THORN

LIGHTING PEOPLE

Architectural **Illumination**

Architectural illumination aims to reveal the existing form of a building and create links between it and the landscape, defining a unique identity while respecting the living environment of people.

Lighting objectives

Lighting can transform the night-time appearance of a building or landscape. The aesthetics, usability and desirability of a structure or place can be increased by good lighting design. To achieve this, there must be a clear understanding between all parties on the objectives of the night-time scene.

Architectural illumination has three main categories:

- Historical - buildings and structures of special historic interest
- Contemporary - modern and "industrial" premises
- Ambience - parks, precincts and water features

All three share the same three broad lighting design objectives: appearance, performance and safety.

Most buildings and their surroundings have a purpose, whether it is commercial or tourism, historical aesthetic or modern. The lighting needs to enhance the brand image, to bring out the beauty of the architecture and open the surrounds to confident exploration and enjoyment. A well lit approach can provide an enhanced appearance whilst satisfying the requirements for safety of those using the space and those who own it.

When translating these objectives into lighting criteria there are several considerations. Firstly, since the visual size of the details to be seen are generally large low levels of lighting tend to be sufficient. Secondly the lighting of vertical surfaces assumes more importance outdoors.

Picture 1: Bridge of Avignon, FR
Photo: © Christophe Canadell
Noctabene Agency
Picture 2: Torre Alemanna, IT.
Photo: © Fabio Baraldi
Architect: Vincenzo Russo
Picture 5: Pont Audemer, FR.
Lighting Design: AGENCE ON

Architectural Illumination

Architectural illumination is one of those subjects which needs to be defined before it can be understood. It differs from other forms of exterior lighting in a number of key aspects, some of which can be lengthy to explain. So perhaps our starting point should be to categorise the various applications

Functional illumination is where light is used to enable people to carry out a task in a particular area. Typically, the area around a security access gate would require functional lighting.

Promotional illumination serves a different purpose, which is to attract the attention of a viewer, and to encourage further involvement – lighting an advertising billboard would fall into this category.

Architectural illumination is quite different from either of the above. The requirement here is to reveal detail differently from the daytime, to create links between architectural features of buildings and landscapes defining a specific identity whilst respecting the living environment of people. It is an area in which the designer needs creativity, intuition and flair.

At Thorn we begin with the idea of light itself before progressing to specific products. Creating aesthetic appeal, conveying messages and meanings, facilitating orientation, maximising safety, conserving energy and establishing how particular light sources will interact with building surfaces are all important considerations. Our aim is to bring art and science together, to encourage creativity, not blandness, and to craft an imaginative lighting solution that balances emotional impact with the functional aspects of the project.

That's why we offer ranges from which almost any architectural lighting requirement may be met. By applying this brochure, including eControl guidance on 15 ways to make energy efficient lighting easy, economic prosperity and citizen well-being can be improved and the impact on the environment reduced.

Why Thorn Lighting?

As a trusted global supplier of professional outdoor and indoor lighting with integrated controls, we have years of experience in luminaire development.
Leveraging our research and development facilities, we actively work to raise lighting standards and are uniquely placed to combine the latest light source technology with our specialist expertise in optical and luminaire design.
When you're lighting facades, structures or amenity spaces with our products you can achieve a solution where aesthetics, optical performance, energy consumption and maintenance are all in perfect balance.

Contents

Picture: Place des Epars à Chartres, FR.
Reichen & Robert.
Architects: Paysagist Atelier Jacqueline Osty.
Lighting Design: Roger Narboni,
Concepto Agency.
Photo: © Xavier Boymond

Criteria

There are a number of variables that must be taken into account when selecting architectural illumination equipment. These can be grouped into: 'function factors' and 'emotion factors'. Functional factors relate to the physical and operational characteristics of the lighting system, whereas emotional factors are those that affect user's evaluation and can be harder to ascertain.

