Underwater Application User Guide

Version No. : V 1.2

Safety Warning

1. Follow the country's electrical safety regulations, and make sure the products are installed and maintained by a qualified electrician.

2. Before any installation, maintenance, or connection, make sure the power is disconnected.

3. Follow the manufacturer's instructions, and ensure the working voltage meets the product's requirements.

4. Underwater projects must comply with NEC 680 regulations, using specified accessories for installation.

5. Keep wiring and device installation away from water contact.

6. The cable junction box must be placed on shore, at least 10 cm above ground.

7. Do not cut or dismantle the light.

8. These products work in seawater and freshwater but must not be used in therapeutic pools or hot tubs with chemicals that can damage the lights, or in any corrosive liquids.

9. Do not leave the light powered on for more than 30 minutes while it is coiled.

Pool water disinfecting tips

⚠ **WARNING:**

Direct contact with undiluted pool chemicals may cause damage.

Proper Handling:

1. Pre-dissolve

   Pre-dissolve disinfectants in a separate container of water and ensure they are fully dissolved before adding to the pool.

2. Apply safely

   Pour the diluted mixture at least 1m (3ft) away from any installed LED neon flex.

To make sure you select the suitable product and implement the pool/underwater project sucessfully,
we will go through three parts as below:

1. What to provide us in advance.
2. How to choose the suitable product.
3. Implementation.

1. What to Provide Us in Advance

It would be better to share with us the CAD file or pictures of the swimming pool including the information below, as it will help us to provide the correct solution.

1.1 Retrofit the Lights in the Pool

a.The distance between the electrical room and junction box, power feed position of the product ... ...

b.The quantity and the position of the current wiring and connection boxs (if it has) which is helpful for provide solution.

c. Swimming pool disinfection method(ozone, chlorine...)

d. Any special chemical thing in the water.

e. Some other information regarding the pool if needed.

1.2 Lights for a Brand New Pool

a.The position of the electrical room.

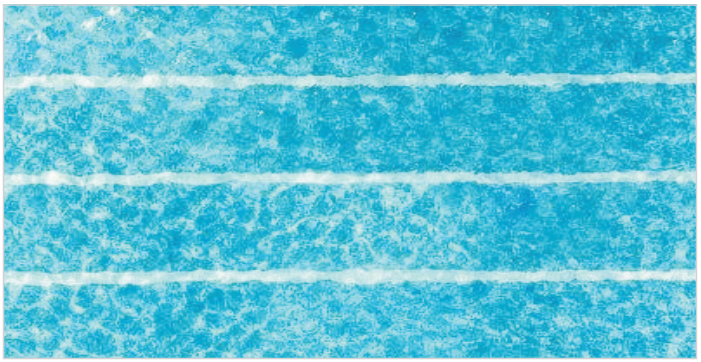
b.Your requirement on the wiring, such as the quantity of connection box.

c. Swimming pool disinfection method.

d.Any special chemical thing in the water.

e.Your any other requirement for the installation.

Connection box (waterproof junction box filled by silicone glue or epoxy resin)



Electrical Room

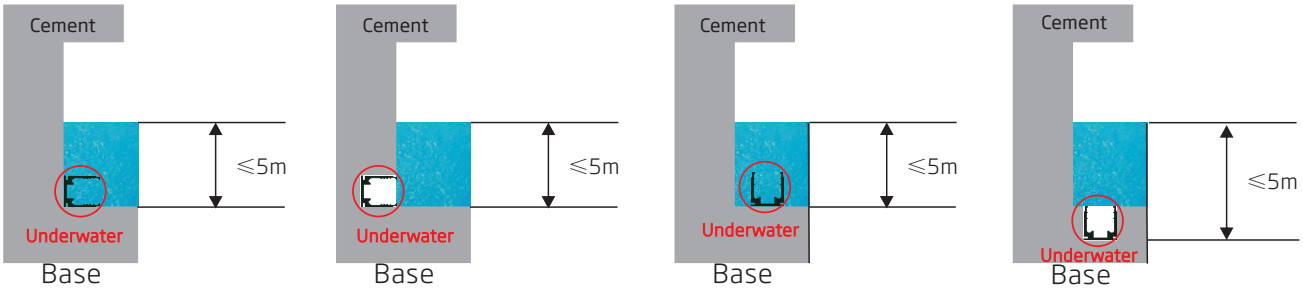
Connection box

Connection box

2.Implementation

2.1 Installation Position

Surface, embedded installation



a. side surface b.side embeded c.bottom surface d.bottom embeded

2.2 Installation Surface Requirements

A hard, flat base surface is required such as cement, brick masonry, marble, ceramic tile, or mosaic tile.
For embedded installations, the bottom of the slot where the profiles are fixed should also be flat.

