OPERATING MANUAL

for

UNIVERSAL PRO-G
CORNER SYSTEM

with

GPS - CONTROL

Introduction

Thank you very much for purchasing a BAUER – microcomputer control unit

The present manual is a detailed description of our new **UNIVERSAL PRO-G**. If you need further information please contact our local dealer or **BAUER company** in Voitsberg.

All information contained in the present manual is based on the latest product details available at the time of printing.

BAUER company reserves the right to make changes without notice, without assuming any liability!

> ⚠️ **Non-observance of this manual may cause personal injury or damage the equipment!**

Please make this manual available to your staff. You are kindly requested to state type and number of the software version of the **UNIVERSAL PRO-G** in all inquiries, correspondence, warranty problems or parts orders.

We wish you success with your BAUER UNIVERSAL PRO-G!

Product details

Type designation:	**BAUER –UNIVERSAL PRO-G f. GPS CORNER**
Type version:	Front panel location
Serial number:	

Dealer:	Name:	
	Address:	
	Phone / Fax:	

Date of shipment:	

Manufacturer of the control unit: Röhren- und Pumpenwerk **BAUER** GmbH

Kowaldstr. 2

A - 8570 Voitsberg

Tel.: +43 3142 200 – 0

Fax: +43 3142 200-320 /-340

Owner or operator:	Name:	
	Address:	
	Phone / Fax:	

TABLE OF CONTENTS

CONTROL CENTRE OF UNIVERSAL PRO-G

Execution and material according to ÖVE and VDE standards, the components correspond to the IEC standards as well as to the VDE regulations.

- Water-proof polyester cabinet (protection class IP 54) with lockable front door
- Pivoting control panel, can be opened only when the main switch is OFF
- System operating voltage 400V
- Control voltage: 230 V single phase
- Separating transformer for control voltage
- Standard industrial switchgears
- Cable connections with cable lugs
- Protection equipment

⚠ **ATTENTION!** During operation always keep the control centre closed to protect it against dirt and splash water.
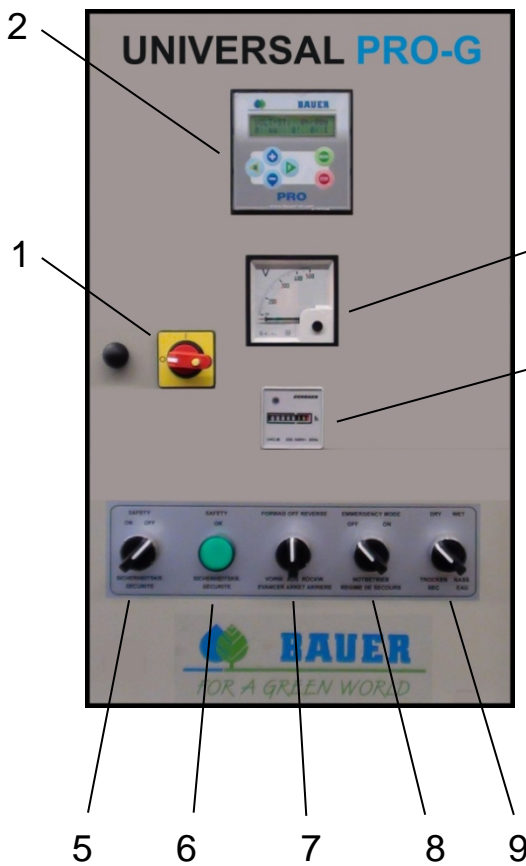
1. Main switch
2. Control panel UNIVERSAL PRO G
3. Voltmeter
4. Operating hours counter
5. Switch safety circuit „ON - OFF"
6. Luminous button safety circuit
7. Switch „FORWARD - OFF - REVERSE"
8. Switch „EMERGENCY MODE OFF - ON "
9. Switch „WET - DRY"
10. Switch „EMERGENCY STOP" (*not shown on the picture*)
11. GPS unit (*not shown on the picture*)

1 SET UP / MAIN COMPONENTS

1.1 CONTROL PANEL
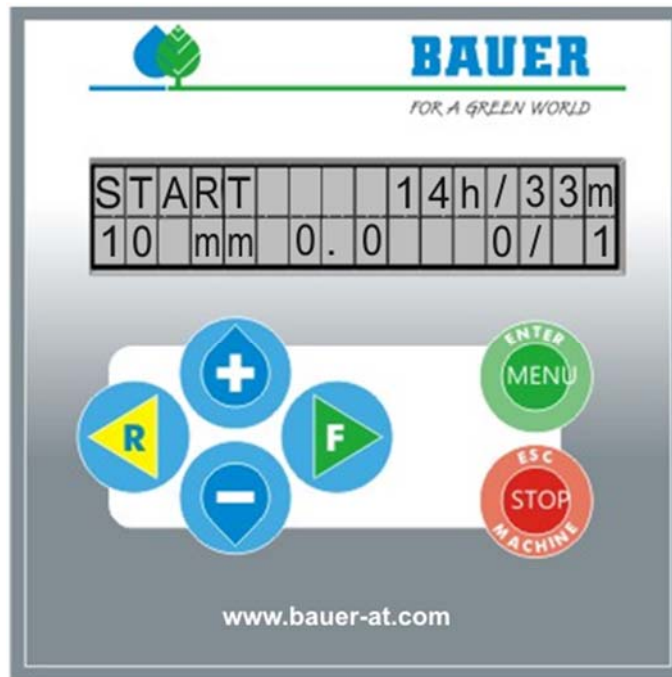
1.1.1 DISPLAY

Display with 2x16 signs, 2 lines, background lighting. If you do not use the keypad for a predetermined time, the background lighting switches off automatically. (adjustable timer for background lighting).

1.1.2 FUNCTIONS/MENU BUTTONS

START FORWARD(F)	Start the Pivot forward (*clockwise*)
START REVERSE(R)	Start the Pivot backwards (*anti-clockwise*)
MENU and **ENTER**	By pressing this key you get to the operator level – double actuation for entering in the programming mode of a parameter and for acknowledging an entry.
STOP (ESC and machine)	Stop operation and multi–function of this button for operating at the technician level and for saving and leaving the programming mode.
+	With this button you can change the depth of precipitation for the current driving direction while operating and its second function is changing of parameters.
-	With this button you can change the depth of precipitation for the current driving direction while operating and its second function is changing of parameters.

2 SWITCHING THE CONTROL UNIT ON

2.1 BOOTING

When switching on the main switch, PROZENTTIMER will be on display and the software version installed with the date of set-up.

Figure 2.1: Display after start

Subsequently "Initialize GSM modem" will be displayed. After correct initialization "GSM modem OK" should be on display, otherwise different error messages can be displayed.

Figure 2.2: Booting display

After successful booting and initialization of the hardware, status window 1 will be displayed (see chapter 3.1).

3 STATUS WINDOW

The status window provides important information about the operating status of the pivot. After booting has been completed, the status window opens automatically. The parameters shown in the status window are updated all the time.

3.1 STATUS WINDOW

The information about the current operating status is shown in the two columns of the status window (*see Fig. 3.1*) Below, the individual elements of the status window are described, from the top left to the bottom right corner of the window:

Figure 3.1: Status window 1

Figure 3.2: Status window 2

The first column and line display the operating status and the current GPS reception status in alternation.