The 'function' factors

Placement

To start an outdoor lighting design you need to know the principal viewing position or approach to the building or area being lit. Don't confuse this with the general aiming orientation for the main lights. This direction should be different from the most common viewing direction for the building, otherwise no shadows will then be visible and the scene will appear flat. The direction of light can be used either to emphasise or flatten detail.

Dazzle or "disability glare" can be avoided with careful positioning and aiming. The additional use of hoods, spill rings and louvres for screening lamps from sight at normal viewing angles are often used, but will reduce performance. Distraction or "discomfort glare" can be overcome by increasing the mounting height, aiming the peak intensity of these floodlights at angles below 70° to the downward vertical and, where possible, increasing background ambient light levels.

How much light?

Most exterior lighting guides give maintained illuminance values for specific applications but this is not what we actually see. Illuminance is a measure (lux) of the quantity of light that falls on a surface. It does not depend on the surface properties of what is being lit. A dark and light surface next to each other could be receiving the same amount of illuminance but the brightness would be quite different. The light surface would look brighter. Surface reflectance is influential in our perception of the brightness of surfaces. Brightness is subjective whereas Luminance, the light reflected from a surface, can be measured (cd/m^2), and can be considered to be objective. Consequently in determining quantities of light for outdoor applications there is a mixture of references to luminance, reflectance and illuminance.

Architectural illumination is particularly subjective and will depend upon the relative brightness of the surroundings or character of the area, often known as district brightness. To avoid overlighting and obtrusive light the lighting industry has issued guidance notes, including specific recommended luminance levels which relate to average and maximum illuminance values for the lighting of a series of environmental zones, ranging from dark landscapes to bright inner city areas.

Fig. 3 The ratio between the average luminance and the maximum luminance will determine the degree of contrast in the subject. This is referred to as the luminance contrast ratio. In the case of a building facade lit to an average level of 10 cd/m^2, the highlighting of a small portion to a luminance of 30 cd/m^2 will only just be noticeable. Increase the luminance to 50 cd/m^2 and the effect becomes more dramatic.

Remember that these ratios relate to the amount of light reflected from the surfaces. If the building facade is red brick with a given reflectance factor of 0.3 and a feature is a white plaque with a reflectance of 0.9, and they are lit to the same illuminance, there will be a brightness ratio of 1:3. To make things easier suggested illuminances can be given for a range of typical materials for use in preliminary design based on the use of a 'white' light source. See Fig 1 and 2.

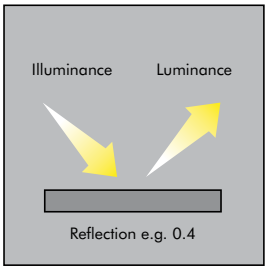


Fig 1 Illuminance onto a surface, luminance off the surface

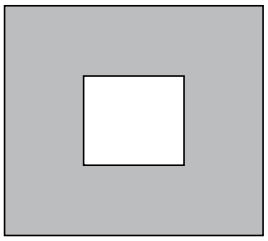


Fig 2 The smaller square of higher reflectance is brighter.

The Effect of Luminance Contrast Ratio	
1:1	Not Noticeable
1:3	Just Noticeable
1:5	Low Drama
1:10	High Drama

Fig 3

Contrast 2 LED Large asymmetric

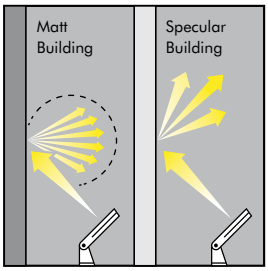
Surfaces

How much light you direct on to a building is less important than how much is reflected back from it and how this is reflected. What you will see is dependent on roughness and reflectance factors of a given surface – darker, more textured surfaces need more light than pale, smooth surfaces. 'Portland stone' for instance reflects well, but 'dirt coated dark brick' would need a lot more light to look as bright.

