EVA LED underwater lighting

Electrical connections - PCB Settings

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1 About this manual

1.1 Language

This manual is meant for the qualified electrician who performs the electrical connection of the product. Read and understand this manual before connecting and using this product. This manual is originally written in English. All other language versions are translations of the original manual.

1.2 Other relevant documents

Document	
EVA LED underwater lighting: Mounting - Installation	www.evaoptic.com
EVAstream: Electrical connections - PCB settings	www.evaoptic.com

1.3 Used symbols

This manual contains safety instructions. Ignoring these instructions may lead to injury or damage to the appliance. Each safety instruction is indicated with a signal word. The signal word corresponds with the level of risk of the described hazardous situation.

⚠ DANGER This symbol indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING This symbol indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION This symbol indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE Indicates a situation that, if not avoided, could result in damage to the product or to the environment.

2 Safety

2.1 Safety warnings and regulations

⚠ DANGER

Electrical shock hazard. Fatal injury will occur. Switch off all electricity near the pool before performing the electrical installation.

⚠ WARNING

Electrical shock hazard. Risk of electric shock and injury. The product must be installed by a certified electrician. Incorrect installation will cause electrical hazards.

⚠ WARNING

Electrical shock hazard. Risk of electric shock due to incorrect mounting.

- Make sure you read the enclosed documents carefully.
- Never connect the product to the main power before connecting all loose wires properly.
- Always disconnect the product from the main power before servicing.

⚠ WARNING

There are no serviceable parts in the fixture and any atempt to open the light unit can cause permanent and irreparable damage. Any form of warranty expires immediately upon any atempt to open the fixture.

NOTICE

Risk of product damage. Prolonged disturbance of frequency may permanently damage the equipment.

- Never place multiple cables in one conduit.

2.2 General safety instructions

1. Follow the instructions in this guide carefully. For questions or queries, please contact your distributor/reseller or visit www.evaoptic.com
2. This lighting system must be installed by a certified electrician in accordance with applicable local rules and regulations. Improper installation can cause electrical hazards.
3. Switch off all relevant live electrical wiring before starting the installation.
4. Please retain these instructions for the user.
5. EVA Optic BV warrants its products to be free from defects in material and/or workmanship, under normalconditions, operation and maintenance for a period of four (4) years from the original invoice date for LED luminaires and four (4) years for drivers/power supplies.
   Visit www.evaoptic.com for datasheets and our fullwarranty.

2.3 Use of material

1. Note that any used materials meet the requirements and guidelines that apply to your specific application.
2. Use only the EVA Optic gaskets/bolts/screws/nuts.
3. Use only original EVA Optic mounting accessories. Warranty will expire irrevocably when using other materials.

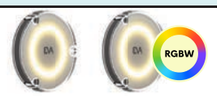
2.4 Electrical safety installation instructions

IMPORTANT! Switch off all relevant live wiring before starting the installation!

1. Always use one power supply per luminaire.
2. Mount the power supply box in a dry, cool area.
3. Allow at least 5 cm of space arround the power supply box for efficient thermal management.
4. Mount the power supply box always with cable glands downwards.
5. Electrical connection according to the supplied wiring diagram.
6. It is important that the NTC is connected. This protects the lamp if the cooling is not suffi cient.
7. Always take care of laying the cable from the technical room to the lamp in a hose/tube so that it can be easily replaced.

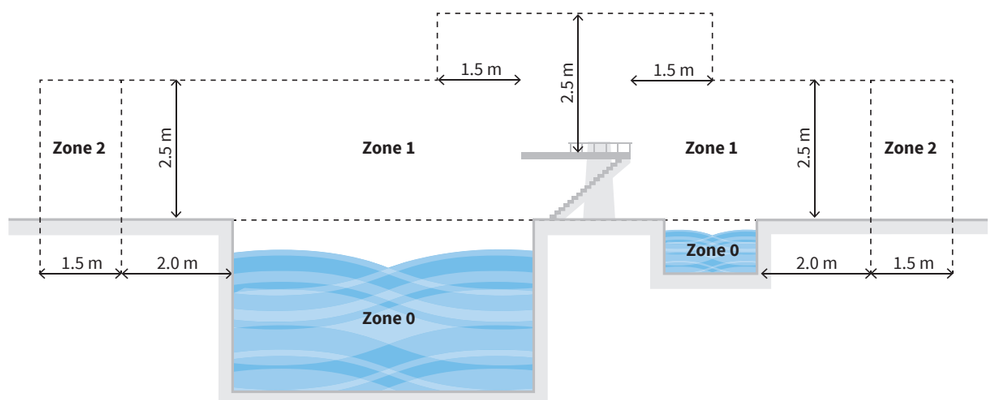
3 Applications

3.1 Applications EVA LED underwater lighting

Applications - SubAqua		
Type of light		
	SubAqua 25W MONO / RGBW	**SubAqua 40W MONO / 50W RGBW**
Applications	Residential pools, instruction pools	Competition, recreational, instruction pools
Type luminaire	IP68 / IPX8 (zone 0)	IP68 / IPX8 (zone 0)
Type of water	Fresh water, chlorinated water	Fresh water, chlorinated water
Cooling	Water cooling (only use in water)	Water cooling (only use in water)
Max. water temperature	40°C	40°C
Max. installation depth	25M	25M
Cable length luminaire (ex factory)	10/20/30 meter (7 wires: 5x0,5mm², 2x0,25mm²). Cable is fixed to the luminaire to ensure watertightness.	10/20/30 meter (7 wires: 5x0,5mm², 2x0,25mm²). Cable is fixed to the luminaire to ensure watertightness.
Max. cable length	The 10M cable can be extended to a maximum of 100 meter (7x2,5mm²)	The 10M cable can be extended to a maximum of 100 meter (7x2,5mm²)

Applications - SubAqua XS / B2		
Type of light		
	SubAqua XS 10W MONO / RGBW	B2 10W MONO / RGBW
Applications	Residential pool steps, small pools	Whirlpools, Playgrounds, prefabricated slides
Type luminaire	IP68 / IPX8 (zone 0)	Frontside IP68 / Backside NOT IP68
Type of water	Fresh water, chlorinated water	Fresh water, chlorinated water
Cooling	Water cooling (only use in water)	Backside (heatsink) air-cooled
Max. water temperature	40°C	40°C
Max. installation depth	25M	25M
Cable length luminaire (ex factory)	10/20/30 meter (7 wires: 5x0,5mm², 2x0,25mm²). Cable is fixed to the luminaire to ensure watertightness.	10/20/30 meter (7 wires: 5x0,5mm², 2x0,25mm²). Cable is fixed to the luminaire to ensure watertightness.
Max. cable length	The 10M cable can be extended to a maximum of 100 meter (7x2,5mm²)	The 10M cable can be extended to a maximum of 100 meter (7x2,5mm²)

3.2 Zone placement



This underwater lighting system should be installed in zones specified in the international safety standard IEC 60364-7-702.

