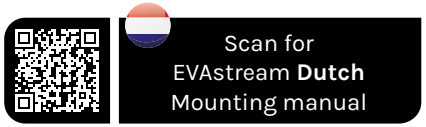
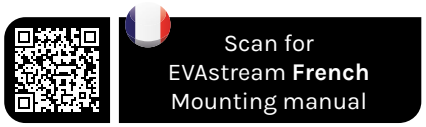
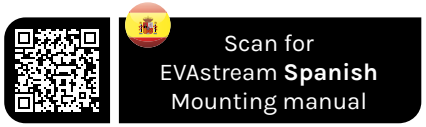
EVAstream

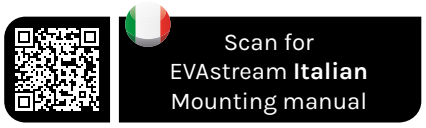
MOUNTING MANUAL

A step-by-step guide to mounting the EVAstream









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1. ABOUT THIS MANUAL

1.1 Language

This manual is meant for qualified installers. Read and understand the information in this manual before mounting and using this product. The original language of this manual is English. All versions of this manual in other languages are translations of the original manual.

1.2 Symbols used

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 mains before connecting all loose wires properly.
- Always disconnect the product from the mains before servicing.

WARNING

Electrical shock hazard. Risk of electric shock due to current leakage.

- Make sure to install the turbine with a PE-earthing.
- It's important to connect the installation niche to the pool earthing, never to the house earthing.

NOTICE

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

- Never place control and power cables together in one conduit, according the Electrical Standards.

2.2 General safety instructions

Follow the NEN1010 guidelines. Follow the specific installation requirements of IEC 60364-7-702: 2010 (Electric low-voltage installations - Part 7-702: Requirements for special installations, spaces, and areas – Swimming pools and fountains). Install the controller in or outside of zone 2 (NOT in zones 0 or 1) according to IEC 60364-7-702: 2010. The power supply must be equipped with an earth leakage circuit breaker (ELCB) with a nominal differential current ≤ 30mA.

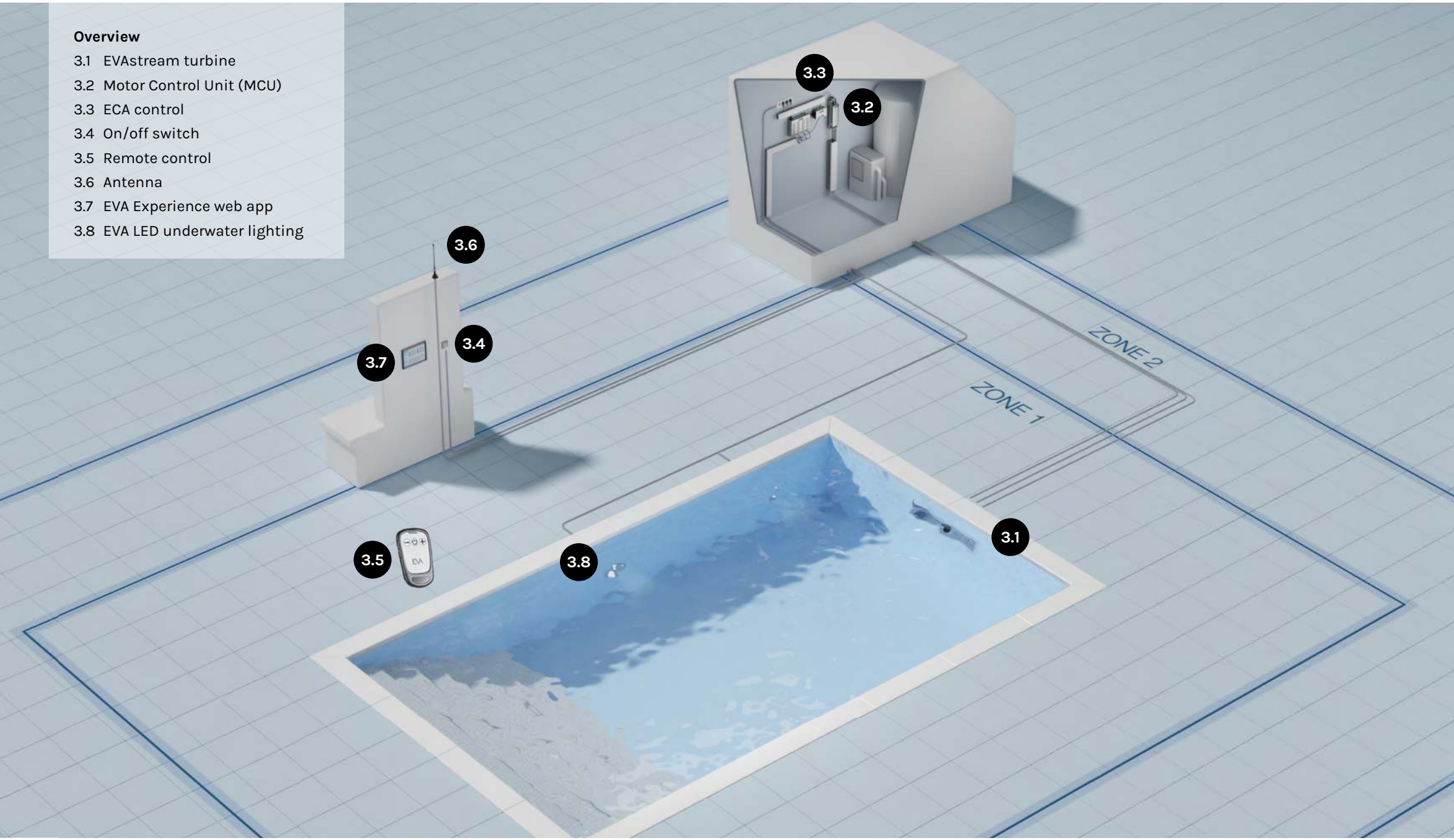
The EVAstream was developed as a counter-current swimming machine for use in a swimming pool. Use for any other purpose is not permitted. Requests for exceptions to this should be submitted to the manufacturer for technical analysis. Only after written approval by EVA Tech B.V. may the EVAstream be applied in any other way than as prescribed in this document.

The general terms and conditions of EVA Tech B.V. apply to all our offers and agreements. EVA Tech B.V. expressly rejects the applicability of the general (purchasing) conditions of counterparties. The warranty provisions of the EVAstream and the general terms and conditions of EVA Tech B.V. can be found at **www.evastream.nl**

3. PRODUCT

Overview

3.1 EVAstream turbine
3.2 Motor Control Unit (MCU)
3.3 ECA control
3.4 On/off switch
3.5 Remote control
3.6 Antenna
3.7 EVA Experience web app
3.8 EVA LED underwater lighting



3.1 + 3.2 EVAstream turbine + MCU

Recreational swimmer

	EVAstream NEXT 175	EVAstream NEXT 225
Recommended use	Recreational swimmer	Recreational swimmer
Water flow capacity	35 - 175 m^3/h (adjustable flow)	45 - 225 m^3/h (adjustable flow)
Volume displacement	0,8 - 4,3 m/s	1,1 - 5,5 m/s
Max. waterflow speed swimzone	2:15 sec. per 100 meter	1:40 sec. per 100 meter
Minimum pool dimensions	4,5 x 2,5 meter (lxb)	4,5 x 2,5 meter (lxb)
Warranty	2-3 years factory warranty*	2-3 years factory warranty*

* Register your product at www.evaoptic.com for 3 years warranty

Turbine		
Number of turbines	1 turbine	1 turbine
Cable type	3x1x16 mm^2	3x1x16 mm^2
Cable length	8 meter, extendable to max. 35 meters	8 meter, extendable to max. 35 meters
IP rating	IPX8	IPX8
Motor type	Brushless motor	Brushless motor
Water temperature	5°C to 35°C	5°C to 35°C

Motor Control Unit		
Dimensions	284 x 90 x 82 mm (lxbxh)	290 x 105 x 91 mm (lxbxh)
IP rating	IP 20	IP 20
Working temperature	-20°C to 32°C, dry and condensation-free area	-20°C to 32°C, dry and condensation-free area
Safety measures	Short circuit, overload, over voltage, over temperature, EVA Torque control, Voltage/current control, Mosfet temperature control	

Electrical specifications input		
Connection voltage (Vac)	90-264 Vac	90-264 Vac
Frequency range	47 - 63 Hz	47 - 63 Hz
Nominal current (A)	3A 230 Vac	4A 230 Vac
Power consumption VA (PF > 0.95)	600W	900W
Standby power consumption (W)	5W	5W
PPM input	PPM1	PPM2

Electrical specifications output		
Turbine output	BLDC	BLDC
Turbine connection power supply	3x1x16 mm^2	3x1x16 mm^2
Nominal voltage (Vdc)	24 Vdc	24 Vdc
Nominal current (A)	23A	35A
Output power sharing	Not available	Not available

3.1 + 3.2 EVAstream turbine + MCU

Experienced swimmer

	EVAstream NEXT 275	EVAstream NEXT 450
Recommended use	Experienced swimmer	Experienced swimmer
Water flow capacity	55 - 275 m^3/h (adjustable flow)	90 - 450 m^3/h (adjustable flow)
Volume displacement	1,3 - 6,7 m/s	2x 1,1 - 5,5 m/s
Max. waterflow speed swimzone	1:25 sec. per 100 meter	1:15 sec. per 100 meter
Minimum pool dimensions	4,5 x 2,5 meter (lxb)	4,5 x 2,5 meter (lxb)
Warranty	2-3 years factory warranty*	2-3 years factory warranty*