OPERATING STATUS

The following general operating statuses are displayed:

- OFF   Pivot not operating
- FORWARD   Pivot moving in the indicated direction
- WAITING   Pivot waiting for the programmed start time to begin
- PAUSE   Pivot is in the programmed irrigation pause
- SAFETY   Pivot has been switched off due to an general interruption of safety circuit.
- ERROR   Pivot has been switched off due to an error
- EMER.OP.   System is in emergency operating mode, operating mode NOT permissible for CORNER SYSTEM, results in lasting damage to the system.
- OK   System is in good order
- SAFE:OFF   Pivot safety circuit has been switched off
- PR.STOP   Pivot was switched off because of insufficient water pressure
- VOLT-ST   Pivot turned off because of low voltage
- CAN-ERR   CAN-BUS communication error
- I2C-ERR   I²C communication error
- START   Pivot waiting till waiting period is up; pump is already active when starting
- PARKPOS.   Pivot moving to or is already in preset parking position.
- REVERSE   Pivot moving in the indicated direction
- GPS ERR.   GPS communication error
- RAIN   Pivot has been switch off through rain sensor
- CORN.ERR   Safety circuit interrupted at Corner
- SPANSENS   Span sensor: interruption of safety circuit
- TILT ERR   Tilting sensor: interruption of safety circuit
- LASTTOWE   Last tower: interruption of safety circuit
- GUID.SAF   Below Ground Guidance safety circuit has been exceeded
- GUID.SIG   Below Ground Guidance does not receive any signal from Below Ground Cable
- CAN GOET   communication error with antenna evaluator error
- CAN DRIV   CAN communication error with frequency converter
- COMPRESS   Maximal admissible running time of compressor has been exceeded (leakage)
- NO MOVE   No movement of machine has been registered

The following GPS operating statuses are displayed.

- INVALI   Invalid GPS reception
- GPSFIX   GPS reception without base / corrective station
- DGPS   GPS signal with corrective data, not sufficient for driving
- FLOAT   GPS precision approx. 15 cm, driving possible at low speed
- RTK   Maximum GPS precision, fluctuations depending on reception strength

REMAINING TIME OF IRRIGATION

Remaining time to complete the active program is indicated in hours and minutes. If the pivot is switched off, 0H/0MIN is displayed. Due to rounding errors and inexact machine parameters (in particular speed and the entry of the angles for calculation), the calculated irrigation time will not correspond to the actual irrigation time. If the pivot stops before the calculated irrigation time has elapsed, the irrigation time will be reset to zero. If the pivot takes longer than calculated, zero is displayed, even if the pivot has not yet ended the program.

DEPTH OF IRRIGATION

The actual depth of irrigation for the current driving direction is indicated while the pivot is moving; when the pivot stands still, the last active depth of irrigation is displayed.

POSITION

The actual position is on display. This value indicates where on the field the machine is currently.

CYCLE

The current cycle and the maximum cycles after which the pivot stops are indicated (0/5), e.g. (2/4) pivot is in the second cycle of 4.

4 PARAMETER MENU

By pressing the MENU key the parameter menu is displayed. It consists of several windows that can be scrolled through with the keys + and − . One window consists of one block with 2 parameters.

> **You can enter the programming mode by pressing the ENTER (Menu) key. The cursor blinks at the first parameter and it can be changed with the keys + and − . You get to the second parameter by pressing the key RIGHT ARROW KEY (F). You get back to the first parameter by pressing the key LEFT ARROW KEY (R).**
>
> **Press ENTER for saving or leave with ESC without saving.**

Below, the functions of the individual menu items are described:

4.1 DESCRIPTION OF INDIVIDUAL PARAMETERS

4.1.1 DEPTH FWD 1 / DEPTH REV 1

Depth Fwd 1:

This value is the set amount of irrigation in mm for the first segment for the driving direction FORWARD.
0 mm means that the machine is running with maximum speed. However the pump is switched off: DRY run.

Setting range: Changes from 0 mm to max. mm according to the set machine parameters.

For changing the parameter press the ENTER key, change the VALUE with + and − , confirm with ENTER and leave the programming mode by pressing the key ESC.

Depth Rev 1:

This value is the set amount of irrigation for the first segment for the driving direction REVERSE
0 mm means that the machine is running at max. speed. However the pump is switched off: DRY run.

Setting range: Changes from 0 mm to max. mm according to the set machine parameters.

For changing the parameter, press the ENTER key, change the VALUE with + and − , confirm with ENTER and leave the programming mode by pressing the key ESC.

Figure 4.1: Configuration of the irrigation amount

You change between the parameters by pressing the right / left arrow key (F) / (R).

Attention: Multiple segments (max. 6) are only available when *GPS* module is activated (*see 5.1.13 Zero position and GPS).*

The depth of precipitation can be set for all six segments as described above.

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY − .

4.1.2 SEGMENT 1 L / SEGMENT 1 R

With these settings, you can define both the position as well as the size of the segments (maximum of 6 segments).

Segment1 L is the starting value in ° for the first segment.
Segment1 R is the ending value in ° for the first segment.

ATTENTION: The order of the values is in the clockwise direction.

If you have mistakenly configured overlapping segments, the preceding segment will always be given priority in the processing.

Example:
Segment1 L: 0°, Segment1 R: 90°
Segment2 L: 80°, Segment2 R: 230°

Segment 1 is irrigated from 0° to 90° with the preset irrigation amounts for segment 1. Segment 2 is irrigated from 90° to 230° with the preset irrigation amounts for segment 2. In the overlapping area from 80° to 90°, the values of the preceding segment, i.e. segment 1, are used.

Segment1	L	0°
Segment1	R	180°

Figure 4.2: Settings for segment 1

You change between the parameters by pressing the right / left arrow key (F) / (R).

Attention: Multiple segments (max. 6) are only available when *GPS* module is activated (*see 5.1.13 Zero position and GPS).*

The size of segment can be set for all six segments as described above.

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.3 SECTOR L / SECTOR R

This parameter is needed when the machine is used for sector operation.

When the machine is used for cycle operation, use the default parameters (see Fig. 4.3). To activate cycle operation, the **angle of operation for both parameters must be 0°.**

Otherwise it is possible to set the sector from 0° to 360°.
By setting the degrees of the left- and right-hand sector limits, the machine will operate only in this area. As described above, the sector area can be divided into six segments.
When the machine has reached the end of sector, the counter will add one cycle.

ATTENTION: The set value of *Sektor L* must be less than that of *Sektor R*.

When changing this value, mind the following parameters: Autoreverse   (OFF-ON)
                                                                   Max. cycles   (0-9)

Figure 4.3: Parameter input for sector operation

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.4 PARKING POSITION / PARKPOSIT

This parameter serves to bring the machine to its parking position.
When switching this parameter to ON (even during irrigation), the machine will go at full speed and in dry run to parking position.

Below, the **parking position** in degrees can be entered.

ATTENTION: During this process the machine can leave the current segment and passes through not adjusted segments.

Figure 4.4: Parameter for setting of parking position

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.5 INTERMEDIATE STOP / INTERMEDIATE POSITION

This parameter serves to bring the machine to its intermediate position.
When switching this parameter to ON, the machine will go at preset speeds (wet), depending on current segments, to intermediate position.

Below, the **intermediate position** in degrees can be entered.

ATTENTION: During this process the machine always chooses the shortest way and can leave the current segment and passes through not adjusted segments.
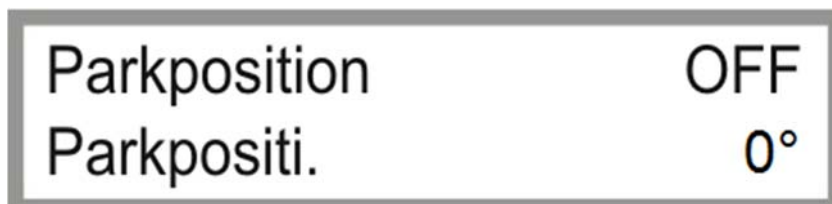
Figure 4.5: Parameter for setting of intermediate position

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.6 ENDGUN1ON1 / ENDGUN1OFF1

This serves to set the limits of irrigation by means of an endgun (*optionally up to 4 endguns*). **Endgun1ON1** is the starting value in ° for the first segment and the first endgun. **Endgun1OFF1** is the ending value in ° for the first segment and the first endgun. With these settings, you can define both the position as well as the size of the segments (maximum of 6 segments).

ATTENTION: The order of the values is in the clockwise direction.

ATTENTION: This parameter only works with a set depth of precipitation of more than 0 mm.