Underwater lights
Mount the underwater lights in zone 0. Always immerse luminaires before commissioning.

Serious and permanent damage to the fixture can occur when the SubAqua underwater light is not submerged during use. An exception to this is the B2 underwater light. This one is air-cooled: the backside (heatsink) of the lamp needs to be air-cooled.

Underwater light including the cable must be installed in such a way, that the underwater light can be replaced completely (including cable).

Power Supply Unit (PSU)
The PSU must be installed in the technical room (dry cool room) outside zone 2.

4 Product

4.1 EVA LED underwater lamp



SubAqua 25W MONO



SubAqua 25W RGBW



SubAqua 40W MONO



SubAqua 50W RGBW



SubAquaXS 10W MONO



SubAquaXS 10W RGBW



B2 10W MONO



B2 10W RGBW

4.2 EVA LED power supply unit (PSU)



PSU - 10W/25W MONO



PSU - 10W/25W RGBW



PSU - 40W MONO



PSU - 50W RGBW

4.3 EVA LED installation niche for SubAqua



EVA-AA-09
Installation niche for all pools

ABS and SS316 cover-plate fits on this niche



EVA-AA-10
Installation niche for tiled pools

Only SS316 coverplate fits on this niche



EVA-AA-34 / 34i
Installation niche for surface mounting

No coverplate needed



EVA-AA-33
Installation set for surface mounting

No coverplate needed

4.4 EVA LED cover plate for SubAqua



EVA-AA-11/11-FL/12
Cover plate
Stainless steel (SS316)



EVA-AA-02A
Cover plate
ABS anthracite

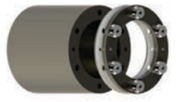


EVA-AA-02G
Cover plate
ABS silver grey



EVA-AA-02W
Cover plate
ABS white

4.5 EVA LED installation niche and coverplate for SubAquaXS



EVA-QA-10
Installation niche for all pools
EVA-QA-13 fits on this niche



EVA-QA-13
Cover plate
Stainless steel (SS316)

4.6 Cable information

EVA LED underwater lighting / EVA Piezo	
Minimum cable lenght	3 meter
Cable	10 meter (7 wires: 5x0,5mm², 2x0,25mm²).
Extension	The 10M cable can be extended to a maximum of 100 meter (7x2,5mm²)
Optional cable length	20 / 30 meter

DMX	
Cable	2 wires > 0.22 mm2 + shield 110 Ohm

4.7 Electrical specifications

Driver - Input / Output	MONO	RGBW
Voltage range	100-240 Vac	100-240 Vac
	30Vdc	30Vdc
Driving technology	0-10 Vdc (dimming)	DMX512
Working temperature power box	-20°C to + 40°C	-20°C to + 40°C
Protection rating power box	IP65 housing	IP65 housing

Protections

Short circuit, overload, overvoltage, SELV, Class 2 output, double insulation

Safety standards

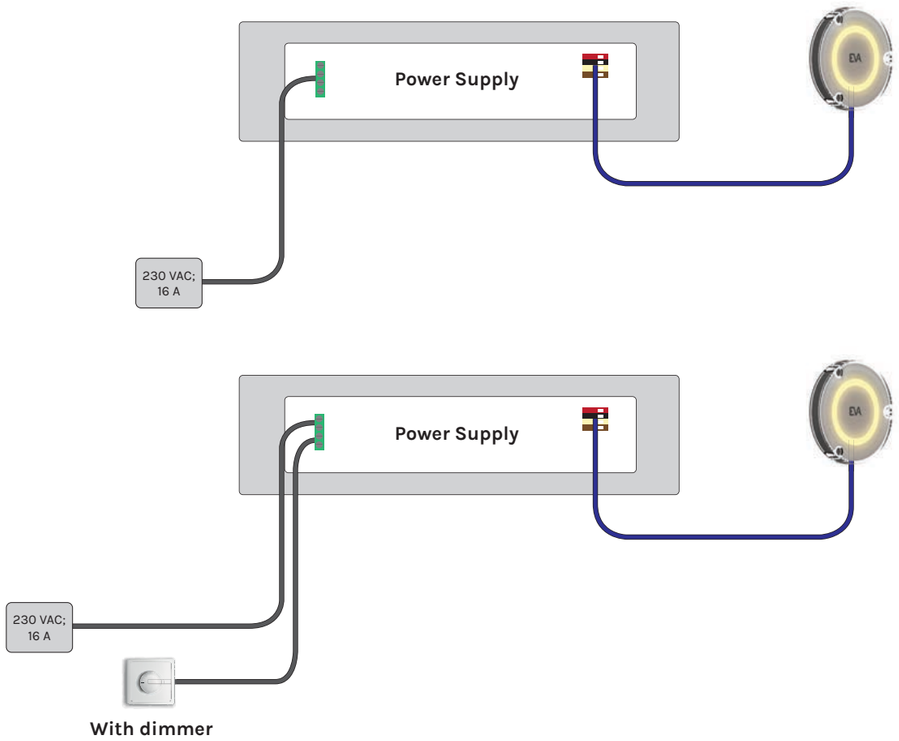
IEC EN 60598-2-18

5 Electrical installation

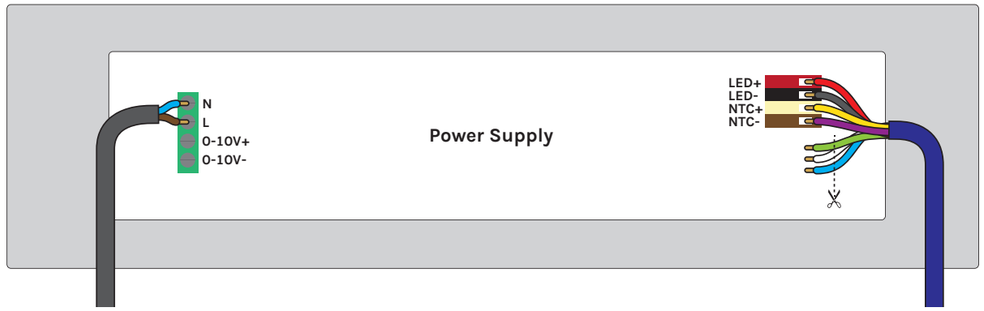
⚠ DANGER

Electrical shock hazard. Fatal injury will occur. Switch off all electricity near the pool before performing the electrical installation.

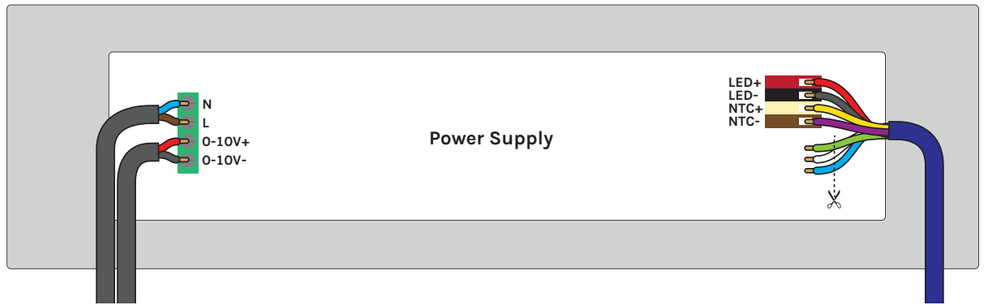
5.1 MONO - SubAqua 10W (XS) / 25W / 40W



Overview - Combination of MONO SubAqua LED underwater lights and Power Supply Units



Connections to the Power Supply Unit of the MONO underwater light (excl. dimmer)



Connections to the Power Supply Unit of the MONO underwater light (incl. dimmer)

⚠ CAUTION

Electrical shock hazard. Risk of electric shock due to leakage of current: Never connect the product to the main power before the installation is finished.

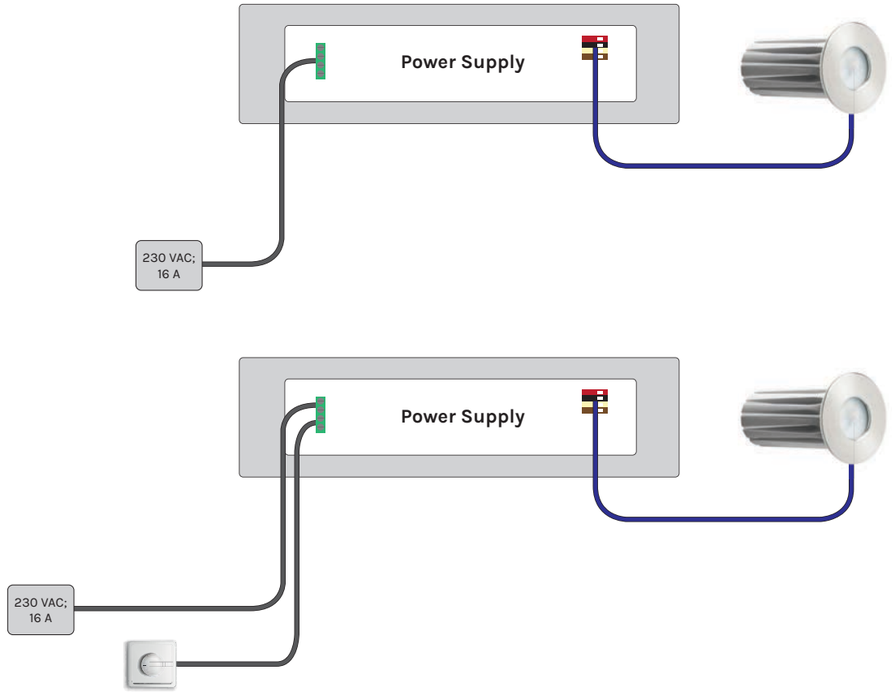
Connect the MONO SubAqua light to the Power Supply Unit:

- Connect the red, black, yellow and purple wires of the 7-wired cable from the MONO SubAqua underwater light to the PSU on the indicated colours.
- The blue, white and green wires are not needed, they can be cut off.

Connect the Power Supply Unit to the mains (230 VAC; 16 A)

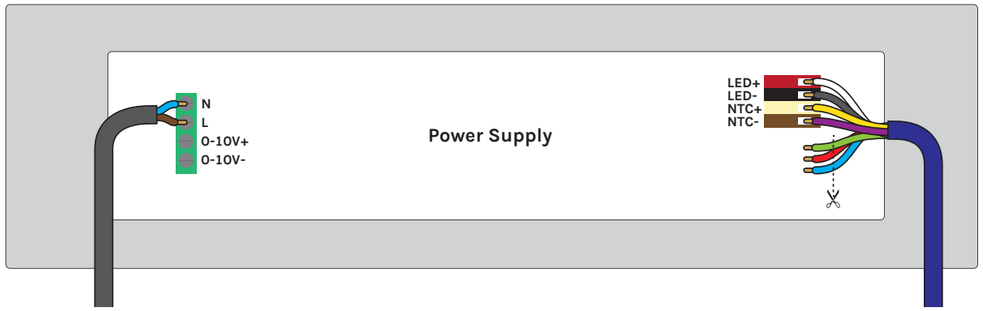
- Without dimmer: Connect the 2-wired cable to the PSU on the indicated colours.
- Without dimmer: Connect the cable from the PSU to the mains (230 VAC; 16A).
- With dimmer: Connect the 2x 2-wired cables to the PSU on the indicated colours.
- Connect a 0-10V dimmer to the black/red cable and connect the blue/brown cable to the mains (230 VAC; 16A).

5.2 MONO/ Fixed light colour - B2

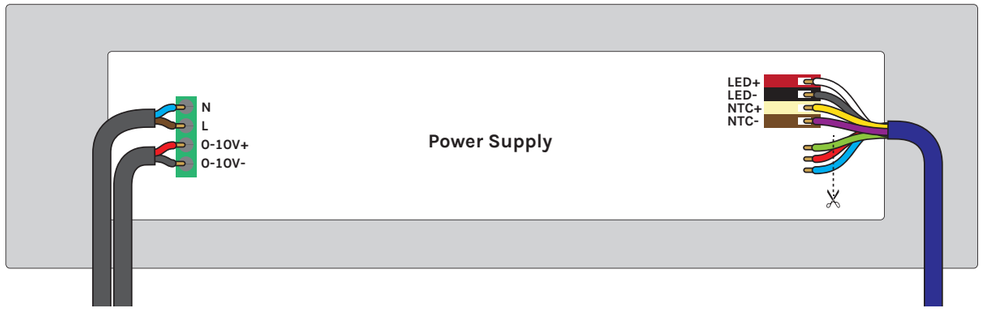


With dimmer

Overview - Combination of B2 underwater lights and Power Supply Units



Connections to the Power Supply of the MONO underwater light (excl. dimmer)



Connections to the Power Supply of the MONO underwater light (incl. dimmer)

⚠ CAUTION

Electrical shock hazard. Risk of electric shock due to leakage of current: Never connect the product to the main power before the installation is finished.

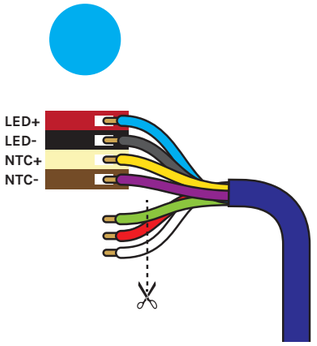
Connect the MONO B2 light to the Power Supply Unit:

- Connect the white, black, yellow and purple wires of the 7-wired cable from the MONO B2 light to the PSU on the indicated colors.
- The blue, red and green wires are not needed, they can be cut off.

Connect the Power Supply Unit to the mains (230 VAC; 16 A)

- Without dimmer: Connect the 2-wired cable to the PSU on the indicated colours.
- Without dimmer: Connect the cable from the PSU to the mains (230 VAC; 16A).
- With dimmer: Connect the 2x 2-wired cables to the PSU on the indicated colours.
- Connect a 0-10V dimmer to the black/red cable and connect the blue/brown cable to the mains (230 VAC; 16A).

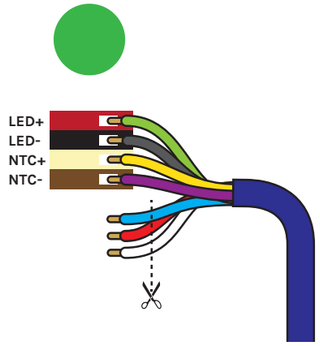
The MONO B2 light can also be set as a fixed colour. There are 5 possible configurations for the light:



