



BAUER

FOR A GREEN WORLD

OPERATING MANUAL

for

BAUER - MONOSTAR



Version: 1/2007

OPERATION MANUAL
MONOSTAR
E

INTRODUCTION

Thank you for purchasing a **BAUER - MONOSTAR!**

This **operating manual** is an important document and describes the operation and maintenance of the **BAUER - MONOSTAR**.

The manual is as detailed as possible. However, should you have any questions feel free to contact your dealer or directly the **BAUER** Company in Voitsberg / Austria.

We would like to draw your attention to the fact that the content of these operating instructions manual is not part of any previous or existing agreement, commitment or legal relationship and that such agreements, commitments or relationships are not altered by this manual. All obligations of **BAUER** result from the purchase agreement that also contains the full and exclusively valid warranty provisions. The contractual warranty provisions are neither extended nor limited by the contents of these operating manual.

Any and all information contained herein is based on the latest product information available at the time of printing.

BAUER reserves the right to make changes at any time without entering into obligations of any kind!

The **BAUER - MONOSTAR** is designed for safe and reliable operation, when operated in accordance with the operating instructions.

Read this manual carefully before putting the **BAUER - MONOSTAR** into operation.

The notes contained herein on operation, control and maintenance must be precisely observed.

If these requirements are met, the **BAUER - MONOSTAR** will perform to your fullest satisfaction for many years!



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

This manual is to be considered an integral part of **BAUER - MONOSTAR**. Suppliers of both new and used systems are advised to put down in writing that they delivered the manual together with the system.

Hand these instructions over to the operators. State the serial number of the **BAUER MONOSTAR** on all inquiries, letters, orders of spare parts or in case of warranty issues.

We wish you a lot of success with your **BAUER - MONOSTAR!**



Owner of the machine

This machine with the serial number	<input type="text"/>
Belongs to	
Name	
Address	
Residence	
Phone	
Dealer	
	Bauer dealer
Service technician	
Phone	

Handing over record

A duly test run has been done in the presence of the client or a nominated agent of the client. The client confirms by signing that the machine has been test run before taken over. A copy of the handing over record needs to be sent back to the company BAUER Ges.m.b.H.

Comments:

For the client

For the company BAUER GMBH



Product details

Date of delivery

Date of putting into operation

Type	BAUER MONOSTAR		
Serial number		
Central tower pivoting arrangement	yes	no	
Travel tower electrically swivelling unit	yes	no	
Span length (m)
Overhang length (m)	1	2	
Booster pump	yes	no	
Endgun	yes	no	
Nozzling		
Supply hose	diam.....	length	
Power generator		
Comments		
		

Producer of the machine:

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A – 8570 Voitsberg
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Fax: +43 3142 200–320 / -340
e-mail: sales@bauer-at.com
www.bauer-at.com

Dealer:

Name:

Address:

.....

Phone / Fax:



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1 GENERAL INSTRUCTIONS

CE SYMBOL



The **CE symbol** that has to be affixed on the machine by the manufacturer outwardly demonstrates compliance of the machine with the directives for machines and other relevant EU directives.

EU conformity certificate (see Annex)



WARNING !

This "Warning" symbol refers to important safety instructions in this manual. Whenever you see this symbol be aware of possible injury hazards. Read the note following the symbol very carefully and inform the other operators accordingly.



CAUTION !

Non-observance of this instruction may damage or destroy the machine or individual components.

NOTE!

It is very important to observe this note or instruction carefully!

Qualified operators

These are persons who on behalf of their training, experience and instruction as well as their knowledge of relevant standards, rules, precautions to be taken for accident prevention, and prevailing operating conditions, have been authorised by the person in charge of plant safety to perform the respective tasks required, and in doing so are able to recognise and avoid potential hazards. Among other things, knowledge of first-aid procedures is also required.

Product liability

According to the product liability law every farmer is an entrepreneur!

According to §9 PHG (Product Liability Law), liability for damage to corporeal things caused by defective products is expressly excluded. This exclusion of liability also applies to parts not manufactured by **BAUER** itself but purchased from external suppliers.

Obligation of information

Any time the customer hands over the machine to third parties he must also pass on the operating instructions, and the person taking over the machine must be trained in its operation with reference to the operating instructions.

Intended use

- BAUER - MONOSTAR has been constructed exclusively for use in normal irrigation (intended use).
- Any employment beyond this normal use is considered non-conforming. The manufacturer is not liable for damage resulting from such non-conforming use, the sole liability for damage from non-conforming use is with the user.
- Intended use also includes compliance with manufacturer's operating, maintenance and service instructions.
- BAUER - MONOSTAR may be used and operated only by persons who are familiar with the system and aware of the hazards involved.
- All relevant rules for accident prevention as well as any other generally accepted specifications and regulations relating to safety, work medicine and traffic law must be strictly observed.
- Unauthorised modifications on the machine release the manufacturer from liability for damage resulting there from.

2 WARNING SIGNS

Dangerous spots on the MONOSTAR are specifically marked by safety stickers. These stickers must be posted in a clearly visible way at the mentioned points in order to protect persons who are working inside the operating range of the machine..

1.   **WARNING !**

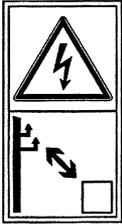
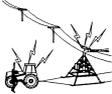
Study and observe the manual and all safety instruction carefully before you put the system into operation.

2.   **WARNING !**

Before maintenance and repair work, always stop the system, disconnect all power, and read the operating manual.

3.   **WARNING !**

1. This system is powered by 400 Volts!
Electric shock hazard / injury hazard !
2. Do not attempt to check any components while the system is live!
3. Never open control cabinet door unless MAIN SWITCH is turned down.

4.   **WARNING !** 

1. Always mind a safety distance from overhead high voltage line when working with the MONOSTAR.
2. Pull towable systems only at a safe distance from electric power lines.
Make sure that the water jet from spray nozzles and end gun does not hit electrical lines. The water jet of the nozzles and of the end gun must not touch electrical wires!



5.



WARNING !

The system can start automatically. Always keep a safe distance from the mobile towers.

6.



WARNING !

1. Do not remove shaft guards.
2. When repair work is performed on the system, make sure that system cannot start running automatically. Disconnect the complete system from power.

3 GENERAL

The **BAUER MONOSTAR** is a sprinkler irrigation system consisting of a two-wheel central unit, a spray boom and of one or two overhangs.

The delivered MONOSTAR is towable.

Water supply is ensured by hydrants and a supply hose. The two-wheel central unit has got a diesel power generator providing the required power for the machine drive. The control center is also mounted onto the central unit.

The central unit and the boom (end tower, span) are electrically driven. By varying nozzle type and size and system speed the water application rate may be tailored to any kind of crop and soil requirements. The travel direction of the system is determined by a furrow drawn in the soil (furrow guidance).



4 GENERAL INSTRUCTIONS FOR SAFETY AND ACCIDENT PREVENTION

Check the operational safety of the machine before every start.

1. In addition to the instructions in this manual, be sure to observe all specifications generally valid for safety and accident prevention!
2. The warning signs and notes affixed to the machine contain information essential to safe operation. Observing them serves your own personal safety!
3. Do not start the machine unless all guards and safety devices are mounted completely and in proper working position!
4. Acquaint yourself with all system components and controls as well as their respective functions, before you start to work. It is too late for this when the system is already running!
5. Check the vicinity of the system before start-up (children!). Make sure that sight is unobstructed!
6. For towing, couple the device according to the instructions and fix it only at the prescribed devices!

Electrical system check-up

1. Before the first start-up, check the electrical system and ensure that the installation complies with the safety requirements.
2. Check the electrical system visually before every start-up.
3. All work beyond normal maintenance of the system is to be performed by a qualified service person only!
4. Never repair or service any part of the before all power has been disconnected!

Maintenance

- As a rule, maintenance and cleaning work as well as repairs of malfunctions may be done only with the drive and the motor turned off!
- Check proper seat of nuts and screws regularly, and tighten them, if needed!
- Dispose of oil, grease, and filters in accordance with regulations.
- Always disconnect system from power before starting any work on the electrical system!
- Before electrical welding on the system itself or built-on components, disconnect the mains or generator supply cable!
- Spare parts must meet minimum technical requirements by the manufacturer of the device.! This is guaranteed by original equipment parts!

5 SAFETY PRECAUTIONS FOR MONOSTAR

In addition to the GENERAL INSTRUCTIONS FOR SAFETY AND ACCIDENT PREVENTION, the following safety principles must be observed when operating the BAUER - MONOSTAR.

5.1 Electrical system



WARNING !

Since system is powered by 400V, always practice extreme caution when dealing with the electrical system and the electric drive !



1. All metal parts of the unit must be interconnected.
2. In addition the yellow-green marked protective conductor, which goes along with the power supply, must be connected to the protective conductor terminal in the control center.
3. Before working on the electrical system, make sure the system is disconnected from all poles and sources, and the power generator is shut down.
4. Provide a lock-out at the MAIN SWITCH to protect yourself against unintentional restarting.
5. Verify safe isolation of electrical system.
6. Never repair or short-circuit a fuse by means of a wire or any other item.
7. Immediately repair or replace all wires with defective isolation.
8. Short-circuiting of system safety circuit is to be done only by a qualified person and only for the purpose of realigning the system.

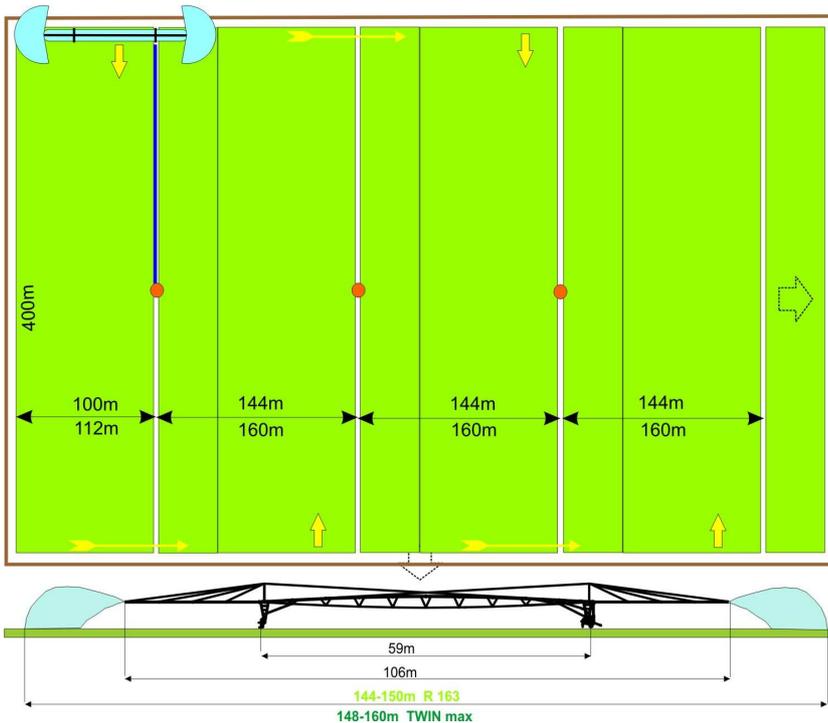
MECHANICAL SYSTEM



WARNING !

1. Never service or repair any part or system component while the machine is operating.
2. Always disconnect the system from power before starting any maintenance work. Turn the MAIN SWITCH to „0“ and lock the switch to prevent unintentional restarting. Be sure to do this by your own!
3. Before you start, make sure that all persons have left the operating range of the system.
4. Make sure that no objects or vehicles are in or near the system tracks when system is running/starting to operate.
5. When the system is operating, the towers come on and off automatically. Keep a safe distance from the towers.
6. Never step on the system while it is running.
7. Utmost care is required by the operator when the MONOSTAR is aligned.
8. Always turn off the system and water supply before working on sprinklers or spray nozzles.
9. Use adequate means of access (ladder, elevating platform) for work on sprinklers or spray nozzles.
10. Proceed with the utmost caution, when system is working near or under electric power lines, so that neither the MONOSTAR nor the water jets of sprinklers get in contact with live wires.
11. When moving towable systems, make sure that the system does not get in contact with a power line.
12. Make sure that no neighbouring plots or roads are wetted by the end gun. This could cause damage or accidents.
13. If fertilisers or other chemicals are added to the irrigation water, avoid mist and do not inhale it.

6 Use options of the MONOSTAR



Type A: towable

Machine with 2 overhangs allows strip widths up to 160 m.

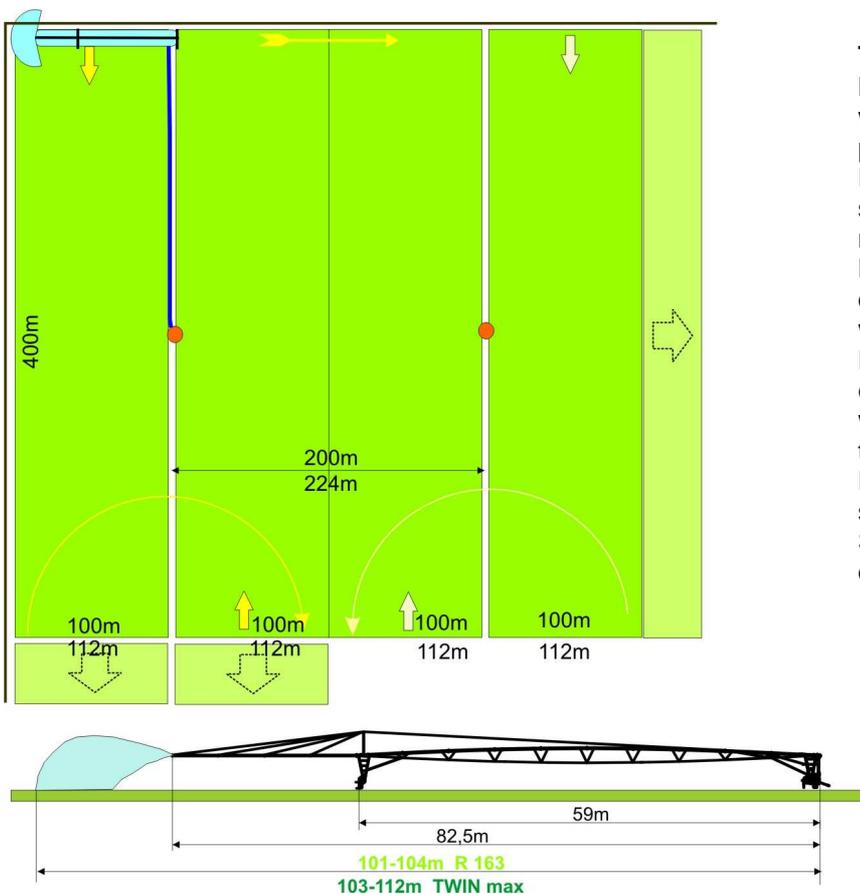
Programmable control cabinet for setting application rate and operation mode.

