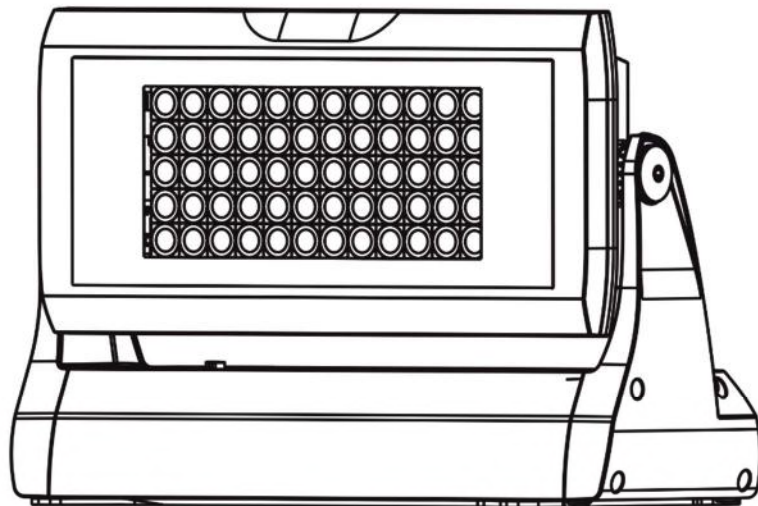




Divine 60 UV



USER MANUAL

Version 1.5 (touring ver.)

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**FOR YOUR OWN SAFETY, PLEASE READ THIS USER MANUAL CAREFULLY
BEFORE POWERING OR INSTALLING YOUR Divine 60 UV!
Save it for future reference.**

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

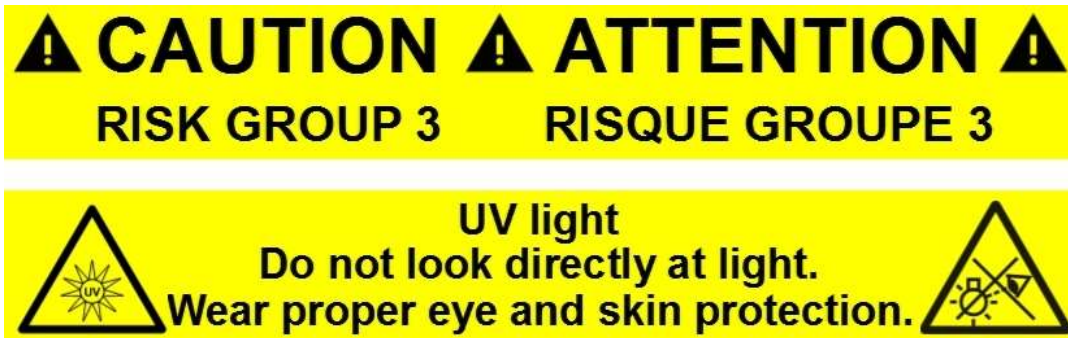
The manufacturer will not accept liability for any resulting damages caused by the non-observance of this manual or any unauthorized modification to the device.

Unauthorized modification will void warranty.

1. Safety instructions

THIS LUMINAIRE IS DESIGNED WITH UV LEDS AND MUST BE INSTALLED IN COMPLIANCE WITH COMPETENT TECHNICAL DIRECTIONS TO PREVENT THE USER'S EYE AND BARE SKIN FROM EXPOSURE TO HARMFUL UV RADIATION.

CE LUMINAIRE EST CONÇU POUR ÊTRE UTILISÉ AVEC DES LED UV ET DOIT ÊTRE INSTALLÉ EN STRICTE CONFORMITÉ AVEC LES INSTRUCTIONS AFIN D'ÉVITER QUE LES YEUX OU LA PEAU L'UTILISATEUR NE SOIENT EXPOSÉS AUX EFFETS NÉFASTES DES RAYONS UV.



CAUTION: Radiation exposure may cause blindness and cancer of skin!

Maximum exposure (beam angle 38°)		
Distance from UV source	Fixture with clear glass	Fixture with black glass
3.5m (11.4ft)	-	18 minutes
4m (13)	-	23 minutes
5m (16.4ft)	24 minutes	37 minutes
6m (19.7ft)	35 minutes	53 minutes
7m (23ft)	48 minutes	73 minutes
8m (26ft)	63 minutes	95 minutes
9m (29.5ft)	80 minutes	120 minutes
10m (32.8ft)	98 minutes	149 minutes

Please read an extract from a test report at the end of the user manual.

Risk Group 3 LED product according to ČSN EN 62471.

**Make sure that materials which are exposed to UV radiation will not be damaged!
Do not look at the fixture's LEDs during operation. The light beam may damage your eyes.**

Make sure that the available voltage is not higher than stated on the rear side of the fixture.
This fixture should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supplied, consult your authorized distributor or local power company.

Always disconnect the fixture from AC power before servicing or cleaning internally.

Do not overload supply line as this can result in fire or electric shock.

Make sure the power/data cable is never crimped or damaged by sharp edges. Check the fixture and the power/data cable from time to time.

Do not install the unit near an open flame.

Refer servicing to qualified service personnel.

This fixture falls under protection class I. Therefore, this fixture has to be connected to a mains socket outlet with a protective earthing connection.

Do not connect this fixture to a dimmer pack.

Keep combustible materials at least 0.3 m away from the fixture.

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

Avoid brute force when installing or operating the fixture.

When choosing the installation spot, please make sure that the fixture is not exposed to extreme heat or dust.

Avoid using the unit in locations subject to possible impacts.

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

Do not block the front glass cover with any object when the fixture is under operation.

The fixture body must never be covered with cloth or other materials.

The fixture becomes very hot during operation. Allow the fixture to cool approximately 30 minutes prior to servicing or maintenance.

Operate the fixture only after having familiarized yourself with its functions. Do not permit operation by persons not qualified to operate the fixture. Most damages are the result of unprofessional operation!

