

## Mobile Warning Trailer with maintenance instructions

**Control unit**  
**Remote control**  
**Lamps**  
**Actuators**

**Operating voltage 12-24V**



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**Thoroughly read operating instructions BEFORE start-up the light arrow board.**

**In case of uncertainties, call us on:**

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## 1. Safety instructions

**Installation and operation of warning trailers on public roads may only be executed by briefed personal, under consideration of the applicable regulations of your country.**

**It is not allowed to transport any unsecured metallic items in the box of the rechargeable batteries.**

### Caution!

#### When charging the batteries ...

- don't smoke
- avoid sparking
- make sure that your working area is well ventilated

During the charging process **explosive gas mixtures** may originate!

The operating hours stated in the manual will only be achieved with new and fully charged batteries.

Before undertaking any works at the electronics of the trailer, make sure to disconnect the batteries

- **first** the negative pole
- **second** the positive pole

**Only use such kind of fuses as specified by horizont klemmfix!**

**Before towing the trailer in traffic, make sure that ...**

- there are no items stored on / or in the box for the rechargeable batteries,
- the stop lights, turn signal indicators and rear lights work properly,
- the rechargeable batteries are fully charged,
- the charging cable has been removed and duly stowed,
- the rechargeable batteries are securely fastened in their box,
- the pole terminals are tightened
- the battery box is closed
- the cable for the remote control is plugged in (for trailers with cable remote control)
- the handbrake is released
- the breakaway cable is connected with your towing vehicle
- the jacks are retracted, locked and secured
- the tires are in good conditions, check air pressure

- the upper board is lowered, locked and secured (depends on trailer version)
- the toggle nuts of the height-adjustable draw bar are tightened and secured
- the draw bar of the trailer is adjusted in height so that the upper board is in vertical position to the road when being raised.
- the trailer is generally in good condition.

## 2. Start operation

Before the initial operation of the trailer, read this manual carefully!

Please pay special attention to the safety, operation and maintenance instructions.

### 2.1 Trailer hook-up

- Make sure that the upper board is lowered and locked
- Make sure that the rear jacks have been fully retracted and locked
- Disconnect the power cord of the battery charger from the mains and stow it e.g. in the battery box.
- Make sure that the screw couplings of the battery holder as well as the ventilation lids of the batteries are tightly fastened. (Hazard of short circuits).
- Lock the battery box and make sure that any items loaded are properly secured.
- Adjust the draw bar of the trailer in height so that it forms a horizontal connection with the tow bar of the towing vehicle.
- Tighten the toggle nuts hand-tight and fix them by means of the splint pin.
- Make sure that the jockey wheel is winded up as far as it will go and fix it with the toggle screw.
- Put the breakaway cable over the tow bar of your towing vehicle.
- Connect the trailers' electric cable with the power socket of the towing vehicle
- Before each departure, ensure the general roadworthiness of the trailer, especially the proper functioning of the vehicle lights. Make sure that the parking brake is released.

## 2.2 Uncoupling of the trailer

- Before uncoupling the trailer, prevent it from inadvertent rolling! Unplug the vehicle lights cable and release the breakaway cable from the towing car.
- Put on the emergency brake to avoid inadvertent rolling.
- Lower the rear jacks and lock them.
- Lower the jockey wheel and open the coupling.

## 2.3. Manual raising of upper board

- Unlock the upper board by means of the clamping lever.
- Unlock raising bar and raise upper board in upright position
- Lock raising bar at frame. Use securing pin!

## 2.4 Automatic raising of upper board

- Switch on remote hand set
- Push the button "Raise board" until the upper board is in upright position and locked
- In order to lower the upper board push the button "**Lower board**" until the upper board is in its final position
- **IMPORTANT:** At FA L you first have to lower and lock the rear jacks before putting any load on.  
Additionally the loading ramp must not be used without lowered jacks!

**! Hazard of tipping over without lowered jacks!**

## 2.5 Towing the trailer with upright arrow board

- Towing the trailer with a ball hitch and in upright position the maximum allowed tow bar load is 25 kg and maximum allowed speed is 62 km/h.
- Towing the trailer in upright position with a pintle eye hitch maximum speed allowed is 80 km/h.

## 3. Central control device

The heart of the control device is a microprocessor circuit which...

- governs and monitors all processes
- sends information about the operating status to the remote control,
- receives and executes instructions sent from the remote control,
- in case of malfunctions executes a fault analysis. The result of the analysis is sent to the remote control where it is displayed.

### Advantages:

- Constant light intensity of the bulbs/LEDs regardless of the operating voltage
- Protection of bulbs/LEDs against overvoltage
- Optimum exploitation of the accumulator capacity

The capacity of the rechargeable batteries is constantly monitored and displayed on the remote control.

The control device is equipped with a photo sensor. By this means the light output is adapted to the ambient light conditions, avoiding dazzling of motorists.

All power outputs are electronically secured against short circuits.

**The long distance warning lamps can be equipped either with xenon flash tubes (7.5 J), halogen lamps or LEDs (55W).**

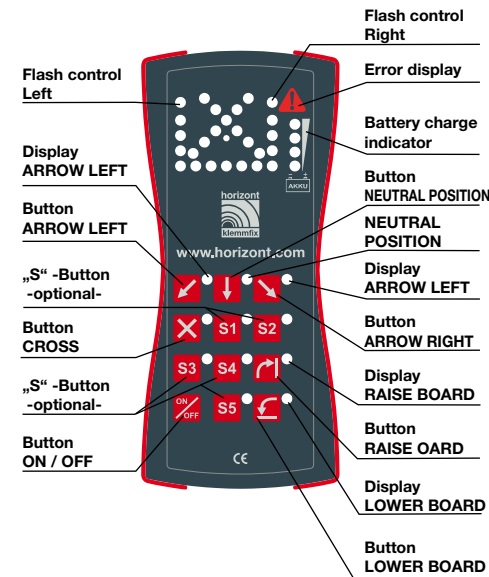
Changing from xenon flash to halogen lamps requires a software change as well, so cannot be done automatically!

