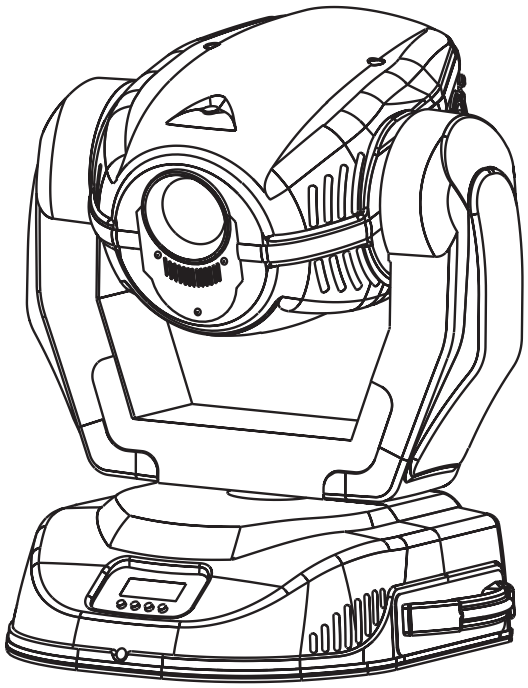
Futurelight®

LIGHTING SYSTEMS MADE IN EUROPE

USER MANUAL

MH - 680 Spotlight



CE

Version 1.1

Keep this manual for future needs!

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FUTURELIGHT CP-192 controller	51834260
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English

MH - 680 Spotlight

User manual

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English

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!

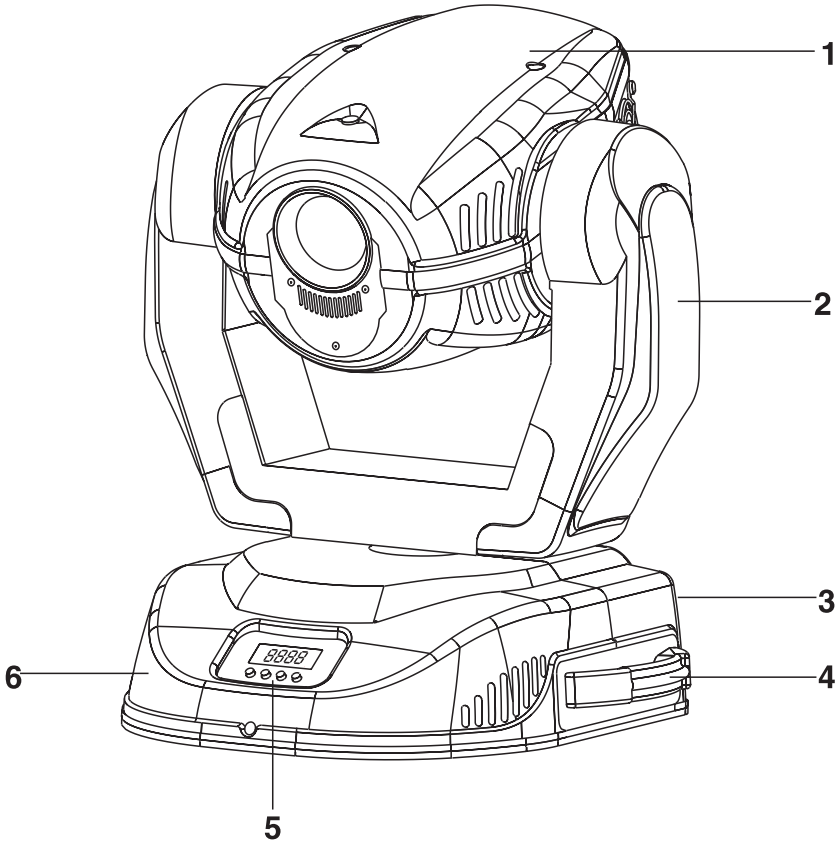
Introduction

Thank you for having chosen a FUTURELIGHT MH-680. You acquired a versatile, powerful and intelligent lighting-effect.
Unpack your FUTURELIGHT MH-680 and make sure that there are no damages caused by transportation. Should there be any, please consult your local dealer and do not take the device into operation.

Features

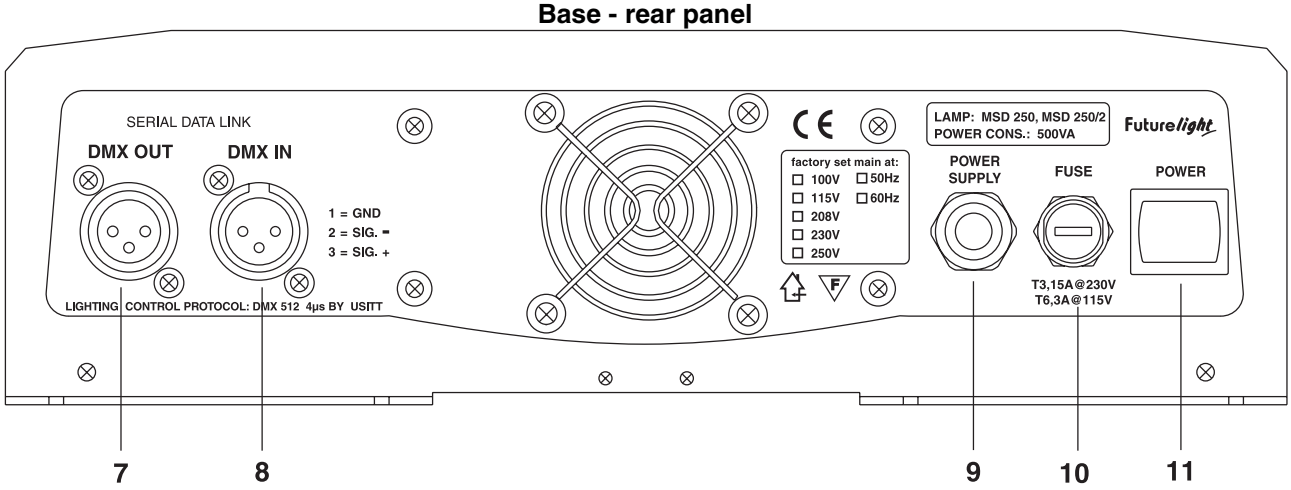
Compact Moving-Head
With extensive accessory for a wide range of illumination and decoration possibilities • Cam Lock system with adapter plate and 2 Omega holders included in the delivery • Versatile operation modes via DMX-512, as stand alone or in Master/Slave-mode (up to 9 slaves) • Three freely programmable programs by which all slaves can be controlled via the master-device • Quick Lock system for easy opening of the projector head • Easy lamp-exchange via service screws • Optimized optical system for highest light output • Motorized multi-step-zoom with five (!) different apertures (15°, 18°, 21°, 24° and 26°) • Rotating gobo-wheel with 5 interchangeable and indexable rotating gobos plus open
• The rotating gobos can be turned by 360°, the adjusted position is memorized • Large E-size gobos for clear projections and advertising logos • New system for replacing the gobos • Colour-wheel with 7 dichroic filters plus open • Effect-wheel with 3 dichroic filters, 3 E-size gobos plus open • Via the combination between effect-wheel and color-wheel even more colour-combinations (32 colours) possible • Rainbow-effect in both directions • Zoom-wheel with motorized Multi-Step Zoom, frost-filter and UV-filter • High-speed rotating 3-facet prism • Remotely controllable motorized focus • Combined shutter/dimmer unit allowing very smooth dimming and strobo effect 1-10 flash per sec. • Modular construction of fixture • 2 built-in transport handles • 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 • Can also be operated without external controller (stand alone mode) • Preprogrammed variable/random strobe and dimmer pulse-effects • Macro-function for rotating gobos/rotating prism combinations • Black-out while Head moving or gobo/colour/prism changing • Remotely controllable speed of Pan/Tilt movement for easy programming • Remote reset function • Intelligent control panel with 4-digit LED display • Silent fans cooling; remotely controllable speed of fans • 16 DMX-channels - 16 bit Pan/Tilt movement resolution • 14 DMX-channels - 8 bit Pan/Tilt movement resolution • Pan-movement range 530° • Tilt-movement range 280° • 8/16 bit movement resolution • Automatic Pan/Tilt position correction • High luminous-efficiency parabolic mirror and double condenser system • All lenses are anti-reflection coated • Self-resetable thermo-fuse • For MSD/HSD 250, MSD 250/2 or MSD/HSD 200 lamp • DMX-control via every standard DMX-controller • Suitable FUTURELIGHT controllers: CP-192 controller, CP-256 controller

Description of the fixture

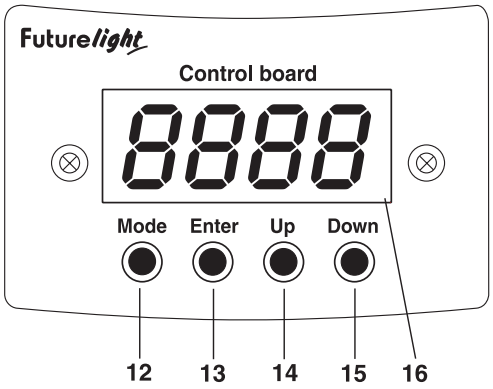


1 - Projector-head
2 - Yoke
3 - Carrying handles
4 - Base
5 - Base - side panel
6 - Control Board

Base - rear panel



7 - DMX-output
8 - DMX-input
9 - Powercord
10 - Fuseholder
11 - Power-switch



Control Board:
12 - Mode-button
13 - Enter-button
14 - Up-button
15 - Down-button
16 - Display

Safety instructions

CAUTION!

Be careful with your operations. With a dangerous voltage 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 user manual.

Important:
Damages caused by the disregard of this user manual are not subject to warranty. The dealer will not accept liability for any resulting defects or problems.

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.

This device falls under protection-class I. The power plug must only be plugged into a protection class I outlet.

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.

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.

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.

Caution: During the operation, the housing becomes very hot.

HEALTH HAZARD!

Never look directly into the light source, as sensitive persons may suffer an epileptic shock (especially meant for epileptics)!

Keep away children and amateurs!

Operating determinations

This device is a moving-head spot for creating decorative effects. This product is only allowed to be operated with an alternating current of 230 V, 50 Hz and was designed for indoor use only.

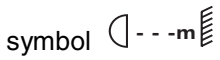
This device is designed for professional use, e.g. on stages, in discotheques, theatres etc.

Lighting effects are not designed for permanent operation. Consistent operation breaks will ensure that the device will serve you for a long time without defects.

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 symbol  determines the minimum distance from lighted objects. The minimum distance between light-output and the illuminated surface must be more than this value.

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 explose and emit a high ultraviolet radiation, which may cause burns.

The maximum ambient temperature t_a must never be exceeded.

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!

Never remove the serial barcode from the device as this would make the guarantee void.