The same is true when colour is used, but is complicated by "colour absorption". The fabric of a building has a colour, or in many cases a mixture of colours. Different types of lamp will give differing colour renditions. Light sources which are monochromatic, or strongly biased towards a small range of colours, will only reveal some of the colours resident in the structure. Using for instance a low pressure sodium lamp (monochromatic yellow) on a red surface would be pointless because the lamp has no red content and there would be almost no visible effect on the lit surface. At the same time, lighting a strongly coloured surface, for instance trees with green foliage, with matching colour light will produce "colour saturation", where the natural colour of the lit subject is reinforced.

"White" sources (which contain a representation of the full spectral range) are therefore necessary for materials which are required to be seen close to their appearance in natural light.

It is not only the lightness of the building surface which is important, but also the degree of specularity. Matt surfaces have the advantage of reflecting light in all directions so when buildings are lit from a low or ground level the apparent brightness when viewed at ground level can be relatively high. However, reflections from specular surfaces such as marble and stainless steel can present difficulties as when projectors are installed at ground level the reflected component is directed into the sky and away from the observer.



Effect of building surfaces on lighting

Lamp types

The most common lamps used for architectural lighting are powerful high-intensity discharge (HID) sources, metal halide and high-pressure sodium, although dimming is not reliable and the latter's quality does not distinguish colours clearly. The excellent colour rendition and brilliant light of mini tungsten halogen means that it continues to be used, but selectively due to poor efficacies and lamp life LED being the most common replacement. The linear fluorescent has high lumen efficacy and a wide choice of colour temperatures and colours, but this relatively large, diffused, light source does not lend itself to providing narrow beam distributions in long throw projectors and is therefore more suited to wall washing and guidance tasks. As performance improves and costs fall, LEDs have rapidly become the lamp of choice. Their unique qualities – instant start, high efficacy, compact size, long life, reliable performance in cold temperatures, good colour rendition and dimmability/colour control - are perfect for most applications. A further attribute of LEDs is that their light is emitted in a specific direction. Thus modern optical designs, materials and techniques can deliver more controlled light distributions and maximise performance.

Maintenance

Even when the most suitable lamp and luminaire combination has been selected, the energy costs can still be reduced by regular maintenance. Floodlights with a re-positioning lock system are helpful if the appearance is to be maintained over successive maintenance operations.

Lamp type	Luminous Efficacy (lm/W)	Lamp Life (h)	CRI	Re-strike times
Tungsten Halogen	12 – 35	2000 – 4000	Very good	Prompt
CFL	40 – 65	6000 – 12000	Good	Prompt
Linear Fluorescent	50 – 100	10000 – 50000	Good	Prompt
Induction Lamp	60 – 80	60000 – 100000	Good	Prompt
Metal Halide	50 – 100	6000 – 12000	Good	5 – 10 minutes
Low Pressure Sodium	100 - 200	6000 - 8000	Very poor	2 – 5 minutes
High Pressure Sodium	40 – 100	12000 – 16000	Fair to good	2 – 5 minutes
LED	20 - 120	20000 – 100000	Fair to very good	Prompt

Colour appearance and colour rendering

Within "near white" light, as a general rule provided by fluorescent, tungsten halogen, metal halide and LED light sources, there is variation by colour temperature, this will change the appearance from warm to cold, the higher the temperature, the "cooler" the light.

A safe and simple design approach is to use warm colour appearance light sources with warm coloured materials and use cool colour appearance light sources with cool coloured materials. For example, red brickwork would be sympathetically lit by high pressure sodium lamps (which have a yellow bias among a limited spectrum output) with a colour temperature of about 2000K, but could look rather dull with metal halide lamps with a colour temperature of over 5000K.

There is also a scale of colour rendering properties expressed as a "CRI" or "Ra" figure (0–100) - again the higher the number, the more accurate the colour rendering. A classification of a light source of Ra80 and above will indicate good colour rendering. Lamps of good colour rendering will make a scene look natural whereas lamps of poor colour rendering will distort some colours making the appearance of a scene unnatural.

Criteria
The ‘emotion’ factors

Colours
Coloured lighting has a dramatic effect on the way people react to the scene. Strong colours reinforce the nature of a busy area, while softer colours induce a more relaxed response. Using different light sources or colour mixing RGB LEDs can produce colour contrasts and allows a distinction to be made between two parts of a building or space. Both methods can also simulate shadow, moonlight and sunrise/sunset.