The remote control itself is also controlled by a microprocessor.

The remote control ....

- displays the current signal of the arrow board
- indicates the capacity of the rechargeable batteries
- receives orders and transfers them to the control device of the trailer
- displays malfunctions of the arrow board

## 4. Remote control



## 5. Operation

### 5.1 On Site

The main switch for the power supply of the trailer is situated in the box for the rechargeable batteries.

Switch on the trailer via the main switch.

You can now govern the trailer via either

- cable remote control or
- radio remote control

After having activated trailer, the entire operation of the trailer takes place via the remote control.

- make sure that the jacks are lowered, locked and secured (depending on trailer version)
- release the locking mechanism of the upper board (depending on trailer version).
- push the ON/OFF button on the remote control in order to activate the arrow board
- the control device will run through an internal self-test and shows the results on the remote control.

**!!! Watch out for acoustic or visual fault indications !!!**

**(See point 9. Malfunctions)**

## Caution

In case malfunctions occur, please keep to the following instructions

- lower and lock the upper board.
- switch the arrow board OFF by means of the main switch in the battery box
- retract the jacks, lock and secure them.

If there are no malfunctions displayed the upper board is ready to operate.

## 5.2 Remote control: Buttons and their functionality

### Caution:

Before raising/lowering the upper board, always make sure that the jacks are lowered, locked and secured for best stability of the trailer.

If you work with a trailer with manual raising/ lowering of upper board: the remote control can only be activated after having raised the upper completely(see 1.3)

For trailers with automatic raising of the upper board: press the button "Raise upper board" on the remote control. The raising process may at any time be interrupted by releasing the button "Raise upper board". In order to continue the raising process, press the "Raise upper board" key again.

When the upper board has reached its final position, the green LED beside the button "**Raise upper board**" will light up.

### 5.2.1 „ON/OFF“

#### Activation of the warning board:

Simply press the button ON/OFF when the system is in stand-by mode in order to activate the arrow board. The system will simultaneously start a self-test.

In case the arrow board has been working before and the warning board is still in upright position, the last displayed symbol will be activated; the position of the mechanical arrow (blue roundel/ white arrow) remains unchanged.

In case of a malfunction, you will hear an acoustic warning signal and the malfunction is displayed on the remote control. For further information please see chapter 9. "Malfunctions."

### De-activation of the warning board:

Press the key "ON/OFF" for approx. 5 sec. until all of the horizontal lower LEDs on the remote control are lighted. Now release the button "ON/OFF" and the system is automatically switched to stand-by mode. Position of the upper board and of the mechanical arrow remain unchanged, the light arrow as well as the two MS340 flashers will be switched off.

In case you work with a radio remote control, pushing the ON/OFF button will only switch off the remote control, the control unit will remain in stand-by mode.

### 5.2.2 Cross (hard shoulder)

Press the key "CROSS".

The light arrow will show a cross.

The two MS340 flashers will be switched on.

The mechanical arrow will show "Pass left"

(Standard for right hand traffic, alternatives for left-hand driving on request)

In case the upper board is not yet in its final up-right position, the upper board will be raised first in its final position (hydraulic or electric). The two MS340 flashers are working during this process. .

The mechanical arrow will turn to the left. During this process, only the two MS340 flashers are working, the light arrow itself does not show any light signal.

As soon as the mechanical arrow has reached its final position, the light arrow board will show the flashing cross.

The LED beside the "CROSS" button on the remote control will light up.

### 5.2.3 ARROW LEFT

Press the key "ARROW LEFT".

The light arrow will show an arrow pointing to the left.

The two MS340 flashers will be switched on.

The mechanical arrow will show "Pass left"

In case the upper board is not yet in its final up-right position, the upper board will be raised first in its final position (hydraulic or electric). The two MS340 flashers are working during this process

The mechanical arrow will turn to the left. During this process, only the two MS340 flashers are working, the light arrow itself does not show any light signal.

As soon as the mechanical arrow has reached its final position, the light arrow board will show the flashing arrow "Keep left".

The LED beside the "ARROW LEFT" button on the remote control will light up.

### 5.2.4 ARROW RIGHT

Press the key "ARROW RIGHT"

The light arrow will show an arrow pointing to the right. The two MS340 flashers will be switched on.

The mechanical arrow will show "Pass right"

In case the upper board is not yet in its final up-right position, the upper board will be raised first in its final position (hydraulic or electric).

The two MS340 flashers are working during this process.

The mechanical arrow will turn to the right. During this process, only the two MS340 flashers are working, the light arrow itself does not show any light signal.

As soon as the mechanical arrow has reached its final position, the light arrow board will show the flashing arrow "Keep Right".

The LED beside the "ARROW RIGHT" button on the remote control will light up.

### 5.2.5 NEUTRAL POSITION

Press the key "NEUTRAL POSITION"

The light arrow will be switched off.

The two MS340 flashers will be switched on.

The mechanical arrow will show "Neutral position", i.e. the arrow will be set to vertical position

In case the upper board is not yet in its final up-right position, the upper board will be raised first in its final position (hydraulic or electric). The two MS340 flashers are working during this process.

The mechanical arrow will turn to the vertical position.

During this process, only the two MS340 flashers are working, the light arrow itself does not show any light signal.

When the mechanical arrow has reached its final position, the two MS340 flashers keep on working; the light arrow board itself does not show any light signal.

The LED beside the "NEUTRAL POSITION" button on the remote control will light up.

### 5.2.6 Buttons Raise BOARD and LOWER BOARD

At trailers with automatic raising and lowering device (hydraulic or electric), the upper board will be raised by pushing the button "RAISE BOARD" and lowered by pushing the button "LOWER BOARD".

When lowering the board, first the mechanical arrow will turn to the neutral position. The movement of the upper board can at any time be stopped by releasing the "Raise Board" or "Lower board" button.