Easy and time saving moving of the machine by towing it by tractor from either side

Electrical swivelling of the central tower wheels by control box for moving the system – optional equipment for end tower.

Second hose connection for end tower – by option.

Steering device for autonomous driving of the machine – by option.



Type B: pivoting / towable

Machine with 1 overhang allows strip widths up to 224 m when operating in pivoting mode.

Programmable control cabinet for setting application rate and operation mode.

Hydraulically lowering pivot stand (by option) ensures high system stability when operating in pivoting mode.

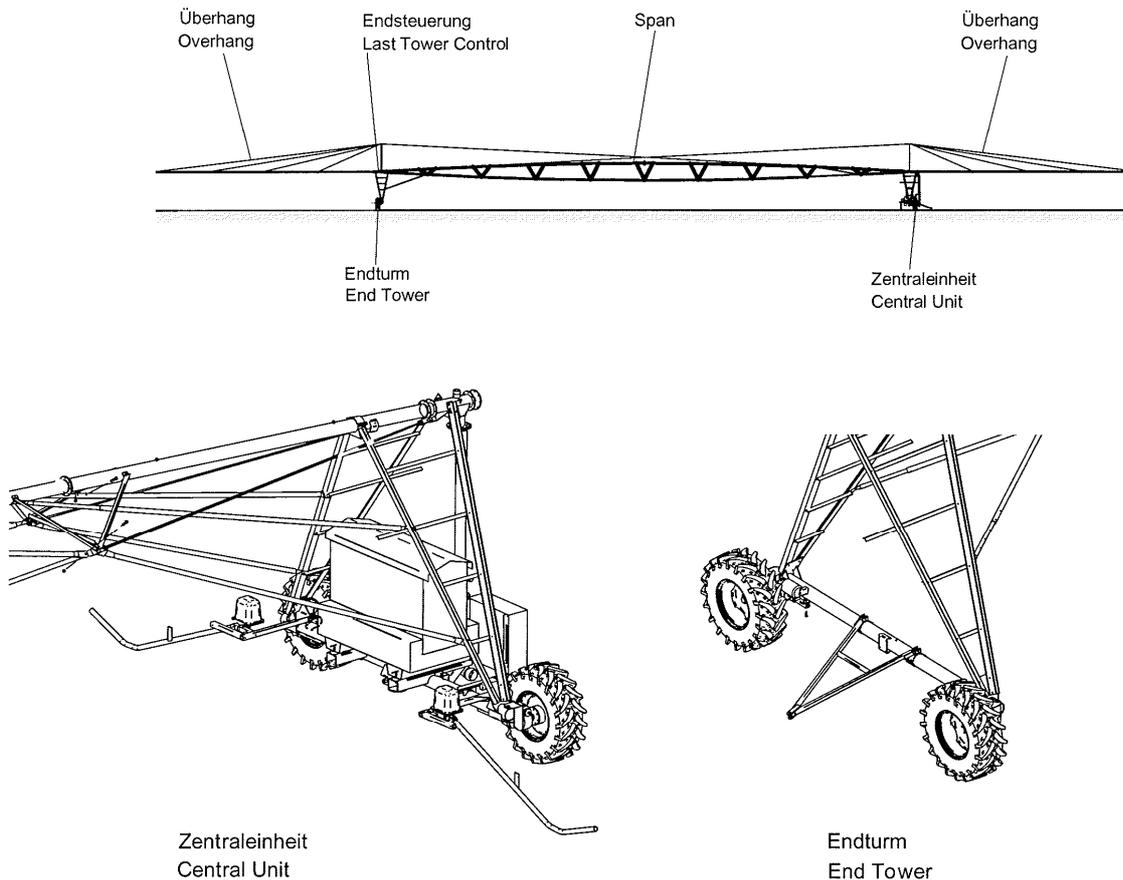
Easy moving of the system due to electrical swivelling of central tower wheels – available by option for end tower too.

End stop plates guarantee high safety during pivoting (by option)..

Steering device for independent driving of the machine (by option).

7 TECHNICAL DESCRIPTION

7.1 Components of the MONOSTAR



CENTRAL TOWER

Travelling central unit (swivelling wheels) with linear control, diesel generator unit, connection for water supply, control center.

SPAN

Arched truss consisting of the water-carrying pipes, of truss rods and of V-jacks.

END TOWER

Carries the span weight and provides for the electromechanical drive of the system. Consists of wheel carrier, tower bracing angle, electrical drive motor, drive shafts, wheel gear and wheels.



END CONTROL

Turns on and off the connecting motors of the end tower

OVERHANG

Overhanging part from last tower to system end and respectively from central unit to system end.

END GUN

Wide range sprinkler at the end of overhang for increased spaying range

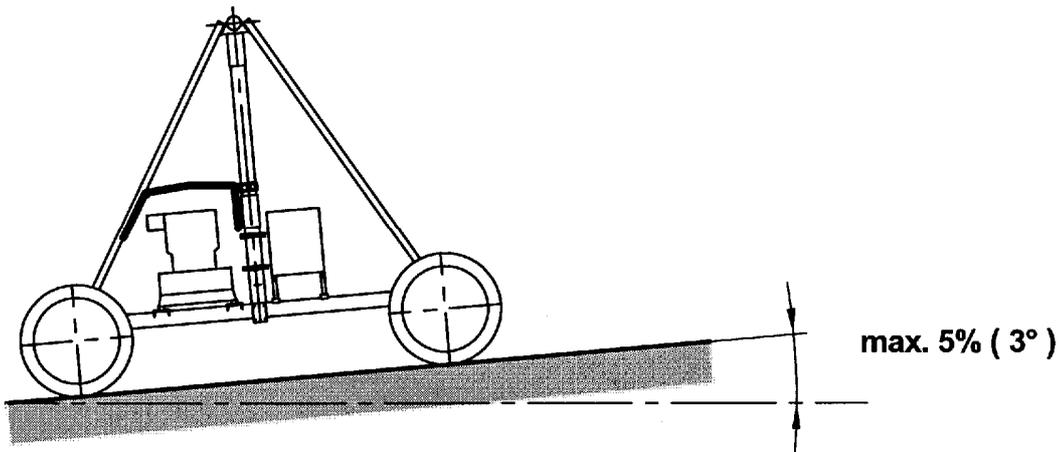
BOOSTER PUMP

Electric pump on the last tower for increasing the pressure to end gun

8 USE OF MONOSTAR

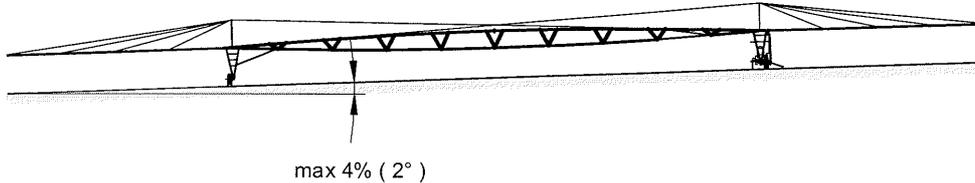
8.1 Limits

8.1.1 Inclination



The maximum permissible inclination along the travel direction in linear mode for the central unit as well as for the end tower is 6.0°.

8.1.2 Permissible bending angles



Maximum permissible inclination along the span is 2.0°.

Maximum difference in elevation between central unit and mobile tower is 2 m!

8.2 Track determination and maintenance

The determination of the track is extremely important, because it has an essential influence on the control of the system.

- Track depth: max. 140 mm
- Track depth with pivoting systems inside rotating range: max. 100 mm
- Track of central unit: completely plain and free of grooves

8.2.1 Travel direction

Before preparing the seed bed and cultivating the crop the following needs should be considered:

- Standard operation of the system is vertical to crop rows.
- If the seed bed is deeper than 100 mm, it is recommended to make the system operate along crop rows.

If it is necessary to operate the system along the crop rows, apply one of the following methods to determine the track.

Method I

1. Before cultivating make a „dry“ run along the entire field. That way the tracks are determined.
2. Use these tracks as guidance for the crop rows to be cultivated.
The distance of the first crop rows to the left and to the right of the track shall be 250 mm.

Method II

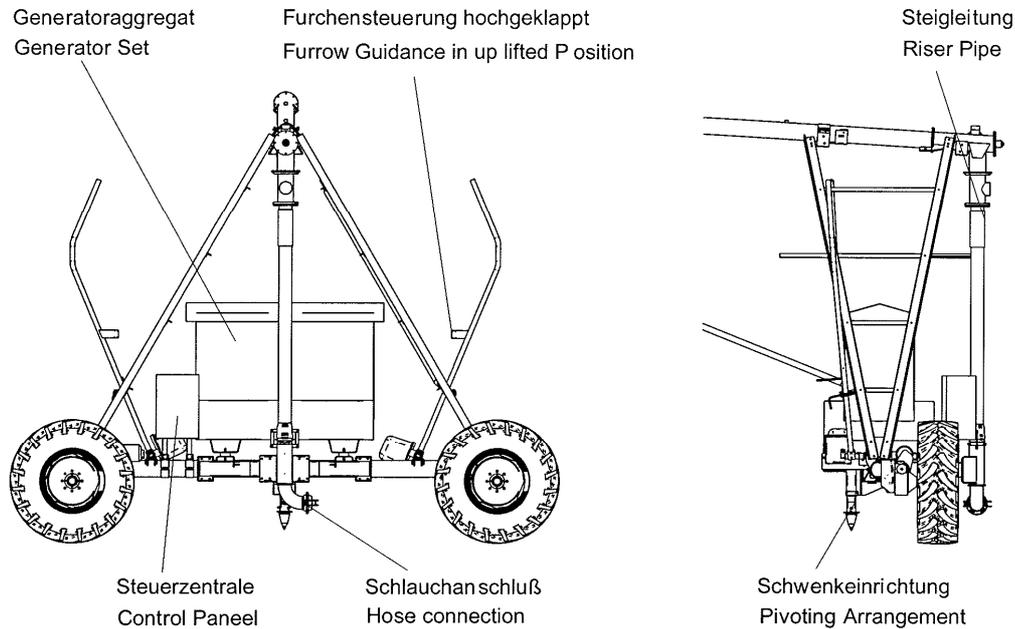
1. Plant the entire field parallel to the system's travel direction.
2. Make a „dry“ run along the entire field.
3. Level out the crop rows 250 mm to either side of the tracks. That way deep tracks and cracks between the crop rows will be prevented.
An exact run of the system is guaranteed.

Instructions for determining tracks

1. Make a „dry“ run over the entire field with timer set to 100 %.
2. Continue by making a "wet" run over the entire field with timer set to 80 - 90 %
Subsequent operation of the system as desired.

If the tracks become too deep, they need to be levelled out or filled up. Then make a dry run over the entire field with timer set to 100 %. Return in „wet“ mode with the same timer setting.

9 MONOSTAR CENTRAL UNIT



The central unit is towable.

The central unit consists of the following components:

- Main frame with two electrically swivelling wheels
- 2 drive gear motors 1.1 kW, drive of the two wheel gears via cardan shaft
- supply connection on machine side with HK coupling
- Supply riser pipe DN 125, electrical shut-off valve
- Control center MONOSTAR
- Linear guidance (Furrow guidance)
- Diesel generator unit 8kVA
- Supply hose depending on system capacity 3" – 4", or
- PE-pipe 90mm – 110mm.

The central unit wheels are swivelling electrically. For the return run it is not necessary to change the connecting point of the central unit supply hose at the end of the field.

10 CONTROL CENTER „MONOSTAR“

Design and material according to ÖVE and VDE norms, the built-in components correspond to the IEC norms as well as to the VDE regulations.



- Water-proof polyester cabinet (system of protection IP 54) with lockable front door
- Swivelling operating panel, can only be opened, if MAIN SWITCH is turned off.
- System operating voltage 400 V
- Control voltage: 230 V one phase
- Isolation transformer for control voltage
- Commercial type industrial switch items
- Cable connection with cable brackets
- Protection devices



CAUTION!

To protect from soiling and splash water close the control center during operation.



1. MAIN SWITCH
2. Control panel MONOSTAR
3. Switch „MACHINE ON-OFF“
4. LED key „SAFETY“
5. Switch „DRIVE ON-OFF“
6. Switch „CENTRAL TOWER – END TOWER“
7. Switch „GENSET ON OFF“
8. Switch „EMERGENCY STOP“



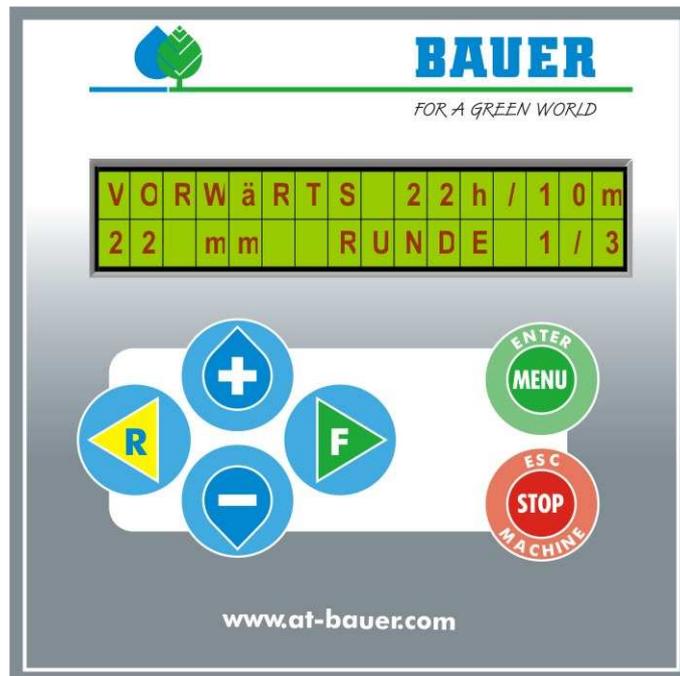
10.1 Standard built-in components

10.1.1 Main Switch

With the MAIN SWITCH the entire power infeed is shut on or off.
In position "I" the electric power supply of the machine is established.
In this position the hinged control panel is locked for safety reasons.

In position "0" the power supply of the system is established.
In this position the MAIN SWITCH may be locked against unintentional switching on.
The hinged control panel can only be opened in this switch position.

10.1.2 Control panel MONOSTAR



10.1.2.1 Display

2x16 alphanumeric LCD, with backlight. If no key is touched within a preset time the backlight automatically turns off (adjustable backlight timer).

10.1.2.2 Function keys

START FORWARD (F) Starts forward run (clockwise)

START REVERSE (R) Starts reverse run (anti-clockwise)

MENU and ENTER By pressing this key you get access to user level – it has got two more functions: getting access to parameter programming mode and confirming the set data (memorizing the parameter).



STOP (ESC and Machine) This key stops machine run and has got two more functions: getting access to expert level and exiting programming mode (without memorizing the parameter).

+ With this key you change application rates and parameter settings.

- With this key you change application rates and parameter settings.

10.1.2.3 Turning on

10.1.2.4 Booting

After turning on the hardware MONOSTAR will appear on the display as well as the installed software version with loading date.

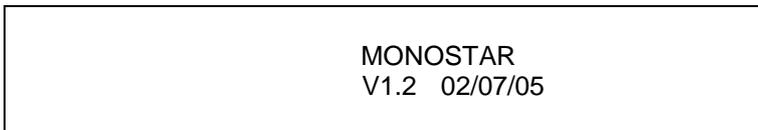


Fig 2.1: Display after turning on

After successful booting and initialising of the hardware the status window opens (see section 0).

10.1.2.5 Status window

The status window informs about the actual operation mode of the MONOSTAR. After successful booting the status window opens automatically. The displayed parameters are permanently updated. .

10.1.2.5.1 Status window

The status window (fig. 3.1) displays a two-column table informing about the actual operating mode. Please follow the explanation here after.

ADVANCE	50H/39MIN
20 MM	LINEAR

Bild 3.1: Status window

Operating mode

The following operating modes are displayed.

- OFF MONOSTAR out of action
- FORWARD MONOSTAR advances
- REVERSE MONOSTAR returns
- INTERMED:STOP MONOSTAR has reached intermediate stop
- DRIVE MONOSTAR is DRIVE
- SAFETY MONOSTAR turned off because safety circuit was cut
- PRESS.STOP MONOSTAR turned off because water pressure is too low
- START MONOSTAR waits for running out of start holding time, when pump is in action
- SWIVELLING MONOSTAR is in operation mode "wheel swivelling"



- I2C FAILURE Failure of I2C clock

Remaining irrigation time

Display in hours and minutes of remaining time until end of program. If the MONOSTAR is out of action, it displays 0H/0MIN. The calculated irrigation time will not comply with the real irrigation time because of rounding errors and inexact machine parameters (especially of driving speed). If the MONOSTAR finishes its program before the end of the calculated irrigation time, the latter will be reset to zero. If the MONOSTAR continues irrigation after the end of the calculated irrigation time, the latter will also be displayed with zero, even though the MONOSTAR has not finished its program.

Application rate

When the MONOSTAR is running, it displays the actual application rate for the actual travel direction, when the MONOSTAR stands still, it displays the latest application rate.

10.1.2.6 **Parameter menu**

By pressing the MENU key you get access to the parameter menu which consists of a series of windows. They will be scrolled through by pressing the + and – keys, each window displaying 2 parameters.

Press the ENTER(Menu) key to get access to programming mode. The cursor at the first parameter starts blinking. Set parameter with + and – keys. Use RIGHT ARROW (F) to move to second parameter. Use LEFT ARROW (R) to return to first parameter. Press ENTER to memorize, press ESC to exit without memorizing.

The functions of the different menu items are described here after.

10.1.2.6.1 Description of parameters

10.1.2.6.1.1 *Mode*

This parameter changes the actual operating mode

- LINEAR Normal linear operating
- PIVOTING End tower pivots around central unit
- WHEEL SWIVEL Wheels of central unit and end tower (by option) respectively are swivelled electrically
- DRIVE autonomous driving of the MONOSTAR

Setting range: Press ENTER to change parameter. Press + or – keys to change value, confirm value by pressing ENTER and exit programming mode with ESC.

10.1.2.6.1.2 *Travel length*

Irrigation length

This value is twice the length of the supply hose.

Setting range:

Press ENTER to change parameter. Press + or – keys to change value, confirm value by pressing ENTER and exit programming mode with ESC.

PRESS – KEY TO GET ACCESS TO NEXT PARAMETER BLOCK

10.1.2.6.1.3 *Failure log*



This menu displays the last 20 failures memorizing date and time.

If no failure has been memorized **NO FAILURE** will be displayed, otherwise you will be able to identify the failure with the displayed text.

Scroll failure log with the RIGHT and LEFT ARROWS; the actual scrolling direction is signalled by the arrows displayed in the left and right corner of the screen.

The latest failure is always displayed first when entering the failure log.

Failures are displayed as follows:

- **NO FAILURE**

No failures occurred so far, failure log is empty. No effect when pressing LEFT or RIGHT ARROWS

- **SAFETY CIRCUIT**

Safety circuit has been cut

Possible causes: emergency stop at control cabinet has been actuated, doglegging or additionally mounted end switch has been triggered.

- **RTC ERROR**

Real Time Clock error or I²C Bus error (repeated error warnings signal a hardware problem)

- **. PRESSURE SWITCH**

Water pressure is too low for set monitoring time.

10.1.2.6.1.4 Wet running hours

Displays running time in hours and minutes when operating with pump switched on.
Reset only when reloading preset parameters.

10.1.2.6.1.5 Dry running hours

Displays running time in hours and minutes when operating with pump switched off.
Reset only when reloading preset parameters.

10.1.2.6.1.6 Counter ENDT (end tower) and cycles

The item counter shows the actual timer reading of the end tower.

The first number displayed under the item cycles indicates the calculated running time of the end tower whereas the second number shows the idle period of the end tower (in PIVOTING MODE).

10.1.2.6.1.7 Counter ZE (central tower) and cycles

The item counter shows the actual timer reading of the central tower.

The first number displayed under the item cycles indicates the calculated running time of the system whereas the second number shows the idle period of the system (in LINEAR MODE, applies to both end and central tower).



10.1.2.6.1.8 *On Delay*

Displays the actual timer readings in seconds.

10.1.2.6.1.9 *Inputs, outputs*

Displays all actual input and output signals
0 = no voltage at input 1 = voltage at input
0 = output off 1 = output on

10.1.2.7 **Machine parameter menu**

10.1.2.7.1 Description of different parameters

Press STOP key for 3 seconds to enter machine parameter menu.
Then the code menu should be displayed.

Use UP and DOWN arrows for setting code. Confirm with ENTER.

If code is right the text *Machine Parameter Menu will be displayed.*

CODE = 12 only for service technicians

PRESS — KEY TO GET ACCESS TO FIRST PARAMETER BLOCK

PRESS + KEY TO GET ACCESS TO PRECEDING PARAMETER BLOCK

10.1.2.7.1.1 *Date and Time*

Setting of system date and system time

Press ENTER key to get access to programming mode.

The cursor is blinking at the actual day. Change value with + - keys.
Press right arrow to move cursor to month. Change value with + - keys.
Press right arrow to move cursor to year. Change value with + - keys.
Press right arrow to move cursor to time. Change value with + - keys.
Press ENTER to memorize settings or ESC to exit programming mode.

PRESS — KEY TO GET ACCESS TO NEXT PARAMETER BLOCK

PRESS + KEY TO GET ACCESS TO PRECEDING PARAMETER BLOCK



10.1.2.7.1.2 *Language and irrigation width*

To change set language, press ENTER key to get access to programming mode.

Change **language** with + – keys, press ENTER to memorize settings or ESC to exit programming mode, or press RIGHT ARROW to move to **irrigation width**, change value with + – keys, press LEFT ARROW to return to LANGUAGE; press ENTER to memorize settings or ESC to exit programming mode.

The irrigation width is the width in meters from central tower up to end tower, including overhangs.

10.1.2.7.1.3 *Travel length and throughput*

The **travel length** is twice the length of the supply hose in meters.

The **throughput** is the calculated or measured system throughput in m³/h.

These values allow for exact calculation of end tower cycles.

Change values according to above mentioned proceeding.

10.1.2.7.1.4 *Time period and irrigation lag*

The **time period** is the total of running time and idle period of the *end tower*.

Running time and idle period are calculated according to the set application rate. The total of running time and idle period is always the time period.

The **irrigation time lag** is a delay in minutes for the motors after turning on the pumps to allow for irrigation under full pressure from the beginning.

Change values according to above mentioned proceeding.

10.1.2.7.1.5 *Pressure switch and pressure lag*

Enter **PRESSURE SWITCH ON** to activate system pressure monitoring by the means of a pressure switch.

The **PRESSURE LAG** is the time in minutes which, when system pressure is too low, will have to elapse before a pressure FAILURE is displayed and the MONOSTAR is stopped.

Change values according to above mentioned proceeding.

10.1.2.7.1.6 *Maximum speed and display backlight*

The **MAXIMUM SPEED** is a factor to calculate cycle duration depending on the set application rate.

This parameter is up to used gearbox, motor speed, tire size and soil conditions..

DISPLAY BACKLIGHT stands for the time for which the display will be backlit (if no time is set, backlight is switched off).

10.1.2.7.1.7 *M (motor) running time and M (motor) correction*

The **MOTOR RUNNING TIME** is the time a motor (of the central tower or of the end tower) must run (only when the system is adjusted by furrow guidance), before the non running motor will be turned on manually in order to eliminate mechanical stress in the system.

The **MOTOR CORRECTION** is the time for which the manually turned on motor will run after the **motor running time** has been achieved



10.1.2.8 Firmware update

- 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 right COM interface (error message comerror if wrongly chosen)
- 6.) Load the latest valid file with the browser (e.g. MonostarV1_7.hex)
- 7.) START DOWNLOAD – files should be downloaded without interruption until message: Software Download successfully finished
- 8.) Separate the serial connection
- 9.) Turn main switch to „OFF“. Turn main switch to „ON“ while pushing R+F (with Pro). Wait until display shows load eprom. The standard parameters are loaded and the PRO is booted.

10.1.2.9 Technical data

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

10.1.3 Switch „MACHINE OFF – ON“

This switch establishes power supply of control panel..

10.1.4 LED key „SAFETY“

This key is spanning the safety circuit when the machine leaves the safety circuit, under the condition the latter has been activated (doglegging, end stop MONOSTAR). Key is alight if machine is outside of safety circuit.

10.1.5 Switch „DRIVE OFF ON“

This switch allows autonomous changing of the operating site of the MONOSTAR.

10.1.6 Switch „CENTRAL- TOWER“

This switch allows changing from central unit to end tower during electrical swivelling of the wheels.

10.1.7 Switch “GENSET OFF - ON“

The generator unit shuts down automatically.

ON

- when system runs into the safety circuit.
- in case of pressure loss
- at the end stop
- at intermediate stop, e.g. when changing the connection of the supply hose.

Use this setting during a regular run !

OFF In this position the generator unit does not shut down for the above mentioned reasons.

This setting is used:

- when aligning the towers.
- at dry run

10.1.8 Switch „EMERGENCY STOP“

Control unit is cut off power.

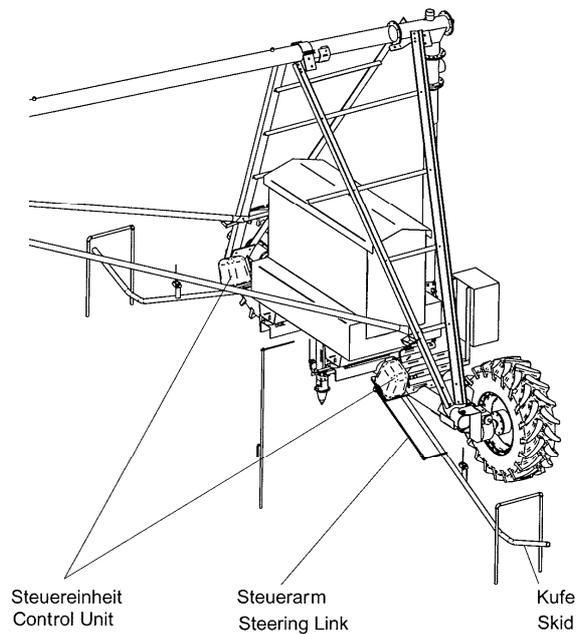
8



11 LINEAR CONTROL

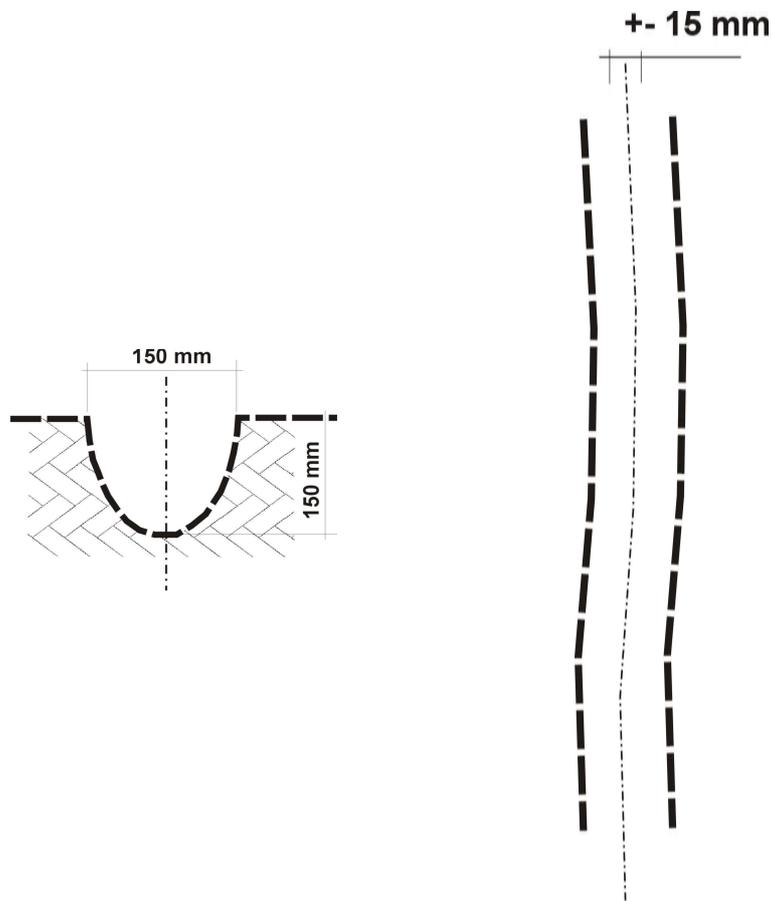
The MONOSTAR is guided along a furrow in the ground (FURROW GUIDANCE),
The linear control system mounted at the side of the central unit controls the two end towers.
This control system allows the system to be always kept at the same distance and at the right angle to the control furrow.

