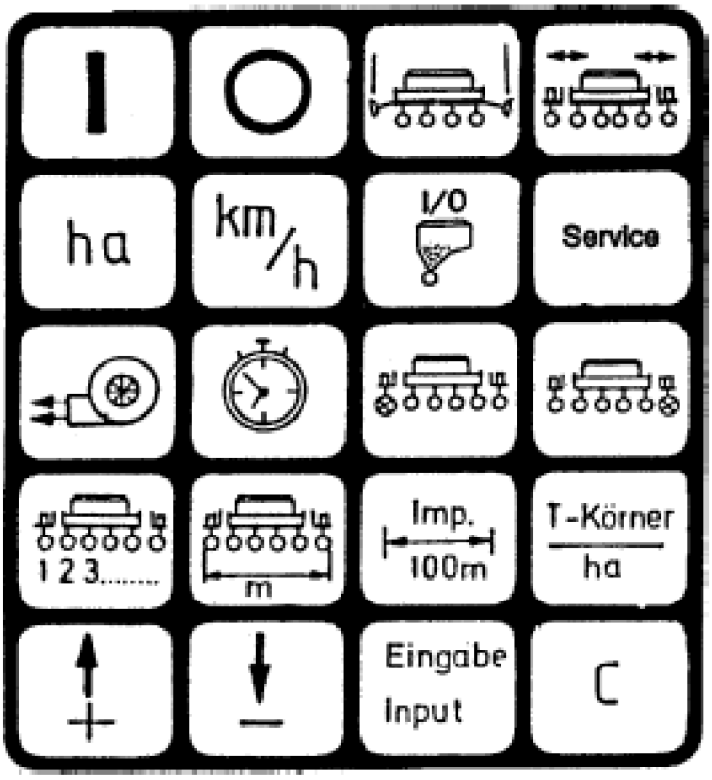
KONGSKILDE

Monitoring System 1502



Instruction manual

Contents

1. System Description

1.1 System Description

The Becker Monitoring System 1502 offers 3 programmes.

- Monitoring device for precision single seed drills (max. 12 units) with seed counting (optical transducer), control of the path marker and switching off of single units with one keystroke.
- Monitoring device for single grain sowing machines (max. 12 units) with stoppage surveillance of the sowing units (inductive sensor), control of the path marker and switching off of single units with one keystroke.
- Hectare counter for all other machines.

The Becker Monitoring System 1502 for precision single seed drills principally consists of:

- The on-board computer (installed in the cab of the tractor), which is used for the input of the desired data as well as for monitoring. Acoustic and optical alert is triggered in the case of malfunction.
- The machine distributor (installed on the frame of the drill) with a connecting cable to the on-board computer.
- The optical transducers, one of which is installed in the lower part of the casing of each seeding unit with a connecting cable to the distributor box.
- The sensor 'A' for determining the distance driven. Installed in the designated holder by the wheel.
- The connecting cables to the hydraulics (path marker) and the wrap-spring clutch (unit stoppage).

1.2 The Becker Monitoring System 1502 functions:

1.2.1 Operation Mode, precision single seed drill with Optical Transducer (Seed Counting)

Monitoring the seeding units. The falling seeds are registered by an optical transducer (infrared light barrier).

Each seed triggers an impulse in the computer.

The computer monitors each path with a given desired value. If the actual value falls short of the desired value by more than 15% an acoustic and optical alert is triggered. The number of the defective unit appears in the display with the number of seeds/ha (x 1000).

- Determining the area worked on per session.
- Displaying the speed.
- Determining the working time.
- Monitoring the blower function.
- Monitoring fertiliser application (possible for up to 10 units inclusive).
- Through the keys "switching off of the units from the left" or right, respectively, monitoring of one or more units can be switched off for a brief time. If the machine is equipped with individual electromagnetic cut-off at the seeding units, the chosen unit is also switched off.

1.2.2 Operation Mode precision single seed drill with Reed Contact Sensor (Stoppage Surveillance of the Sowing Units).

Same functions as in the operation mode with optical transducer. An alert is triggered, if no signal is given from the sowing unit sensor to the computer within 5 wheel revolutions.

1.2.3 Operation Mode Hectare Counter

- Determination of the area worked on from the start of work.
- Displaying the speed.
- Determination of the work time.
- With partial width adjustment.

The respective operation mode is selected by the key "number of seeds/ha" (see 3.2.5).

