

## Seed Flow Control

### Operating manual

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For hardware version from	–
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## Identification of the machine

Your dealer will require certain information about your machine to be able to help you as quickly as possible. Please enter the following data.

Designation

Seed Flow Control

Working width

Weight

Machine number

Accessories

Address of dealer

Manufacturer's address

Kverneland Group Soest GmbH  
Coesterweg 42

D-59 494 Soest

Telephone +49 (0)2921 / 974-0

<b>First of all .....</b>	<b>4</b>
<b>Safety.....</b>	<b>5</b>
<b>Becoming familiar with the machine .....</b>	<b>6</b>
Area of use of the device	6
Features	7
An overview of the device	8
Technical data	10
<b>Delivery and assembly/installation.....</b>	<b>11</b>
Checking the scope of delivery	11
Assembly	11
<b>Connecting up the machine .....</b>	<b>13</b>
Safety	13
Connecting a device	13
<b>Operation.....</b>	<b>14</b>
Switching on	14
Functions of the keys	14
“Block”	15
“Rate”	19
Displays	19
Operation	19
<b>Removal, storage.....</b>	<b>20</b>
Removal	20
Storage	20
<b>Removing faults.....</b>	<b>21</b>
<b>Disposal.....</b>	<b>23</b>
<b>The EC Conformity Declaration .....</b>	<b>24</b>
According to EC Directive	
2004/108/EC	24
<b>Index .....</b>	<b>25</b>

## Target group for this operating manual

This operating manual is designed for use by trained agriculturists and persons who are otherwise qualified to work in agriculture and who have received instruction on how to use this machine.

### For your safety

Please familiarise yourself with the contents of this operating manual before commissioning or assembling the machine. You will thereby achieve optimum performance results and operational safety.

### As an employer

All personnel are to be instructed on a regular basis, but at least once a year, according to the provisions of Employer's Liability Insurance Association, Article 1. Untrained or unauthorised persons should not use the machine.

## Instruction

You will receive instruction from your dealer about machine operation and maintenance.

## Meaning of the symbols

We have used various symbols in the text to make the presentation clearer. They are described below:

- A bullet point stands next to enumerations

> A triangle is placed before activities which you should undertake

→ An arrow indicates cross-references to other text passages

[+] A plus sign indicates that the item is an accessory which is not part of the standard version.

We also use pictograms which will aid you in finding text passages:

**NOTE** The word "Note" refers to tips and guidelines concerning operating the machine.



The screwdriver symbol indicates tips concerning assembly or setting up work.



The hazard warning triangle refers to important safety instructions. Nonobservance of these can lead to the following consequences:

- Serious malfunctioning of the machine
- Damage to the machine
- Injury to persons or accidents.



A star indicates examples which aid better understanding.



### **Checking the cables**

Inspect cables prior to connection and replace any damaged cables. Damaged cables can result in damage to the machine or cause uncontrolled behaviour in the electronic control system.

### **Pay attention to the temperature range**

The device will only operate reliably within the specified temperature range. Higher or lower temperatures can lead to uncontrolled behaviour in the electronic control system.

### **What to do in the event of malfunctions**

Stop working immediately if a malfunction occurs and switch off the device. Refer to the chapter »Removing faults« (Rectifying faults) and remove the fault. Inform our Customer Service Department if the fault cannot be removed. Continuing to operate a faulty machine can lead to major damage to the machine and errors in the seed deposit.

### **Maintenance work**

Disconnect the power supply when conducting maintenance work. It may prove impossible otherwise to exclude damaging the device.

# Becoming familiar with the machine

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This chapter contains general information about your machine as well as information about:

- Area of use
- Features
- Technical data and
- Functions

## **Area of use of the device**

The device is designed for use in agriculture. On seeding machines, it checks correct seed flow into the seed delivery tubes provided with a sensor. An alarm sounds on the device when there a blockage, and the display shows which seed delivery tube is affected.

## **Intended use**

The device is designed to be used in conjunction with agricultural seeding machines to monitor the seed flow. Any other use is forbidden.