* Register your product at www.evaoptic.com for 3 years warranty

Turbine		
Number of turbines	1 turbine	2 turbines
Cable type	3x1x16 mm^2	3x1x16 mm^2
Cable length	8 meter, extendable to max. 30 meters	8 meter, extendable to max. 25 meters
IP rating	IPX8	IPX8
Motor type	Brushless motor	Brushless motor
Water temperature	5°C to 35°C	5°C to 35°C

Motor Control Unit		
Dimensions	380 x 90 x 96 mm (lxbxh)	360 x 182 x 117 mm (lxbxh)
IP rating	IP 20	IP 20
Working temperature	-20°C to 32°C, dry and condensation-free area	-20°C to 32°C, dry and condensation-free area
Safety measures	Short circuit, overload, over voltage, over temperature, EVA Torque control, Voltage/current control, Mosfet temperature control	

Electrical specifications input		
Connection voltage (Vac)	90-264 Vac	180-264 Vac
Frequency range	47 - 63 Hz	47 - 63 Hz
Nominal current (A)	6A 230 Vac	9A 230 Vac
Power consumption VA (PF > 0.95)	1300W	1800W
Standby power consumption (W)	40W	80W
PPM input	PPM2	PPM2

Electrical specifications output		
Turbine output	BLDC	BLDC
Turbine connection power supply	3x1x16 mm^2	3x1x16 mm^2
Nominal voltage (Vdc)	24 Vdc	24 Vdc
Nominal current (A)	50A	2x 35A
Output power sharing	24 Vdc 100W	24 Vdc 100W

3.1 + 3.2 EVAstream turbine + MCU

Professional swimmer

	EVAstream NEXT 350	EVAstream NEXT 550
Recommended use	Professional swimmer	Professional swimmer
Water flow capacity	70 - 350 m³/h (adjustable flow)	110 - 550 m³/h (adjustable flow)
Volume displacement	1,7 - 8,6 m/s	2x 1,3 - 6,7 m/s
Max. waterflow speed swimzone	1:10 sec. per 100 meter	1:05 sec. per 100 meter
Minimum pool dimensions	4,5 x 2,5 meter (lxb)	4,5 x 2,5 meter (lxb)
Warranty	2-3 years factory warranty*	2-3 years factory warranty*

* Register your product at www.evaoptic.com for 3 years warranty

Turbine		
Number of turbines	1 turbine	2 turbines
Cable type	3x1x16 mm²	3x1x16 mm²
Cable length	8 meter, extendable to max. 25 meters	8 meter, extendable to max. 25 meters
IP rating	IPX8	IPX8
Motor type	Brushless motor	Brushless motor
Water temperature	5°C to 35°C	5°C to 35°C

Motor Control Unit		
Dimensions	380 x 90 x 96 mm (lxbxh)	360 x 182 x 117 mm (lxbxh)
IP rating	IP 20	IP 20
Working temperature	-20°C to 32°C, dry and condensation-free area	-20°C to 32°C, dry and condensation-free area
Safety measures	Short circuit, overload, over voltage, over temperature, EVA Torque control, Voltage/current control, Mosfet temperature control	

Electrical specifications input		
Connection voltage (Vac)	90-264 Vac	
Frequency range	47 - 63 Hz	180-264 Vac
Nominal current (A)	8A 230 Vac	47 - 63 Hz
Power consumption VA (PF > 0.95)	1700W	12A 230 Vac 2600W
Standby power consumption (W)	40W	
PPM input	PPM2	80W PPM2

Electrical specifications output		
Turbine output	BLDC	
Turbine connection power supply	3x1x16 mm²	BLDC
Nominal voltage (Vdc)	24 Vdc	3x1x16 mm²
Nominal current (A)	65A	24 Vdc 2x 50A

Safety standards EVAstream turbine

EVAstream was built for speed and safety. Safety measures were taken to ensure safety of fingers, toes and also hair. EVAstream complies to safety standards DIN EN16582-1/2/3, EN16713-2 (residential pools) and EN13451-1/3 (commercial pools).

Safety standards Power Supply Unit

SELV, UL62368-1, CSA C22.2 No. 62368-1, TUV EN62368-1 + A11, EAC TP TC 004, BSMI CNS14336-1 approved, EN55032 (CISPR32) Class A/B, EN61000-3-2/3, EN61000-4-2/3/4/5/6/8/11, EN55024 , EN61204-3, EN61000-6-2, BSMI CNS13438.

3.3 ECA Control

	ECA Control Eco	ECA Control 1 Essential	ECA Control 2 Training	ECA Control 3 ProTrainer
Suitable for EVAstream type	EVAstream NEXT 175	EVAstream NEXT 225 - 275 - 350 EVAstream NEXT 450 - 550	EVAstream NEXT 225 - 275 -350 EVAstream NEXT 450 - 550	EVAstream NEXT 225 - 275 -350 EVAstream NEXT 450 - 550
Available EVA web app functions	Start / stop Speed / timer	Start / stop Speed / timer	Start / stop Speed / timer 3 swim workouts	Start / stop Speed / timer 20 swim workouts
Connection EVA LED underwater lighting	Not available	Optional (extension)	Optional (extension) Compatible with swim workouts	Optional (extension) Compatible with swim workouts
Connection EVA Remote control	Optional (extension)	Optional (extension)	Optional (extension)	Optional (extension)
ECA Unit				
Dimensions	158 x 119 x 75 mm (lxbxh)	158 x 119 x 75 mm (lxbxh)	158 x 119 x 75 mm (lxbxh)	158 x 119 x 75 mm (lxbxh)
IP rating	IP20	IP20	IP20	IP20
Working temperature	-20°C tot 32°C, dry/ condensation-free	-20°C tot 32°C, dry/ condensation-free	-20°C tot 32°C, dry/ condensation-free	-20°C tot 32°C, dry/ condensation-free
Warranty	2 years factory warranty	2 years factory warranty	2 years factory warranty	2 years factory warranty
Electrical specifications (input)				
Connection voltage (Vac)	230 Vac 5W	230 Vac 10W	230 Vac 10W	230 Vac 10W
Pulse input (piezo-ready)	Not available	3x Piezo ready	3x Piezo ready	3x Piezo ready
Electrical specifications (output)				
PPM output	PPM 1	PPM 2	PPM 2	PPM 2
Lighting control output	Not available	DMX	DMX - EVA	DMX - EVA
Fan output 5W (power box ventilation)	Not available	24 Vdc 5W	24 Vdc 5W	24 Vdc 5W

3.4 On/off switch

If the EVAstream is permanently connected to 230V mains, the installation must additionally be equipped with an on/off switch mounted near the swimming pool where the EVAstream is located.
After use, the power must be switched off.

3.5 Remote control

Electrical specifications - Receiver

Radio frequency band	433.92 MHz
Antenna	BNC connector, external antenna optional (preferably dipole antenna for DIN-receivers and 1/2 - or 1/4 antenna for wall mounting. The antenna is supplied as standard with a 10-metre cable.)

Electrical specifications - Remote control

Radio frequency band	433.92 MHz
On/off switch	included
IP-rating	IP67
Environmental conditions	-20°C to +55°C / -4°F to +130°F (humidity 10–90%)
Moisture	10–90%
Dimensions	65x 112 x 35 mm / 2.6 x 4.4 x 1.4 inch

3.6 Antenna

General specifications

Frequency	433.92 MHz
Weight	426 grams
Dimensions	33x195x33 mm
Range	50 m, in open field

3.7 EVA Experience web app

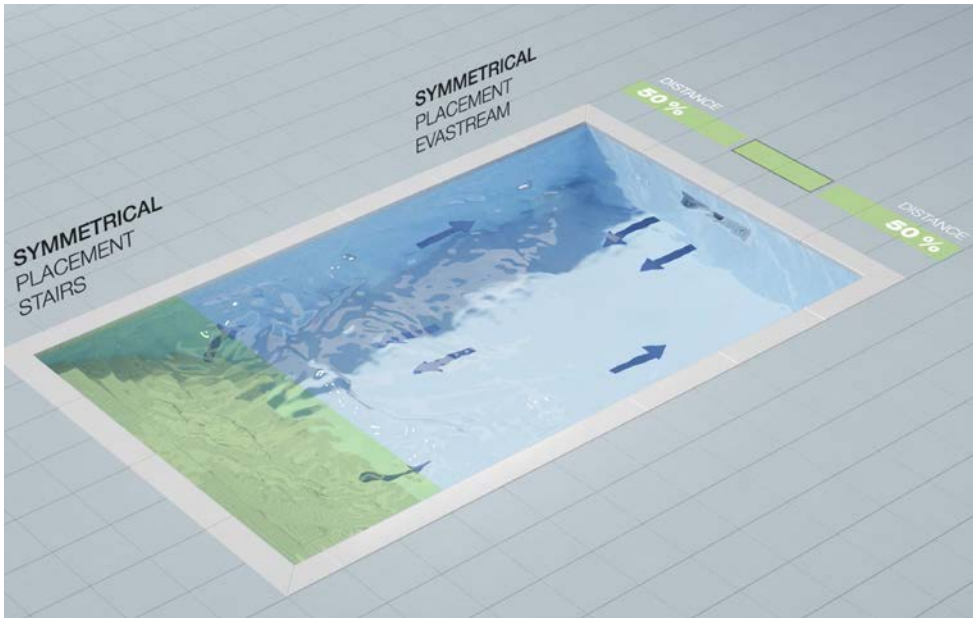
Use the EVA Experience web app to manage the EVAstream.
For instructions on how to set up the tablet environment, please refer to chapter 7.

3.8 EVA LED underwater lighting

The EVA RGBW LED underwater pool lighting completes the counter current pool experience. The underwater lighting guides you through the training. For instructions on how to set up the underwater lighting, please refer to the mounting & installation manual of the EVA LED underwater lighting.