2. **Accessory Instructions -** Precision Single Seed Drills

2.1 Computer

The computer is to be installed with the enclosed console within sight of the driver. There should be a distance from the radio set and radio antenna of at least 1m.

2.2 Connecting of 12 V Socket to Tractor Battery

For the power supply of the Becker Monitoring System 1502 (computer and actuators) the attached 12V socket must be connected to the tractor battery directly. No other device must be connected through this 12V socket. The 12V socket must be protected by a16Amp melt-fuse, which is located in the cable connector of the brown 12V line.
Line Colours:
- brown + 12 Volt
- blue - Earth

The negative pole of the battery must always be connected to earth (frame, chassis).

2.3 Signal Deployment/ Sensors Precision Single Seed Drills

The installation of the signal deployment and the sensors is factory-set (pre-set).
For this reason the following points are only relevant either to repair work or the additional equipping of the Aeromat type of BECKER seed drill with the Becker Monitoring System 1502.

- The distributor box should be installed on the frame of the drill with 20 x M4 screws. The plug of the connecting cables is to be connected to the on-board computer and the cable must be carefully fixed using the cable clamp and plastic ties.
- Optical transmitter (infrared light barrier):
  One transmitter is installed at the lower part of the casing of each seeding unit with a connecting cable to the distributor box. The optical transmitter is suitable if the size of the seed at least corresponds to pelleted beet seed.

- Reed contact switch for monitoring the cell wheel, cable marking 1-12. A magnet is fixed to each cell wheel. The sensor is installed to the holder with the hand-screw M6 (turn clockwise). The end of the sensor is connected to the distributor box circuit board .

- Sensor for determining the distance travelled (cable marking A):
  The magnet is fixed to the wheel aperture with the accompanying brass screw, M5. The sensor (cable marking A) must be installed to the designated holder at a distance of 10-20 mm from the magnet and be wired to the distributor box circuit board .

- Monitoring of the rpm of the blower (cable marking C):
  The magnet is installed to the front of the aluminium disk on the shaft of the blower. The sensor is fastened to the bracket opposite the magnet at a distance of 3-5 mm. After any drive belt adjustment, the sensor must be readjusted in the holder so that it again points directly at the magnet. The cable is wired to the distributor box circuit board .
  If the magnet in the blower is replaced, care has to be taken that the polished side (south pole)of the magnet points to the sensor. All other magnets can be replaced in their designated places without regard to polarity.

- Function monitoring of the fertiliser spreader drive shaft:
  Up to 10 units inclusive of the inputs 11 and 12 are automatically monitored by the fertiliser spreader monitoring. The inputs in a work situation demand at least 1 impulse within 5 wheel revolutions. If no monitoring of the fertiliser spreader is planned, the input sensor A (wheel, green cable) and the inputs (green) 11 and 12 must be connected together. If only one sensor is installed, the input 11 must be bridged by 12.
  Set-up and installation of the sensor is as for sensor A.

3. Safety

3.1 Correct Use

The Becker Monitoring System 1502 is exclusively designed for proper application in agriculture. Any use exceeding this is not appropriate.

The manufacturer is not liable for any damage to persons and objects resulting from this. All risks of incorrect use are at the sole risk of the user.

The proper application includes the observance of the operation and maintenance conditions specified by the manufacturer in the operating instructions.

The relevant accident prevention regulations and other commonly acknowledged safety-related, industrial safety regulations and road traffic law regulations have to be observed. Unauthorised modifications of the Becker Monitoring System 1502 nullify liability of the manufacturer.

3.2 Safety Regulations

Before starting work on the electrical installations the connection to the battery must be disconnected. Similarly, disconnect from the battery before any welding is carried out.

4. Operating Instructions

4.1 Putting into Operation

On switching on the device, a self-test is performed. Following this, the last function that was displayed before switching off is automatically selected.
In case of a fault in the electronics, the device displays:
HALP 00 or **HALP 88** .

If this occurs, the device must be returned for repair.

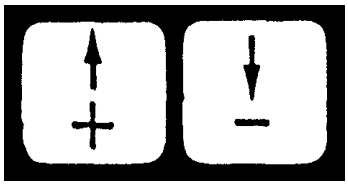
4.2 Description of the Return Keys

The keyboard is divided into 3 colours:

- white keys = function keys (determine the information displayed)
- blue keys = return keys (input the machine information)
- yellow keys = control keys (switch the units on and off, control of the path marker)

4.2.1 Position Keys +/- (Fig.1)

With the first keystroke on the **+** or **-** key, respectively, the display proceeds by one position in the desired direction. By holding down the key the display moves continuously in the chosen direction until the key is released.



