

Futurelight®

LIGHTING SYSTEMS MADE IN EUROPE

BEDIENUNGSANLEITUNG

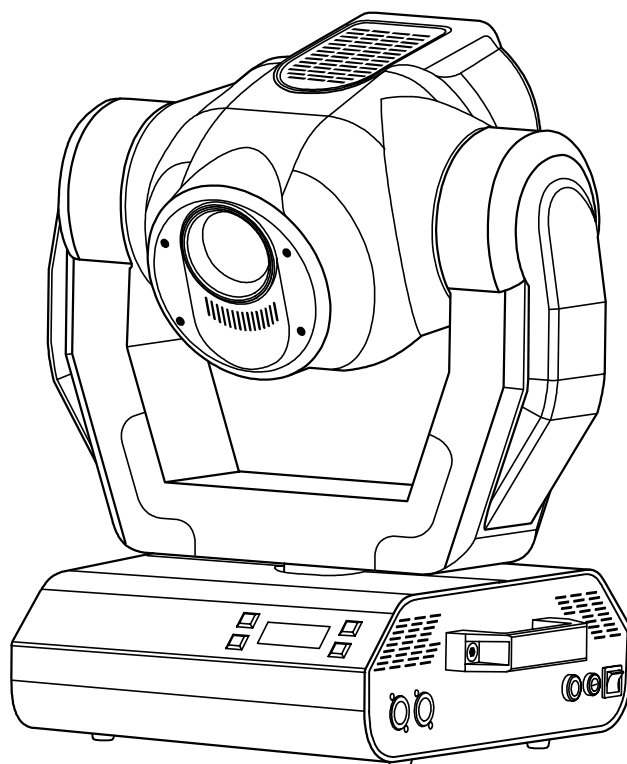
USER MANUAL

MODE D'EMPLOI

MANUAL DEL USUARIO

MH - 660

Spotlight



Version 1.0

Für weiteren Gebrauch aufbewahren!
Keep this manual for future needs!
Gardez ce mode d'emploi pour des
utilisations ultérieures!
Guarde este manual para posteriores
usos.

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Artikelbeschreibung	Best.-Nr.
Article designation	No.
Description d'article	N° d'art.
Descripción del artículo	Referencia
FUTURELIGHT LICHTEFFEKTE FUTURELIGHT LIGHTING EFFECTS FUTURELIGHT EFFETS LUMINEUX FUTURELIGHT EFECTOS LUMINOSOS	
FUTURELIGHT RT-150 lighting-effect	51830500
FUTURELIGHT FX-150 lighting-effect	51830550
FUTURELIGHT CIRCLE lighting-effect	51832030
FUTURELIGHT GOBOFLY lighting-effect	51832040
FUTURELIGHT CROSS BEAM 400 centre-piece	51832050
FUTURELIGHT CROSS BEAM HMI 575 W centre-piece	51832060
FUTURELIGHT SPIDER centre-piece	51832065
FUTURELIGHT MERCURY 400 lighting-effect	51832070
FUTURELIGHT DF-250 lighting-effect	51832085
FUTURELIGHT MIRACLE HMI 575 W lighting-effect	51832090
FUTURELIGHT MIRACLE HMI 1200 W lighting-effect	51832092
FUTURELIGHT CC-150 color-changer	51832100
FUTURELIGHT CC-200 PRO color-changer	51832200
FUTURELIGHT DUKE 1200 scanner	51832270
FUTURELIGHT SC-240 scanner	51832281
FUTURELIGHT SC-370 scanner	51832286
FUTURELIGHT AS-200 Advertising Scan black	51832290
FUTURELIGHT AS-200 Advertising Scan white	51832291
FUTURELIGHT PS/D-200 Promotion Scan black	51832292
FUTURELIGHT PS/D-200 Promotion Scan white	51832293
FUTURELIGHT PS/D-200 Promotion Scan special colour	51832294
FUTURELIGHT SC-330 scanner	51832303
FUTURELIGHT SC-530 scanner	51832305
FUTURELIGHT SC-570 scanner	51832307
FUTURELIGHT SC-740 scanner	51832317
FUTURELIGHT SC-780 scanner	51832320
FUTURELIGHT SC-940 scanner	51832323
FUTURELIGHT SC-980 scanner	51832325
FUTURELIGHT H-150 scanner	51832330
FUTURELIGHT DP-H250 advertising projector	51832340
FUTURELIGHT DP-200 advertising projector	51832342
FUTURELIGHT DV-200 advertising projector	51832344
FUTURELIGHT DOMINATOR MKII centre-piece	51832603
FUTURELIGHT MH-640 Moving-Head Washlight	51833000
FUTURELIGHT MH-660 Moving-Head Spot	51833020
FUTURELIGHT CONTROLLER FUTURELIGHT CONTROLLERS FUTURELIGHT CONTROLEURS FUTURELIGHT CONTROLADORES	
FUTURELIGHT HC-controller	51834020
FUTURELIGHT C-16 controller	51834050
FUTURELIGHT Universal DMX-controller	51834090
FUTURELIGHT CP-16 SC-3 controller	51834152
FUTURELIGHT CP-16 H-150 controller	51834160
FUTURELIGHT C-32 H-150 controller	51834166
FUTURELIGHT CP-32 controller	51834168
FUTURELIGHT CP-64 SC-5 controller	51834190
FUTURELIGHT C-64 MKII controller	51834202
FUTURELIGHT C-128 controller	51834250
FUTURELIGHT CP-192 controller	51834260

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User manual

MH-660 Spotlight

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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

1.1 Safety instructions

Every person involved with the installation, operation 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 230 V 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.