When pushing the button again, the corresponding process will be continued.

As soon as the upper board has reached its final lowered position, the control unit will be switched to stand-by mode.

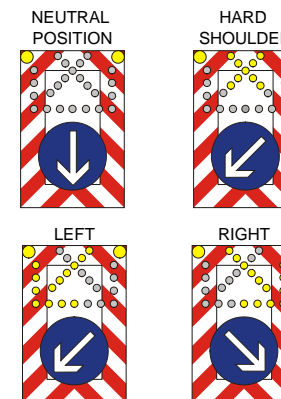
The raising respectively lowering of the board is indicated on the remote control by a flashing LED beside of the corresponding button. As soon as the board has reached its final position, the LED beside the corresponding button will light up constantly.

### 5.2.7 When using a combined Cable/Radio remote control

Please make sure to consider the following when using a combined cable / radio remote control:

1. The trailer can be operated via radio communication as well as via cable communication.
2. In case the cable of the remote control is connected with the trailer, the communication will automatically take place via the cable.
3. You can charge the rechargeable batteries of the remote control via this cable, as long as the cable is connected with the trailer and the trailer is switched on. The charging process is indicated by the corresponding LED indicator, showing a progressive light from red to green. When the batteries are completely charged, only the upper LED will constantly light up green.
4. In case the trailer is switched off, the remote control can only be charged via the charging cable, delivered separately.
5. In case the remote control is switched off, or has automatically been switched off in order to prevent from total discharge, only the remote control is switched off, not the arrow board itself!
6. If you move the trailer to another site, you should always re-assure which signal is currently being shown by the arrow board. In case the remote control is switched off, please switch the remote control ON again, in order to check the current light signal.

## 6. System surveillance during operation



## 7. System surveillance during operation

During operation, the central control device observes

- the charge condition of the rechargeable batteries
- the proper working of the two MS 340 flashers/ Halogen Lights
- the proper working of the bulbs/Leds of the arrow board
- the proper working of the mechanical arrow
- the position of the upper board

### Caution:

Even though the system is self-monitoring, this does not release you from the responsibility to constantly supervise the correct operation of the system yourself. This surveillance implies especially the monitoring of the remote control as well as the control lamps on the lid of the control device. Especially in case of a malfunction of the micro-processor, it is possible that those malfunctions do not cause an acoustic warning by the signal horn or display on the remote control.

Omitted constant surveillance might lead to serious or even fatal accidents!



The control LEDs on the lid of the control device

- light up simultaneously with the sign displayed by the light arrow

In case a malfunction is detected...

- the corresponding symbol displayed by the LEDs will start flashing quickly.
- the signal horn sounds the alarm and the malfunction is displayed on the remote control
- a red exclamation mark will light up on the control box lid.

The signs (arrow, cross, etc.) displayed by the LEDs on the lid of the control device are only symbolic.

They flash synchronously with the sign displayed on the arrow board.

In case of broken bulbs/LEDs on the arrow board, the corresponding sign symbol on the control device start flickering, e.g. the right arrow, left arrow, etc. The LEDs do not indicate which lamp is broken.

All malfunctions will also be displayed on the remote control.

The decision about a possible stop of the operation due to malfunctions of the trailer is up to the person responsible for the operation of the trailer.

**Note: Repairs may not be executed on site!**

## 8. Capacity of the rechargeable batteries

The charge condition of the rechargeable batteries is indicated by 4 LEDs on the remote control.

In case the batteries

- are fully charged, all 4 LEDs light up (red, yellow, green, green)
- are sufficiently charged, only 3 LEDs light up (red, yellow, green)
- have low charge only the red and yellow LEDs light up.

**In case the batteries are not charged and the discharge process continues ...**

- the red and yellow LED will start blinking
- the signal horn will sound

### CAUTION:

Even though the two MS340 flashers keep on working, the main part of the trailer is no longer operative!

- **Stop working!**
- **Switch OFF the complete system!**
- **Charge batteries!**

### Don't continue working without recharging the batteries!

Otherwise the remaining battery power will be too low to lower the arrow board and turn the mechanical arrow into the neutral position.

In case you continue working with low-charged batteries, the two MS340 flashers will stop working and the system will shut off automatically in order to prevent the batteries from deep discharge.

## 9. Malfunction

### 9.1 Malfunction indication on the remote control

The remote control displays the current operation status of the warning trailer.

In case of malfunctions the red warning triangle on the remote control lights up.

### 9.2 Defective lamps in the arrow board

The most common malfunction is the break of a lamp.

In case only a single lamp is already broken when the system is activated...

- the corresponding LED on the remote control starts flashing for approx. 30 sec.
- the signal horn sounds

In case one or several lamps get broken during operation

- the corresponding LEDs on the remote control extinguish
- the signal horn sounds

In case one or both MS340 flashers are defective

- the corresponding LED on the remote control extinguishes
- the signal horn sounds

### 9.3 Defective mechanical arrow

In case the mechanical arrow is defective, the LEDs on the remote control show a flashing "M" (M= Mechanical fault).

In this case you should immediately switch off the complete system by means of the main switch!

**IMPORTANT: Do not try to restart the system!**

### CAUTION!

Any malfunction in the mechanical arrow is a serious malfunction!

Operation of the system is no longer admissible!

In case repairs are not executed correct, you run the risk of damaging further parts of the system, e.g. parts of the motor for the mechanical arrow.

**Do not undertake repairs on site! You run the risk of severe or even fatal accidents!**

The flashing "M" on the remote control indicates a defect in the mechanical turning device.

The three centre LEDs in the lower row indicate the position of the proximity switches, respectively which proximity switch causes the problem.

A flashing LED indicates that the corresponding proximity switch has not reached its final position.



### NOTE:

**After any repairs executed you should always carry out a functionality test!**

### ! IMPORTANT!

**Before executing any repairs make sure to switch off the system by means of the main switch and/or disconnect the batteries.**

## 9.4 Maintenance and repair

All electronic components or modules in the remote control, main processor or lamps are maintenance free!