## **Mode of operation**

Sensors are used to monitor the seed flow in the connected seed delivery tubes. An alarm sounds if there is a blockage.

# Becoming familiar with the machine

## Features

The seed flow is monitored with a terminal, in conjunction with one sensor for each seed delivery tube to be monitored. The system as a whole consists of the following:

- Terminal
- Sensors
- Y-cable
- Connection cable, as required
- Extension cable, as required

## Terminal

The terminal is used for entering and monitoring information.

## Sensors

One sensor per seed delivery tube captures the data and transmits it.

## Y-cable

The Y-cable transmits the information from the sensors to the terminal.

## Connection cable

If two or more distributor heads are to be used for monitoring the seed delivery tubes, a connection cable between each of the distributor heads is required.

## Extension cable

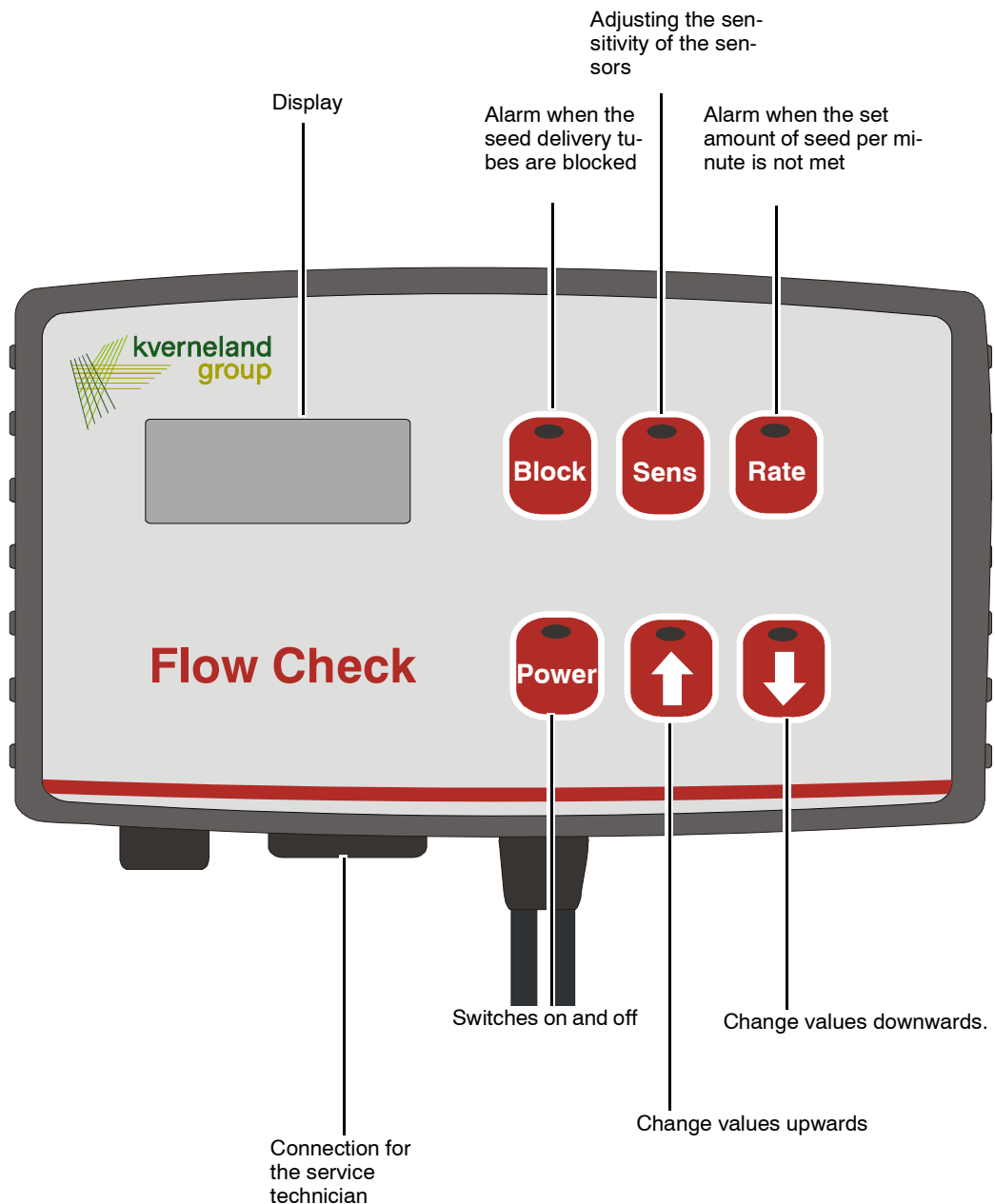
The extension cable is required between the Y-cable and the monitor if the length of the monitor cables is not sufficient.