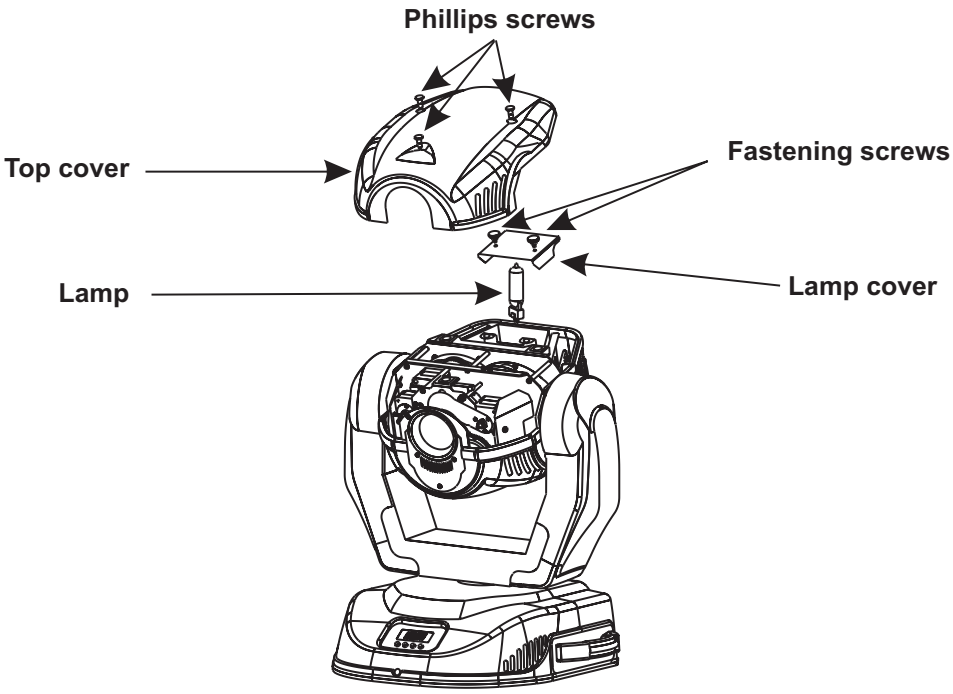
If this device will be operated in any way different to the one described in this manual, the product may suffer damages and the guarantee becomes void. Furthermore, any other operation may lead to dangers like short-circuit, burns, electric shock, lamp explosion, crash etc.

Installation

Fitting/Exchanging the lamp

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

English



To insert the lamp MSD/HSD 200 GY-9.5, MSD/HSD 250 GY-9.5 or MSD 250/2 GY-9.5 open the top cover of the projector head (see the drawing) by loosening the screws on the top cover.
Then open the small lamp cover by loosening the 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-handed 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).

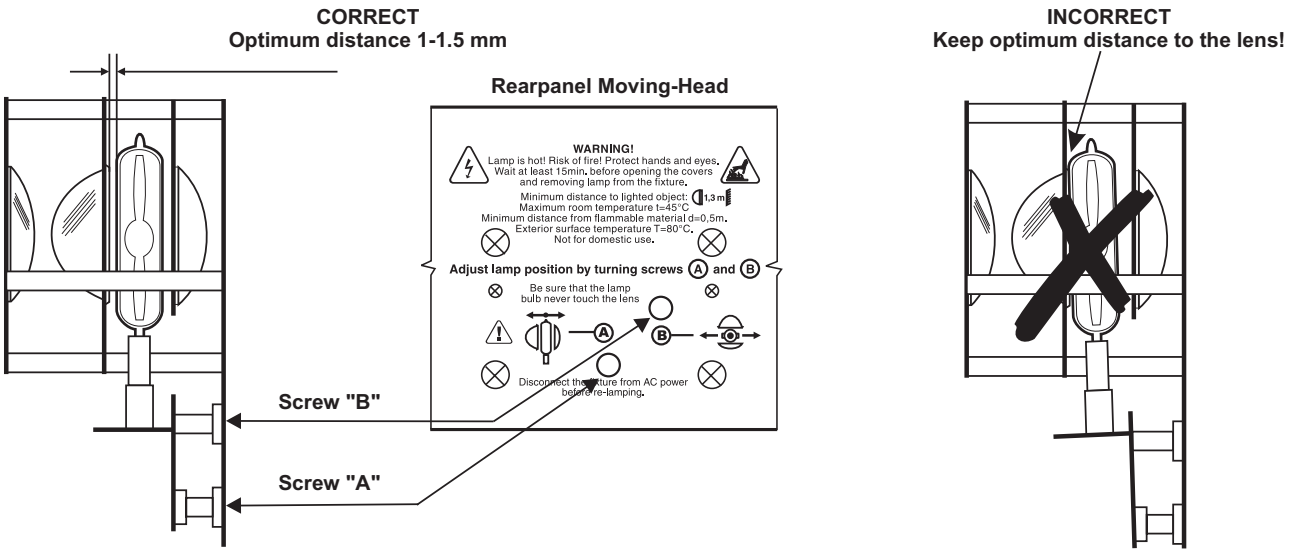
Then close the small lamp cover by tighten the fastening screws again.

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

Before striking the lamp, reset the "LAti" counter and the "LASt" 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 the fixture with opened housing-cover!

Lamp adjustment

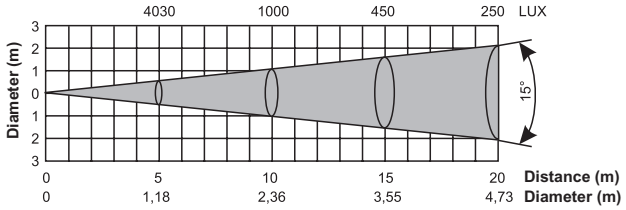


The MH-680 lampholder is aligned at the factory. Due to differences between lamps, fine adjustment may improve light performance.
Strike the lamp and focus the light on a flat surface (wall). As the optimum distance of lamp from lens was adjusted during the installing or changing the lamp (by turning 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 srew **"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.

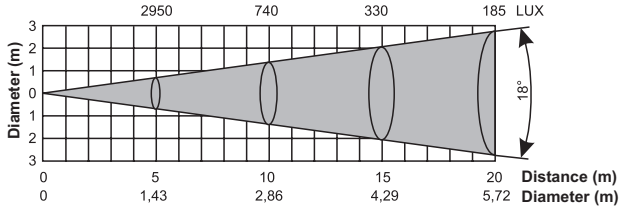
English

Beampath

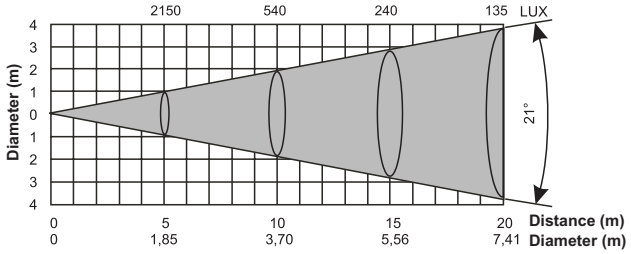
15° radiation angle



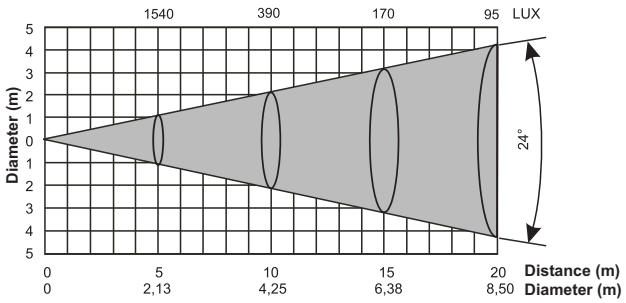
18° radiation angle



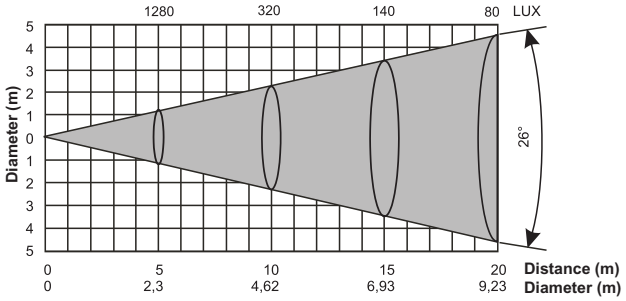
21° radiation angle



24° radiation angle



26° radiation angle



Inserting/Exchanging gobos

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

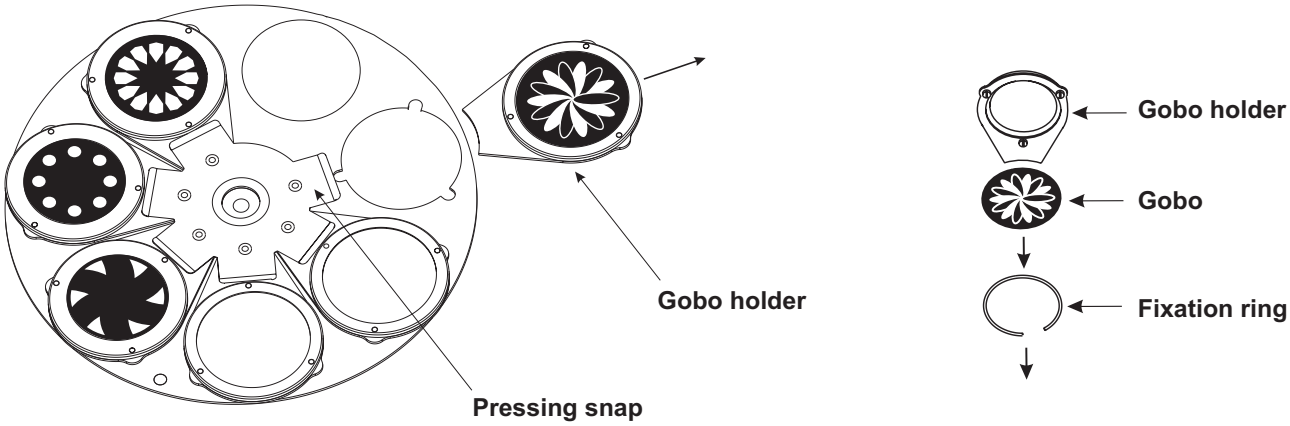
To insert the gobos open the top cover of the head by loosening the screws on the front and rear sides of the top cover.

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:

Static gobo-wheel:
Carefully bend the gobo holder out of the fixation and remove it from the pressing snap.

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.