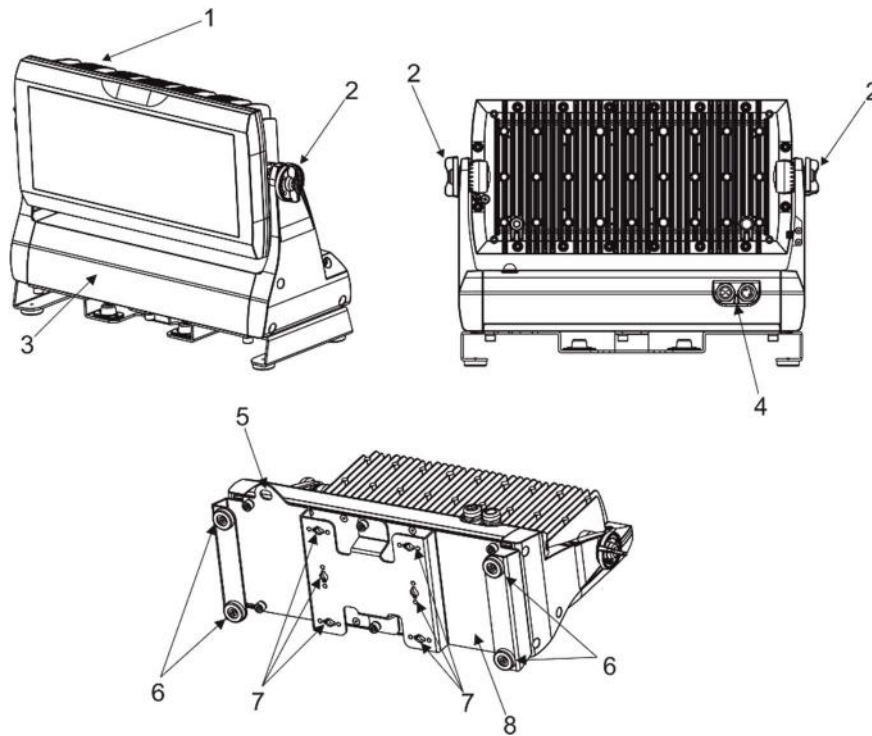
Please consider that unauthorized modifications on the fixture are forbidden due to safety reasons!

Divine 60 UV

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

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

2. Fixture exterior view



1. Head with LED array
2. Tilt lock
3. Base
4. Power and DMX connection
5. Attachment point for safety wire
6. Rubber feet
7. Openings for mounting brackets Omega CL assemble
8. Universal base adaptor for Strobe IP

3. Installation

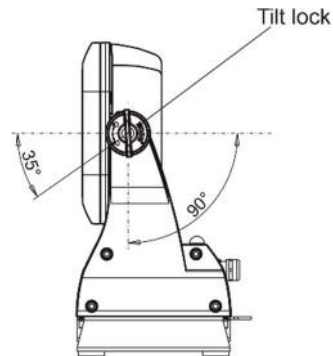
3.1 Connection to the mains

***Fixtures must be installed by a qualified worker in accordance with all national and local electrical and construction codes and regulations.
This device falls under class one and must be grounded!***

The Divine 60 UV is equipped with auto-switching power supply that automatically adjusts to any 50-60Hz AC power source from 100-240V (CE) or 100-277 V (US). The fixture must be connected to a non-dimmable power source in order to avoid damage to its internal power supply and other electrical components. Connect the fixture to the mains by means of inbuilt power cord with the plug.

3.2 Mounting the fixture

The Divine 60 UV can be arranged in any position/orientation without altering its operation characteristics. The LED module can be tilted to desired position by means of the tilt lock.



The Universal base adaptor of the fixture (8) is equipped with two pairs of rubber feet (6) for standing the fixture on the floor and three pairs of openings (7) for installation of the mounting brackets Omega CL (9) which allow to rig the fixture to the truss.

For overhead installation, the fixture must be always secured with a safety wire.

A structure (truss) intended for installation of the fixture (s) must safely hold weight of the fixture(s) placed on it. The structure has to be certificated to the purpose.

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.

IMPORTANT! Overhead installation requires extensive experience including calculating working load limits, installation material being used, and periodic safety inspection of all installation material and fixtures. Fixtures may cause severe injuries when crashing down! If you have doubts concerning the safety of a possible installation, do not install the fixtures and consult installation with an expert.

CAUTION!
Use 2 mounting brackets Omega CL and appropriate clamps to rig the fixture on the truss.
Make sure that the device is fixed properly!
Ensure that the structure (truss) to which you are attaching the fixtures is secure.

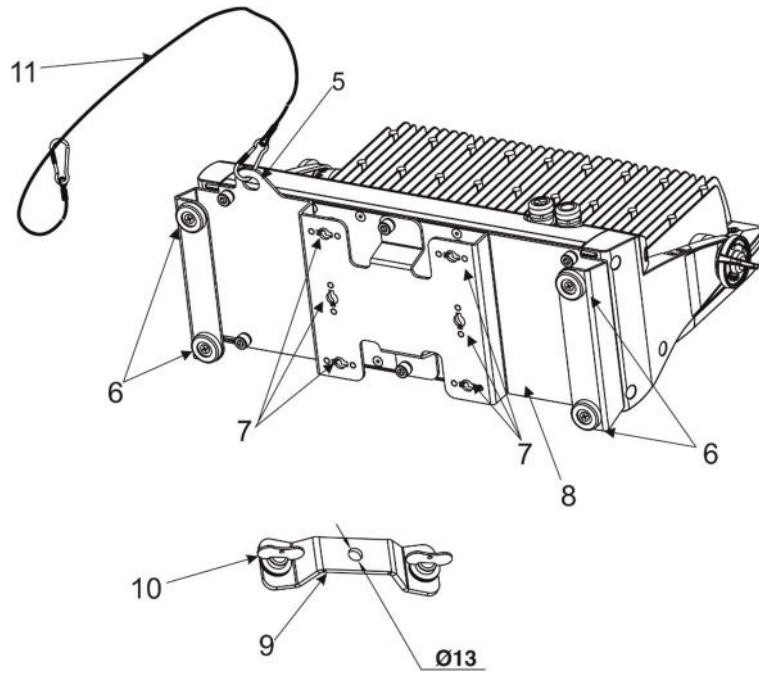
The fixture must never be fixed swinging freely in the room.

For securing the fixture to the truss, install a safety wire which can hold at least 10 times the weight of the fixture. Use only the safety wire with a snap hook with screw lock gate.

Truss installation

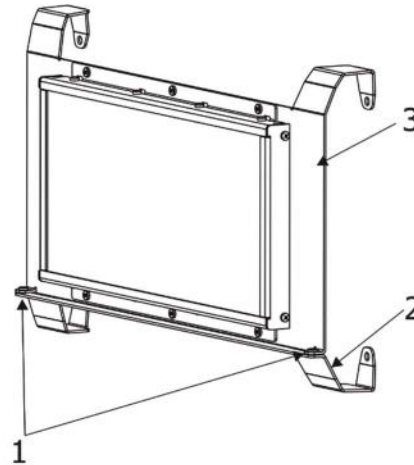
1. Bolt clamp to the bracket Omega CL (9) with M12 bolts and lock nuts through the hole in the bracket Omega CL.
2. Fasten the two brackets Omega CL on the universal base adaptor (8) by means of the quick-lock fasteners (10) and tighten them fully clockwise.
3. Fasten the safety cable (11) in the attachment point (5) and around the truss.

Divine 60 UV

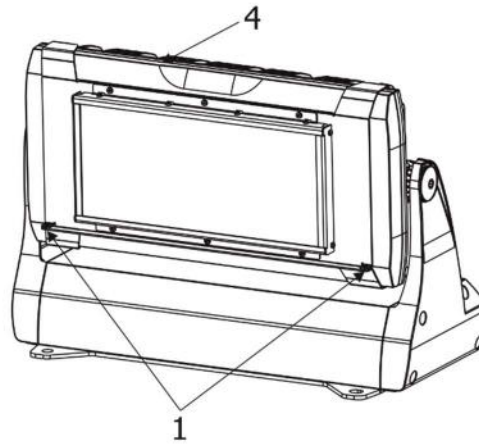


3.3 Adapter black glass installation

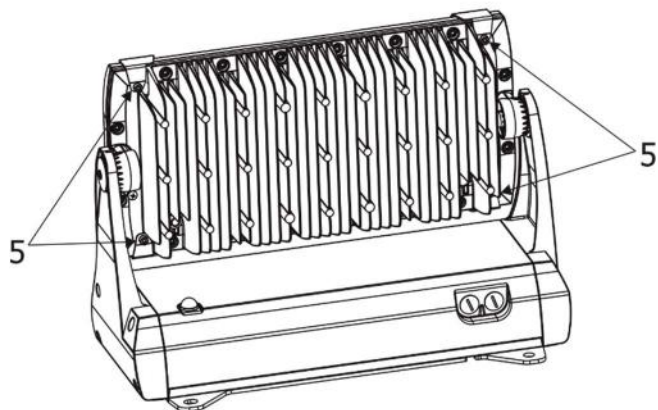
1. Unscrew two screws M3x5 (1) to separate the bottom part (2) from the upper part (3) of the adapter.



2. Place both parts of the adapter on the head (4) and screw both parts of the adapter together by means of two screws M3x5 (1).



3. Fasten the adapter to the head by means of the four screws M5x10 (5) and four spring washers.



3.4 DMX 512 connection

The fixture is equipped with 5-pin XLR connectors for DMX input/output. Only use a shielded twisted-pair cable designed for RS-485 and 5-pin XLR connectors in order to connect the controller with the fixture or one fixture with another.

Wiring of the XLR connectors:

XLR socket:



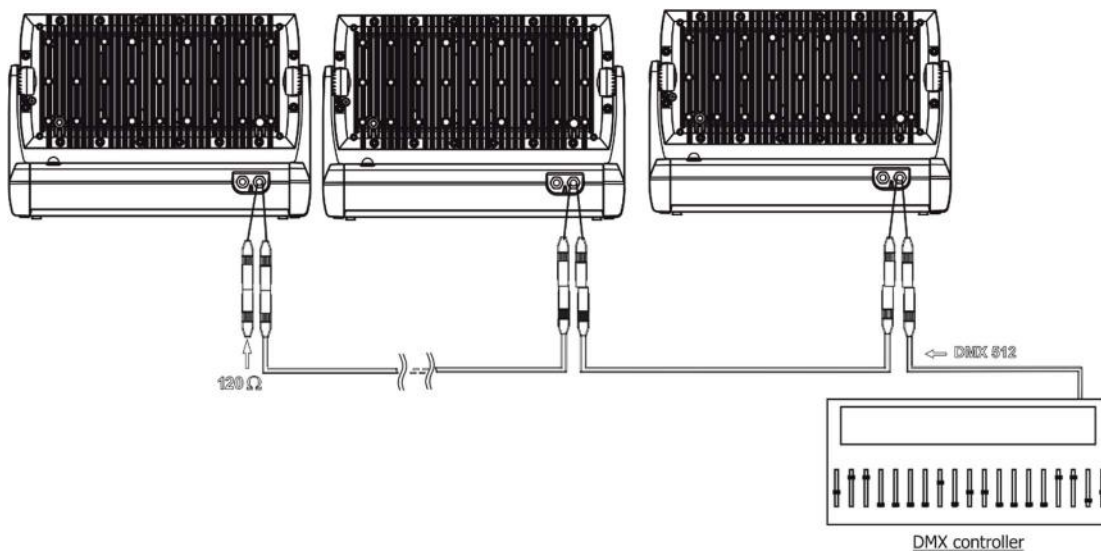
XLR plug:



- | | |
|---|-----------------|
| 1 | – Shield |
| 2 | - Signal (-) |
| 3 | - Signal (+) |
| 4 | – Not connected |
| 5 | – Not connected |

To build a DMX chain

1. Connect the DMX output of the controller directly with the DMX input of the first fixture in the DMX chain.
2. Connect the DMX output of the first fixture in the DMX chain with the DMX input of the next fixture.
3. Always connect the DMX output with the input of the next fixture until all fixtures are connected.
Do not overload the link. Max. 32 fixtures may be connected on a DMX link.