# Becoming familiar with the machine

## An overview of the device

### The front side

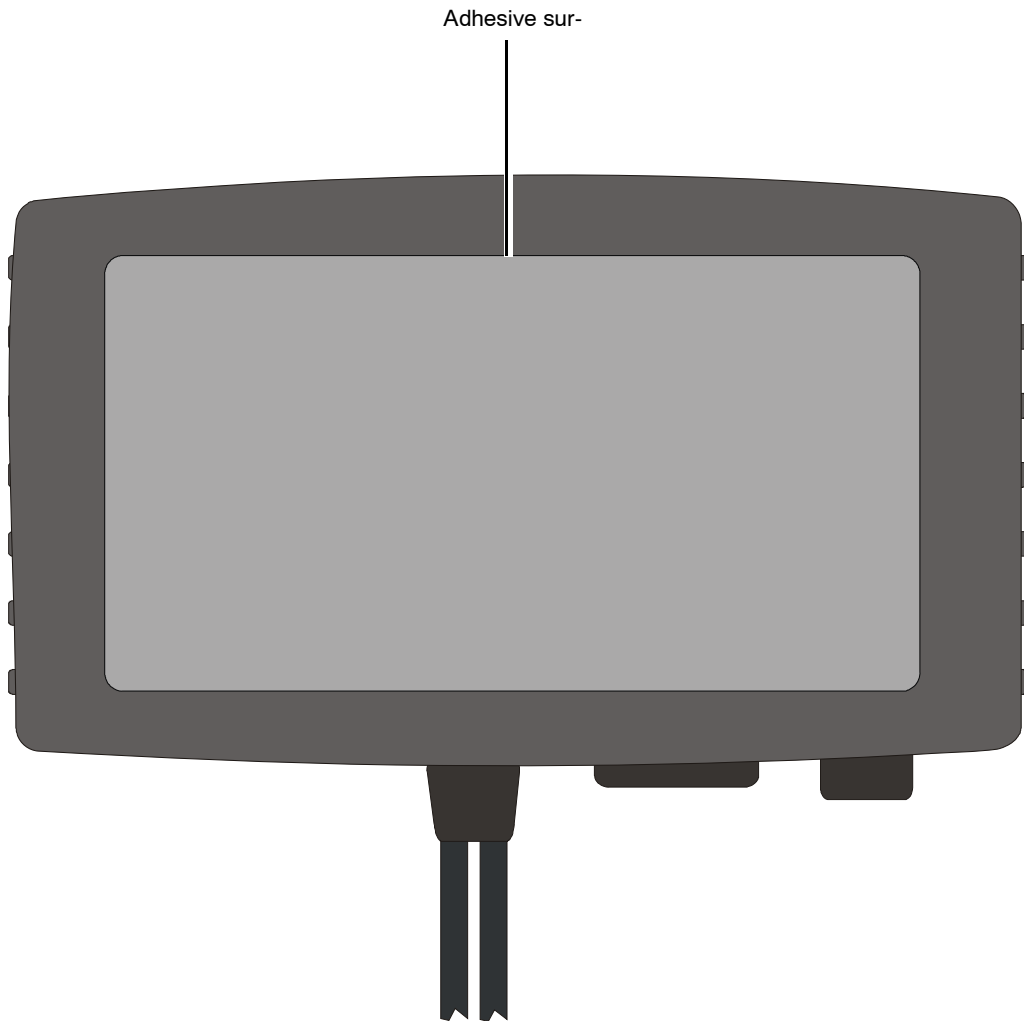
The overview shows the display and all of buttons which have each been allocated a function. The exact functions involved are described in the appropriate place.