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-handed 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) !



1.2 Operating determinations

This fixture is only allowed to be operated with an alternating current of 230 V/50 Hz.

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!

This device was only designed for indoor and professional use.

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

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

You can install the device at any desired place in dry rooms. 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.

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!

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.

2. Introduction

Thank you for having chosen a FUTURELIGHT MH-660. You acquired a versatile, powerful and intelligent lighting-effect.

Unpack your FUTURELIGHT MH-660 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.

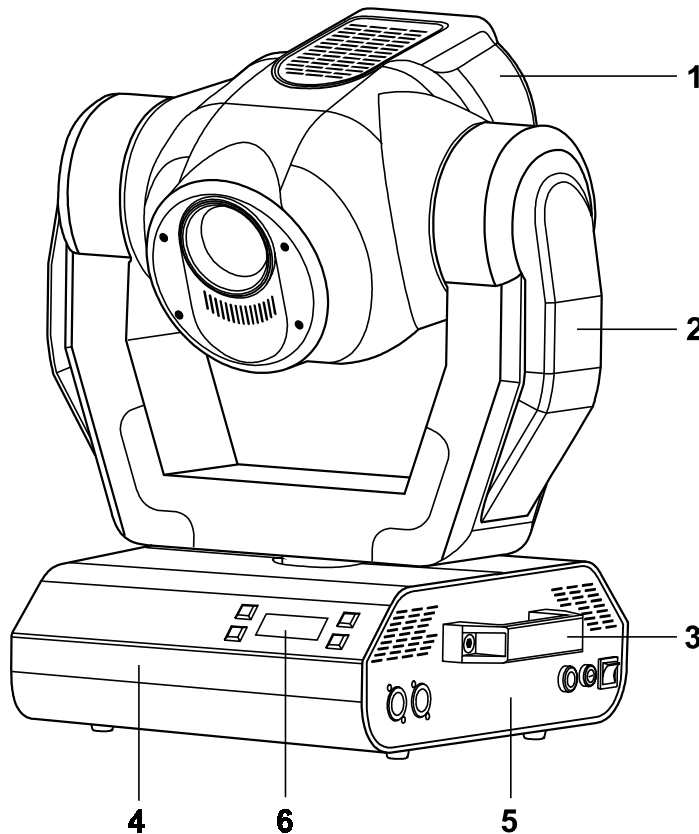
2.1 Features

Moving-head spot

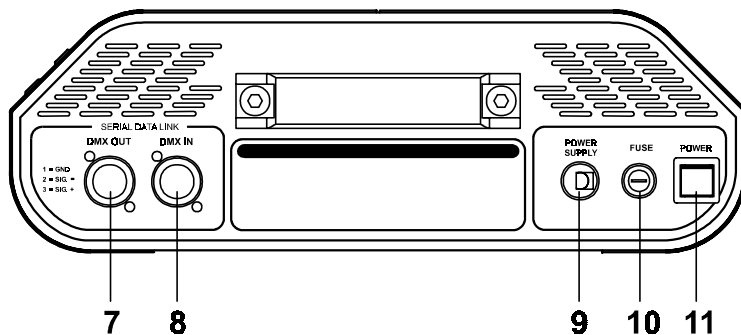
Rotating gobo-wheel with 6 interchangeable and indexable rotating gobos plus open. Rotating gobos: 4 metal gobos, 1 multicolor dichroic gobo, 1 glass gobo. Rotating gobo-wheel continuous rotation • The rotating gobos can be turned by 360°, the adjusted position is memorized • 3 additional metal-gobos and 2 glass-gobos are included • Colour-wheel with 11 dichroic filters plus open. Colour-wheel continuous rotation (rainbow effect) in both directions • Via the combination between dichro-gobos and color-wheel or multicolor-dichro-gobo even more colour-combinations possible • Rainbow-effect in both directions • 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 • 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 test sequence • 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 • 15° standard objective (12° and 18° optional) • All lenses are anti-reflection coated • 10 high-quality stepper-motors for smooth movements • Self-resettable thermo-fuse • For MSD/HSD 230 V/250 W GY-9.5 or MSD/HSD 230 V/250 W GY-9.5 lamp • DMX-control via every standard DMX-controller • Suitable FUTURELIGHT controllers: C-128 controller, CP-192 controller

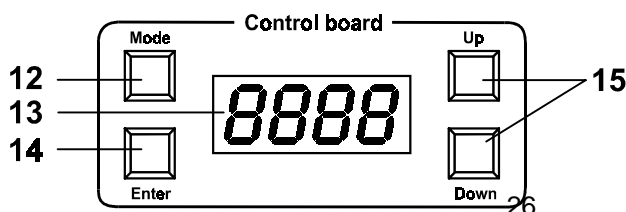
2.2 Description of the fixture



- 1 - Moving Head
- 2 - Moving arms
- 3 - Carrying handles
- 4 - Base
- 5 - Base - side panel
- 6 - Control Board