Two control skids transmit the distance and the angle of the central unit to the control furrow.
The linear control system consists of two control units, the one at the front (looked in running direction) is responsible for the control of the system and controls the operation of the electric drive motor of the end towers





Max. deviation of control furrow from straight line



Admissible curve radius of the control furrow

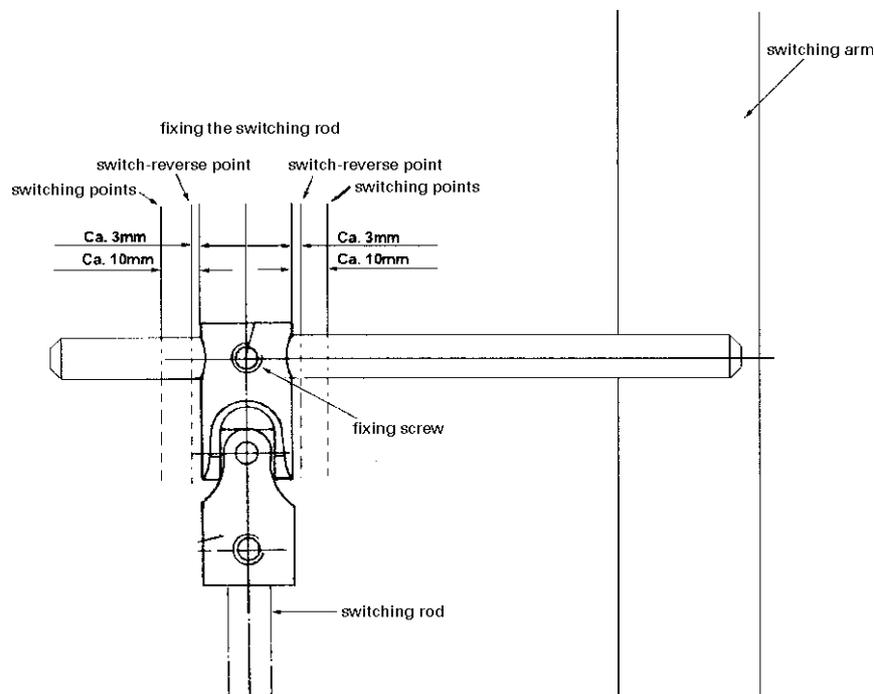
$$R = 2,5 \times SL$$

SL.....System length of MONOSTAR
R.....Admissible curve radius

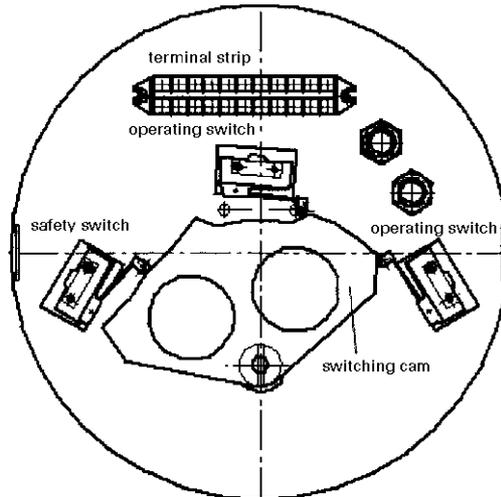
11.1 SETTING LINEAR CONTROL

Before starting, adjust the linear control system such, that the central unit in both directions runs parallel and at the same distance to the control furrow.

- Position the central unit in relation to the control furrow in such a way, that both steering links, when they are in their operating condition (skids in the furrow) are on a straight line with the fixed control frame of the central unit.
- Loosen the fixing screw on the control rod, which actuates the control cam of the control system. Now the control rod can move freely on the guide pin.
- By moving the control rod hence and forth, the switching points of the micro-switches are determined. Every micro-switch has two switching points, a switch-on point and a switch-reverse point. Each of these switching points is marked on the guiding pin. The switching points shall be according to the following sketch:



- If the gap between the end switching points of both micro-switches is too small or too large, the position of the micro switches has to be corrected and the gap between the switching points checked as to its correct value.
- If the gap between the switching points is correct, the control rod must be fixed exactly in the center between the switching points.



- The second linear control system must be set in the same way.

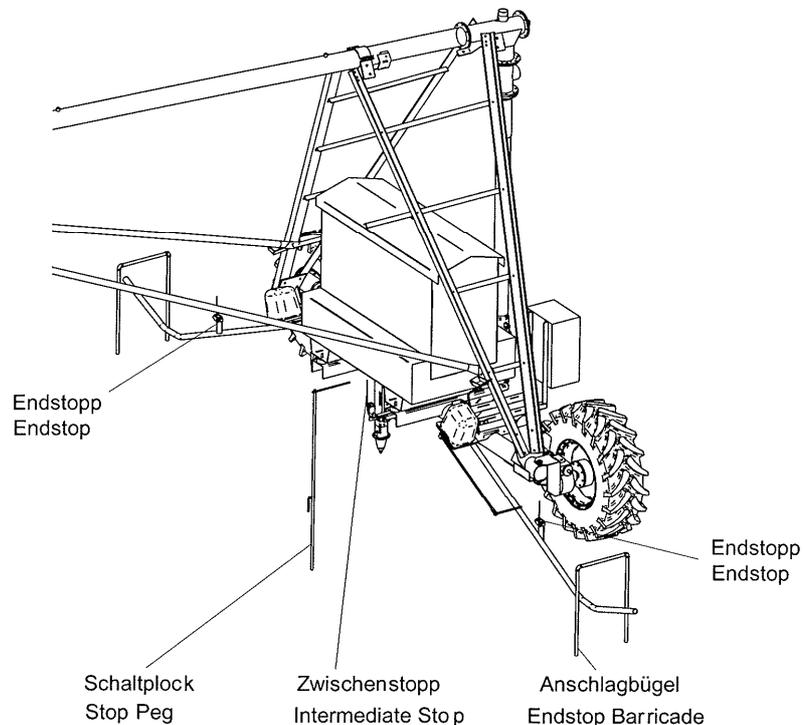
11.2 SETTING STOP SWITCH

There are switches on the central unit of the MONOSTAR, which stop the system. To activate these switches, stop pegs must be provided along the track.

The following switches must be mounted:

- End stop
Safety switch at the end of the field that shuts off all functions.
- Intermediate stop
Stops the system, e.g. between 2 hydrants to change the hose connection.

The stop levers for the end stops must be set in such a way that the switch for the end stop is actuated for sure.





12 DIESEL GENERATOR UNIT

For the supply of the electric drive and control system of the MONOSTAR a diesel generator unit is mounted on the central unit. The electrical power of the unit is 10kVA

The unit is complete and consists of the following components:

- Base frame with integrated fuel tank.
- Diesel engine with electric start including battery
- Generator directly coupled to the engine.
- Unit cover
- Unit control panel with following functions and indications:
 - Three amperemeters(one per phase)
 - One voltmeter with phase converter
 - Frequency indication
 - Operating hour meter
 - Malfunction LED
 - Error indicator for oil pressure, cooling water temperature, battery charging, fuel,
 - Warning siren
 - Fuses
 - Start lock with key
 - Stop switch

13 ELECTRICAL SYSTEM

	WARNING !	Operation voltage of the machine is 230 V and 400 V (460 V). All maintenance and service work is to be performed by a qualified person with extreme diligence and under strict observance of the valid safety regulations!
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	WARNING !	The whole electrical system will be installed under power-off conditions!
--	------------------	--

13.1 WIRING AND MARKING

1. The power cable has got 11 coloured conductors. .

	Conductor colour	Conductor number
Main circuit	Black	1
	Blue	2
	Brown	3
Control circuit	Pink	4
	Grey	5
	Red	6
	White	7
	Violet	8
	Green	9
	Orange	10
Ground wire	Yellow / Green	

2. Cable lengths

The cables are cut to length and their ends are isolated in the factory.

3. Mounting of cables

Pass along the cable end on the travel tower side of the span until the end of the pipe, where the end control is mounted on the end pipe, and fasten it to the pipe with spring clamps. This way the two cable ends have exactly the right mounting length.



13.2 INSTALLATION, CONNECTION OF CONTROL CENTER



WARNING !

Be sure to power off the supply line before connecting the control center or performing any installation work on the electrical system!

1. Put the cable into the control center and connect it to the terminal strip according to the wiring diagram.
2. Connect the three phase conductors of the connecting cable also according to wiring diagram. (Check if magnetic field turns to the right, use a rotating field meter. If the magnetic field turns to the left, change 2 phase conductors of the connecting cable against each other at MAIN SWITCH Q1).
3. Tighten ingoing screw terminals at control center enclosure to prevent water penetration.

13.3 CONNECTION OF END CONTROL

1. Introduce 2 cables into the end control.
 - Supply cable
 - Connecting cable to drive motor of end tower
2. Connect according to enclosed wiring diagrams.

CAUTION !

Correct wiring of end control is of crucial importance. In case of mixed up phases the end tower will run in the opposite direction to the central unit.

3. Tighten ingoing screw terminals at control center enclosure to prevent water penetration.

14 FIRST START-UP

14.1 CHECKING OF CENTRAL UNIT

- Are all screws well tightened?
- Proper wiring of control center?
Check circuit continuity with a circuit continuity tester
- Are pipe clips at connecting hoses of riser pipe fastened properly?
- Does the fixing ring abut against the bearing pipe and is it well screwed ?
- Are the wheel nuts well tightened? (tightening torque 130 Nm)
- Tire pressure:
 - 1,1 bar for tire size 14,9 – 24
 - 2,1 bar for tire size 11,2 – 24
 - 0,8 bar for tire size 16,9 R 24
- Are wheel gears and drive motors filled up with oil? (see points 21.2.1 and 21.2.2)

14.2 CHECKING OF TRUSS, END TOWER AND OVERHANG

- Are all screw connections well tightened? (Flange screws with 100 Nm)
- Are all wheel nuts well tightened? (Tightening torque 130 Nm)
- Tire pressure:
 - 1,1 bar for tire size 14,9 – 24
 - 2,1 bar for tire size 11,2 – 24
 - 0,8 bar for tire size 16,9 R 24
- Are wheel gears and drive motors filled up with oil?
- Are electric cables properly fastened?
- Are cable inlets water tight?
- Are sprinklers and nozzles properly installed according to delivered computer table?
- Are all overhang ropes fastened the right way?

14.3 CONTROL CENTER

**WARNING !****All works on the electric control center must be performed by a trained electrician!**

14.3.1 Checking of voltage and wiring

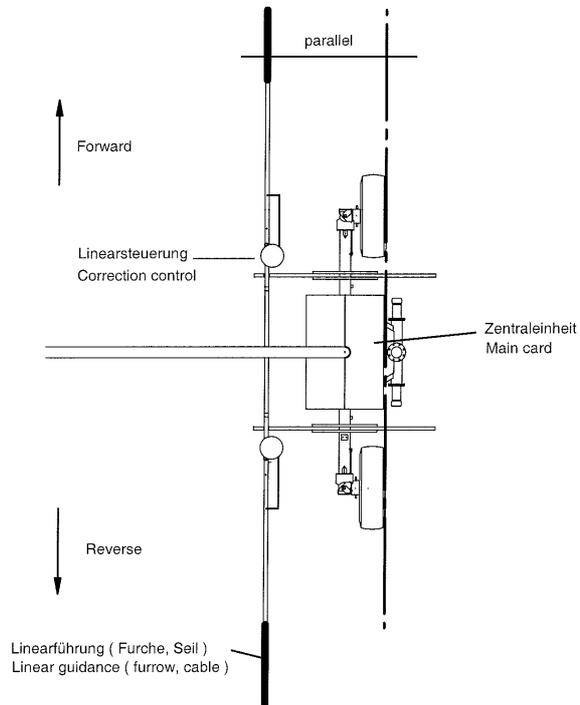
- Check (measure) supply voltage.
3 phase alternating current / three phase current:
400 V +/- 5 % / 50 Hz +/- 2 %
or 460 V +/- 5 % / 60 Hz +/- 2 % as an alternative
- Check control voltage on transformer (L11, N11). 230 V +/- 5 %

14.4 CHECKING OF TRAVEL DIRECTION OF CENTRAL UNIT AND OF END TOWER

- Start generator unit
- Put MAIN SWITCH Q1 to „I“
- Put switch MACHINE „OFF – ON“ to „ON“
- Put switch DRIVE „OFF – ON“ to „OFF“
- Put switch „Central-Tower“ to „Central“
- Control panel
 - Press key „Enter (Menu)“, cursor starts blinking
 - Set operating mode „Linear“ with +/- keys
 - Confirm with „Enter“
 - Exit programming mode with „ESC“
 - Press key „Forward“. The MONOSTAR must start to run clockwise.
 - Press key „Reverse“. The MONOSTAR must start to run anti clockwise.
- If neither the central unit nor the end tower run according to the preset travel direction, cut off power supply and change 2 phases of the connecting cable against each other at MAIN SWITCH Q1.
- If only the end tower runs against the preset travel direction, cut off power supply and reverse polarity of the motor connecting cable at the end tower.

15 ALIGNMENT OF THE MONOSTAR

15.1.1 Align the central unit parallel to the linear guidance (furrow)



16 TERMINOLOGY

Forward

Looking from the central unit to the system, the MONOSTAR moves to the right.

Reverse

Looking from the central unit to the system, the monostar moves to the left.

Inward

Direction central unit

Outward

Direction end tower



17 START-UP

The MONOSTAR is only to be released for operation to the customer after it has been completely assembled and installed and after a successful start-up is completed by a qualified person!

As the plant is operated with voltages from 230 V up to 460 V, the control components and the electric drive need to be handled with the utmost caution! Service and repair works should only be done by a professional electrician!

Before starting the system check, if all connected units (generator, pumps) are ready for operation. Have the responsible service center repair possible damages, before you start irrigating. Be extremely cautious with live parts.

The starting as described below is valid for a BAUER MONOSTAR without options. In case the system has various options (see chapter options), these should be set or switched on before the start-up.