The on-board computer requires the following machine data in order to operate: impulses / 100 m, width of work, number of units, nominal number of revolutions (e.g. blower) and the desired value "seeds/ha".

4.2.2 Key "Width of Work" (Fig.2)

The actual width of work is entered thus:
- Press key "width of work".
- Select value through the **+/-** keys.
- Press key "enter".

Subsequently, the entered value should again be checked by pressing the key "width of work".

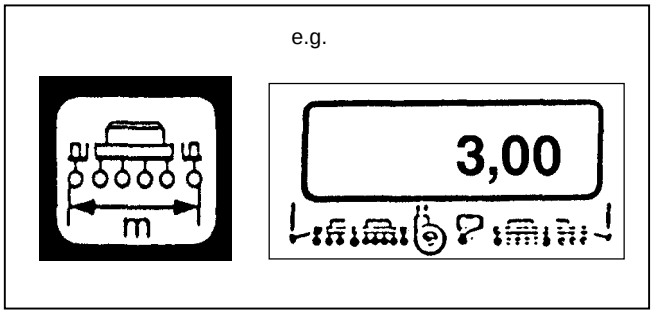


Fig.2

4.2.3 Key "Impulses/100 m" (Fig.3)

This is used to enter to the computer the number of impulses which the sensor A emits during a run of 100 m.

There are two possibilities of entering:

1. The value of impulses/100 m is known

- Press key "impulses/100 m"
- Select value through the +/- keys
- Press key "enter"

2. The value impulses/100 m is not known:

- Measure and mark a distance of 100m on the field
- Place tractor in starting position
- Press keys "impulses/100 m" and "C" simultaneously
- Drive over the distance of 100 m
- Press key "enter".

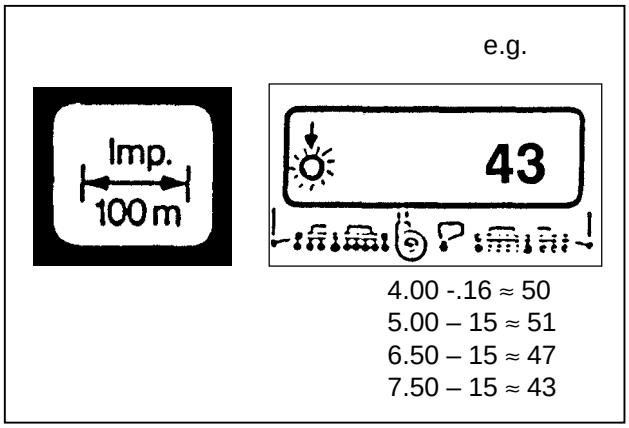


Fig.3

Fig.1

4.2.4 Key "Number of Units" (Fig.4)

Between 1-12 units may be entered.
- Press key "number of units".
- Select value with the **+/-** keys.
- Press key "enter".

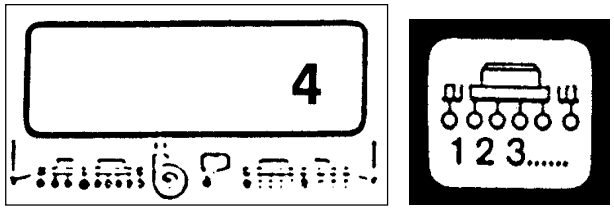


Fig.4

4.2.5 Key "number of seeds/ha" (Fig.5)

This key accesses the operation mode.
- Operation mode "optical transmitter" (seed counting) in this case the number of seed/ha is entered (for 95 000 seeds/ha enter = 95).
- Operation mode "reed contact sensor" (stoppage surveillance) here 1 is always entered regardless of the number of seeds/ha.
- Operation mode "hectare counter", here a zero is always entered, the unit monitoring is switched off. The device can be used as a hectare counter.

Entry process:

- Press key "number of seeds/ha".
- Enter value through the **+/-** keys.
- Press key "enter".

The value entered is with a factor of 1,000, i.e. for 95 000 seeds/ha the figure 95 is entered.

e.g.

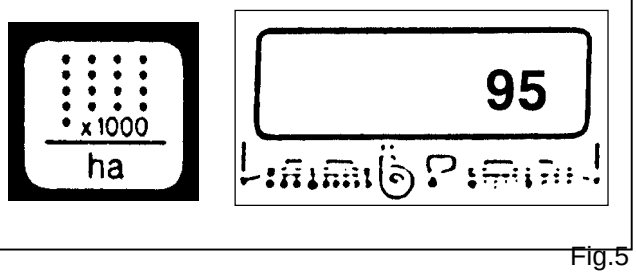


Fig.5

4.2.6 Programming for the Revolutions Protection (Fig.6)

The nominal number of fan revolutions has to be entered into the computer once before the beginning of the season.