Caution: Terminate the link by installing a termination plug in the output of the last fixture. The termination plug is a male 5-pin XLR plug with a 120 Ohm resistor soldered between Signal (-) and Signal (+).

Warning:

Fixture's XLR connectors are dust and water protected according to IP 67 by mating with related XLR cable connectors.

They cannot stay disconnected outdoor. DMX output connector (XLR female) at the last fixture in a DMX line has to be covered with the rubber cap before inserting a terminator. The rubber cap does not supply the terminator.

The XLR terminator (male) has to be dust and water protected.

If the fixture is to be outdoor without connecting to DMX line, always interconnect its DMX input with DMX output to keep declared IP rating of XLR connectors.

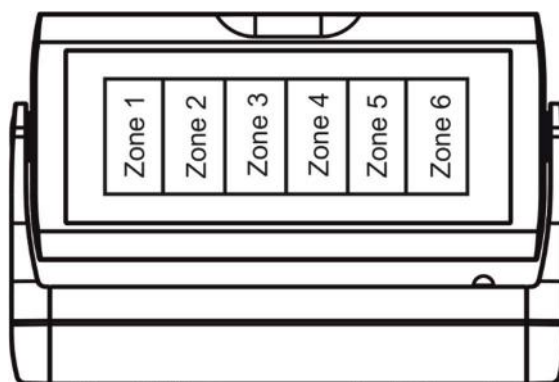
4. Divine 60 UV - DMX protocol

Version 1.1

Mode 1	Mode 2*	Mode 3	DMX Value	Function	Type of control
-	-	1	0 - 255	Zone 1 Intensity Intensity from 0% to 100%	proportional
-	-	2	0 - 255	Zone 2 Intensity Intensity from 0% to 100%	proportional
-	-	3	0 - 255	Zone 3 Intensity Intensity from 0% to 100%	proportional
-	-	4	0 - 255	Zone 4 Intensity Intensity from 0% to 100%	proportional
-	-	5	0 - 255	Zone 5 Intensity Intensity from 0% to 100%	proportional
-	-	6	0 - 255	Zone 6 Intensity Intensity from 0% to 100%	proportional
-	1	7	0-31 32-63 64-95 96-127 128-143 144-159 160-191 192-223 224-255	Shutter/ Strobe (all zones) Shutter closed Shutter open Strobe-effect from slow to fast Shutter open Opening pulses in sequences slow--> fast Closing pulses in sequences fast --> slow Shutter open Random strobe-effects from slow to fast Shutter open	step step proportional step proportional proportional step proportional step
1	2	8	0 - 255	Dimmer (all zones) Dimmer intensity from 0% to 100%	proportional
2	3	9	0 - 255	Dimmer fine (all zones) Fine dimmer intensity from min. to max.	proportional

*Default mode

Zone order:



5. Control menu

The Divine 60 UV is equipped with 4-segment LED display which allows to set the fixture's behaviour according to your needs, obtain information on its operation, control all range of effects and program it in stand-alone mode.

The four control buttons have the following functions:

- ↖ - ESCAPE button-leaves menu without saving changes.
- ↵ - ENTER button- enters menu, confirms adjusted values and leaves menu.
- ▲ - UP and ▼ - DOWN buttons - move between menu items on the same level, sets values.

After switching the fixture on, display shows current DMX address.



5.1 Fixture Address



Use this menu to set the DMX address of the fixture.

dM.Ad. --- **DMX addressing.** Select this submenu to set a DMX start address.

To set a DMX address.

1. Use UP/DOWN buttons to find "A001" menu.
2. Press the ENTER button.
3. Use the UP/DOWN buttons to select desired start address.
4. Press the ENTER button to confirm the choice.

Note: After switching on, the Divine 60 UV 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 the set address.

DM.Pr. --- **DMX preset.** Select this menu item to set a desired DMX mode.

5.2 Fixture information



Use this menu to read useful information about the fixture status.

To display desired information.

1. Use the UP/DOWN buttons to find the "InFo" menu.
2. Press the ENTER button.
3. Use the UP/DOWN buttons to select the required menu item.
4. Press the ENTER button to confirm the choice.

Po.ti. --- **Power On Time.** Use the menu item to read the number of operation hours of the fixture.

totL - the function shows the total number of the operation hours since the Divine 60 UV has been fabricated.

rESEt - the function shows the number of the operation hours since the counter was last reset.

In order to reset this counter to 0, you have to press and hold the UP and DOWN buttons and at the same time press the ENTER button.

VErS. --- **Software Versions.** Select this function to read the software version of the fixture processors.

IC1.b. --- display processor 1

IC2.b. --- display processor 2

IC3.L. --- LED processor 3

IC4.L. --- LED processor 4

ViFi --- Wireless DMX module (if installed)

tEMP --- **Fixture Temperatures.** Select this menu to read the temperatures of the fixture:

bASE

Cur.t. --- the current temperature of the fixture base.

Hi.tE. --- the menu item shows the max. temperatures of the fixture base since the fixture has been fabricated.

rSet --- the menu item shows the maximum temperatures of the fixture base since the counter was last reset. In order to reset this counter to 0 you have to press and hold the UP and DOWN buttons and at the same time press the ENTER button.

LEdS

Cur.t. --- the current temperature of the fixture LEDs PCB.

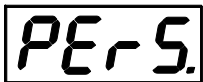
Hi.tE. --- the menu item shows the max. temperatures of the LEDs PCB base since the fixture has been fabricated.

rSet --- the menu item shows the maximum temperatures of the LEDs PCB since the counter was last reset. In order to reset this counter to 0 you have to press and hold the UP and DOWN buttons and at the same time press the ENTER button.

The temperatures can be displayed in either °C or °F units - see option "tnP.u." in the menu "Pers".

DM.In.---**DMX values.** Select this function to read DMX values of each channel received by the fixture.

5.3 Personality



Use this menu to modify the Divine 60 UV operating behaviour.