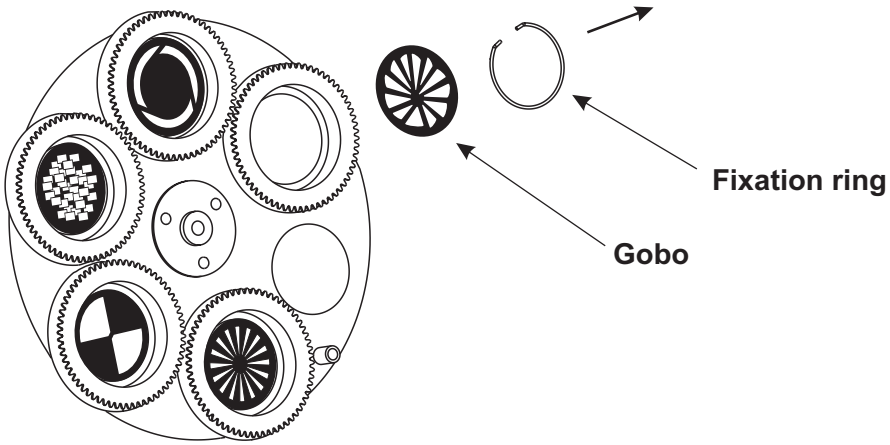
Press the gobo holder back into the pressing snap and insert it into the fixation.



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.



Rigging

DANGER TO LIFE!

Please consider the EN 60598-2-17 and the respective national norms during the installation! The installation must only be carried out by an authorized dealer!

The installation of the projector has to be built and constructed in a way that it can hold 10 times the weight for 1 hour without any harming deformation.

The installation must always be secured with a secondary safety attachment, e.g. an appropriate catch net. This secondary safety attachment must be constructed in a way that no part of the installation can fall down if the main attachment fails.

When rigging, derigging or servicing the fixture staying in the area below the installation place, on bridges, under high working places and other endangered areas is forbidden.

The operator has to make sure that safety-relating and machine-technical installations are approved by an expert before taking into operation for the first time and after changes before taking into operation another time.

The operator has to make sure that safety-relating and machine-technical installations are approved by an expert after every four year in the course of an acceptance test.

The operator has to make sure that safety-relating and machine-technical installations are approved by a skilled person once a year.

Procedure:
The projector should be installed outside areas where persons may walk by or be seated.

IMPORTANT! OVERHEAD RIGGING REQUIRES EXTENSIVE EXPERIENCE, including (but not limited to) calculating working load limits, installation material being used, and periodic safety inspection of all installation material and the projector. If you lack these qualifications, do not attempt the installation yourself, but instead use a professional structural rigger. Improper installation can result in bodily injury and.or damage to property.

The projector has to be installed out of the reach of people.

If the projector shall be lowered from the ceiling or high joists, professional trussing systems have to be used. The projector must never be fixed swinging freely in the room.

Caution: Projectors may cause severe injuries when crashing down! If you have doubts concerning the safety of a possible installation, do NOT install the projector!

Before rigging make sure that the installation area can hold a minimum point load of 10 times the projector's weight.

DANGER OF FIRE!

When installing the device, make sure there is no highly-inflammable material (decoration articles, etc.) within a distance of min. 0.5 m.

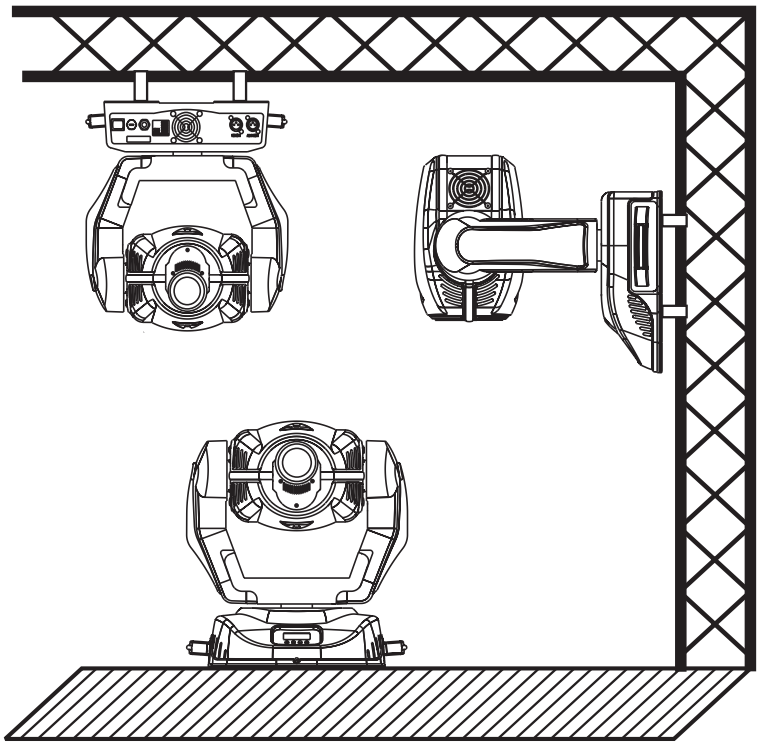
CAUTION!

Use 2 appropriate 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.

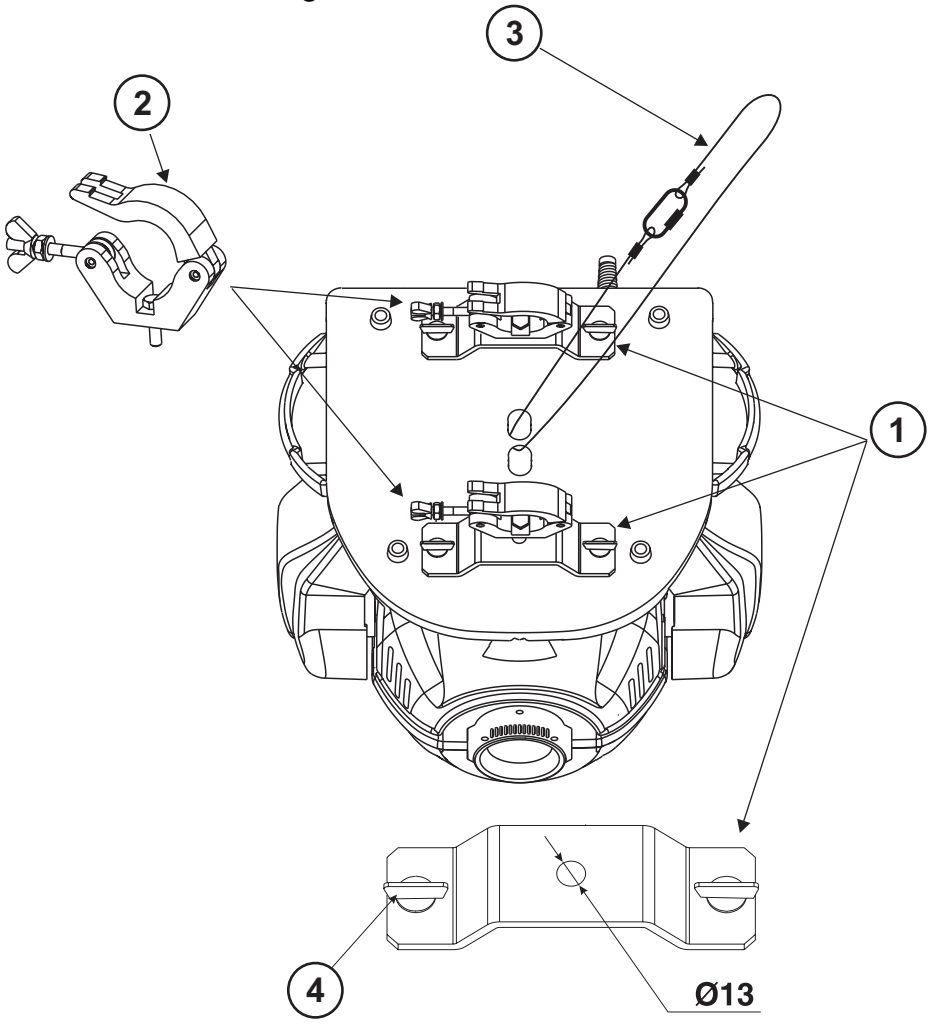
The Moving-Head can be placed directly on the stage floor or rigged in any orientation on a truss without altering its operation characteristics (see the drawing).

The fixture's base enables to be mounted in two ways: via the Omega-holders or via the adapter plate. Use the clamps with screws M12.

For overhead use, always install a safety-rope that can hold at least 12 times the weight of the fixture. You must only use safety-ropes with screw-on carabines.