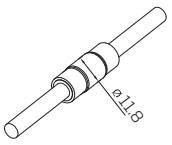
2.3 Fundamental Construction

Regulations

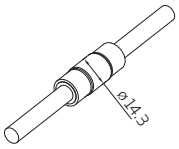
When installing lights in a pool, keep the bottom of the junction box ≥10cm above the floor, maintain ≥20cm vertical clearance below the water surface, and ≥120cm horizontal clearance from the pool edge.

1. Use a waterproof junction box for all cable connections, whether linking LED neon flex or connecting to the driver.
2. Run cables inside conduit, and seal both inlet and outlet holes with resin or silicone to prevent water or debris entry, make sure the cable conduit is big enough to fit the anti-wicking ferrule (not applicable to UL676).

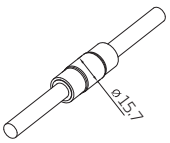
Anti-wicking Ferrule



Applicable to:
Mono color series

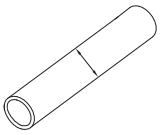


Applicable to:
RGB, Dynamic white, RGBW,
DMX Pixe, SPI Pixel series



Applicable to: Mono color,
Dynamic white, SPI Pixel series
(for unifit connector)

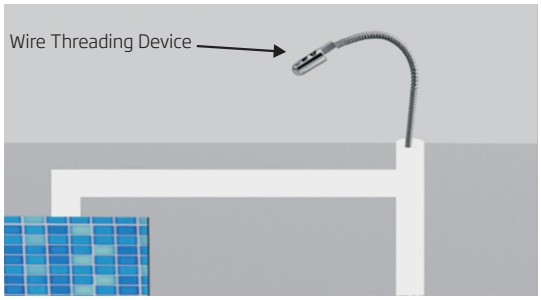
Conduit

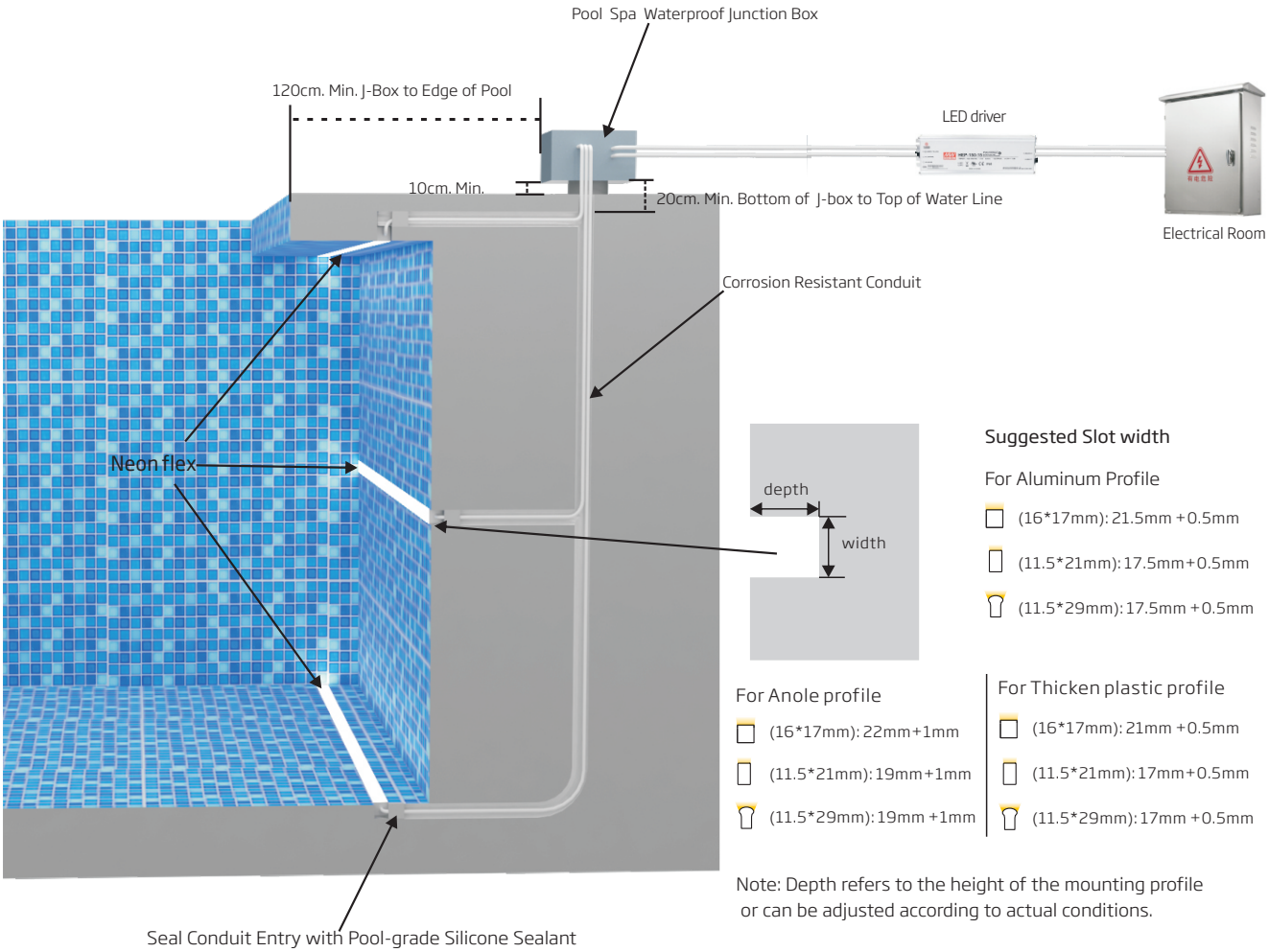


Must be larger than
Anti-wircking Ferrule

3. For underwater use, run one cable per conduit when possible to simplify installation and maintenance.