DM.Pr. --- **DMX preset.** Select this menu item to set a desired DMX mode. Please refer to the chapter "DMX protocol" for detail description of each DMX mode.

dM.In. --- **DMX input.** Select this menu item to select desired DMX input:

UirE --- Wired DMX.

UirL --- Wireless DMX

UrLo --- Wireless DMX → wired DMX. The fixture receives wireless DMX signal and sends it to its DMX output connector. Next fixtures can be connected to this fixture by DMX cable (fixture works as a Wireless-DMX converter).

AnL.d. --- Analog dimmer. If this option is selected, the dimmer channel can be controlled via DC voltage (0-10V) connected between pins 1 (data ground) and 3 (Data +) of DMX input of the fixture (0-data ground, 10V-data +).

Procedure of setting:

1. Set fixture's channels at desired values (by means of menu item Init Positions "In.Po").
2. Disconnect DMX controller
3. Select option "AnL.d." from menu DMX input
4. Connect DC voltage to the DMX input of the fixture

F.tin. --- **Max. Fade time.** Select this menu item to set a desired max. fade time (0-25.4 sec.). This adjusted fade time influences fade of Red, Green, Blue, White and dimmer during DMX operation:

If time between two receiving DMX values is > than fade time set in the item "F.tin. ", the entire adjusted fade time will be used.

If time between two receiving DMX values is < than fade time set in the item "F.tin. ", the adjusted fade time will be reduced to fill entire time between the two receiving DMX values.

e.g "F.tin."=2sec. and fixture has received from DMX controller value Red=0 DMX, after 5 seconds will receive Red=255 DMX. It means, that red will go to full intensity during 2 seconds.

"F.tin."=8 sec. and fixture has received Red=0 DMX, after 5 seconds will receive Red=255 DMX. It means, that red will go to full intensity during 5 seconds. (Max, fade time is reduced from 8 sec. to 5 sec.).

DiSP. --- **Display adjusting.** This function allows you to change the display settings.

d.On --- this function allows you to keep the display on or to turn off automatically 2 minutes after last pressing any button on the control panel.

d.Int. --- select this function to adjust the display intensity (6-min.,100-max.).

turn --- select this function to used to rotate menu 180 degrees from current orientation.

diM.C. --- **Dimmer curve.** The menu item allows to select desired dimmer curve:

Lin. --- linear

SqL --- Square law

tnP.u. --- **Temperature unit.** Use this menu in order to display the fixture temperatures in desired units: °C or °F.

In.Po. --- **Init effect positions.** Use this function to set all effects to the desired positions to which they will move after switching the fixture on (if DMX is not receiving).

dF.SE. --- **Default Settings .**The menu item sets all fixture parameters to the default (factory) values.

5.4 Manual mode



Use this menu to control all channels via buttons of the control board.

Items in this menu depend on selected DMX mode.

To control fixture channels.

1. Use the UP/DOWN buttons to find " Man.C " menu.
2. Press the ENTER button.
3. Use the UP/DOWN buttons to select desired effect (channel).

List of control channels:

"CoL.1" – a zone 1 LEDs saturation

"CoL.2" – a zone 2 LEDs saturation

"CoL.3" – a zone 3 LEDs saturation

"CoL.4" – a zone 4 LEDs saturation

"CoL.5" – a zone 5 LEDs saturation

"CoL.6" – a zone 6 LEDs saturation

"Stro." - a strobe/shutter

"dinr" - a coarse dimmer

"din.F" a fine dimmer

4. Press the ENTER button and use the UP/DOWN buttons to set value , press the ENTER button to confirm it.

5.5 Test sequences

tEST

Use this menu to run demo-test sequences without an external controller, which will show you some possibilities of using the Divine 60 UV.

5.6 Stand-alone setting

StAL.

The fixtures on a data link are not connected to the controller but can execute pre-set programs which can be different for every fixture. "Stand-alone operation" can be applied to the single fixture or to multiple fixtures operating synchronously.

Auto. --- Automatic playback. This function allows you to select the program which will be played after switching the fixture on. Selected program will be played continuously in a loop.

1. Use the UP/DOWN buttons to select test program ("tEST"), user program ("u.PrG") or disable this function (OFF).
2. Press the ENTER button to confirm the choice.

PLAY --- Playing program. Entering this menu provides a complete overview of all programs offered, from which the selected program can run.

1. Use the UP/DOWN buttons to select desired program.
2. Press the ENTER button. The selected program runs in a loop.

Edit --- Editing a program. The fixture offers a freely editable program up to 40 steps. Every program step includes a step time-the total time occupied by the step in the program and a fade time- during which effects move to new positions.

1. Use the UP/DOWN buttons to select a desired program step ("St.01" - "St.40") and press ENTER button.
2. Use the UP/DOWN buttons to select a channel you want to edit and press the ENTER button.

List of editable items:

"P.End" - a total number of the program steps (value 1-40). This value should be set before start of programming (e.g. if you want to create a program with 10 steps, set P.End=10).

"CoL.1" - a zone 1 LEDs saturation

"CoL.2" - a zone 2 LEDs saturation

"CoL.3" - a zone 3 LEDs saturation

"CoL.4" - a zone 4 LEDs saturation

"CoL.5" - a zone 5 LEDs saturation

"CoL.6" - a zone 6 LEDs saturation

"Stro." - a strobe/shutter

"dinr" - a coarse dimmer

"din.F" a fine dimmer

"F.tin" a fade time

"S.tin" a step time

"COPY". - this item duplicates the current prog. step to the next prog. step.

Note: Items in this menu depend on selected DMX mode.

3. Use the UP/DOWN buttons to set a DMX value of the channel and then press the ENTER button.
4. Use the UP/DOWN buttons to select next channel and press the ENTER button.

- After having set all channels in the current program step, press the ESCAPE button to go one menu level back and select another program step.

5.7 Special functions



rdM.L --- **Code.** This menu item shows the first part of the RDM identification code.

rdM.H --- **Code.** This menu item shows the second part of the RDM identification code.

ViFi --- **Wireless DMX.** The menu serves for reading of the wireless operation status (only for Wireless DMX version).