Installation via the Omega holders

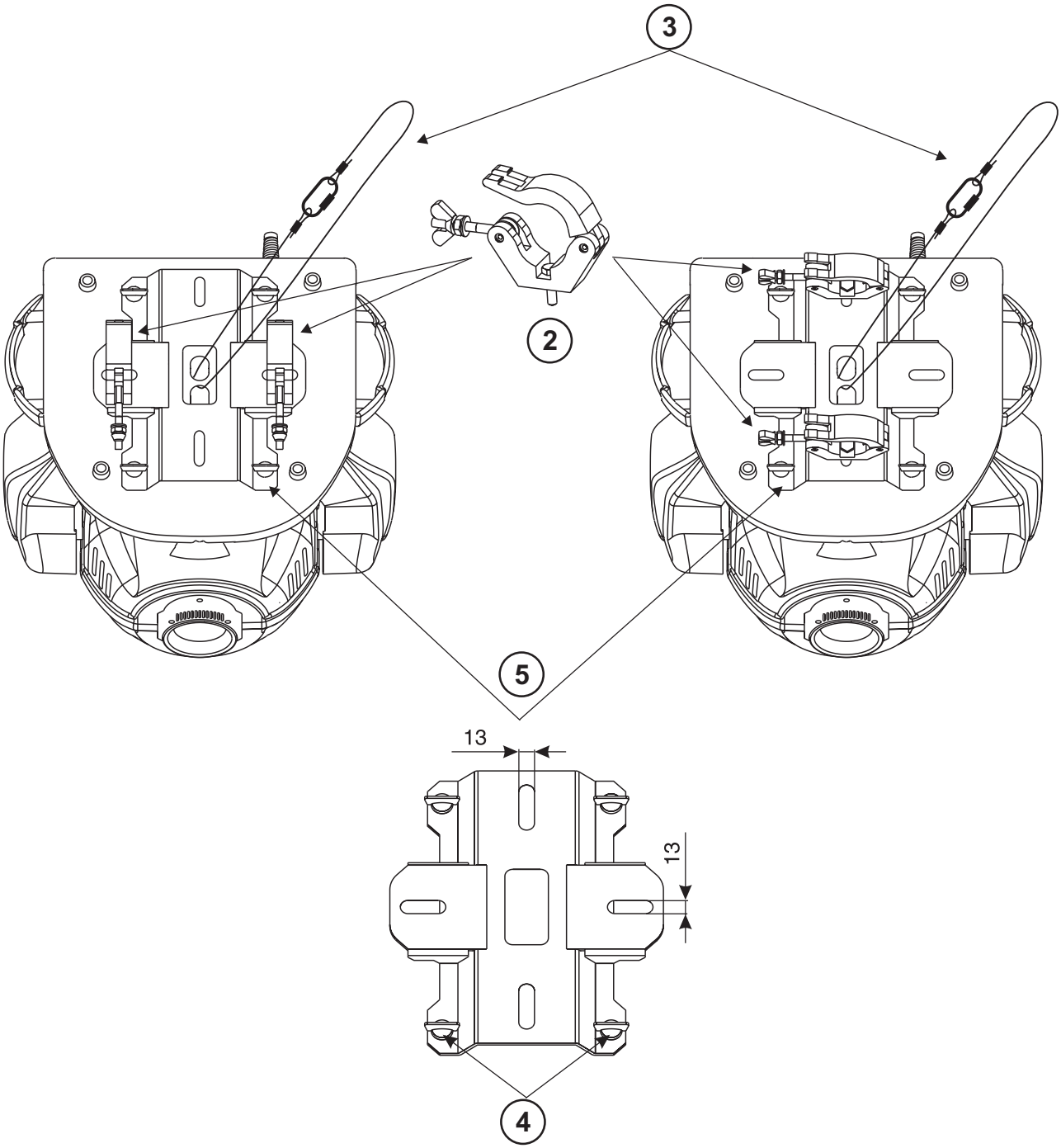


(1) Omega holders
(2) Clamp
(3) Safety-rope
(4) Quick-lock fastener

Screw one clamp each via a M12 screw and nut onto the Omega holders.
Insert the quick-lock fasteners of the first Omega holder into the respective holes on the bottom of the device. Tighten the quick-lock fasteners fully clockwise. Install the second Omega holder.
Pull the safety-rope through the holes on the bottom of the base and over the trussing system or a safe fixation spot. Insert the end in the carabine and tighten the safety screw.

Installation via the adapter plate
Via the adapter plate, you can easily install the clamps in both directions.

(2) Clamp
(3) Safety-rope
(4) Quick-lock fastener
(5) Adapter plate



Screw both clamps via a M12 screw and nut onto the respective holes in the adapter plate.
Insert the four quick-lock fasteners of the adapter plate into the respective holes on the bottom of the device. Tighten the quick-lock fasteners fully clockwise.
Pull the safety-rope through the holes on the bottom of the base and over the trussing system or a safe fixation spot. Insert the end in the carabine and tighten the safety screw.

Connection with the mains

Connect the device to the mains with the power-plug.

The occupation of the connection-cables is as follows:

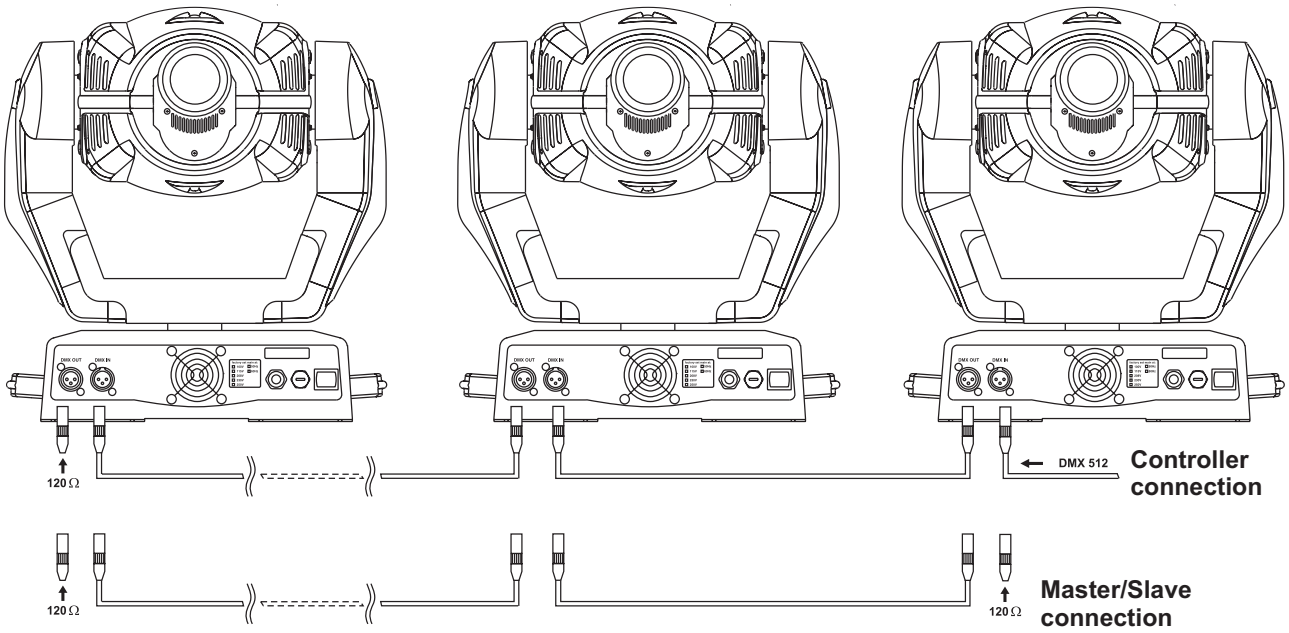
Cable	Pin	International
Brown	Live	L
Blue	Neutral	N
Yellow/Green	Earth	⏚

The earth has to be connected!

In general, lighting effects should not be connected to dimming-packs.

DANGER TO LIFE!
Before taking into operation for the first time, the installation has to be approved by an expert!

DMX-512 connection / connection between fixtures



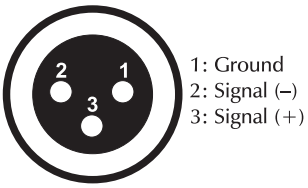
The wires must not come into contact with each other, otherwise the fixtures will not work at all, or will not work properly.

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:

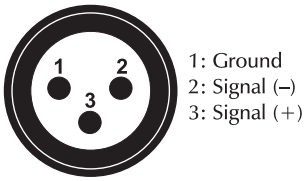
DMX-output

XLR mounting-socket:



DMX-input

XLR mounting-plug:



If you are using the recommended FUTURELIGHT-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 Ω resistor between Signal (–) and Signal (+) into a 3-pin XLR-plug and plug it in the DMX-output of the last fixture.

Master/Slave-operation

The master/slave-operation enables that several devices can be synchronized and controlled by one master-device.

On the rear panel of the MH-680 you can find an XLR-jack (DMX Out) and an XLR-plug (DMX In), which can be used for connecting several devices.

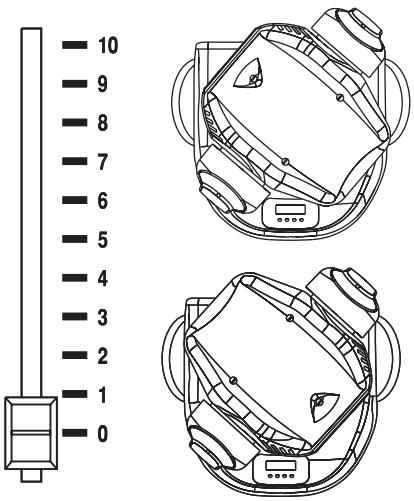
Choose the device which is to control the effects. This device then works as master-device and controls all other slave-devices, which are to be connected to the master-device via a balanced microphone lead. Connect the DMX OUT-jack with the DMX IN-plug of the next device.

Caution: At the master-device and at the last slave-device, the DMX-cable has to be terminated with a terminator. Solder a 120 Ω resistor between Signal (–) and Signal (+) into a 3-pin XLR-plug and plug it in the DMX-output.

Function of the control channels - 16 bit protocol

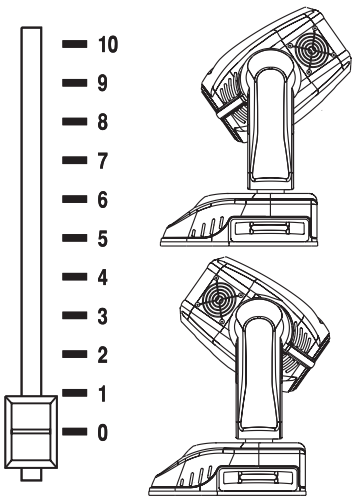
Channel 1 - Horizontal movement (Pan)

Push slider up in order to move head horizontally (PAN).
Gradual head adjustment from one end of the slider to the other (0-255, 128-center). The head can be turned by 530° and stopped at any position you wish.



Channel 2 - Vertical movement (Tilt)

Push slider up in order to move head vertically (TILT).
Gradual head adjustment from one end of the slider to the other (0-255, 128-center). The head can be turned by 280° and stopped at any position you wish.



Channel 3 - Pan fine 16 bit

Channel 4 - Tilt fine 16 bit

Channel 5 - Speed of PAN / TILT movement

0	Max speed (tracking mode)
1	Max speed (vector mode)
249	Min. speed (vector mode)
250-252	Max. speed (tracking mode), black-out color/gobo changes
253-255	Max. speed (tracking mode), black-out while PAN, TILT moving or color/gobo changes

Channel 6 - Switch on / off the lamp, reset, speed control of cooling fan

0	Max. speed of fan
127	Min. speed of fan (silent operation) from 0 to 127 - decreasing speed of fan
128 - 139	Switch on the lamp after 3 seconds, Reset
140 - 229	No function
230 - 239	Switch off the lamp after 3 seconds
240 - 255	No function

English

Channel 7 - Colour-wheel 1

Linear colour change following the movement of the slider. In this way you can stop the colour-wheel in any position - also between two colours creating double-coloured beams.
Between 128 and 189 and between 194 and 255, the colour-wheel rotates continuously the so-called "Rainbow" effect.

