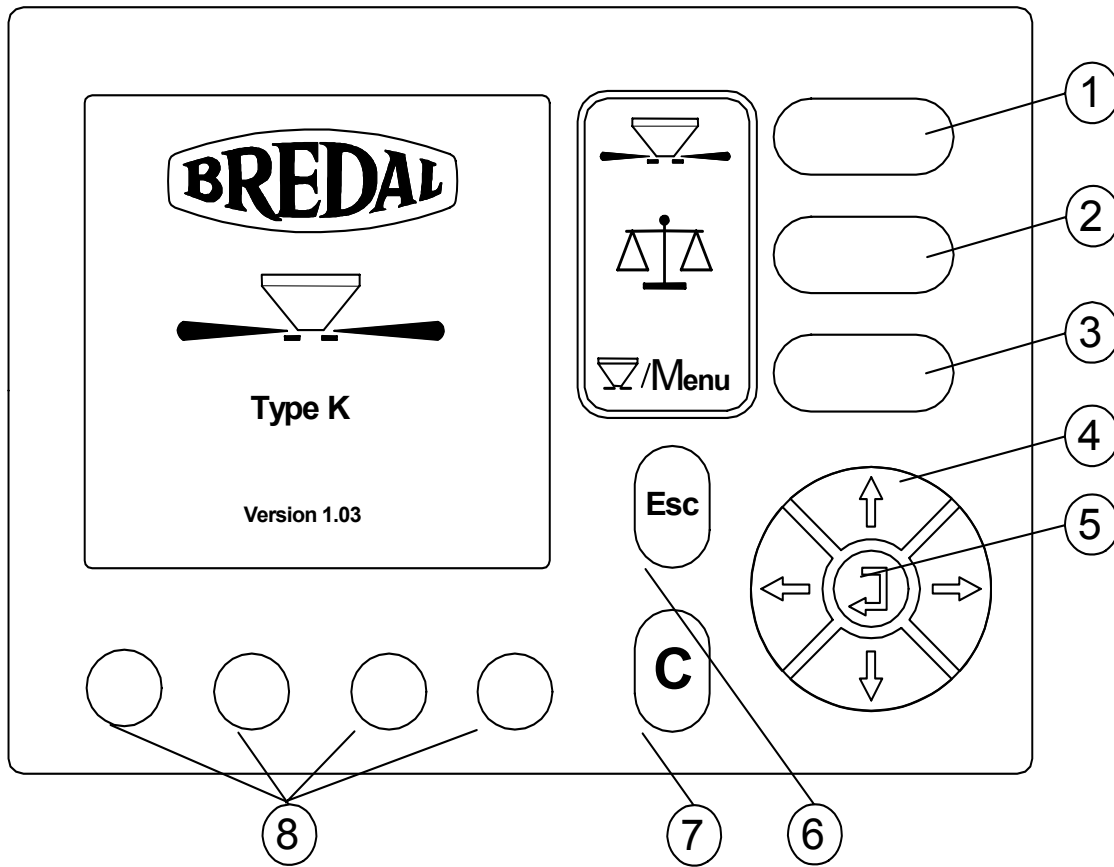


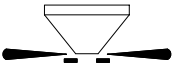
# Operation of the 500 computer

## Meaning of the different knobs

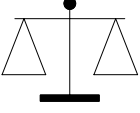


Pos.	Description
1	Start/Stop key
2	Application rate key
3	Menu key
4	Arrow keys
5	Enter key
6	Escape key
7	Clear key
8	Program keys


**START/STOP KEY (1)**

Key	Description
	Press this key to start or stop the spreader. If the spreader is operating, this symbol is shown on the screen.

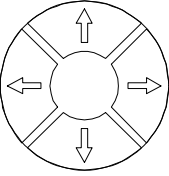
**APPLICATION RATE KEY (2)**

Key	Description
	Press this key to calculate the Kg/ha based on the actual quantity remaining and the area which has been worked. This function can only be used when stationary, as it is very important for the calculation that the weighing system is not in motion.

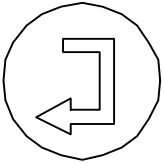
**MENU KEY (3)**

Key	Description
 /Menu	Press the MENU key to change between the operation screen and the main menu. The key has a “toggle” function. If the operation screen is on display when the key is pressed, the main menu will be displayed. If this key is pressed while entering data, the display will change to the operation screen.