50 --- **Wireless DMX signal intensity.** The menu item shows level of received signal in %. If the fixture is not linked to the transmitter, "niSS" is displayed.

UnLI --- **Wireless DMX unlink.** The item serves for unlinking the fixture from transmitter.

uPd.M. --- **Updating mode.** The menu item allows you to update software in the fixture via either serial or USB port of PC.

The following are required in order to update software:

- PC running Windows /7/8/10 or Linux
- DMX Software Uploader
- Flash cable RS232/DMX P/N.13050624 (if you want to use a serial port of PC)
- Robe Universal Interface (if you want to use an USB port of PC)

Note: Software update should be executed by a qualified person. If you lack qualification, do not attempt the update yourself and ask for help from your ROBE distributor.

DMX address, user program and all items in the menu "PerS" will be set to their default (factory) values.

To update software in the fixture:

I. Installation of the DMX Software Uploader.

- DMX Software Uploader program is available from the Anolis web site at WWW.robe.cz.
- Make a new directory (e.g. Robe Uploader) on your hard disk and download the software to it.
- Unpack the program to the directory.

II. Fixture software updating.

1. Determine which of your ports is available on your PC and connect it:

- with the DMX input of the fixture if you are using the flash cable RS232/DMX
- with the DMX output of the Robe Universal Interface if you are using the USB cable.

Disconnect the fixture from the other fixtures in the DMX chain. Turn both the computer and the fixture on. Make sure the lamp is switched off (only if the fixture involves a lamp).

2. Switch the fixture to the updating mode by selecting the "uPd.M." item and then selecting "yES".

Note: If you do not want to continue in software update, you have to switch the fixture off and on to escape from this menu.

We recommend canceling all running programs before starting the Software Uploader.

3. Run the Software Uploader program. Select desired COM and then click on the Connect button. (Select COM if the serial port is used or Robe Universal Interface if the USB port is used).

If the connection is OK, click on the "Start Uploading button" to start uploading. It will take several minutes to perform software update.

If the option "Incremental Update" is not checked, all processors will be updated (including processors with the same software version).

If you wish to update only later versions of processors, check the "Incremental Update box".

Avoid interrupting the process. Update status is being displayed in the Info Box window.

Divine 60 UV

When the update is finished, the line with the text “The fixture is successfully updated” will appear in this window and the fixture will reset with the new software.

Note: In case upload process is interrupted (e.g. power loss), the fixture stays in “Updating mode” and you will have to repeat the software update again.

6. Technical specifications

Power supply

- Electronic auto-ranging
- Input voltage (EU): 100 - 240V AC, 50-60 Hz
- Input voltage (US): 100 - 277V AC, 50-60 Hz
- Max. power consumption: 180W
- Inrush current: 30A (at 230V), 20A (at 115V)

Optic & Effects

- Light source: 60 x UV LEDs (365nm wave length)
- Beam angle: 38°
- 6 LED zones
- Adjustable strobe sequences
- Typical Lumen maintenance: 70% @ 16.000 hours

Control

- Setting & Addressing: 4-segment LED display & 4 control buttons
- Control: USITT DMX 512 (RDM support)
- DMX protocol modes: 3 (2,3,9 control channels)
- Operations modes: DMX, Stand-alone
- Manual control of all effects via control panel
- One editable program, up to 40 steps

Wireless DMX/RDM module (only for wireless DMX version of the Divine 60 UV)

- Compliance with USITT DMX-512 (1986 & 1990) and 512-A
- Full DMX fidelity and frame integrity
- Auto sensing of DMX frame rate and frame size
- <5ms DMX latency
- Operational frequency range of 2402-2480 MHz
- Producer: LumenRadio

Strobe

- Strobe effect with variable speed (max. 20 flashes per second)
- Pre-programmed random strobe pulse-effects

Dimmer

- Smooth 16-bit dimming from 0 - 100 %

Connection

- Power: power cable with plug
- DMX: 2x DMX outdoor cable CA-0611 +5-pin XLR (male, female, IP 67)

Mounting

- via Universal base adaptor for Strobe IP

Protection factor

- **EU:** IP 67 (except power plug)
- **US:** Suitable for wet location (except power plug)

Temperatures

- Operating Ambient Temperature: -20°C / +40°C (-4°F / +104°F)
- Operating Temperature: +75°C @ Ambient +40°C (+167°F @ Ambient +104°F)

Minimum distance

Min. distance from flammable surfaces: 0.3 m

Total heat dissipation

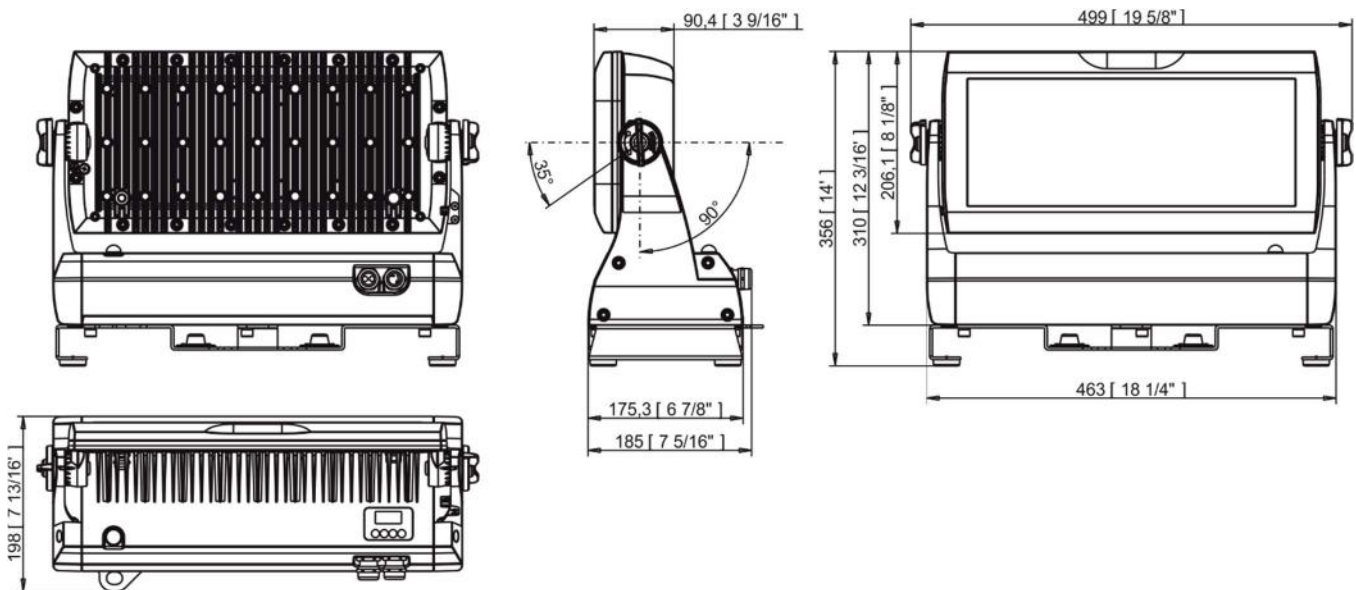
- 680 BTU/h (calculated)

