system in accordance with the guidelines of the business liability insurance. The use of the control system by untrained or unauthorized persons is prohibited.

4.2 Application

These operating instructions contain all necessary data and information for safe operation and commissioning of the spreader.





Make sure that all persons responsible for operation of the control system or persons working in the immediate environment of the control system are familiar with the operating instructions as well as the safety information in this manual.

These operating instructions are part of the product and have to be kept in a safe place. In case of resale or transfer of the control system to third parties, these operating instructions have to be included.

All information, illustrations and technical data correspond to the technical state at the time of printing. Subject to technical modifications.

4.3 Conventions used

This manual uses the following typographic conventions:

Symbol	Signal word	Meaning
	Danger	Indicates an imminent dangerous situation, which - in case of non-observance of the safety instructions - will entail death or grievous bodily harm.
	Warning	Indicates a possibly dangerous situation, which - in case of non-observance of the safety instructions - may entail death or grievous bodily harm.
	Caution	Indicates a possibly dangerous situation, which - in case of non-observance of the safety instructions - may result in minor injuries or damage to property.
	Notice	Contains useful information with respect to proper handling of the machine.

4.4 Change history

Date	Version	Modification
January 13, 2016	1.1	First edition
Oct 14, 2016	1.2	Software modifications
Dec 6, 2016	1.3	Software modifications in the setup menu
Apr 25, 2019	1.4	Setup menu revised

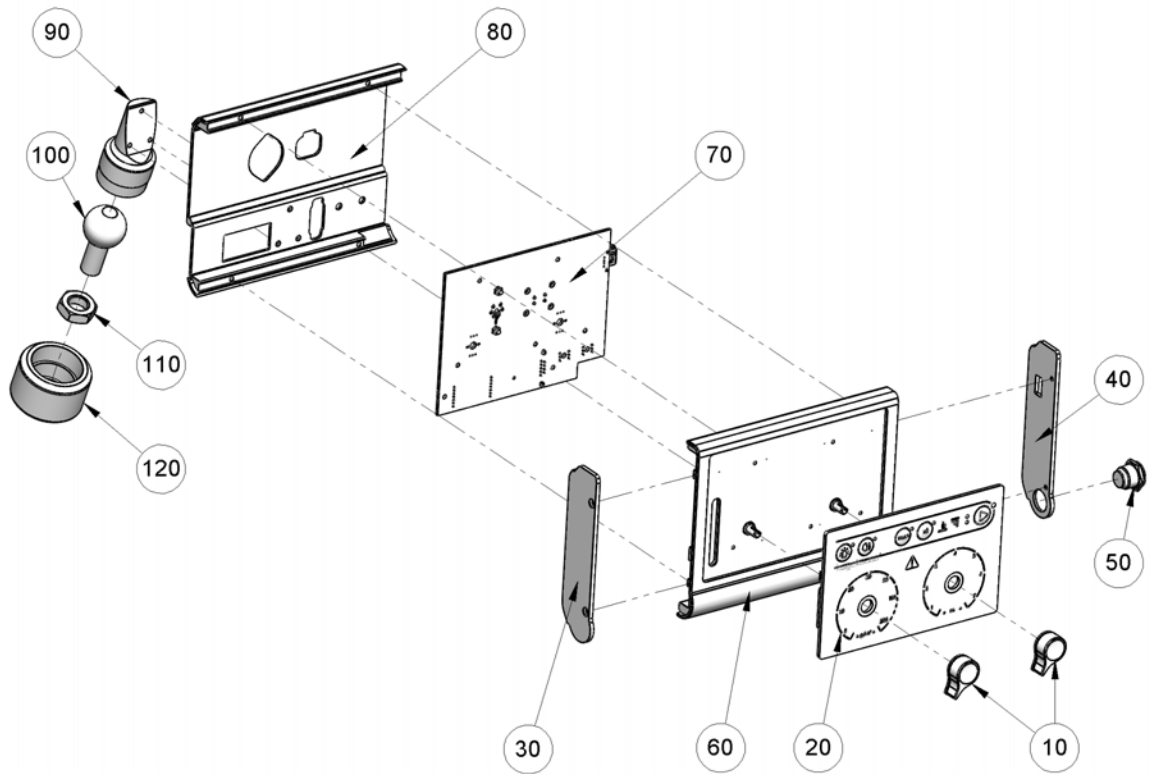
5 General description

This chapter gives you information on the following:

- Chapter 5.1 *"Components of the control system"*, page 10
- Chapter 5.2 *"User interface"*, page 11
- Chapter 5.3 *"Control variants"*, page 13
- Chapter 5.4 *"Setup menu"*, page 14
- Chapter 5.5 *"Designated use"*, page 15
- Chapter 5.6 *"Obvious misuse"*, page 15
- Chapter 5.7 *"Wear parts"*, page 16