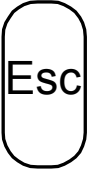
**ARROW KEYS (4)**

Key	Description
	<p>The arrow keys are used to select and change settings.</p> <p>When entering data, the arrow keys are used to select and set the digits which you wish to change. Each digit can be set to a value between 0-9 using the UP and DOWN arrows. Use the LEFT and RIGHT arrows to choose the digit to be changed.</p>

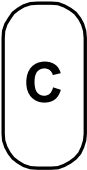
**ENTER KEY (5)**

Key	Description
	The enter key is used to confirm, for example, entered values, and to return to the previous screen.

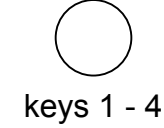
**ESCAPE KEY (6)**

Key	Description
	This key is used to return to the previous menu, <b>without</b> saving.

**CLEAR KEY (7)**

Key	Description
	The Clear key is used to reset settings/counters and to acknowledge alarms.

**PROGRAM KEYS (8)**

Key	Description
	The functions of the program keys are shown in the operation screen. Each function is shown on the screen, directly above the actual key.

## Operation

The operation screen is displayed when you press the MENU key, no matter where you are in the program. The operation screen is the first thing displayed when the device is switched on.

*Correct operation requires that all data entry/calibration has been carried out.*

## 6 {0>Ønsket mæ SCREEN The operation screen is divided into the THE OPERATION SCREEN

The operation screen is divided into the following “sections”. These sections are described below:

The state of the spreader		The arrows show whether the app. rate is being increased (up arrow) or decreased (down arrow)
Step app. rate status		App. rate shown i kg/ha
		Operating function 2 (selectable)
Step app. rate: + = increase. - = decrease		Change which function is selected as function 2.

### STATE OF THE SPREADER

Shows whether the spreader is open or closed.

### STEP APPLICATION RATE

The application rate can be change in increments equivalent to the number of per cent chosen under settings. If the +/- step application rate keys are activated, these are shown on the display, along with the percentage amount the application rate has been changed by. The size of the increments is the same for both + and – stepping.

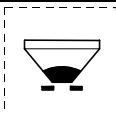
### OPERATING FUNCTION 2

This operating function is selectable, i.e. the function displayed on the screen can be selected using the PROGRAM keys. Press PROGRAM key 3 or 4 to select from all the available operating functions. Each operating function is described below:

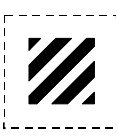
### SPEED

Key	Description
	The instantaneous speed, shown in kilometres per hour.


### **KG LEFT**

Key	Description
	The amount remaining in the spreader, shown in kg, i.e. the actual weight of the fertilizer left in the spreader, as weighed by the weighing system.

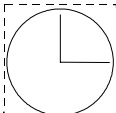
### **AREA**

Key	Description
	The area worked since this was last reset, shown in ha. The area counter is shown with 2 decimal places up to 99.99 ha, and then with 1 decimal place, up to 999.9 ha. Above this the area is shown without decimals.

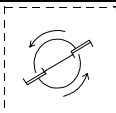
### **KG COUNTER**

Key	Description
	The quantity spread since the last reset. This is counted in kg up to 9999 kg, and then in tonnes (99.99, 999.9, 9999). When the display changes to tonnes, a "T" is shown in the symbol.

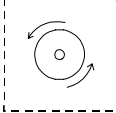
### **TIME**

Key	Description
	The current time


### **SPREADING DISC SPEED**

Key	Description
	The speed of the spreader discs, in revolutions per minute.

### **CELL WHEEL SPEED**

Key	Description
	The speed of the oil motor, in revolutions per minute.

## KG/HOUR

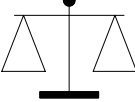
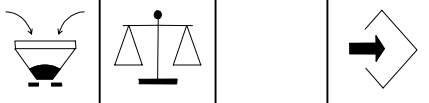
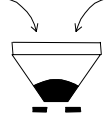

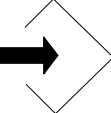

Key	Description
	The amount being spread, shown in kg/min.

