

Table of contents

1. About this document 2

2. Importance of IP protection classes 2

2.1. First reference number - protection against contact and foreign bodies	2
2.2. Second reference number - Protection against water	3

3. Classification of IP66/IP67 Outdoor devices from Tridonic 4

4. Installation recommendations to improve device protection 5

4.1. Best Practice	6
4.2. Acceptable alternative methods	7
4.3. Things to avoid	8

1. About this document

Electric control gear must function reliably at all times and under a wide variety of conditions. Particularly high requirements apply to Outdoor devices which are exposed to a variety of external influences due to weather conditions or temperature differences.

Important aspects for assessing and improving the protection of Outdoor devices are the IP classification of the device and different recommendations during installation.

This document provides a general overview of IP protection classes, enables the assessment of Outdoor devices from Tridonic by assigning them to IP protection classes and provides concrete recommendations for the installation.

2. Importance of IP protection classes

The IP protection classes defined in IEC/EN 60529 (IP stands for "International Protection") provide information about which tests a device has successfully passed and against which influences it is therefore protected. The information is presented in the form IPxy, i.e. "IP" followed by two reference numbers. The exact meaning of these numbers is explained below.

2.1. First reference number - protection against contact and foreign bodies

1. number	Protection of the device against contact	Protection against foreign bodies
0	No protection	No protection
1	Protected against large-scale contact (e.g. back of the hand)	Protected against large solid objects (diameter \geq 50 mm)
2	Protected against finger touch	Protected against medium-sized solid objects (diameter \geq 12 mm)
3	Protected against contact with tools and wires (diameter \geq 2.5 mm)	Protected against small solid objects (diameter \geq 2.5 mm)
4	Protected against contact with tools and wires (diameter \geq 1 mm)	Protected against grain-shaped solid objects (diameter \geq 1 mm)
5	Complete contact protection	Protected against dust in harmful quantities (dust-proof)
6	Complete contact protection	Complete protection against dust ingress (dustproof)

2.2. Second reference number - Protection against water

2. number	Protection against water
0	No protection
1	Protected from vertically falling drops of water
2	Protected against direct sprays of water at an angle (up to 15°)
3	Protected against direct sprays of water up to 60° against the vertical
4	Protected against water splashed from all directions
5	Protected against low pressure jets of water from all directions
6	Protected against strong jets of water
7	Protected from temporary immersion
8	Protected from continuous immersion
9	Protected against water during high-pressure/steam jet cleaning in agriculture

3. Classification of IP66/IP67 Outdoor devices from Tridonic

If the control gear is installed in a sealed housing, the higher protection class of the housing applies to the entire system. Without a housing or with an unsealed housing, the following requirements apply to control gear for IP66 and IP67.

Tridonic Outdoor devices are tested according to the specifications of IP66, IP67 or both. Devices tested on IP66 and IP67 meet all the requirements of both protection classes. Additionally, Tridonic offers devices that are also tested according to salt spray tests (ISO 9227). See the data sheet of a device to find out about its IP classification and salt spray test.

Protection against water ingress	IP66 requirements to be met	IP67 requirements to be met	Requirements met by IP66/IP67 devices
against water immersion < 30 minutes		✓	✓
against water jets	✓		✓
against water splashing	✓		✓

✓
= is fulfilled

4. Installation recommendations to improve device protection

Outdoor control gear from Tridonic provides a high degree of protection against the ingress of moisture. But meeting the requirements of both IP66 and IP67 is often not enough to meet all environmental conditions as the effects of e.g. moisture, thermal cycles, air pollutants or UV damage are not taken into account by the corresponding IEC/DIN 60529 standard.

In practice, the requirements for Outdoor control gear are often even more demanding than what is covered by standards. Because of this, the methods and techniques used during installation are crucial for the long-term security and reliability of devices.

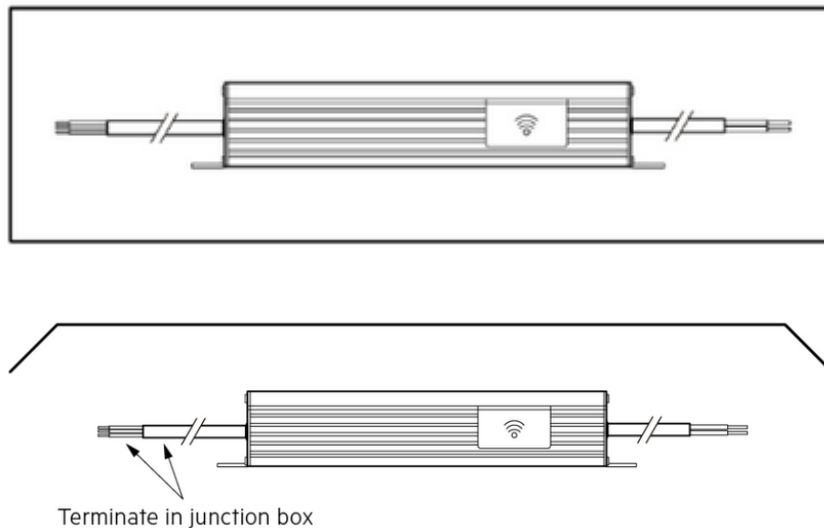
The following overview lists important points. These are put into three groups which are arranged according to the degree of protection achieved.

NOTICE

Consider thermal performance for each design and application!

4.1. Best Practice

The best possible method is to mount control gear in a waterproof case or under a waterproof cover. These two methods are shown as a picture. Below is the full list of other methods.