### EXCEPTION:

**The rechargeable batteries need to be checked and maintained regularly.**

If any component needs to be replaced, please make sure to keep to the instructions in this manual and/or the SERVICECARD, which you will find inside the control device box.

In case you replace a component, you should note down the initial connection sequence before.

You may not undertake any repairs at the components themselves!

Please contact our service department for any repair requests.

### Safety first!

Do not undertake repairs on site!

Only use tools and measuring tools in faultless conditions.

Keep in mind that short circuits in devices fed via rechargeable batteries may cause fire and/or smelting.

In case of maintenance work at the trailer, make sure that no person can be injured during the repairs.

### Positioning drives and motors

Before exchanging the electric actuator, make sure to prevent the upper board from inadvertent lowering.

Before exchanging the motor of the mechanical arrow or the motor responsible for locking the upper board, make sure to prevent the mechanical arrow from inadvertent turning.

### MS340 Xenon flashers

In the MS340 Xenon flashers a voltage of up to 5,000 V DC is generated!

In case you need to replace a flash tube or undertake any other repairs:

**Before opening the lamp housing make sure to wait at least 1 minute after having deactivated the system via the main switch or released the negative pole from the battery!**

### MS340 and RS2000 Halogen or LED

No need for any specific measurements in order to prevent from electric strike.

However, halogen and LED lamps may become hot during operation; if required let them cool down for at least 5 minutes before replacing them.

Halogen bulbs should not have contact with skin as their proper functioning may be impaired already by minor particles of skin oil.

Therefore halogen bulbs may only be touched with a clean cloth.

In case you have touched the bulb with your skin, make sure to clean it thoroughly with alcohol/ethyl alcohol.

### Central control device and remote control

No need for any specific measurements in order to prevent from electric strikes.

When closing the housing of the control device or remote control, make sure that the seal tape is in perfect condition and placed in the foreseen slot.

## 10. Regular Maintenance,

### Arrow board

#### After each operation on site.....

- clean the trailer thoroughly
- park the trailer at a dry but ventilated space
- charge the batteries regularly; make sure that the battery box stays open during the charging process

Keep to the instructions of the manufacturer of the rechargeable batteries

### CAUTION!

#### Explosion hazard in case of non-observance!

- Check the trailer for visible damages.

### NOTE!

Never use High Pressure Cleaners for cleaning the upper board, rechargeable batteries, remote control and/or all other electrical devices at your trailer. The pressurised water might enter the housing and thus destroy the electronic parts.

Furthermore you should not use acrid or scrubbing agents to clean the remote control and central control device, in order to avoid scratching of the plastics surfaces.

#### Every 8 weeks you should

- check the level of the battery acid and if necessary refill distilled water
- clean the surface of the rechargeable batteries, especially the space between the poles, with mild cleaning agents. Make sure that your cleaning device is non-metallic and non-conductive.
- clean and grease the poles of the rechargeable batteries.
- open the fuse box and check the fuse holder for corrosion.
- clean the battery box in order to prevent from corrosion which might occur in case battery acid leaking.
- check all plastic parts of the lamps, remote control and central control device for visible damages and if necessary replace damaged parts. This will help to prevent damages due to water intrusion.
- keep to the maintenance guidelines concerning the chassis and constructional parts of your trailer.

- check the flash tubes in the two MS340 flashers for colour changes. A black or dark coloured tube is an indicator for a soon breakdown of the tube. Additionally the staining of the tube considerably reduces the light output.

#### In case the trailer is not used for a longer period...

- carry out the maintenance works which should be effected after each operation as well the ones you should carry out every 8 weeks.

#### Additionally

- remove the rechargeable batteries and charge them
- store the batteries at a dry and cool place
- charge them every 3 months

Keep to the instructions to the manufacturer's instructions as concerns the chassis and constructional parts if the trailer is not in use for a longer period.

## 11. Maintenance, Chassis

The first control of screw fittings has to take place after 50 km of driven distance.

The next checks are due after 1,000 km and hereafter every 5,000 km of driven distance, at least once a year.

### CAUTION!

#### Pay attention to the respective bolting torques!

For bolted connections (minimum quality of bolts 8.8) metal/metal the following torques are valid:

Coarse pitch-thread ...Torque in Nm

M8 .....	25 .....	to .....	30
M10 .....	43 .....	to .....	47
M12 .....	76 .....	to .....	84
M14 .....	120 .....	to .....	130
M16 .....	170 .....	to .....	190

Standard fine thread

M12 x 1,5 .....	70 .....	to .....	80
M14 x 1,5 .....	120 .....	to .....	140
M16 x 1,5 .....	190 .....	to .....	210

Wheel bolts

M12 x 1,5 .....	80 .....	to .....	100
M14 x 1,5 .....	95 .....	to .....	105
M16 x 1,5 .....	230 .....	to .....	240

- The hinge-joints of the upper board are equipped with lubrication cups and should be lubricated at least twice a year. All other hinges should be lubricated as needed with machine oil.
- Clean the "window" on the central control device regularly in order to guarantee that the light intensity of the arrow board will be adapted to the environmental conditions.
- Read and keep to the instructions of the axle manufacturer as concerns the draw bar and breaking system!
- Clean the chassis with usual vehicle cleaning products.

Don't use High Pressure Cleaners!

## Recommended inflation pressure

Observe the legally required tread depth of tires!

FA10 .....	2,4 bar
FA10 L .....	3,0 bar
FA 10 LR .....	3,0 bar

### Lamps

Rear lights .....	12 V / 10 W
Brake lights .....	12 V / 21 W
Direction indicator .....	12 V / 21 W
Rear fog lights .....	12 V / 21 W

12. Wiring diagram

CAUTION !

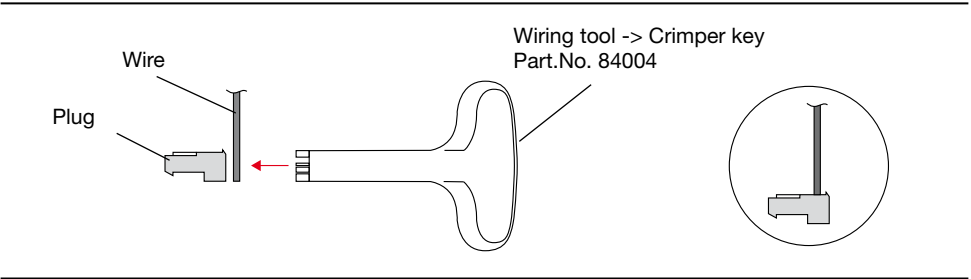
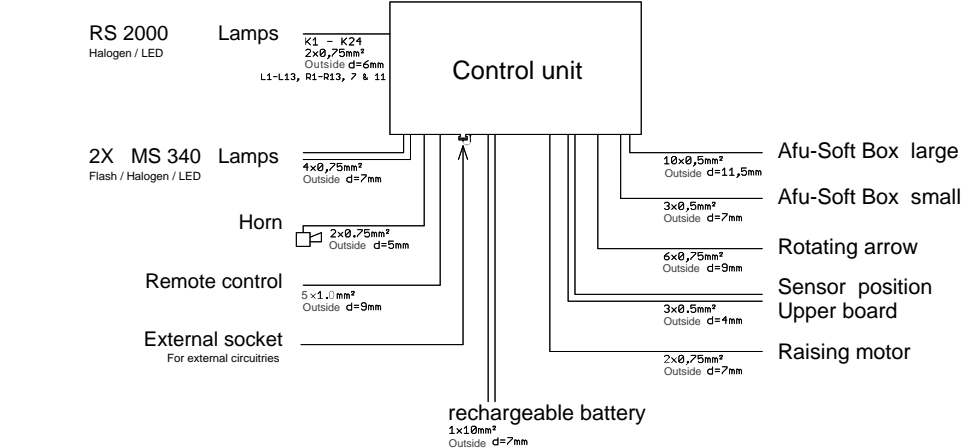
Adhere strictly to the wiring diagram, especially concerning grounding and conductor cross section.

Any modification may lead to a deterioration of the electromagnetic compatibility (EMC), which might lead to a total blackout of the whole trailer during operation.

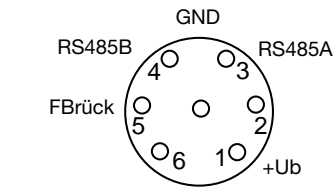
The information in this wiring diagram is thought for the expert.

It is not thought as an invitation for laymen to do the wiring themselves or search for faults in the wiring.

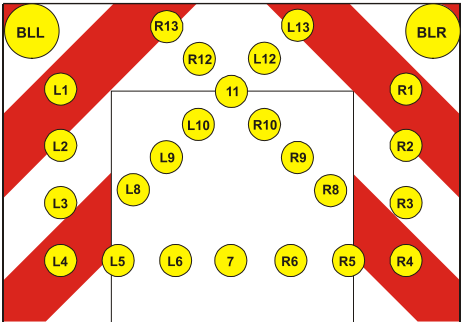
Wiring diagram



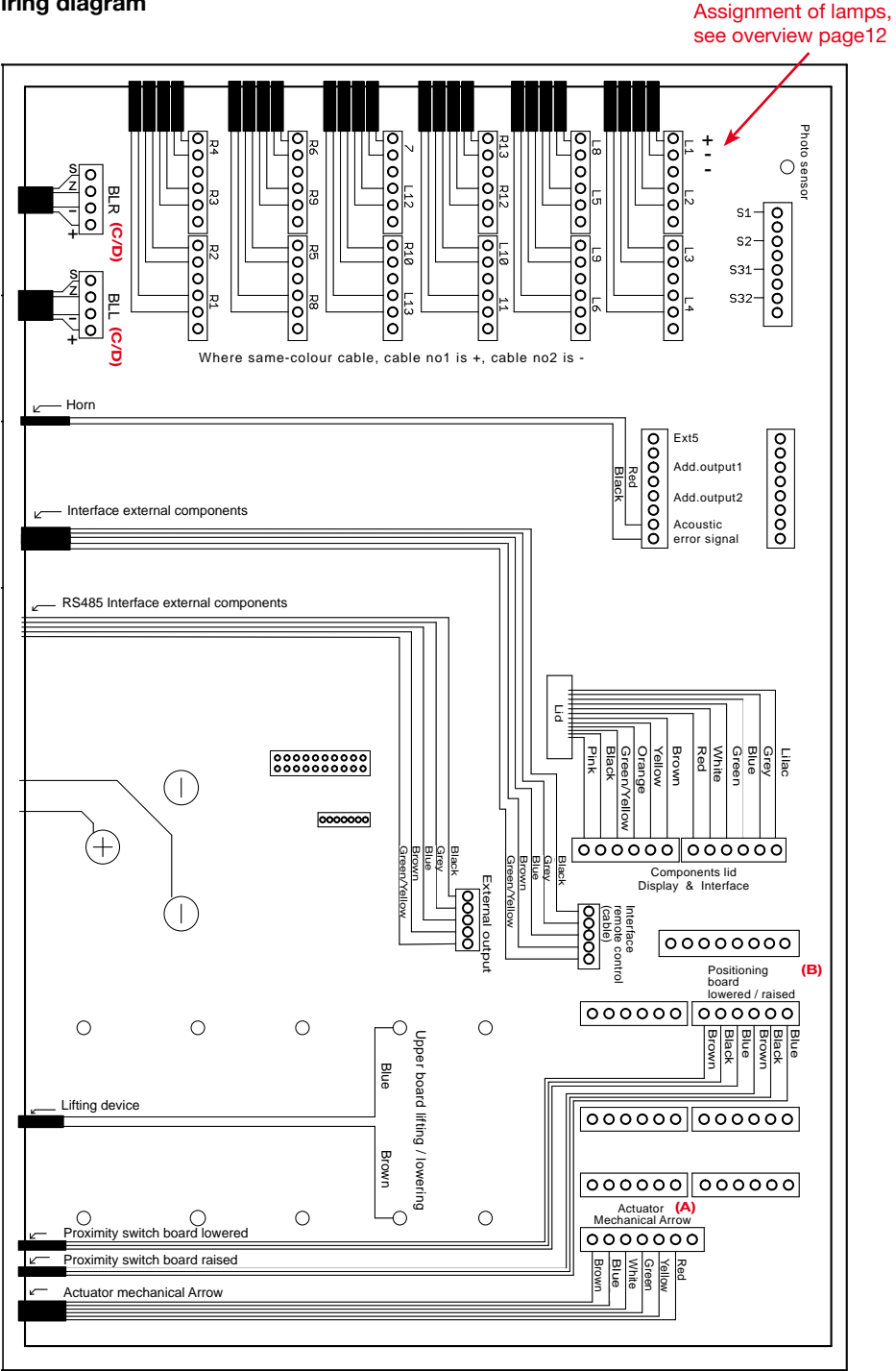
CA6 socket for coupler plug/socket remote control, cable