### CALCULATION OF THE AVERAGE APP. RATE

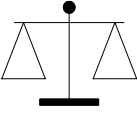



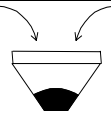
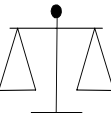
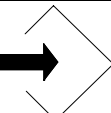
Press the APP. RATE key to calculate the average application rate for the amount of material spread since the last calculation. The average app. rate is calculated based on the quantity remaining, either as an entered amount, if the system is not equipped with weighing cells, or the weighed amount remaining if it is.

The average app. rate is calculated as follows:

### CALCULATION WITH WEIGHING CELLS

Step/Key	Description								
<p>1</p> 	<p>Press the APP. RATE key, and this screen will be displayed:</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p style="text-align: center;">App. Rate Kg/ha</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">Calculated</td> <td style="text-align: right;">XXXX</td> </tr> <tr> <td>Weighed</td> <td style="text-align: right;">XXX</td> </tr> <tr> <td>Actual flow factor</td> <td style="text-align: right;">X.XX</td> </tr> <tr> <td>New flow factor</td> <td></td> </tr> </table> </div> 	Calculated	XXXX	Weighed	XXX	Actual flow factor	X.XX	New flow factor	
Calculated	XXXX								
Weighed	XXX								
Actual flow factor	X.XX								
New flow factor									
<p>2</p> 	<p>Press the "Fill" PROGRAM key and the calculation is reset. <b>This is done during refilling, or if the flow factor has been changed.</b></p>								
<p>3.</p>	<p>Spread an appropriate amount (depends on the desired app. rate), e.g. 600 kg.</p>								
<p>3</p> 	<p>Press the "Weigh" PROGRAM key to calculate the average app. rate, and a suggested new flow factor will be displayed.</p>								
<p>4</p> 	<p><b>If the new flow factor is acceptable:</b> Press the "Save" PROGRAM key, and the new flow factor will be saved. The contents of the spreader will automatically be weighed, and you can continue spreading.</p>								
<p>5.</p> 	<p><b>If the new flow factor is not acceptable:</b> Press the MENU key and continue spreading until you have spread a greater amount.</p>								

## CALCULATION WITHOUT WEIGHING CELLS

Step/Key	Description								
<p>1</p> 	<p>Press the APP. RATE key, and this screen will be displayed:</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p style="text-align: center;">App. Rate Kg/ha</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">Calculated</td> <td style="text-align: right;">XXXX</td> </tr> <tr> <td>Weighing</td> <td style="text-align: right;">XXX</td> </tr> <tr> <td>Actual flow factor</td> <td style="text-align: right;">X.XX</td> </tr> <tr> <td>New flow factor</td> <td style="text-align: right;">X.XX</td> </tr> </table> </div> <div style="display: flex; justify-content: space-around; align-items: center;">    </div>	Calculated	XXXX	Weighing	XXX	Actual flow factor	X.XX	New flow factor	X.XX
Calculated	XXXX								
Weighing	XXX								
Actual flow factor	X.XX								
New flow factor	X.XX								
<p>2</p> 	<p>Press the “Fill” PROGRAM key and enter the amount filled. <b>Do this when refilling the spreader.</b></p>								
<p>3</p> 	<p>When you want to calculate the app. rate, press the “Weigh” PROGRAM key, and enter the current quantity which is left in the spreader.</p>								
<p>4</p> 	<p>A new flow factor will automatically be calculated when you press the “Save” PROGRAM key.</p>								

## **App. Rate setting**

The “App. Rate setting” menu can be selected from the main menu by pressing the MENU key and using the UP and DOWN arrows to select “**App. Rate setting**”. Then press the ENTER key.

Based on the data entered, the maximum speed is calculated. Max km/h can be viewed in the info menu.

### **KG/HA**

Select “**Kg/Ha**” to enter the desired application rate in Kg/Ha.

### **WIDTH**

Select “**Width (m)**” to enter the spreader’s working width in metres.

### **SPECIFIC GRAVITY (Density)**

Select “**Specific gravity**” to enter the specific gravity (density) of the fertilizer.

### **STEP %**


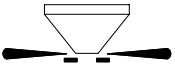
Select “**Step %**” to enter the size of the increments in which you wish to change the app. rate.

### **FLOW FACTOR**

Select “**Flow Factor**” to enter the flow factor, if this is known.

## **Emptying**

The spreader can be emptied, while stationary, as follows:’

<b>Step/Key</b>	<b>Description</b>
1  /Menu	Press the MENU key.
2	Move the cursor using the UP and DOWN arrows to select “ <b>Emptying</b> ”.
3	Press the ENTER key.
4 	The spreader can now be emptied by pressing the START/STOP key.