# Becoming familiar with the machine

## The rear side

The overview shows all connections on the rear side.



# Becoming familiar with the machine

## Technical data

<b>Flow Check</b>	
Power supply (V) DC	12-14
Protection classes <ul style="list-style-type: none"><li>• Terminal</li></ul>	IP 54
Temperature range (°C)	-10 to +50

## Checking the scope of delivery

The following are included in the scope of delivery:

- Terminal
- Cable
- Sensors

**NOTE** A claim should be made without delay to your dealer, the importer or the manufacturer for any missing parts or parts which have been damaged during transport.

## Assembly

The following items are mounted on the seed machine at the works:

- Sensors to the seed delivery tubes to be monitored
- Cable connections

## Terminal

After assembly, the terminal can be taken back out of the tractor cab. It is provided with a velcro fastening.



### Maintain defined minimum clearances

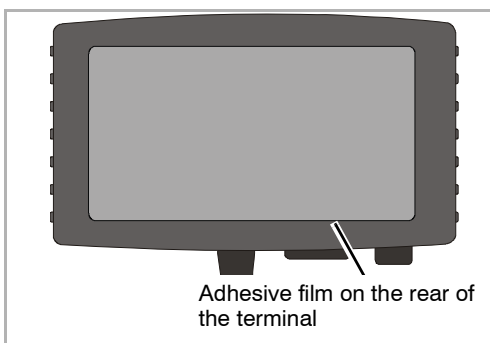
When mounting the terminals a minimum distance of one metre must be maintained from mobile telephones, radios or radio antennae. Unforeseen malfunctions could occur if the distance is too small.

### Ensuring a good view

The terminal must not limit the operator's view. Access to all functions of the tractor must remain unimpaired. Accidents can arise if the operator's view is blocked or there are impairments to operating tractor functions.

- > Find a place in the tractor cab where the terminal can be clearly read and all operating keys can be easily reached. The surface to which the terminal is to be fitted must be smooth and clean.

**TIP** If no suitable surfaces can be found in the tractor cab, make and fit a retainer plate.



- > Clean and dry the assembly surfaces on the terminals. Remove the film from the rear of the terminal and attach the terminal as desired.

**NOTE** The terminal is provided with a velcro fastening and can be removed. To do so, pull a corner on the terminal, so that the velcro fastening can be detached.

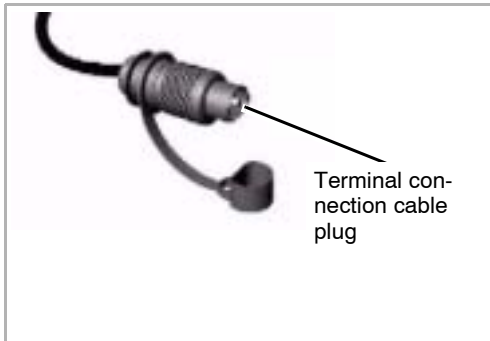
# Delivery and assembly/installation

## Connection to the power supply



### Fitting should be undertaken by a specialist workshop

Connection to the tractor power supply should only be carried out by qualified personnel. Errors when connecting to the power supply can lead to irreparable damage to the terminal, unforeseeable malfunctions or serious errors in the tractor's electrics.



- > Fit a suitable socket in the tractor cab. The connection cable from the terminal is fitted with a three-pin plug.
- > Connect the red cable to a positive terminal that is switched on with the tractor's ignition.
- > Connect the black cable to the negative terminal. This will ensure it is not connected directly to the tractor battery.

# Connecting up the machine

Prerequisites for connecting up the machine are:

- The machine is coupled to the tractor.
- All components are installed in an orderly manner.
- All cables and plugs are in perfect condition.