Entering is performed as follows:
- Put the machine into operation (normal load)
- Press key "revolutions monitor" (current number of revolutions is displayed in revolutions/min.)
- Press key "enter".

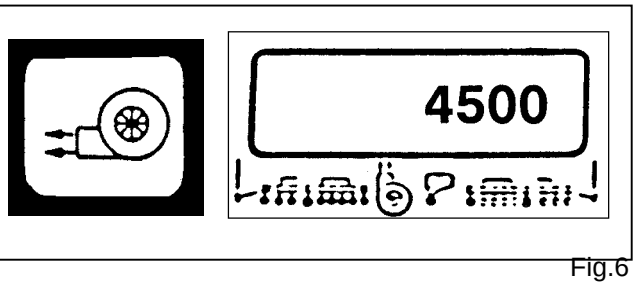


Fig.6

e.g.

The value displayed at this point in time is saved as the nominal number of revolutions.
While working, if the number of revolutions falls below this setting by more than 10 %, the horn is sounded and an arrow flashes above the symbol "blower" in the display. By pressing the key " revolutions monitor" the current number of revolutions will be displayed.

If, for instance, monitoring the number of revolutions is to be switched off through transferring the computer to a different machine, the following entry is required:

- Press key " revolutions monitor" (display 0)
- Press key "enter"
- The revolutions monitoring is thus switched off.

After the values described in 4.2.1. - 4.2.6. have been entered, the on-board computer is ready for use.

4.2.7 Stoppage Surveillance for Fertiliser Spreader Drive (Fig.7)

Fig.7

The input units 11 and 10 are automatically used for a stoppage surveillance for the fertiliser spreader drive with up to 10 units being monitored.

Within 5 wheel revolutions the inputs require at least 1 impulse from the sensors. Surveillance on: arrow visible in the display.
In case of a fault in the drive, the horn is sounded and an arrow flashes above the symbol "fertiliser spreader" in the display.

4.3 Description of the Function Keys

4.3.1 Equipment On/Off (Fig.8)

Fig.8

With the key "on" (1) the equipment is switched on. With the key "off" (0) it is switched off.
If, for instance on starting the tractor, the distribution voltage falls below 9 volts, the computer switches itself off automatically. It can be switched on again with the "on" key.

4.3.2 "Start Function" (Fig.9)

The start function is released by simultaneously pressing the keys "=" and "C". That is, the memory for area, time and distance is set to 0. Time is restarted automatically with this keystroke. This function should be performed before beginning a working session.

Fig.9

4.3.3 Key "Time" (Fig.10)

Pressing this key displays the working time that has elapsed after the performance of the "start function" (see 3.3.2.). When the tractor is switched off and the computer is without voltage, time registration is stopped. It is restarted after switching on the equipment. The clock can also be stopped during the working process. After pressing the key "time" a second key-press can stop the clock. It is restarted by again pressing the key "time".

Fig.10

Press key once = daily area
Press key twice = annual area

4.3.4 Key "Area" (Fig.11)

This displays the area that has been covered after performing the "start function" 4.3.2. measurement is interrupted as soon as the computer ceases to receive wheel impulses. In the operation mode 0 = hectare counter the sensor Y (working position) is required.

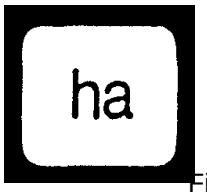


Fig.11

4.3.5 Key "Speed" (Fig.12)

After pressing this key the current speed is displayed.

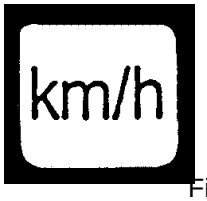
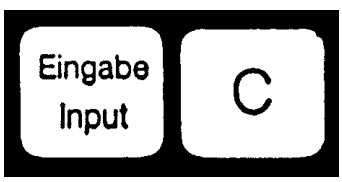


Fig.12



4.4 Description of the Control Keys (Fig.13)

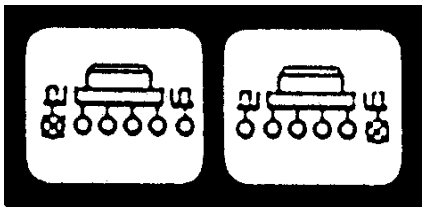


Fig.13

4.4.1 Key "Switch Off Units" (Fig.14)

During work the units can be switched off and on again with these keys.
Pressing the right or left key pre-selects on which side of the machine the units are to be switched off. The switching off itself is achieved with the [-] key.

