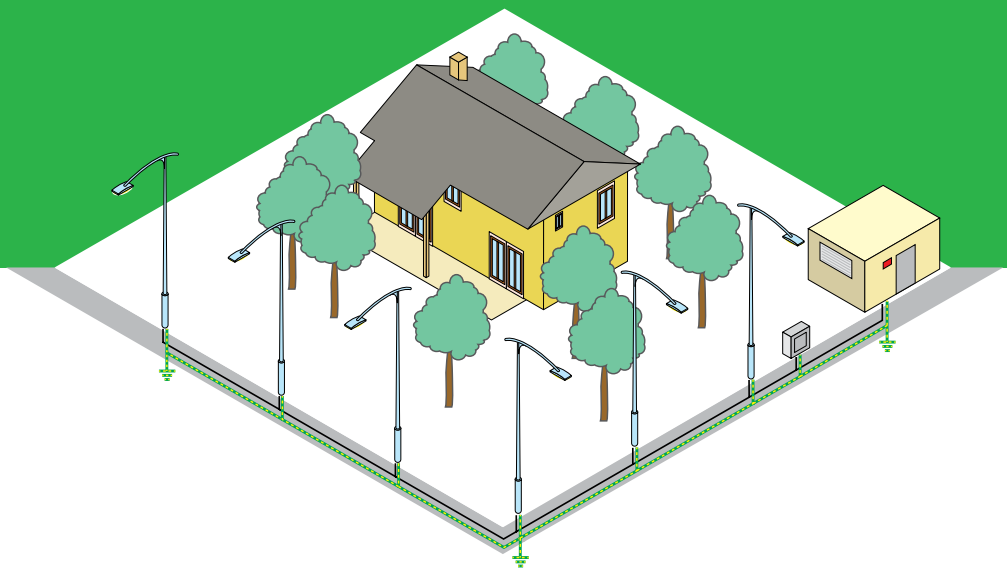
Life Is On Schneider Electric

Application

LED public lighting



The LED lighting technology offers numerous operating possibilities and now appears the ideal solution for smart lighting management.

This technology is the most suitable for the new regulations and provides comfort combined with energy savings.

General

Lighting loads implementing LED technology for functional lighting in service-sector and industrial buildings and for infrastructure (outdoor public lighting) are increasingly used in lighting applications.

One of the factors of success of LED-technology luminaires is their luminous efficiency.

The luminous efficiency (ratio between the luminous flux and the power demand of the source expressed in lumens per watt (lm/W) in the international system) is very good.

A conventional incandescent lamp has a luminous efficiency ranging between 5 lm/W and 20 lm/W, while lamps employing LED technology can achieve a luminous efficiency of 140 lm/W.

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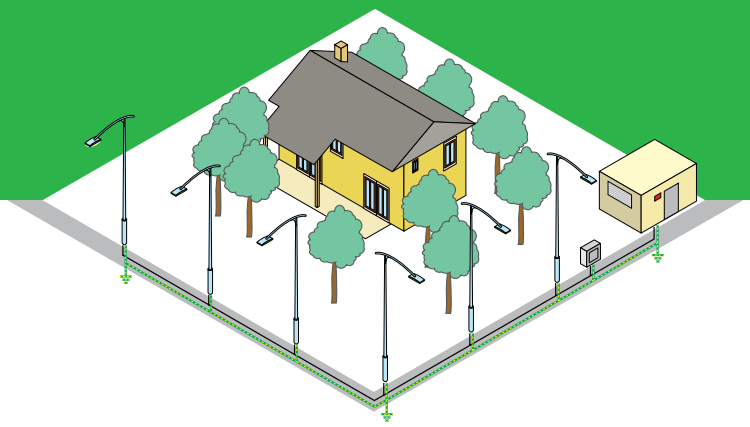