Blue

LED+ Blue
LED- Black
NTC+ Yellow
NTC- Purple

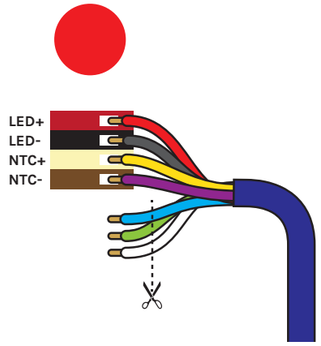
Not used, cut off
Green
Red
White



Green

LED+ Green
LED- Black
NTC+ Yellow
NTC- Purple

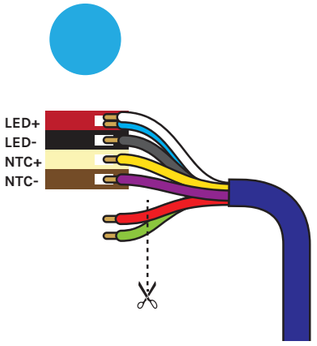
Not used, cut off
Blue
Red
White



Red

LED+ Red
LED- Black
NTC+ Yellow
NTC- Purple

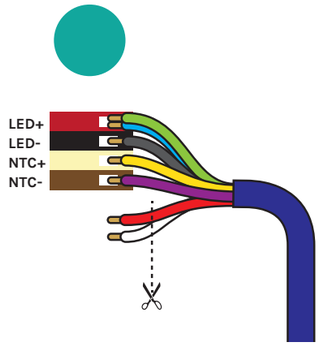
Not used, cut off
Green
Red
White



Sky Blue

LED+ Blue, White
LED- Black
NTC+ Yellow
NTC- Purple

Not used, cut off
Green
Red

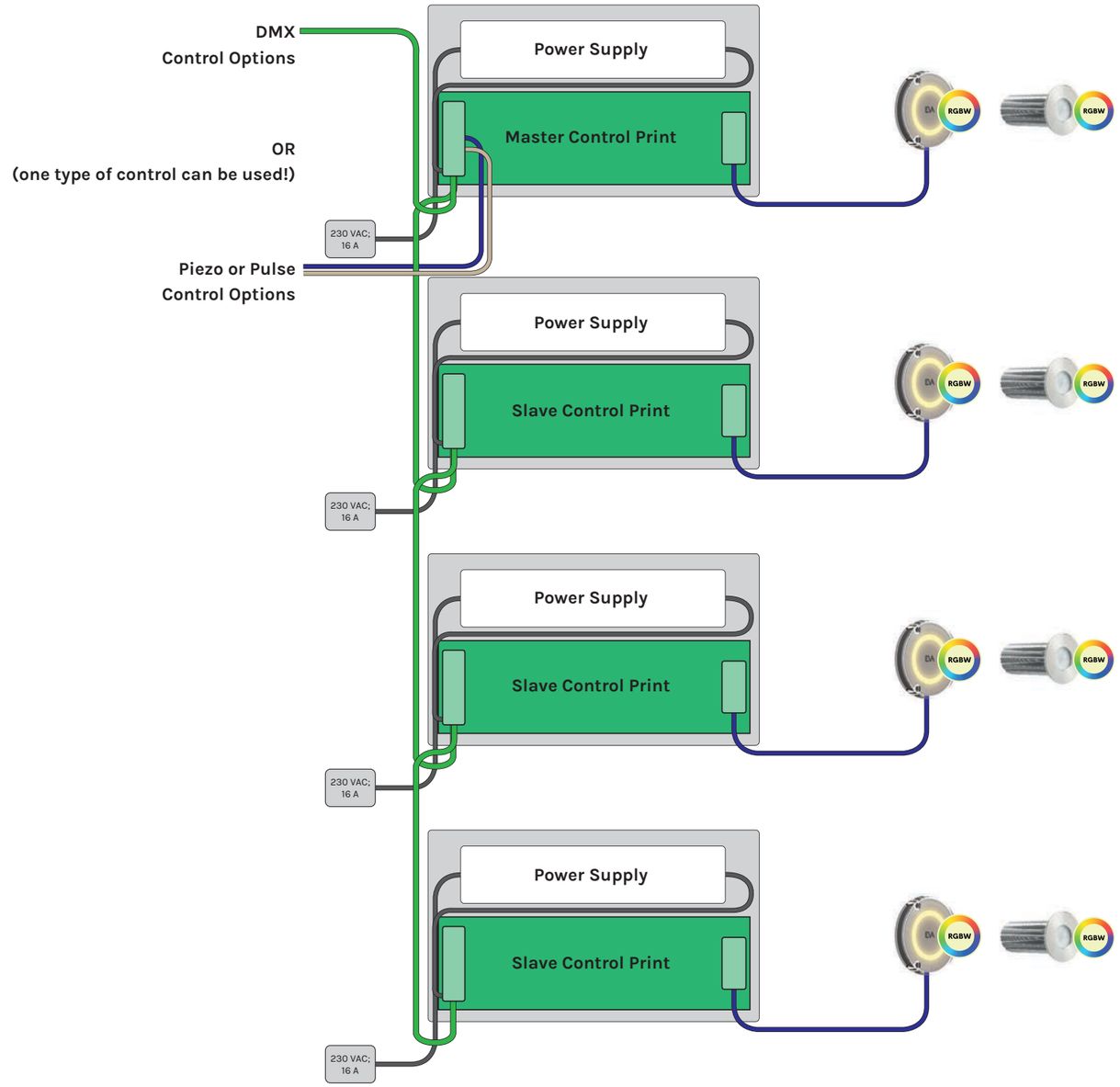


Mediterranean

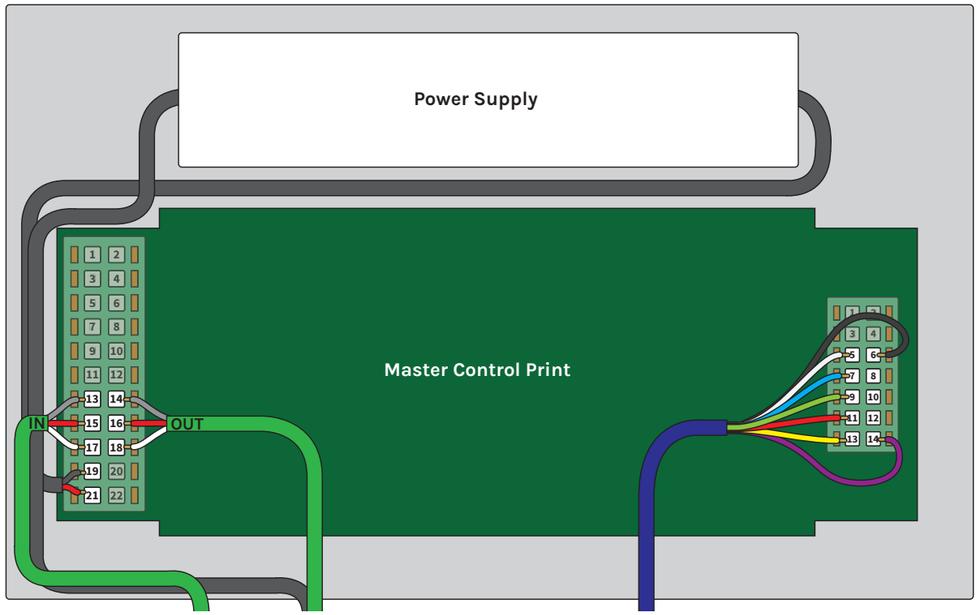
LED+ Blue, Green
LED- Black
NTC+ Yellow
NTC- Purple

Not used, cut off
Red
White

5.3 RGBW - SubAqua 10W (XS) / 25W / 50W and B2



Overview - Combination of RGBW LED underwater lights and Power Supply Units



Connections to the Control print of the Power Supply Unit - Caution: Just 1 type of control can be used!

⚠ CAUTION

Electrical shock hazard. Risk of electric shock due to leakage of current: Never connect the product to the main power before the installation is finished.

Connect the RGBW light to the Power Supply Unit (PSU):

- Connect the 7 wired cable from the RGBW light to the Control Print on the right side of the PSU on the indicated numbers (5,6,7,9,11,13,14).

Connect the Power Supply to the Control Print:

- Check if the 2 wired cable of the Power Supply is connected to the Control Print on the left side on the indicated numbers (19, 21)

Connect the PSU's to each other using DMX cable:

- Connect the DMX-cable (2-wires + shield) to the Control Print on the left side of the PSU on the indicated numbers (14,16,18).
- Connect the same DMX-cable to the Control Print on the left side of the following PSU on the indicated numbers (13,15,17).
- Repeat this for all PSU's.

Connect the PSU's to the mains (230 VAC; 16 A)

- Connect the cables of the Power Supply to the mains (230 VAC; 16A)

6 RGBW - Control Options

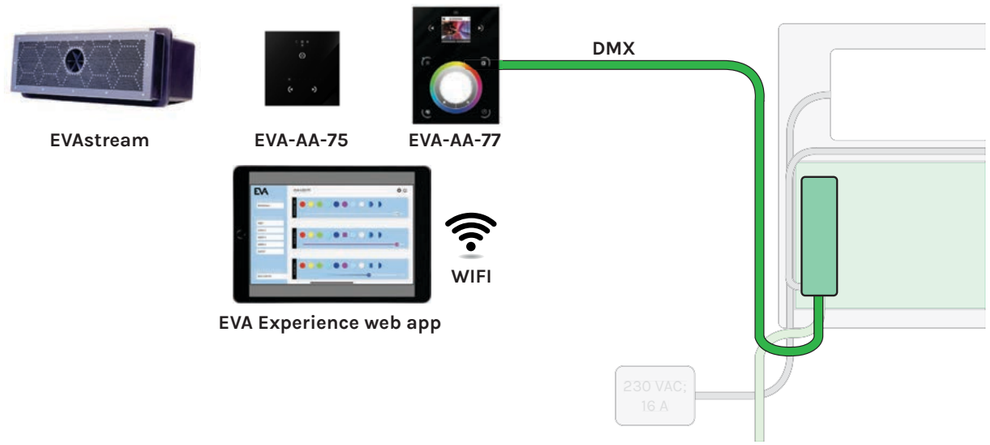
⚠ DANGER

Electrical shock hazard. Fatal injury will occur. Switch off all electricity near the pool before performing the electrical installation.