Figure 4.6: Parameters for setting of ON and OFF range of endgun

If you have mistakenly configured overlapping segments, the preceding segment will always be given priority in the processing.

You change between the parameters by pressing the right / left arrow key (F) / (R).

ATTENTION: Multiple segments (max. 6) are only available when *GPS* module is activated (*see **5.1.13 Zero position and GPS**).*

If you purchased the option of *endgun control for up to 4 endguns*, follow the same steps to configure the settings for the other endguns. Activate additional endguns under **5.1.16 ENDGUN1-4.**

Use the + / - keys to switch between endguns.

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.7 AUTOREVERSE / ENDGUNONOFF

The ***Autoreverse*** function can be switched ON and OFF. When using a sector operation, the pivot stops at the end of the sector if the Autoreverse is switched off.

Analogously this function is not used for full circle operation.

If the Autoreverse is switched on, the pivot turns automatically at the end of the sector and returns to the other end of the sector and so on until it has completed the maximum set cycles. Then the program is finished and the pivot stops.

EndgunOnOff provides information about the current operating status of the endgun.
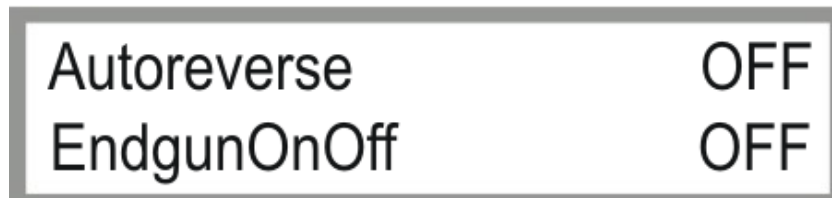
```
Autoreverse          OFF
EndgunOnOff          OFF
```
Figure 4.7: Parameter Autoreverse / EndgunOnOff

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY — .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.8 MAX. ROUNDS / A. RESTART

With ***Max. Rounds*** you can set the maximum number of rounds, from 1-99. In full circle operation, the cycle counter is incremented by 1 for every full circle completed. In sector operation, the counter adds one at the end of every sector; this way you can choose the end position of the pivot after irrigation has been completed.
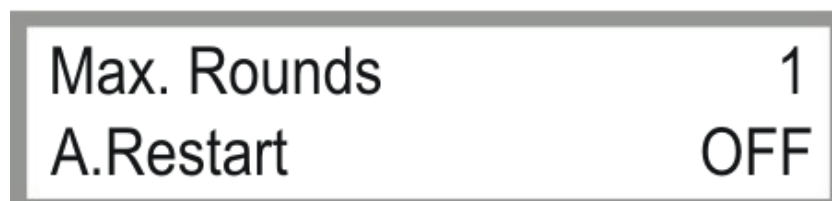
```
Max. Rounds            1
A.Restart            OFF
```
Figure 4.8: Parameter for setting of max. rounds and Auto Restart

With the parameter ***Auto Restart***, you can define how the machine should respond after a power failure. If ***Auto Restart*** is set to *ON*, the original machine status is restored. The machine will be restarted automatically if no other errors appear.

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY — .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.9 START TIME

Here you can program the start time for starting the pivot automatically.

Enter the programming mode by pressing the key ENTER, the cursor blinks at the left side on the display and the time sets to the current system time to make the setting easier for you.

Now you can change the day by pressing the keys + and - . In order to get to the month, you need to press the right arrow key (F); the cursor blinks at the month and you can set the starting month with the keys + and - . With the same procedure you get to the year and then to the time. Press ENTER for saving and leave the programming mode with the key ESC.

You can also hold down the + or - key to switch more quickly to the desired value.

Figure 4.9: Setting of start time

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.10 PAUSE ON / PAUSE OFF

This function serves to set the start and stop time for the irrigation pause. After reaching this set time, the irrigation program stops automatically. When reaching the set end time for irrigation pause, irrigation will be continued automatically. If you do not want any pause, the start and stop time for the irrigation pause must be the same.

The setting of the start and stop time for the irrigation pause follows the same procedure as setting of the start time.

Figure 4.10: Parameter for setting start and stop time for irrigation pause

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.11 ERROR LOG

In this menu the last 20 errors recorded including date and time of error are indicated.

If no errors are recorded, the display indicates **NO ERROR**.
Otherwise you can identify the error by reading the text.

If errors are recorded, the log can be browsed by pressing the RIGHT and LEFT arrow keys. The keys appear in the right and left corner of the display.

When entering the error log, the last error will be displayed first.
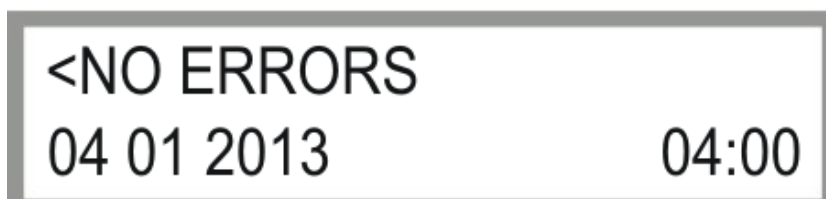
Figure 4.11: Error log

All error texts are explained below:

- *NO ERRORS*

No errors occurred so far; the error buffer is empty. Pressing the LEFT and RIGHT arrow key has no effect.

- *SAFETY CIRCUIT*

The safety circuit was interrupted
a) by pressing the EMERGENCY STOP switch in the control cabinet,
b) by activation of a limit switch on the tower,
c) by off-track running or by an additionally mounted sector limit switch.

- *I2C ERROR*

Error on I²C bus. If this error occurs more often an error in the hardware exists.

- *RTC ERROR*

 Error at the Real Time Clock or at the I²C Bus. If this error occurs more often an error in the hardware exists.

- *PRESSURE SWITCH*

The water pressure is too low for the preset monitoring time.

- *LOW VOLTAGE*

Operation interrupted because of low voltage. This error can only be displayed if the PRO module has an uninterruptible power supply.
Example: If power is supplied via a generator unit and the PRO module is supplied via its battery.

- *CAN-ERR*

Error in the CAN communication.

- *GUID.SIG*

BELOW GROUND GUIDANCE not receiving a signal from UNDERGROUND CABLE or signal too weak.

- *GPS ERR.*

No GPS signal or GPS communication error.

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬.

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚.

4.1.12 OPERATINGH. WET

The operating hours in hours and minutes are indicated only for the operating time with the pump switched on.
A reset is only possible by reloading the preset parameters.
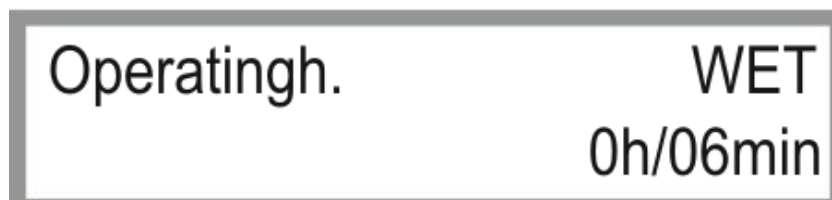
Figure 4.12: Operating hours WET

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬.

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚.

4.1.13 OPERATINGH. SUM

The operating hours in hours and minutes are indicated for the total operating time.
A reset is only possible by reloading the preset parameters.
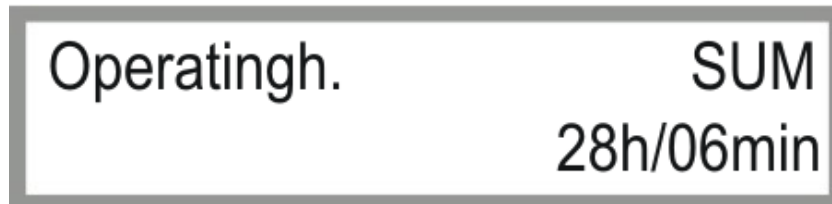
Figure 4.13: Operating hours total

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.14 OPERATINGH. ENDGUN

The operating hours in hours and minutes are indicated only for the operating time with the endgun switched *ON*.
A reset is only possible by reloading the preset parameters.