Weight

- 14.5 kg

Dimensions

mm [inch]



Included items

- 1 x Divine 60 UV
- 1 x Universal base adaptor for Strobe IP (P/N 10980379)
- 1 x User manual

Optional accessories

- Top Hat Strobe IP black/Divine 60 UV black (P/N 10980354)
- Half Top Hat Strobe IP/Divine 60 UV black (P/N 10980355)
- Wire Guard/Anti-Glare Strobe IP (P/N 10980385)
- Barndoor Module Strobe IP/Divine 60 black (10980356)
- Adaptor black glass for Divine UV black (P/N10980355)
- Set of Rubber Feet black (P/N 10980370)
- Omega clamps CL-regular 2 pcs in box (P/N 10980033)

7. Cleaning and maintenance

DANGER !
Disconnect from the mains before starting any cleaning or maintenance work

Rinse off loose dirt with low pressure water spray. Wash the housing with a soft brush or sponge and a mild, non-abrasive washing detergent. Rinse it.

Maintenance and service operations are only to be carried out by a qualified person. Should you need any spare parts, please use genuine parts.

7.1 Replacing a fuse

This replacement has to be realized by a qualified person or Anolis service worker only.

7.2 Disposing of the product

To preserve the environment please dispose or recycle this product at the end of its life according to the local regulations and codes.

8. Extract from a test report of Brno University Of Technology – Light laboratory

8.1 Measurement results for all LEDs with clear glass (max. power), beam angle 38°

Evaluated according: ČSN EN 62471, ČSN EN 62471-5, IEC TR 62778, ANSI/IESNA RP -27.3-07

Risk	Measured values	Result (Group of Risk)
Ultraviolet hazard (200 to 400 nm) E_S [$W.m^{-2}$]	0,1032	High Risk Group
Ultraviolet hazard (315 to 400 nm) E_{UVA} [$W.m^{-2}$]	1154,3	High Risk Group
Retinal blue light hazard (300 to 700 nm) L_B [$W.m^{-2}.sr^{-1}$]	85,1	Exempt Risk Group
Retinal thermal hazard (380 to 1400 nm) L_R [$W.m^{-2}.sr^{-1}$]	279,6	Exempt Risk Group
Cornea/Lens Infrared hazard (780 to 3000 nm) L_{IR} [$W.m^{-2}.sr^{-1}$]	0	Exempt Risk Group

Fixture at a distance, which produces illuminance of 500 lx. Results for Divine 60 UV are in bold frame

Risk	Exempt Risk Group	Low Risk (Group 1)	Mod Risk (Group 2)	High Risk (Group 3)
Ultraviolet hazard	Not required	NOTICE: UV emitted from this source.	CAUTION: UV emitted from this source.	WARNING: UV emitted from this source.
200 nm to 400 nm	-	Minimize exposure to eyes or skin. Use appropriate shielding.	Eye or skin irritation may result exposure. Use appropriate shielding.	Avoid eye and skin exposure to unshield source.
Ultraviolet hazard (UVA)	Not required	NOTICE: UVA emitted from this source.	CAUTION: UVA emitted from this source.	WARNING: UVA emitted from this source.
315 nm to 400 nm	-	Minimize exposure to eyes or skin. Use appropriate shielding.	Eye or skin irritation may result exposure. Use appropriate shielding.	Avoid eye and skin exposure to unshield source.
Retinal blue light hazard	Not required	Not required	Possibly hazardous optical radiation from this source	Possibly hazardous optical radiation from this source
300 nm to 700 nm	-	-	Do not stare at operating lamp. May be harmful to the eyes.	Do not look at operating lamp. Eye injury may result.
Retinal thermal hazard	Not required	Not required	NOTICE: Possibly hazardous optical radiation from this source	NOTICE: Possibly hazardous optical radiation from this source
380 nm to 1400 nm	-	-	Do not stare at operating lamp. May be harmful to the eye.	Do not look at operating lamp. Eye injury may result.
Cornea/Lens Infrared hazard	Not required	NOTICE: IR emitted from this source	NOTICE: IR emitted from this source	NOTICE: IR emitted from this source
780 nm to 3000 nm	-	Use appropriate shielding or eye protection.	Avoid eye exposure. Use appropriate shielding or eye protection.	Avoid eye exposure. Use appropriate shielding or eye protection.

Key to identify the hazards in the evolution tables

Group	Exempt Group	Low Risk	Mod Risk	High Risk
Colour of cell				

If the cell has transparent background and the text is written in italics, the value is not used to evaluate risk.