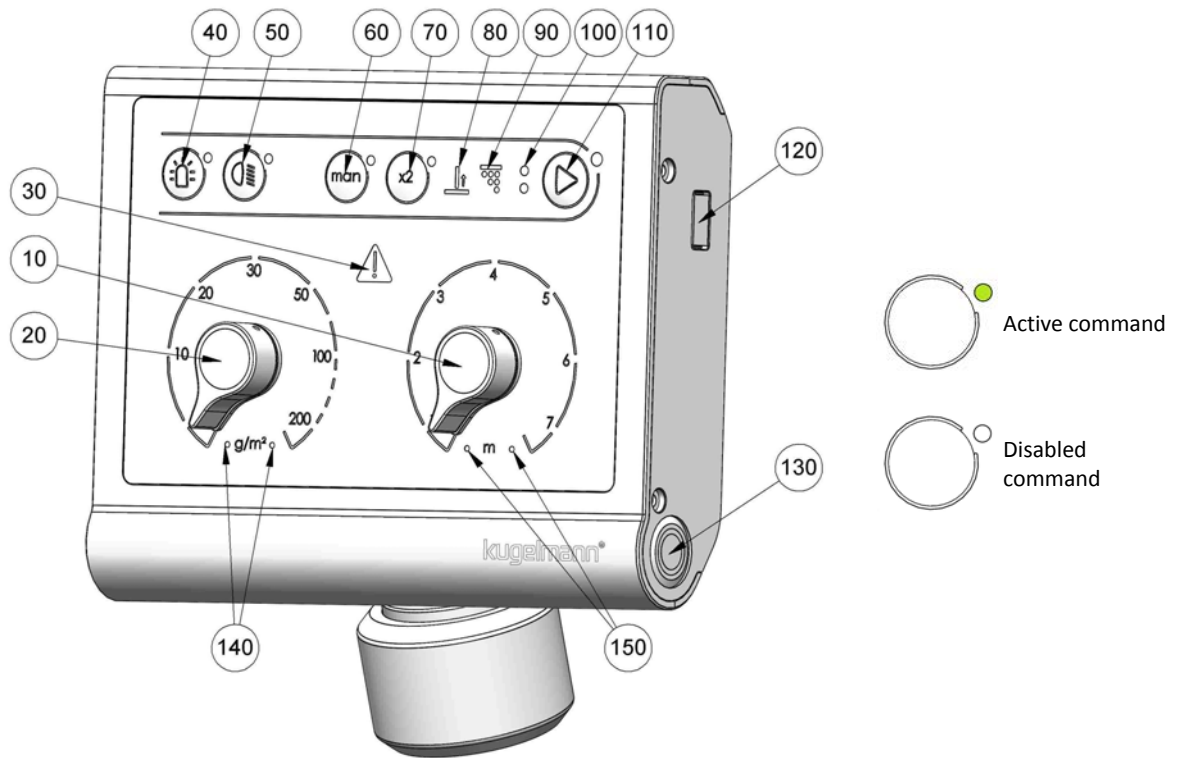
5.1 Components of the control system

Please see the following illustration for components of the control system:

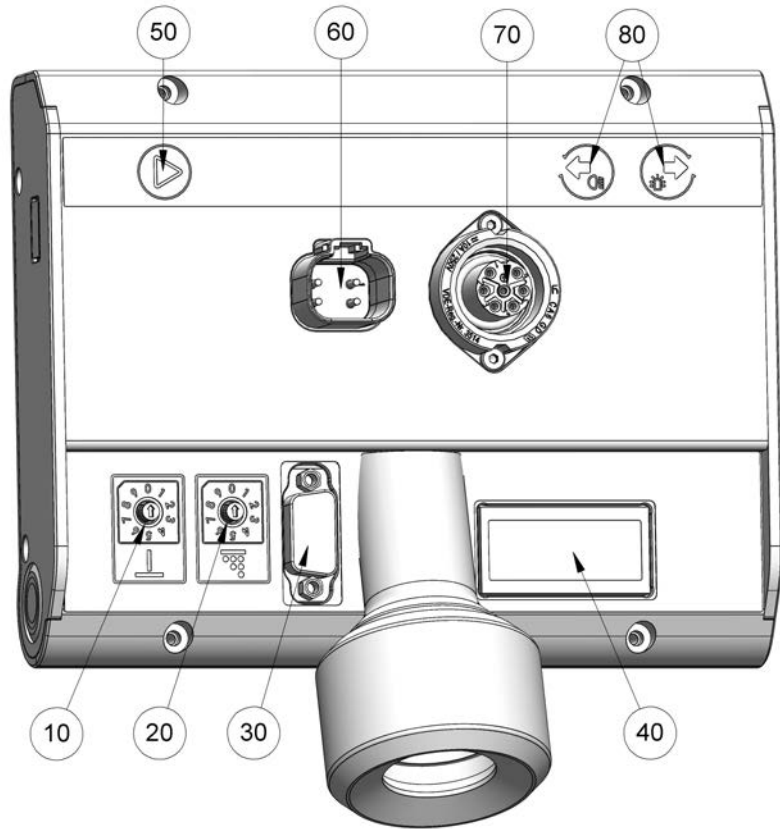


Pos.	Part
10	Turning knob
20	Membrane keyboard
30	Side plate (lh)
40	Side plate (rh)
50	ON / OFF push-button
60	Housing front shell
70	Printed circuit board (PCB)
80	Housing rear shell
90	Fixture
100	Spherical head
110	Counternut
120	Locking nut

5.2 User interface




Pos. No.	Key command
10	Setting of spreading width
20	Setting of spreading density
30	<ul style="list-style-type: none"> • Orange -> Warning • Red -> Error
40	Rotating beacon / Flasher
50	Working headlight
60	Speed and spreading quantity resulting from V Sim
70	Double spreading density
80	Chute sensor
90	Electrical spreading pattern control
100	<ul style="list-style-type: none"> • Upper LED lights up if V=10 km/h is exceeded and goes out if the speed falls below V=5 km/h • Lower LED lights up if a drive signal has been recognized
110	Spreading operation / Pause
120	USB interface for software update
130	ON / OFF
140	<ul style="list-style-type: none"> • Glowing permanently in case of error-free operation
150	<ul style="list-style-type: none"> • Flashing in case of undersupply or oversupply



Pos. No.	Key command
10	Adjustment of spreading width
20	Adjustment of spreading density
30	RS 232 plug for data protocol
40	Workshop display
50	Trigger button -> actuation at the front
60	Drive signal / current supply
70	Coupling for slave connecting cable
80	Navigation keys -> actuation at the front

5.3 Control variants

Three different control variants are available:

- 1 Basic variant with operation/pause control via key 
- 2 Start/stop function:
 - ⇒ Regulation via drive signal of carrier vehicle:
 - Regardless of speed -> same spreading rate, different spreading density.
 - Standstill -> no spreading.
- 3 Path-dependence:
 - ⇒ Drive signal is detected via speedometer or a sensor with punched disk at the carrier vehicle:
 - Spreading rate proportional to speed.
 - Setting of spreading density.
 - Standstill -> no spreading.



Hinweis

Drive signal at carrier vehicle.