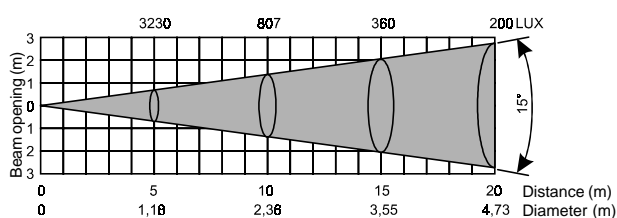
- Base - side panel:**
- 7 - DMX-output
 - 8 - DMX-input
 - 9 - Powercord
 - 10 - Fuseholder
 - 11 - Power-switch



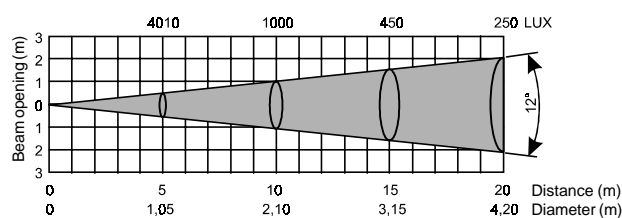
- Control Board:**
- 12 - Mode-button
 - 13 - Display
 - 14 - Enter-button
 - 15 - Up/Down-buttons

2.3 Beampath

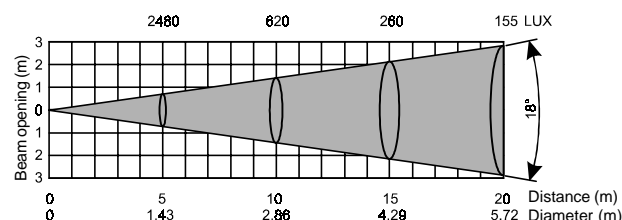
Standard 15° objective



Optional narrow 12° objective



Optional wide 18° objective



3. Installation

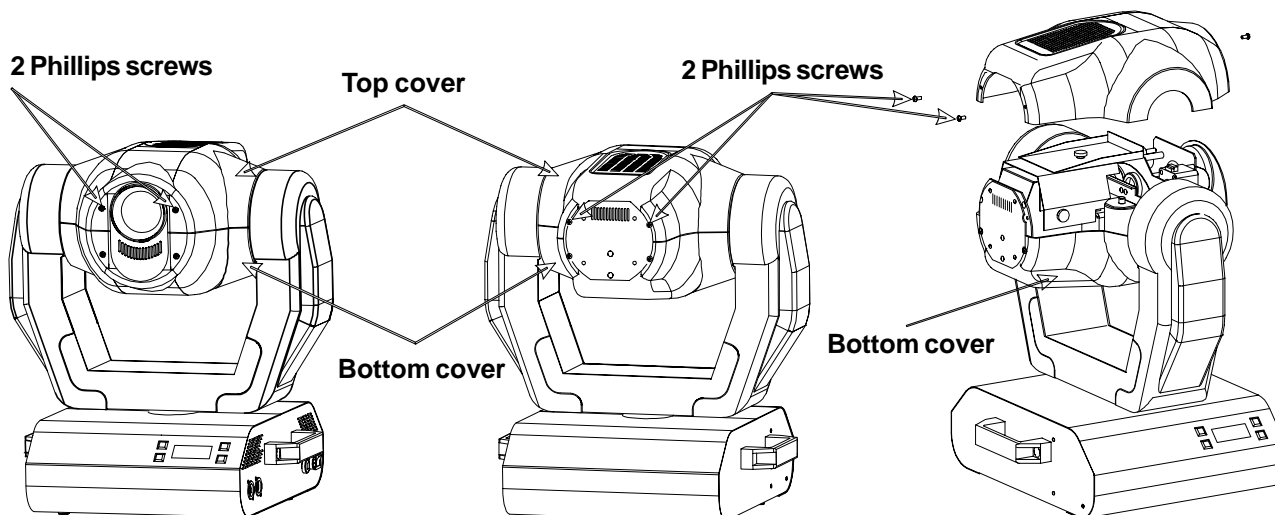
3.1 Fitting the lamp



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 the 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-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 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 the fixture with opened housing-cover!

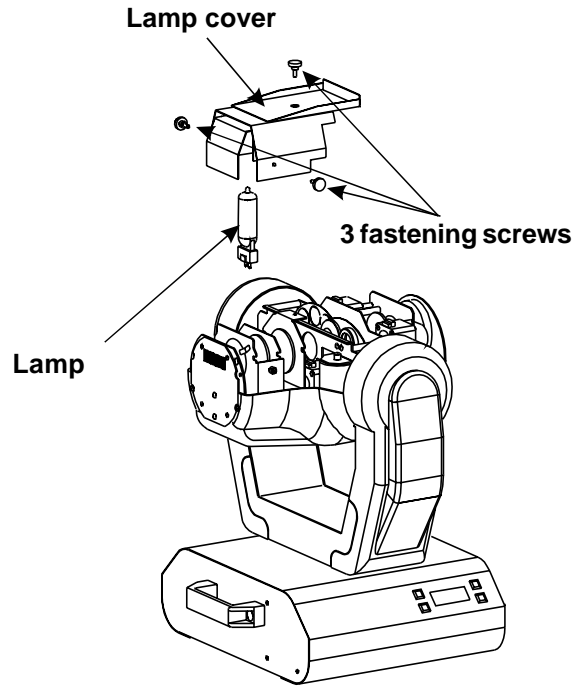
Lamp adjustment

The MH - 660 lampholder is aligned at the factory. Due to differences between lamps, fine adjustment may improve light performance.