## Safety



### Checking the cables

Check the cables before connecting them and replace any damaged cables. Damaged cables can trigger unexpected malfunctions.

### Pay attention to the temperature range

The device will only operate reliably within the specified temperature range. Higher or lower temperatures can trigger unexpected malfunctions.

## Connecting a device

Two cables must be connected before operation:

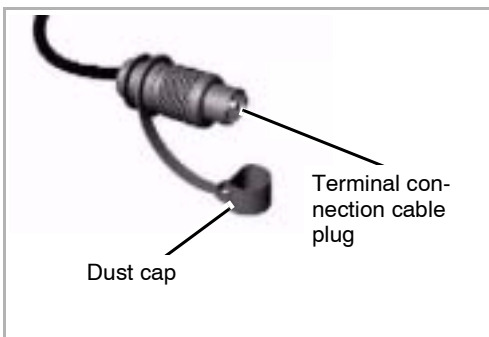
- The cable from the terminal to the sensor, and an additional extension cable as required
- The power cable to the tractor



### Cable from the terminal to the sensor

- > Remove the dust cap.
- > Connect the plug with the Y-cable bush. When doing so, pay attention to the colours. The plug and bush are blue.

**NOTE** If the cable from the terminal to the sensors is not long enough, the supplied extension cable can be used.

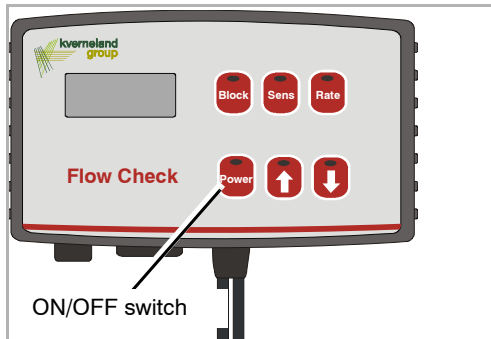


### Power cable

- > Remove the dust cap.
- > Connect the plug to the socket in the tractor cab

# Operation

## Switching on



After connection, the system is ready for operation. The terminal switches itself on when power is supplied.

If the terminal was switched off:

- > Press On-Off switch on the terminal

The system performs a short self-test. "ART" briefly appears on the display and 3 signals sound.

You will then see "End" on the display



## Functions of the keys

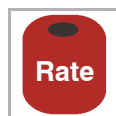
The following is an explanation of the keys that can be found on the terminal.



If selected, an alarm sounds when one or more seed coulters are blocked, and the relevant seed coulters are displayed. "Block" is always activated when the power is switched on.




Adapts the sensitivity of the sensors. In conjunction with the   keys, the sensitivity of the sensors to the seed can be adjusted.



If selected, the current flow of seed per second is given in grains.



1. Change values up or down
2. Deactivate the alarm (  key)

## “Block”



So that a blockage in the seed delivery tube can be correctly displayed, the sensors must be set for the correct type of seed. There are two options for this:

- Calibration
- Calculation

**NOTE** Before calibration or calculation, ensure that the metering device is set to the value from the calibration test.

## Calibration

With calibration, an adjustment is provided which is adapted to the special conditions.


**TIP** You can carry out calibration of the operation without actually sowing. To do so, bring the seeding machine into the operating position and raise it by approximately 10 cm, so that the seed can flow down over the seed coulter. Switch on the fan. For seeding machines with electrical drive, adjust using the electronic control system. For seeding machines with mechanical drive, turn the drive wheel.

- > Intentionally cause a blockage in a monitored seed delivery tube. To do so, detach the seed delivery tube from a monitored seed coulter and then block the seed delivery tube with a cloth or something similar.
- > Begin to “sow”. To do this, turn the drive wheel.

When the seed delivery tube is blocked, an alarm should sound after a short while. The smaller the seed and the smaller the deployed quantity of seed per hectare is, the longer it may take for the alarm to sound.

### If no alarm sounds:



- > Press the key
- > Press the  key to increase the sensitivity to 10.