- Please see the operating instructions of the carrier vehicle for the position where the drive signal is taken.
-

5.4 Setup menu

1 screw	2 screws	Description
Setup 0 0 1 . 0 3 0	Setup 0 0 1 . 0 3 0	Installed software version.
V CONFIG 0 2	V CONFIG 0 2	Regulation equipment of the device (see Chapter 7.3 "Regulation equipment", page 26).
V 1 5 <TEACH>	V 1 5 <TEACH>	Adjustment of drive signal (see Chapter 7.4 "Configuration of drive signal", page 26).
V 3 0 <TEACH>	V 3 0 <TEACH>	
Vsim 1 5	Vsim 1 5	Setting of simulated speed (see Chapter 7.5 "Simulation speed", page 28).
SENS W <RUN>	SENS W <RUN>	Check sensors (see Chapter 7.6 "Checking and setting of sensors", page 28).
SENS D <RUN>	SENS L <RUN>	
	SENS R <RUN>	
CHAR W <RUN>	CHAR W <RUN>	Recording characteristic curve of spreading disc (see Chapter 7.7 "Regulator adjustment", page 30).
CHAR D <RUN>	CHAR L <RUN>	Recording characteristic curve of conveyor screw(s) (see Chapter 7.7 "Regulator adjustment", page 30).
	CHAR R <RUN>	
IMP / KG D <RUN>	IMP / KG L <RUN>	Checking of spread quantity (see Chapter 7.8 "Weighing of spreading materials", page 31).
	IMP / KG R <RUN>	
CONV D I / KG 4 2	CONV L I / KG 4 2	Fine correction of spread quantity (see Chapter 7.8 "Weighing of spreading materials", page 31).
	CONV R I / KG 4 2	
CONV 2 0	CONV 2 1	Number of metering screws (see Chapter 7.9 "Number of screws", page 33).
WIDTH I / M 5 . 0	WIDTH I / M 5 . 0	Fine correction of spreading width (see Chapter 7.10 "Configuration of spreading width", page 33).
DISKSTOP STOPP 0	DISKSTOP STOPP 0	Stop of spreading disc in case of vehicle stop (see Chapter 7.11 "Stop of spreading disc when vehicle stops", page 35).
DISKSTOP PAUSE 1	DISKSTOP PAUSE 1	Stop of spreading disc in case of pause ▶ (see Chapter 7.12 "Stop of spreading disc at pause", page 35).
ESK 0	ESK 0	Electrical monitoring of spreading process (see Chapter 7.13 "Electrical monitoring of spreading process", page 36).
FLASHER 0	FLASHER 0	Rotating beacon (see Chapter 7.14 "Rotating beacon", page 36).
LAMP 0	LAMP 0	Working headlight (see Chapter 7.15 "Working headlight", page 37).
PROTOCOL 0	PROTOCOL 0	Possibility to record and assemble a spreading protocol (see Chapter 7.16 "Spreading protocol", page 37).
BOOST 0	BOOST 1	Increased spreading output when starting (see Chapter 7.17 "Boost function", page 38).
	BOOST S 0 , 5	Time of increased spreading output when starting (see Chapter 7.17 "Boost function", page 38).
	BOOST G 1 0 0	Quantity of spreading material in the set time (see Chapter 7.17 "Boost function", page 38).
RESET (! ! ! ! ! ! !)	RESET (! ! ! ! ! ! !)	Reset to standard settings (see Chapter 7.18 "Reset to factory settings", page 39).
UPDATE NO STICK	UPDATE NO STICK	Update (see Chapter 8.2 "Update", page 44).

5.5 Designated use

Use the control system only for spreaders manufactured by Kugelmann Maschinenbau e.K.

Use the control system only with the plug-and-socket connections provided for this purpose and with the respective original cables.

Any kind of use that deviates from the procedure set forth herein is considered contrary to its designated use. The operator of the control system is liable for any damages arising from such action.

Use and reconditioning of the control system may only be carried out by trained and competent personnel.

To operate the equipment within the limits of its designated use, please note the following:

- These operating instructions as well as all other enclosed documentation.
- The relevant accident prevention regulations.
- The generally recognised rules relating to technical safety requirements and occupational health.
- The operating instructions of the carrier vehicle.

5.6 Obvious misuse

It is not allowed to operate machines with the control system which were not designed and manufactured by Kugelmann Maschinenbau e.K.

Do not use or store the control system outside or uncovered.

The control system shall not be used as handle.

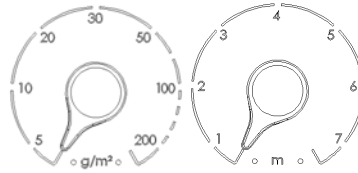
5.7 Wear parts



Hinweis

Wear parts are:

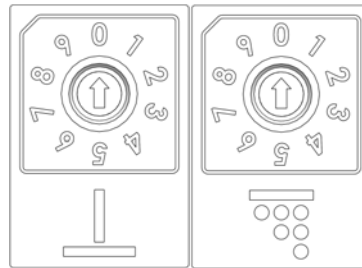
- Potentiometer for:
 - Spreading density
 - Spreading width
- Membrane keyboard



- ON/OFF push-button



- Rotary control for:
 - Spreading density
 - Spreading width



- Lighting
 - Rotating beacon
 - Working headlight
- Connector

6 Safety instructions

This chapter gives you information on the following:

- Chapter 6.1 "General safety instructions", page 17
- Chapter 6.2 "Commissioning", page 18
- Chapter 6.3 "Use", page 19
- Chapter 6.4 "Maintenance", page 19
- Chapter 6.5 "Designations", page 21

6.1 General safety instructions



Warning

Use of the control system by untrained persons.

Risk of serious injury.

- Make sure that all persons responsible for operation or maintenance of the control system are trained in the operation of the device and are familiar with the operating instructions as well as the safety information in this manual!
 - Insist on compliance with the applicable safety regulations!
-



Warning

Non-observance of guidelines.

Risk of serious injury or death.

- Please observe the regulations relating to accident prevention!
 - Please observe the generally applicable safety regulations, industrial standards and medical guidelines!
 - Please observe the road transport guidelines!
 - Please pay attention to the general advice in these operating instructions!
-

**Caution**

Changes at the control system.

Impairment of functionality and danger of property damage.

- Do not make any changes at the control system!
-

6.2 Commissioning

**Caution**

First commissioning without instruction.