4. Use a professional wire threading device to run wires through the conduit.Once in position, seal both ends with epoxy or silicone to prevent water ingress.





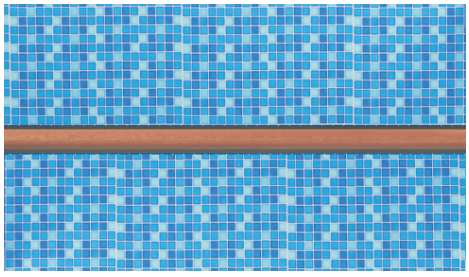
You can choose surface or embedded installation. Embedded is recommended for swimmer safety and light protection.
Dig a slot in the installation surface when embedding.

Note:

1. Complete all groundwork, junction box and switch installation, cable bushings, slot cutting before installing lights.
2. Use only an isolated low-voltage power supply with an ungrounded output rated for pool use.

Tips for Slotting

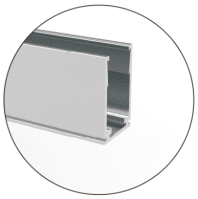
1. Refer to the dimension of the profile, and make the slot around 1 to 2mm bigger than the dimension of the profile.
2. After the slot is made, you could place something inside the slot, for example, put a wood frame, or useless strip or cover, which guarantees that during the rest of the construction process of the pool, it does not take away the dimension from the slot and do not damage the strip.



3.Installation

3.1. Profile Installation

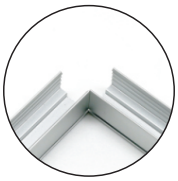
3.1.1 Profile Cutting



Ensure the profile's cross-section is smooth and burr-free when cutting, or the light housing may be pierced, causing water ingress.

3.1.2 Profile Joint

1. Leave 5 mm for profile joints to allow for contraction and expansion.



2. Join profiles at right angles only when two pieces of lights meet at that angle.

3. For curves, leave enough gap between profiles or use a flexible profile.

Angular Misalignment

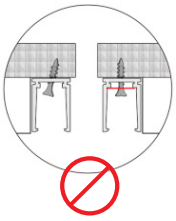
Parallel Vertical Misalignment

Parallel Horizontal Misalignment

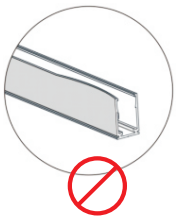
Above wrong misalignments will make the light improperly bent, and lead to the wrinkle or fracture on PCB.

3.1.3 Other Notices for Profile

Remove any debris from the profile before installation to avoid impaling the housing and causing water ingress.

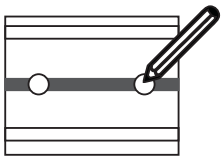


Ensure slots have no bulges to prevent housing damage and water ingress.

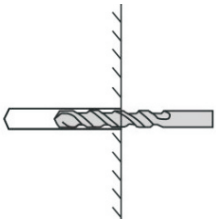


Do not use severely deformed profiles.

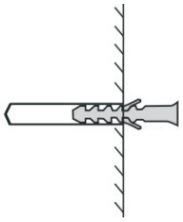
3.2.1 Screw Fixation



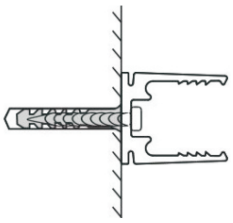
Step 1:
Mark drill points on the mounting surface.



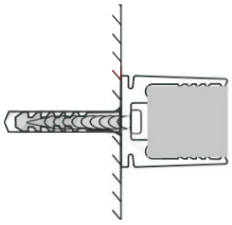
Step 2:
Drill holes at the marked positions.



Step 3:
Insert expansion bolts.



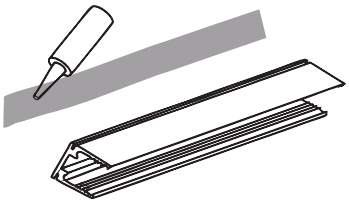
Step4:
Secure the plastic profile with screws.



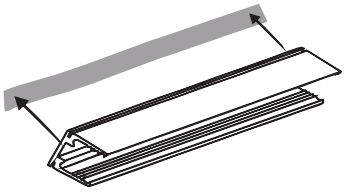
Step 5:
Fit the light into the profile.

3.2.2 Adhesive Fixation

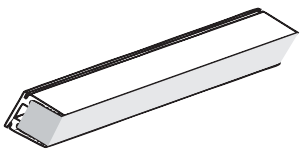
Step 1:
Mark and clean both the base and the profile underside.



Step 2:
Apply anti-chlorine waterproof adhesive evenly.



Step 3:
Press the profile onto the base and cure for 24 hours.



Step 4:
Press the light into the profile slot evenly from end to end.

3.2. Comparison of Two Fixing Methods

Screw Fixation:

Advantages: Reliable installation, resists loosening, and has low material cost.

Disadvantage: Requires professional tools and experienced installers; the process is relatively complicated.

Adhesive Fixation:

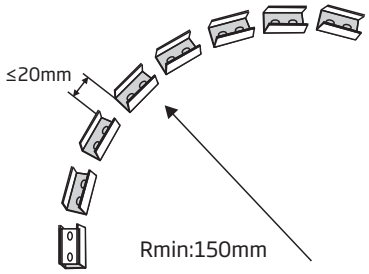
Advantages: No specialized tools required; simple installation.

Disadvantages: Higher cost; adhesive may age and loosen over time.

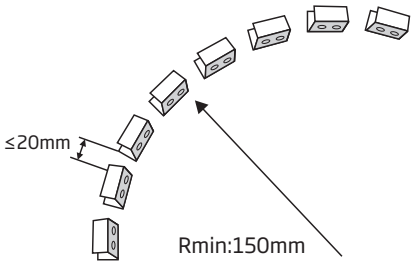
3.3. Curve Installation

4.3.1 Arrange the short 35mm plastic profiles on the mounting surface to form the required arc. Secure them using screws or adhesive.