0	White
16	Blue
32	Red
48	Green
64	Yellow
80	Magenta
96	Cyan
112	Light green
128 - 189	Forwards rainbow effect from fast to slow
191 - 193	No rotation
194 - 255	Backwards rainbow effect from slow to fast
0 - 255	Colour macro function (channel 8 set from 128 - 255) - 32 different colours in following order: white, pink, magenta, red, orange, yellow, green, cyan, blue

Channel 8 - Colour-wheel 2 / Static gobo-wheel

0 - 11	White
16 - 35	Light blue
36 - 51	Pink
52 - 71	Umber
72 - 87	Gobo 1 (dichroic)
88 - 107	Gobo 2 (dichroic)
108 - 127	Gobo 3 (dichroic)
128 - 191	Enable macro color function on channel 7
192 - 193	No rotation
194 - 255	Backwards rainbow effect from slow to fast

Channel 9 - Prism-wheel

0 - 95	Open position (no prism)
96 - 159	3 - facet rotating prism
160 - 255	**Prism/Gobo macros**
160 - 167	Macro 1
168 - 175	Macro 2
176 - 183	Macro 3
184 - 191	Macro 4
192 - 199	Macro 5
200 - 207	Macro 6
208 - 215	Macro 7
216 - 223	Macro 8
224 - 231	Macro 9
232 - 239	Macro 10
240 - 247	Macro 11
248 - 255	Macro 12

Channel 10 - 3-facet-prism rotation control

0	No rotation
1 - 126	Forwards rotation from fast to slow
127 - 128	No rotation
129 - 255	Backwards rotation from slow to fast

Channel 11 - Rotating gobo-wheel

0 - 31	Open
32 - 63	Rot. gobo 1 (glass)
64 - 95	Rot. gobo 2 (metal)
96 - 127	Rot. gobo 3 (metal)
128 - 159	Rot. gobo 4 (metal)
160 - 223	Rot. gobo 5 (metal)
224 - 255	Rot. gobo wheel cont. rotation slow to fast

Channel 12 - Rotating gobo index, rotating gobo rotation

0 - 127	Gobo indexing
128 - 190	Forwards gobo rotation from fast to slow
191 - 192	No rotation
193 - 255	Backwards gobo rotation from slow to fast

Channel 13 - Effect-wheel

	Zoom without focus correction
0 - 31	Zoom 15°
32 - 47	Zoom 18°
48 - 63	Zoom 21°
64 - 79	Zoom 24°
80 - 95	Zoom 26°
96 - 111	Frost-filter
112 - 127	UV-filter
	Zoom with focus correction
128 - 159	Zoom 15°
160 - 175	Zoom 18°
176 - 191	Zoom 21°
192 - 207	Zoom 24°
208 - 223	Zoom 26°
224 - 239	Frost-filter
240 - 255	UV-filter

Channel 14 - Focus

0 - 255	Continuous adjustment from far to near

Channel 15 - Shutter, Strobe

0 - 31	Shutter closed
32 - 63	No function (Shutter open)
64 - 95	Strobe-effect from slow to fast (max. 10 flashes/second)
96 - 127	No function (Shutter open)
128 - 159	Pulse-effect in sequences
160 - 191	No function (Shutter open)
192 - 223	Random strobe-effect from slow to fast
224 - 255	No function (Shutter open)

Channel 16 - Dimmer intensity

0 - 255	Gradual adjustment of the dimmer intensity from 0 to 100 %

English

Function of the control channels - 8 bit protocol:

DMX Channel	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Function	PAN	TILT	PAN/TILT SPEED	FAN ON/OFF LAMP	COL. 1 WHEEL	COL. 2/ ST. GOBO WHEEL	PRISM	PRISM CONTROL	ROTATING GOBOS	GOBO ROTATION	ZOOM	FOCUS	STROBE	DIMMER

DMX-controlled operation

You can control the projectors individually via your DMX-controller. Every DMX-channel has a different occupation with different features. In order to call up the different features, you first have to ignite the lamp (control channel 6, DMX-value 128-139).

Addressing

The Control Board on the front side of the base allows you to assign the DMX fixture address, which is defined as the first channel from which the MH-680 will respond to the controller.
If you set, for example, the address to channel 5, the MH-680 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 MH-680 correctly and independently from any other fixture on the DMX data link.
If two, three or more MH-680 are addressed similarly, they will work similarly.

For address setting, please refer to the instructions under "Addressing" (menu "A001").

Controlling:
After having addressed all MH-680, you may now start operating these via your lighting controller.
Note:
After switching on, the MH-680 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 occurr if:
- the 3 PIN XLR plug (cable with DMX signal from controller) is not connected with the input of the MH-680.
- 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.

Remotely controllable functions

Lamp

The MH-680 is to be operated with a MSD/HSD 200, MSD/HSD 250 or MSD 250/2 GY-9.5 lamp.
A relay inside of the MH-680 allows you to switch on and off the lamp via the Control Board on the top side or via your controller without affecting the rest of the lighting.
For switching on and off the lamp via the Control Board, please refer to the instructions under "Switching On/Off the lamp" (menu "LAMP")

Note :
It is also important to note that the discharge lamp is a cold restrike type, which means that it has 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 MH-680 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 MH-680. 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.

Colour-wheel 1

The MH-680 features a colour-wheel with 8 color positions - 7 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.
Via the colour macro function, 32 different colours can be produced in following order: white, pink, magenta, red, orange, yellow, green, cyan, blue.

Colour-wheel 2/Static gobo-wheel

This wheel has 3 dichroic gobos, 3 color positions and one open position. All gobos are interchangeable. The gobos have an outside diameter of 37,3 mm and an image diameter of 31,5 mm.

Rotating gobo-wheel

The rotating gobo-wheel includes 4 metal gobos and 1 glass gobo rotating in both directions, indexable, rotating gobo wheel cont. rotation slow to fast. All gobos are interchangeable. The gobos have an outside diameter of 37,3 mm and an image diameter of 31,5 mm.

3-facet rotating prism

3-facet prism rotating in both directions at different speeds. 12 Prism-rotating gobo macros.

Focus - multistep zoom

Motorized focus enables the beam to be focused anywhere on stage at different beam angles: 15°, 18°, 21°, 24°, 26° provided by the special multistep zoom.

Dimmer / Shutter / Strobe

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

Fans

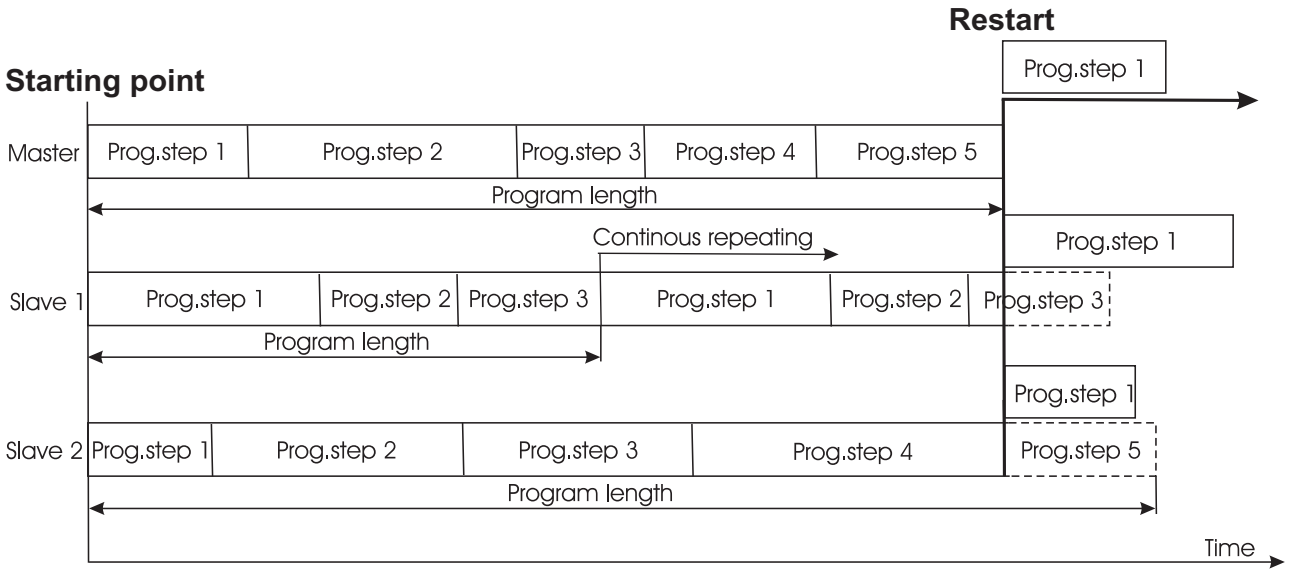
The MH-680 is cooled by three axial fans - two in the projector head and one in the base. The speed of the fan (and of course the noise) can be continuously reduced if very quiet performance is required.
By the Control Board using the **"FAnS"** function you can choose 5 types of fan speed operating modes. Please refer to the instructions under "Fan speed operating modes" (menu "FAnS").

Stand Alone-mode

In the Stand Alone-mode, one or several projectors of the data link can be operated without controller. Every projector features three pre-programmed programs which can be edited individually. Every projector can call up a different program. In order to set the desired program, please refer to the explanations under "Stand Alone-setting" (menu "St.AL.").
The Stand Alone-mode includes the operation of an individual projector or a chain of several projectors in master/slave-operation.
For the synchronized operatio of several projectors, the projectors have to be connected with each other via a data cable. One projector has to be defined as master-device and the others as slaves. Every slave needs to have its own slave-address "SLA-1" to "SLA-9". Please note that every slave-address can only be assigned to one projector.

The device's display shows the current program.

Please note: If the master-device runs through a reset, switches the lamp on or off or runs through the test program, all slave-devices follow the master. Furthermore, you cannot call up programs via the Control Board or edit them if the master-device is switched on and connected with the slaves.
The master-device starts the program run simultaneously at all slaves. All devices start their programs at a defined starting point. Every slave runs through the internal programs until the master-device requires a restart. If the slave's internal program is longer than the master's, the last step will not be executed and the program will be restarted.

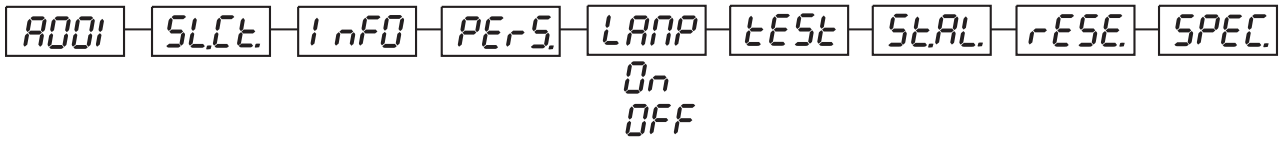


Please note: Disconnect the master and slaves from the DMX-controller before you start master/slave-operation. Otherwise danger of data collisions.

Caution: At the master-device and at the last slave-device, the DMX-cable has to be terminated with a terminator. Solder a 120 Ω resistor between Signal (–) and Signal (+) into a 3-pin XLR-plug and plug it in the DMX-output.

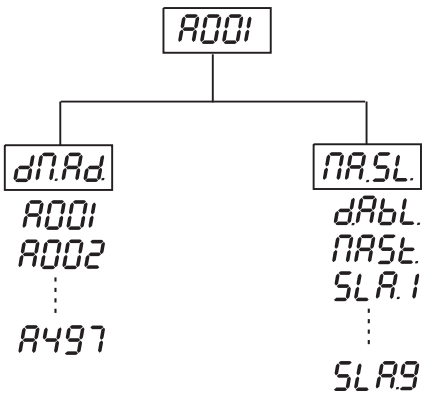
Control Board

The Control Board situated on the front side of the base offers several features. You can simply set the starting address, read the number of lamp or unit hours, switch on and off the lamp, run a test program, make a reset and also use special functions for manual control and service purposes.
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. Press **[Enter]** if you wish to select one of them. The functions provided are described in the following sections and the function hierarchy is shown below.