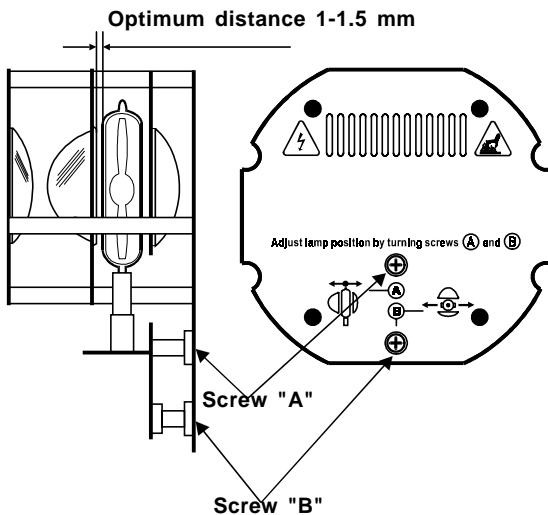
Strike the lamp and focus the light on a flat surface (wall). As the optimum distance of lamp from lens was adjusted during the installing or changing the lamp (by turning the screw "A"), it is necessary to adjust only the second position by turning the screw "B", in order to center the hot-spot (the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

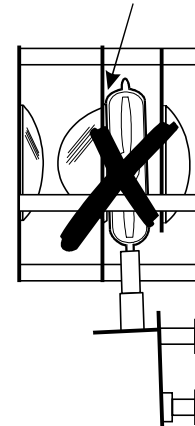


CORRECT



INCORRECT

Keep optimum distance to lens



3.2 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.

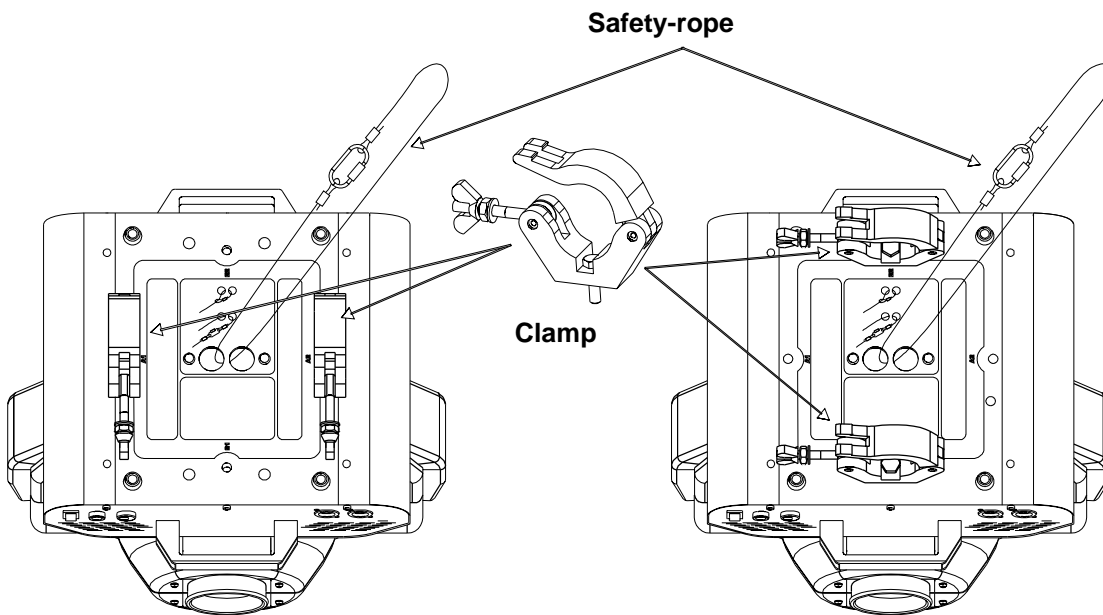
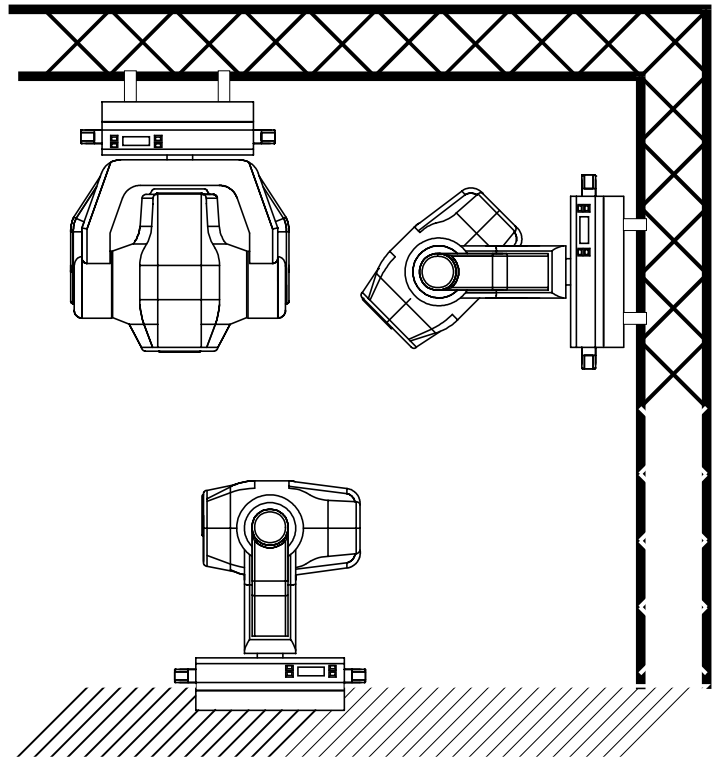
Warning !

Use 2 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 MH - 660 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-rope that can hold at least 10 times the weight of the fixture. Never use the carrying handles for secondary attachment.



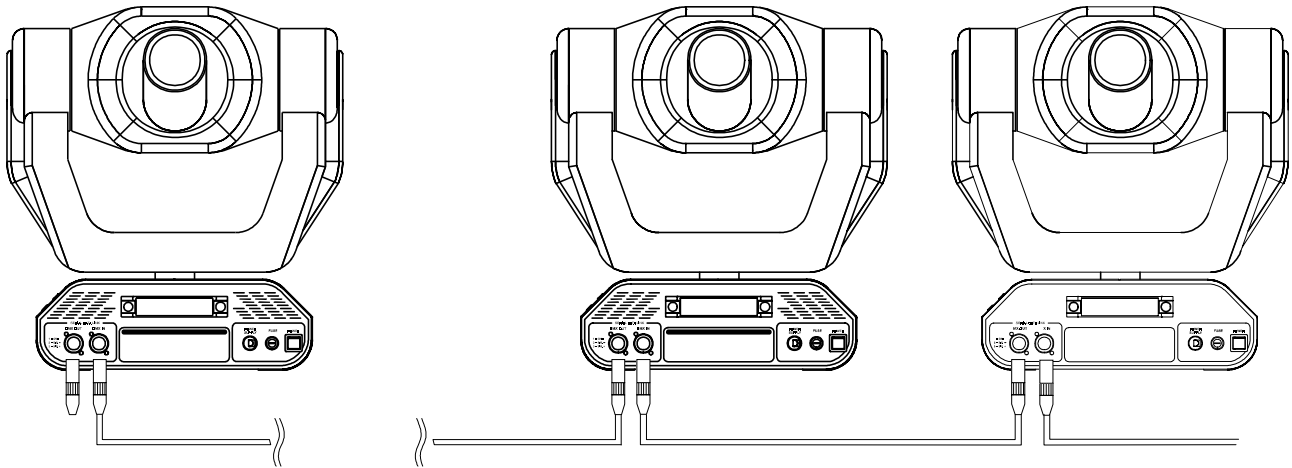
3.3 Connection to the mains

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

The occupation of the connection-cables is as follows:

Connections		Possible designations		
Cable	Pin	International	US	UK
Brown	Live	L	Yellow or brass	Red
Blue	Neutral	N	Silver	Black
Yell./Green	Earth		Green	Green

3.4 DMX-512 connection / connection between fixtures



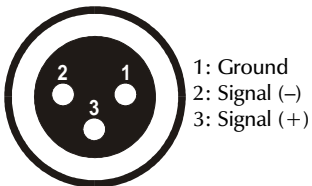
The wires must not come into contact with each other, otherwise the fixtures will not work at all, or will not work properly.

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

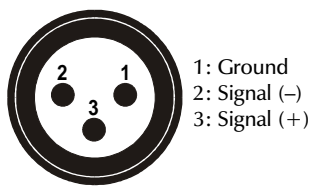
XLR mounting-socket:



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

DMX-input

XLR mounting-plug:



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

The XLR-connection of the FUTURELIGHT-devices complies with the DMX-standard. 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.

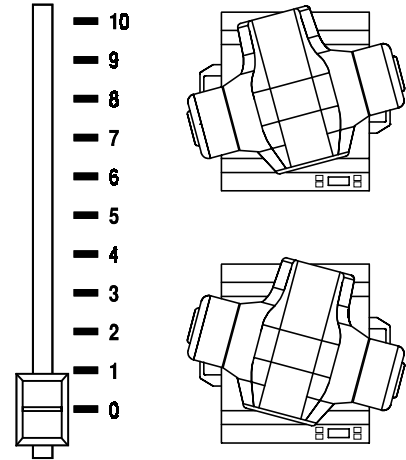
Caution: At the last fixture, the DMX-cable has to be terminated with a terminator. Solder a 120 Ω resistor between Signal (-) and Signal (+) into a 3-pin XLR-plug and plug it in the DMX-output of the last fixture.

4. DMX-Protocol

4.1 Function of the control channels - 16 bit protocol

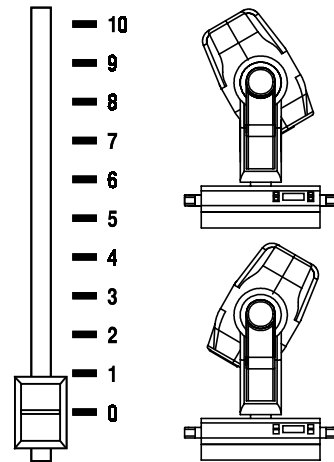
4.1.1 Channel 1 - Horizontal movement (Pan)

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.



4.1.2 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.



4.1.3 Channel 3 - Pan fine 16 bit

4.1.4 Channel 4 - Tilt fine 16 bit

4.1.5 Channel 5 - Speed of PAN / TILT movement

0	Max speed
249	Min. speed
250-255	Max. speed, blackout while PAN, TILT moving or color, rot. gobo or prism changes

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

0	Open, max. speed of fan
127	Open, min. speed of fan (silent operation) from 0 to 127 - decreasing speed of fan
128 - 139	Switch on the lamp, reset, open position
140 - 239	No function
230 - 239	Switch off the lamp after 3 seconds
240 - 255	No function

4.1.7 Channel 7 - Colours

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 190 and between 193 and 255, the colour-wheel rotates continuously the so-called "Rainbow" effect.

0	Open / white
10	Turquoise
21	Red
32	Cyan
42	Green
53	Magenta
64	Light Blue
74	Yellow
85	Green
96	Pink
106	Blue
117	Orange
128 - 190	Forwards rainbow effect from fast to slow
191 - 192	No rotation
193 - 255	Backwards rainbow effect from slow to fast

4.1.8 Channel 8 - No function

4.1.9 Channel 9 - Prism-wheel

0 - 95	Open position (hole)
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

4.1.10 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

4.1.11 Channel 11 - Rotating gobos, cont. rotation

0 - 31	Open
32 - 63	Rot. gobo 1 (multicolor dichroic)
64 - 95	Rot. gobo 2 (glass)
96 - 127	Rot. gobo 3 (metal)
128 - 159	Rot. gobo 4 (metal)
160 - 191	Rot. gobo 5 (metal)
192 - 223	Rot. gobo 6 (metal)
224 - 255	Rot. gobo wheel cont. rotation slow to fast

4.1.12 Channel 12 - Rotating gobo index, rotating gobo rotation

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

4.1.13 Channel 13 - No function

4.1.14 Channel 14 - Focus

0 - 255	Continuous adjustment from far to near
---------	--

4.1.15 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)

4.1.16 Channel 16 - Dimmer intensity

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

4.2 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	TLT	PAN/TILT SPEED	FAN ON/OFF LAMP	COLOURS	-	PRISM	PRISM ROTATION	ROTATING GOBOS	GOBO ROTATION	-	FOCUS	STROBO	DIMMER

5. Addressing

The Control Board on the top side of the MH-660 allows you to assign the DMX fixture address, which is defined as the first channel from which the MH-660 will respond to the controller.

If you set, for example, the address to channel 5, the MH-660 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-660 correctly and independently from any other fixture on the DMX data link.

If two, three or more MH-660 are addressed similarly, they will work similarly.

For address setting follow this procedure:

1. Switch on the MH-660 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 MH-660, you may now start operating these via your lighting controller.

Note:

After switching on, the MH-660 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 MH-660
- 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.

6. Remotely controllable functions

6.1 Lamp

The MH-660 is to be operated with a MSD 250 W/200 W lamp.

A relay inside of the MH-660 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.

6.2 Switching on and off the lamp via the Control Board

1. Switch on the MH-660 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 switching 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 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-660 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-660. 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.

6.3 Colour-wheel

The MH-660 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.

6.4 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.

6.5 3-facet rotating prism

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

6.6 Focus

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

6.7 Dimmer / Shutter / Strobe

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

6.8 Fan

The MH - 660 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 3 types of low fan speed operating :

1. "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.

2. "Lo.HI"- 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 MH - 660 automatically switches from low to high the fan speed.

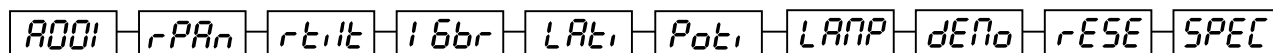
3. "Lo.OF" - low speed / Switch off the lamp

The fan keeps the adjusted low speed until the temperature exceeds max. inside temp. then the MH - 660 automatically switches off the lamp.

7. Control Board

The Control Board situated on the top side of the MH-660 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 demonstration sequences, 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 - 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 provided are described in the following sections and the function hierarchy is shown below.



7.1 Main functions

A001 - DMX 512 Address settings

The letter "**A**" flashes. Use the [Up] and [down] keys to select required address (001 - 496) and press [Enter] to confirm or [Mode] to cancel and return to the main menu.

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.

LAti - 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.

Poti - Power On time

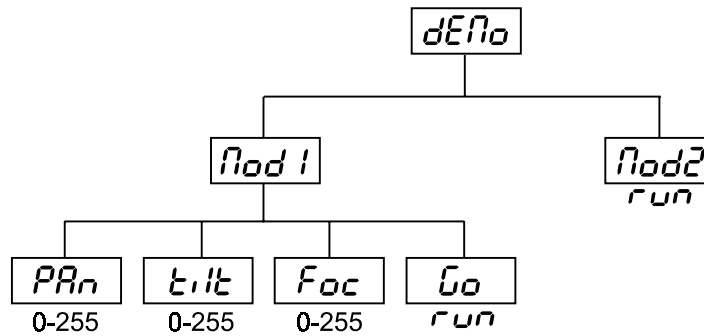
By this option you can read the total number of hours that the MH-660 has been powered on. Press [**Enter**] or [**Mode**] to return to the main menu.

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.

dEMo - 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 MH - 660. 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 - 660 functions and therefore is good for a complete introduction of the fixture.