Risk of injury or property damage.

- First commissioning of the control system must be accomplished by employees of the dealer, the manufacturer or a representative of our works!
-

**Caution**

Wrong polarity.

Danger of property damage.

- Check the polarity prior to commissioning.
-

**Caution**

Damaged power lines.

Risk of injury or property damage.

- Damaged power lines have to be replaced immediately!
-

**Caution**

Commissioning without making sure that the machine is in perfect technical condition.

Risk of injury or property damage.

- Check all important parts before commissioning!
 - Check all safety-related protection devices before commissioning!
 - If applicable, please replace damaged parts!
-

**Caution**

Improper fixing of control system.

Danger of property damage.

- Make sure that the control system is fixed at an appropriate place designated for this purpose!
-

6.3 Use

**Caution**

Non-observance of regulations concerning road safety.

Risk of injury or property damage.

- Please make sure that the control system complies with the regulations concerning road safety!
-

**Caution**

Operating the spreader in the event of malfunctions.

Risk of injury or property damage.

- In the event of malfunction, stop the control system and switch it off!
 - Resolve the error immediately or ask a workshop!
-

6.4 Maintenance

**Warning**

Electric shocks during maintenance work.

Risk of serious injury or death.

- Interrupt power supply before executing work at an electrical device!
-

**Caution**

Non-observance of safety regulations.

Risk of injury or property damage.

- Comply with the safety regulations during all maintenance work!
-

**Caution**

Use of wrong spare parts.

Risk of injury or property damage.

- Do only use original parts for repair work!
-

**Caution**

Maintenance work without necessary technical knowledge or appropriate tooling.

Risk of injury or property damage.

- Only carry out maintenance work if you have the necessary expertise as well as suitable tools!
-

**Caution**

Cleaning with high-pressure cleaner.

Danger of property damage.

- Cleaning of bearings, plastic parts, electronic parts and hydraulic lines only with low pressure!
-

**Caution**

Cleaning of metallic surfaces.

Risk of material damage due to detergents.

- Do not use aggressive detergents!
-


**Caution**

Loose cable / screw connections.

Danger of property damage.

- Retighten loose bolted connections and screw connections after repair and maintenance work!

6.5 Designations

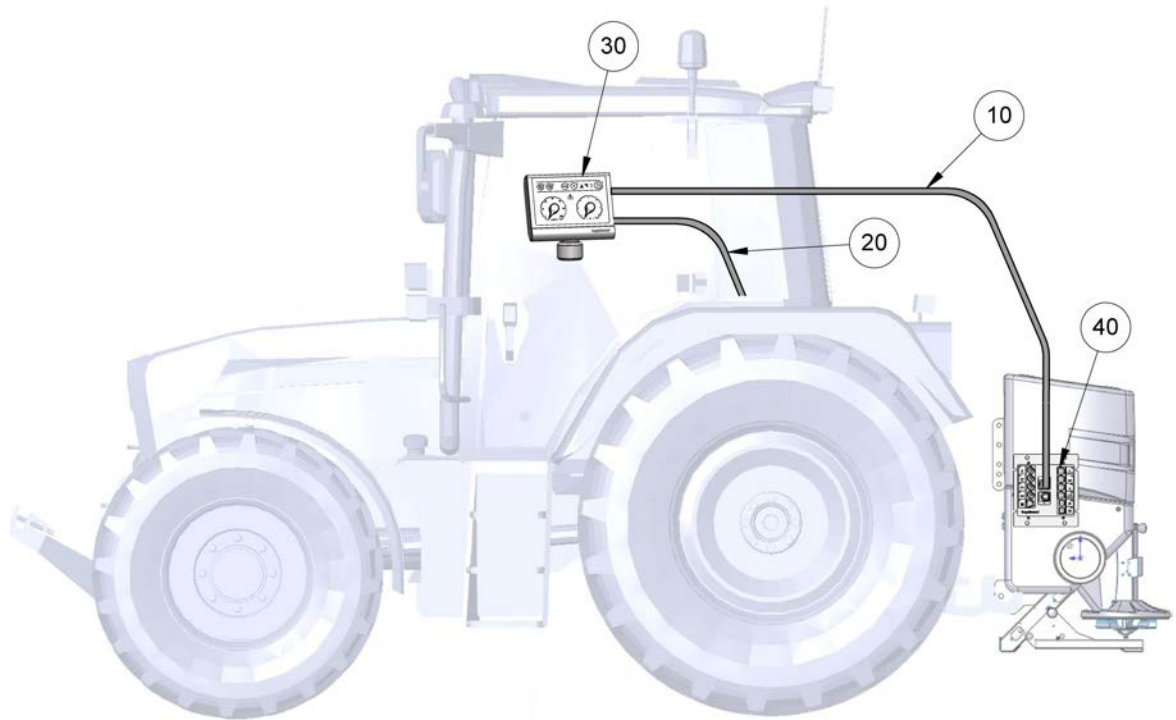
Marking	Explanation
	Basis for Declaration of Conformity

7 Commissioning

This chapter gives you information on the following:

- Chapter 7.1 *"Wiring diagram"*, page 23
- Chapter 7.2 *"Start/finish setup menu"*, page 25
- Chapter 7.3 *"Regulation equipment"*, page 26
- Chapter 7.4 *"Configuration of drive signal"*, page 26
- Chapter 7.5 *"Simulation speed"*, page 28
- Chapter 7.6 *"Checking and setting of sensors"*, page 28
- Chapter 7.7 *"Regulator adjustment"*, page 30
- Chapter 7.8 *"Weighing of spreading materials"*, page 31
- Chapter 7.9 *"Number of screws"*, page 33
- Chapter 7.10 *"Configuration of spreading width"*, page 33
- Chapter 7.11 *"Stop of spreading disc when vehicle stops"*, page 35
- Chapter 7.12 *"Stop of spreading disc at pause"*, page 35
- Chapter 7.13 *"Electrical monitoring of spreading process"*, page 36
- Chapter 7.14 *"Rotating beacon"*, page 36
- Chapter 7.15 *"Working headlight"*, page 37
- Chapter 7.16 *"Spreading protocol"*, page 37
- Chapter 7.17 *"Boost function"*, page 38
- Chapter 7.18 *"Reset to factory settings"*, page 39
- Chapter 7.19 *"Recommissioning"*, page 40

7.1 Wiring diagram



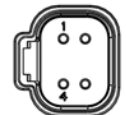
Pos. no.	Component
10	Connecting cable from operating unit (Pos. 30) to slave (Pos. 40).
20	Drive signal / power supply from carrier vehicle to operating unit (Pos. 30).
30	Operating unit of control unit k-basic 2.
40	Slave of k-basic 2 control system within the spreader.