Fig.14

By pressing the key "number of units" (fig.14) all units are again switched on.

All units are also automatically switched on again at the end of the field.

If no off-switch is installed in the units, pressing the keys merely switches off the monitoring.

4.5 Key "Path Marker"(Fig.15)

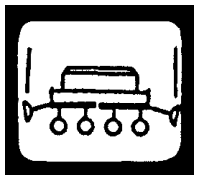


Fig.15

After switching on the appliance, both markers are active, both arrows are visible in the display. Repeated pressing of the – Marker - key switches over to the right or left Marker. Alternately, which is shown in the display.

4.6 Key "Raise - Lower"(Fig.16)

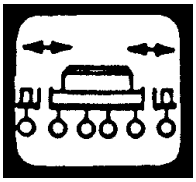


Fig.16

Independent of the function selection Marker, after pressing the key "telescope“, the function telescope L is selected.

With machines with quadruple magnet blocks the flip cylinders are switched according to the display through repeated pressing of the "telescope“ key, in function.

Pressing the "Marker“ key automatically blocks telescope cylinder or flip cylinder.

4.7 Operation Process

After entering the machine data (see 4.2.) only the start function remains to be carried out before the start of work.
During the working process the current amount of seeds/ha and the unit no. are automatically displayed. After 5 seconds the display automatically switches over to the next unit.

If the computer recognises a fault in one of the units, it is displayed. Additionally the horn is sounded.

Pressing a function key displays the desired value for approx. 5 seconds. Afterwards the computer automatically switches back to the function "number of seeds/ha" with the unit no.

4.8 Function Service: (Fig.17)

Fig.17

This function is used to check the system. If the function is selected and the light barrier is interrupted, the number of the unit appears in the display and the horn is sounded. No signal in case of fault.

5. Maintenance

5.1 Computer

The computer requires no maintenance. In winter it should be stored in a place with the correct temperature.

5.2 Sensors

If dirty, the optical transmitters must be cleaned with a soft brush. If they must not be washed, the optical transmitter is cleaned with detergent. Afterwards wipe dry with a grease-free cloth. The cleaning applies to the inside surface of the optical transmitters (infrared diode and phototransistors).

The sensor "wheel" requires no maintenance.

6.	**Troubleshooting**		
	Trouble	**Cause**	**Remedy**
6.1	The equipment cannot be switched on	Incorrect polarity	Check polarity
		Disruption in the voltage supply	Check battery connecting cable; check clamps at the battery and fuse.
6.2	Area is not measured	Input "width" or "impulses /100 m" is missing	Enter values (see 4.2.2. and 4.2.3)
		No impulses track indicator. Ring in the display is not flashing.	Check sensor A, check cable to sensor for damage, possibly replace sensor.
6.3	The adjusted Deliver-Quantity is not displayed. The horn sounds.	No impulses arrive at the calculator.	Clean optical transmitter thoroughly. Clean occasionally with detergent and soft brush, dry afterwards.
6.4	The computer indicates HALP 88 or HALP 00	There is a memory error.	Send computer for repair.

6.	**Troubleshooting**		
	Trouble	**Cause**	**Remedy**
6.4	**The adjusted Deliver-Quantity is not displayed**. (number 0 grains/ha)	Optical transmitters don't emit impulses to the computer.	Unit defective, seed hopper empty
			Optical transmitters are soiled, clean thoroughly. Before the season wash with detergent and a soft brush. Dry afterwards.
			Connect cable in the distributor properly green = gn = signal brown = br =+12 volts white = ws = 0 volts
			Sensor is defective, replace
			Computerr is defective, replace
			Distributor is defective, replace
6.4.1	The display seeds/ha fluctuates a lot	Optical transmitters emit impulses to the computer irregularly.	Adjust units properly, irregular rack
			Optical transmitters are soiled, clean thoroughly
6.5	Instead of 8 units, e.g., only 4 are being monitored	Input of number of units is not correct	Enter correct number of units
6.6	No alert in case of faulty seeder unit	Input of number of units is not correct	Enter correct number of units
		Input of number of seeds is missing	Enter desired number of seeds

Notes: