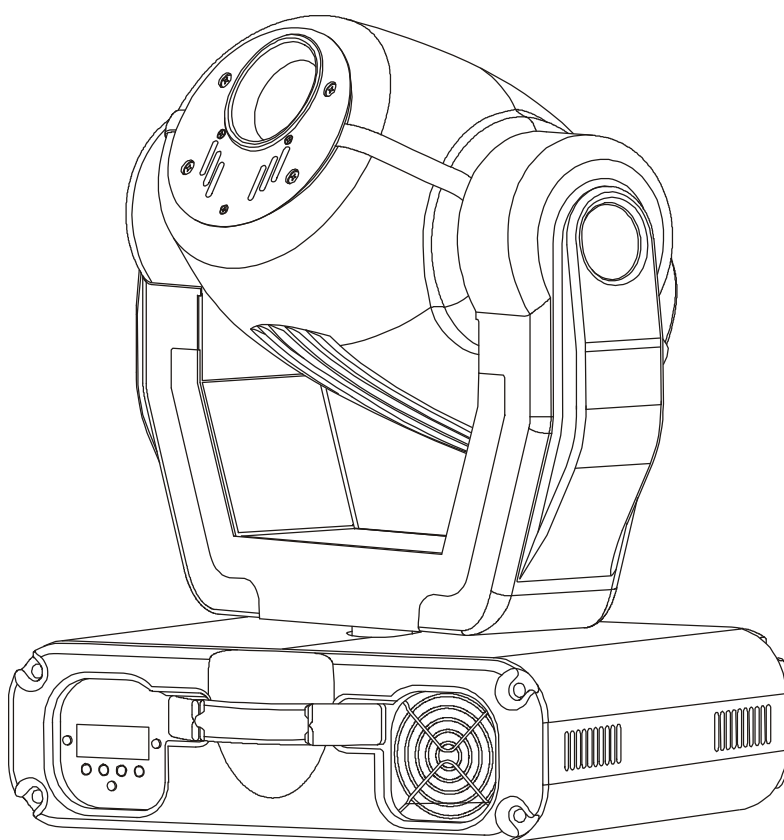


SERVO SPOT

automated light system

USER MANUAL



SERVO SPOT

automated light system

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CAUTION!

***Keep this device away from rain and moisture!
Unplug mains lead before opening the housing!***

**FOR YOUR OWN SAFETY, PLEASE READ THIS USER MANUAL CAREFULLY
BEFORE YOU INITIAL START - UP!**

1. Safety instructions

Every person involved with installation and maintenance of this device have to:

- be qualified
- follow the instructions of this manual

CAUTION!

***Be careful with your operations.
With a voltage of 230V (115V) you can suffer
a dangerous electric shock when touching the wires!***

This device has left our premises in absolutely perfect condition. In order to maintain this condition and to ensure a safe operation, it is absolutely necessary for the user to follow the safety instructions and warning notes written in this manual.

Important:

The manufacturer will not accept liability for any resulting damages caused by the non-observance of this manual or any unauthorized modification to the device.

Please consider that damages caused by manual modifications to the device are not subject to warranty.

Never let the power-cord come into contact with other cables! Handle the power-cord and all connections with the mains with particular caution!

Make sure that the available voltage is not higher than stated on the rear panel.

Always plug in the power plug least. Make sure that the power-switch is set to OFF-position before you connect the device to the mains. The power-plug has to be accessible after installing the device.

Make sure that the power-cord is never crimped or damaged by sharp edges. Check the device and the power-cord from time to time.

Always disconnect from the mains, when the device is not in use or before cleaning it. Only handle the power-cord by the plug. Never pull out the plug by tugging the power-cord.

This device falls under protection class I. Therefore it is essential to connect the yellow/green conductor to earth.

The electric connection, repairs and servicing must be carried out by a qualified employee.
Do not connect this device to a dimmer pack.

Do not switch the fixture on and off in short intervals as this would reduce the lamp's life.

During the initial start-up some smoke or smell may arise. This is a normal process and does not necessarily mean that the device is defective.

Do not touch the device's housing bare hands during its operation (housing becomes hot)!
For replacement use lamps and fuses of same type and rating only.

CAUTION ! EYEDAMAGES !

***Avoid looking directly into the light source
(meant especially for epileptics) !***

2. Operating determinations

If the device has been exposed to drastic temperature fluctuation (e.g. after transportation), do not switch it on immediately. The arising condensation water might damage your device. Leave the device switched off until it has reached room temperature.

Never run the device without lamp!

Do not shake the device. Avoid brute force when installing or operating the device.

Never lift the fixture by holding it at the projector-head, as the mechanics may be damaged. Always hold the fixture at the transport handles.

When choosing the installation-spot, please make sure that the device is not exposed to extreme heat, moisture or dust. There should not be any cables lying around. You endanger your own and the safety of others!

The minimum distance between light-output and the illuminated surface must be more than 1 meter.

Make sure that the area below the installation place is blocked when rigging, derigging or servicing the fixture.

Always fix the fixture with an appropriate safety-rope. Fix the safety-rope at the correct holes only.

Only operate the fixture after having checked that the housing is firmly closed and all screws are tightly fastened.

The lamp must never be ignited if the objective-lens or any housing-cover is open, as discharge lamps may explode and emit a high ultraviolet radiation, which may cause burns.

The maximum ambient temperature $t_a = 45^\circ \text{C}$ must never be exceeded. Otherwise, the lamp is switched off and the fixture is out of operation for 5 minutes.

CAUTION!

The lens has to be replaced when it is obviously damaged, so that its function is impaired, e. g. due to cracks or deep scratches!

Operate the device only after having familiarized with its functions. Do not permit operation by persons not qualified for operating the device. Most damages are the result of unprofessional operation!

CAUTION!

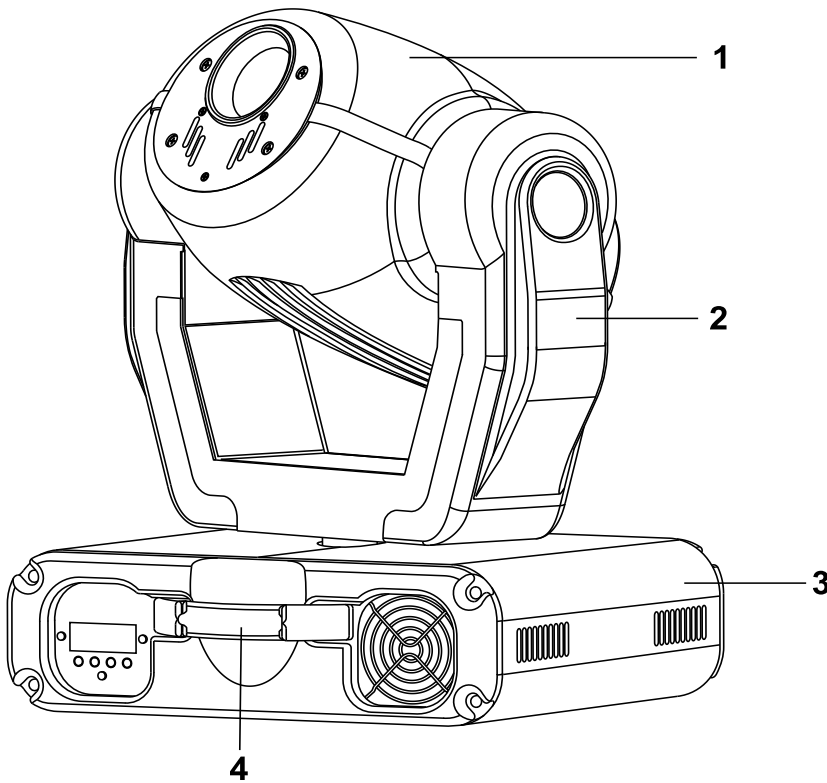
The lamp has to be replaced when it is damaged or deformed due to the heat!

Please use the original packaging if the device is to be transported.

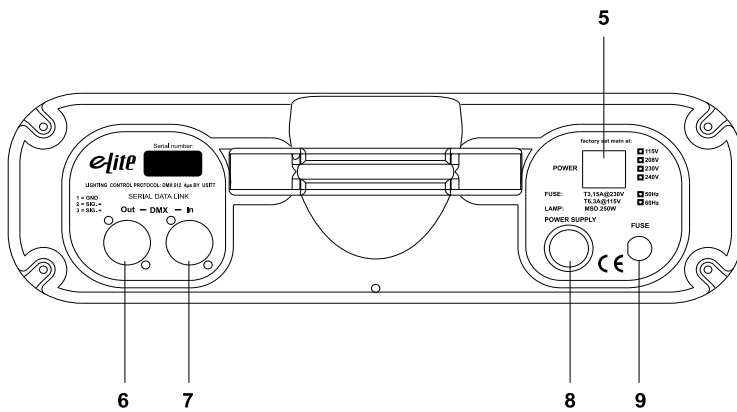
Please consider that unauthorized modifications on the device are forbidden due to safety reasons!

If this device will be operated in any way different to the one described in this manual, the product may suffer damages and the guarantee becomes void. Furthermore, any other operation may lead to dangers like short-circuit, burns, electric shock, burns due to ultraviolet radiation, lamp explosion, crash etc.

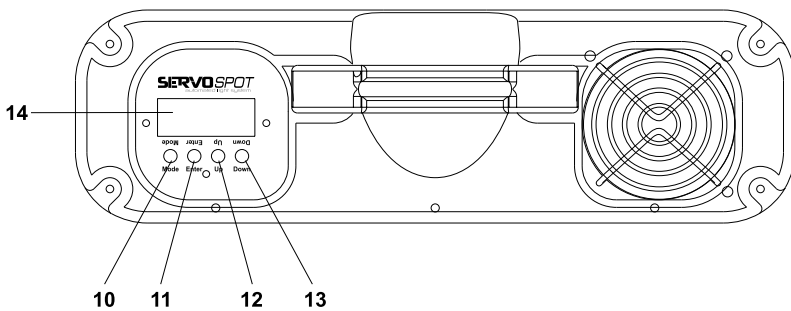
3. Description of the device



- 1 - Moving Head
- 2 - Yoke
- 3 - Base
- 4 - Carrying handles



- Rear panel:**
- 5 - Power-switch
 - 6 - DMX output
 - 7 - DMX input
 - 8 - Powercord
 - 9 - Fuseholder



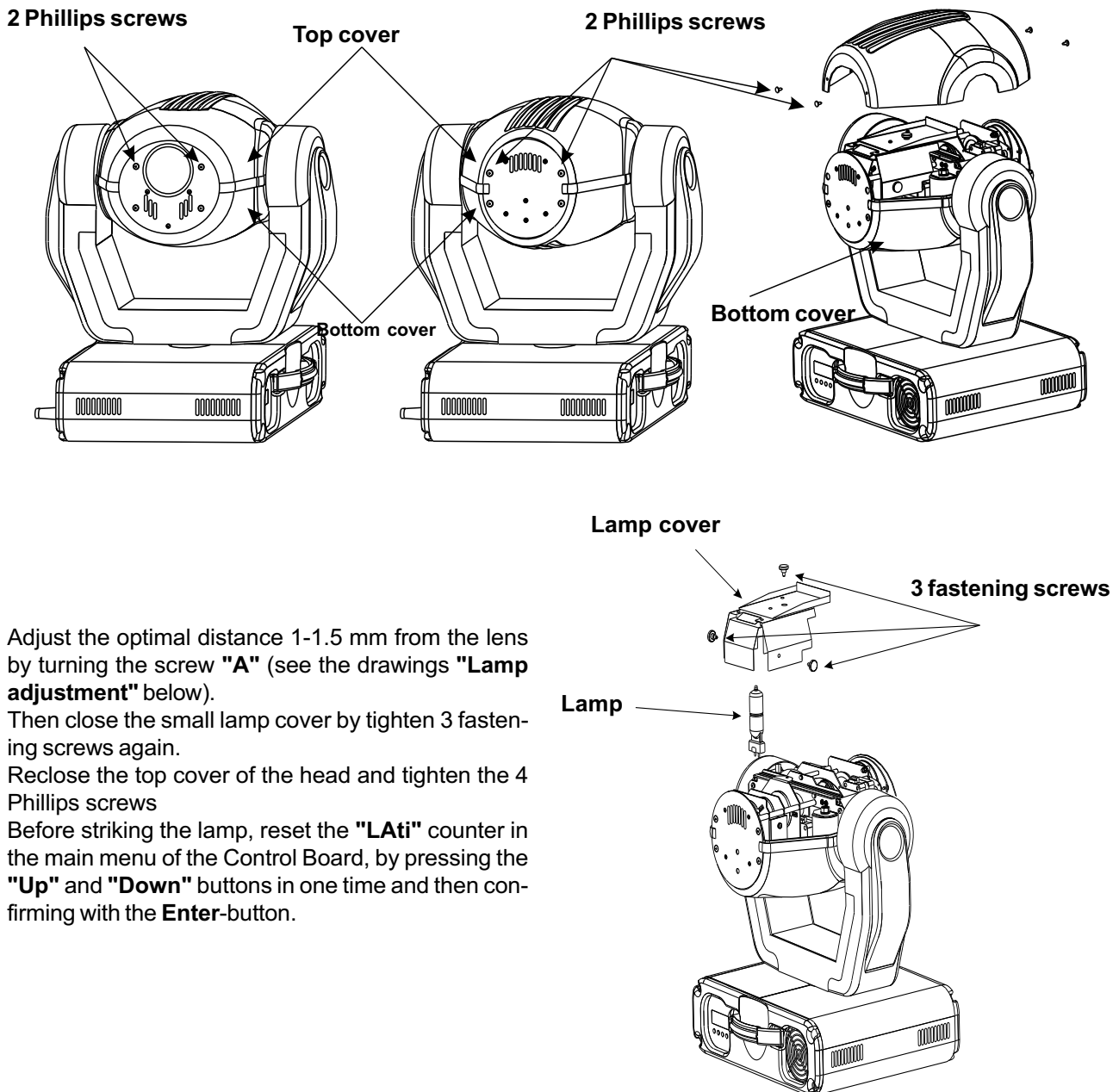
- Front panel:**
- 10 - Mode-button
 - 11 - Enter-button
 - 12 - Up-button
 - 13 - Down-button
 - 14 - Display

4. Installation

4.1 Fitting the lamp

DANGER !
Install the lamps with the device switched off only.
Unplug from mains before !

To insert the lamp MSD 230 V/250 W or MSD 230 V/200 W open the top cover of the head (see the drawings to identify which cover is top) by loosening the 4 Phillips screws on the front and rear sides of the top cover. Then open the small lamp cover by loosening 3 fastening screws (see the drawing). If changing the lamp, remove the old lamp from the socket. Insert the lamp to the socket. Do not install a lamp with a higher wattage! A lamp like this generates temperatures the device is not designed for. Damages caused by non-observance are not subject to warranty. Please follow the lamp manufacturer's notes! Do not touch the glass-bulb bare hand during the installation! Make sure that the lamp is installed tightly into the lampholder system.



Adjust the optimal distance 1-1.5 mm from the lens by turning the screw "A" (see the drawings "Lamp adjustment" below).

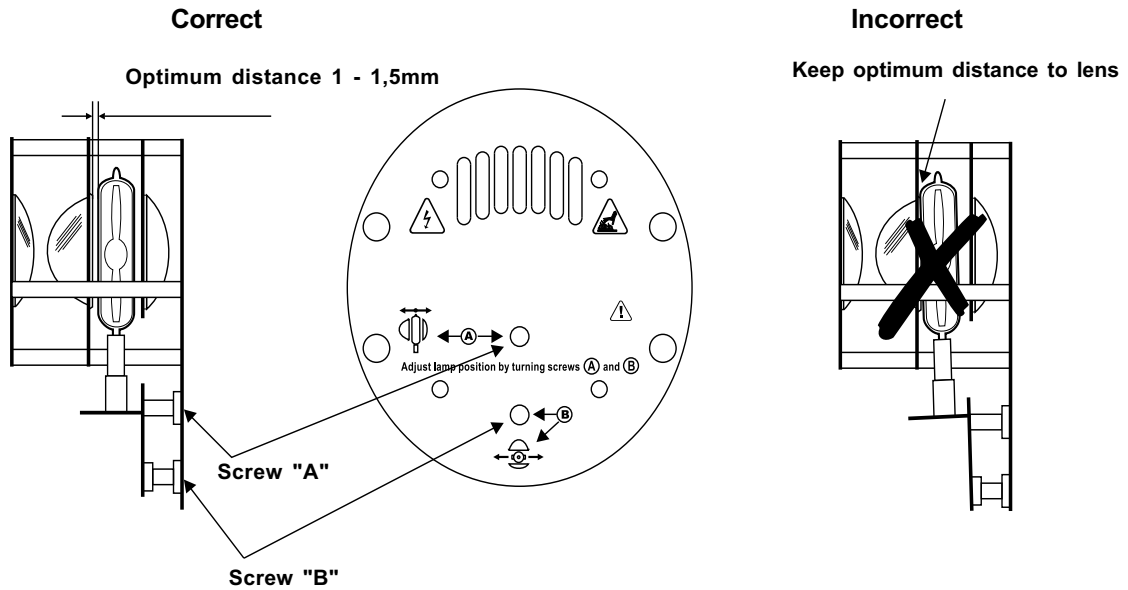
Then close the small lamp cover by tightening 3 fastening screws again.

Reclose the top cover of the head and tighten the 4 Phillips screws

Before striking the lamp, reset the "LAti" counter in the main menu of the Control Board, by pressing the "Up" and "Down" buttons in one time and then confirming with the **Enter**-button.

Do not operate this fixture with opened housing-cover!

4.2 Lamp adjustment



The SERVOSPOT lampholder is aligned at the factory. Due to differences between lamps, fine adjustment may improve light performance.

Strike the lamp and focus the light on a flat surface (wall). As the optimum distance of lamp from lens was adjusted during the installing or changing the lamp (by turning the screw "A"), it is necessary to adjust only the second position by turning the screw "B", in order to center the hot-spot (the brightest part of the beam).

If the hot spot seems to be too bright, you can lower its intensity by moving the lamp closer to the reflector. Do so by turning screw "A" until the light is evenly distributed.

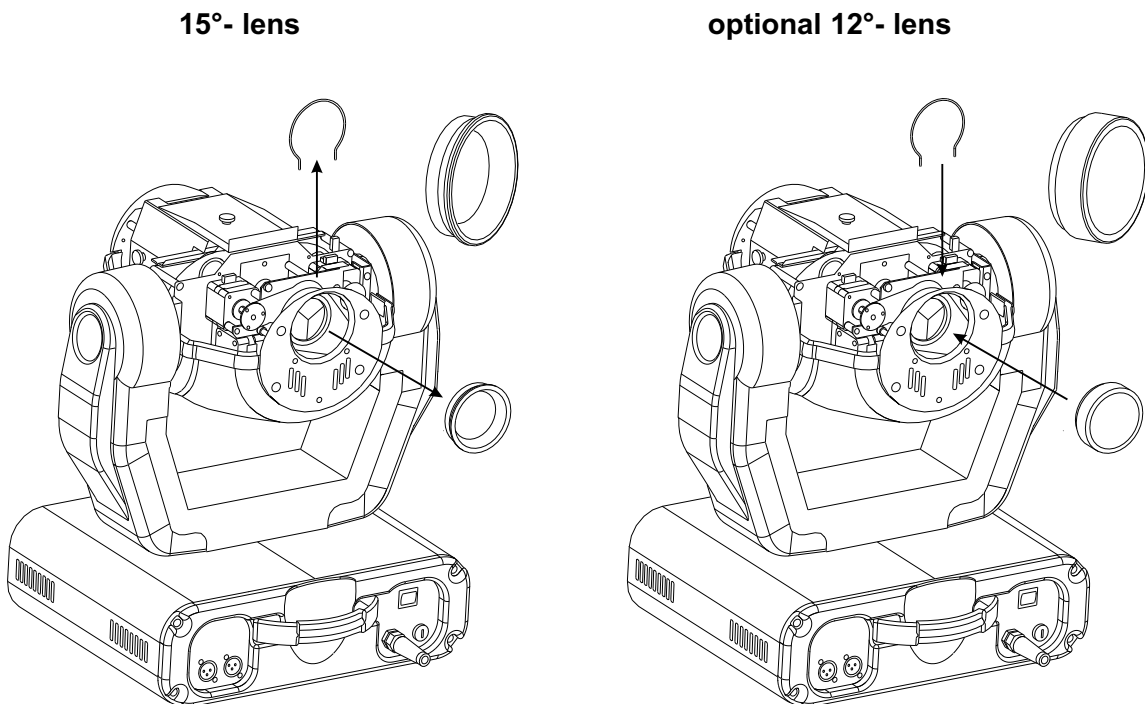
If the light on the edge seems to be brighter as in the center, the lamp is too close at the reflector. In this case, you need to move the lamp away from the reflector until the light is evenly distributed and the beam appears bright enough.

4.3 Installation of an optional lens

The device is delivered with a 15°-standard lens. If you wish to insert an optional 12° or 18°-lens, please follow the instructions below:

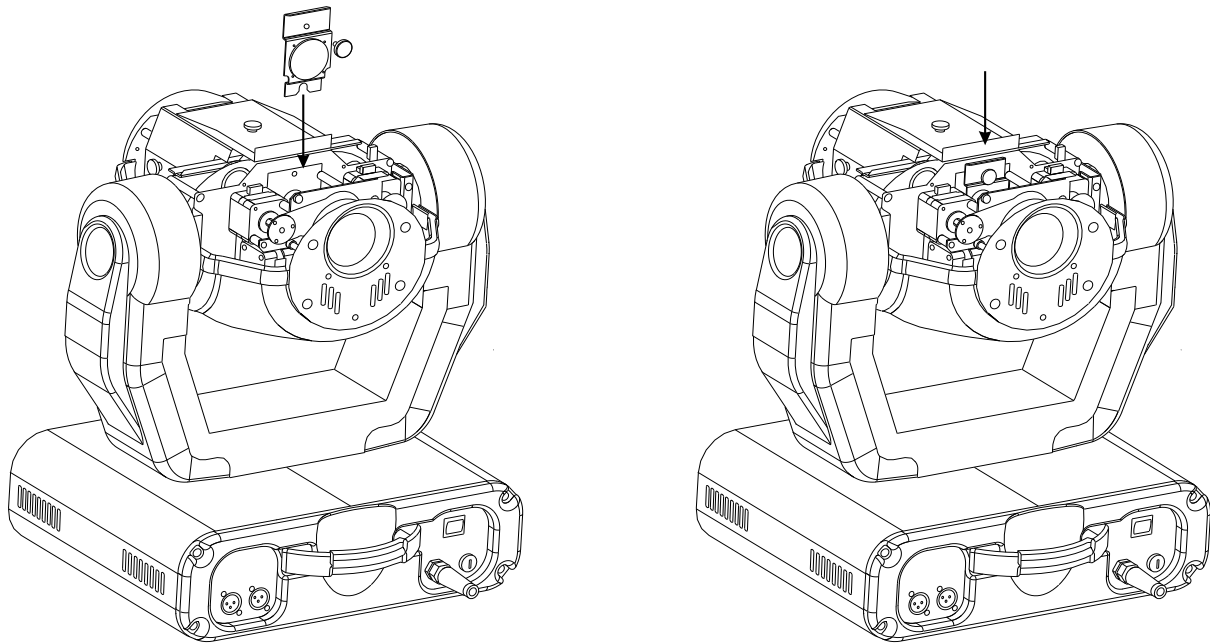
Optional 12°-lens:

Remove the fixation-ring of the 15°-lens with an appropriate tool. Remove the lens. Install the optional 12°-lens and fix it with the fixation-ring.



Optional 18°-lens:

Unscrew the knurled-head screw on the plate of the light-output. Install the optional 18°-lens and fix it with the knurled-head screw.



4.4 Inserting/Exchanging gobos

DANGER!
*Install the gobos with the device switched off only.
Unplug from mains before!*

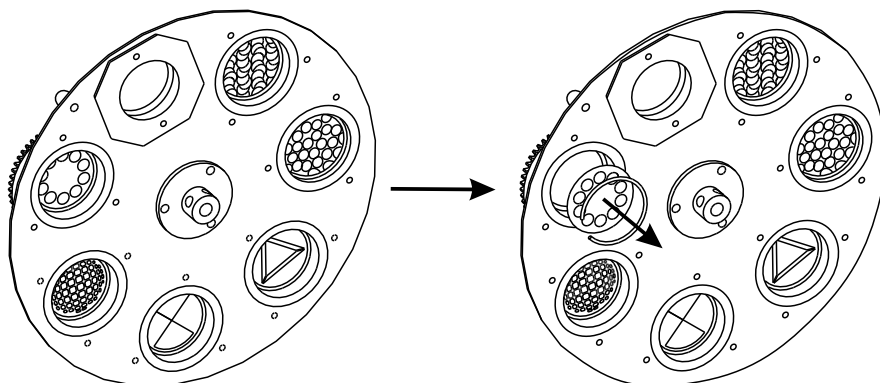
To insert the gobos open the top cover of the head by loosening the 4 Phillips screws on the front and rear sides of the top cover.

If you wish to use other forms and patterns as the standard-gobos, or if gobos are to be exchanged, please follow the instructions below:

Rotating gobo-wheel:

CAUTION!
*Never unscrew the screws of the rotating gobo
as the ball bearing will otherwise be opened!*

Remove the fixation-ring with an appropriate tool. Remove the gobo and insert the new gobo. Press the fixation-ring together and insert it in front of the gobo.



4.5 Rigging the fixture

Danger of fire !

When installing the device, make sure there is no highly inflammable material (decoration articles, etc.) in between a distance of min. 0,5 m.

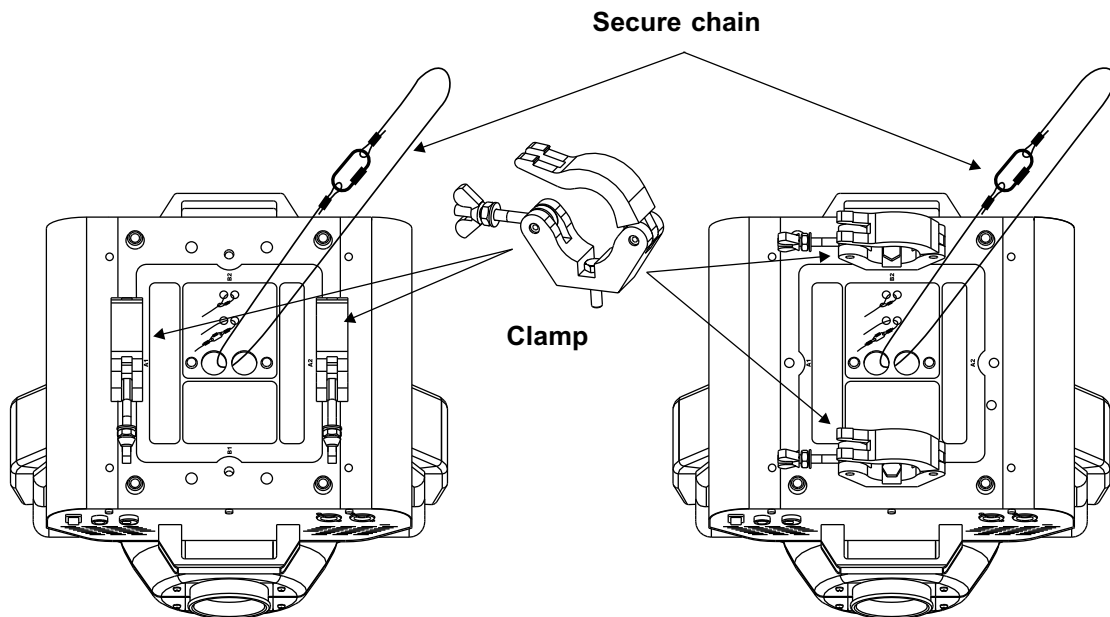
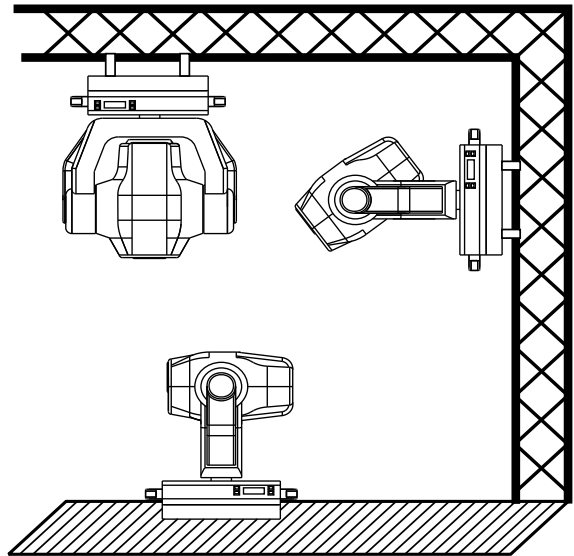
Warning ! Use 2 clamps to rig the fixture on the truss.

Follow the instructions mentioned at the bottom of the base.

Make sure that the device is fixed properly! Ensure that the structure (truss) to which you are attaching the fixtures is secure.

The SERVOSPOT can be placed directly on the stage floor or rigged in any orientation on a truss without altering its operation characteristics (see the drawing). The fixture's base enables to be mounted in two ways. Use the clamps with screws M10 or M8 - check the base bottom.


Install a safety wire that can hold at least 10 times the weight of the fixture. Never use the carrying handles for secondary attachment.



4.6 Connection to the mains

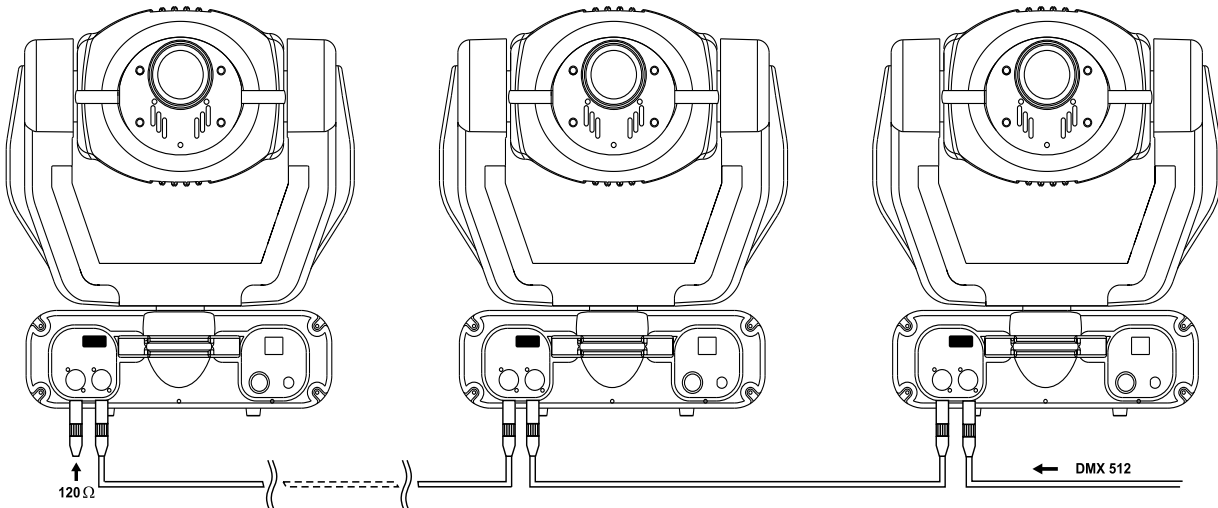
Connect the fixture to the mains with the enclosed power-plug.
The earth has to be connected!

The occupation of the connection-cables is as follows:

Cable	Pin	International
Brown	Live	L
Blue	Neutral	N
Yellow/Green	Earth	

4.7 DMX-512 connection/connection between fixtures

The wires must not come into contact with each other, otherwise the fixtures will not work at all, or will not work properly.

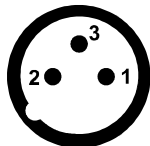


Only use a stereo shielded cable and 3-pin XLR-plugs and connectors in order to connect the controller with the fixture or one fixture with another.

Occupation of the XLR-connection:

DMX - output

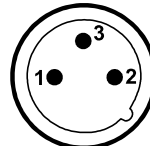
XLR mounting-socket:



- 1 - Ground
- 2 - Signal (-)
- 3 - Signal (+)

DMX-input

XLR mounting-plug:



- 1 - Ground
- 2 - Signal (-)
- 3 - Signal (+)

If you are using the standard DMX -controllers, you can connect the DMX-output of the controller directly with the DMX-input of the first fixture in the DMX-chain. If you wish to connect DMX-controllers with other XLR-outputs, you need to use adapter-cables.

Building a serial DMX-chain:

Connect the DMX-output of the first fixture in the DMX-chain with the DMX-input of the next fixture. Always connect one output with the input of the next fixture until all fixtures are connected.

Caution: At the last fixture, the DMX-cable has to be terminated with a terminator. Solder a 120 ohms resistor between Signal (-) and Signal (+) into a 3-pin XLR-plug and plug it in the DMX-output of the last fixture.

5. DMX PROTOCOL

Channel 16 bit	Channel 8 bit	Value	Function	Type of control
1	1	0-255	Pan Pan movement by 530°	proportional
2		0-255	Pan fine Fine control of pan movement	proportional
3	2	0-255	Tilt Tilt movement by 280°	proportional
4		0-255	Tilt fine Fine control of tilt movement	proportional
5	3	0 1-249 250-255	Speed of PAN/TILT movement Max. speed (tracking mode) From max. speed to min.speed (vector mode) Max. speed,black-out while PAN,TILT moving or color changes (tracking mode)	step proportional step
6	4	0-127 128-139 140-229 230-239 240-255	Lamp on/off,reset,fans speed control From max.speed of fan to min. speed of fan Lamp on,reset, No function Lamp off after 3 sec No function	proportional step step step step
7	5	0 10 21 32 42 53 64 74 85 96 106 117 128-189 190-193 194-255	Colours Open/white Turquoise Red Cyan Green Magenta Light Blue Yellow Green Pink Blue Orange Forwards rainbow effect from fast to slow No rotation Backwards rainbow effect from slow to fast	proportional proportional proportional proportional proportional proportional proportional proportional proportional proportional proportional proportional proportional proportional proportional
8	6		No function	
9	7	0-95 96-159 160-255 160-167 168-175 176-183 184-191 192-199 200-207 208-215 216-223	Effect-wheel Open position (hole) 3-facet rotating prism Prism/gobo macros Macro 1 Macro 2 Macro 3 Macro 4 Macro 5 Macro 6 Macro 7 Macro 8	step step step step step step step step step step

Channel 16 bit	Channel 8bit	Value	Function	Type of control
9	7	224-231 232-239 240-247 248-255	Macro 9 Macro 10 Macro 11 Macro 12	step step step step
10	8	0 1-126 127-128 129-255	3 facet prism rotation control No rotation Forwards rotation from fast to slow No rotation Backwards rotation from slow to fast	step proportional step proportional
11	9	0-31 32-63 64-95 96-127 128-159 160-191 192-223 224-255	Rotating gobos Open Rot. gobo 1 (multicolor dichroic) Rot. gobo 2 (glass) Rot. gobo 3 (metal) Rot. gobo 4 (metal) Rot. gobo 5 (metal) Rot. gobo 6 (metal) Rot. gobo wheel cont.rotation from slow to fast	step step step step step step step proportional
12	10	0-127 128-190 191-192 193-255	Rotating gobo index,rotating gobo rotation Gobo indexing Forwards gobo rotation from fast to slow No rotation Backwards gobo rotation from slow to fast	proportional proportional step proportional
13	11		No function	
14	12	0-255	Focus Continuous adjustment from far to near	proportional
15	13	0-31 32-63 64-95 96-127 128-159 160-191 192-223 224-255	Shutter,Strobe Shutter closed No function (shutter open) Strobe-effect from slow to fast (max. 10 flashes/second) No function (shutter open) Pulse -effect in sequences No function (shutter open) Random strobe-effect from slow to fast No function (shutter open)	step step proportional step proportional step proportional step
16	14	0-255	Dimmer intensity Gradual adjustment of the dimmer intensity from 0 to 100%	proportional

6. Addressing

The control board on the front panel of the SERVOSPOT allows you to assign the DMX fixture address, which is defined as the first channel from which the SERVOSPOT will respond to the controller.

If you set, for example, the address to channel 5, the SERVOSPOT will use the channel 5 to 20 for control.

Please, be sure that you don't have any overlapping channels in order to control each SERVOSPOT correctly and independently from any other fixture on the DMX data link.

If two, three or more SERVOSPOT are addressed similarly, they will work similarly.

For address setting follow this procedure:

- 1) Switch On the SERVOSPOT and wait until the fixture reset has finished ("**rSt**" is flashing at the display).
- 2) Press the **[Mode]** key in order to access the main menu. Browse through the menu by pressing the **[Up]** and **[Down]** keys until the display shows "**A001**". Confirm by pressing **[Enter]** key and the letter "**A**" will flash.
- 3) Use the **[Up]** and **[Down]** keys to select the desired address.
- 4) Confirm by pressing **[Enter]** or **[Mode]** to cancel.

Controlling:

After having addressed all SERVOSPOT, you may now start operating these via your lighting controller.

Note: After switching on, the SERVOSPOT will automatically detect whether DMX 512 data is received or not.

If there is no data received at the DMX-input, the display will start to flash "**A001**" with actually set address.

This situation can occur if:

- the 3 PIN XLR plug (cable with DMX signal from controller) is not connected with the input of the SERVOSPOT
- the controller is switched off or defective, if the cable or connector is defective or the signal wires are swap in the input connector.

Note: It's necessary to insert the XLR termination plug (with 120 Ohm) in the last lighting in the link in order to ensure proper transmission on the DMX data link.

7. Remotely controllable functions

7.1 Lamp

The SERVOSPOT is run with a MSD 250W/200W lamp.

A relay inside of the SERVOSPOT allows you to switch On and Off the lamp via itself control board on the front panel or via your controller without affecting the rest of the lighting.

7.2 Switching On and Off the lamp by Control Board

1. Switch On the SERVOSPOT and wait until the fixture reset has finished.
2. Press the **[Mode]** key in order to access the main menu. Browse through the menu by pressing the **[Up]** and **[Down]** keys until the display shows "**LAMP**". Confirm by pressing **[Enter]** key.
3. Use the **[Up]** and **[Down]** keys to select "**On**" for switch On the lamp and "**Off**" for switch Off the lamp and press **[Enter]** to confirm or **[Mode]** to cancel.

Note: It is also important to note, that the discharge lamp is cold restrike types, that means, that they have to be cold before re-striking. For this reason, you have to wait 5 minutes (max. speed of fan must be adjusted) after having switched Off the lamp before you can switch it back On again. If you try to switch On the lamp within 5 minutes after having switched it Off, the SERVOSPOT will store this information and automatically ignite the lamp when the 5 minutes period has expired. The message "**HEAT**" will appear on the control board display at the back side of the SERVOSPOT. If the ignition of the lamp is seven times unsuccessful, on the display will appear "**LA.Er**", meaning that the lamp could be damaged or even missed, or there could be a failure on the ignitor or ballast.

7.3 Colour wheel

The SERVOSPOT features a colour-wheel with 12 color positions - 11 of these with dichroic colors and the last one open. The wheel can be positioned between two adjacent colors in any position. It is also possible to rotate the color-wheel continuously at different speeds - the so-called "Rainbow effect" is created.

7.4 Rotating gobo wheel

The rotating gobo-wheel includes 4 metal gobos, 1 glass gobo and 1 multicolor dichroic gobo rotating in both directions, indexable, rotating gobo wheel cont. rotation slow to fast. The multicolor dichroic gobo (containing C,M,Y colors) can be combined with the color-wheel especially with cyan, magenta and yellow colours in order to obtain several different multicolor beams. The gobos have an outside diameter of 27 mm and an image diameter of 23 mm.

7.5 3-facet rotating prism

3-facet prism rotating in both directions at different speeds.

7.6 Focus

Motorized focus enables the beam to be focused anywhere on stage.

7.7 Dimmer/Shutter/Strobe

Smooth 0 - 100 % dimming is provided by the combined mechanical dimmer/shutter unit. This unit may also be used for strobe effect (1 - 10 flashes per second)

7.8 Fan

The SERVOSPOT is cooled by two axial fans - one each in the projector head and one in the base. The speed of the fan (and of course the noise) can be continuously reduced if very quiet performance is required.

By the Control Board using the "**FAnS**" function you can choose 4 types of low fan speed operating:

1. "HIGH" - high (max.) speed of fans

The cooling fans work on max. speed (max. cooling)

2. "rEG" - continuous controlling of the fan speed

the fan automatically raises its speed in order to control inside temperature of the lighting, if the temperature inside increases about certain level (the low fan speed reduces the cooling of the lighting). This cycle can repeat several times until the temperature inside is on suitable level.

3. "LoOF" - low speed/Switch Off the lamp operating

the fan keeps the adjusted low speed until the temperature exceeds max. inside temp. Then the SERVOSPOT automatically switch Off the lamp.

4. "LoHI" - low/high speed of the fan operating

the fan keeps the adjusted low speed until the temperature exceeds max. inside temp. of the fixture, then the SERVOSPOT automatically switch from low to high the fan speed.

8. Control Board

The control board situated on the front panel of the SERVOSPOT offers several features. You can simply set the lighting address, read the number of lamp or unit hours, switch On and Off the lamp, run test show, make a reset and also use special functions for manual, demo and service purposes.

8.1 Main functions

The main menu is accessed by pressing the **[Mode]** key - press this one so many times until the display shows message "**A001**" (with actually stored address). Browse through the menu by the pressing **[Up]** and **[Down]** keys - the display shows step by step these messages: **A001**, **rPAn**, **rTilt**, **16br**, **LAti**, **Poti**, **LAMP**, **dEMo**, **rESE**, **SPEC**. Press **[Enter]** if you wish to select one of them. The functions are described in the following sections and the function hierarchy is shown below.



DMX 512 Address settings

The letter "A" flashes. Use the [Up] and [Down] keys to select required address (001 - 497) and press [Enter] to confirm or [Mode] to cancel and return to the main menu.

Pan reverse

This function allows you to invert the pan movement. Use the [Up] and [Down] keys to select "On" if you wish this feature or "Off" if you don't wish this feature and press [Enter] to confirm or [Mode] to cancel and return to the main menu.

Tilt reverse

This function allows you to invert the tilt movement. Use the [Up] and [Down] keys to select "On" if you wish this feature or "Off" if you don't wish this feature and press [Enter] to confirm or [Mode] to cancel and return to the main menu.

Movement resolution

By this function you can adjust the desired movement resolution 8 or 16 bit. Use the [Up] and [Down] keys to select "On" if you wish the 16 bit high resolution or "Off" if you wish only 8 bit resolution and press [Enter] to confirm or [Mode] to cancel and return to the main menu.

Note: If you adjust the 16 bit resolution the fixture will occupy 16 DMX channels, if you adjust the 8 bit resolution, the fixture will be operated by only 14 DMX channels. Please, check the DMX protocol.

Lamp On time

This option enables you to read the total number of hours that the lamp has been powered On. Press [Enter] or [Mode] to return to the main menu. In order to reset the counter to 0, you have to hold the [Up] and [Down]-button and press the [Enter]-button.

Power On time

By this option you can read the total number of hours that the SERVOSPOT has been powered On. Press [Enter] or [Mode] to return to the main menu.

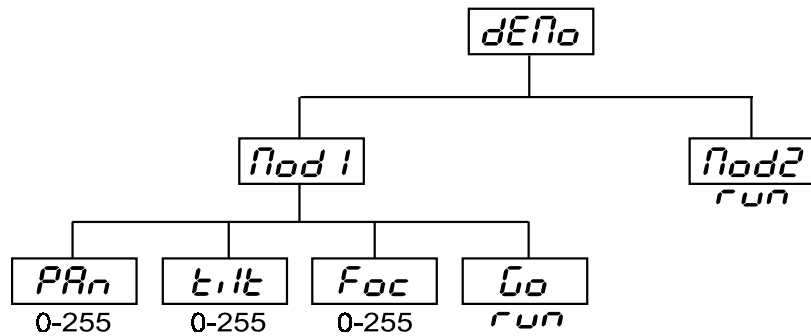
Switch On/Off the lamp

Use the [Up] and [Down] keys to select "On" if you wish the switch On the lamp or "Off" if you wish switch Off the lamp and press [Enter] to confirm or [Mode] to cancel and return to the main menu.



Demo sequences

This function allows you to run a special demo-test sequences without an external controller, which will show you some possibilities of using SERVOSPOT. Press **[Up]** and **[Down]** keys to select the "Mod1" or "Mod2" sequences. The "Mod1" is suitable for projections on the wall, ceiling or ground without any head-movement, the "Mod2" uses all SERVOSPOT functions and therefore is good for a complete introduction of the fixture.



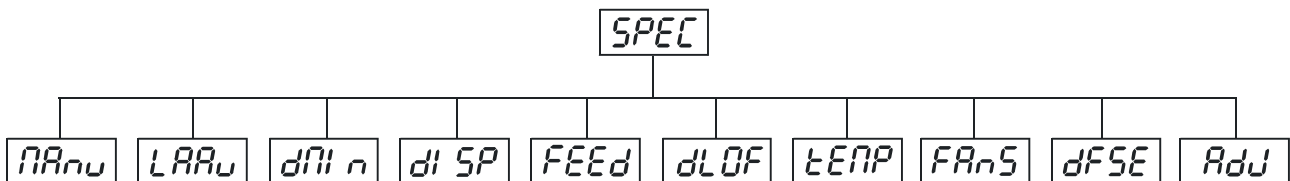
Reset function

Press **[Enter]** key to run reset. This option enables the SERVOSPOT to index all effects (functions) and return to their standard positions.

8.2 SPEC - Special functions



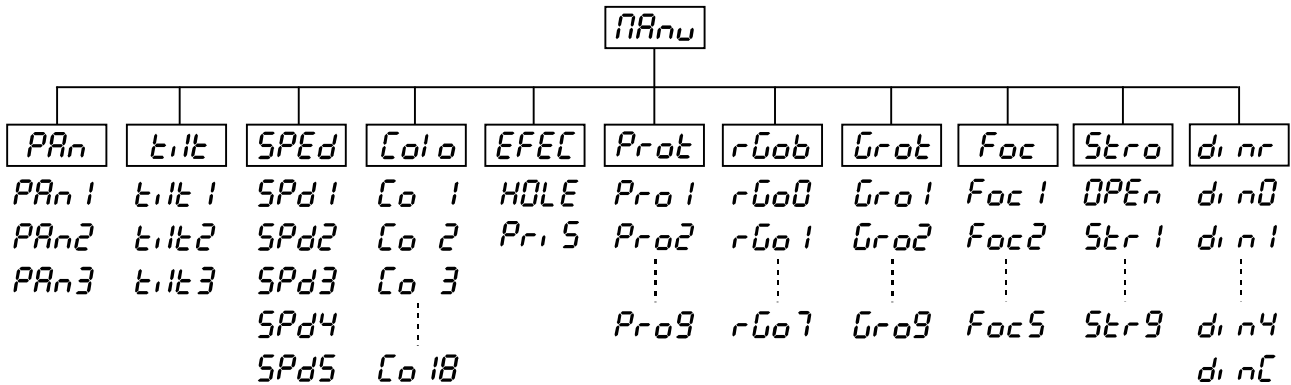
Use the **[Up]** and **[Down]** keys to browse through the special functions and select the one by pressing **[Enter]**.





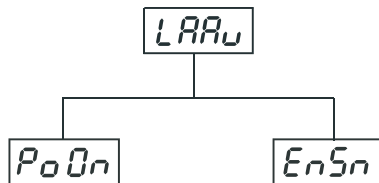
Manual control of effects

This function allows you to control manually the channel functions of the fixture. Use the **[Up]** and **[Down]** keys to select desired function and press **[Enter]** to adjust the effect or **[Mode]** to cancel and return to the menu.



Lamp On automatically

This menu allows you to turn the lamp On after switching the fixture On and switch On/Off the lamp light sensor.



Lamp On after switching the fixture On

This function enables to turn the lamp On automatically after switching the fixture On. Use the **[Up]** and **[Down]** keys to select "On" if you wish to turn the lamp On automatically after switching the fixture On or "Off" if you wish the lamp Off after switching On the fixture and press **[Enter]** to confirm or **[Mode]** to cancel and return to the menu.



Switch On/Off the lamp light sensor

Use the **[Up]** and **[Down]** keys to select "On" if you wish to switch the lamp light sensor On and press **[Enter]** to confirm or **[Mode]** to cancel and return to the menu. **The option "On" is for the standard operation.**

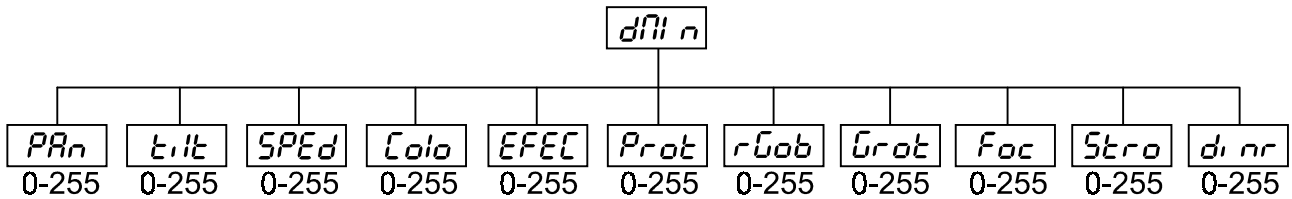
Use the **[Up]** and **[Down]** keys to select "Off" if you wish to switch the lamp light sensor Off and press **[Enter]** to confirm or **[Mode]** to cancel and return to the menu.

Important: The option "Off" is for "emergency operation" only if the lamp light sensor is defective and you will wait for a delivery of the spare light sensor! If the lamp light sensor was switched Off, the error messages "LAEr,SnEr,HEAt" will not appear on the display (only the message "HEAt" will appear if the lamp was turned Off and On within 5 minutes) and at switching On of the lamp the electronics will still try to ignite the lamp until it shines (even when the lamp is damaged or absent), on this account some electronics parts could be damaged!



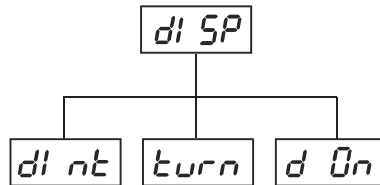
DMX values

Readout DMX values of each channel received by the fixture. Use the **[Up]** and **[Down]** keys to select desired channel and press **[Enter]** to read its value coming to the fixture or **[Mode]** to cancel and return to the menu.



Display adjusting

This function allows you to adjust the display settings:



Display intensity

By this function you can adjust from 20% to 100% the intensity of the display. Use the **[Up]** and **[Down]** keys to select the level of the display intensity and press **[Enter]** to confirm or **[Mode]** to cancel and return to the menu.



Display-reverse

With this function, you can rotate the display by 180°. Use the **[Up]** and **[Down]** keys to select "normal display" or "display turned by 180°" and press **[Enter]** to confirm or **[Mode]** to cancel and return to the menu.



Display - On

This function allows you to keep the display On or to turn Off automatically 2 minutes after last pressing any key on the control board. Use the **[Up]** and **[Down]** keys to select "On" if you wish to keep the display On or "Off" if you wish to turn Off automatically 2 minutes after last pressing any key on the control board and press **[Enter]** to confirm or **[Mode]** to cancel and return to the menu.



PAN/TILT - feedback

This function allows to return the mowing head to the required position after changing the position by external force (e.g.by stroke). Use the **[Up]** and **[Down]** keys to select "On" if you wish to enable this function or "Off" if you wish not to return the mowing head to the required position and press **[Enter]** to confirm or **[Mode]** to cancel and return to the menu.

Note: If feedback was switched Off , the pan/tilt- position is changed by external force and feedback is switched On again, the moving head might not to be synchronized with the DMX signal. You have to make a reset in order to synchronize the moving head with the DMX signal.



Lamp Off via DMX

This function allows you to switch Off the lamp by DMX. Use the **[Up]** and **[Down]** keys to select "On" if you want to switch Off the lamp by DMX or "Off" if you don't want to switch Off the lamp by DMX and press **[Enter]** to confirm or **[Mode]** to cancel and return to the menu.



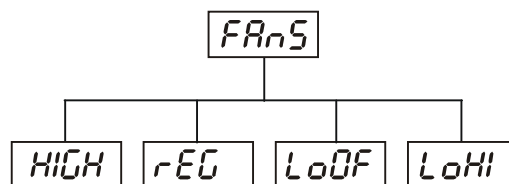
Temperature

Temperature readouts of the fixture inside in Celsius. Inside temperatures below 70° C are not critical. 70° C and more lead to the lamp being switched off. Please note that the outside temperature should not exceed 45° C.



Low fan speed operating

By using this function you can choose 4 types of low fan speed operating. Browse through this menu by the pressing **[Up]** and **[Down]** keys - the display shows step by step these messages: "HIGH, reG, LoOF, LoHI". Press **[Enter]** if you wish to select one of them or **[Mode]** to cancel and return to the menu.



high (max.) speed of fans

The cooling fans work on max. speed (max. cooling)



continuous controlling of the fan speed

The fan automatically raises its speed in order to control inside temperature of the lighting, if the temperature inside increases about certain level (the low fan speed reduces the cooling of the lighting). This cycle can repeat several times until the temperature inside is on suitable level.



low speed/Switch Off the lamp operating

The fan keeps the adjusted low speed until the temperature exceeds max. inside temperature, then the SERVOSPOT automatically switch Off the lamp.



low/high speed of the fan operating

The fan keeps the adjusted low speed until the temperature exceeds max. inside temperature of the fixture, then the SERVOSPOT automatically switch from low to high the fan speed.



Default settings

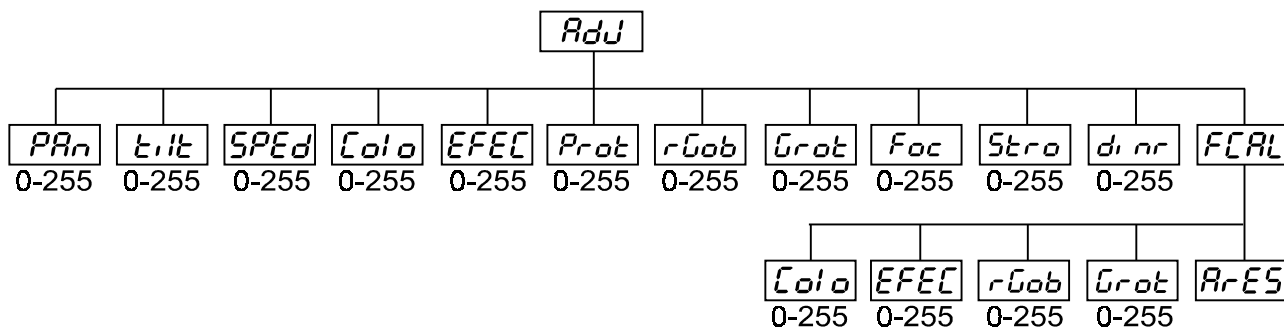
Press **[Enter]** to reset all fixture personalities (not the adjusting functions) to the default values. On the display will appear „rSt” meaning that the fixture makes the reset. See the table of personality setting and their default positions.

Personality	Display	Default values (SHADED)
Pan reverse	rPAN	On
		OFF
Tilt reverse	rtilt	On
		OFF
Movement resolution	16br	On
		OFF
Lamp On after switch the fixture On	PoOn	On
		OFF
Switch On/Off the lamp light sensor	EnSn	On
		OFF
Display-On	d On	On
		OFF
Display intensity	d Int	20 40 60 80 100
Display- reverse	turn	turn
		turn
PAN/TILT feedback	FEED	On
		OFF
Lamp Off via DMX	dLOF	On
		OFF
Low fan speed operating	FRnS	HIGH
		rEG
		LoDF
		LoHI



Adjusting the default positions. of colour, gobo and effect wheels

By this function you can calibrate and adjust the colour, gobo and effect wheels to their standard/right positions. Use the **[Up]** and **[Down]** keys to browse through the adjusting menu - the display shows step by step these messages: "Pan, Tilt, SPed, Colo, EFEC, Prot, rGOB, Grot, Foc, Stro, dimr, FCAL" by which you can adjust the fixture to the required/desired position (0-255) before the function calibration. Then when the positioning is finished use the last "FCAL" function (Fixture calibration).



1. Calibration via the control board

Press **[Enter]** and the **[Up]** and **[Down]** keys in order to display the following messages: "Colo, EFEC, rGob, Grot" for very smooth function calibration. Select one of them, press **[Enter]** and use the **[Up]** and **[Down]** keys

in order to adjust their right value from 0 to 255. Then press **[Enter]** to confirm or **[Mode]** to cancel and return to the menu. This can be repeated for each calibration parameter if it is required. When the calibration is finished, it is necessary to use the **"ArES"** function in order to write the calibration values to the memory (EPROM) and to make a reset in order to check the newly adjusted positions of the colour, gobo and effect wheels. When the reset of the fixture is finished, the display will show the **"FCAL"** message. Press **[Enter]** to repeat the calibration or **[Mode]** to return to the **"AdJ"** menu.

2. Calibration via the external controller

Press **[Enter]** and the **[Up]** and **[Down]** keys in order to display the following messages: **"Colo, EFEC, rGob, Grot"** - calibration parameters. Select one of them and press **[Enter]**.

Now you can calibrate the colour, gobo and effect wheel by your controller. The DMX calibration protocol is described in the table mentioned below.

DMX Calibration protocol:

DMX chanel	Function	
1	Colour	S m o o t h e p m i o v e r o s e n t
2	No function	
3	Effect	
4	Rotating gobo	
5	Gobo rotating	
6	No function	
7	Colours	Standard protocol
8	No function	
9	Effect(prism)	Standard protocol
10	Prism rotation	Standard protocol
11	Rotating gobos	Standard protocol
12	Gobo rotation	Standard protocol
13	No function	
14	Focus	Standard protocol
15	Strobo	Standard protocol
16	Dimmer	Standard protocol

After having calibrated required functions press **[Enter]** to confirm (or **[Mode]** to cancel and return to the menu without reset by the **"ArES"** function) and use the **"ArES"** function in order to write the calibration values to the memory (EEPROM) and to make a reset in order to check the new adjusted positions of the colour, effect and rot. gobo wheels and gobo indexing.

9. Error and information messages

HEAt

This message appears if you try to switch on the lamp within 5 minutes after having switched it off (the lamp is too hot). The message will appear on the display if the lamp doesn't ignite within 28 seconds. The fixture will store this information and automatically ignite the lamp when the 5 minutes period has expired.

Caution: The message is disabled if the lamp light sensor (function "EnSn") is switched Off (only if the lamp was turned Off and On within 5 minutes, the message "HEAt" will appear).

LAEr

The ignition of the lamp is seven times unsuccessful (the HEAt message appeared six times before), and the display shows "**LAEr**", meaning that the lamp could be damaged or even missed, the fixture is overheating (this can occur if the ambient temperature is 45° C or more) or there could be a failure on the ignitor or ballast. Please place or replace the lamp, check the ambient temperature or contact your dealer if the situation was not caused by the lamp.

Caution: The message is disabled if the lamp light sensor (function "EnSn") is switched Off.

MbEr

This message informs you that the main PCB does not communicate correctly with the Control Board.

CoEr (color-wheel error)

The message will appear after the reset of the fixture if the magnetic-indexing circuit malfunctions (sensor failed or magnet missing) or the stepping-motor is defective (or its driver circuit on the main PCB). The color-wheel is not located in the default position after the reset.

rGEr (rotating gobo-wheel error)

The message will appear after the reset of the fixture if the magnetic-indexing circuit malfunctions (sensor failed or magnet missing) or the stepping-motor is defective (or its driver circuit on the main PCB). The rotating gobo-wheel is not located in the default position after the reset.

iGEr (rotating gobo indexing error)

The message will appear after the reset of the fixture and if the magnetic-indexing circuit malfunctions (sensor failed or magnet missing) or the stepping-motor is defective (or its driver circuit on the main PCB). The rotating gobo is not located in the default position after the reset.

PrEr (prism error)

This message will appear after the reset of the fixture if the magnetic-indexing circuit malfunctions (sensor failed or magnet missing) or the stepping-motor is defective (or its driver circuit on the main PCB). The prism-wheel is not located in the default position after the reset.

FtEr

This error message informs you that the fixture was overheating (occured if the ambient temperature is 45° C or more) and that the relay switched off the lamp. This message will appear on the display until the temperature will be on a suitable level, then the display will show the message "**HEAt**" meaning the lamp is too hot (explanation see above).

SnEr

This message appears if the lamp lighting sensor is failed.

Caution: The message is disabled if the lamp light sensor (function "EnSn") is switched Off.

PoEr

This message will appear if the fixture was shortly disconnect from the main.

PAEr (Pan-yoke movement error)

This message will appear after the reset of the fixture if the yoke's magnetic-indexing circuits malfunction (sensors failed or magnet missing) or the stepping motor is defective. (Or its driving IC on the main PCB). The yoke is not located in the default position after the reset.

tiEr (TILT-head movement error)

This message will appear after the reset of the fixture if the head's magnetic-indexing circuit malfunctions (sensor failed or magnet missing) or the stepping motor is defective. (Or its driving IC on the main PCB). The head is not located in the default position after the reset.

FrEr

It will appear if the frequency of the main is not standard 50 or 60 Hz

10. Technical specifications

Power supply:

- EU model:** -Voltage.....210/230/250 V AC, 50/60 Hz ~
 -Fuse.....T 3.15A@ 230 V
- US model:** -Voltage.....100/115/208/230V AC, 50/60 Hz ~
 -Fuse.....T 6.3A@ 115V
 -Power consumption.....500W

Compatible lamps:

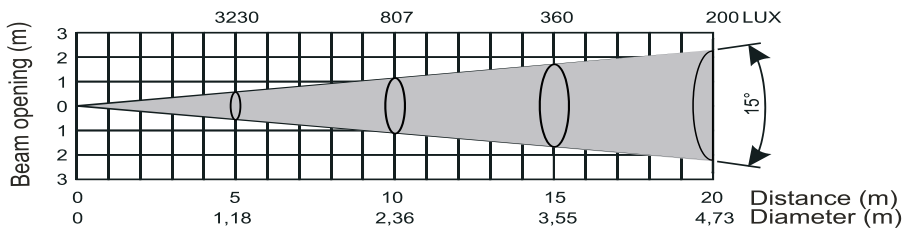
-MSD/HSD 230 V/250 W GY-9.5 or MSD/HSD 230 V/200 W GY-9.5

Optical system:

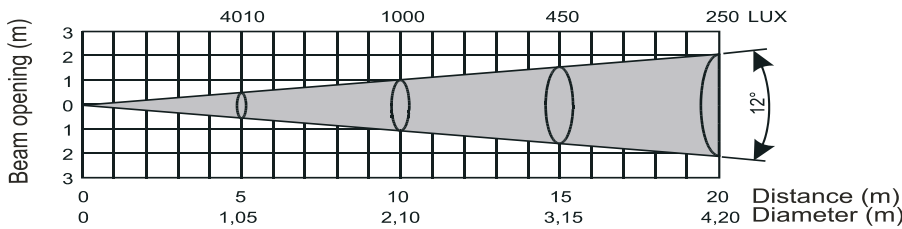
- High luminous-efficiency parabolic mirror and double condenser system
- Standard 15° focused beam angle
- Optional 12° and 18° lens
- All lenses are anti-reflection coated

Beampath:

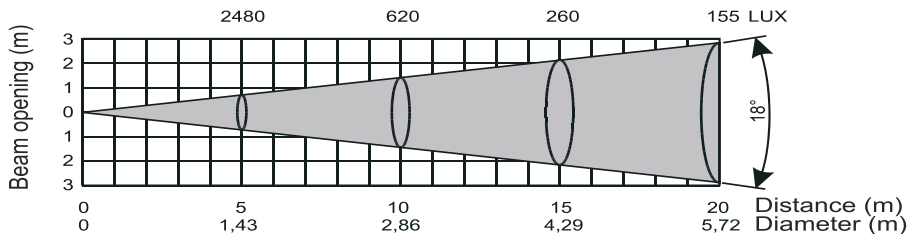
Standart 15° objective



Optional narrow 12° objective



Optional wide 18° objective



Colours:

- Color-wheel with 11 dichroic filters plus open
- Colour-wheel continuous rotation in both directions (rainbow effect)
- Via the combination between multicolor dichroic gobo and color-wheel even more color combinations possible

Rotating gobos:

- Rotating gobo-wheel with 6 interchangeable and indexable rotating gobos plus open
- Rotating gobo-wheel cont. rotation
- 4 metal gobos, 1 glass gobo and 1 multicolor dichroic gobo rotating in both directions at different speeds
- Rotating gobos can be turned by 360°, the adjusted position is memorized
- Gobo indexing
- 3 additional metal-gobos and 2 glass-gobos are included
- Outside diameter 27 mm, image diameter 23 mm.

Strobe:

- Strobe effect with variable speed (1 - 10 flashes per second)
- Preprogrammed variable/random strobe and dimmer pulse-effects

Dimmer:

- Smooth dimmer from 0 - 100 %

Prism:

- 3-facet-prism rotating in both directions at different speeds
- Macro-function for rotating gobos/rotating prism combinations

Focus:

- Remotely controllable motorized focus from near to far

Motors:

- 10 high quality stepping-motors controlled by microprocessors

Electronics:

- Addressing, special functions setting, effects calibration via control panel with 4-digit LED display
- Readout fixture and lamp usage, receiving DMX values, temperature, etc
- Built-in analyzer for easy fault finding, error messages
- Remotely switching of the lamp
- Built-in demo sequences
- Black-out while head moving or gobo/color/prism changing
- Silent fans cooling, remotely controllable speed of fans
- Self-resetable thermo-fuse
- Digital serial input DMX-512
- DMX-control via every standard DMX controller
- 14 DMX-channels (8 bit Pan/Tilt movement resolution)
- 16 DMX-channels (16 bit Pan/Tilt movement resolution):
 - Channel 1: Horizontal head-movement 8 bit
 - Channel 2: Fine Horizontal head-movement 16 bit
 - Channel 3: Vertical head-movement 8 bit
 - Channel 4: Fine Vertical head-movement 16 bit
 - Channel 5: Pan/Tilt speed
 - Channel 6: Fan speed, On/Off lamp, reset
 - Channel 7: Colours
 - Channel 8: No function
 - Channel 9: Prism-wheel
 - Channel 10: Prism-rotation
 - Channel 11: Rotating gobos
 - Channel 12: Gobo rotation, gobo indexing
 - Channel 13: No function
 - Channel 14: Focus
 - Channel 15: Shutter, strobe
 - Channel 16: Dimmer

Pan/Tilt

- Pan movement range 530°
- Tilt movement range 280°
- 8/16 bit movement resolution
- Automatic Pan / Tilt position correction
- Maximum PAN-movement 530° in 2.65 s
- Maximum TILT-movement 280° in 1.68 s
- Remotely controllable speed of Pan/Tilt movement for easy programming

Rigging

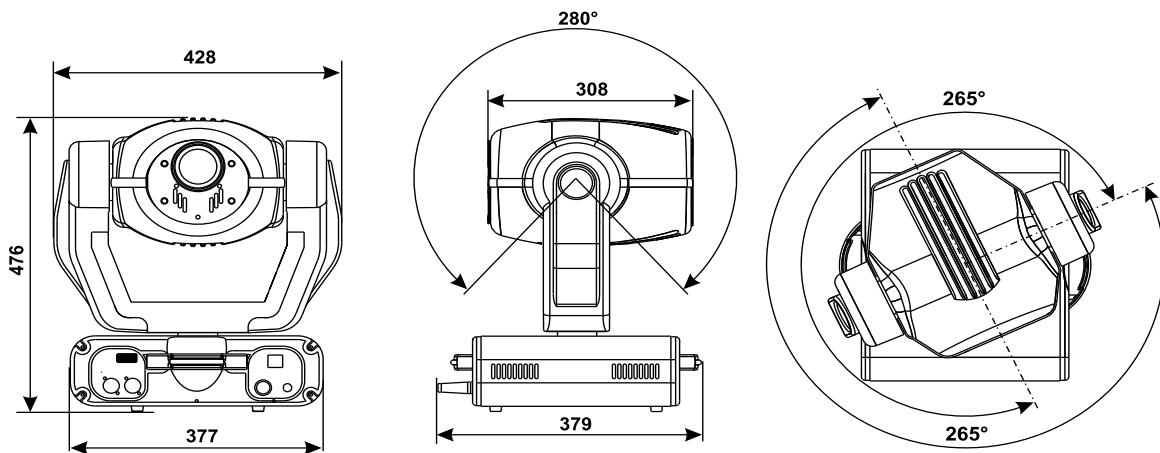
- Stands directly on the floor
- Mounts horizontally or vertically with 2 clamps
- 2 truss orientation
- Safety chain/cord attachment point

Temperatures

- Maximum ambient temperature t_a : 45° C
- Maximum housing temperature t_b (steady state): 80° C

Dimensions and weight

- Length of base (including handles): 372 mm
- Width of yoke: 426 mm
- Height (head horizontal): 447 mm
- Weight (net): 16 kg
- Shipping weight: 25 kg



11. Maintenance and cleaning

It is absolutely essential that the fixture is kept clean and that dust, dirt and smoke-fluid residues must not build up on or within the fixture. Otherwise, the fixture's light-output will be significantly reduced. Regular cleaning will not only ensure the maximum light-output, but will also allow the fixture to function reliably throughout its life. A soft lint-free cloth moistened with any good glass cleaning fluid is recommended, under no circumstances should alcohol or solvents be used!

DANGER !
***Disconnect from the mains before starting any
maintenance work***

The objective lens will require weekly cleaning as smoke-fluid tends to building up residues, reducing the light-output very quickly. The cooling-fans should be cleaned monthly.

The gobos may be cleaned with a soft brush. The interior of the fixture should be cleaned at least annually using a vacuum-cleaner or an air-jet.

The dichroic colour-filters, the gobo-wheel and the internal lenses should be cleaned monthly.

To ensure a proper function of the gobo-wheel, we recommend lubrication in six month intervals. The quantity of oil must not be excessive in order to avoid that oil runs out when the gobo-wheel rotates.

Replacing the fuse

If the lamp burns out, the fine-wire fuse of the device might fuse, too. Only replace the fuse by a fuse of same type and rating.

Before replacing the fuse, unplug mains lead.

Procedure:

- 1) Unscrew the fuseholder on the rear panel with a fitting screwdriver from the housing (anti-clockwise).
- 2) Remove the old fuse from the fuseholder.
- 3) Install the new fuse in the fuseholder.
- 4) Replace the fuseholder in the housing and fix it.

12. Appendix

We believe you will enjoy your SERVOSPOT. We assure you will enjoy this product for years if you follow the instructions given in this manual.

If you have any questions and comments, please do not hesitate to contact us.

Please note: errors and omissions for every information given in this manual excepted. Every information is subject to change without prior notice. Any claim due to missing or wrong information in this manual is herewith excluded!