17.1 STARTING OF MONOSTAR IN OPERATING MODE “LINEAR”

17.1.1 START MONOSTAR WITH HOSE CONNECTION

- Connect the supply hose to hydrant and central unit, open water supply.
- Put switch GENSET “OFF – ON” to “OFF”
- Start the generator unit
- Put MAIN SWITCH to “I”
- Put switch MACHINE “OFF – ON” to “ON”
- Put switch DRIVE „OFF – ON“ to „OFF“
- Put switch „Central-Tower“ to „Central“
- Control panel
 - Press key „Enter (Menu)“, cursor starts blinking
 - Set operating mode „Linear“ with +/- keys
 - Press “Forward Arrow” key to go to parameter travel length, change with + - keys
 - Confirm with „Enter“
 - Exit programming mode with „ESC“
 - Depending on travel direction press key „Forward“ or “Reverse”
 - Change application rate with +/- keys .
 - Put switch GENSET “OFF – ON” to “ON”



17.1.2 START MONOSTAR WITH DITCH FEED

- Start the generator unit
 - Put MAIN SWITCH to "I"
 - Put switch MACHINE "OFF – ON" to "ON"
 - Put switch DRIVE „OFF – ON“ to „OFF“
 - Put switch „Central-Tower“ to „Central“
 - Put down suction line until strainer completely covered with water
 - Close stop valve in pressure line
 - Open stop cock in exhaust suction line
 - engage exhaust sucker
 - Suck in until hose of the exhaust suction line is filled with water
 - Put switch of pump "ON-OFF" to "ON"
 - Close stop cock in exhaust suction line
 - Open stop valve in suction line
 - Disengage exhaust sucker
-
- Control panel
 - Press key „Enter (Menu)“, cursor starts blinking
 - Set operating mode „Linear“ with +/- keys
 - Press "Forward Arrow" key to go to parameter travel length, change with + - keys
 - Confirm with „Enter“
 - Exit programming mode with „ESC“
 - Depending on travel direction press key „Forward“ or "Reverse"
 - Change application rate with +/- keys .
 - Put switch GENSET "OFF – ON" to "ON"

17.2 STARTING AFTER INTERMEDIATE STOP

In certain cases it is required to stop the MONOSTAR along an irrigation strip, for instance if the supply hose needs to be connected to another hydrant or if only a partial area has to be irrigated.

In this case a shut-down sensor is actuated by a stop peg and thus turned off.

The shut-off valve in the riser pipe (optional) is closed, the generator unit is shut down, if the switch GENSET "OFF – ON" has been put to "ON"

- .Control panel
 - Press key "Forward" or „Reverse“ respectively.

17.3 SHUT-DOWN PROCEDURE

17.3.1 Shut-down of the MONOSTAR while irrigating

- Control panel
 - Press key „ESC – Stop“

If switch GENSET „OFF – ON“ has been put to „ON“, the generator unit shuts down automatically. If the switch has been turned to „OFF“ the generator unit must be shut down separately. The water supply is cut automatically by the shut-off valve.

17.3.2 Automatic shut-down of the MONOSTAR at the end of the field

The switches of the central unit shut the MONOSTAR automatically down, when they are actuated by the end stoppers which have been placed at the end of the field.

If the switch GENSET „OFF – ON“ has been put to „ON“, the generator unit shuts down automatically. If the switch has been turned to „OFF“ the generator unit must be shut down separately

The water supply is cut automatically by the shut-off valve

17.4 STARTING OF THE MONOSTAR IN OPPOSITE DIRECTION AFTER AUTOMATIC SHUT-DOWN

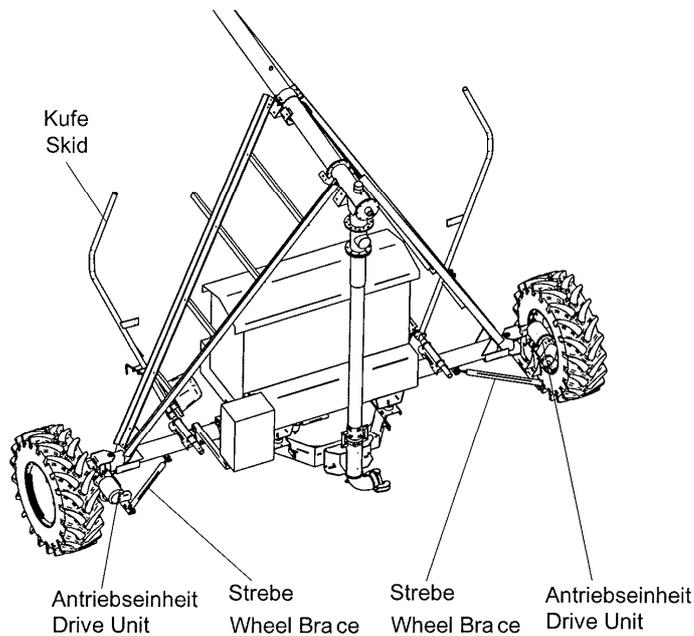
- Put switch GENSET „OFF – ON“ to „OFF“
- Start generator unit
- Establish water supply
- Press LED key SAFETY, hold key.
- Press key „Forward“ or „Reverse“ respectively on control panel. (Hold LED key SAFETY until the central unit has left the switching range of the safety switch)
- Put switch GENERATOR UNIT „OFF – ON“ to „ON“

17.5 STARTING OF MONOSTAR IN OPERATING MODE „WHEEL SWIVELLING OF CENTER UNIT“

- Disconnect supply hose from central unit
- Lift up the skids of the furrow guidance and fasten them on the central unit..
- Put switch GENSET „OFF – ON“ to „OFF“
- Start the generator unit
- Put MAIN SWITCH Q1 to „I“
- Put switch MACHINE „OFF – ON“ to „ON“.
- Put switch DRIVE „OFF – ON“ to „OFF“.
- Put switch „Central unit – Tower“ to „Central“.
- Control panel
 - Press „Enter (Menü)“, the cursor starts blinking
 - Set mode „wheel swivelling“ with „+/-“ keys
 - Confirm with „Enter“.
 - Exit programming mode with „ESC“
- Detach fixing device of drive console at wheel carrier
- Press one of the arrow keys on control box to check which one of the motors gets started.

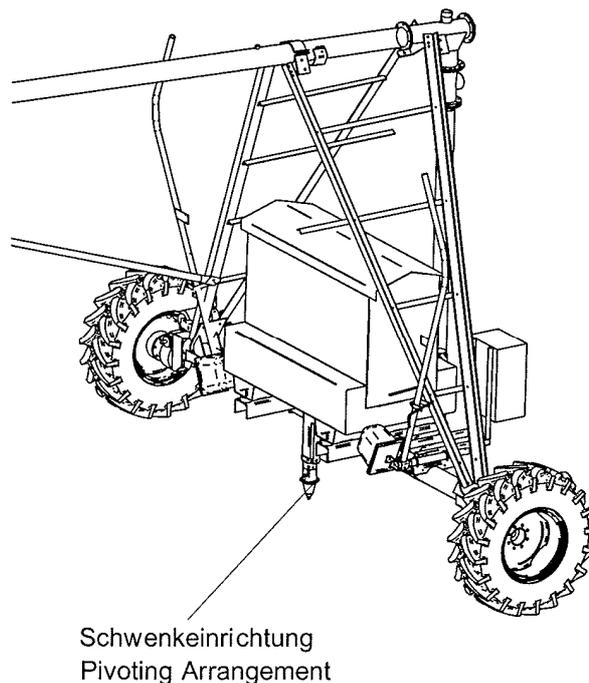


- Press arrow keys „(Forward-Reverse) 90° to rotate related wheel.
- Fix wheel with wheel brace
- Press both arrow keys of control box simultaneously to go to second motor.
- Press arrow keys of control box to rotate second wheel through 90°
- Fix with wheel brace.
- Remove driving pin of gearbox (freewheel).



17.6 STARTING OF MONOSTAR IN OPERATING MODE „PIVOTING“

- Connect supply hose to hydrant and central unit.
- Lift up skids of furrow guidance and fasten them on the central unit
- Put switch „GENSET OFF“ – ON to „OFF“.
- Start the generator unit.
- Put MAIN SWITCH Q1 to „I“.
- Put switch „MACHINE OFF – ON“ to „ON“.





- Put switch „DRIVE OFF – ON“ to „OFF“
- Put switch „CENTRAL - TOWER“ to „CENTRAL“
- Swivelling of central unit wheels according to point 17.5
- Lower pivoting arrangement (hydraulic stand) by means of hydraulic hand pump
- Establish water supply
- Control panel
 - Press key „Enter (Menu)“, the cursor starts blinking.
 - Set mode “Pivoting” with +/- keys.
 - Confirm with „Enter“.
 - Exit programming mode with „ESC“.
 - Press “Forward” or „Reverse“ depending on travel direction
 - Change application rate with +/- keys.
 - Put switch “GENSET OFF – ON” to „ON“.

17.7 SHUT-DOWN PROCEDURE

17.7.1 Shut-down of the MONOSTAR while irrigating

- Control panel
 - Press key „ESC – Stop“

If switch GENSET „OFF – ON“ has been put to „ON“, the generator unit shuts down automatically. If the switch has been turned to „OFF“ the generator unit must be shut down separately. The water supply is cut automatically by the shut-off valve.

17.7.2 Automatic shut-down of the MONOSTAR

A switch mounted on the end tower of the central unit shuts down the MONOSTAR automatically, when it is actuated by a shut-off bar which has been placed at the end of the field (optional).

If the switch “GENSET OFF – ON” has been put to „ON“, the generator unit shuts down automatically. If the switch has been turned to „OFF“ the generator unit must be shut down separately
The water supply is cut automatically by the shut-off valve

17.8 STARTING OF MONOSTAR IN OPPOSITE DIRECTION AFTER AUTOMATIC SHUT-DOWN

- Put switch “GENSET OFF – ON” to „OFF“
- Start generator unit
- Establish water supply
- Press LED key SAFETY, hold key.
- Press key „Forward“ or „Reverse“ respectively on control panel. (Hold LED key SAFETY until the central unit has left the switching range of the switch)
- Put switch “GENSET OFF – ON” to „ON“

18 CHANGING THE OPERATING SITE OF THE MONOSTAR

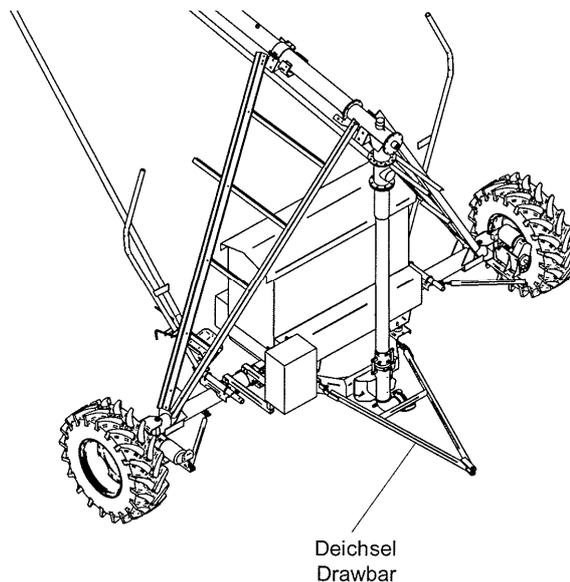
General Notices

- The machine should move on even ground, if possible along a cart track (width 7 m).
- The track must be even and free of rain grooves, furrows etc.
- If the track is grooved make sure to level it.
- You should not move the machine inside the field (off road).
If the machine is to be moved inside the field, make sure to level the track first and remove all kinds of obstacles in order to avoid increasing the rolling resistance.
- "Travel speed" must not exceed 4 km/h.
- Tire pressure: 1 to 1,1 bar.

18.1 CHANGING THE OPERATING SITE BY PULLING THE MONOSTAR BY TRACTOR

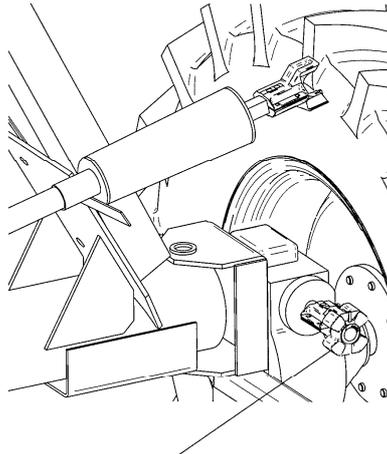
18.1.1 Swivelling of central unit wheels

- Swivelling according to point 17.5.
- Mounting of drawbar



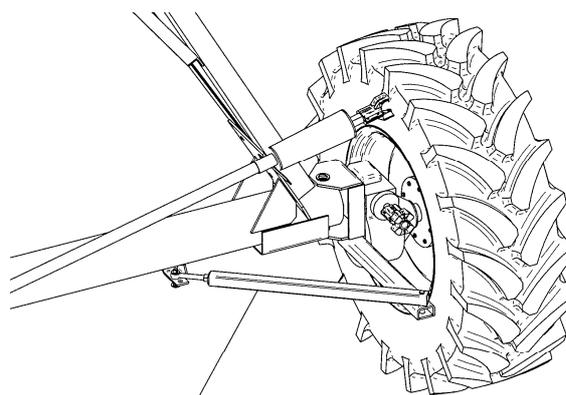
18.1.2 Swivelling of end tower wheels

- Loosen and push back drive shaft guard at wheel gears.
- Unscrew driving pin at wheel hub. At wheel gear disengage gear by means of shift lever.
- Loosen fixing device of gear carrier.
- Rotate gear carrier and wheel. The coupling parts with the rubber package must remain on the wheel gear. If necessary lift wheel carrier with jack or tractor hydraulics.



Kupplungshälften mit Gummipaket
coupling part with rubber package
semi-raccord a vec garniture en caoutchouc
parte de acople con paquete de goma

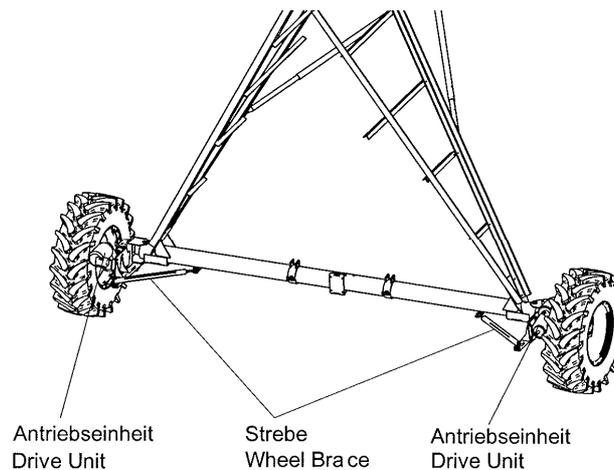
- Place drive shaft with the coupling parts on holder which is mounted on the travel tower bracing angle.
- Hold gear carrier steady with the connecting braces (rotate 90°).