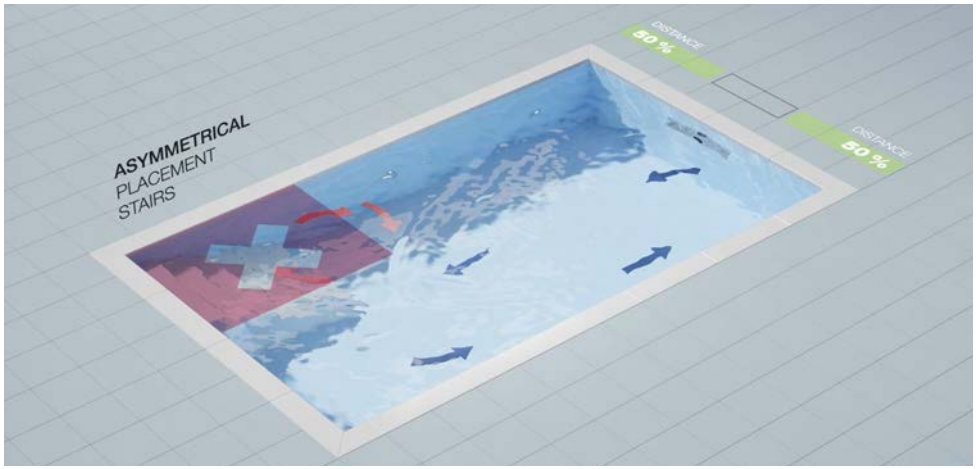
Scan the **QR-code** to go to the manual

4. SYMMETRICAL PLACEMENT OF THE EVASTREAM



The importance of symmetrical placement of the EVAstream

To create the optimal swimming experience for the customer, it is important to think carefully about the positioning of the EVAstream in the design phase, for example in relation to elements such as stairs and platforms. Such 'obstacles' can cause a less pleasant swimming experience. For optimal water flow, the EVAstream should be placed in the middle of the pool wall in a symmetrically designed pool.



Blockages in the water circulation

Suppose you have placed a staircase in the corner of the pool. As a result, the circulation of the flow is not equal on both sides of the pool, because the staircase influences the flow. The flow of the EVAstream is still just as powerful, but the user experiences the current as if it were faltering.

Flow with asymmetrical placement

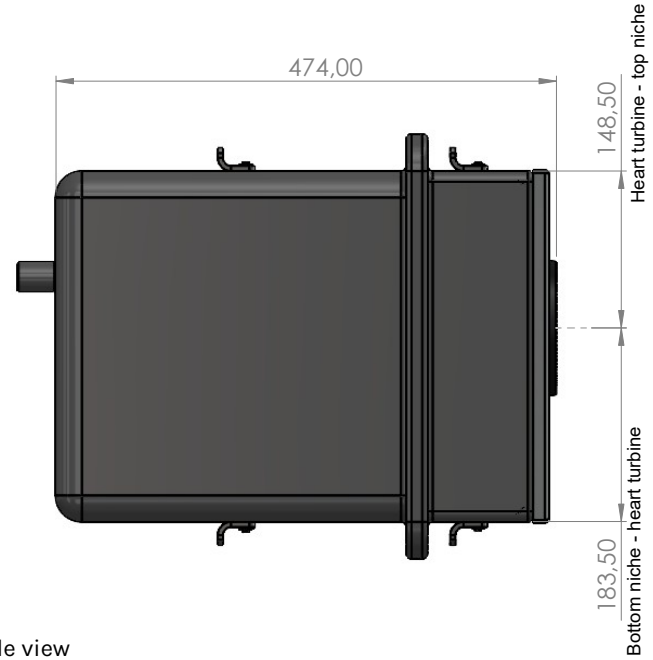
When a turbine is not placed symmetrically in the pool, the circulation of the current is not equal on both sides of the pool. The current of the EVAstream is still just as powerful, but it creates a kind of vortex in the middle of the pool.

5. MOUNTING THE EVASTREAM

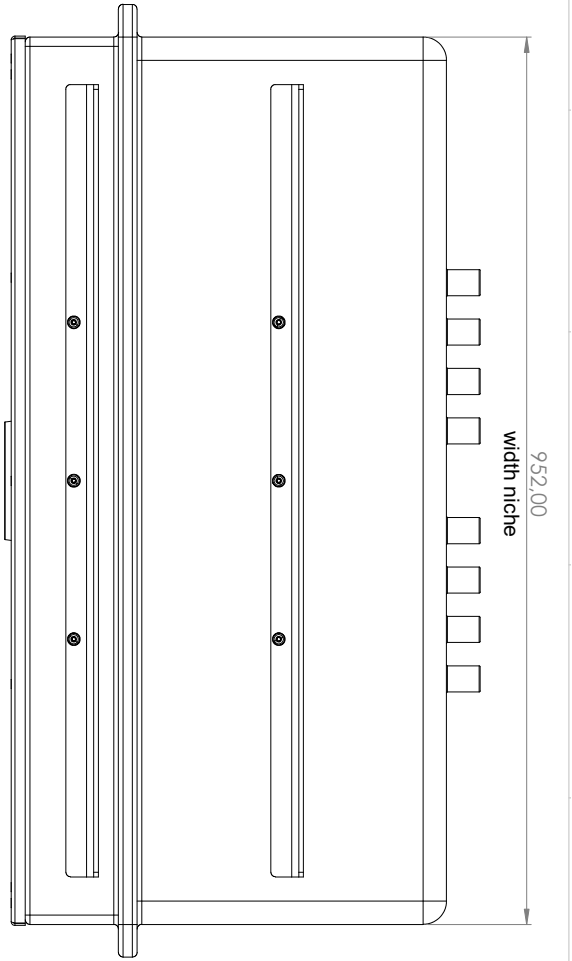
5.1 Mounting drawings

EVAstream installation niche PP

- Mounting depth: 250 mm below water level (centre of the turbine).
- Mount the EVAstream horizontally in the middle of the poolwall.



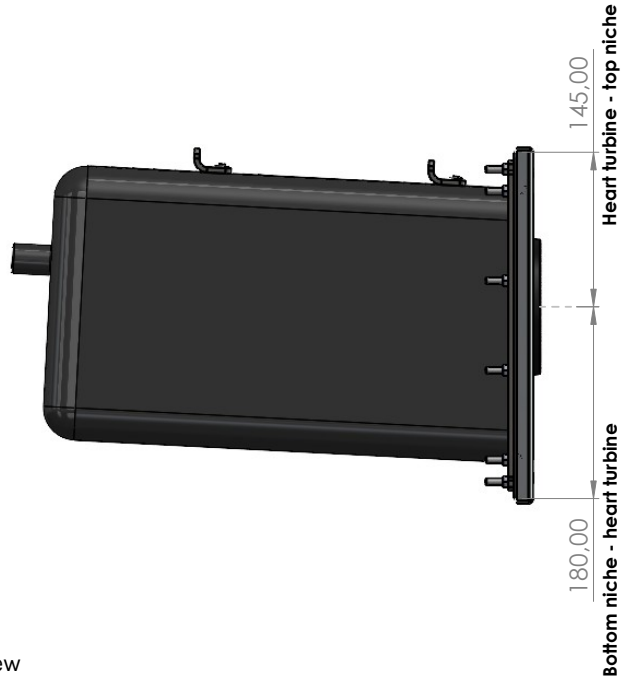
Side view



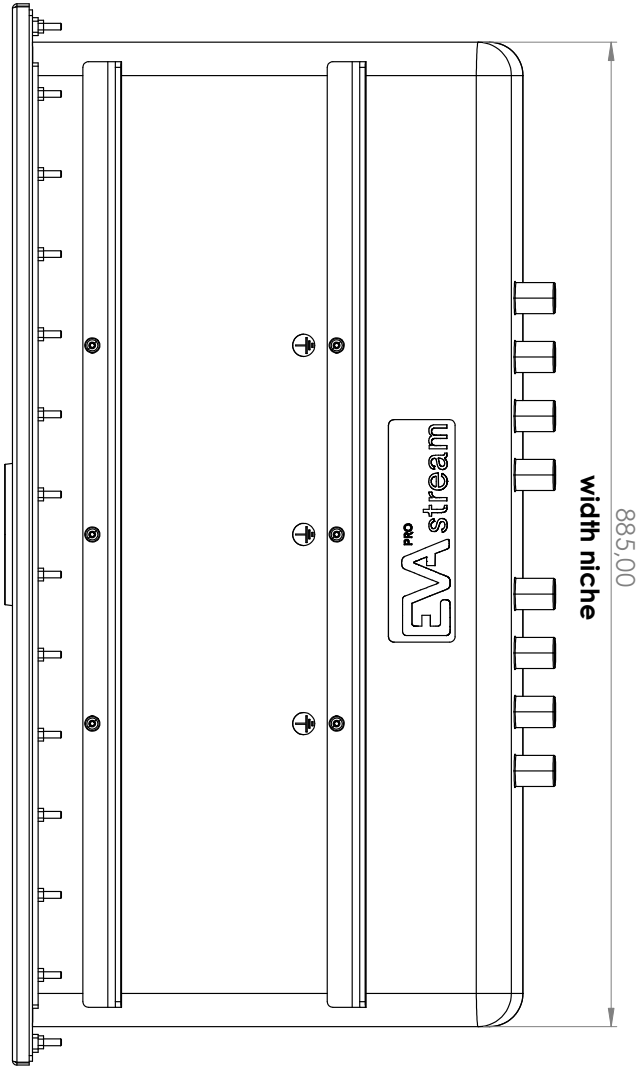
Top view

EVAstream installation niche POLY

- Mounting depth: 250 mm below water level (centre of the turbine).
- Mount the EVAstream horizontally in the middle of the poolwall.