- > Press the key
- > Continue to sow
- > Continue this process until an alarm sounds
- > After calibration, remove the blockage

**NOTE** No seed is distributed from a blocked seed delivery tube. Therefore there will be gaps in the plant coverage.

**NOTE** If an alarm sounds even though none of the seed delivery tubes are blocked, the sensitivity can be gradually reduced until the alarm no longer sounds during normal operation.

# Operation

## Calculation

This method is more accurate. The reading for the sowing quantity can be taken in kg/ha or in seeds per square metre.

### Quantity output in kg/ha

For this calculation, the following readings are required:

- Drive speed for sowing in km/h
- Working width of the seeding machine in metres
- Quantity output in kg/ha
- Thousand grain weight of the seed in grammes
- Number of seed delivery tubes on the seeding machine

$\frac{\text{Drive speed (km/h)} \times \text{working width (m)} \times \text{application rate (kg/ha)} \times 27.8}{\text{Thousand grain weight (g)} \times \text{number of seed delivery tubes}}$	= Number of seeds per second per seed delivery tube
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✳ Example:

Drive speed	8 km/h
Seeding unit working width	4 m
Application rate	200 kg
Thousand grain weight	45 g
Number of seed delivery tubes	32

:

$\frac{8 \text{ km/h} \times 4 \text{ m} \times 200 \text{ kg/ha} \times 27.8}{45 \text{ g} \times 32}$	= 123
---	-------

With this value, the table value for the recommended sensitivity of the sensors can be determined.

→ Table on page 18

## Seeds/m<sup>2</sup>

For this calculation, the following readings are required:

- Drive speed for sowing in km/h
- Working width of the seeding machine in metres
- Number of seeds per square metre
- Number of seed delivery tubes on the seeding machine

$\frac{\text{Drive speed (km/h)} \times \text{working width (m)} \times \text{seeds (m}^2\text{)}}{\text{Number of seed delivery tubes} \times \text{...}}$	= Number of seeds per second per seed delivery tube
---	---

✱ Example:

Drive speed	8 km/h
seeding unit working width	4 m
Application rate in seeds per square metre	444
Number of seed delivery tubes	32

:

$\frac{8 \text{ km/h} \times 4 \text{ m} \times 138}{32 \times 6} = 123$	
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With this value, the table value for the recommended sensitivity of the sensors can be determined.

→ Table on page 18

# Operation

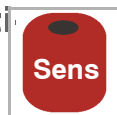
## Determining the table values

Once the amount of seed per seed delivery tube is known, the table can be used to determine the recommended value for the sensitivity of the sensors.

Amount of seed	Sensitivity	Amount of seed	Sensitivity	Amount of seed	Sensitivity	Amount of seed	Sensitivity
4	1	29	26	123	51	615	76
5	2	30	27	131	52	657	77
6	3	32	28	139	53	702	78
7	4	34	29	148	54	750	79
8	5	36	30	158	55	801	80
9	6	38	31	168	56	856	81
10	7	40	32	179	57	914	82
11	8	42	33	191	58	976	83
12	9	44	34	204	59	1043	84
13	10	47	35	218	60	1114	85
14	11	50	36	232	61	1190	86
15	12	53	37	247	62	1271	87
16	12	56	38	263	63	1358	88
17	14	59	39	281	64	1451	89
18	15	63	40	300	65	1550	90
19	16	67	41	320	66	1656	91
20	17	71	42	341	67	1769	92
21	18	75	43	364	68	1890	93
22	19	80	44	389	69	2019	94
23	20	85	45	415	70	2157	95
24	21	90	46	443	71	2305	96
25	22	96	47	473	72	2463	97
26	23	102	48	505	73	2632	98
27	24	109	49	539	74	2812	99
28	25	116	50	576	75	3005	100

**NOTE** If an alarm sounds even though none of the seed delivery tubes are blocked, the sensitivity can be gradually reduced until the alarm no longer sounds during normal operation.

## Adjusting the sensitivity



> Press the key

> Press the   key to adjust the sensitivity



> Press the key

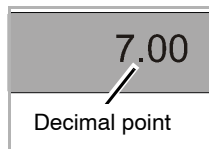
Check the adjustment and correct, if necessary.