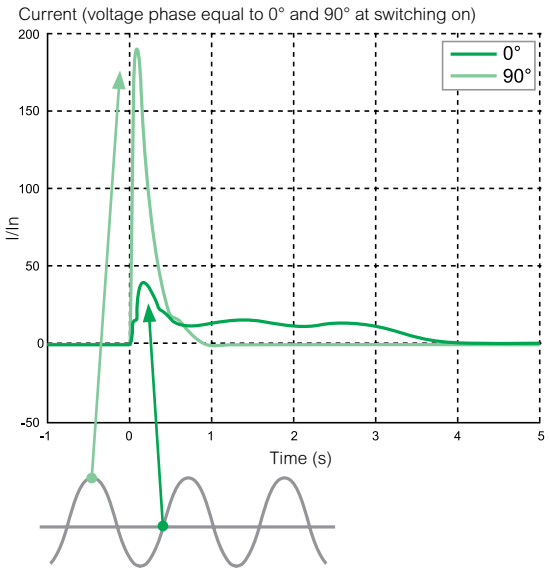
Specific features of the LED technology

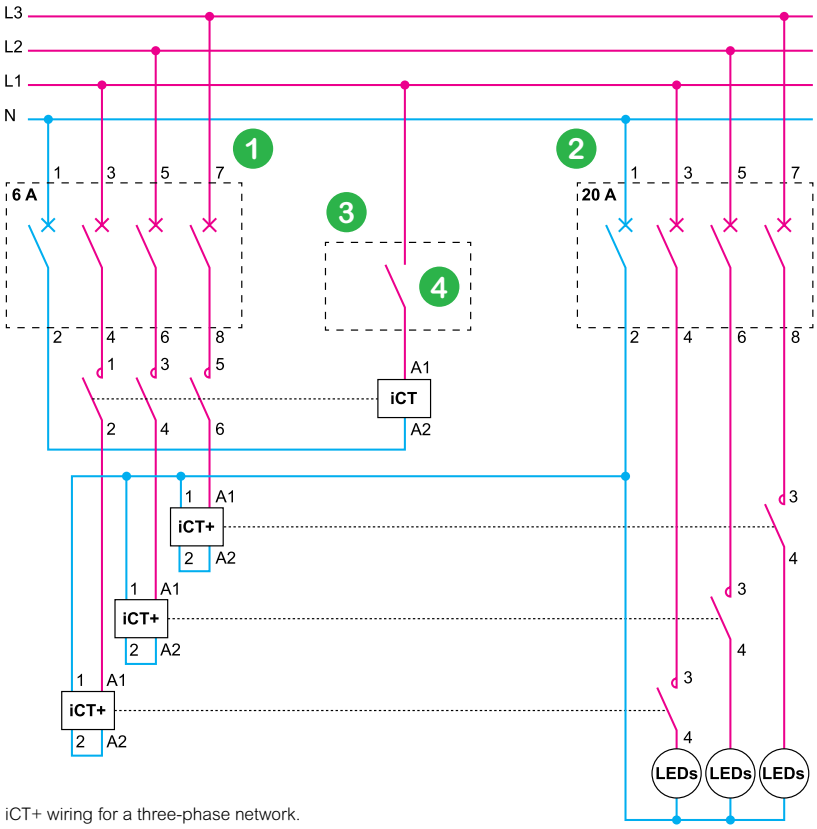
Strong inrush current at start-up

In the initial moments following luminaire power-up, there appears a significant transient current which could trip the protective circuit breakers. This problem can be overcome by using the iCT+ contactor.

It can be observed that the inrush current is significantly attenuated.

Switching upon zero crossing of the voltage wave: iCT+ contactor





iCT+ wiring for a three-phase network.

1. Circuit breaker - Control circuit
2. Circuit breaker - Luminaire power supply circuit
3. BMS power supply circuit
4. PLC - System

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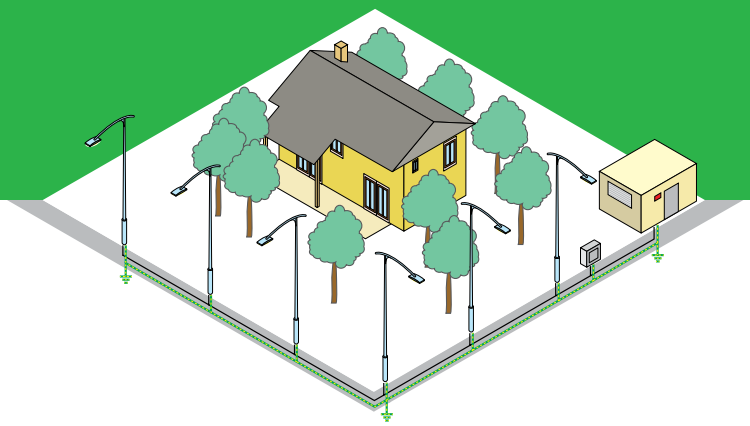


Sensitivity to surge

LED-technology luminaires containing electronic components are sensitive to surge, which will attack the power supply drivers and LED components and therefore drastically reduce the luminaires' theoretical lifetime.