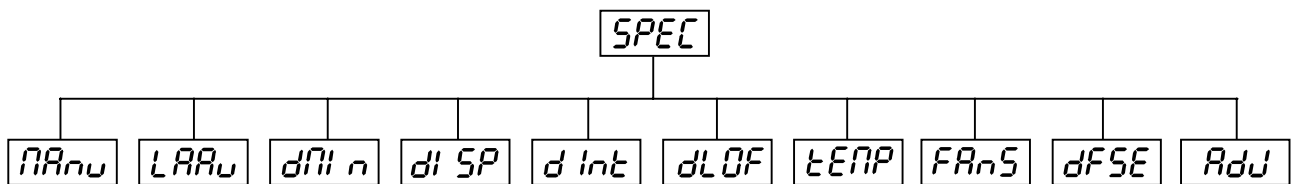


rESE -Reset Function

Press [Enter] key to run reset. This option enables the MH-660 to index all effects (functions) and return to their standard positions.

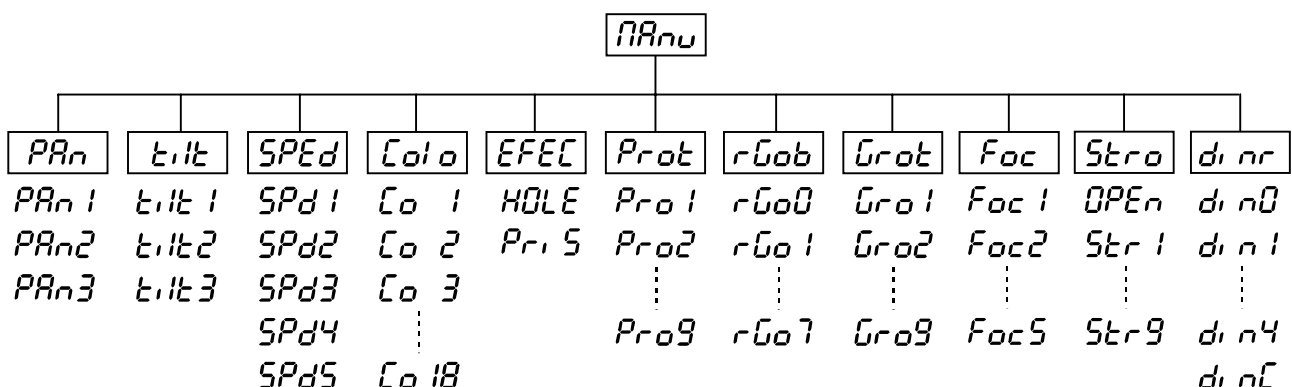
7.2 SPEC -Special functions

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.

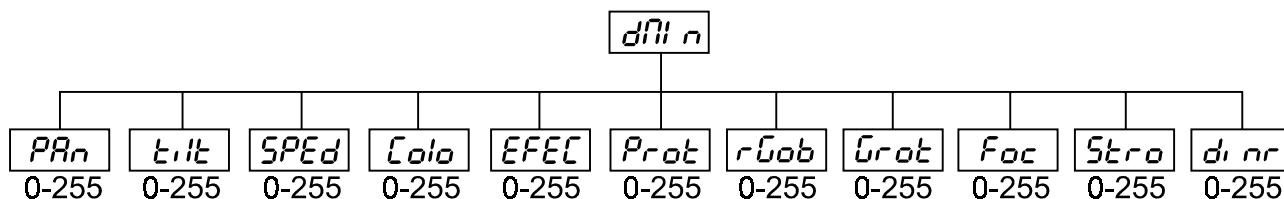


LAAU - Lamp On automatically

This function enables to switch on the lamp automatically after switching on the fixture. Use the [Up] and [Down] keys to select „On” if you wish to switch on the lamp automatically after switching on the fixture 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.

dMIn - 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.



dISP - Automatic blackout of Display

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.

dInt - 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.

dLOf - Lamp off via DMX

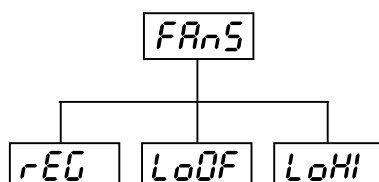
This function allows you to switch off the lamp by DMX. Use the **[Up]** and **[Down]** keys to select "On" if you want to switch off the lamp by DMX or "Off" if you don't want to switch off the lamp by DMX and press **[Enter]** to confirm or **[Mode]** to cancel and return to the menu.

tEMP - Temperature

Inside temperature readouts of the fixture 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.

FAnS - Low fan speed operating

By using this function you can choose 3 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: "reG", "Lo.HI", "Lo.OF". Press **[Enter]** if you wish to select one of them or **[Mode]** to cancel and return to the menu.



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 a suitable level.

Lo.OF - low speed / switch off the lamp operating

The fan keeps the adjusted low speed until the temperature exceeds max. inside temp. then the MH-660 automatically switches off the lamp.

Lo.HI - 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 MH-660 automatically switches from low to high fan-speed.