Figure 4.14: Operating hours Endgun

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.15 RAIN SENSOR

Indicates whether the rain sensor is *OFF*, *ON* or set to automatic *AUT*. If *OFF* is selected, the rain sensor is deactivated and has no influence. The system does not switch off when it begins to rain.

If *ON* is selected, the system shuts off automatically as soon as it begins to rain. The system must then be manually started again.

If *AUT* is selected, the system shuts off automatically as soon as it begins to rain. When the rain stops, the system starts again automatically and continues the irrigation program.

Figure 4.15: Rain sensor

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.16 FLOW / WATERV. (CURRENT FLOW / WATER CONSUMPTION)

Flow shows the current flow in m³/h.

Waterv. Shows the previous total flow through the system in m³.

```
Flow                     0m/h
Waterv.                    0m
```
Figure 4.16: Current flow, water consumption so far

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.17 WATER S. START

Water s. Start shows the water volume consumed since startup of the machine.

```
Wasser s.              Start
                      0m3/h
```
Figure 4.17: Water consumption since start

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.18 COMPRESSOR / TILT SWITCH

Compressor shows the current operating status of the compressor. Possible values are "*ON" and "OFF"*.

Tilt Switch shows the current operating value of the tilt switch. Possible values are "ON" and "OFF".

ON: Tilt switch OK, machine works properly.
OFF: Tilt switch activated, end tower probably tilted over, tilt switch malfunction
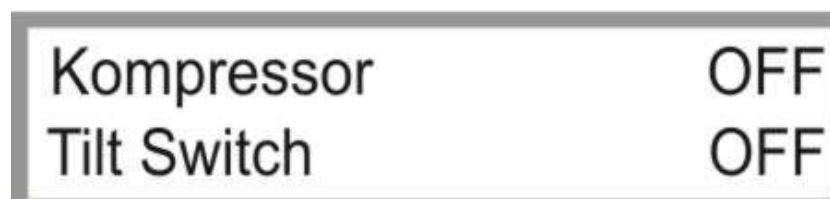
```
Kompressor             OFF
Tilt Switch            OFF
```
Figure 4.18: Compressor, tilt switch

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.19 NOT CONNECTED / PINGTIME

1st line shows the connection status of the GPRS modem.

NOT CONNECTED   Modem is connected / connection to server.
CONNECTED   Modem is NOT connected / no connection to server.

pingtime shows the counter / remaining time to next ping.

```
NOT            CONNECTED
pingtime              0s
```
Figure 4.19: Status GPRS modem

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.20 INPUTS / OUTPUTS

Inputs and *Outputs* provide information about the operating status of the inputs and outputs.
"0" signifies: no voltage at the input / output.
"1" signifies: voltage at the input / output.
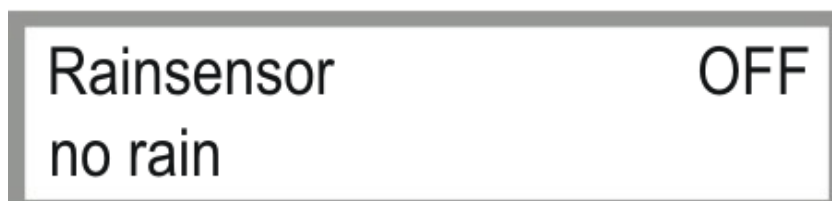
```
Inputs        0000000001
Outputs           010000
```
Figure 4.20: Inputs / Outputs

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.21 COMREADIN

Menu item for error diagnosis of the RS 232 interface.

ATTENTION: Only for repair technicians.
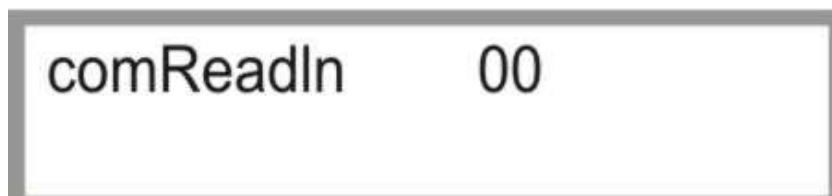
```
comReadIn     00
```
Figure 4.21: Error diagnosis RS232

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.22 RADIUS / ANGLE

Radius shows the current distance of the CORNER tower to the central tower in "m".

Angle shows the current value of the imaginary connecting line between the CORNER tower and the central tower relative to the *zero degree position*. The *zero degree position* is the position of the imaginary connecting line between the CORNER tower and the central tower that points in the direction of GPS north (*geographic north)*.

Radius	0.00m
Angle	0.00°

Figure 4.22: Display of radius and angle

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.23 COUNTER / COUNTS

The *counter* indicates the current timer status of the end tower.

The first number of cycle indicates the calculated switch-on time and the second the switch-off time of the end tower.

counter		3s
counts	59s	1s

Figure 4.23: Counter / Counts

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.24 RECONNT. / MODEM, PAR

Shows current values of GPRS-modem for visualisation.

NOTE: This window is not used without GPRS modem (*visualisation*).

Figure 4.24: Parameter GPRS Modem / ping time

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✛ .

4.1.25 ANALOGUE OUTPUTS

Shows current values of analogue outputs.

ATTENTION: Only for repair technicians.

Figure 4.25: Status analogue outputs

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✛ .

4.1.26 SAFETY CORNE. / CORNECLOS

Saftety Corne. shows the current operating status of the safety circuit. Possible values are "ON" and "OFF".

CornerCLOS / ***CornerOP*** shows the current angle of the CORNER span relative to the pivot in °, where 165° means that the CORNER span is entirely swung out.

OPEN / ***CLOSE*** shows the current movement of the CORNER span.
OPEN indicates a swinging out movement.
CLOSE indicates a swinging in movement.

Figure 4.26: Safety circuit CORNER, CORNER angle

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✛ .

4.1.27 **CORNERSEKT1 / CORNERSEKT2**

With **CornerSekt1** to **CornerSekt5**, you can define up to 4 different sectors (*in °*), to which you can assign individual nozzle switching sequences (*see **4.1.31** to **4.1.39***).
CornerSekt1 and **CornerSekt2** are the sector limits for the *first sector*, **CornerSekt2** and **CornerSekt3** are the sector limits for the second *sector,* etc.


```
CornerSekt1              0
CornerSekt2             90
```

Figure 4.27: Configuring sectors for nozzle control

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.28 **CORNERSEKT3 / CORNERSEKT4**

See **4.1.27 CornerSekt1 / CornerSekt2**.


```
CornerSekt3            180
CornerSekt4            270
```

Figure 4.28: Configuring sectors for nozzle control

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.29 **CORNERSEKT5 / VALVE INDEX**

CornerSekt5 see **4.1.27 CornerSekt1 / CornerSekt2**.

Valve Index shows the currently selected sector for which you can define the nozzle switching sequences under **4.1.31** to **4.1.39**.

Valve Index 0 = Sector 0
Valve Index 1 = Sector 1
Valve Index 2 = Sector 2
Valve Index 3 = Sector 3


```
CornerSekt5            360
Valve Index             0
```

Figure 4.29: Configuring sectors for nozzle control / control valve display

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✛ .

4.1.30 **CORNERHYSTOP / CORNERHYSTCL**

With **CornerHystOP**, you can set the desired switching hysteresis for the activation sequence of the nozzles ("*swinging out" of the CORNER frame*).

With **CornerHystCL**, you can set the desired switching hysteresis for the deactivation sequence of the nozzles ("*swinging in" of the CORNER frame*).

CornerHystOP	1
CornerHystCL	1

Figure 4.30: Configuring the switching hysteresis of the nozzle control

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✛ .