Verbindungsstrebe
connecting brace
entretoise
tirante de unión

18.1.3 Electrical rotating of wheels on end tower (Option)

- Put switch „GENSET OFF – ON“ to „OFF“
- Start generator unit
- Put MAIN SWITCH to „I“
- Put switch „MACHINE OFF – ON“ to „ON“
- Put switch „DRIVE OFF – ON“ to „OFF“
- Put switch „CENTRAL - TOWER“ to „TOWER“
- Control panel
 - Press key „Enter (Menu)“, the cursor starts blinking
 - Set mode „Rotate wheel“ with +/- keys
 - Confirm with „Enter“
 - Exit programming mode with „ESC“
- Loosen fixing of drive console on wheel carrier
- Press one of the arrow keys on control box to check which one of the motors gets started. Press arrow keys „(Forward – Reverse)“ in order to rotate related wheel through 90°
- Fix wheel with wheel brace
- Press both arrow keys of control box simultaneously to go to second motor.
- Press arrow keys of control box to rotate second wheel through 90°
- Fix with wheel brace.
- Remove driving pin of gearbox (freewheel).



18.1.4 Hooking up of drawbar to drawbar ring at tractor



18.2 AUTONOMOUS DRIVING OF MONOSTAR

18.2.1 Swivelling of central unit wheels

Proceed as described under point 17.5

18.2.2 Swivelling of end tower wheels

Proceed as described under 18.1.2 and 18.1.3 respectively

18.2.3 Starting

- Start generator unit
- Put MAIN SWITCH to „I“
- Put switch “MACHINE OFF – ON“ to „ON“
- Put switch “DRIVE OFF – ON“ to „ON“
- Put switch “CENTRAL – TOWER” to „CENTRAL“
- Control panel
 - Press key “Enter (Menu)“, the cursor starts blinking
 - Set mode „Drive“ with +/- keys
 - Confirm with „Enter“
 - Exit programming mode with „ESC“
- Press one of the arrow keys of the control box (wheels must travel in drawing direction). If wheels travel in opposite direction release arrow key immediately (danger of destroying the span). In this case press other arrow key. The MONOSTAR will move as long as the arrow key of the control box is hold.



18.3 DRAWING THE MONOSTAR FROM END TOWER SIDE

18.3.1 Swivelling of central unit wheels

Proceed as described under point 17.5

18.3.2 Swivelling of end tower wheels

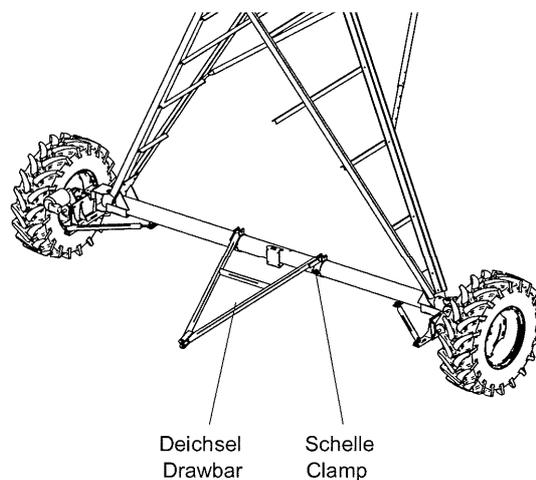
Proceed as described under 18.1.2

18.3.3 Electrical swivelling of end tower wheels

Proceed as described under 18.1.3

18.3.4 Mounting of drawbar on end tower

- Attach clamps on end tower
- Fasten drawbar to clamps



18.3.5 Hooking up of drawbar to tractor towbar



18.4 INDEPENDENT TRAVERSING OF THE MONOSTAR FROM THE END TOWER

18.4.1 Swivelling of the wheels of the central unit

As described in 17.5, but do not take away the step pins of the gear

18.4.2 Swivelling of the wheels of the end tower

As described in 18.1.3, but do not take away the step pins of the gear

18.4.3 Start activity

- start gen set
- put main switch tp " I "
- Put switch machine " OFF - ON " to " ON "
- Put switch Drive " OFF - ON " to " ON "
- Put switch "CENTRAL - TOWER " to " TOWER "
- Panel
 - Push key " ENTER (MENU) ", cursor starts blinking
 - Adjust modus "DRIVE" with keys " +/- "
 - Confirma with key " ENTER "
 - Leave the program modus with key " ESC "
- Push one of the shaft keys of the push button control (Wheels should move in towing direction)
If the wheels move in the wrong direction, let off the shaft keys inmediately (danger of destroying the spans). If wheels turn in wrong direction push other shaft key.
The MONOSTAR moves as long as shaft keys of push button control are pushed.



19 MAINTENANCE INSTRUCTIONS

Notice

In case of warranties they will only be accepted if the rules of handling and maintenance (according to service schedule) have been followed. Service should be done by an authorised dealer and confirmed in the service schedule. The service schedule is considered as evidence for warranties.

The meaning of a service schedule

The service schedule suggests when to do a service and what kind of service should be done. In the fields that provides evidence we confirm the carrying out of the service. These services can be a condition for possible warranty claims.

We kindly ask you to understand that wasting and damages due to overstrain, improper handling or unauthorised modifications are not included in the warranty.

- Always cut the system off power before starting any maintenance work. Turn the MAIN SWITCH to "0" and actuate the safety lock to prevent unauthorised or unintentional re-closing of the system. Always disconnect the system yourself - do not depend on other persons.
- Always re-mount all protective devices which have been dismantled during maintenance.

19.1 Service intervals

- **Monthly service**
- **Annual service**



19.2 SERVICE SCHEDULE

Extent of Service	Monthly Service	Annual-Service
Central tower		
- Check all screwed joints		X
- Check cable inlets into control center for leakage (replace if necessary)		X
- Check connecting hoses in riser piper for leakage.	X	X
Trussing, overhang, coupling		
- Check all screwed joints on flanges, truss rods and braces on towers and on overhang		X
- Check connecting hose of tower couplings for leakage.		X
- Lubricate ball joint of the drive tower coupling	X	X
- Empty sand trap	X	X
- Booster pump – rotating of the shaft between engine and pump – check if runner of the pump is rotating freely (if existing)		X
- Check end gun (if existing)		X
Alignment control		
- Check shifting travel of the micro switches	X	X
- Check function of micro switches (operation switch and safety switch)		X
- Check all electric connections for proper contact		X
- Check tightness of all cable inlets into casing of the alignment control		X
- Check tightness of alignment control cover		X
- Check function of switches for intermediate stop and end stop		X



Extent of Service	Monthly Service	Annual-Service
- Lubricate cross joints	X	X
- Check distance and parallel position of central tower to furrow guidance	X	X
- Check straightness of guide track (furrow)	X	X
Drive unit		
- Check oil level of gearboxes and drive motors		X
- Change oil after first irrigation season, then after every third irrigation season		X
- Wheel gear: Make sure that drainage holes on the bearing covers and the hole for ventilation on the expansion chamber are not blocked.		X
- Gearbox Typ TNT – Lubricate the bale assembly	X	X
- Drive motor: Make sure that the drainage hole at the bottom of the motor is not blocked.		X
- Wheel gear, drive motor - check shaft sealing ring for leakage	X	X
- Lubricate outside hubs of towable gearboxes		X
- Check screw connections of the driveline coupler		X
- Check if rubber packages of driveline coupler are damaged. Replace worn out and broken rubber packages.	X	X
- Check wheel nuts	X	X
- Check tire pressure:	X	X
1,1 bar with tires 14,9 – 24		
2,1 bar with tires 11,2 – 24		
0,8 bar with tires 16,9 – 24		
- Check tires for damages	X	X
- Check anti twist device of drive shaft guard	X	X
Generator unit		
- see separate motor repair manual		



19.3 Post-season maintenance

1. Remove the drain valves and plugs in the pipeline.
2. Open sand trap stop valve.
3. Flush the pipelines.
4. Mount the drain valves and plugs again and close the sand trap stop valve again.
5. Take away the supply hose from the irrigation field and stock it in a building.
7. Empty the cooling liquid of the generator unit or check if sufficient anti-freeze has been added.

19.4 Pre-season maintenance

1. Check control central and end control for damage by oxidation or rodents and insects.
2. Open sand trap stop valve and flush the pipelines.
3. Check flange seals and connecting hoses for leakage.
4. Close sand trap stop valve again.
5. Draw a new furrow for the furrow guidance
6. Place and align the pegs correctly for intermediate stop and end stop
7. Unwind infeed hose and check for leakage
8. Fill in the cooling liquid at the generator unit or fill it up respectively, check motor oil
9. Further checks => CHECKLIST



19.5 Pretensioning forces and tightening values of bolts

The listed pretensioning forces and turning moments are guiding values for standard metric thread per DIN 13 and head requirements per DIN 912, 931, 934, 6912, 7984, and 7990 as well as thread measured in inches rough (UNC) and smooth (UNF). They result in a bolt utilisation - limit of 90°. It was based on a friction factor of 0,14 (new bolt without after treatment, unlubricated)

Screws standard metric thread DIN 13			
dimension	quality	turning moment Nm	pretensioning force N
M 8	8.8	25,5	16230
M 10	8.8	50	25791
M 12	8.8	87,3	37657
M 14	8.8	138,3	51681
M 16	8.8	210,8	71196
M 20	8.8	411,9	111305
M 24	8.8	711	160338

Screws UNC standard thread			
dimension	quality	turning moment Nm	pretensioning force N
1/4"	S	12,5	10080
5/16"	S	21,3	13954
1/2"	S	92,7	38463

Screws UNF standard thread			
dimension	quality	turning moment Nm	pretensioning force N
9/16"	S	150	57143

Don't fasten the bolts 1/2" UNC for tightening the wheel gears with a power screwdriver. There may be a danger in damaging the winding in the gear casing. festziehen.



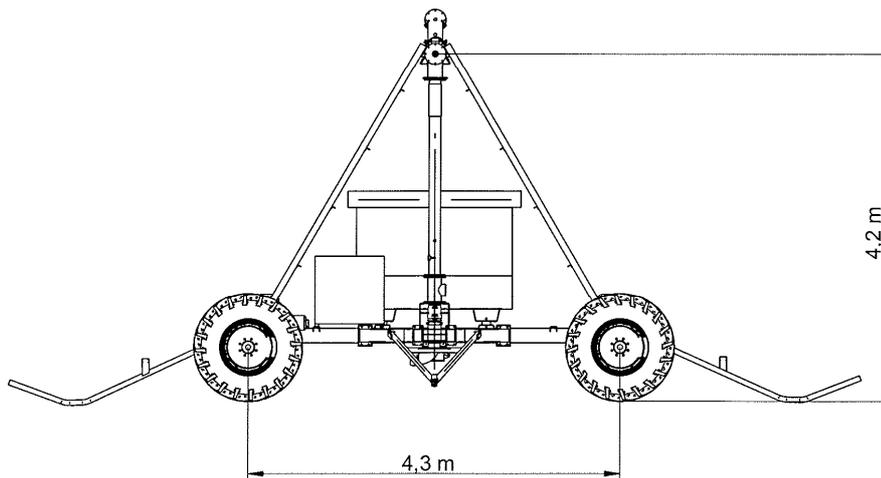
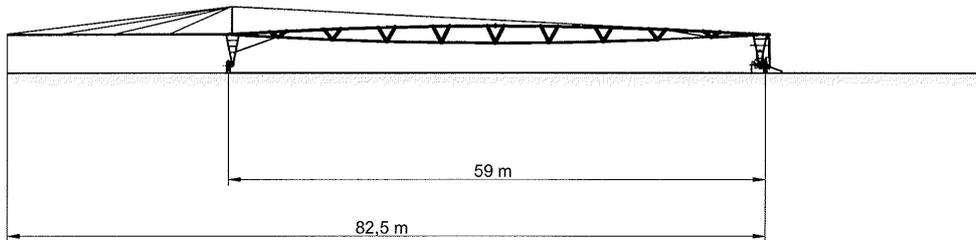
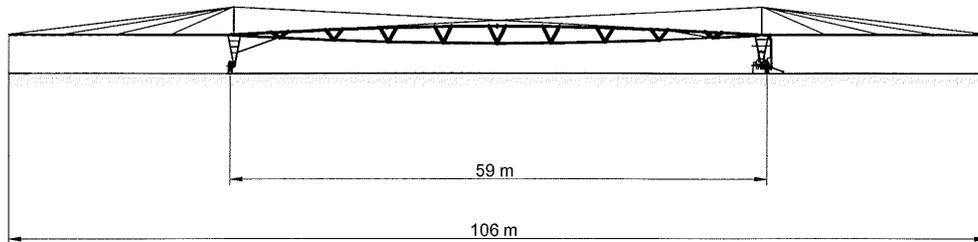
20 TROUBLESHOOTING

FAULT	POSSIBLE CAUSE	REMEDY
System shut down automatically: a) power generating unit	low fuel low battery loose terminals low coolant low oil pressure loose V-belt	refuel recharge tighten fill up soiled oil filter fill up lube oil tighten
System running in safety circuit	Doglegging poor mechanical equipment micro switch defective obstacle in the track intermediate stop switch has been actuated leakage-current relay triggered by short circuit to system	realigning by trained service staff replace micro switch remove obstacle adjust stop bracket properly or remove obstacle reset leakage-current relay (blue reset button)
Abnormal motor or gearbox noise	low oil level oil worn defective bearing	top up oil exchange the oil exchange bearing
System does not start up	MAIN SWITCH turned off safety disconnect Q1 turned off fuses of fuse switch disconnector defective fuses F1, F2, F3, F4 defective safety circuit interrupted because system flex larger than maximum permissible bending angle no water pressure (only with low-pressure shut-off option)	turn it on turn it on replace defective fuses see "Alignment of MONOSTAR" check water supply readjust pressure switch
End tower always runs in safety circuit	contactor defective cable loose tower slips thermal protection (built into the motor) triggered because of: obstacle in the track deep soil low oil in gearbox	readjust micro switch replace switch replace contactor check connections and tighten, if required level the track remove obstacle fill up and level the track refill oil
Drive unit has different distances to the furrow guidance when going forward and backward	The micro switches of the alignment control are adjusted differently	Adjust micro switches in both alignment controls



21 TECHNICAL DATA

21.1 DIMENSION OF THE MONOSTAR





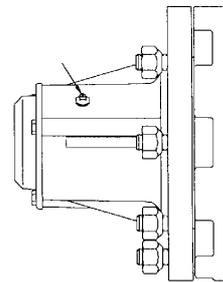
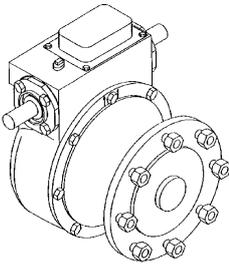
21.2 WHEEL GEAR AND DRIVE MOTORS

21.2.1 Wheel gear

Worm gear with 50:1 reduction ratio.