- _ Avoid direct exposure of the control gear to rain or moving water:
 - _ Mount the control gear in a waterproof housing -or-
 - _ mount at least under a cover

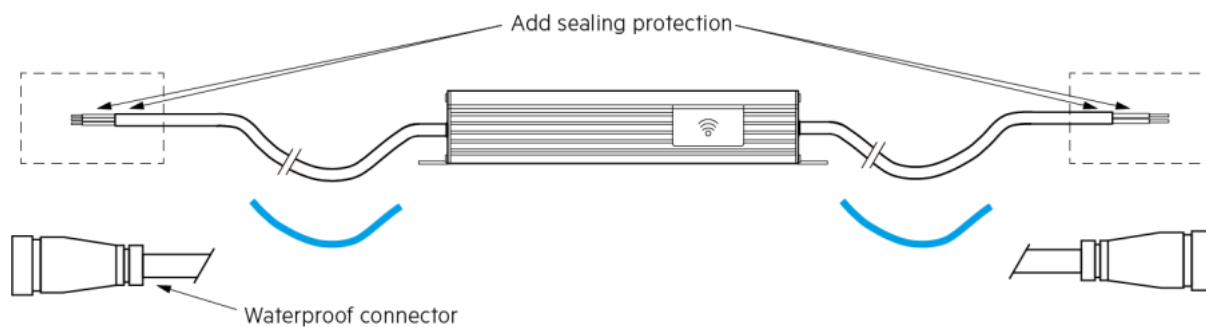
- _ Other protective measures for the control gear:
 - _ Provide a drainage system with holes -or-
 - _ at least provide a path to move water away from the control gear

- _ Protect wires and cable sheath protect:
 - _ Use waterproof junction boxes
 - _ Use waterproof connections

- _ Other protective measures for cables and small parts:
 - _ Keep cables straight
 - _ Avoid gaps between cables and grommet

4.2. Acceptable alternative methods

Sealing protection and waterproof connector are among useful complementary methods. This is shown as an image. Below is the full list of other methods.

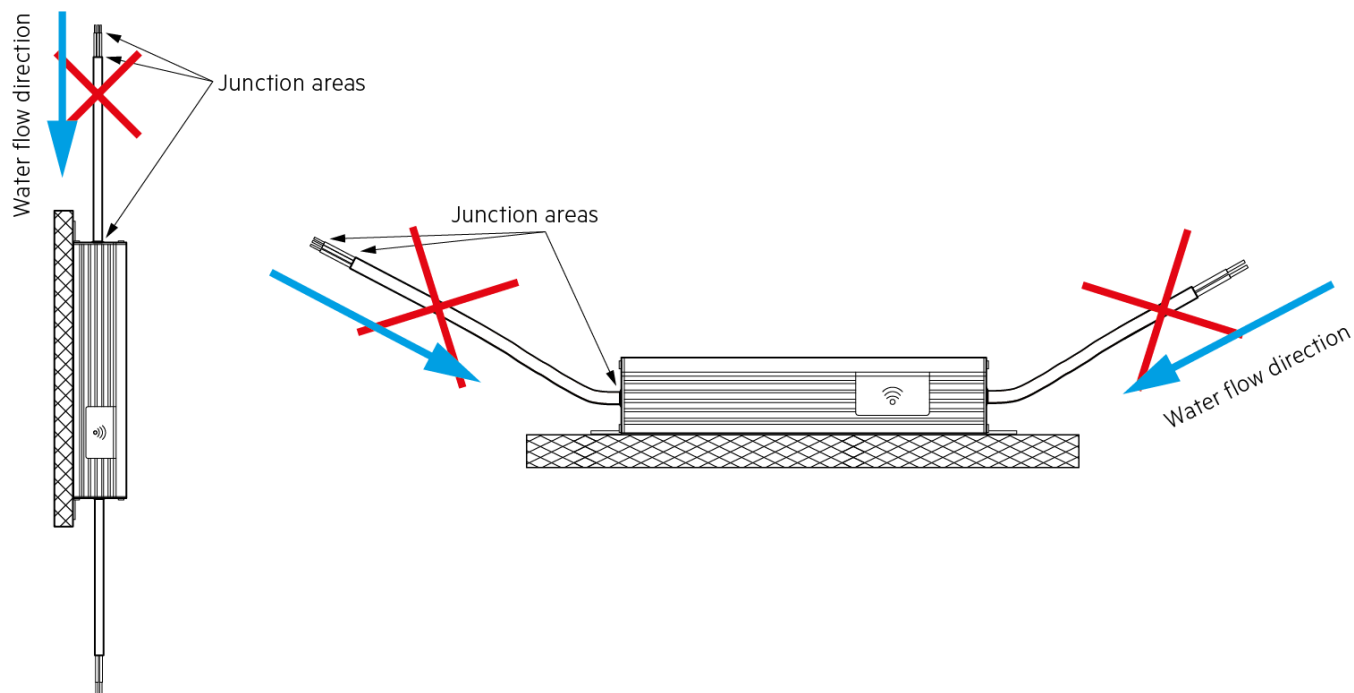


_ Protect connection areas and cables:

- _ Run cables deeper than control gear to prevent water from flowing to the connection areas
- _ Mount control gear horizontally to prevent water accumulation at connection areas
- _ Use waterproof plugs or add sealing protection

4.3. Things to avoid

It is essential to avoid installation methods in which water and moisture can flow to the control gear and collect there! This is shown in the following image.



The omission or the opposite execution of the aforementioned measures should be avoided:

- _ Avoid moisture and water retention on the control gear or on wire lines:
 - _ Do not mount control gear vertically
 - _ Do not bend or loop wires above the control gear