4.1.31 **V1 OP SEKT0 / V2 OP SEKT0**

Vx: nozzle group **1-9**
OP: **OPEN** indicates a swinging out movement *(CORNER span)*
CL: **CLOSE** indicates a swinging in movement *(CORNER span)*
Sekt0:   sector **0-3**

With **V1 OP Sekt0**, you can define the activation point ("*swinging out" of the CORNER frame*) of *nozzle group 1* for sector 0 (*see 4.1.27 – 4.1.29).*

With **V2 OP Sekt0**, you can define the activation point ("*swinging out" of the CORNER frame*) of *nozzle group 2* for sector 0 (*see 4.1.27 – 4.1.29).*

To define the switching points of the other sectors, change the value **Valve Index** under **4.1.29**. Return to **4.1.31**, the display will show *V1 OP Sekt1, V1 OP Sekt2, etc.*

CornerCLOS / **CornerOP** shows the current angle of the CORNER span relative to the pivot in °, where 165° means that the CORNER span is entirely swung out.

ATTENTION: The activation points are defined as the tenfold value in ° of the angle of the CORNER span relative to the pivot (879 = 87.9°)!!

V1 OP Sekt0	879
V2 OP Sekt0	917

Figure 4.31: Configuring the activation point for nozzle groups 1 & 2

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.32 **V3 OP SEKT0 / V4 OP SEKT0**

Vx: nozzle group *1-9*
OP: *OPEN* indicates a swinging out movement *(CORNER span)*
CL: *CLOSE* indicates a swinging in movement *(CORNER span)*
Sekt0:   sector *0-3*

With *V3 OP Sekt0*, you can define the activation point ("*swinging out*" of the CORNER frame) of *nozzle group 3* for sector 0 (*see 4.1.27 – 4.1.29*).

With *V4 OP Sekt0*, you can define the activation point ("*swinging out*" of the CORNER frame) of *nozzle group 4* for sector 0 (*see 4.1.27 – 4.1.29*).

To define the switching points of the other sectors, change the value *Valve Index* under *4.1.29*. Return to *4.1.32*, the display will show *V3 OP Sekt1, V3 OP Sekt2, etc.*

ATTENTION: The activation points are defined as the tenfold value in ° of the angle of the CORNER span relative to the pivot (946 = 94.6°)!!

| V3 OP Sekt0 | 946 |
| V4 OP Sekt0 | 988 |

Figure 4.32: Configuring the activation point for nozzle groups 3 & 4

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.33 **V5 OP SEKT0 / V6 OP SEKT0**

Vx: nozzle group *1-9*
OP: *OPEN* indicates a swinging out movement *(CORNER span)*
CL: *CLOSE* indicates a swinging in movement *(CORNER span)*
Sekt0:   sector *0-3*

With *V5 OP Sekt0*, you can define the activation point ("*swinging out*" of the CORNER frame) of *nozzle group 5* for sector 0 (*see 4.1.27 – 4.1.29*).

With *V6 OP Sekt0*, you can define the activation point ("*swinging out*" of the CORNER frame) of *nozzle group 6* for sector 0 (*see 4.1.27 – 4.1.29*).

To define the switching points of the other sectors, change the value *Valve Index* under *4.1.29*. Return to *4.1.33*, the display will show *V5 OP Sekt1, V5 OP Sekt2, etc.*

ATTENTION: The activation points are defined as the tenfold value in ° of the angle of the CORNER span relative to the pivot (1014 = 101.4°)!!

Figure 4.33: Configuring the activation point for nozzle groups 5 & 6

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY —.

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚.

4.1.34 **V7 OP SEKT0 / V8 OP SEKT0**

Vx: nozzle group *1-9*
OP: *OPEN* indicates a swinging out movement *(CORNER span)*
CL: *CLOSE* indicates a swinging in movement *(CORNER span)*
Sekt0:   sector *0-3*

With **V7 OP Sekt0**, you can define the activation point ("*swinging out*" of the CORNER frame) of *nozzle group 7* for sector 0 (*see 4.1.27 – 4.1.29*).

With **V8 OP Sekt0**, you can define the activation point ("*swinging out*" of the CORNER frame) of *nozzle group 8* for sector 0 (*see 4.1.27 – 4.1.29*).

To define the switching points of the other sectors, change the value **Valve Index** under **4.1.29**. Return to **4.1.34**, the display will show *V7 OP Sekt1, V7 OP Sekt2, etc.*

ATTENTION: The activation points are defined as the tenfold value in ° of the angle of the CORNER span relative to the pivot (1067 = 106.7°)!!

Figure 4.34: Configuring the activation point for nozzle groups 7 & 8

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY —.

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚.

4.1.35 **V9 OP SEKT0 / V1 CL SEKT0**

Vx: nozzle group *1-9*
OP: *OPEN* indicates a swinging out movement *(CORNER span)*
CL: *CLOSE* indicates a swinging in movement *(CORNER span)*
Sekt0:   sector *0-3*

With **V9 OP Sekt0**, you can define the activation point ("*swinging out*" of the CORNER frame) of *nozzle group 9* for sector 0 (*see 4.1.27 – 4.1.29*).

With *V1 CL Sekt0,* you can define the deactivation point (*"swinging in" of the CORNER frame*) of *nozzle group 1* for sector 0 (*see 4.1.27 – 4.1.29).*

To define the switching points of the other sectors, change the value *Valve Index* under *4.1.29*. Return to *4.1.35*, the display will show *V9 OP Sekt1, V9 OP Sekt2, etc.*

ATTENTION: The activation points are defined as the tenfold value in ° of the angle of the CORNER span relative to the pivot (1210 = 121.0°)!!

```
V9 OP Sekt0          1210
V1 CL Sekt0          1011
```

Figure 4.35: Configuring the activation / deactivation point for nozzle groups 9 & 1

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.36 **V2 CL SEKT0 / V3 CL SEKT0**

Vx: nozzle group *1-9*
OP: *OPEN* indicates a swinging out movement *(CORNER span)*
CL: *CLOSE* indicates a swinging in movement *(CORNER span)*
Sekt0:   sector *0-3*

With *V2 CL Sekt0,* you can define the deactivation point (*"swinging in" of the CORNER frame*) of *nozzle group 2* for sector 0 (*see 4.1.27 – 4.1.29).*

With *V3 CL Sekt0,* you can define the deactivation point (*"swinging in" of the CORNER frame*) of *nozzle group 3* for sector 0 (*see 4.1.27 – 4.1.29).*

To define the switching points of the other sectors, change the value *Valve Index* under *4.1.29*. Return to *4.1.36*, the display will show *V2 CL Sekt1, V2 CL Sekt2, etc.*

ATTENTION: The activation points are defined as the tenfold value in ° of the angle of the CORNER span relative to the pivot (1038 = 103.8°)!!

```
V2 CL Sekt0          1038
V3 CL Sekt0          1065
```

Figure 4.36: Configuring the deactivation point for nozzle groups 2 & 3

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.37 **V4 CL SEKT0 / V5 CL SEKT0**

Vx: nozzle group *1-9*
OP: *OPEN* indicates a swinging out movement *(CORNER span)*
CL: *CLOSE* indicates a swinging in movement *(CORNER span)*
Sekt0:   sector *0-3*

With **V4 CL Sekt0,** you can define the deactivation point (*"swinging in" of the CORNER frame*) of *nozzle group 4* for sector 0 (*see **4.1.27 – 4.1.29**).*

With **V5 CL Sekt0,** you can define the deactivation point (*"swinging in" of the CORNER frame*) of *nozzle group 5* for sector 0 (*see **4.1.27 – 4.1.29**).*

To define the switching points of the other sectors, change the value **Valve Index** under **4.1.29**. Return to **4.1.37**, the display will show *V4 CL Sekt1, V4 CL Sekt2, etc.*

ATTENTION: The activation points are defined as the tenfold value in ° of the angle of the CORNER span relative to the pivot (1097 = 109.7°)!!