Surge generated by lightning

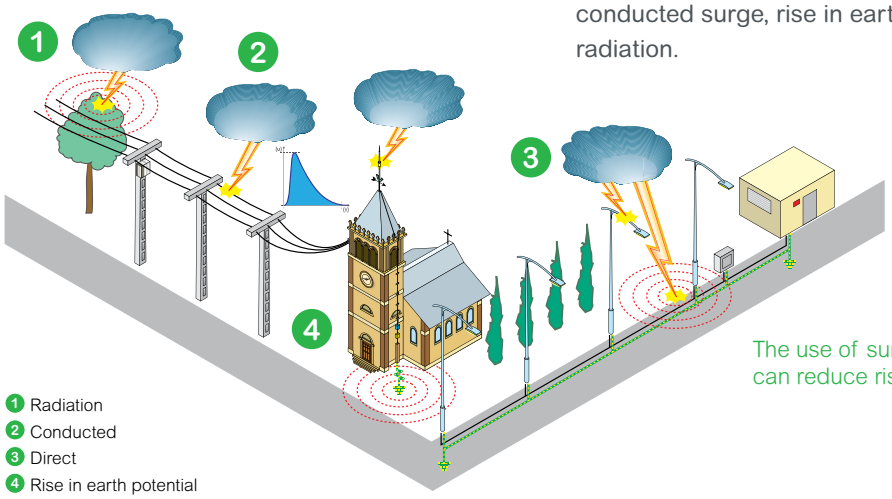
The lightning phenomenon

The atmospheric phenomenon of lightning is due to the sudden discharge of the electrical energy accumulated in storm clouds.

The effects of lightning strokes can be approached in two ways: when the component examined is the one which receives the lightning, this is a case of a direct lightning stroke, and when the component examined merely sustains effects, this is an indirect lightning stroke.

Direct lightning stroke: when the lightning falls on a structure, the lightning current generates a pulse surge.

Indirect lightning stroke: this is the remote manifestation of a direct lightning stroke. Its effects are presented here from three aspects: conducted surge, rise in earth potential and radiation.

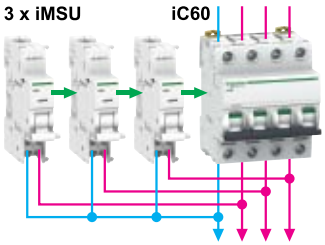


1 Radiation
2 Conducted
3 Direct
4 Rise in earth potential

The use of surge protective devices can reduce risks of failure

Temporary surge

Some surges (called TOV, for Temporary Over Voltage) are caused by neutral breaking. These surges, often ignored, are generally caused by disconnection of the neutral conductor.



Protection by iMSU voltage threshold tripping device

Tripping of the protective device when the voltage across its terminals exceeds its nominal value

Time	255 V AC	275 V AC	300 V AC	350 V AC	400 V AC
Maximum operating time	No tripping	15 s	5 s	0.75 s	0.20 s
Minimum non-response time		3 s	1 s	0.25 s	0.07 s