Assignment of lamps



Wiring diagram



Assignment of lamps, see overview page12

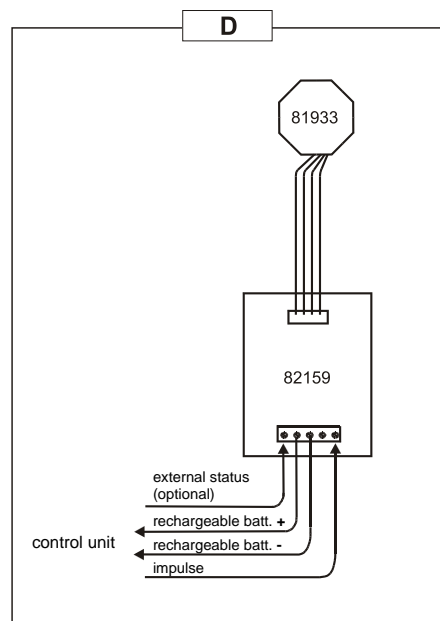
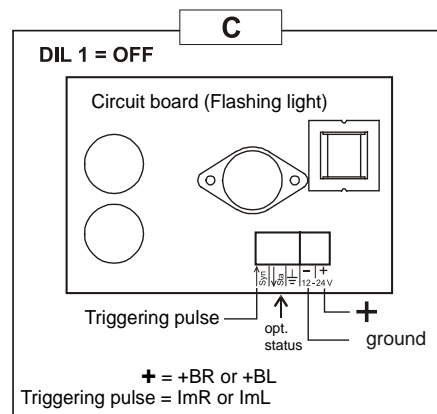
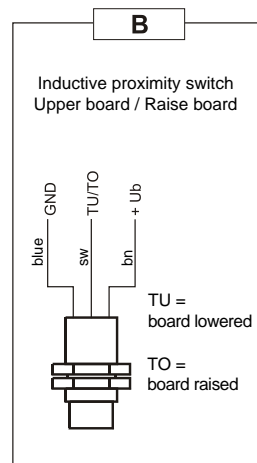
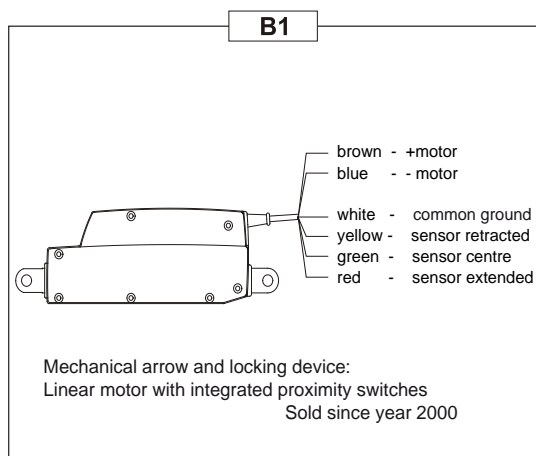


Fig. A

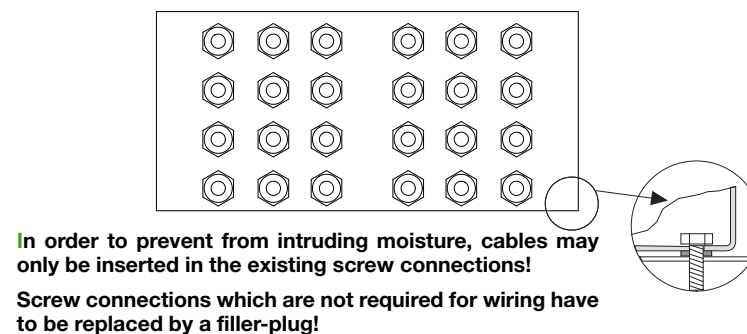
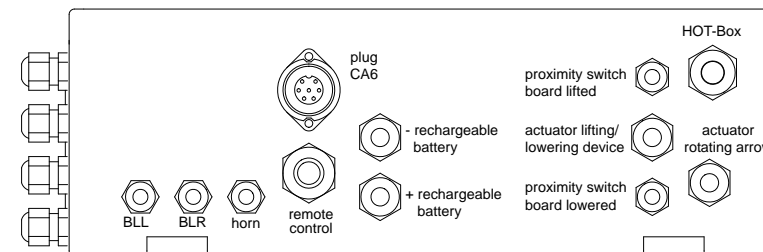
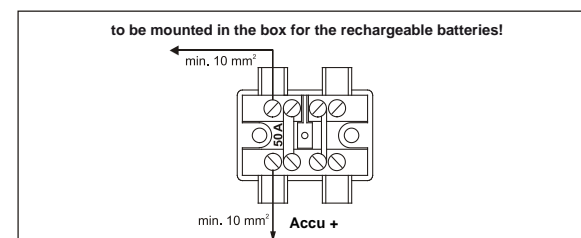