Execution: For stationary systems.
For towable systems with freely rotating hub.

Type of oil: SAE 85W-140, multigrade oil
Oil quantity approx. 3.8 litres up to lower edge of filling hole
Oil expansion is compensated by expansion membrane.



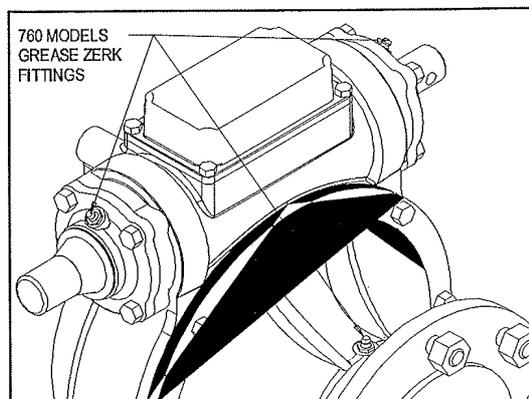
Gearbox Typ TNT

Lubricate the bale assembly with a #2 lithium grease. The 2 grease fittings are located on the top of the gearbox.

Gearbox 760 U

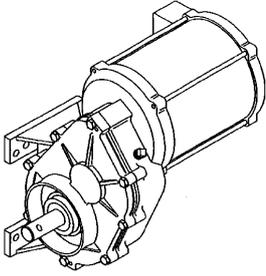
The 760 Heavy duty model gearbox is supplied with three grease fittings. Two are located on the top of the gearbox and the third is located at the output shaft position. (see fig.below). These fittings are # 2 lithium grease.

NOTE: use a small amount of grease as the seal lips will not allow excess grease to exit the box but be forced inside.





21.2.2 Drive motor



Spur gearing with 40:1 reduction ration, optional 30:1 reduction.

Standard motor output: 0.55 kW; optional 1.1 kW

Travel speed with tires 14.9-24 reduction 40:1 = 144 m/h
reduction 30:1 = 193 m/h

Type of oil: SAE 50W or SAE 20W-50 multigrade motor oil

Amount of oil approx 3.8 litres up to lower edge of filling hole

22 OPTIONS

22.1 LOW PRESSURE SHUT-OFF

The supply pressure on the central unit is monitored by a pressure gauge. If the supply pressure is lower than the minimum pressure set on the pressure gauge, the shut-off valve closes (option), and the MONOSTAR is shut off.

22.2 ELECTRIC SHUT-OFF VALVE (CENTRAL UNIT)

An electric shut-off valve in the central tower infeed line is closed automatically, if the MONOSTAR is shut off or in case of malfunction.

22.3 END GUN

To increase the irrigated strip width an end gun can be mounted at the end of the MONOSTAR overhang. It may be operating along the whole irrigation strip or only along parts of it.

If an interrupted irrigation is wanted, an automatic "ON/OFF" control must be set.

22.4 BOOSTER PUMP FOR END GUN

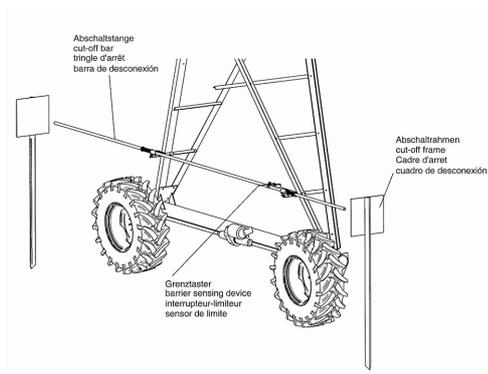
In most cases the end gun needs a higher pressure than it is required for a MONOSTAR with regular nozzling.

An electric booster pump, which is mounted on the end tower, provides the sufficient operating pressure for the end gun. A pressure hose connects the pump on the end tower with the gun on the overhang.

22.5 RUNNING LIGHT

It is mounted on the end tower or on the central tower. The light is on as long as the MONOSTAR is operating.

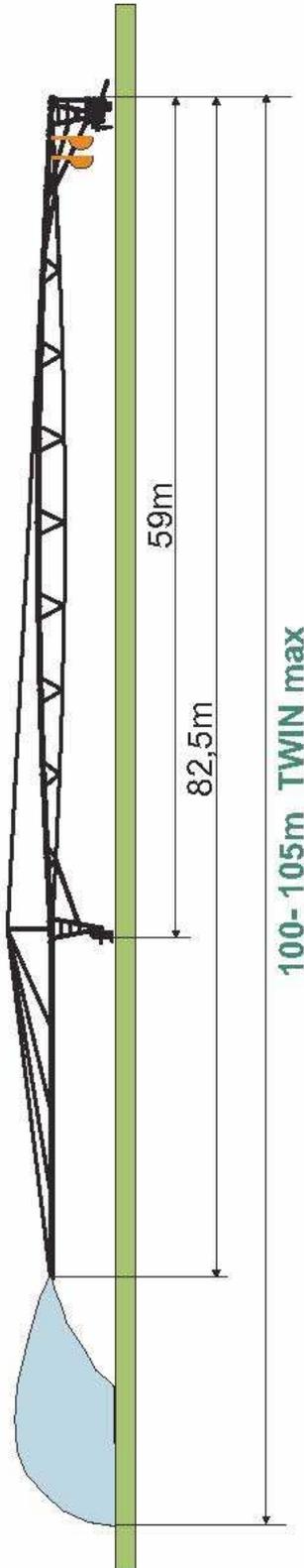
22.6 END STOP



If it is necessary to stop the system in the very moment it arrives the field boundaries, the shut-down of the system is made from the end tower side. A contact limit switch mounted on the end tower is actuated by a stopper which has been placed in the track of the end tower at the end of the field. The machine stops.

22.7 Nozzling variations

MONOSTAR BMS100 - Nozzling variations



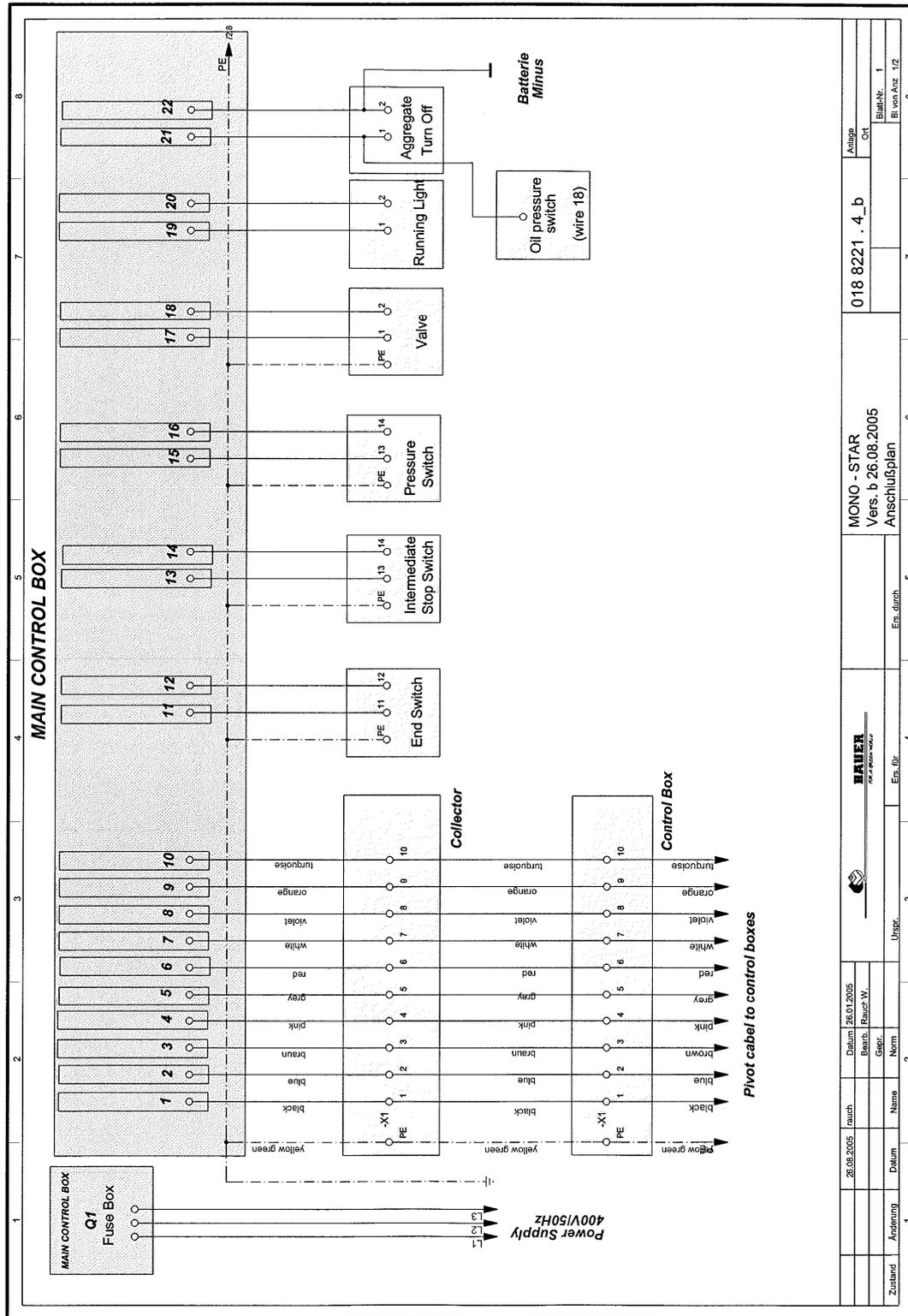
Irrigated Strip m	Flow m ³ /h	Sprinkler-type	Nozzle Ø / Pressure	26 Full circle-nozzle -type	2 Nozzle 180° -type
102	87	TWIN max	16mm / 3,0 bar	#19	#18
102	94	TWIN max	16mm / 2,9 bar	#20	#19
102	104	TWIN max	18mm / 2,7 bar	#21	#20
102	114	TWIN max	20mm / 2,4 bar	#22	#21
102	121	TWIN max	20mm / 2,2 bar	#23	#22
102	132	TWIN max	22mm / 2,0 bar	#24	#23



23 ELECTRICAL WIRING DIAGRAMS

23.1 MONOSTAR Control Center

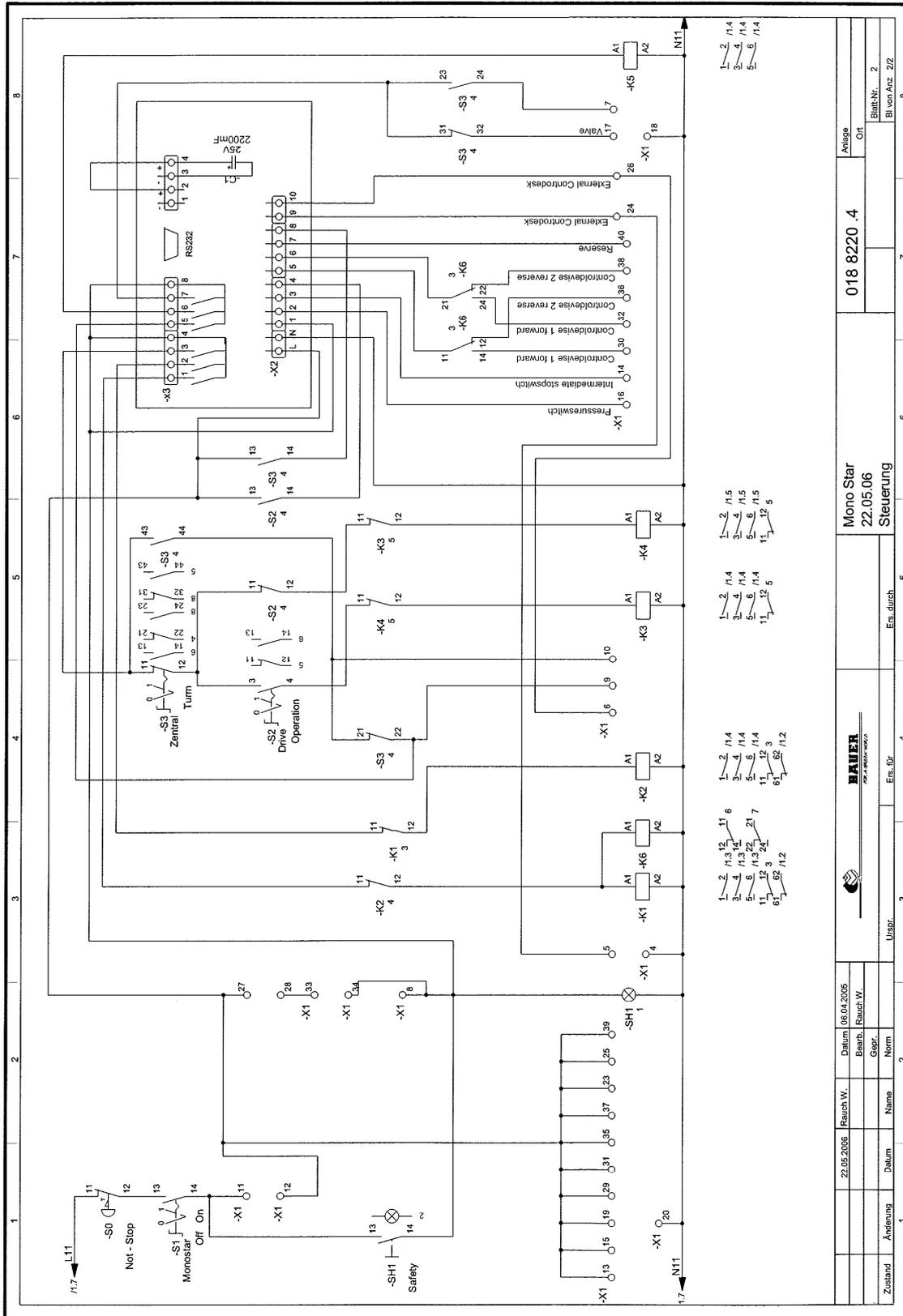
23.1.1 MONOSTAR – Connecting diagram



Zustand	Änderung	Datum	Name	Norm	Urspr.	Erz. durch	Erz. für	018 8221 . 4_b	Anschlußplan	MONO - STAR Vers. b 26.08.2005	018 8221 . 4_b	Blatt-Nr. 1	Bl. von Anz. 1/2
		26.08.2005	lauch										
		Datum	Name	Norm	Urspr.	Erz. durch	Erz. für						