Side view



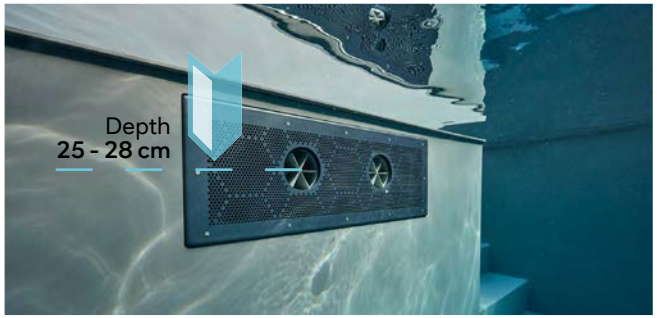
Top view

5.2 Placement of the EVAstream niche

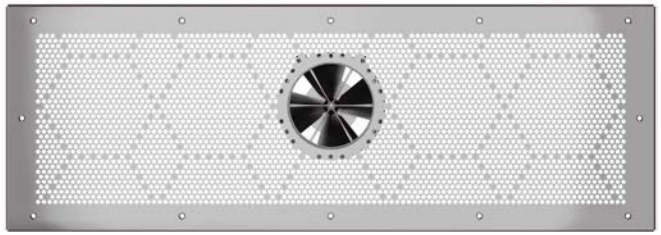
When installing the niche, always calculate the depth based on the final pool water level. The niche must be positioned so that the centre of the turbine is exactly 25 to 28 cm below the final pool water level.

Caution: Take this offset into account during installation, as incorrect depth placement directly affects counter-current performance and flow quality.

Installation Guidelines



Water Level: Position turbine centre exactly 25–28 cm below finished water level.



Turbine Depth: Please note that the turbine is not located in the centre of the niche.

Example calculation

PP niche for liner and concrete pools

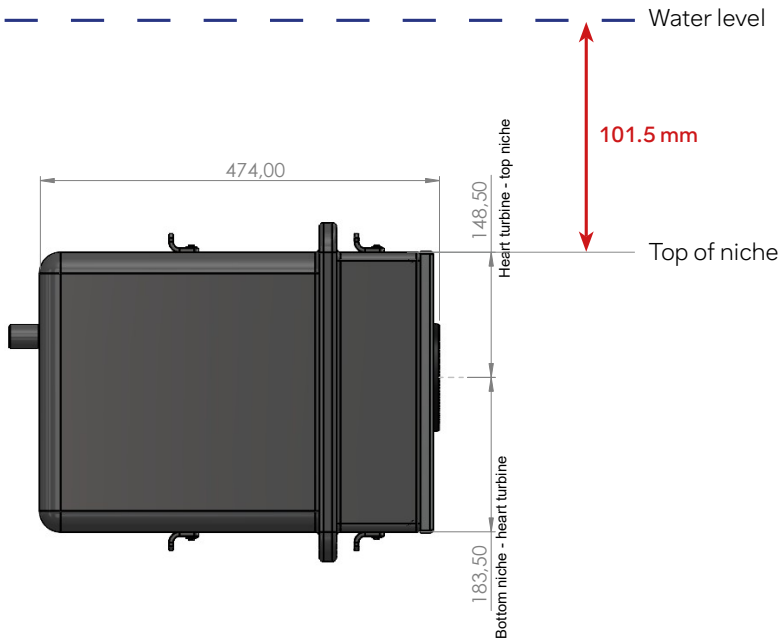
Required turbine depth below water level: **250 mm**
Distance from top of niche to turbine centre: **148.5 mm**

Calculation

250 - 148.5 = 101.5 mm

Result

Install the top of the niche 101.5 mm below the finished water level.



5.3 Remove the ribs

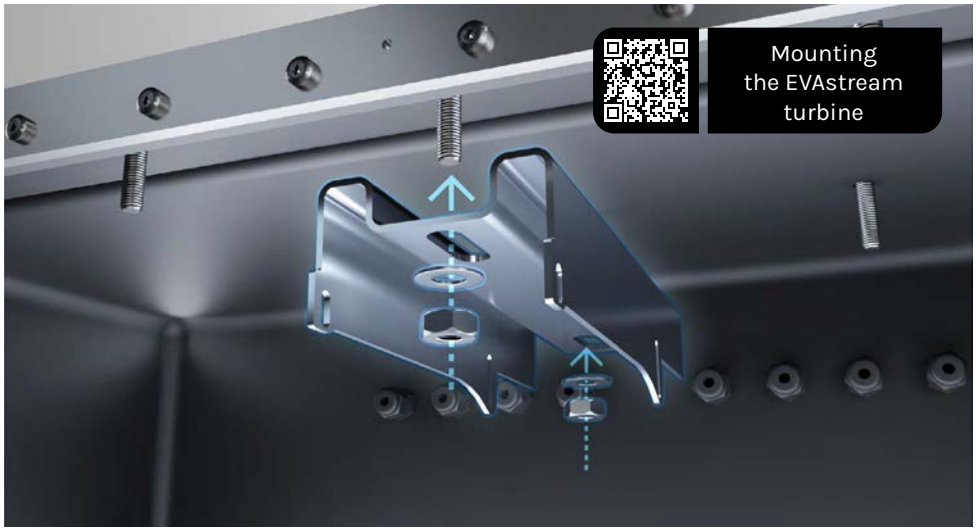
1. Remove the ribs with a saw suitable for plastic

Use a saw suitable for plastic and saw off the ribs along the blue dotted line.

2. Empty installation niche

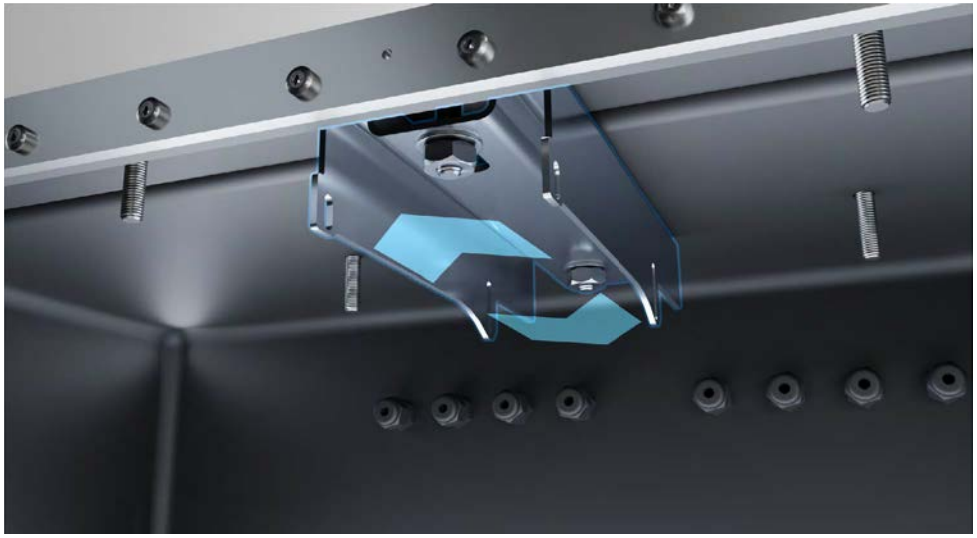
The installation niche is now completely empty and ready for mounting the turbine.

5.4 Mounting the EVAstream turbine



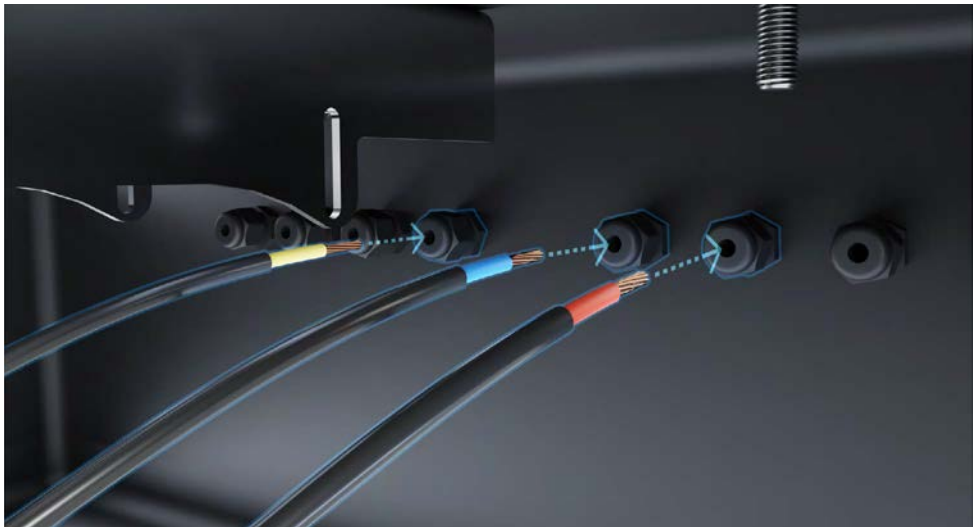
1. Mount the bracket in the niche

Use the washers and M12 nuts.