Fig. B



Denomination	Coated Cable	Screw thread
+ rechargeable battery	1 x 10 mm <sup>2</sup>	9
- rechargeable battery	1 x 10 mm <sup>2</sup>	9
BLR (Flasher right)	3 (optical 4) x 1,0 mm <sup>2</sup>	7
BLL (flasher left)	3 (optical 4) x 1,0 mm <sup>2</sup>	7
Actuator raising/lowering device	Original cable	9
Actuator rotating arrow	Original cable	9
Horn	2 x 0,75 mm <sup>2</sup>	7
HOT-Box	Original cable	11
TU (proximity switch: board lowered)	Original cable	7
TO (proximity switch: board raised)	Original cable	7
FB (Remote control)	5 x 1,0 mm <sup>2</sup>	13,5
Lamps (Fig. A)	2 x 0,75 mm <sup>2</sup>	7

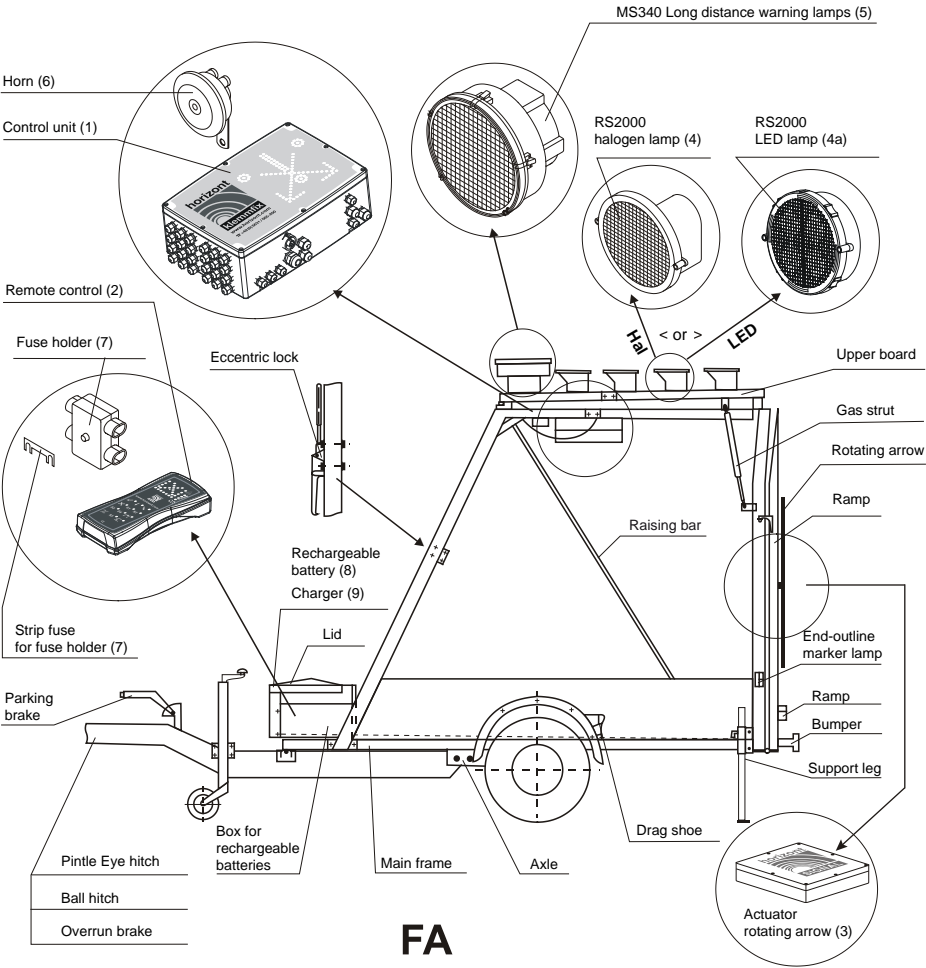
Fig. C



13. Component List

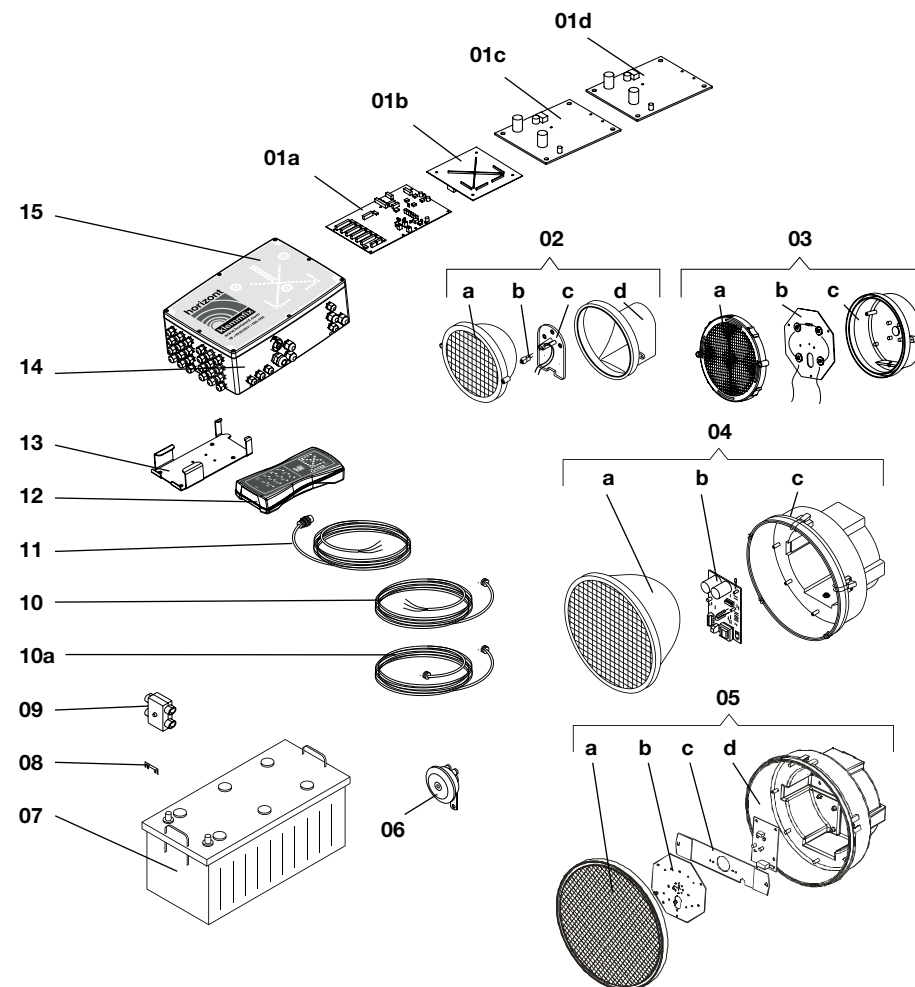
Control unit.....	(1)
Remote control.....	(2)
Rotating arrow set.....	(3)
24 RS2000 Halogen lamps.....	(4)
24 RS2000 LED lamps (12/24V ) .....	(4a)
2 lamps Typ MS340.....	(5)
Horn.....	(6)
Fuse holder with 2 strip fuses .....	(7)
Rechargeable batteries .....	(8)
Charger (if required) .....	(9)