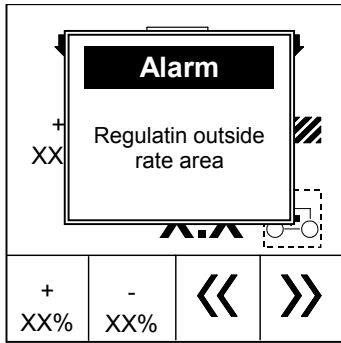
## Operating alarms

Situations can arise during operation that cause an alarm to be raised. The various alarms can be acknowledged by pressing the C key.

**Carefully investigate why an alarm occurred before acknowledging the alarm.**

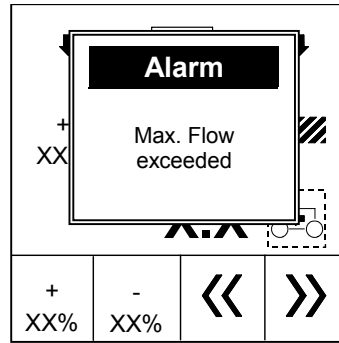
Below is an explanation of the “standard” alarms which can occur:

### Application rate is outside the possible range:



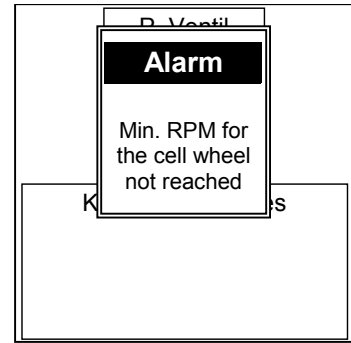
The desired app. rate cannot be reached with the current settings and driving speed. Slow down, and the alarm will automatically disappear.

### Max. Flow exceeded:



The maximum flow rate for the spreader has been exceeded, slow down or change the app. rate setting.

### Min. RPM for the cell wheel not reached:



The minimum rotating speed for the cell wheel (500 RPM) cannot be reached. This alarm is only displayed during calibration of the hydraulic motor.

There are descriptions of the optional alarms, along with directions for setting them up on page 36.



# SETTINGS

The “Settings” menu can be selected from the main menu by pressing the MENU key and using the UP and DOWN arrows to select “Settings”. Then press the ENTER key.

## Alarms

Select alarm settings from the settings menu by selecting “Alarms” using the UP and DOWN arrows. Then press the ENTER key.

The available alarms can be enabled and disabled using the following PROGRAM keys. Alarms which arise can be acknowledged using the C Key.

Key	Description
	Alarm on.
	Alarm off.

## KG LEFT ALARM

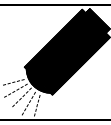

You can turn the alarm ON/OFF, and set the minimum number of kg left in the spreader before the alarm is to be raised.

## DISC RPM ALARM

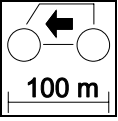
You can turn the alarm ON/OFF, and set the minimum disc speed in RPM, below which the alarm should be raised.

## Speed sensor

The type of speed sensor, and the calibration factor can be set her. It is also possible to automatically calibrate the speed sensor. Select this menu from the settings menu by selecting “Speed sensor” using the UP and DOWN arrows. Then press the ENTER key.

Key	Description
	Press this key (program key 1) to select radar as the speed sensor (via the 7-pin DIN/ISO connector). <i>If the number of pulses per 100 m is known, this number can be entered directly.</i>
	Press this key (program key 2) to select a wheel sensor mounted on the tractor as the speed sensor (via the 7-pin DIN/ISO connector). <i>If the number of pulses per 100 m is known, this number can be entered directly.</i>

## **AUTOMATIC SPEED CALIBRATION**

<b>Step/Key</b>	<b>Description</b>
<b>1</b>	Measure off a 100 metre stretch and drive up to the start mark.
<b>2</b>	Select the speed sensor, as described above.
<b>3</b> 	Press this key and drive along the 100 m stretch. Stop exactly at the stop mark. <i>The computer will count the pulses while you drive.</i>
<b>4</b>	Press the ENTER key and calibration of the speed sensor is complete.

### **Hydraulic calibration**

It is not normally necessary to calibrate the proportional valve. Calibration has been done at the factory. However, if there are problems with the hydraulic system it may be necessary to calibrate again.