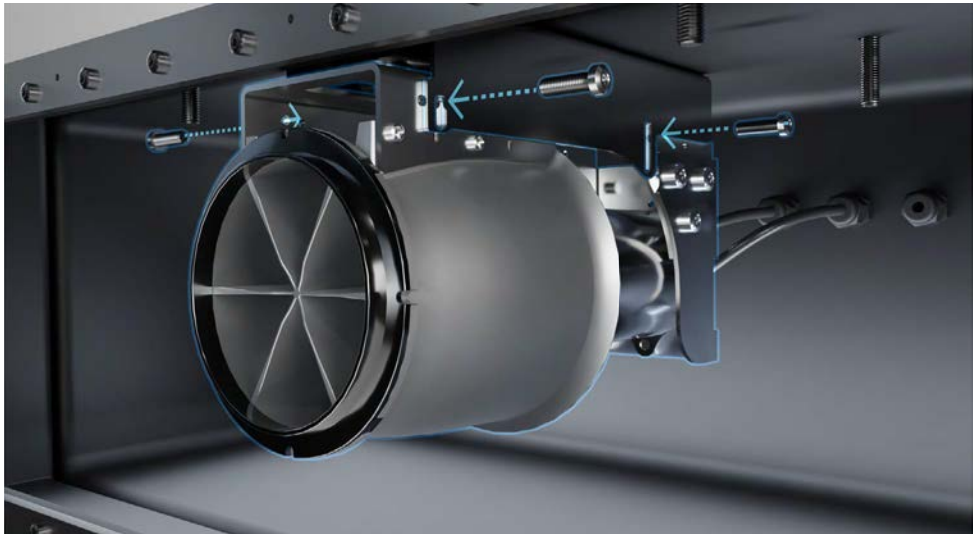
2. The bracket is still adjustable

Make sure the bracket can be moved forwards and backwards.



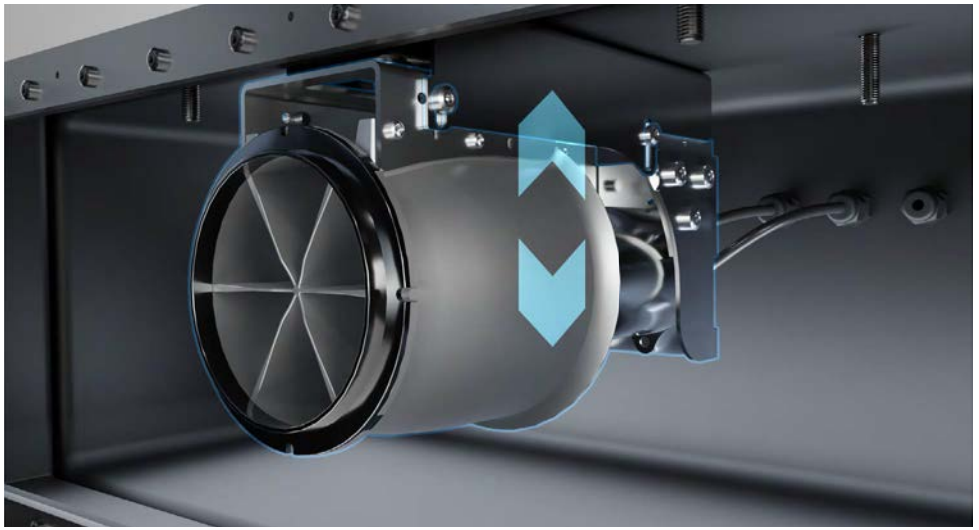
3. Put the turbine cables through cable glands

Use red, orange and black cables. Do not change the colours of the cables!



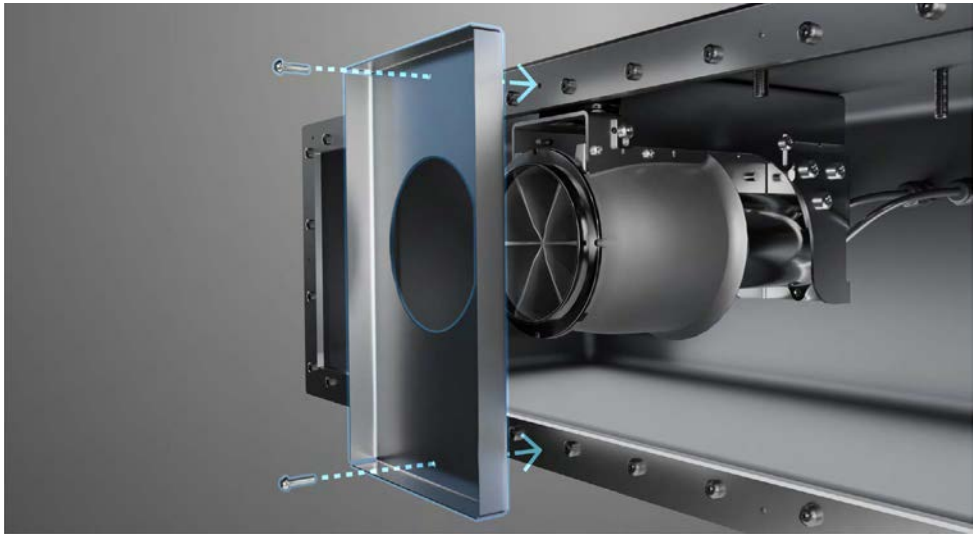
4. Mount the turbine to the bracket

Use the M6x10 screws.



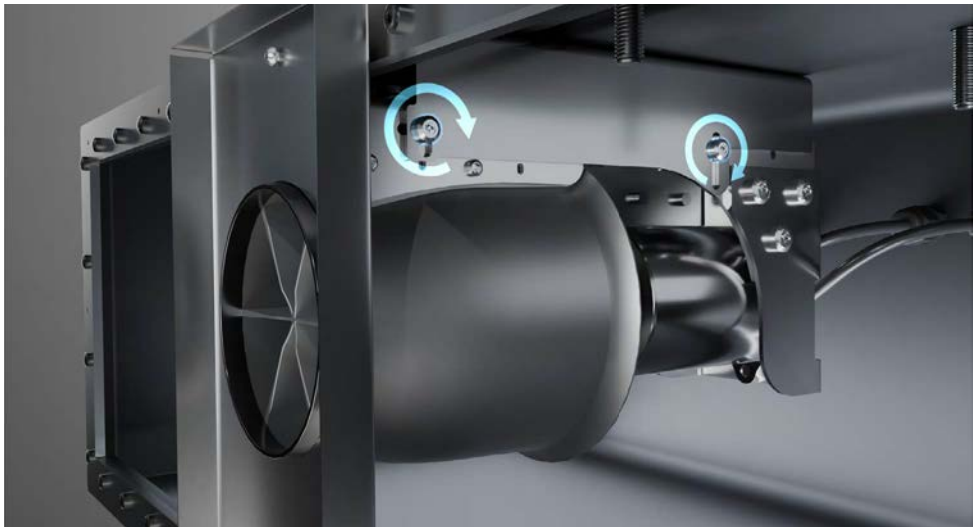
5. The turbine is still adjustable

Make sure the turbine can be moved up and down.



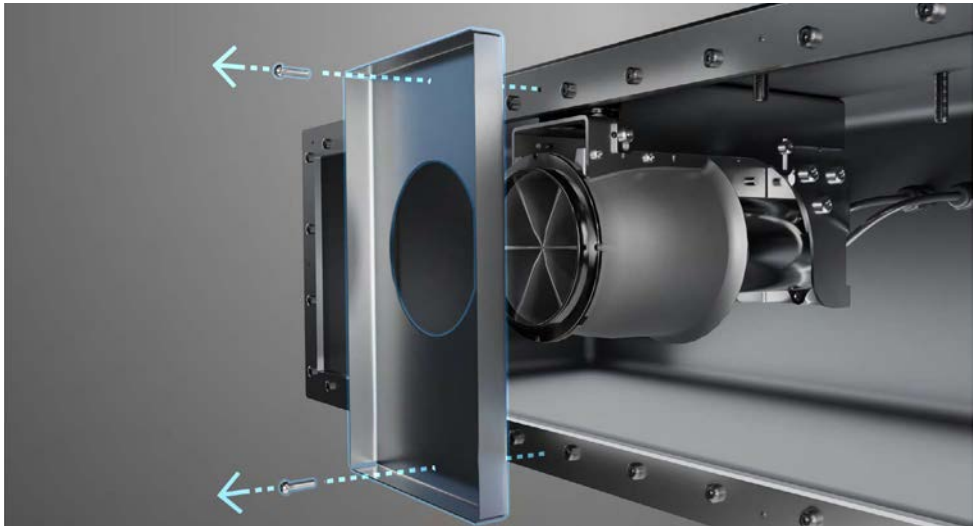
6. Mount the adjusting plate to the niche

To ensure the correct horizontal position of the turbine.



7. Tighten the turbine to the bracket

The front of the turbine must be pressed against the adjustment plate to ensure the correct position. Secure the turbine by tightening the screws.

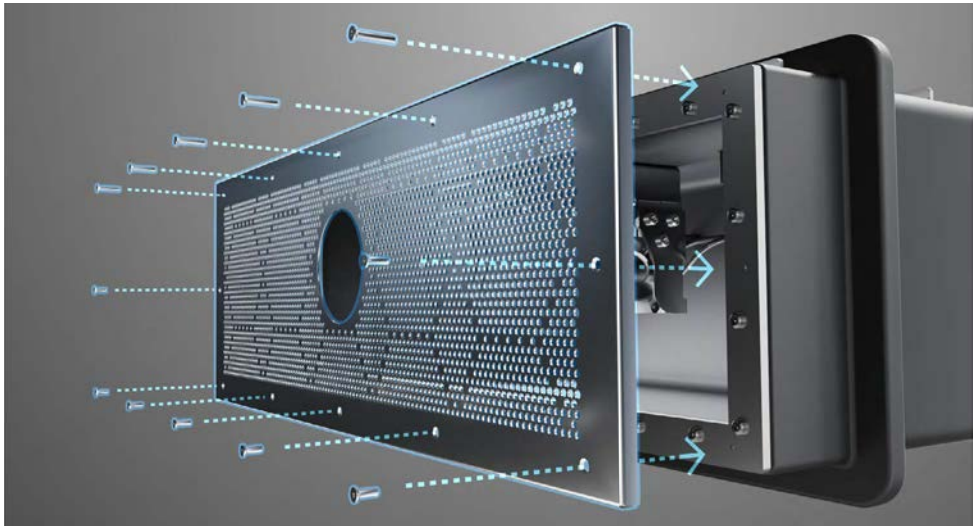


8. Remove the adjustment plate

This was only used to ensure the correct horizontal position of the turbine.