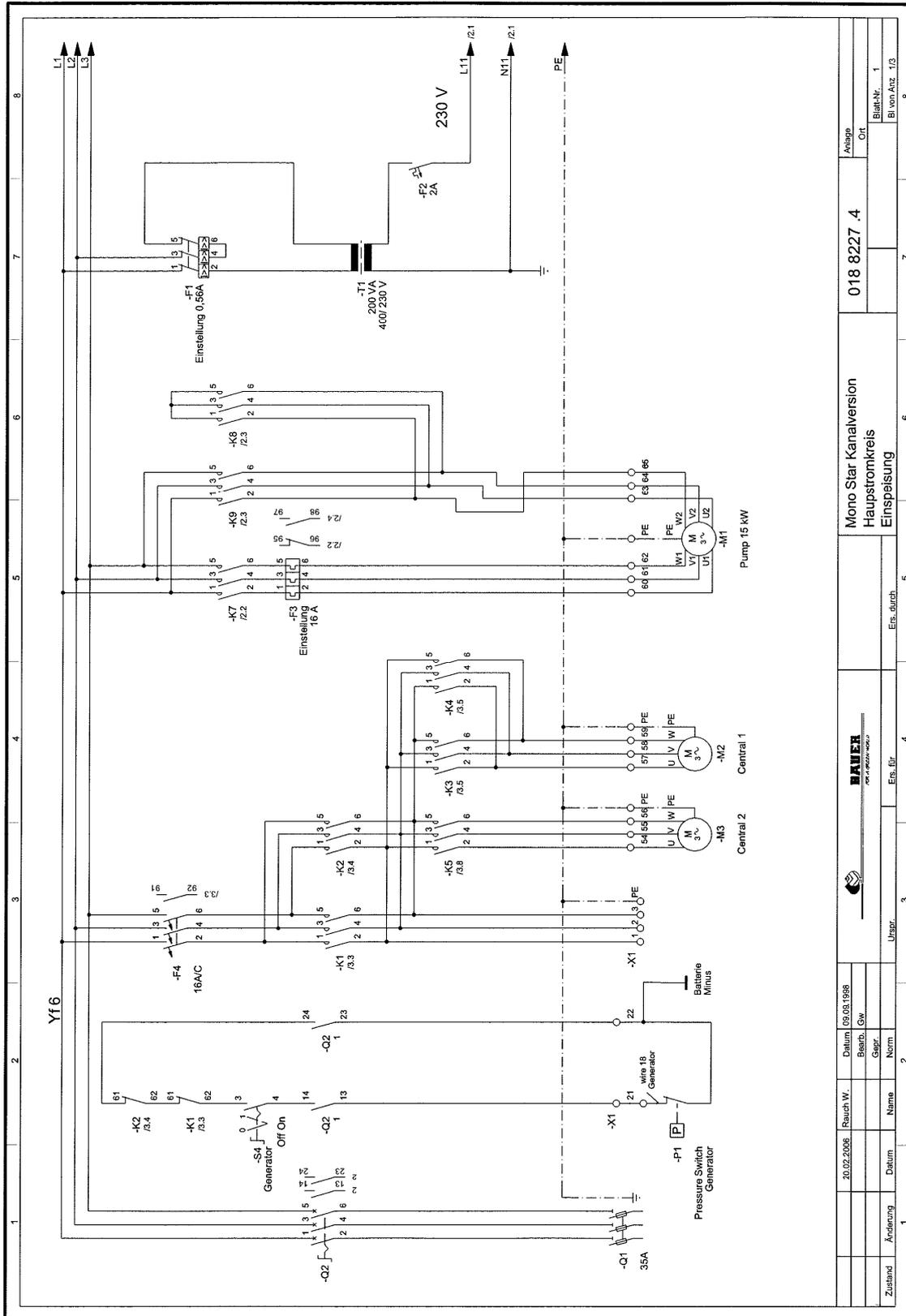
23.1.4 MONOSTAR – Infeed



Zustand	Änderung	Datum	Name	Grp.	Norm	Urspr.	Einr. für	Einr. durch	018 8220 .4	Anlage	Ort	Blatt Nr.	2	Bl. von Anz	2/2
		22.05.2006	Fauch W.						Mono Star						
		06.04.2005	Fauch W.						22.05.06						
									Steuerung						



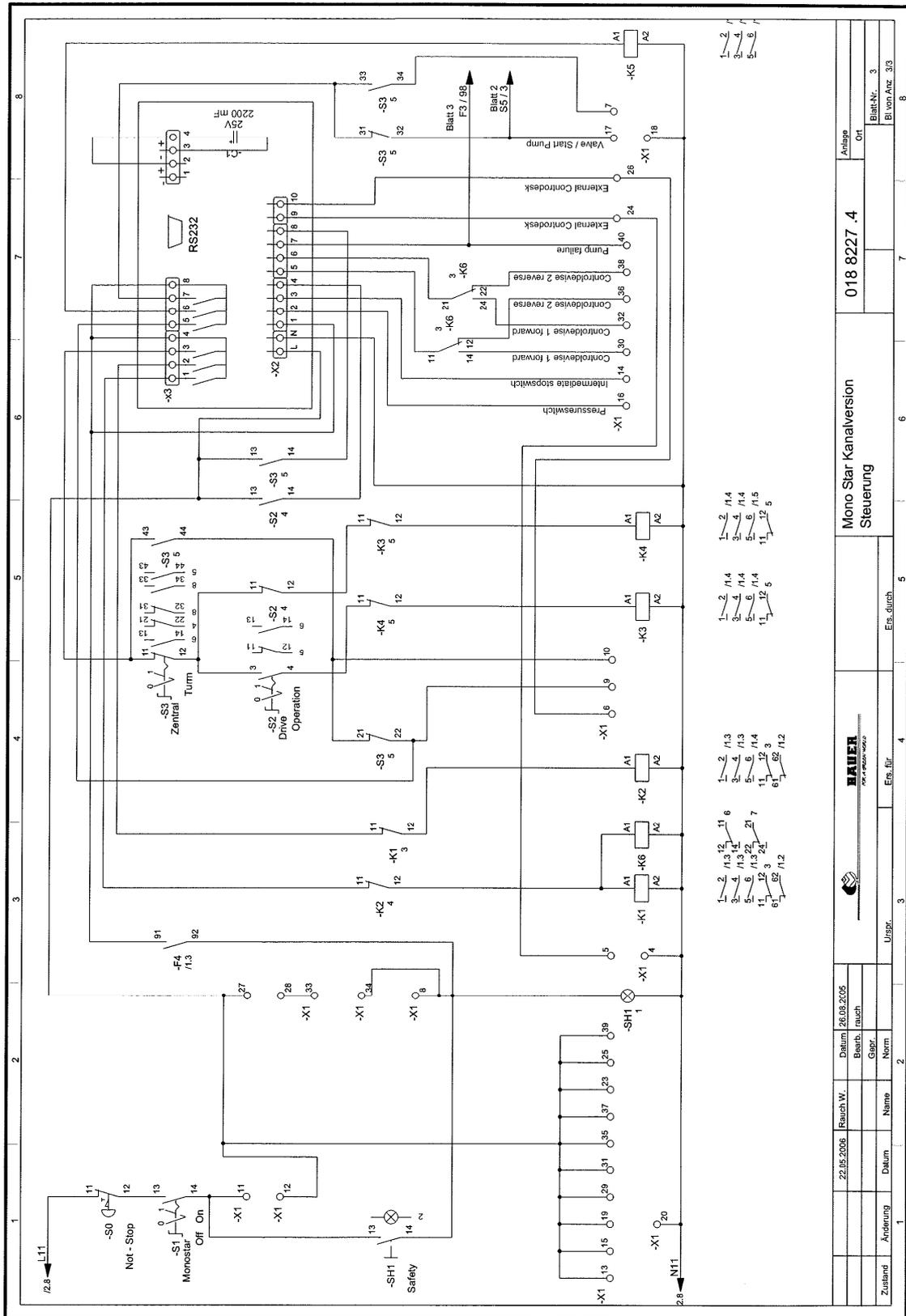
23.1.5 MONOSTAR canal feeding



Zustand		20.02.2008		Rauch W.		Datum 09.08.1998		Anlage	
Änderung						Bauteil Gw.		018 8227 .4	
Datum				Name		Grp.		Mono Star Kanalversion	
Urspr.		3		Ers. für		Ers. durch		Hauptstromkreis	
1		2		4		5		Einspeisung	
6		7		8		9		Blatt-Nr. 1	
10		11		12		13		Bl. von Anz. 1/3	



23.1.7 MONOSTAR canal feeding

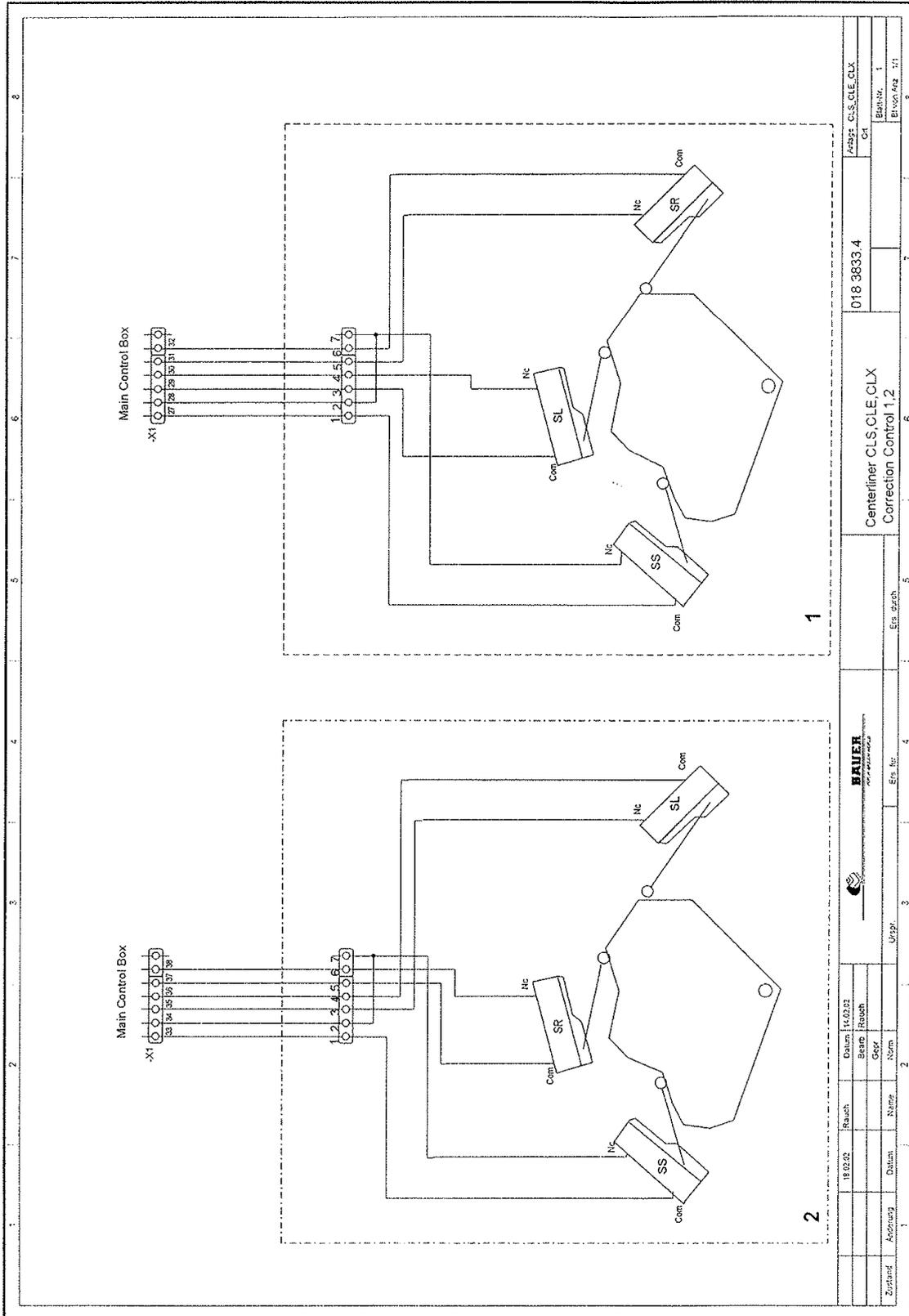


Zustand	Änderung	Datum	Name	Norm	Urspr.	Erst. für	Erst. durch	5
		22.05.2006	Rauch W.					
		26.09.2005	Rauch					
Mono Star Kanalversion Steuerung								
018 8227 4								
Anlage								01
BlattNr.								3
Bl. von/Ans.								3/3



23.3 MONOSTAR Linear Control

23.3.1 LINEAR CONTROL – Furrow guidance





24 Service – Proof

Has been done	Yes	No	Date	Operating hours	Proof for the accomplished service
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part-Service					
Oil change-Service					
Annual-Service					

Has been done	Yes	No	Date	Operating hours	Proof for the accomplished service
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Oil change-Service					
Annual Service					



Has been done	Yes	No	Date	Operating hours	Proof for the accomplished service
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Oil change-Service					
Annual-Service					

Has been done	Yes	No	Date	Operating hours	Proof for the accomplished service
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Oil change-Service					
Annual Service					



Has been done	Yes	No	Date	Operating hours	Proof for the accomplished service
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Oil change-Service					
Annual-Service					

Has been done	Yes	No	Date	Operating hours	Proof for the accomplished service
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Oil change-Service					
Annual Service					



Has been done	Yes	No	Date	Operating hours	Proof for the accomplished service
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Oil change-Service					
Annual-Service					

Has been done	Yes	No	Date	Operating hours	Proof for the accomplished service
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Part -Service					
Oil change-Service					
Annual Service					



25 CONFORMITY CERTIFICATE

Conformity Certificate

according to the EC Directive for Machines 98/37/EC, Annex II A

We,

Röhren- und Pumpenwerk BAUER Gesellschaft m.b.H.
Kowaldstraße 2, A - 8570 Voitsberg - Austria
Tel. +43 3142 200 - 0, Telefax: +43 3142 200-320 /-340

herewith declare that in respect of its conception and construction and in the types and styles marketed by our company, the machine mentioned below fully complies with the relevant fundamental provisions for safety and health as stipulated in the EC directives
Any modification of this machine without our prior express consent render this certificate invalid.

Designation of the machine: **BAUER MONOSTAR**
Basic models:

This range of machines has been designed and built in compliance with the standard:

EN 909

including also the normative references to EN 292-1 - 1991, EN 292-2 – 1991, EN 294 – 1992.

Johann Langmann
Technical Director

Voitsberg, July 2003