Figure 4.37: Configuring the deactivation point for nozzle groups 4 & 5

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.38 **V6 CL SEKT0 / V7 CL SEKT0**

Vx: nozzle group *1-9*
OP: *OPEN* indicates a swinging out movement *(CORNER span)*
CL: *CLOSE* indicates a swinging in movement *(CORNER span)*
Sekt0:   sector *0-3*

With **V6 CL Sekt0,** you can define the deactivation point (*"swinging in" of the CORNER frame*) of *nozzle group 6* for sector 0 (*see **4.1.27 – 4.1.29**).*

With **V7 CL Sekt0,** you can define the deactivation point (*"swinging in" of the CORNER frame*) of *nozzle group 7* for sector 0 (*see **4.1.27 – 4.1.29**).*

To define the switching points of the other sectors, change the value **Valve Index** under **4.1.29**. Return to **4.1.38**, the display will show *V6 CL Sekt1, V6 CL Sekt2, etc.*

ATTENTION: The activation points are defined as the tenfold value in ° of the angle of the CORNER span relative to the pivot (1181 = 118.1°)!!

Figure 4.38: Configuring the deactivation point for nozzle groups 6 & 7

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.39 **V8 CL SEKT0 / V9 CL SEKT0**

Vx:	nozzle group *1-9*
OP:	*OPEN* indicates a swinging out movement *(CORNER span)*
CL:	*CLOSE* indicates a swinging in movement *(CORNER span)*
Sekt0:	sector *0-3*

With *V8 CL Sekt0,* you can define the deactivation point (*"swinging in" of the CORNER frame*) of *nozzle group 8* for sector 0 (*see 4.1.27 – 4.1.29*).

With *V9 CL Sekt0,* you can define the deactivation point (*"swinging in" of the CORNER frame*) of *nozzle group 9* for sector 0 (*see 4.1.27 – 4.1.29*).

To define the switching points of the other sectors, change the value *Valve Index* under *4.1.29*. Return to *4.1.39*, the display will show *V8 CL Sekt1, V8 CL Sekt2, etc.*

ATTENTION: The activation points are defined as the tenfold value in ° of the angle of the CORNER span relative to the pivot (1309 = 130.9°)!!

Figure 4.39: Configuring the deactivation point for nozzle groups 8 & 9

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.40 **SX1 / SX2**

SX1 and SX2 are antenna values of the BELOW GROUND GUIDANCE and the GPS CONTROL.

S1 shows the cumulative value of antenna 1 (*forward*)

X1 shows the differential value of antenna 1 (f*orward*)

S2 shows the cumulative value of antenna 2 (*backward*)

X2 shows the differential value of antenna 2 (*backward*)

Cumulative values reflect the field strength, *differential values* reflect the deviation from the track guiding wire or the stored GPS path.

Figure 4.40: Display of the antenna values

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.41 SPANPOTI / SOLLF-R

SpanPoti shows the current value of the span sensor.

SollF-R shows the set value of the span sensor, where the left column stands for the direction forward and the right column for the direction backward.

Figure 4.41: Display of span sensor

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.42 NODEG.CORNER / SPANPOTI

NodeG.Corner is the monitoring timer of the CORNER tower drive in seconds. You can set the time period under *4.1.43 DRIVE TIMEOUT*. If no positive response is received within this defined time period from the CORNER tower drive (*frequency inverter)*, the safety circuit of the machine is interrupted and the system is shut down.

SpanPoti shows the current value of the span sensor.

Figure 4.42: Display of NodeG.Corner & SpanPoti

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

4.1.43 DRIVECHECK / DRIVETIMEOUT

With **DriveCheck**, you can activate the monitoring of the CORNER tower drive.

DriveCheck 0 = Monitoring deactivated
DriveCheck 1 = Monitoring activated

With **DriveTimeout**, you can define the time period in seconds for the monitoring of the CORNER tower drive. If no positive response is received within this defined time period from the CORNER tower drive (*frequency inverter)*, the safety circuit of the machine is interrupted and the system is shut down.

| DriveCheck | 1 |
| DriveTimeout | 5 |

Figure 4.43: Display of DriveCheck & DriveTimeout

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

5 MACHINE PARAMETER MENU

5.1   DESCRIPTION OF THE INDIVIDUAL PARAMETERS

For entering the machine parameter menu, press the key STOP.
Then the code display appears.

By using the UP and DOWN keys, you can set the code and confirm it by pressing the key ENTER.

If you use the correct code *Machine Parameter Menu* is displayed.

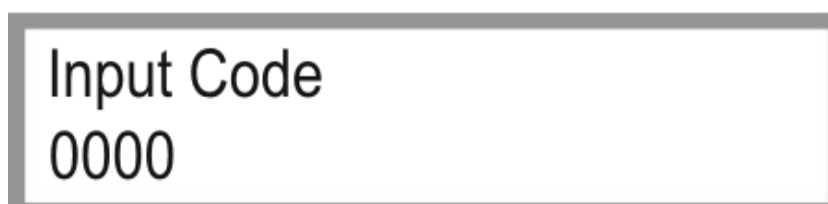CODE=12   only for repair technicians

Input Code
0000

Figure 5.1: Parameter for code input

Input Code
0012

Figure 5.2: Entering code 12

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

5.1.1 **DATE / TIME**

Setting the system date and the time.

Enter the programming mode by pressing the key ENTER.

The cursor blinks at the current day. By using + and -, you can change the day.
By using the right arrow key, you get to the month and can change it by using + and - .
With the same procedure you get to the year and then to the time where you can set the time by again using + and – keys.
Save with ENTER and/or leave the programming mode with ESC.

DD / MM / YYYY   Time
01 02 2013   01:23

Figure 5.3: Setting of date and time

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

5.1.2 LANGUAGE AND IRRIGATION RADIUS

For changing the language, press ENTER to get to the programming mode.

By using + and – you can change the **language**. Confirm with ENTER and press ESC for leaving the programming mode. By pressing the right arrow key you change to the **irrigation radius**.

By using + and – you can change the radius; by pressing the left arrow key, you get back to LANGUAGE, press ENTER for saving and leave the programming mode with ESC.

The *irrigation radius* is the radius from the central tower to the final point of the pivot (final tower incl. overhang)

```
Language           English
Irrigationrd        350m
```

Figure 5.4: Setting of language and irrigation radius

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬.
IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚.

5.1.3 RADIUS OF LAST TOWER AND FLOW

The ***radius to the final tower*** is the radius to the last span without overhang.

The ***flow*** is the calculated or measured system flow of the plant in m³/h.

These data are *important* for an exact calculation of the cycle time of the final tower.

For *changing* follow the same procedure as in the menus above.

```
Rad. last To        450m
Flow              125m/h
```

Figure 5.5: Parameters radius to last tower and flow

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬.
IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚.

5.1.4 PERIOD OF TIME AND PIN

The ***Timeperiod*** is the sum of all *switch-on and switch-off times of the final tower*.
Depending on the set precipitation, the switch-on and switch-off times will be calculated and the sum results in the period of time.

The ***PIN*** is the *PIN CODE* of the *SIM card* which has been inserted into the GSM modem.
IMPORTANT! Before inserting the SIM card into the modem, set the PIN CODE, because otherwise you would possibly need to set a PUK CODE by means of a mobile phone.

For *changing* follow the same procedure as in the menus above.

```
Timeperiod              60s
PIN                    0000
```
Figure 5.6: Setting of period of time and PIN input

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬.

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✛.

5.1.5 TELEPHONE NUMBER

You can set the **phone number** to which *all SMS will be sent*.

SETTING: Enter by pressing the key ENTER; the cursor changes to the first number that needs to be entered.
After ✛ set the country code without 0 and then the area code and phone number.