4.3.2 Insert the light into the plastic profiles to complete the installation.



Plastic Profile Joint Horizontally



Plastic Profile Joint Vertically

Cautions:

a. Do not bend lights below a 300 mm minimum diameter.

b. Bend only in the direction marked on the light body.

c. Maintain at least 20mm between short 35mm mounting profiles.

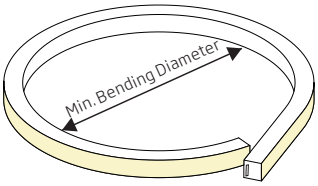
d. Use only standard 35 mm profiles; on-site cutting creates sharp edges that can damage the light or cause injury.

3.4. Cautions:

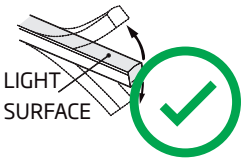
a. Ambient installation temperature for PVC products must be above 0°C , or the light may be damaged when unpacking or bending in the cold; ambient installation temperature for silicone products is ≥ -40°C .

b. Verify the rated voltage is DC24V before unpacking.

4. Light Installation



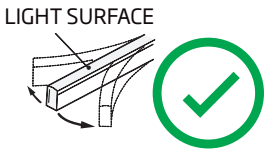
Model	Min. Bending Diameter
(16*17mm)-VB	300mm



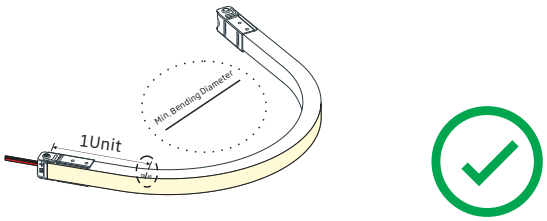
VB-Vertical Bending

When operating the light, please pay attention to the bending diameter and direction.

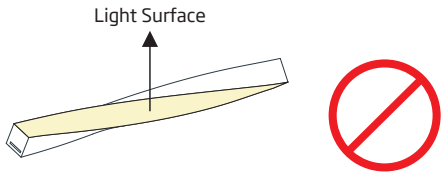
Model	Min. Bending Diameter
(11.5*21mm)-HB	120mm
(11.5*29mm)-HB	120mm
(16*17mm)-HB	300mm



HB-Horizontal Bending



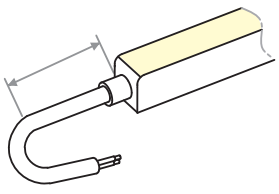
Follow the minimum bending diameters when operating and avoid bending at the first light segment and connector to prevent PCB or LEDs damage.

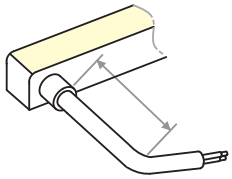


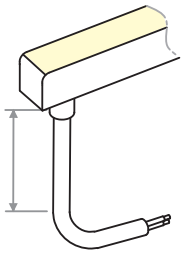
Avoid over-twisting or incorrect bending.

4.1 Cable Requirement

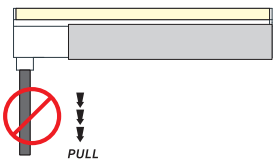
Keep cables loose at joints: leave at least 60 mm for PVC cables and 20 mm for silicone cables. Do not pull the cable, as this may disable the connector and allow water ingress.

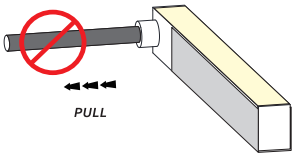


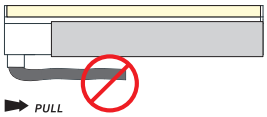




Do not pull the cable, otherwise it may disable the function of the connector and lead to water ingress.