## “Rate”



Here you will find information on the amount of seed per second that is flowing through the monitored seed delivery tubes. The more seed delivery tubes are fitted with sensors, the higher the value is for the same quantity of seed per hectare.


**NOTE** Before using this information, the sensitivity of the sensors must be adjusted. Monitoring for blocked seed delivery tubes is still active.  
→ Chapter »Operation«, section »“Block”«, page 15



The amount is displayed in 1000 seeds per second. For very large amounts of seed per hectare and a high number of sensors, the display can be switched to 100,000 seeds. The decimal point flashes in the display to indicate this.



Example: 2 sensors fitted, speed of 10 km/h, 150 kg/ha of seeds. Display shows approximately 7.00 to 8.00 = 3500 to 4000 seeds per second and per seed delivery tube.

**NOTE** If there is a blockage, an audible alarm sounds. The number of the blocked seed delivery tube is displayed when the  key is pressed.

**NOTE** The display does not show the number of seeds per ha or per square metre. It is not possible to determine the number of seeds that flow through the monitored seed delivery tubes per second from the deployed quantity of seed.

## Displays



Displays all the sensors currently monitored – without faults. The display automatically goes through all remaining sensors and then starts again from “1”.



Displays a sensor with a fault. At the same time an audible signal sounds. This display is not shown if the “Rate” key has been pressed; only the audible alarm sounds.

## Operation

The Seed Flow Check display is not connected to the seeding machines' electronic control system. An alarm will therefore always sound when no seed is being conveyed in the seed delivery tubes.

## Headlands

At the headlands, an alarm sounds when the metering device switches off and no seed is reaching the seed delivery tubes.

## Tramlines

An alarm will also sound if, when creating tramlines, the monitored seed delivery tubes become blocked.

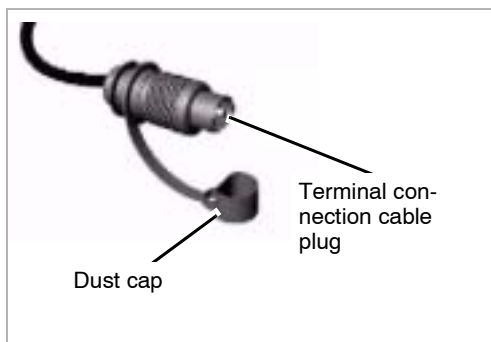
# Removal, storage

## Removal



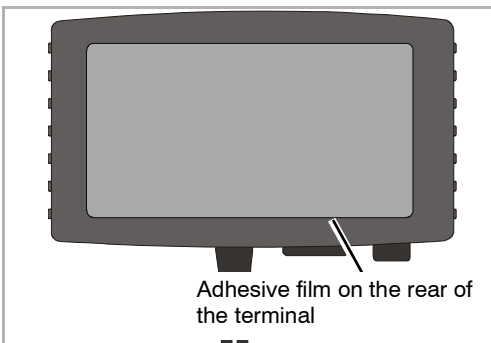
### Cable from the terminal to the sensor

- > Pull the plug out of the Y-cable bush
- > Fit the dust cap.



### Power cable

- > Pull the plug out of the socket in the tractor cab
- > Slip on dust protection cap.



### Terminal

The terminal is provided with a velcro fastening and can be removed. To do so, pull a corner on the terminal, so that the velcro fastening can be detached.

- > Remove the terminal

## Storage



There should be no major fluctuations in temperature where the terminal is stored. The temperature range figures given in the technical data should be observed during storage as well. A dry and frost-free storage location is a prerequisite for a long working life of the device.

# Removing faults

Faults can often be easily and rapidly removed.  
Please check with the aid of the table whether you can remove the fault yourself before calling in the customer service.