Torre Alemanna, IT. © Fabio Baraldi, Architect: Vincenzo Russo

District brightness
The degree to which an object is accentuated depends upon the contrast between the object and its background. To achieve a desired emphasis the luminance of the object has to be related to the district brightness. The light levels used on a structure or natural feature should be in harmony with the light levels of the surrounding area. For example, a country church may need little more than moonlight levels to make its presence felt whereas a building lit to this level in the centre of a city would hardly be noticed.

Beam control

Floodlights have a light distribution which is related to the shape of the reflector. A round reflector will produce a conical beam, symmetrical between vertical and horizontal axes. This is known as a "circular" type and is useful for long-throw requirements, typically to pick out a single feature. A rectangular reflector, curved in one direction only, will produce a beam which is "asymmetrical" between its two axes – useful for lighting areas rather than small points. But it is rare that an "off the peg" floodlight will give the precision required. Constraints in mounting positions will often generate a need for a "modified" beam, and add-on accessories such as refractor glasses and holographic films which vary the beam shape, are vital in getting the right result. Manufactured from thin film substrates holographic films can be placed above LEDs to soften or dramatically re-shape the beam. Their high transmission efficiencies far exceed that of glass or plastic material. Used as "beam shapers" they can expand a circular beam or stretch it to a linear line of light.

Intensive light beam

Semi-extensive light beam created with intensive + refractor

Extensive light beam created with intensive + refractor

Light effect created with asymmetrical light beam

Contrast

In an exterior scene it is the highlights and shadows that bring contrast and achieve modelling; these are created by the direction (a function of the geometry of the installation) and the intensity of the light. Spaces and structures that feature areas of light and shade are generally preferred by observers and considered more interesting. Light naturally attracts, so highlighting key features will help an observer relate to the structure. Care should be taken to only light those details that are required, as too many highlights will destroy the effect and either make the structure appear bland and uninteresting or disjoined and incoherent. Completeness is also important and care should be taken to avoid "floating" appearances where the upper part of a building is lit but the lower level is not, removing the connection with the ground.

The impressions of a lit area are subjective and cannot be measured. Designers mainly rely on experience, supplemented if necessary by daytime photographs, computer visual simulations, scale models and site experiments, to achieve the desired results.

Colour temperatures

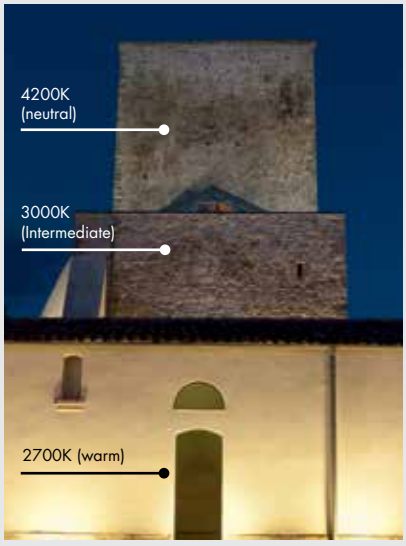
The colour appearance of a light source can evoke a warm or cool atmosphere depending on the choice of colour temperature of the source. The spectral distributions of light emitted by typical 'white' lamps show quite notable differences from warm to cool, so that you can produce subtle contrasts in colour appearance.

By colour

By direction

By intensity

By colour temperature



econtrol

To help you through the process of understanding, specifying, installing and maintaining good quality, energy efficient lighting, we recommend you take advantage of our eControl programme.