1 Fit operating unit (Pos. 30) at appropriate place in the carrier vehicle.

2 Take out drive signal and power supply from carrier vehicle (Pos. 20) and connect with operating unit (Pos. 30).



Alternatively, connect directly with the slave (Pos. 40) in the spreader.



3 Plug in data cable (Pos. 10) at the rear of the operating unit (Pos. 30). Pay attention to the marked protrusion.



For exact wiring diagrams, please see the spare parts list.

**Caution**

Wrong polarity.

Danger of property damage.

- Check the polarity prior to commissioning.
-

**Caution**

First commissioning without instruction.

Risk of injury or property damage.

- First commissioning of the control system must be accomplished by employees of the dealer, the manufacturer or a representative of our works!
-

**Caution**

Damaged power lines.

Risk of injury.

- Damaged power lines have to be replaced immediately!
-

**Caution**

Commissioning without making sure that the machine is in perfect technical condition.

Risk of injury or property damage.

- Check all important parts before commissioning!
 - Check all safety-related protection devices before commissioning!
 - If applicable, please replace damaged parts!
-

**Caution**

Improper fixing of control system.

Danger of property damage.

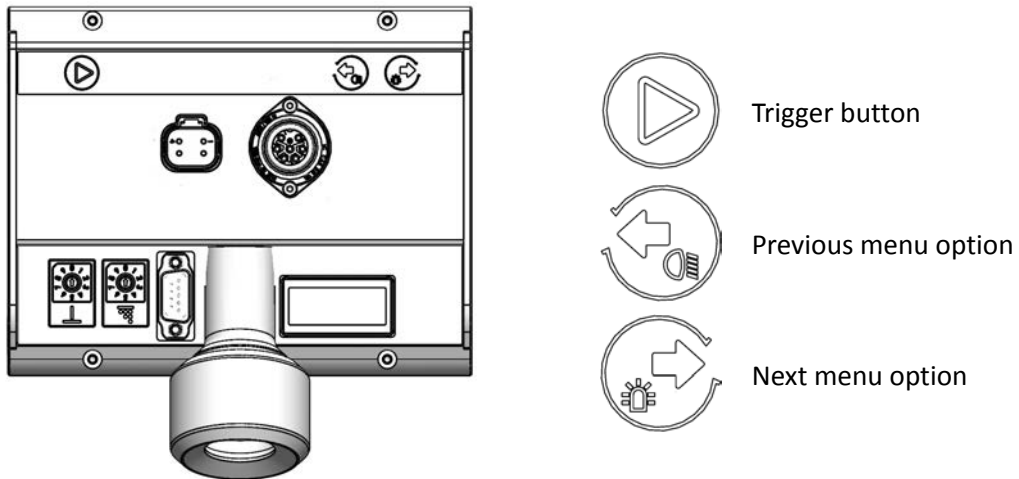
- Make sure that the control system is fixed at an appropriate place designated for this purpose!
-

7.2 Start/finish setup menu

All parameters have to be configured before the control system is put into operation.

Navigation:

The dummy keys described below have to be actuated via the front buttons.



Start menu:

1 Switch off device.

2
 Hold down.

⇒

S	e	t	u	p			0
	0	1	.	0	3	0	

3
 Release.

Finish menu:

Switch off device.

7.3 Regulation equipment

For detailed information regarding the respective regulation equipment, refer to Chapter 5.3 "Control variants", page 13.

1 Start setup menu (see Chapter 7.2 "Start/finish setup menu", page 25).



Actuate.

⇒

V		C	O	N	F	I	G
						0	2

- 00 = Regulation via spreading operation/pause
- 01 = Start/Stop
- 02 = Path-dependence



Hinweis

This value is fixed (optional) and can not be modified externally.

7.4 Configuration of drive signal

The drive signal has to be configured before the control system is put into operation:



Hinweis

Only possible with regulation equipment 01 and 02 (see Chapter 7.3 "Regulation equipment", page 26)



Hinweis

For the correct configuration of the drive signal, the carrier vehicle must fulfill the following conditions:

- The drive signal must have been taken correctly from the carrier vehicle
- Square wave signal
- Pulse-Pause max. 20%
- min. 4 imp/min.
- Voltage swing min. 4 V
- max. 1kHz

1 Start setup menu (see Chapter 7.2 "Start/finish setup menu", page 25).



Actuate several times.

⇒

V	1	5					0
<	T	E	A	C	H	>	

⇒

V	3	0					0
<	T	E	A	C	H	>	

3 Depending on carrier vehicle drive either 15 km/h or 30 km/h (30 km/h is preferable).



Hinweis

- V15 = the control system is taught when the carrier vehicle drives at a speed of 15 km/h.
- V30 = the control system is taught when the carrier vehicle drives at a speed of 30 km/h.

4 Start driving until the speedometer of the carrier vehicle shows the set speed.



Press shortly as soon as the speed has been reached.



Hinweis

Compare current driving speed (on top right) and speedometer speed of the carrier vehicle.

7.5 Simulation speed

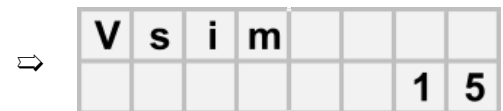
The simulation speed serves for stationary spreading tests and for manual operation.

1 Start setup menu (see Chapter 7.2 "Start/finish setup menu", page 25)



Actuate several times.

Example: 15 km/h



Actuate to change set simulation speed [5; 10; 15; 20; 30].