Main functions

A001 - Address setting and master/slave-selection



dMAd. - DMX 512 Address settings

1. 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 pressing the [Up] and [Down] keys.

2. Press **[Enter]** and select "dM.Ad." by pressing the [Up] and [Down] keys.
3. Press **[Enter]**. 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.
4. Select "MA.SL." and press **[Enter]**. Select "d.Abl." (no master/slave) by pressing the [Up] and [Down] keys and press **[Enter]**.
5. Press the **[Mode]** key and the adjusted starting address is displayed. If the starting address is flashing, there is no DMX-data on the DMX-input.

MASL. - Master/Slave settings

1. 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).
2. Press **[Enter]** and select "MA.SL." by pressing the [Up] and [Down] keys.
3. Press **[Enter]**. Use the [Up] and [down] keys to select "MASt" (in order to define the projector as master) or "SLA.1" to "SLA.9" (in order to define the projector as a slave) and press **[Enter]** to confirm or **[Mode]** to cancel and return to the main menu. If you want to define "No master, no slave", select "d.AbL.".
4. Press the **[Mode]** key and the adjusted starting address is displayed. If "MASt." is flashing, a DMX-signal is received on the DMX-input. In this case, you need to disconnect the DMX-controller.

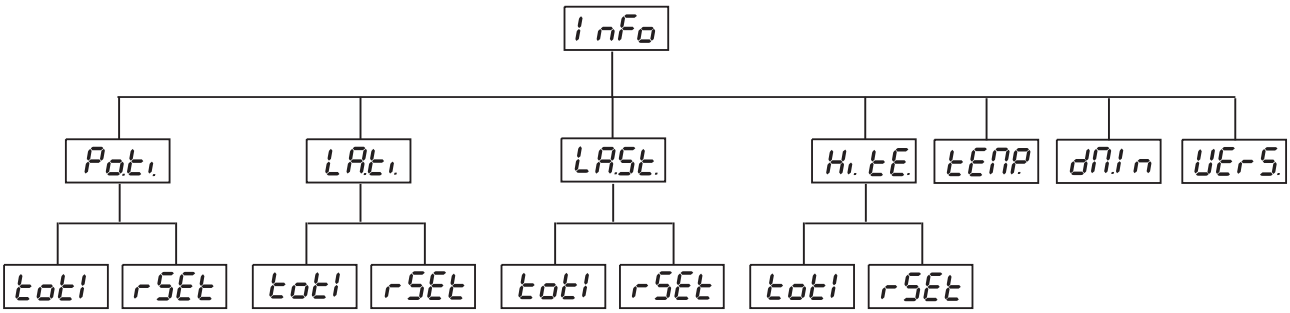
Only one fixture may be the master. Up to the 9 slaves may be connected to the master and on the certain address can be connected only one slave fixture (SLA1-SLA9).
Note: Disconect the fixtures from the DMX controller before master/slave operating, otherwise data collisions can occur and the fixtures will not work properly!
If the fixture is set as the master and DMX signal is connected to its input ,the error massage "MAEr" will appear on its display and the fixture's address will be set to its DMX address in order to respond to DMX signal from the controller.
For example:
The master fixture has these address setting:"dM.Ad."-menu.....**A017**
"MA.SL."-menu.....**MASt** (is displayed)
The DMX signal is connected to the master fixture.The message **"MAst"** starts fast flashing and after 20s error massage "MA.Er" appears on its display and the fixture automatically will be switched to its DMX address (master address is disabled).
Now the fixture has these address setting: "dM.Ad."-menu.....**A017** ("A017"/" MA.Er" flashing)
"MA.SL."-menu.....**d.AbL.**
If the fixture is set as the slave and DMX signal is connected to its input, the fixture will respond to DMX signal from the controller (in dependence on the fixture's DMX address).

SLCt. - Slave control

This function allows you to control the slaves from the master's control panel in a master/slave operation.
Select this function from the main menu and press **[Enter]**-button**.**Browse the list of all connected slaves (**"SL.C.1" - "SL.C.9"**) by pressing **[Up]** or **[Down]** button.Select the desired slave and press **[Enter]**-button.The slave's control panel is available from the master's control panel.
If no slave is connected to the master, the messages "SL.C.1","SL.C.2","SL.C3"..."SL.C.9" still round repeat.
Note: This function is available from the master fixture only.

InFo - Fixture information

The menu allows you to read an useful information about the fixture as the lamp life, head temperature, software version, etc.
Press **[Up]** and **[Down]** buttons to select the desired option and press **[Enter]** to see the value or next submenu.



Poti - Power On time

toti - By this option you can read the total number of the operation hours since the MH-680 has been fabricated. Press **[Enter]** or [Mode] to return to the menu.

rSEt - The number of the hours that the MH-680 has been powered On since the counter was last reset. Press **[Enter]** or **[Mode]** to return to the menu. In order to reset this counter to 0, you have to hold the **[Up]** and **[Down]**-button and press the **[Enter]**-button.

LAti. - Lamp On time

toti - By this option you can read the total number of the lamp's operation hours since the MH-680 has been fabricated. Press **[Enter]** or [Mode] to return to the menu.

rSEt - The number of the hours that the lamp has been powered On since the counter was last reset. Press **[Enter]** or **[Mode]** to return to the menu. In order to reset this counter to 0, you have to hold the **[Up]** and **[Down]**-button and press the **[Enter]**-button.

LASt. - Lamp strikes

toti - By this option you can read the total number of lamp strikes since the MH-680 has been fabricated. Press **[Enter]** or [Mode] to return to the menu.

rSEt - The number of lamp strikes since the counter was last reset. Press **[Enter]** or **[Mode]** to return to the menu. In order to reset this counter to 0, you have to hold the **[Up]** and **[Down]**-button and press the **[Enter]**-button.

Hi tE. - Maximum fixture head temperature

toti - By this option you can read the maximum temperature since the MH-680 has been fabricated. Press **[Enter]** or [Mode] to return to the menu.

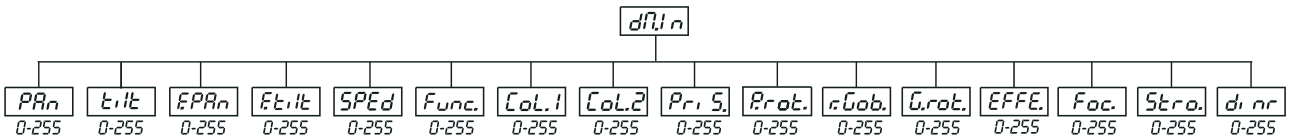
rSEt - The maximum temperature since the counter was last reset. Press **[Enter]** or **[Mode]** to return to the menu. In order to reset this counter to 0, you have to hold the **[Up]** and **[Down]**-button and press the **[Enter]**-button.

tEMP. - Temperature

Inside temperature readouts of the fixture in Celsius. Inside temperatures below 74° C are not critical. 74° C and more lead to the lamp being switched off. Please note that the outside temperature should not exceed 45° C.

dMX n - 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.

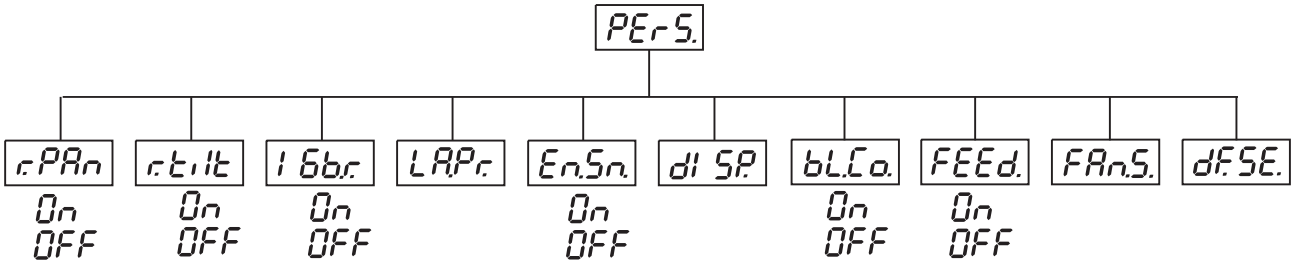


UErS. - Software version

By this function you can read the software version of the display module. Press **[Enter]** to read its value or [Mode] to return to the menu.

PErS. - Personality options

These options allow you to modify MH-680 operating behavior. Press **[Up]** and **[Down]** buttons to select the desired option and press **[Enter]** to set the value or to see next submenu.



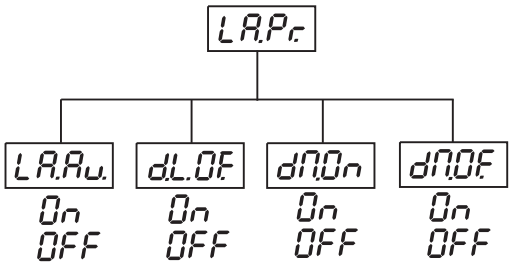
rPAn - Pan reverse
This function allows you to invert the Pan-movement. Use the [Up] and [Down] keys to select **"On"** if you wish this feature or **"Off"** if you don't wish this feature and press **[Enter]** to confirm or **[Mode]** to cancel and return to the main menu.

rtilt - 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.

16br - 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 16bit 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.

LAPr - Lampen preset
This function allows you to adjust the lamp settings:



LAAu- 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]** buttons 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.

dLOF - Lamp Off via DMX
This function allows you to switch Off the lamp by DMX. Use the **[Up]** and **[Down]** buttons 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.

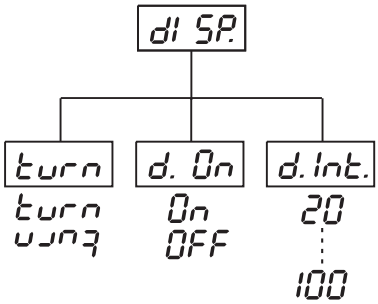
dN0n - Lamp On if DMX is present
This function allows you to strike the lamp automatically after 26 seconds if DMX signal is present on the data link.If the ignition is unsuccessfull (e.g.lamp is too hot),the fixture will try to ignite the lamp after next 26 s.This process will repeat until the lamp lights.Use the **[Up]** and **[Down]** buttons to select **"On"** if you want to strike the lamp or **"Off"** if you don't want to strike the lamp and press **[Enter]** to confirm or **[Mode]** to cancel and return to the menu.

dN0F - Lamp Off if DMX is missing
This function allows you to switch Off the lamp automatically after 2 minutes if DMX signal is missing on the data link. Use the **[Up]** and **[Down]** buttons to select **"On"** if you want to switch Off the lamp or **"Off"** if you don't want to switch Off the lamp and press **[Enter]** to confirm or **[Mode]** to cancel and return to the menu.