Fault	Cause	Remedy
The device cannot be switched on	The poles of the supply voltage are reversed	<ul style="list-style-type: none"> <li>• Have the polarity checked.</li> </ul>
	Power supply interrupted	<ul style="list-style-type: none"> <li>• Check the connector cable</li> <li>• Check the terminals on the battery</li> <li>• Connect up the power cable if the power supply was uncoupled</li> <li>• Check the voltage; the supply voltage must be 12-14 V</li> </ul>
	System failure	Inform the Customer Service
No read out on the display	No power to display	Start the device from the beginning again Send the device back to the manufacturer if the display still shows nothing after the new start or the display cannot be changed.
Terminal displays unexpected values	A mobile telephone, radio or radio antenna is operating too close to the device	Maintain a minimum separation of 1 metre
"0" is displayed after "Block" is pressed	Sensitivity is set to "0"	Adjust the sensitivity to the type of seed
	Sensor defective	Inform the Customer Service
"CLN" displayed with the number of sensors	The sensors are dirty	Wipe the affected sensors with a damp cloth. If the message is still displayed, contact customer service.
"ERR" displayed with the number of sensors	Error with the connector cable	Check the connections to the sensors. If the message is still displayed, contact customer service.
A blockage is displayed, but no blockage is present	Sensitivity is set too high	Reduce the value for sensitivity
	Sensor heavily soiled	Wipe the sensor with a damp cloth.
3 x "CLN" displayed with the number of sensors	The sensor cannot detect any correct values	Clean the sensor opening
A blockage is displayed, but no blockage is present	Sensitivity is set too high	Reduce the value for sensitivity

# Removing faults

Fault	Cause	Remedy
<p>Alarms can be confirmed using the -key. The audible warning signal will stop and you can look for and correct the cause of the alarm without being disturbed.</p>		
	Seed delivery tube blocked. The figure indicates the number of the monitored seed delivery tube.	Clear the blockage.

The device must be disposed of in an orderly manner it finally comes to the end of its working life. Please observe the currently valid disposal regulations.

### **Plastic parts**

The plastic parts can be disposed of in the normal domestic rubbish according to specific national laws (residual waste).

### **Metal parts**

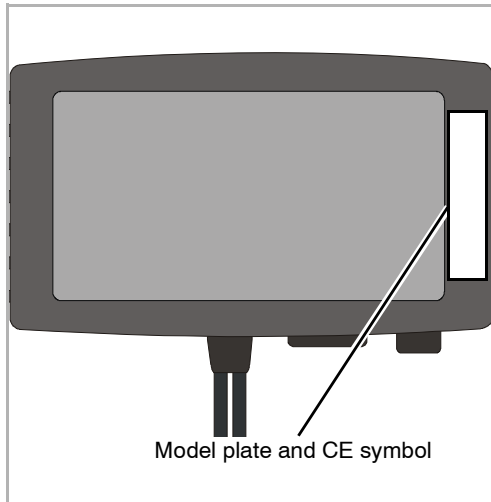
All components can be delivered to a used iron recycling centre.

### **Electronics**

The PCB is to be treated as electronic scrap and must be disposed of as special waste. You can return the electronic part for disposal to the manufacturer if you are not able to locate a special waste collection centre near you. It will be disposed of in an environmentally favourable manner from there.

# The EC Conformity Declaration

## According to EC Directive 2004/108/EC



**Kverneland Group Soest GmbH**  
**Coesterweg 42**  
**59494 Soest**  
**Germany**

declares under its sole responsibility that the following product complies with EC Directive 2004/108/EC:

Flow Check

Kverneland Group Soest GmbH  
Soest, 01.10.2008



Friedrich Pehle  
Managing Director

## A

Alarms	22
Area of use	6

## B

Basic settings	15
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## C

Conformity Declaration	24
Connecting up the machine	13
Connections	9

## D

Display	8
Disposal of the device	23

## E

Employer	4
----------	---

## I

Instruction	4
-------------	---

## M

Mode of operation	10
-------------------	----

## P

Pictogram	4
-----------	---

## R

Removal	20
Removing faults	21

## S

Safety	5
Scope of delivery	11
Switching on	14
Symbols	4

## T

Target group	4
Technical data	10
The front side	8