7.6 Checking and setting of sensors



Hinweis

Prerequisites:

- Spreader and carrier vehicle shall be in operation
- Make sure that hydraulic oil pressure is sufficient



Caution

Sensor too close to the sensor disc.

Danger of property damage.

- Start measurement with sufficient safety distance with regard to the sensor disc!

1 Start setup menu (see Chapter 7.2 "Start/finish setup menu", page 25).



Example: Sensor spreading disc

Actuate several times.

⇒

S	E	N	S				W
<	R	U	N	>			



Successful

Measuring by pressing and hold it pressed until spreading disc / conveyor screw stands still.

⇒

1	2	7		o	k		W
1	1	5			1	3	9

Upper line:

⇒ Average (optimum value: 127)

Lower line:

⇒ Left: min value

⇒ Right: max value

Sensor setting failed:	
average too high	Sensor too close ⇒ Turn sensor away from the sensor disc.
Average too low	Sensor too far away ⇒ Turn sensor in direction of disc.
Sensor much too far away, defective, drive not running, oil level/speed too low.	

⇒

1	9	5		!	!		W
1	8	2			2	0	8

⇒

	8	2		!	!		W
	6	3			1	0	1

⇒

		0		e	r	r	W
		0					0

4 Repeat procedure for:

screw

⇒

S	E	N	S				D
<	R	U	N	>			

two-chamber operation:

screw L

⇒

S	E	N	S				L
<	R	U	N	>			

screw R

⇒

S	E	N	S				R
<	R	U	N	>			

7.7 Regulator adjustment

All characteristic curves have to be configured before the control system is put into operation:

- Characteristic curve disc
- Characteristic curve screw (at one-chamber machines)
- Characteristic curve left screw
- Characteristic curve right screw



Hinweis

Hydraulic oil performance must be consistently high!

⇒ Motor speed approx. 2000 1/min

1 Start setup menu (see Chapter 7.2 "Start/finish setup menu", page 25).

2  Actuate several times.

Example: Characteristic curve spreading disc

⇒

C	H	A	R				W
<	R	U	N	>			

3  Start/stop adjustment.

Successful

⇒

C	H	A	R				W
<	R	U	N	>		O	k

Failed

⇒

C	H	A	R				W
N	o	t				O	k

4 Repeat procedure for:
screw

⇒

C	H	A	R				D
<	R	U	N	>			

Two-chamber operation:

screw LH



C	H	A	R				L
<	R	U	N	>			

screw RH



C	H	A	R				R
<	R	U	N	>			

7.8 Weighing of spreading materials

- 1 Fill in spreading material into spreader.
- 2 Fill screw tunnel (See Chapter 5.2 "User interface", page 11)!
- 3 Start setup menu (see Chapter 7.2 "Start/finish setup menu", page 25).



4

Actuate several times.

Example: One-chamber operation



I	M	P	/	K	G		D
<	R	U	N	>			

- 5 Place a reservoir that is appropriately large under the screw conveyor outlet.



6

Press and hold it pressed.



k	g		2	0	,	0	D
I	m	p			8	3	0

- Top line: weight theoretically spread [kg]
- Lower line: Pulses

For a more detailed setting, we recommend to take out 20 kg.

- 7 Weigh spreading material and compare it with number above.

8



Turn pressure regulator for rough correction: (1, 2, 3, 10) x 20 imp./kg. Basic setting abt. 2

9 Empty collecting basin and repeat step 4 - 8!

Fine correction:

10



Actuate several times.

⇒

C	O	N	V				D
I	/	K	G			4	0

11



Fine correction by pressing [Imp/kg].

12 Repeat step 4 - 7.

13 If necessary, repeat step 3 - 12!

Execute procedure at both screws in case of two-chamber machines:

⇒

I	M	P	/	K	G		L
<	R	U	N	>			

⇒

I	M	P	/	K	G		R
<	R	U	N	>			

7.9 Number of screws

1 Start setup menu (see Chapter 7.2 "Start/finish setup menu", page 25).



Actuate several times.

Two screws



C	O	N	V	2			
							1

One screw



C	O	N	V	2			
							0

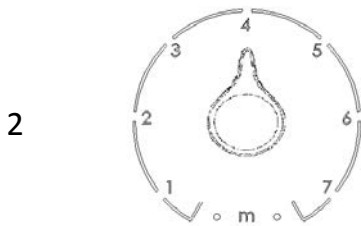


Change by actuating.

7.10 Configuration of spreading width



Switch on control system.



Setting of spreading width.
Example: 4.0 m



Start spreading.

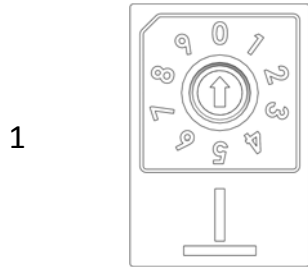
4 Spread until a clear spreading image can be seen on the ground.



Finish spreading.

6 Measure spreading width.

If there is a difference compared to the set spreading width (in this example: 4,0 m), this difference shall be corrected as follows:



Turn pressure regulator for rough correction: (1, 2, 3,, 10) x 1 imp./m

2 Repeat step 3 - 6 (see above).

Fine correction:



Switch off control system.

4 Start setup menu (see Chapter 7.2 "Start/finish setup menu", page 25).



Actuate several times.

⇒

W	I	D	T	H			
I	/	M			6	,	0



Fine correction by pressing [Imp/m].

7.11 Stop of spreading disc when vehicle stops

1 Start setup menu (see Chapter 7.2 "Start/finish setup menu", page 25).



Actuate several times.

0 = spreading disc continues to run when vehicle stops.



D	I	S	K	S	T	O	P
S	T	O	P	P			0



Actuate.

1 = spreading disc stops in case vehicle stops. ⇒

D	I	S	K	S	T	O	P
S	T	O	P	P			1



Hinweis

Can only be activated with regulation equipment 01 and 02 (see Chapter 7.3 "Regulation equipment", page 26)!

7.12 Stop of spreading disc at pause

1 Start setup menu (see Chapter 7.2 "Start/finish setup menu", page 25).



Actuate several times.

0 = spreading disc continues to run in case of pause. ⇒

D	I	S	K	S	T	O	P
P	A	U	S	E			0



Actuate.