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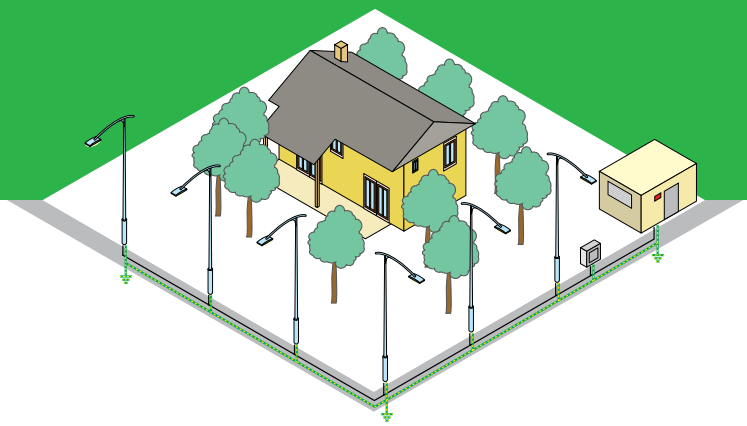
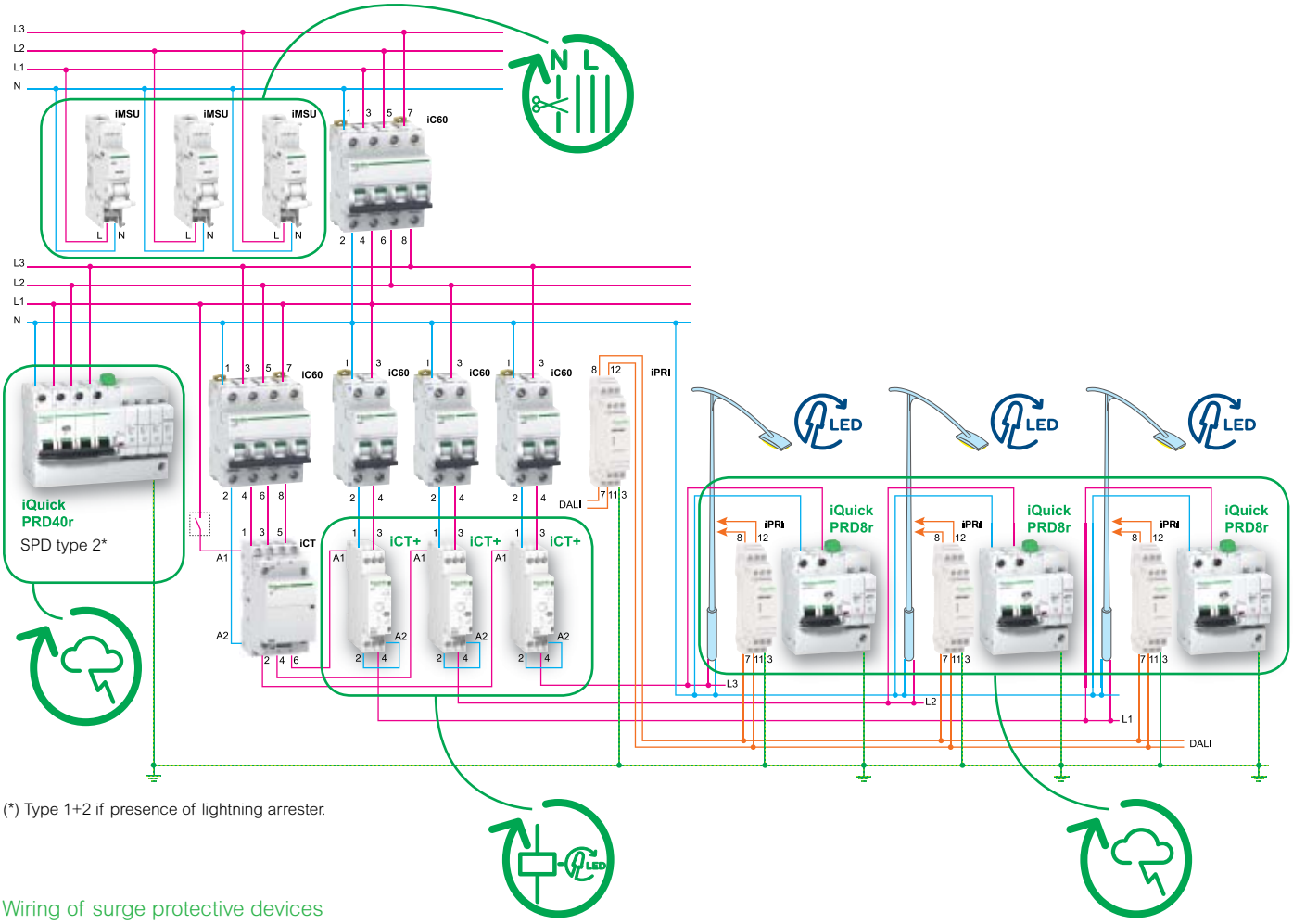
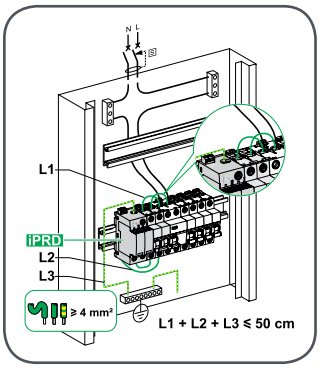


Example of an installation



(*) Type 1+2 if presence of lightning arrester.

Wiring of surface protective devices



SPD with integrated circuit breaker
iQuick PRD

or

SPD with external circuit breaker
iC60 + iPRD

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