EnSn - 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!

dI SP. - Display-adjusting

This function allows you to adjust the display settings:



d.Int. - Display intensity

With this function, you can adjust the display-intensity from 20 % to 100 %. 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.

turn - 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.

d. On - 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.

bLCo. - Blackout during movement correction

The function executes the blackout during the head movement correction (the moving head has lost its right pan/tilt-position for a short moment). Use the **[Up]** and **[Down]** buttons to select **"On"** if you want to execute the blackout or **"Off"** if you don't and press **[Enter]** to confirm or **[Mode]** to cancel and return to the menu.

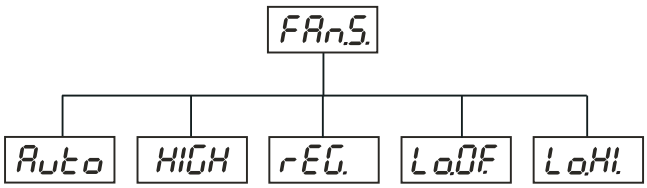
FEEd. - PAN/TILT-Feedback:

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 Moving 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 feedbeck 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.

FAnS. - Fan speed operating

By using this function you can choose 5 types of fan speed operating. Browse through this menu by the pressing **[Up]** and **[Down]** keys - the display shows step by step the following messages: **"Auto, HIGH, reG, Lo.HI, Lo.OF"**. Press **[Enter]** if you wish to select one of them or **[Mode]** to cancel and return to the menu.



Auto - continuous controlling of the fan speed without the DMX value

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.The initial level of the fan speed can´t be adjusted by the DMX.

HI GH - high speed of the fans

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

rEG. - continuous controlling of the fan speed

This mode is similar to "Auto", but the initial level of the fan speed can be adjusted by the DMX.

LoOF - 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 MH-680 automatically switches Off the lamp.

LoHI - low speed / switch off the lamp operating

The fan keeps the adjusted low speed until the temperature exceeds max. inside temperature of the fixture, then the MH-680 automatically switches from low to high the fan speed.

Note: In the mode “HIGH“ and “Auto“- the fan speed can´t be adjusted by DMX.

dFSE. - 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 value (shaded)
PAN-reverse	rPAn	On OFF
TILT-reverse	rtilt	On OFF
Resolution	16br	On OFF
Lamp On after switching on	LAAu	On OFF
Lamp Off via DMX	dLOF	On OFF
Lamp On if DMX is present	dNOn	On OFF
Lamp Off if DMX is missing	dNOF	On OFF
Blackout during movement correct.	bLCo	On OFF
Display permanent on	d On	On OFF
Display-intensity	d Int	20 40 60 80 100
Display-reverse	turn	turn usnq
Feedback-function	FEEd	On OFF
Switch on/off lamp light sensor	EnSn	On OFF
Ventilation fan	FAnS	Auto HIGH rEG LoOF LoHI

LAMP - Switch on / off the lamp

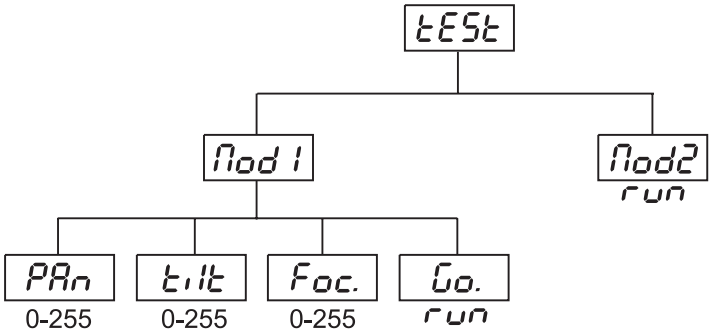
Use the **[Up]** and **[Down]** keys to select **"On"** if you wish the switch on the lamp or **"Off"** if you wish switch off the lamp and press **[Enter]** to confirm or **[Mode]** to cancel and return to the main menu.

tESt. - Test sequences

This function allows you to run a special demo-test sequences without an external controller, which will show you some possibilities of using MH-680. Press **[Up]** and **[Down]** keys to select the **"Mod1"** or **"Mod2"** sequences.

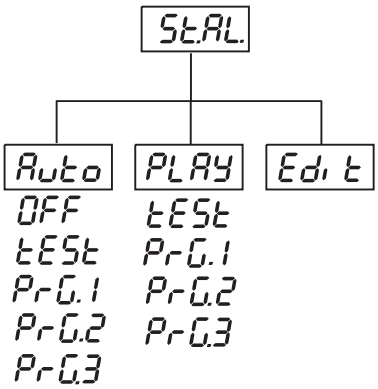
The **"Mod1"** is suitable for projections on the wall, ceiling or ground without any head-movement, the **"Mod2"** uses all MH - 680 functions and therefore is good for a complete introduction of the fixture.Select

"**Mod1**" or "**Mod2**" by **[Up]** and **[Down]** buttons and press **[Enter]** to confirm the choice.If the test program is running, message "**run/test**" flashes on the display.
If you want to pause the runnnig program in the required position, press the **[Enter]-**button(messages"**PAUS**"/"**test**" blink).To continue the program running,press the **[Enter]-**button again.



StAL. - Stand Alone-settings

This menu offers options for stand-alone mode as a selection of playing program, programming and modifying current programs.



Auto - Playback preset

This function allows you to select the the program which will be played in the stand-alone mode after switching the fixture On.Use the **[Up]** and **[Down]** buttons to select desired program ("**tESt**"- bilt-in program) or **"OFF"** if you don't want trigger any program after switching the fixture On and press **[Enter]** to confirm or **[Mode]** to cancel and return to the menu.Selected program will be played continuously in a loop as long as it appears on the display.
This option should be set "**OFF**" for all slaves in the master/slave chain by reason of the right program starts.
For example: You have selected program "**PrG.3**" in this menu and:
- this fixture is set as a single fixture (master/slave or controller operating)- the fixture will run its program "**PrG.3**".
- this fixture is set as a master in a data chain- the fixture will run its program "**PrG.3**".
- this fixture is set as a slave in a data chain- the fixture will run its program according to the master(if the master runs its own program "**PrG.1**", the slave will run its own program "**PrG.1**"also).
Note:If the fixture operates in the controller mode (DMX controller is connected) and any program from this menu is selected, in this case the fixture will not respond to the DMX controller after switching On and will play selected program.

PLAY - Playing program

This function allows you to run a built-in program **"tESt"** and the 3 freely-programmable programs **"PrG.1, PrG.2, PrG.3"**. Press **[Up]** or **[Down]** buttons to select the desired program and press **[Enter]** to run the program which will be played continuously in a loop.
If you want to pause the runnnig program in the required position, press the **[Enter]-**button(messages"**PAUS**"/"**program No**." flashes).To continue the program running, press the **[Enter]-**button again.
Note: If the fixture operates in the controller mode (DMX controller is connected) and any program from this function is selected in this case the fixture will not respond to the DMX controller and will play selected program.
You can't play programs on the slave fixtures from their control panels if the master fixture is switched On and connected to the slaves (playing is forced by the master).

EdIt - Editing program

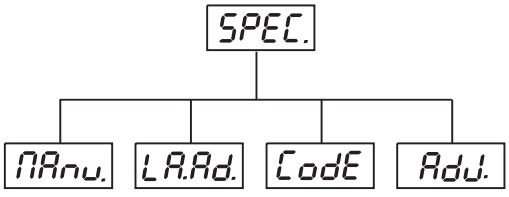
This menu item allows you to select a program to edit or create.The MH-680 has one built-in program (**"tESt"**) and the 3 free programs,each up to 99 steps.Each program step has a dynamic part(fade time) and static part(step time).
Fade time-the time,during which effects move to the programmed position.
Step time-the time,during which effects last in the current step.
If the fixture is set as a master, then you may edit any program in the slaves.You can't edit programs on the slave fixtures from their control panels if the master fixture is switched on and connected to the slaves (editing is possible by the master control panel only).
Procedure:
1. Press **[Up]** or **[Down]-**button to select the program you want to edit ("PrG.1" - "PrG.3") and press **[Enter]**.
2. Press **[Up]** or **[Down]-**button to select the desired fixture ("MASt." - "SLA.9") and press **[Enter]**-button.
3. Press **[Up]** or **[Down]-**button to select the desired program step ("St.01" - "St.99") and press **[Enter]**-button.
4 Press **[Up]** or **[Down]-**button to select the desired item and press **[Enter]-**button.Now you can edit by **[Up]** or **[Down]** buttons the DMX value for selected item:
"P.End." - a total number of the program steps,value 1-99 .**This value you must set before start programming**(e.g. if you want to create program with the 10 steps,set the value onto 10).
"PAn" - a pan,value 0-255
"tilt" - a tilt,value 0-255
"F.PAn" - a fine pan, value 0-255
"F.tilt" - a fine tilt,value 0-255
"SPEd" - a speed of PAN/TILT movement,value 0-255
"Col.1" - a colour 1, value 0-255
"Col.2" - a colour 2/stat.gobo,value 0-255
"Pris." - a prism and prism/rot.gobo macro,value 0-255
"P.rot" - a prism rotation,value 0-255
"r.Gob." - a rot.gobo,value 0-255
"G.rot." - a rot. gobo rotation,value 0-255
"EFFE." - a zoom,frost and UV filter, value 0-255
"Foc." - a focus ,value 0-255
"Stro." - a strobe,value 0-255
"dimr" - a dimmer, value 0-255
"S.tim." - a step time,value 0,1-25,5 seconds
"F.tim." - a fade time,value 0,1-25,5 seconds
"COPY." - a copying the current prog. step to the next prog. step .If the last prog.step is copied to the next prog. step, parameter **"P.End"** is increased about 1 by itself (except step 99).
5. Press **Enter]-**button to confirm adjusted value .
6. Press **[Mode]-**button,select next prog. step and repeat this procedure (steps 4 and 6).
The editing programs "PrG.1, PrG.2, PrG.3" are saved in the current modified fixture (master or slave1-9).

rESE. - Reset Function

Press **[Enter]** key to run reset. This option enables the MH-680 to index all effects (functions) and return to their standard positions.

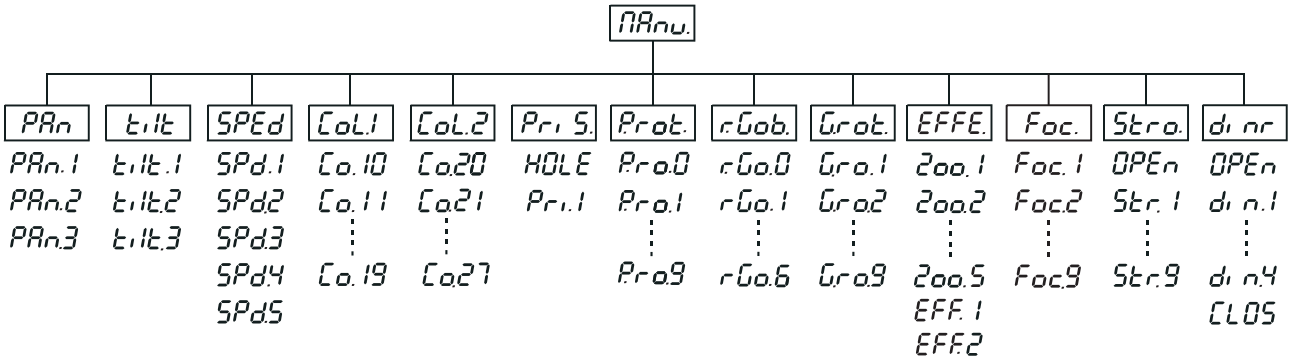
SPEC -Special functions

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



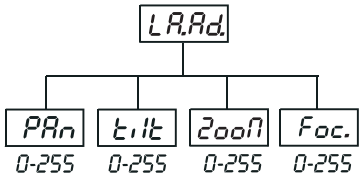
MAnu - Manual control of effects

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.