1 = spreading disc stops during pause. ⇒

D	I	S	K	S	T	O	P
P	A	U	S	E			1

7.13 Electrical monitoring of spreading process

1 Start setup menu (see Chapter 7.2 "Start/finish setup menu", page 25).



Actuate several times.

0 = electrical monitoring of spreading process **not** available. ⇒

E	S	K							
									0



Actuate.

1 = electrical monitoring of spreading process available. ⇒

E	S	K							
									1

7.14 Rotating beacon

1 Start setup menu (see Chapter 7.2 "Start/finish setup menu", page 25).



Actuate several times.

0 = Rotating beacon **not** available. ⇒

F	L	A	S	H	E	R			
									0



Actuate.

1 = Rotating beacon available. ⇒

F	L	A	S	H	E	R			
									1

7.15 Working headlight

1 Start setup menu (see Chapter 7.2 "Start/finish setup menu", page 25).



Actuate several times.

0 = Working headlight **not** available.



L	A	M	P				
							0



Actuate.

1 = Working headlight available.



L	A	M	P				
							1

7.16 Spreading protocol

By activating (1), a spreading protocol can be recorded and retrieved via the RS 232 plug (see Chapter 5.2 "User interface", page 11).

1 Start setup menu (see Chapter 7.2 "Start/finish setup menu", page 25).



Actuate several times.

0 = Spreading protocol **inactive**.



P	R	O	T	O	C	O	L
							0



Actuate.

1 = Spreading protocol **active**.



P	R	O	T	O	C	O	L
							1

7.17 Boost function

When the machine stops, some spreading material is lost. This spreading material lacks during starting and can be compensated by the boost function.

This function is responsible for spreading the set amount of spreading material.

You can add this function as follows:

1 Start setup menu (see Chapter 7.2 "Start/finish setup menu", page 25).



Actuate several times.

0 = Boost function **inactive**.



B	O	O	S	T			
							0



Actuate.

1 = Boost function **active**.



B	O	O	S	T			
							1



Actuate.

Time of increased spreading output when starting [s].



B	O	O	S	T			
S					0	,	5



Actuate to change the set time [0.3, ..., 2.0 s].



Actuate.

Quantity of spreading material in the set time [g].



B	O	O	S	T			
G					1	0	0



Actuate to change the spreading quantity [40, ..., 500 g].

7.18 Reset to factory settings



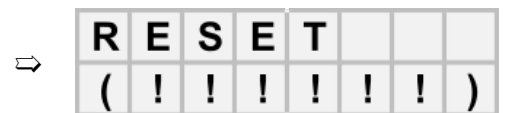
Hinweis

This function resets all spreader settings to the standard settings!

1 Start setup menu (see Chapter 7.2 "Start/finish setup menu", page 25).



Actuate several times.



Actuate.

7.19 Recommissioning

1. Recommissioning at **the same carrier vehicle** where the control system was mounted before:
 - ⇒ In case of recommissioning at the same carrier vehicle after storage in summer, repair work or maintenance work; it is not necessary to make new settings in the setup menu.
 - ⇒ If a hydraulic component is repaired or replaced, the characteristic curves (see Chapter 7.7 "Regulator adjustment", page 30) must be recorded again.
 - ⇒ The operating unit has to be reassembled in the carrier vehicle and all cables have to be connected (see Chapter 7.1 "Wiring diagram", page 23).
2. Recommissioning at **a new or different carrier vehicle**:
 - ⇒ The operating unit has to be remounted in the carrier vehicle and all cables have to be connected (see Chapter 7.1 "Wiring diagram", page 23).
 - ⇒ The setup has to be initialized again (see Chapter 7.2 "Start/finish setup menu", page 25 - 7.17 "Boost function", page 38).



Caution

Damaged power lines.

Risk of injury.

- Damaged power lines have to be replaced immediately!
-



Caution

Maintenance work without necessary technical knowledge or appropriate tooling.

Risk of injury or property damage.

- Only carry out maintenance work if you have the necessary expertise as well as suitable tools!
-



Caution

Loose cable / screw connections.

Danger of property damage.

- Retighten loose bolted connections and screw connections after repair and maintenance work!
-

8 Operating instructions

This chapter gives you information on the following:

- Chapter 8.1 *"Info menu"*, page 42
- Chapter 8.2 *"Update"*, page 44
- Chapter 8.3 *"Error codes"*, page 45
- Chapter 8.4 *"Requirements for carrier vehicle"*, page 49

8.1 Info menu



i	n	f	o	M	0
			0	.	0 3 1

Software version Master.



i	n	f	o	S	0
			0	.	0 3 1

Software version Slave.



E	R	R	/	W	A	R	N
---	---	---	---	---	---	---	---

See Chapter 8.3 "Error codes", page 45.

V	C	O	N	F	I	G
					0	0

See Chapter 7.3 "Regulation equipment", page 26.



C	O	N	V	2		
						1

See Chapter 7.9 "Number of screws", page 33.



W				0	.	0
3	.	7		0	.	0

- Bottom left = set spreading width [m].
- Top right = frequency [Hz].
- Bottom right = feedback.



D				0	.	0
1	4					0

- Bottom left = set spreading rate of screw []
- Top right = frequency [Hz].
- Bottom right = feedback.



// ORIGINAL OPERATING INSTRUCTIONS

L					0	.	0
	1	4					0



- Bottom left = set spreading rate of lh screw []
- Top right = frequency [Hz].
- Bottom right = feedback.

R					0	.	0
	1	4					0



- Bottom left = set spreading rate of rh screw []
- Top right = frequency [Hz].
- Bottom right = feedback.

V				k	m	/	h
							1 5



Set simulation speed (see Chapter 7.5 "Simulation speed", page 28).

C	H	A	R				
						O	K



See Chapter 7.7 "Regulator adjustment", page 30.

I	M	P	/	K	G		
1	0	2		1	0	2	



Pulses per kg of spreading material.

I	M	P	/	M			
				6	.	5	



Pulses per meter of spreading width.

S	n	M	a	s	t	e	r
							0



Serial number Master.