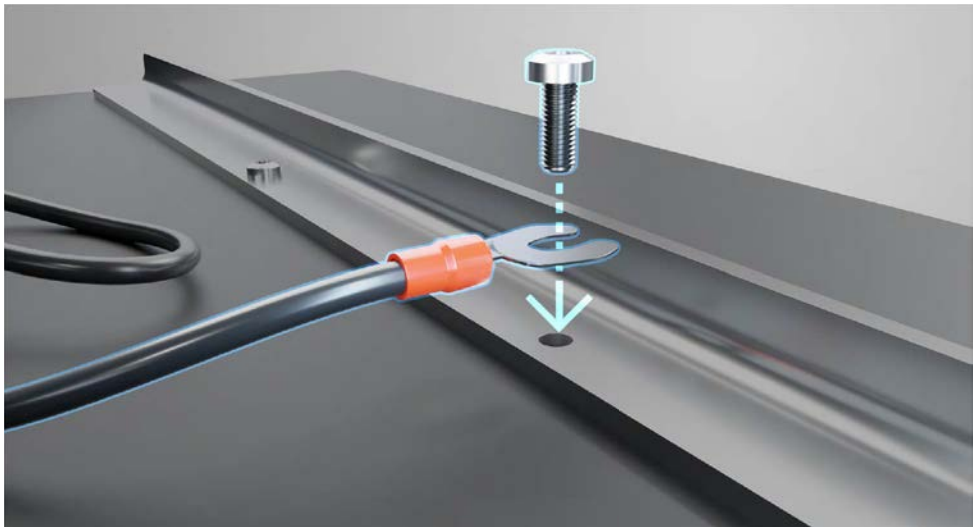
9. Tighten the bracket to the niche

Secure the bracket to the niche by tightening the nuts. The turbine is now set to the correct base height and completely fixed as mounted.



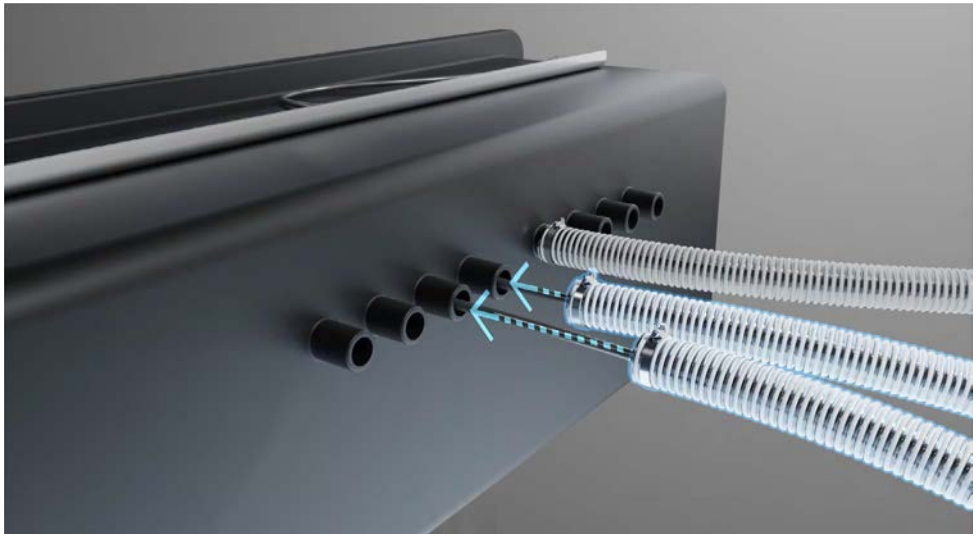
10. Mount the frontplate to the niche

Use the M5x12 screws with a stainless steel frontplate. Use the M5x16 screws with an ABS frontplate.



11. Earth the installation niche

The installation niche needs to be connected to the pool earthing on the top of the niche.



12. Mount the conduits

The cables need to be placed in separate conduits.

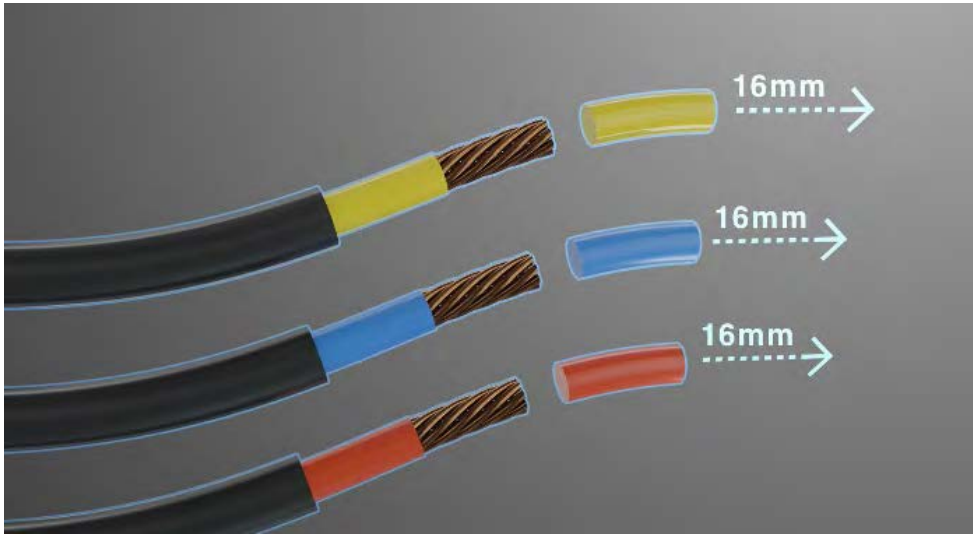
6. ELECTRICAL INSTALLATION

DANGER

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

Electrical installation

6.1 Connect the EVAstream turbine to the Motor Control Unit



1. Make sure the cables are properly finished

Dismantling length should be 16 mm.

2. Connect the cables from the EVAstream Turbine to the Motor Control Unit (MCU)

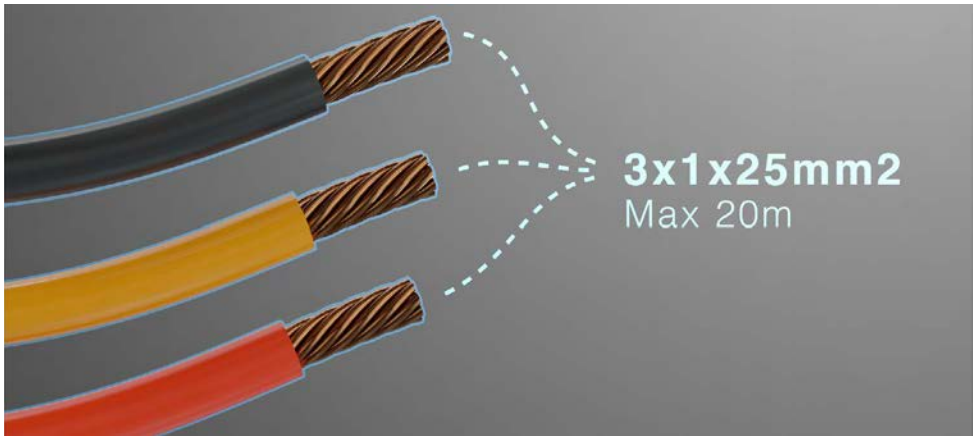
The cables need to be placed in separate conduits.

3. Insert the cables into their respective holders

Insert the red, yellow, and blue cable (do not alter the cable colors) and tighten them using a flat-head screwdriver.

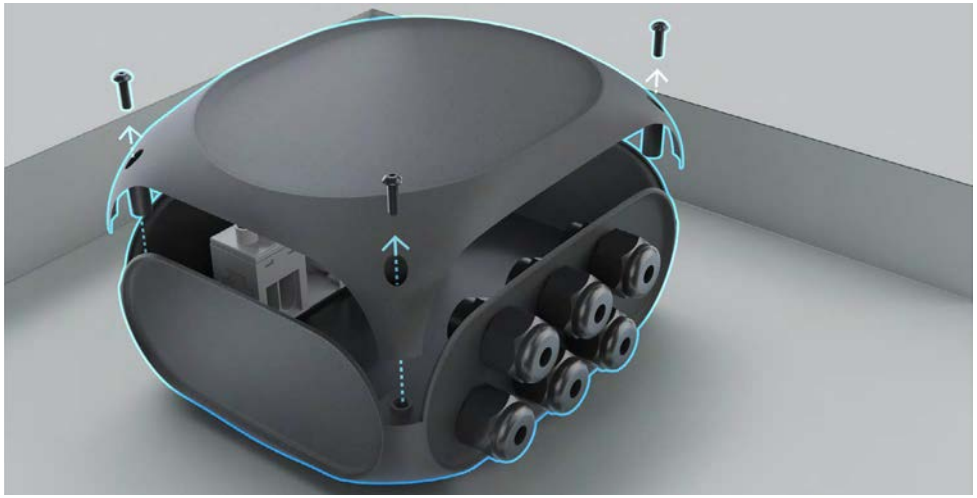
6.2 Optional: EVAstream Cable connection box

If the cables are not long enough, they can be extended. You can extend the cable from the Turbine to the Motor Control Unit using the EVA connection box.