Select this menu from the settings menu by selecting “**Hydr. calibration**” using the UP and DOWN arrows. Then press the ENTER key. The procedure for calibrating the proportional valve is as follows:

1. The hydraulic oil must be at normal operating temperature and the spreader must be empty.
2. The tractor motor must be running at normal operating speed. Press the ENTER key.
3. The cell wheel will run up to maximum speed, and the speed will then be reduced until the cell wheel stops.
4. Once calibration is finished, the display returns to the calibration menu. If the hydraulic motor is unable to reach a minimum speed of 500 RPM, an alarm is raised.

## ***Application rate calibration***

**Application rate calibration has normally been carried out at the factory and does not need to be done by the user. It will only be necessary to do it in special circumstances.**

Select this menu from the settings menu by selecting “**App. Rate calibration**” using the UP and DOWN arrows. Then press the ENTER key.

For operational accuracy, the number of cm<sup>3</sup> which is released per pulse needs to be set. If the quantity released per pulse is known in advance, it can be set directly.

Otherwise the quantity released per pulse can be automatically calculated by calibrating the system as follows:

1. Select “**New calibration**” and press the RETURN key.
2. Enter the specific gravity (density) of the fertilizer (**very important**).
3. Press the ENTER key and the cell wheel is made ready (the cell wheel rotates and is filled with fertilizer).
4. Empty the spill tray.
5. Press the START/STOP key to start the calibration (the cell wheel will turn).
6. Once a sufficient quantity has been released, stop the cell wheel by pressing the START/STOP key.
7. Weigh the quantity released and enter the weight.
8. Press the ENTER key and the app. rate calibration is complete.

## ***Weighing***

The Weighing menu can be selected from the main menu by pressing the MENU key and using the UP and DOWN arrows to select “**Weighing**”. Then press the ENTER key.

To set whether or not the system is equipped with weighing cells, select “**Weighing**” (in the Weighing menu) and then press the ENTER key. Press the ENTER key to toggle between Weighing = ON and Weighing = OFF.


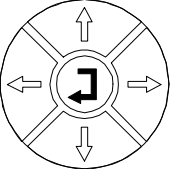
## ***TARE***

***The spreader must be empty and the PTO shaft must not be turning when you tare the weighing system.***

To tare (reset) the weighing system, select “Tare” from the weighing menu, and press the ENTER key twice. The weighing system will then be reset.

## Calibrating the weighing system

The weighing system must be calibrated the first time it is used, and then at regular intervals after that. The calibration procedure is as follows:

Step/Key	Description
1  /Menu	With the <b>spreader empty</b> , press the MENU key.
2	Move the cursor using the UP and DOWN arrows to select <b>"Weighing"</b> .
3	Press the ENTER key.
4	Move the cursor using the UP and DOWN arrows to select <b>"Calibrate"</b> .
5. 	<p>Press the ENTER key, and this warning will be displayed:</p> <div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;"> <div style="border: 1px solid black; padding: 2px; text-align: center; margin-bottom: 5px;">Calibrating</div> <div style="border: 2px solid black; padding: 5px; text-align: center;"> <p><b>Warning</b></p> <p>Continue cal Are you sure? ESC = exit</p> </div> </div> <p>If you wish to calibrate the weighing system, press the ENTER key again.</p>
6.	With the spreader empty, and the PTO shaft not turning, press the ENTER key and the system will be reset.
7.	Fill the spreader with a quantity of known weight and enter this weight in kg. Then press the ENTER key. A new calibration figure will be calculated and the calibration is complete.

## CALIBRATION FIGURE

If the calibration figure is known, you can enter this directly by selecting **"Cal. Figure"** from the weighing menu and entering this number directly. Press the ENTER key to save the calibration figure and return to the previous menu.

## Info

The information menu displays an overview of the various settings, and can be accessed from the main menu (press the MENU key). Then use the UP and DOWN arrows to select “**Info**”, and press the ENTER key.

Info	
App. Rate (Kg/ha)	XXX
Width (m)	XX
Specific gravity	X.XX
Step %	XX
Flow factor	X.XX
Max. Kmh	XX.X

## Trip Counter

It is possible to have up to ten different trip counters (jobs) in operation, which can be started and stopped, for example, when changing to another field.