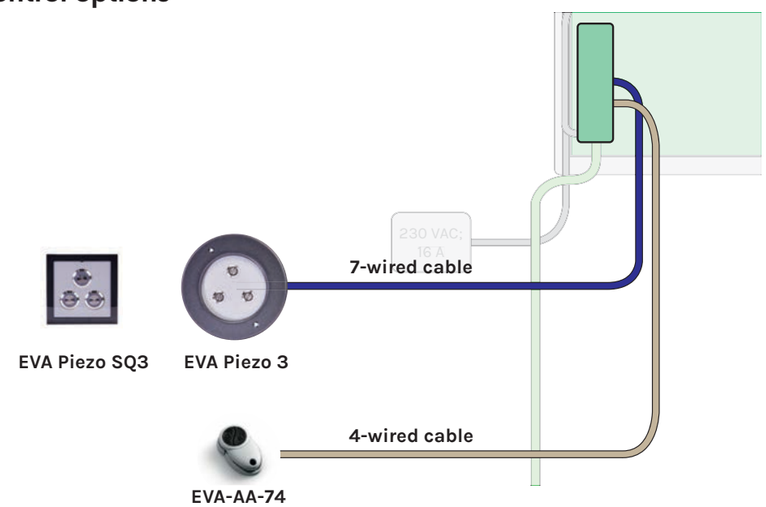
⚠ CAUTION

Electrical shock hazard. Risk of electric shock due to leakage of current: Never connect the product to the main power before the installation is finished.

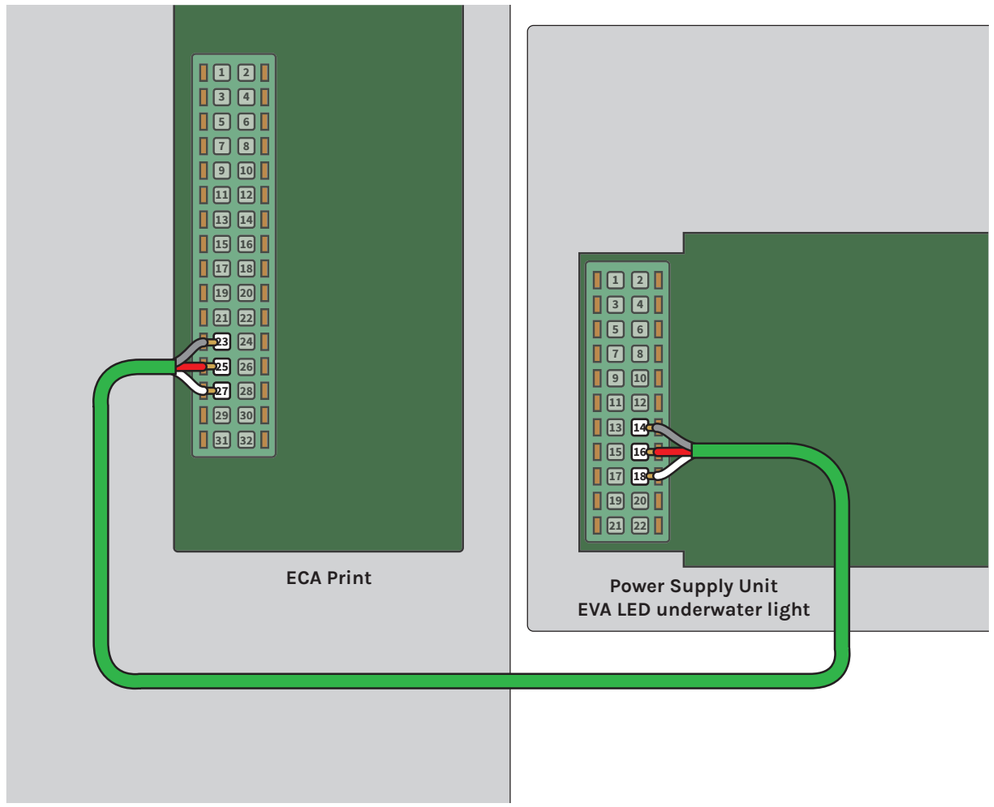
DMX - Control options



Piezo / Pulse - Control options



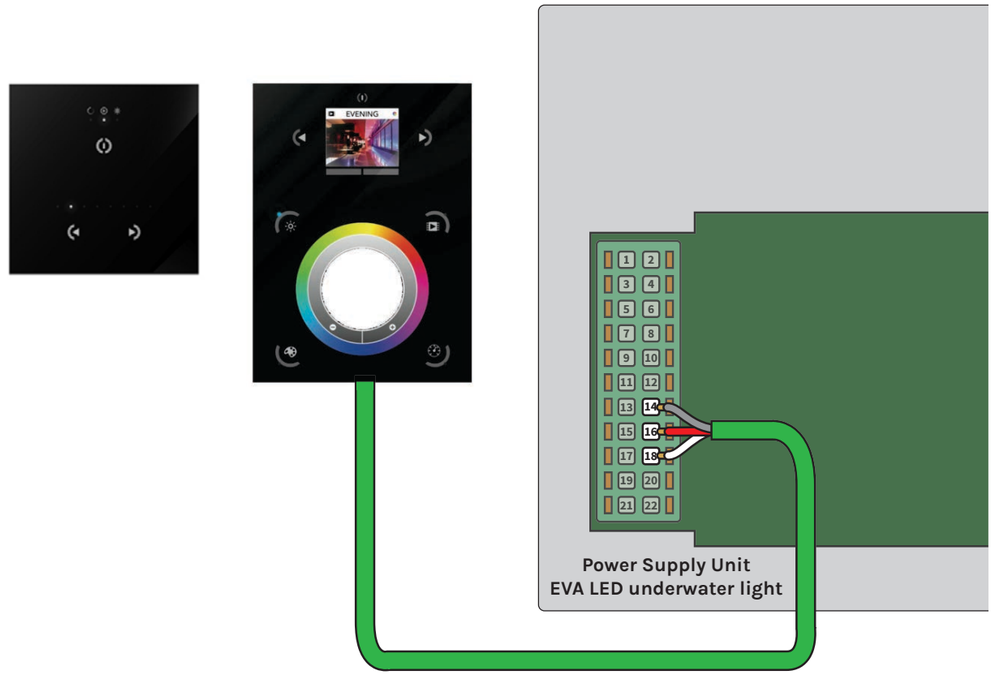
6.1 EVAstream / EVA Experience web app



Connect the DMX cable (2-wires + shield) from the Control Print of de PSU (14,16,18) to the ECA Print (23,25,27) on the indicated numbers.