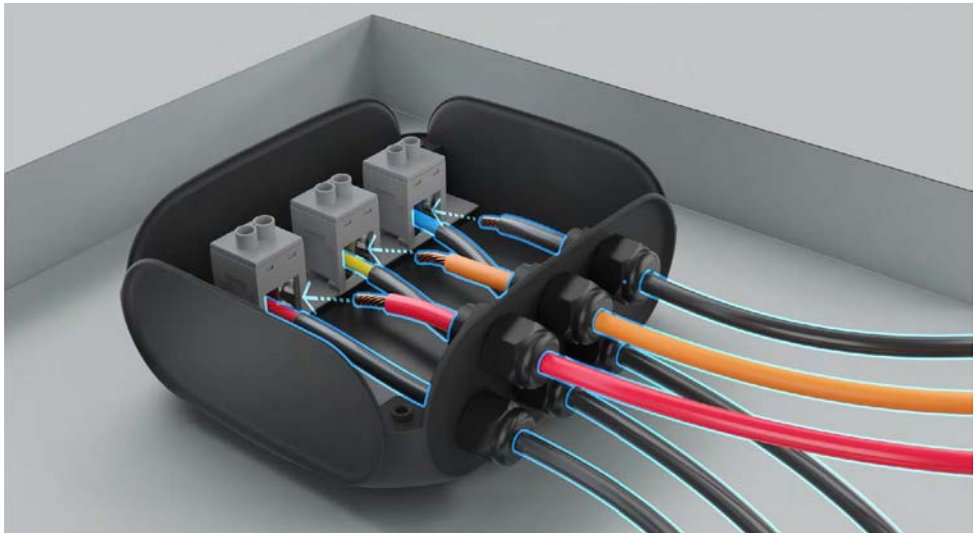
1. Choose your cable (flexible cable of fine copper wire stands)

- Use 3x1x16/25mm^2 cable to a maximum cable length of 20 meters (total maximal 25 meters including the existing cable).
- Use 3x1x25mm^2 cable to a maximum cable length of 30 meters (total maximal 35 meters including the existing cable).



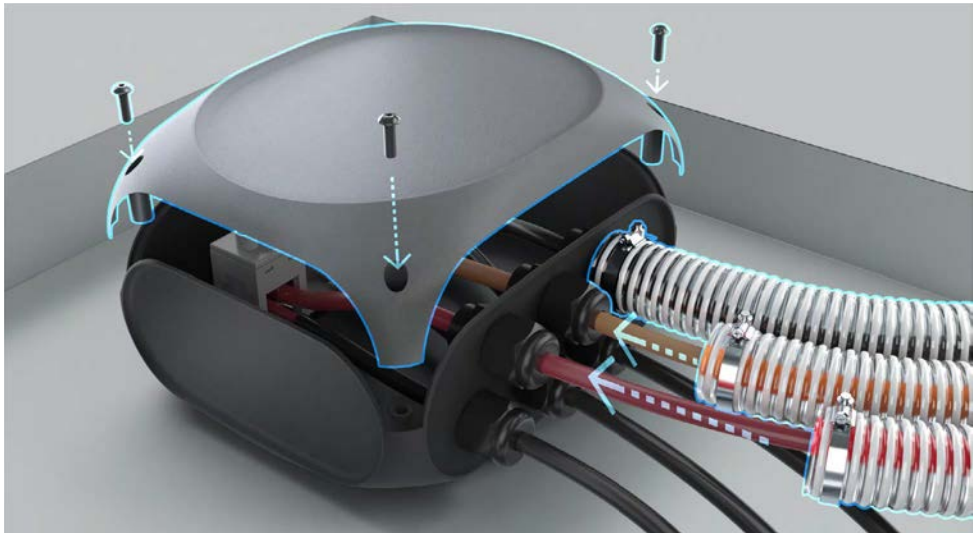
2. Place the EVA connection box

The cable connection box must be placed above the ground (accessible).



3. Connect the cables

Use red, orange and black cables. Do not change the colours of the cables!



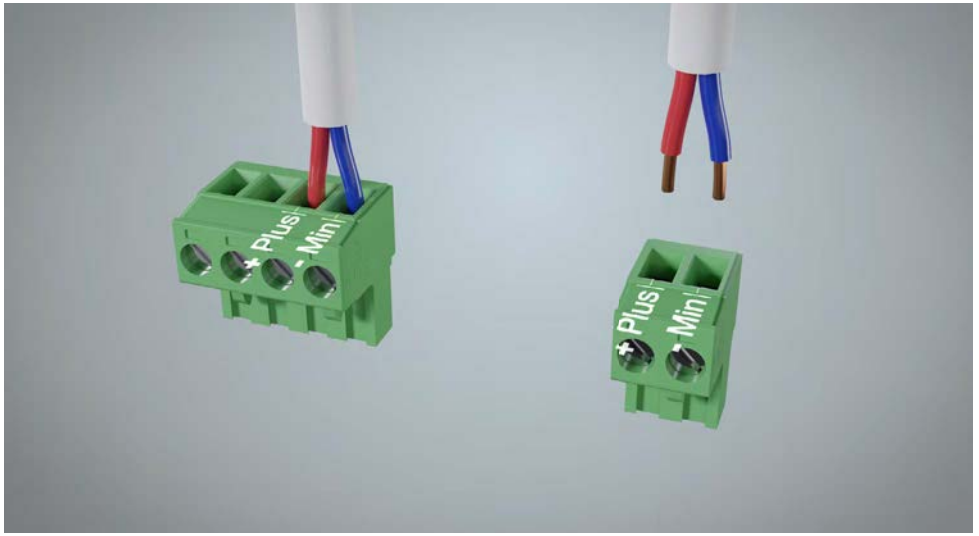
4. Mount the conduits

The cables need to be placed in separate conduits and the connection box closed.

6.3 Connect the ECA Control to the Motor Control Unit (MCU)

1.Connect the ECA Control to the Motor Control Unit (MCU)

Use the supplied 2-core signal cable.



2. If the supplied cable is not long enough, a longer cable can be installed

Important: connect plus to plus and minus to minus.

3. Install the antenna to the ECA control

If you use the remote control, install the antenna outside the technical room for optimal range.

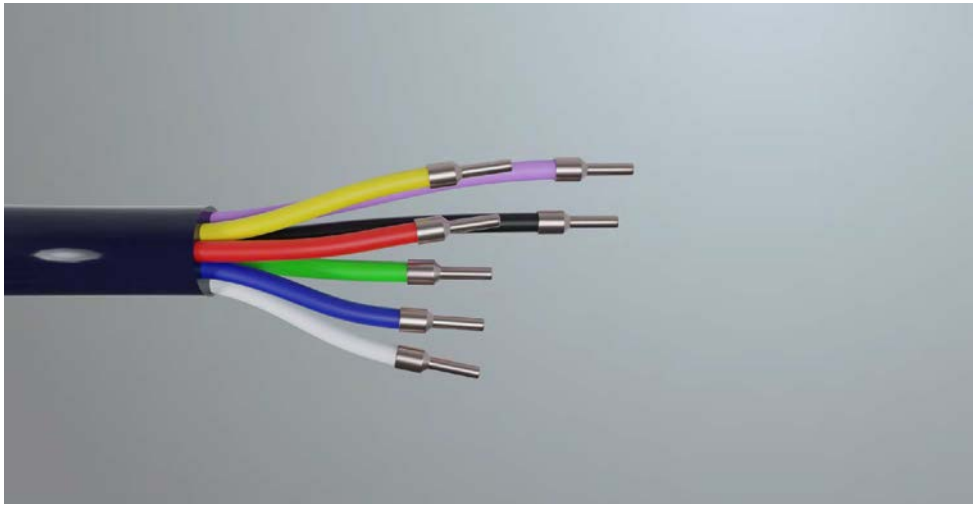
4. Additional options:

The ECA 1 Essential, 2 Trainer, and 3 ProTrainer models offer the following additional options:

- **DMX:** for connecting underwater lighting,
- **FAN:** for connecting an external fan,
- **3x Piezo:** for connecting Piezo buttons.

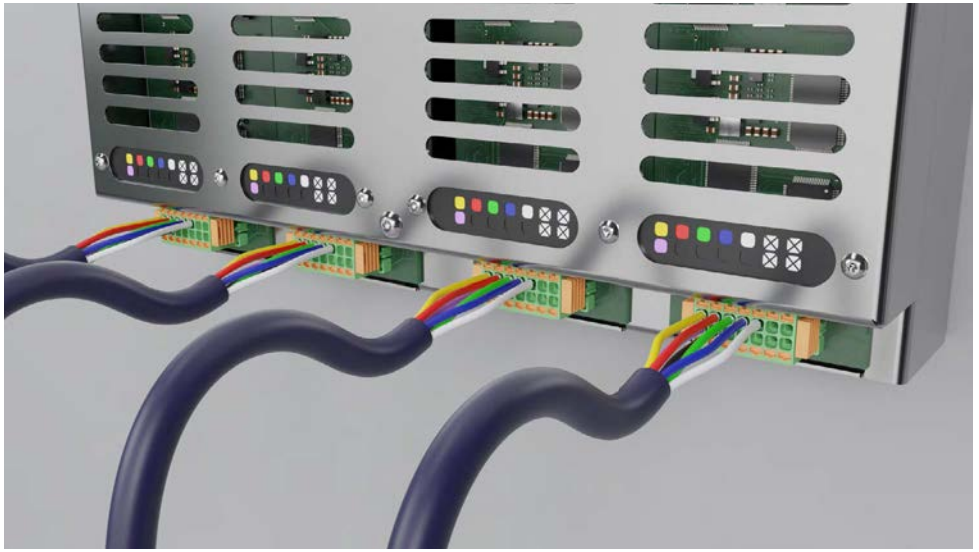
6.4 Optional: Connect the EVA LED underwater lighting Power Supply Unit (PSU) to the ECA Control