Originally conceived to promote electronic dimming and indoor control systems, eControl has now been expanded to cover all our outdoor energy focused initiatives products and services (including those above). If you are considering migrating to the latest energy efficient technologies, eControl advice is available on request. Within this philosophy we have developed 15 easy ways to save energy, for the full frame work see below

15 ways to make energy efficient lighting easy

When considering energy efficiency and lighting it is important that it is not considered in isolation. A lighting installation has a basic requirement to provide a sufficient amount of light to allow a task to be performed efficiently and safely. Requirements for this are given in standards such as EN 12464 (Lighting of workplaces), EN 13201 (road lighting), EN 1838 (emergency lighting), etc. In addition, as well as providing good task illumination the lighting installation should provide light of a good enough quality to provide a pleasant and fulfilling environment for the occupants of a space. The ideal is to provide these two aspects in as energy efficient way as possible.

Energy efficiency is a complex set of interactions and relationships linked to technology, physical environment, social behaviour and work requirements. However we can consider energy efficiency may generally be split into four main areas:

Technology

Lamp efficacy
How efficiently a lamp converts electricity into light (lm/W)

Ballast classification
Controls the electricity supply to the lamp (Energy Efficiency Index EEI)

Luminaire distribution
Light is controlled and emitted from a luminaire using optics which bend and shape the light to the correct location

System efficacy
The combination of optical and thermal control within the luminaire (luminaire lm/W)

Application

Task lighting
Lighting the task areas with the correct amount of light

Zoning of lighting
Lighting is zoned according to area use

Maintenance schedule
Maintenance must be performed in response to product age, performance and environment

Waste light
Any light which does not hit the intended target is waste light

Control

Presence/Absence
Presence: Lights automatically turn on and off with movement.
Absence: Lights automatically turn off and have to be manually switched on.

Daylight
Artificial lighting responds to the natural light conditions

Constant illuminance
A function designed to produce correct lighting levels for the duration of the maintenance period

Task/Scene setting
Allows the user to set scenes and adapt the lighting to different aesthetics and tasks

Timed off
Automatic cut-off can be installed to turn all lights off during unoccupied hours

Environment

Reflectance
Light is reflected from the surface within the space

Visible smart metering
Results of actions can be quickly seen as increased or decreased energy use

National Museum of Sèvres Ceramic, Lighting concept: Roger Narboni, CONCEPTO agency.
PFI and installation : Bouygues Energy & Services. Photo: © CONCEPTO.

Forus Bridge, Stavanger, Norway


THORN

Product Focus
Contrast 2 LED NEW

High light output in a compact and discreet design with a wide choice of light effects created using different light distributions and accessories

- Performance
- Compactness
- Complete flexibility

Product Focus
Contrast 2 LED NEW

National Museum of Sèvres Ceramic, Lighting concept: Roger Narboni, CONCEPTO agency. PFI and installation : Bouygues Energy & Services. Photo: © CONCEPTO.

A compact architectural floodlight range combining high output LEDs of predefined beams offering complete flexibility

- Innovative, compact design with integral gear for the Medium and Large sizes (static or dynamic versions). Small versions use remote gear boxes
- Exceptional modularity with LED colours, light distributions, accessories and light outputs in three body sizes
- Manual dimming on monochromatic versions (Medium and Large) and DMX controls on RGB versions for a variety of lighting effects
- All sizes are available with a remote gear box (on request) for countries with temperatures reaching 50°C

Applications

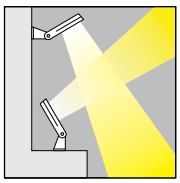
- Illumination and façades

Lamp Information

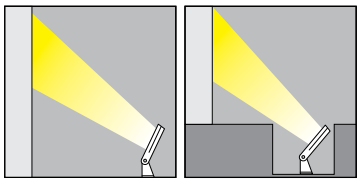
- Small size: 4 LEDs, Medium size: 12 LEDs, Large size: 36 LEDs
- 40,000 hours @ L70 Ta 25°C or 50°C depending on the version
- From 9 to 18W for the small versions. Up to 62 Llm/W. LED module efficacy: 92 lm/W for 4000K at 1A.
- From 27 to 46W for the medium versions. Up to 54 Llm/W. LED module efficacy: 92 lm/W for 4000K at 1A.
- From 95 to 126W for the large versions. Up to 61 Llm/W. LED module efficacy: 105 lm/W for 4000K at 700mA.
- Colour temperature 3000K and 4000K for all sizes. 6000K only available for the Large version. Other colour temperatures on request
- CRI 80 minimum for the 3000 and 4000K. Typical CRI 70 for the 6000K.