The trip counter menu can be accessed from the main menu (press the MENU key). Then use the UP and DOWN arrows to select “**Trip counter**”, and press the ENTER key.

When you start a new job, the counters are reset. If you change to another job, and then change back again to the first job, the counters will continue counting from their previous values.

Jobs can be reset individually.

## TRIP COUNTERS FOR A JOB

Trip counter	
<b>New counter</b>	
<b>Delete counter</b>	
Kg	X
Area	X.XX
Time	X:XX

This window is displayed when you select the “**Trip counter**” menu. The individual counters are described below:

**Kg:**

The total number of kg spread since the job was started or last reset.

**Area:**

The accumulated area worked since the job was started or last reset. This area corresponds to the effective area, i.e., only the area which has been spread.

**Time:**

The total effective time spent since the job was started or last reset.

## ***STARTING OR CONTINUING A JOB***

When you select the “**Trip counter**” menu, the last job you accessed is re-opened. If this is the very first job you are starting, job one will be opened.

<b>Trip counter</b>	
<b>Counter no</b>	<b>1</b>
<b>Counter no</b>	<b>2</b>
<b>Counter no</b>	<b>3</b>
<b>Counter no</b>	<b>4</b>
<b>Counter no</b>	<b>5</b>
<b>Counter no</b>	<b>6</b>
↓	↓
↓	↓

To start or continue another job, press the “**New counter**” key. You can then select between jobs 1 – 10 by using the UP and DOWN arrow keys to highlight the desired number. Then press the ENTER key.

To return to the operation screen, press the MENU key.

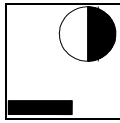
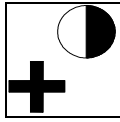
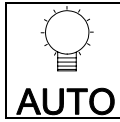
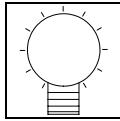
## ***RESETTING A JOB***

If you want to reset the counters for a job, select the job as described above, and then select “**Delete counter**” and press the ENTER key.

## System

The system menu can be accessed from the main menu (press the MENU key). Then use the UP and DOWN arrows to select “System”, and press the ENTER key.

### CONTRAST/LIGHT

Key	Description
	Press this program key to make the display brighter.
	Press this program key to make the display darker.
	Press this program key to activate the auto light feature. The display light turns off, and turns on automatically when any key is pressed.
	Use this key to turn the display light on and off.

### LANGUAGE

This option allows you to choose the working language for the LH Bredal 500 computer.

### SPEED SIMULATE

It is possible to simulate a speed, for example when troubleshooting or when you wish to spread independent of the driving speed. You can enter the desired simulated speed in km/h, with 1 decimal place. The speed simulation can be started and stopped using PROGRAM keys 1 & 2.

## Test

### TEST INPUT

Use the test input feature if, for example, you believe a sensor may be defective.

For each input, there is a counter shown on the right side of the display which indicates the number of times that input has been activated (the counter resets automatically when you leave the “**Test Input**” menu, or if you press the C key).

On the left side, the instantaneous status of the input is shown (**Hi/Lo**).

You can page through the inputs by pressing the UP and DOWN arrows (2 pages in total).

The input names displayed correspond to the following items:

Input	Description
Wheel DIN/ISO	Speed signal from the wheel sensor installed on the tractor (via the 7-pin DIN/ISO connector in the tractor).
Radar DIN/ISO	Speed signal from the radar installed on the tractor (via the 7-pin DIN/ISO connector in the tractor).
RPM cell wheel	Signal from the RPM sensor mounted near the cell wheel.
<b>Press the DOWN arrow key to see the next set of inputs:</b>	
RPM disc	Signal from the RPM sensor mounted near the discs.
Weighing	Signal from the weighing system.
<b>Press the UP arrow key to see the first set of inputs:</b>	

### TEST PROPORTIONAL. Valve

In order to test the hydraulic motor’s proportional valve, you must specify a “duty cycle %”. Enter the desired duty cycle percentage, and then press the ENTER key.

### TOTAL COUNTERS

Under the system menu you will find the following total counters:

**Kg:** The total amount spread, in kg, since the last reset.

**Area:** The total area spread since the last reset.

**Time:** The accumulated time which the spreader has been working.

You can reset a counter by selecting it and then pressing the C key.

### HYDRAULIC VALVE TYPE

Here you can select which type of valve is installed on the spreader.