1. The PSU can accommodate 2, 3, or 4 underwater lights



2. Before connecting the cables, cable sleeves must be installed

Refer to the video “Connecting PSU RGBW” at www.evaoptic.com

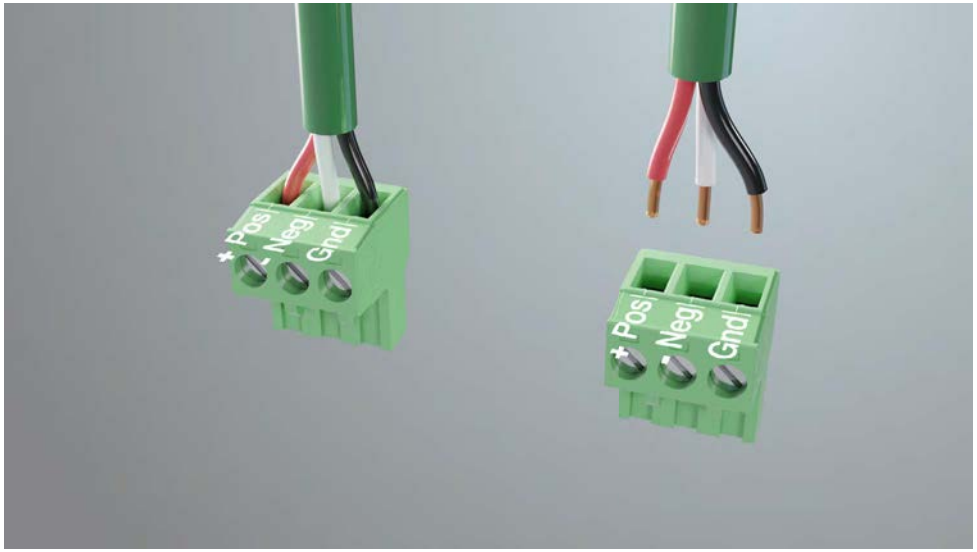


3. Connect the 7-core cables from the underwater lights to the PSU

Ensure they are inserted into the correct ports.

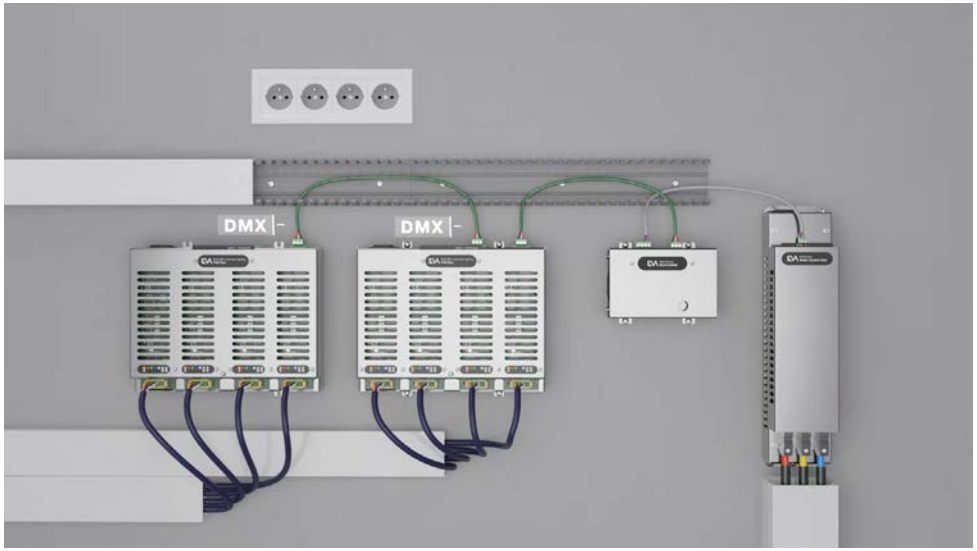
4. Connect the DMX cable from the PSU to the ECA Control

Use the supplied DMX cable.



5. If the supplied cable is not long enough, a longer cable can be installed

Ensure proper connections: connect the positive wire to the red cable, the negative wire to the white cable, and the ground wire to the black cable.



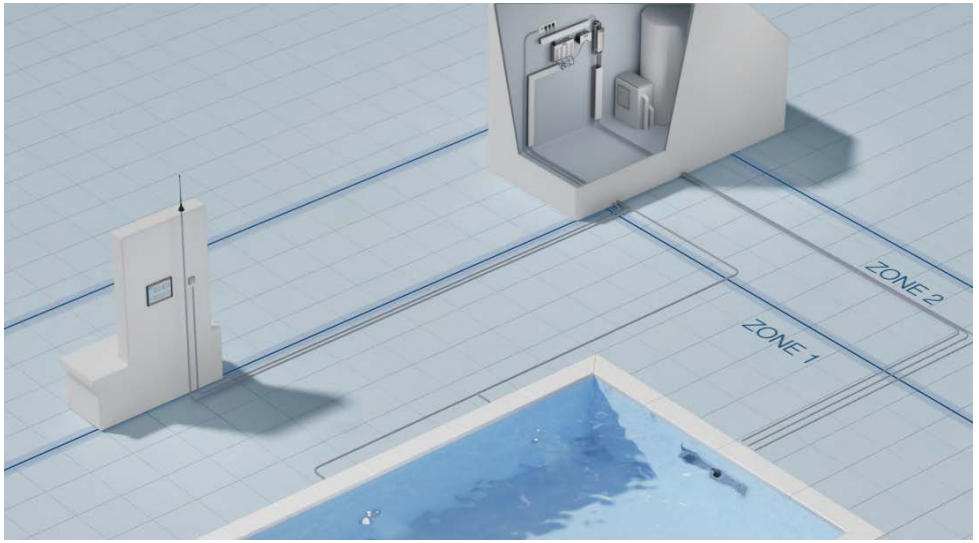
6. Optinal: installation with more than 4 lights in the pool

Link the PSU to an additional PSU using the DMX output.

6.5 Connect to the mains power

1. Connect to the mains

Connect the EVAstream Motor Control Unit, the ECA Control, and the EVA LED underwater lighting Power Supply Unit to the mains power.



2. Install an on/off button

Connect an on/off button (power switch) to the socket and install near to the pool.

6.6 Optional: Connect the router to the ECA Control

If the wireless connection is too weak, a wired connection can be made by connecting a UTP cable from the router to the ECA Control.

7. CONTROL OPTIONS

7. 1 EVA Experience web app

Especially for the EVAstream, we have developed a complete training program for swimmers of every age and every skill level. The workouts consist of interval, sprint and endurance elements and increase in duration and intensity. Use the EVA Experience web app to manage the training session.

To set up the EVA Experience web app, **scan** the **QR code**

To set up the EVA Experience web app, **watch the video**

7.2 Remote control

The EVA Remote control has the following functions:

ON/OFF button	EVAstream ON/OFF
Button +	
Short press:	increase intensity 5%
Long press:	increase intensity as long as you press for a stepless increase in speed
Button -	
Short press:	decrease intensity 5%
Long press:	decrease intensity as long as you press for a stepless decrease in speed

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 of 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.

ATTACHMENT 1

NORM COMPLIANCE

EMC Directive: 2014/30/EU	Low-voltage LVD Directive: 2014/35/EU
EMI Electromagnetic Emission	EN 60364-4-41
EN 55032 (CISPR32) Class A, B	EN 62368-1
	EN 60364-7-702

EMC Electromagnetic Compatibility
EN 61000-3-2
EN 61000-3-3

EMC Immunity & Safety
EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6
EN 61000-4-8
EN 61000-4-11
EN 55024
EN 615204-3
EN 61000-6-2

Specific standards
EN 13451-1
EN 13451-3
EN 16582-1
EN 16582-2
EN 16582-3
EN 16713-2
EN 15288-1
EN 60204-1

ATTACHMENT 2

Environmental conditions and use of EVAstream

Ambient temperature of power supply box (mounting in a dry condensation-free room): 0^0C to 32^0C. Water temperature: $+1^0$C to $+35^0$C

ATTACHMENT 3

Water Values

The user of the EVAstream is responsible for providing the right conditions for an optimal product life cycle. To fulfil the warranty conditions, the EVAstream should only be used in basins with a water composition within the following limits:

- Water temperature: $+1^{O}$C to $+35^{O}$C
- pH value: 6.8 – 7.8
- Maximum chlorine levels for water:
  - Indoor swimming pool – Free available chlorine (FAC): 0.5 ≤ VBC ≤ 1.5 mg/l
  - Open-air swimming pool >= 20 m^2 – Free available chlorine (FAC): 0.5 ≤ VBC ≤ 3.0 mg/l
  - Open-air swimming pool < 20 m^2 – Free available chlorine (FAC): 0.5 ≤ VBC ≤ 5.0 mg/L
  - All basins – Bound available chlorine: < 0.6 mg/l
- The basin and the available accessories must be free of electrolysis.
- Installation housing must be properly earthed to prevent electrolysis.
- Cyanuric acid: ≤ 100 mg/l
- Metals: ≈ 0 mg/l
- Carbonate hardness: ≥ 2^{O}dH (^{O}dH = mmol/l x 2.8); (^{O}eH =mmol/l x 3.5); (^{O}fH = mmol/l x 5.0)
- Ozone: 0 mg/l
- chlorite + chlorate: ≤ 30 mg/l
- Redox potential: ≥ 700 mV

ATTACHMENT 4

Unintended uses

- Not for use in potentially explosive areas.
- Not for use in an aggressive environment (gases, acids, vapours, substances, oils).
- Not for use in dirty water.
- The turbine should not be used above water.
- Depending on the type of concrete, the installation shaft must be protected. When using concrete with high chloride and sulphate constituents (e.g. Thermotec), the back of the installation shaft must be protected against these harmful substances with a PE film (building protection film).

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