S	n	S	l	a	v	e	
							0

Serial number Slave.

8.2 Update

1



switch off

2



+



Hold down.



S	e	t	u	p			0
		0	1	.	0	3	0

3



or



Scroll menu.



U	P	D	A	T	E		
N	O		S	T	I	C	K

4 Plug in USB stick.



U	P	D	A	T	E		
(!	!	!	!	!	!)

5



+



Hold down.



U	P	D	A	T	E		
(M	A	N)			

6



U	P	D	A	T	E		
(R	U	N)			

7



Update begins.

8 Update finished successfully ⇒



Update failed. ⇒



9



New start.

8.3 Error codes

E R R / W A R N	Error
0	No message, place holder
1	No message for key; 1 % defined
3	No video installed
251	Power supply overheating
252	Control voltage too low
253	Input voltage too low
254	Vehicle voltage below 8.2 V
255	Vehicle voltage below 12 V
256	Vehicle voltage too low
257	Chute above
272	Disc valve short circuit
273	Lh screw valve short circuit
274	Rh screw valve short circuit
275	Brine pump valve short circuit
276	Reversing short circuit
277	Load Sensing valve short circuit
288	Disc valve cable break
289	Lh screw valve cable break
290	Rh screw valve cable break
291	Brine pump valve cable break
292	Reversing cable break

E R R / W A R N	Error
293	Load Sensing valve cable break
304	Disc sensor short circuit
305	Lh screw sensor short circuit
306	Rh screw sensor short circuit
307	Brine pump sensor short circuit
308	Reversing sensor short circuit
309	Load Sensing sensor short circuit
320	Disc sensor cable break
321	Lh screw sensor cable break
322	Rh screw sensor cable break
323	Brine pump sensor cable break
324	Reversing sensor cable break
325	Load Sensing sensor cable break
336	Disc under-supply
337	Lh screw under-supply
338	Rh screw under-supply
339	Brine pump under-supply
352	Disc standstill
353	Lh screw standstill
354	Rh screw standstill
355	Brine pump standstill
368	Disc oversupply
369	Lh screw oversupply
370	Rh screw oversupply
371	Brine pump oversupply
384	Rotating beacon short circuit
385	Working headlight short circuit
400	Rotating beacon cable break
401	Working headlight cable break
416	Servo motor - spreading pattern short circuit
417	Servo motor - spreading pattern cable break
418	Servo motor - spreading pattern blocked

E R R / W A R N	Error
419	Servo motor - potentiometer - error
432	Short circuit chute sensor
433	Short circuit reversing
434	Short circuit dry run - sensor
435	Short circuit sensor - electrical spreading pattern control
436	Sensor 11 short circuit
437	Sensor 12 short circuit
438	Sensor 13 short circuit
439	Sensor 14 short circuit
448	Cable break chute sensor
449	Cable break reversing
450	Cable break dry run - sensor
451	Cable break sensor - electrical spreading pattern control
452	Sensor 11 cable break
453	Sensor 12 cable break
454	Sensor 13 cable break
455	Sensor 14 cable break
464	Short circuit temperature sensor
465	Cable break temperature sensor
480	Start - error motor unit
481	Motor - unit has stopped.
482	Motor - unit could not be stopped
600	Date / time not correctly set
601	Loss of connection to spreader
4353	Pause because of chute
4368	Max. performance SBE motor exceeded
4369	Max. duty cycle SBE motor exceeded
4384	Warning electrical spreading pattern control
4400	Brine dry run
4416	Fuel tank of unit empty
4417	Oil tank of unit empty
4418	Maintenance of unit necessary

E R R / W A R N	Error
4432	Speed too high
4433	No speed signal

8.4 Requirements for carrier vehicle

This chapter gives you information on the requirements for the carrier vehicle for optimum functionality of the control system:

Supply voltage	10 - 30 V
Speed signal *	5 - 200 Imp/m
Air humidity	20 - 80 %

* If no speed signal or an insufficient speed signal is available at the carrier vehicle, it is possible to fix a sensor disc provided by us at the carrier vehicle.

9 Storage

This chapter informs you on necessary precautions that have to be taken when putting the control system into stock.



Hinweis

- Always store the control system in a dry, frost-free and salt-free area.
 - Protect the control system against direct sunlight.
 - Store the control system at a dust-protected place, if necessary, in an appropriate bag.
-

10 Technical Data

Supply voltage	10 - 30 V
Internal operating voltage	12 V
Power input	max. 10 A
Spreading width	1 - 7 m
Spreading density	5 - 200 g/m ²

11 Disconnecting the system

The control system must be disposed of in accordance with local or state regulations. Dispose of electrical and electronic waste at the collection points provided for this purpose. Kugelmann also takes care of the disposal.

Warranty

Kugelmann Maschinenbau e.K., 87675 Rettenbach a.A., warrants its machines to be free from defects in material and workmanship and undertakes to replace free of charge all parts ex works which have been purchased by relevant Kugelmann dealers and have been acknowledged as defective after having been checked by Kugelmann. The warranty expressly given shall be limited to a period of 12 months from the date of delivery of the machine to purchaser. All further claims by the customer shall be excluded.

All wear parts are excluded from warranty.

The manufacturer takes no responsibility for third-party products not produced at the works of Kugelmann. However, we assign our claims against the supplier to the customer. No warranty will be given for machines purchased second-hand or used and modified or converted machines.



Hinweis

Please make sure that you fill in your warranty card and send it back to the manufacturer immediately. Claims have to be notified with a warranty claim in writing after their occurrence without undue delay (after 30 days at the latest).

----- ✂

<p><i>Company</i> <i>Kugelmann Maschinenbau e.K.</i> <i>Gewerbepark 1-5</i> <i>87675 Rettenbach a.A.</i> <i>Germany</i></p>	<p>Device type:</p> <p>Serial number:</p> <p>Number of control system:</p> <p>Address of dealer: </p> <p>Address of user/owner: </p>
---	--

I have read the operating instructions.

Signature of user:

The warranty card has to be sent directly to the manufacturer.

ATTENTION: Warranty claims are only accepted with the warranty card of Kugelmann Maschinenbau e.K.

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