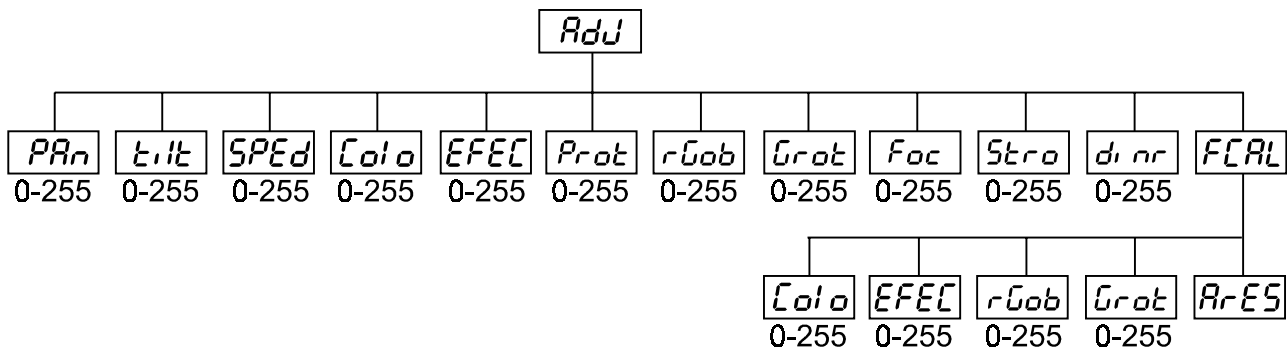
dfSE - Default settings

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 values (SHADED)
Pan reverse	rPAn	On
		OFF
Tilt reverse	rtilt	On
		OFF
Movement resolution	16br	On
		OFF
Lamp on automatically	LAAu	On
		OFF
Automatic black-out of display	diSP	On
		OFF
Display intensity	dInt	20 40 60 80 100
Lamp off via DMX	dLOF	On
		OFF
Low fan speed operating	FArS	rEG
		LoDF
		LoHI

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, 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 (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: "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 Channel	1	2	3	4	5	6	7	8
Function	COL.	-	EFEC.	RGOB	GROT	-	COLOURS	-
	CALIBRATION 0 - 255	-	CALIBRATION 0 - 255	CALIBRATION 0 - 255	CALIBRATION 0 - 255	-	STANDARD PROTOCOL	-
SMOOTH MICROSTEP MOVEMENT								

9	10	11	12	13	14	15	16
EFFECT (PRISM)	PRISM ROTATION	ROTATING GOBOS	GOBO ROTATION	-	FOCUS	STROBO	DIMMER
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.

8. 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-660 will store this information and automatically ignite the lamp when the 5 minutes period has expired.

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.

MbEr

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

CoEr

(color-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 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.

IGEr

(rotating gobo indexing error) This 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.

EFEr

(prism-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 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 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.

FrEr

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

9. Technical Specifications

Power supply:

EU-model: 210/230/250 V, 50/60 Hz

US-model: 100/120/210/230/250 V, 50/60 Hz

Power consumption: 400 W

Fuse: T3.15 A

Lamp:

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

Colours

- 11 interchangeable dichroic-filters plus white

- Colour-wheel with variable rotation speed

Rotating gobos

- 4 metal gobos, 1 glass gobos and 1 dichroic gobo rotating in both directions at different speeds

- Gobo indexing

- Rotating gobo-wheel cont. rotation

- Outside diameter 27 mm, image diameter 23 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

Motor

- 10 high quality stepping-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

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

Rigging

Stands directly on the floor

Mounts horizontally or vertically with 2 clamps

2 truss orientation

Safety chain/cord attachment point

Dimensions and weight:

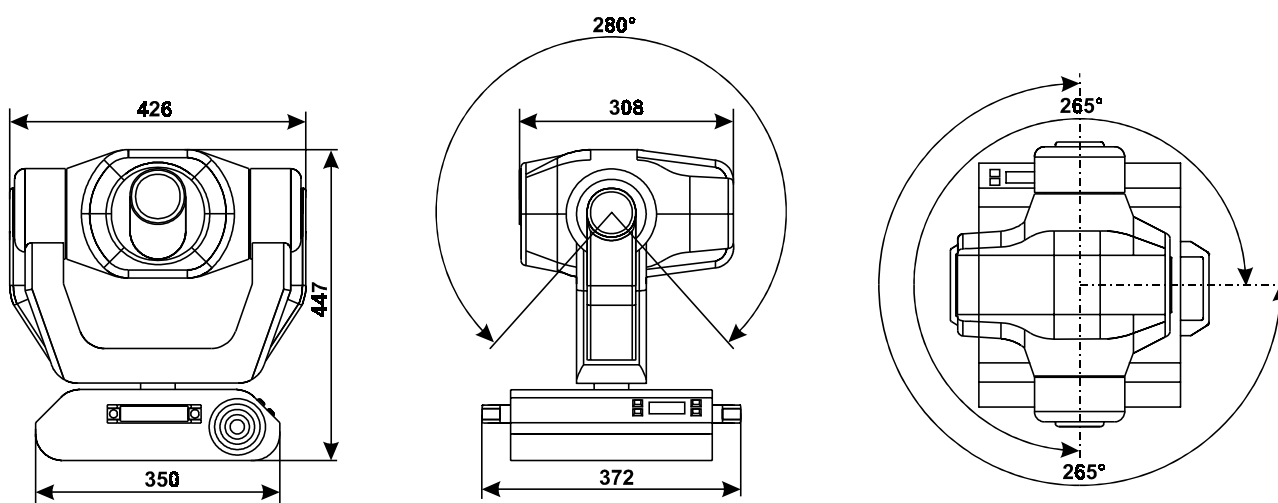
Length of base (including handles): 372 mm

Width of yoke: 426 mm

Height (head horizontal): 447 mm

Weight (net): 16 kg

Shipping weight: 25 kg



10. 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.

11. Appendix

We hope you will enjoy your MH-660. 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.

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! 4/99 ©

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