By using + and – you can choose numbers from 0-9. By pressing the right arrow key you change to the next position for the number. This way you can enter number for number. Save with ENTER or leave the programming mode with ESC.
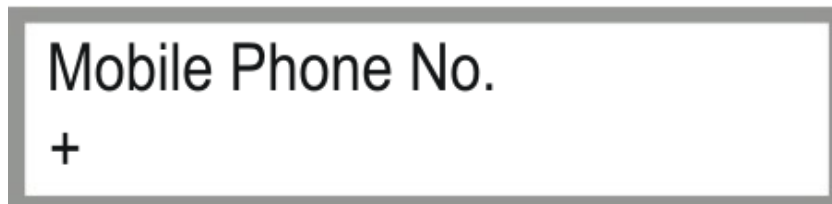
```
Mobile Phone No.
+
```
Figure 5.7: Entering the phone number

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬.

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✛.

5.1.6 ON DELAY / SECTOR DELAY

ON delay is the delay for the engines in minutes with pump output switched on in order to irrigate with full pressure right from the beginning.

Sector delay also makes the engine rest for a short time but this time for changing the sector and not for restarting the plant.
For changing follow the same procedure as in the menus above.

```
On Delay                2m
Sektor Del.             1m
```
Figure 5.8: Parameters for ON delay and sector delay

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬.

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✛ .

5.1.7 PRESSURE SWITCH AND PRESSURE DELAY

You can activate the monitoring of the system pressure with by pressing a connected press switch: *PRESSURE SWITCH ON*
If you set the value to *OFF*, the system moves regardless of whether water pressure is present or not.
If you set the value to **AUT**, the machine starts automatically after a pressure drop as long as sufficient water pressure has been restored.

The *PRESSURE DELAY* is the minimum time in minutes that the pressure can drop below the standard value before displaying a *pressure ERROR* and stopping the pivot.

```
Pressure Swi.          ON
Press. Delay           5m
```

Figure 5.9: Parameters for pressure switch and pressure delay

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✛ .

5.1.8 MAXIMUM SPEED AND DISPLAY LIGHT

The *MAXIMUM SPEED* is a calculating factor in order to calculate the cycle times with the aid of the set precipitation. This parameter depends on the mounted gears, the engine speed, the diameter of the wheels and the condition of the surface.

DISPLAY LIGHT is the time for switching off the background lighting (if you do not press any key for the set time, the background lighting will be switched off).

```
M. Speed           155 m/h
Display L.            200s
```

Figure 5.10: Setting of max. speed and display light

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✛ .

5.1.9 FORWARD EXTERNAL START AND REVERSE EXTERNAL START

You can activate an external start via two INPUTS.

When applying a voltage at the entry for forward or reverse and when external start is switched on, the pivot starts.

Figure 5.11: Parameters for forward external start and reverse external start

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

5.1.10 ERROR SMS / START SMS

This function serves to set sending of SMS.

ERROR   SMS will be sent if an error occurs.

START   SMS will be sent in case of a start from the key pad or an external start of the pivot (when starting via SMS you always get a check-back signal).

Figure 5.12: Setting of SMS in case of error and start

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

5.1.11 STOP SMS AND SECTOR CHANGE SMS

STOP   SMS when the machine stops.

Sector change SMS when getting to the end of a sector or when changing the driving direction.

Figure 5.13: Setting of Stop SMS and sector change SMS

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

5.1.12 INTENSITY AND OPERATION TIME STOP

Intensität (intensity) serves to set the brightness of the display.

With parameter "op. timestop" = ON, the machine will stop when the calculated irrigation time has elapsed.

| Intensity | 110 |
| op. timestop | OFF |

Figure 5.14: Setting of intensity and operation time stop

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .
IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

5.1.13 ZERO POSITION AND GPS

Zero position serves to shift the zero degree position.

The zero position setting of 0° refers exactly to the GPS north.

The ***GPS*** offers the possibility of an operation with 10 different positions.

0:   GPS is deactivated
1 to *10*:   stored positions

| Zeropos. | 0° |
| GPS | 0 |

Figure 5.15: Parameter for shifting of zero position and for GPS activation

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .
IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

5.1.14 FLOW FACTOR

Conversion factor for flow transmitter pulses.
Configuration of communication: *OFF*, *SMS* or *DATA*
OFF: no data transmission
SMS: data transmission via SMS to the number entered
DATA: visualization on PC

| FlowFaktor | 300 |
| Remote Con. | OFF |

Figure 5.16: Flow factor and configuration of communication

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ▬ .
IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ✚ .

5.1.15 **MOVEMENT TRACING**

With *movement monitoring*, you can monitor the movement of the machine. The value refers to the time in minutes during which the machine must travel 1° with an irrigation amount of 0 mm.

GPSErrorTime is the maximum time in minutes that will be waited for the reception of a GPS signal.

| MovementMon. | 10m |
| GpsErrorTime | 5m |

Figure 5.17: Movement tracing & GPS error time

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ➖.

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ➕.

5.1.16 **ENDGUN1-4 / GPS TIMER**

If you have purchased the option of *endgun control for up to 4 endguns*, you can activate the additional endguns with **Endgun1-4 On**. Set the value to "0" if you have one endgun. Set the value to "1" if you have two endguns, etc. *(see also **4.1.6**)*

The **GPS Timer** is an indicator of how often a GPS signal is received. The **GPS Timer** counts continuously in seconds, starting at "0" and resets to "0" once a new signal is received.

| Endgun1-4 On | 0 |
| GPS Timer | 0 |

Figure 5.18: Endgun setting / GPS Timer setting

The second line alternates every few seconds between displaying the number of *visible* **satellites** and the **HDOP** value. The **HDOP** value provides information about the quality of the position determination; the lower this value is, the higher the precision. An *HDOP value* of 0 means no deviation from the actual position.

| Endgun1-4 On | 0 |
| SAT 0 | HDOP 0 |

Figure 5.19: Endgun setting / Display GPS information

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ➖.

IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ➕.

5.1.17 **COMM.TIMEOUT / PINGTIME**

Settings for GPRS-modem when using visualisation.

Comm.Timeout: Maximum time period after what a communication error is registered.

Ping Time: Time period wherein a server ping is executed.

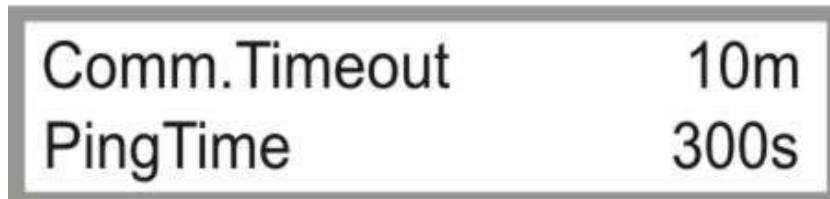**Attention:** This window is not used without *GSM* or *GPRS modem.*

Figure 5.20: Setting Comm.Timeout & PingTime

IN ORDER TO GET TO THE NEXT PARAMETER BLOCK PRESS THE KEY ━ .
IN ORDER TO GET TO THE PREVIOUS PARAMETER BLOCK PRESS THE KEY ＋ .