All LEDs on (max. power)

Calculated values of illuminance (E) with uncertainty of measurement ($k=2$) 0,94%, actinic ultraviolet irradiance (E_s) with uncertainty of measurement ($k=2$) 1,29%, ultraviolet irradiance (E_{UVA}) with uncertainty of measurement ($k=2$) 1,27%, depending on distance (l) with uncertainty of measurement ($k=2$) 0,47%.

l	E	E_s	$t_{\max UV}$	E_{UVA}	$t_{\max UVA}$
[m]	[lx]	[W.m ⁻²]	[s]	[W.m ⁻²]	[s]
0,381**	500,0	0,10320	290,7	1154,3	8,66
0,5	291,8	0,06024	498,0	673,7	14,84
1	73,0	0,01506	1992,1	168,4	59,37
1,5	32,4	0,00669	4482,2	74,9	133,59
2	18,2	0,00376	7968,4	42,1	237,48
2,5	11,7	0,00241	12450,6	26,9	371,07
2,914*	8,6	0,00177	16915,7	19,8	504,14
3	8,1	0,00167	17928,9	18,7	534,34
3,5	6,0	0,00123	24403,3	13,7	727,30
4	4,6	0,00094	31873,6	10,5	949,94
5	2,9	0,00060	49803	6,7	1484,28
6	2,0	0,00042	71716	4,7	2137,36
7	1,5	0,00031	97613	3,4	2909,19
8	1,1	0,00024	127495	2,6	3799,8
9	0,9	0,00019	161360	2,1	4809,1
10	0,7	0,00015	199210	1,7	5937,1

*Measured values. From these values are calculated other values.

**Calculated values for illuminance of detector $E=500lx$. These values are decisive for determining of hazard group.

8.2 Measurement results for all LEDs with black glass (max. power), beam angle 38°

Evaluated according: ČSN EN 62471, ČSN EN 62471-5, IEC TR 62778, ANSI/IESNA RP -27.3-07

Risk	Measured values	Result (Group of Risk)
Ultraviolet hazard (200 to 400 nm) $E_S [W.m^{-2}]$	0,12342	High Risk Group
Ultraviolet hazard (315 to 400 nm) $E_{UVA} [W.m^{-2}]$	1354,2	High Risk Group
Retinal blue light hazard (300 to 700 nm) $L_B [W.m^{-2}.sr^{-1}]$	47,9	Exempt Risk Group
Retinal thermal hazard (380 to 1400 nm) $L_R [W.m^{-2}.sr^{-1}]$	87,1	Exempt Risk Group
Cornea/Lens Infrared hazard (780 to 3000 nm) $L_{IR} [W.m^{-2}.sr^{-1}]$	0	Exempt Risk Group

Fixture at a distance, which produces illuminance of 500 lx. Results for Divine 60 UV are in bold frame

Risk	Exempt Risk Group	Low Risk (Group 1)	Mod Risk (Group 2)	High Risk (Group 3)
Ultraviolet hazard	Not required	NOTICE: UV emitted from this source.	CAUTION: UV emitted from this source.	WARNING: UV emitted from this source.
200 nm to 400 nm	-	Minimize exposure to eyes or skin. Use appropriate shielding.	Eye or skin irritation may result exposure. Use appropriate shielding.	Avoid eye and skin exposure to unshield source.
Ultraviolet hazard (UVA)	Not required	NOTICE: UVA emitted from this source.	CAUTION: UVA emitted from this source.	WARNING: UVA emitted from this source.
315 nm to 400 nm	-	Minimize exposure to eyes or skin. Use appropriate shielding.	Eye or skin irritation may result exposure. Use appropriate shielding.	Avoid eye and skin exposure to unshield source.
Retinal blue light hazard	Not required	Not required	Possibly hazardous optical radiation from this source	Possibly hazardous optical radiation from this source
300 nm to 700 nm	-	-	Do not stare at operating lamp. May be harmful to the eyes.	Do not look at operating lamp. Eye injury may result.
Retinal thermal hazard	Not required	Not required	NOTICE: Possibly hazardous optical radiation from this source	NOTICE: Possibly hazardous optical radiation from this source
380 nm to 1400 nm	-	-	Do not stare at operating lamp. May be harmful to the eye.	Do not look at operating lamp. Eye injury may result.
Cornea/Lens Infrared hazard	Not required	NOTICE: IR emitted from this source	NOTICE: IR emitted from this source	NOTICE: IR emitted from this source
780 nm to 3000 nm	-	Use appropriate shielding or eye protection	Avoid eye exposure. Use appropriate shielding or eye protection	Avoid eye exposure. Use appropriate shielding or eye protection

Key to identify the hazards in the evolution tables

Group	Exempt Group	Low Risk	Mod Risk	High Risk
Colour of cell				

If the cell has transparent background and the text is written in italics, the value is not used to evaluate risk.

All LEDs on (max. power)

Calculated values of illuminance (E) with uncertainty of measurement ($k=2$) 0,94%, actinic ultraviolet irradiance (E_s) with uncertainty of measurement ($k=2$) 1,29%, ultraviolet irradiance (E_{UVA}) with uncertainty of measurement ($k=2$) 1,28%, depending on distance (l) with uncertainty of measurement ($k=2$) 0,47%.

l	E	E_s	$t_{\max UV}$	E_{UVA}	$t_{\max UVA}$
[m]	[lx]	[W.m ⁻²]	[s]	[W.m ⁻²]	[s]
0,287**	500,0	0,12342	243,1	1354,2	7,38
0,5	165,0	0,04073	736,5	446,9	27,38
1	41,3	0,01018	2946,1	111,7	89,50
1,5	18,3	0,00453	6628,8	49,7	201,38
2	10,3	0,00255	11784,5	27,9	358,01
2,5	6,6	0,00163	18413,3	17,9	559,39
2,898*	4,9	0,00121	24742,8	13,3	751,68
3	4,6	0,00113	26515,2	12,4	805,53
3,5	3,4	0,00083	36090,1	9,1	1096,41
4	2,6	0,00064	47138,1	7,0	1432,05
5	1,7	0,00041	73653	4,5	2237,58
6	1,1	0,00028	106061	3,1	3222,11
7	0,8	0,00021	144360	2,3	4385,65
8	0,6	0,00016	188552	1,7	5728,2
9	0,5	0,00013	238637	1,4	7249,8
10	0,4	0,00010	294613	1,1	8950,3

*Measured values. From these values are calculated other values.

**Calculated values for illuminance of detector $E=500$ lx. These values are decisive for determining of hazard group.

Full report from the Light Laboratory on request.

Specifications are subject to change without notice

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