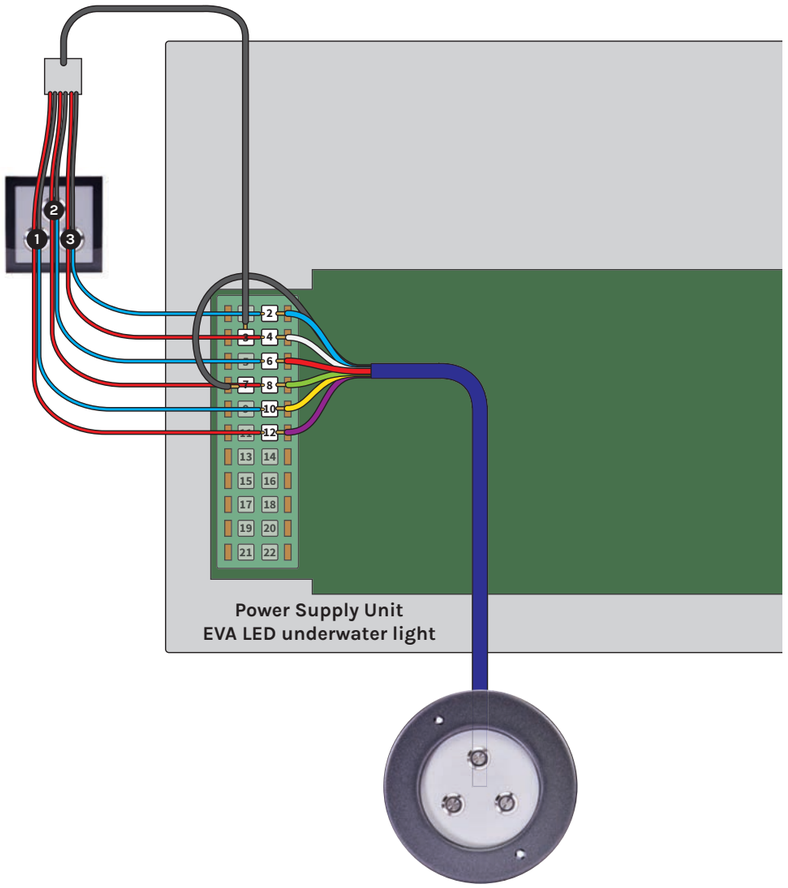
The ECA Print provides the control (master). If control with the EVA Piezo is desired, it must be connected to the ECA Print.

6.2 EVA-AA-75 / EVA-AA-77



Connect the DMX cable (2-wires + shield) from the Control Print of the PSU (14,16,18) to the EVA-AA-75 or EVA-AA-77 on the indicated numbers.

6.3 EVA Piezo - only using underwater lighting (no EVAstream)



General

- You can install only an EVA Piezo3 or SQ3, or you can install both.
- You can put multiple cables into one port.
- Always check the wire coloring of the EVA Piezo and 12Vdc polarity before installation.

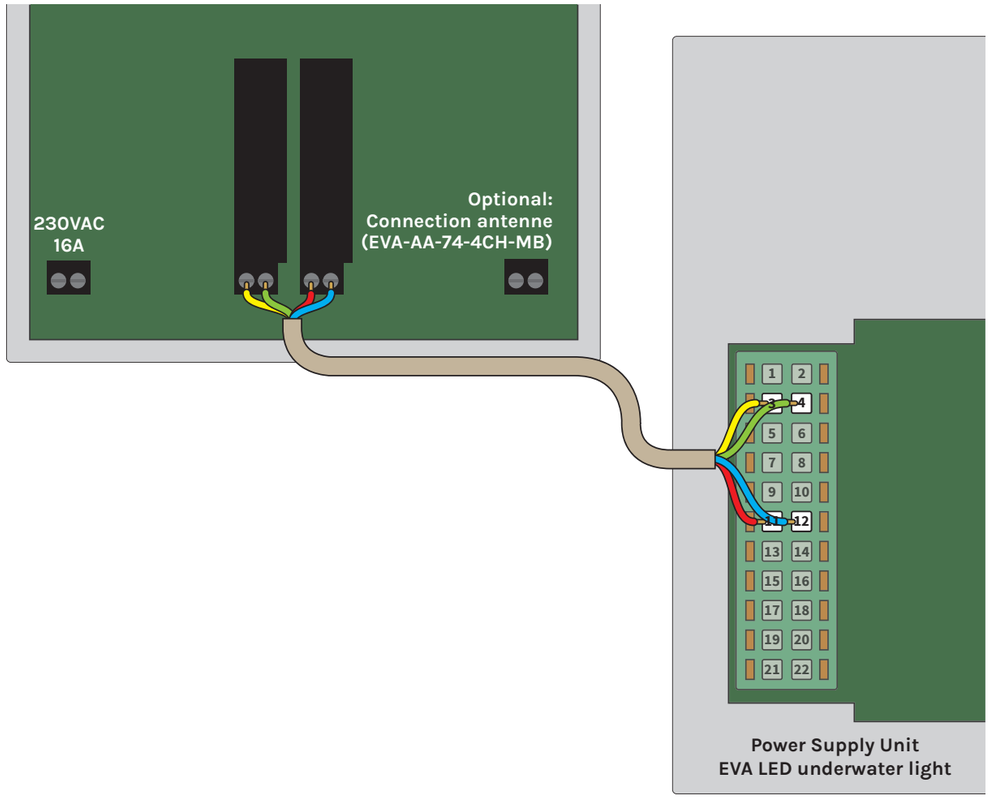
EVA Piezo3

- Connect the 7-wired cable from the EVA Piezo3 to the Control print of the PSU on the indicated numbers (2,4,6,7,8,10,12)

Piezo SQ3

- Connect the blue and one of the red cables from the EVA Piezo SQ3 to the Control print of the PSU.
- Combine the black and the remaining red cables from the EVA Piezo SQ3 and connect to the Control print of the PSU.