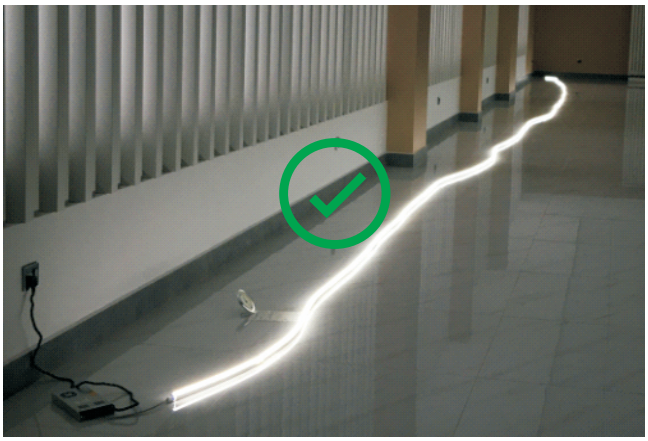






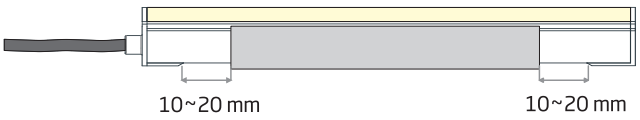
4.2 Light Testing

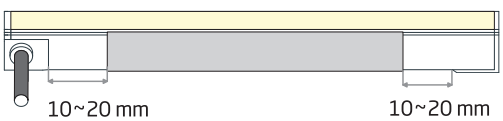
Test the light before installation to ensure it's working properly.

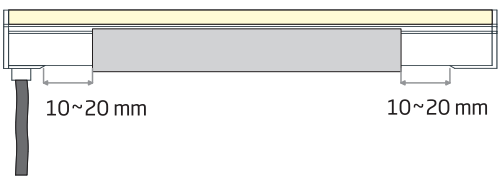


4.3 Connector Placement

Maintain a 10-20 mm gap between each connector and the profile to prevent damage from expansion/contraction or profile movement, which can cause water ingress and failure.





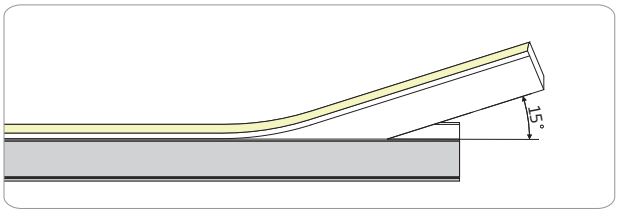


4.4 Light Fixing

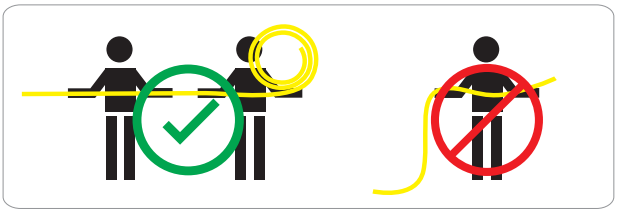
Note: Avoid repeated installations to prevent internal damage.

Make sure the light is fitted in vertically.

Use your palm, not fingers to press the light into the profile, and install it vertically.

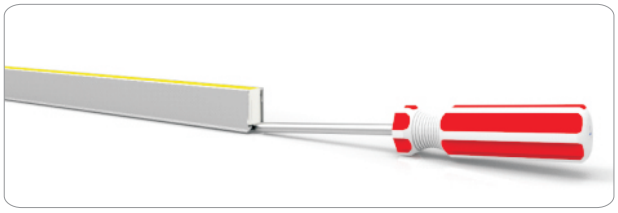


Keep the insertion angle below 15°.

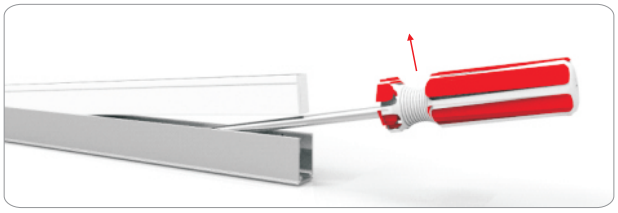


If the light is over 2m long, have someone assist to avoid over-bending or twisting.