5.1.18 ADDRESS AND PORT NUMBER

Use the address entered on the PC configuration for the relevant machine (*see Fig. 5.22 marked red).*
These numbers are available only once and they are clearly defined.
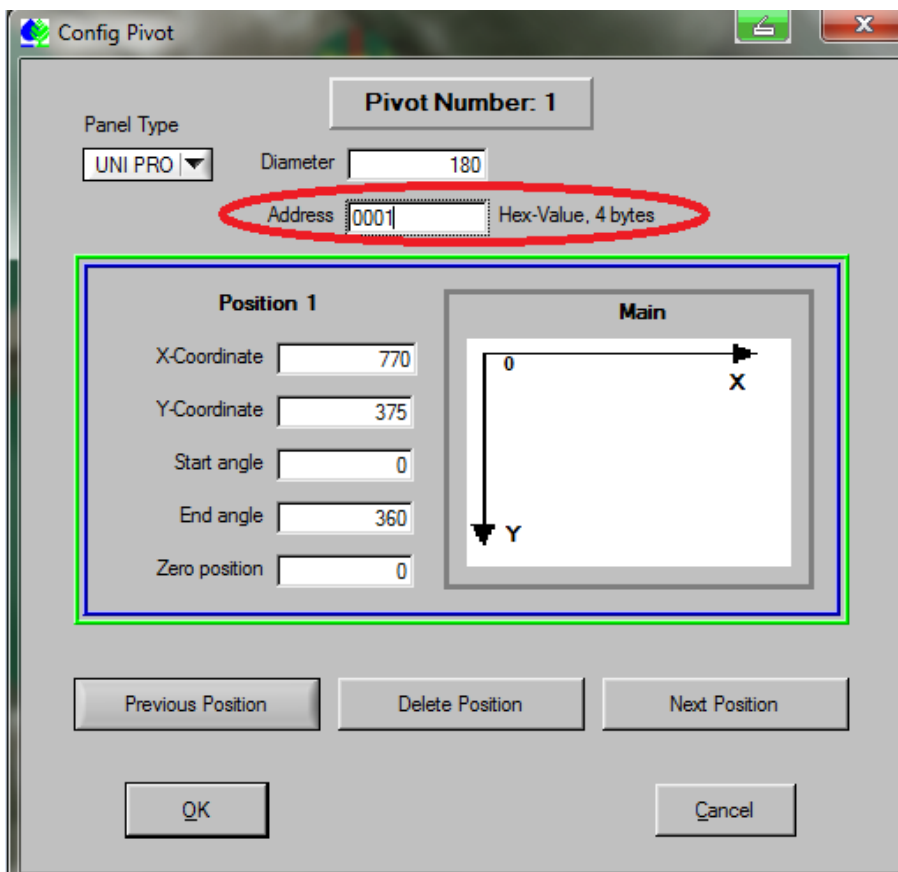

Figure 5.21: Input of address and port number

Figure 5.22: Address in PC configuration

Under parameter "port number", the internet connection number used is set.
The control unit tries to establish a TCP connection to the PC control centre on the port set.
The same port number must be entered on all machines and on the PC configuration (*please mind port forwarding*).

6 OPERATING VIA SMS

6.1 RECEIVING SMS MESSAGES WITH THE PRO CONTROLLER

You can receive various SMS messages with a standard GSM mobile phone when connecting a GSM modem to the Pro Controller. These can be STATUS messages after a STOP or a START of the machine or error reports, e.g. after a pressure loss or off-track running.

Procedure:
1) Start the Pro Controller.
2) Set the telephone number and the PIN Code in the machine parameter menu.
3) Shut off the Pro Controller and connect the GSM modem to the Pro Controller.
4) Turn on the Pro Controller and observe the initialization; GSM MODEM OK should be indicated on the display.
5) After successful boot procedure, an SMS is sent to the set telephone number. Then all functions of the Pro Controller with SMS function are active (sending error reports, status messages, acknowledgements per control SMS).

6.2 CONTROLLING THE PRO CONTROLLERS BY MEANS OF SMS MESSAGES

You may confirm the functions START, STOP or change the precipitation depth by SMS.

Starting the Pro Controllers by SMS

In order to start the Pro Controller, you need to send an SMS to the telephone number of the PRO GSM module, saying:

FWD-CMDxx   *or*   **FWD-CMD**   (*old version:* ***FWDxx / FWD*** *or* ***FWD_CMDxx / FWD_CMD***)
RVW-CMDxx   *or*   **RVW-CMD**   (*old version:* ***RVWxx / RVW*** *or* ***RVW_CMDxx / RVW_CMD***)

Attention: ALL THE LETTERS NEED TO BE CAPITAL LETTERS**!**

xx stands for the chosen precipitation in mm. "xx" always must have two digits. With a chosen precipitation of less than 10, you must enter, e.g., **FWD-CMD05** into the SMS in order to start forward operation of the machine with a precipitation of 5 mm (*longer texts will not be accepted*).

ATTENTION: Changing precipitation rate is only possible for first segment.

Stopping the Pro Controller via SMS

In order to stop the Pro Controller, you need to send an SMS to the telephone number of the PRO GSM module, saying:

STOP-CMD   (*old version:* ***STOP***)

STATUS monitoring via SMS

In order to get the current STATUS of the Pro Controller, you need to send an SMS to the telephone number of the PRO GSM module, saying:

STATUS-CMD   (*old version:* ***STATUS***)

Replies of the Pro Controller
To each SMS sent, the Pro Controller returns a check-back SMS, reading:
- Machine status (e.g.: forward)
- Precipitation forward and reverse in mm
- System time
- Current cycle
- Maximum cycles
- Remaining irrigation time

7 FIRMWARE UPDATE

7.1 WITH PDA / LAPTOP

1.) Put the main switch of the control panel in position „OFF"
2.) Open the inner door and connect the PRO-module via a serial cable to the laptop (PC or PDA)
3.) Turn the main switch in position „ON" while pushing the MENU key (display shows: FLASH BOOTLOADER)
4.) Start the programme „**DownloadTool**"
5.) Choose the correct COM interface (error message **comerror** if wrongly chosen)
6.) Load the latest file valid with the browser (e.g. ProzenttimerV5_28.hex)
7.) START DOWNLOAD – files should be downloaded without interruption until message: **Software Download successfully finished**
8.) Separate the serial connection
9.) Wait until display shows *load eprom,* the standard parameters are loaded and the PRO is booted.

7.2 WITH BAUER PROGRAMME LOADER

The firmware can be updated with the separately available *Programme Loader.*

1.) Put the main switch of the control panel in position „OFF"
2.) Open the inner door and connect the PRO-module via a serial cable to the *Programme Loader.*
3.) Connect power cable to the PRO-module (orange plug).
4.) Connect USB stick with desired *firmware* version to the *Programme Loader*.
   ATTENTION: File needs to be stored in the root directory and renamed to "firmware.hex" (e.g. ProzenttimerV5_28.hex -> firmware.hex).
5.) Turn the main switch in position „ON" while pushing the MENU key (display shows: FLASH BOOTLOADER)
6.) Indicator light flashes, upload process is starting.
7.) Wait until display shows *load eprom,* the standard parameters are loaded and the PRO is booted.
8.) Separate the connection the *Programme Loader.*
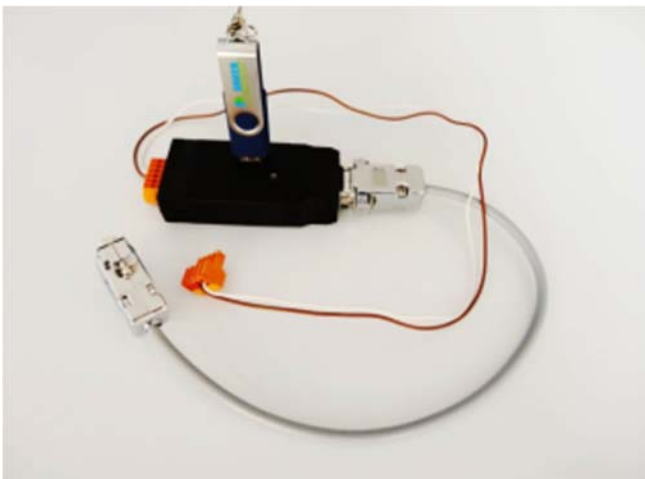
7.3 RESTORE FACTORY SETTINGS

1.) Turn main switch to „OFF". Turn main switch to „ON" while pushing **R+F**. Wait until display shows *load eprom*. The standard parameters are loaded and the PRO is booted.

8 TECHNICAL DATA

Control unit	
Voltage	230 V/50 Hz (+/- 10 %) or 12V -
Input	4 VA
Ambient temperature	0 to 65 °C
Dimensions (HxWxD)	85x90x75
Breaking capacity of the relays	230V~ 5A
Entries	230 V/50 Hz (+/- 10 %)

9 CONNECTION AND WIRING DIAGRAM

All inputs and outputs need to be connected at the rear with three plugs.