6.4 EVA-AA-74

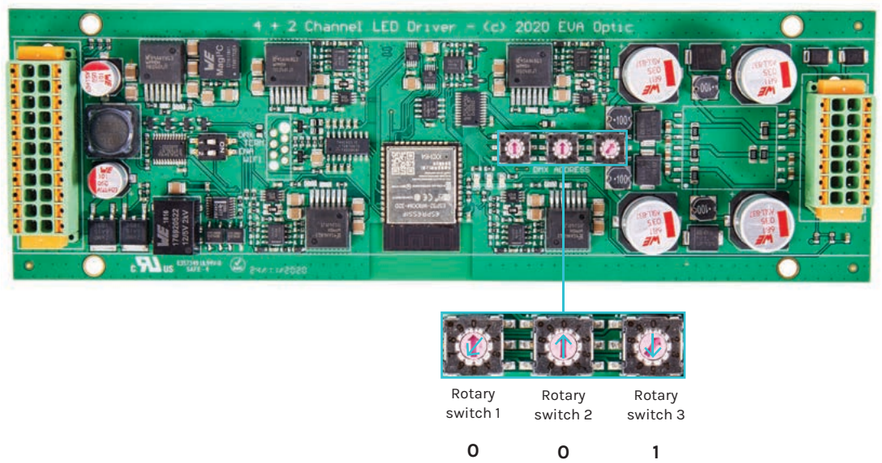


Connect the 4-wired 4* 0,5 mm2 cable from the Control Print of the PSU to the Control Print of the EVA-AA-74 on the indicated numbers (3,4,11,12).

7 PCB Settings

7.1 EVA LED underwater lighting controlled by DMX

In case of external master control (DMX advanced controller: EVA-AA-75 or EVA-AA-77) or the EVAstream / EVA Experience web app the Control Print must set in slave mode (001).



Setting the Control Print:
Set the Rotary switches at **001**

Functions:
When the rotary switches of the Control print are set to 001, the EVA-AA-75, EVA-AA-77 and EVA Experience web app have the following functions:



EVA-AA-75 control options:
Button 1: On / Off
Button 2: Light scene Previous
Button 3: Light scene Next



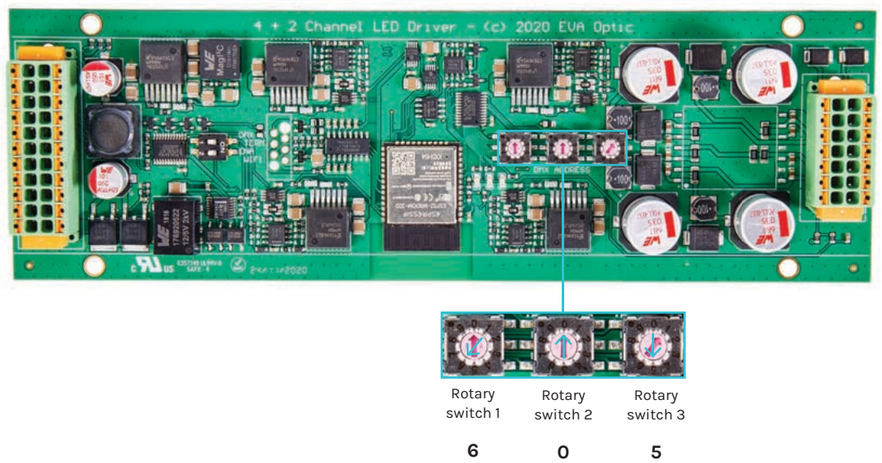
EVA AA-77 control options:
Button 1: Select Zone (Zone 3: EVA poollight - choose the light color or light show).
Button 2: Intensity: dimming lighting.
Button 3: Duration: extending or shortening a light scene (light show Fade or Jump).
Button 4: Colour: to adjust the color of the underwater lighting.



EVA Experience web app
See User manual EVA Experience web app (www.evaoptic.com/support/download).

7.2 EVA LED underwater lighting controlled by EVA Piezo or EVA-AA-74

Use the following settings when the EVA LED underwater light is only controlled by EVA Piezo or EVA-AA-74 inside or outside the pool.



Setting the Control Print:
Set the Rotary switches at **605 for Sequence scenes (with scene memory):**
White / Sky blue / Blue / Mediterranean / Green / Red / Purple / Colour show fade / Colour show jump

Functions:
When the rotary switches of the Control Print are set to 605 or 615, the EVA Piezo and EVA-AA-74 has the following functions:



EVA Piezo control options:
Button 1: Light scene Next
Button 2: Light scene Previous
Button 3: On / Off



EVA AA-74 control options:
Button 1: Color change
Button 2: On / Off

8 Disposal

8.1 Decommissioning

⚠ WARNING

Electrical shock hazard. Risk of electric shock and injury. Make sure to disconnect the product from the mains cable before decommissioning.

1. Switch off the power.
2. Switch off the power around the swimming pool.
3. Disconnect the mains cable.
4. Disconnect all other cables.

8.2 Disposal

Before disposing of the different materials, separate them into recyclables, normal waste and special waste. Comply with local legal regulations and provisions when disposing the product and the individual components. A product marked with the WEEE symbol must be sent for separate collection of electrical and electronic devices. Contact your supplier for more information.

Attachments

Overview of the EVA LED Driver 22-pin connection

Function	Type	Port		Type	Function
Piezo 3 LED 12Vdc	-	1	2	+	Piezo 3 LED 12Vdc
Piezo 3 switch	sw	3	4	sw	Piezo 3 switch
Piezo 2 LED 12Vdc	-	5	6	+	Piezo 2 LED 12Vdc
Piezo 2 switch	sw	7	8	sw	Piezo 2 switch
Piezo 1 LED 12Vdc	-	9	10	+	Piezo 1 LED 12Vdc
Piezo 1 switch	sw	11	12	sw	Piezo 1 switch
DMX G (shield)	G	13	14	G	DMX G (shield)
DMX in/out	-	15	16	-	DMX in/out
DMX in/out	+	17	18	+	DMX in/out
24 Vdc in/out	-	19	20	-	
24 Vdc in/out	+	21	22	+	

Overview of the EVA LED Driver 14-pin connection

Function	Type	Port		Type	Function
CH6 = 0/1VDC	+	1	2	-	CH6 = 0/1VDC
CH5 = 0/1VDC	+	3	4	-	CH5 = 0/1VDC
CH4 = WHITE	+	5	6	-	CH4 = WHITE
CH3 = BLUE	+	7	8	-	CH3 = BLUE
CH2 = GREEN	+	9	10	-	CH2 = GREEN
CH1 = RED	+	11	12	-	CH1 = RED
NTC	+	13	14	-	NTC

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