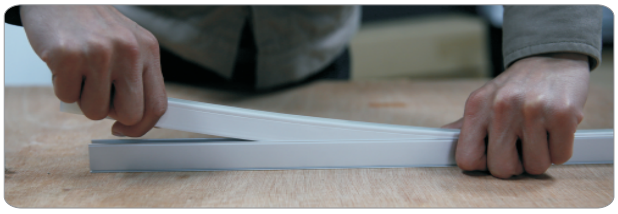
5. Light Uninstallation



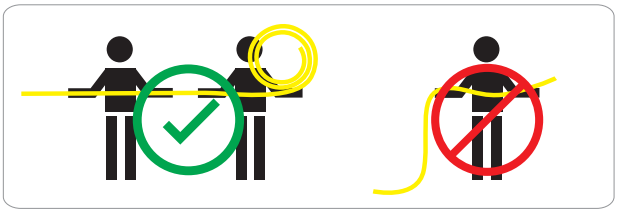
Prepare a screwdriver, and put the screwdriver at the bottom of light.



To uninstall, slide a screwdriver under the light and gently lift it, keeping the angle between the light and profile under 15°.



Once one end is free, grasp both sides and pull the light out slowly and evenly along the profile to avoid PCB damage.



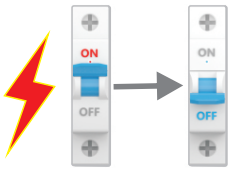
If the light is longer than 2m, have someone help lift it so its weight doesn't force a tight bend or twist that could damage the PCB.

6. Installation via Screw Fixation

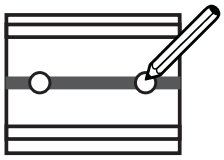
Material to be used: Plastic profile, ø6*30 rubber expansion bolt, M4*30 stainless steel screw.

Step 1: Cut off the power supply for lights to avoid any electrical shock or casualty , and remember to keep the power off during the whole period of installation.

Step 2: Mark hole positions on the mounting surface using the plastic profile, at 200 mm intervals.



Step 1 Power Off

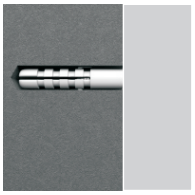


Step 2
Mark The Punching Position

Step 3: Drill holes with a Ø6mm percussion bit to 35mm depth, keeping them vertical to the slot bottom.

Step 4: Insert Ø6×30 mm rubber expansion bolts.

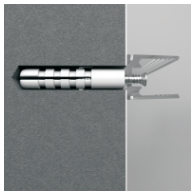
Step 3
Punch The Hole



Step 4
Fit The Rubber Expansion Bolt

Step 5: Secure the plastic profile with M4×30 mm stainless steel screws.

Step 6: Unpack and take out the light, and press it into the plastic profile from one end to another end of profile orderly by palm with lighting surface outwards .



Step 5
Fix The Mounting Profile

Step 6
Fix The Light

Step 7: Connect the light to the power supply or controller/dimmer.

Step 8: Check all wiring against the planned diagram.

Step 7 Wiring

Checkup
Step 8/Step 9/Step 10

Step 9: Turn on the switch to test the lights.

Step 10: Once confirmed, clean the site, fill the pool to its normal level under professional supervision, and cycle the lights and controller 3-5 times to verify operation.

The installation will be completed only when the switches, controllers and lights are all in good working state.

7. Other Installation Cases

Referring to the above installation guidance of swimming pool, the primary procedures include:

1. Read the user manual carefully, and remember the relevant safety clauses included.

2. Make the installation plan, such as wiring diagram, selection of power supply and controller, wire gauge and length, etc.

3. Installation:
   Mounting Position: surface or embedded
   Fixation Method: screw or adhesive
   Installation Procedure:
   Mark the places where the profiles should be fixed
   Fix plastic profiles through screw or adhesive
   Put lights into mounting profiles properly
   Connect light with power supply

4. Check, power on and test.

5. Clear the site.

8. Troubleshooting

Trouble	Solution
Brightness and Color Temperature Drift	a. Inspect for the inadequate cable gauge or the overlength cabling. b. Verify whether the line exhibits abnormal voltage drop and if the terminal voltage falls below 22.5V.
Some LED light sources are dark	Inspect for overbent light that may cause internal circuit damage.
Light flickers abnormally	a. Verify the power supply and dimmer match the light's requirements. b. Inspect all connections for loose contacts.
Light is on and off repeatedly	Ensure the driver isn't overloaded and the terminal voltage remains at or above 22.5 V.