Please contact us for further information on customized versions.



#### 14. Spare parts

	12V	24V
	Typ 21150	Typ 21151
01a Circuit plate control unit.....	82134	82135
01b Circuit plate operating display .....	82136	82139
01c Circuit plate – Interface DECT.....	82140	82140
(only for remote control 21154 "FB-LPS kpl.")		
01d Circuit plate – Interface GPS/GPRS .....	82145	82145
02 RS2000 halogen complete lamp .....	20875	20993
02a Reflector + lens for RS2000.....	92230	92230
02b Halogen bulb 20W G4.....	20100	20102
02c Plate with bulb holder .....	92794	92794
02d Housing RS2000 halogen .....	92751	92751
03 RS2000 LED complete lamp .....	21143	211432
03a Lens for RS2000 LED.....	81456	81456
03b LED cluster .....	82066	820663
03c Housing RS2000 LED .....	82098	82098
04 MS340 Xenon flash complete lamp .....	20828	20828
04a Reflector with lens for MS340.....	92478	92478
04b Circuit board with flash tube .....	928123	928123
04c Gehäuse MS340 .....	92536	92536
05 MS340 LED complete lamp.....	20828AT	20828AT
05a Lens MS340 LED .....	81933	81933
05b Circuit board MS340 LED .....	82159	82159
05c Holding plate MS340 LED.....	81944	81944
05d Housing MS340 LED.....	92536	92536
06 Horn .....	94144	94174
07 Rechargeable battery 12V/135 Ah .....	25014	25014
08 Fuse strip .....	94195	94195
09 Fuse box .....	94193	94193
10 Remote control cable .....	820472	820472
10a Remote control cable (optional).....	820472-1	820472-1
11 Proximity switch.....	94345	94345
12 Remote control cable / radio complete .....	21154	21154
(only together with ref. 82140 "LP- Interface DECT")		
13 Cradle for remote control.....	81876	81876
14 Housing control unit .....	81722	81722
15 Lid .....	94151Lpf	94141Lpf



#### 15. Operating data Warning Trailer "FA"

**Supply voltage:** 12V-trailer/electrical system 11, 2V .....15V  
24V-trailer/electrical system 22, 4V.....30V

Direct current from rechargeable batteries "semi-traction"

The use of starter batteries is not recommended.

In buffer mode, the rechargeable batteries can be driven via external current generators with charging function, solar system, fuel cell, etc.

**12V Systems 2x rechargeable battery for semi-traction 12V in parallel connection**

**24V System 2x rechargeable battery for semi-traction 12V in series connection**

Voltage supply on + pole via lead fuse 50 A

Voltage supply on + pole can be interrupted via main circuit.

Operating hours h <sup>1)</sup>

	Version Operating mode	RS2000 Halogen MS340 Xenon flash	RS2000 Halogen MS340 Halogen	RS 2000 LED MS 340 Xenon flash	RS 2000 LED MS 340 Xenon flash	RS 2000 LED MS 340 Halogen
12 V	Arrow L/R	18	17	28	26	26
	Cross	24	24	37	34	34
	Lane divider	15	15	25	22	22
24 V	Arrow L/R	18	17	X	25	25
	Cross	24	24	X	33	33
	Lane divider	15	15	X	21	21

1) The operating hours are calculated with 2 rechargeable batteries 12V / 180 Ah (C20), under optimal conditions, not considering any alteration due to ageing, temperature and charging condition.

RS 2000 Halogen	Art. Nr. 20875OT	12 V	1,7 A		
RS 2000 LED single voltage only 12V	Art. Nr. 21143	12 V	0,8 A		
RS 2000 LED dual voltage 12/24V	Art. Nr. 211432	12 V	1,0 A	24 V	0,5 A
MS 340 Halogen	Art. Nr. 20824	12 V	4,2 A		
MS 340 Xenon flash	Art. Nr. 20828	12 V	1,3 A	24 V	0,8 A

Rechargeable battery display

	12V	24V
	Typ 21150	Typ 21151
Display rechargeable battery under load		
red + yellow + green + green.....	> 12,2 V	> 24,4 V
red + yellow + green.....	< 12,2 V	24,2 V
red + yellow .....	< 11,8 V	23,6 V
red + yellow flashing + horn .....	< 11,6 V	23,2 V
Automatic switch- off light arrow at .....	< 11,2 V	22,4 V

All data are computed averaged values under normal circumstances and may vary due to the condition of the rechargeable battery and/or ambient air temperature.