LAAd. - Lamp adjustment

This function can be used when you make the fine adjustment of the lamp.If you select "**LAAd**" pressing by **[Enter]**-button ,all effects will be canceled,shutter will be opened and the dimmer intensity will be set onto 100%. By using the options "**PAn, tilt, ZooM, Foc**" you can focus the light on a flat surface (wall) and perform the fine lamp adjustment.

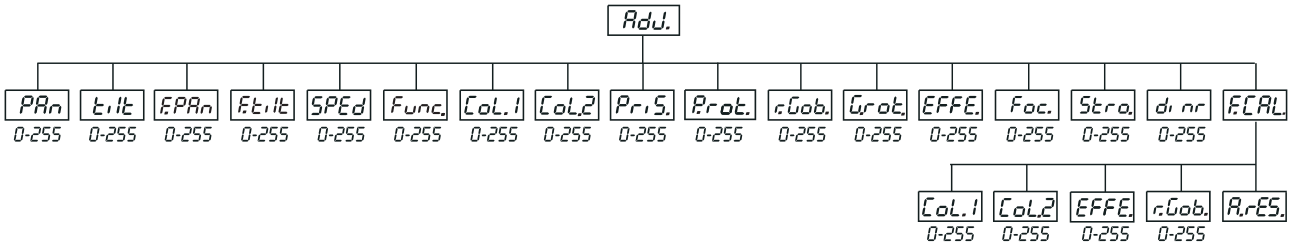


CodE - Fixture code

The option contains identification code (1-9999) for the fixture, which is used for the master/slave operation.

AdJ- 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, FPAn, Ftilt, SPEd, Func, Col1, Col2, PriS, Prot, rGob, Grot, EFFE, 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: **" Col1, Col2, EFFE, rGob "** 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 (EEPROM) 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: **" Col1, Col2, EFFE, rGob "** - 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 Channel	1	2	3	4	5	6	7	8
Function	COL. 1	COL2./S.GOBO	EFFECTS	R.GOBO	-	-	COLOURS 1	COL.2/ST.GOBOS
	CALIBRATION 0-255	CALIBRATION 0-255	CALIBRATION 0-255	CALIBRATION 0-255	-	-	STANDARD PROTOCOL	STANDARD PROTOCOL
	SMOOTH MICROSTEP MOVEMENT							

DMX Channel	9	10	11	12	13	14	15	16
Function	PRISM	PRISM CONTROL	ROTATING GOBOS	GOBO ROTATION	ZOOM	EFFECTS	STROBE	DIMMER
	STANDARD PROTOCOL	STANDARD PROTOCOL	STANDARD PROTOCOL	STANDARD PROTOCOL	STANDARD PROTOCOL	STANDARD PROTOCOL	STANDARD PROTOCOL	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.

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 MH-680 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 "En.Sn.") 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.

FAn

The message informs you that the fixture was overheating and switched off. This message will appear on the display if the fan speed operating "LOOF" was selected.

nbEr

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

C 1Er

(Color-wheel 1 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 color-wheel is not located in the default position after the reset.

C2Er

(Color-wheel 2 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 color-wheel is not located in the default position after the reset.

rGEr

(Rotating gobo-wheel 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 rotating gobo-wheel is not located in the default position after the reset.

EFEr

(Effect-wheel 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 rotating gobo-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 HEAt message meaning the lamp is too hot (explanation see above).

SnEr

This message appears if the lamp lighting sensor is failed. Please contact your dealer.

PoEr

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

PAEr

(PAN-yoke movement error) This message will appear after the reset of the fixture if the yoke's magnetic-indexing circuit malfunction (sensor 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.

ti Er

(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

This message will appear if the frequency of the mains is not standard 50 or 60 Hz.

Technical specifications

Power supply

EU-model: 208/230/240 V AC, 50/60 Hz ~
Fuse: T 3.15 A, 250 V
US-model: 100/115/208/230 V AC, 50/60 Hz ~
Fuse: T 6.3 A, 115 V
Power consumption: 450 W

Lamp

MSD/HSD 200 GY-9.5, MSD/HSD 250 GY-9.5 or MSD 250/2 GY-9.5

Optical System

-High luminous-efficiency parabolic mirror and double condenser system
-Multi-Step Zoom (15°, 18°, 21°, 24° und 26°)
-All lenses are anti-reflection coated

Colours

Colour - wheel :
- 7 dichroic-filters plus white,colour-wheel with variable rotation speed in both directions

Colour/static gobo - wheel:
- 3 dichroic-filters plus white

Gobos

Colour/static gobo - wheel
- 3 dichroic gobos plus an open position
- Outside diameter 37.3 mm, image diameter 31.5 mm.

Rotating gobos

- 4 metal gobos and 1 glass gobo rotating in both dirrections at different speeds
- Gobo indexing
- Rotating gobo-wheel cont. rotation
- Outside diameter 37.3 mm, image diameter 31.5 mm.

Strobe

- Strobe effect with variable speed (1 - 10 flashes per second)

Dimmer

- Smooth dimmer from 0 - 100 %

Prism

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

Focus

- Motorized focus from near to far

Effects

- 12 prism-gobo macros
- Preprogrammed pulse effects

Motor

- 9 high-quality stepper-motors controlled by microprocessors

Electronics

- Digital serial input DMX-512
- 16 control-channels (full 16 bit protocol):

Channel 1: Horizontal mirror-movement 8 bit
Channel 2: Vertical mirror-movement 8 bit
Channel 3: Fine Horizontal mirror-movement 16 bit
Channel 4: Fine Vertical mirror-movement 16 bit
Channel 5: Pan/Tilt speed
Channel 6: Fan speed, On/Off lamp, reset
Channel 7: Colours 1
Channel 8: Colours 2/stat.gobos
Channel 9: Prism-wheel
Channel 10: Prism-rotation
Channel 11: Rotating gobos
Channel 12: Gobo rotation, gobo indexing
Channel 13: Effects
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 2.7 s
Maximum TILT-movement 280° in 1.7 s

Rigging

Stands directly on the floor
Mounts horizontally or vertically with 2 clamps
2 truss orientation
Cam Lock system with adapter plate and 2 Omega holders
Safety chain/cord attachment point

Temperatures

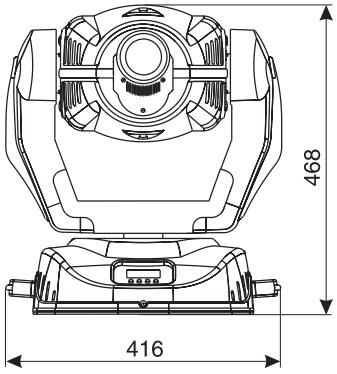
Maximum ambient temperature t_a: 45° C
Maximum housing temperature t_B (steady state): 80° C

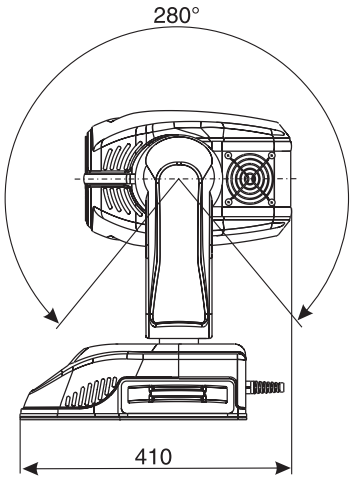
Minimum distances:

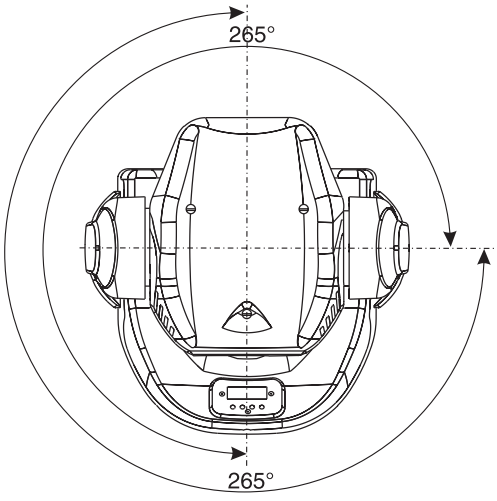
Min.distance from flammable surfaces: 0.5 m
Min.distance to lighted object: 1.3 m

Dimensions and weight

Length of base (including handles): 420 mm
Width of yoke: 410 mm
Height (head horizontal): 492 mm
Weight (net): 23 kg
Shipping weight: 28 kg







Cleaning and maintenance

The operator has to make sure that safety-relating and machine-technical installations are inspected by an expert after every four years in the course of an acceptance test.

The operator has to make sure that safety-relating and machine-technical installations are inspected by a skilled person once a year.

The following points have to be considered during the inspection:
1) All screws used for installing the devices or parts of the device have to be tighly connected and must not be corroded.
2) There must not be any deformations on housings, fixations and installation spots (ceiling, suspension, trussing).
3) Mechanically moved parts like axles, eyes and others must not show any traces of wearing (e.g. material abrading or damages) and must not rotate with unbalances.
4) The electric power supply cables must not show any damages, material fatigue (e.g. porous cables) or sediments. Further instructions depending on the installation spot and usage have to be adhered by a skilled installer and any safety problems have to be removed.

DANGER TO LIFE!
Disconnect from mains before starting maintenance operation!

We recommend a frequent cleaning of the device. Please use a moist, lint-free cloth. Never use alcohol or solvents!

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!

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.

There are no serviceable parts inside the device except for the lamp and the fuse. Maintenance and service operations are only to be carried out by authorized dealers.

Please refer to the instructions under "Installing/Replacing the lamp".

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:

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

Should you need any spare parts, please use genuine parts.

If the power supply cable of this device becomes damaged, it has to be replaced by authorized dealers only in order to avoid hazards.

Should you have further questions, please contact your dealer.

Appendix

We hope you will enjoy your MH-680. We can assure you that you will enjoy this device for years if you follow the instructions given in this manual.

Should you have further questions, do not hesitate to contact your local dealer.