Ways of lighting

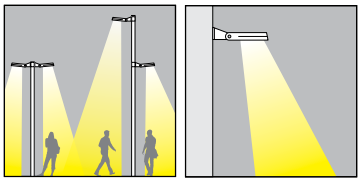
Contrast 2 LED can be installed on the ground, in recessed boxes, on walls or on dedicated columns



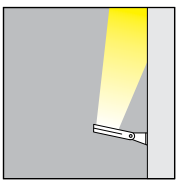
Offset from surface



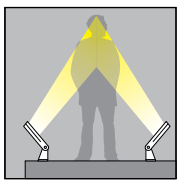
Offset from ground recessed boxes



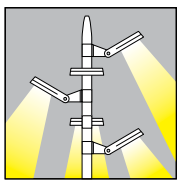
Pedestrian application with mast fixation or wall fixation



Wall washing



Accentuation



Illumination from a column

Light distributions

A choice of predefined light beams: circular, elliptical or asymmetrical.
Standard beam angles range from 8° to 50°x50° for the Medium and Large sizes.
The Small size has angles of 12°, 32° and 44x12°.

Standard versions:
Small and Medium versions are available in whites (3000K and 4000K), colours (R, G and B) and RGB DMX. Amber, 2700K and 6000K on request.

Large version is available in white (3000K, 4000K and 6000K) and RGB DMX versions. Other colours: R, G, B, A and 2700K on request.

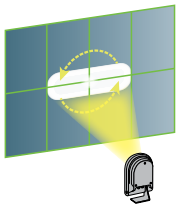
For all sizes, RGBW, RGBA or tunable white are available on request.

High ambient temperature versions: please contact your local sales representative.

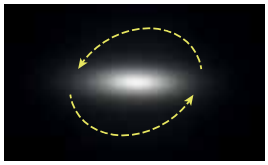
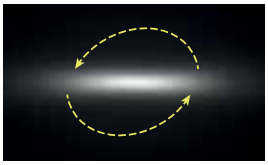
Light distribution shape	Beam angles	
	Small	Medium/Large
Circular 	12°	8°
	32°	24°
	-	36°
Elliptical 	44 x 12°	8 x 16°
Asymmetrical 	-	50 x 50° 30° deviation

Light distribution with holographic films

- A choice of light shaping holographic films and accessories to create a range of static or dynamic lighting effects with minimal light loss and glare (see below)
- Holographic films available in 1x60°, 5x30° and 60x60°
- Standard Monochromatic Medium and Large size floodlights have an integral user-adjustable control to vary light output on site
- We recommend using holographic films with circular light beams. It is more effective to install a holographic on an intensive light beam. The wider the light beam the less efficient the flux value and light effect.

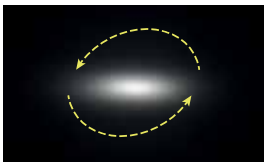
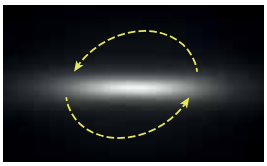




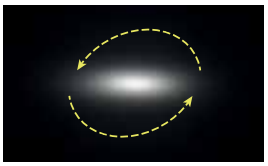
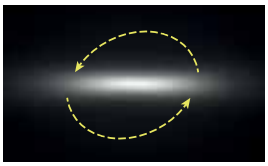

Small version | 12° | 12° + 5 x 30° holographic film | 12° + 1 x 60° holographic film | 12° + 60 x 60° holographic film




Medium version | 8° | 8° + 5 x 30° holographic film | 8° + 1 x 60° holographic film | 8° + 60 x 60° holographic film




Large version | 8° | 8° + 5 x 30° holographic film | 8° + 1 x 60° holographic film | 8° + 60 x 60° holographic film

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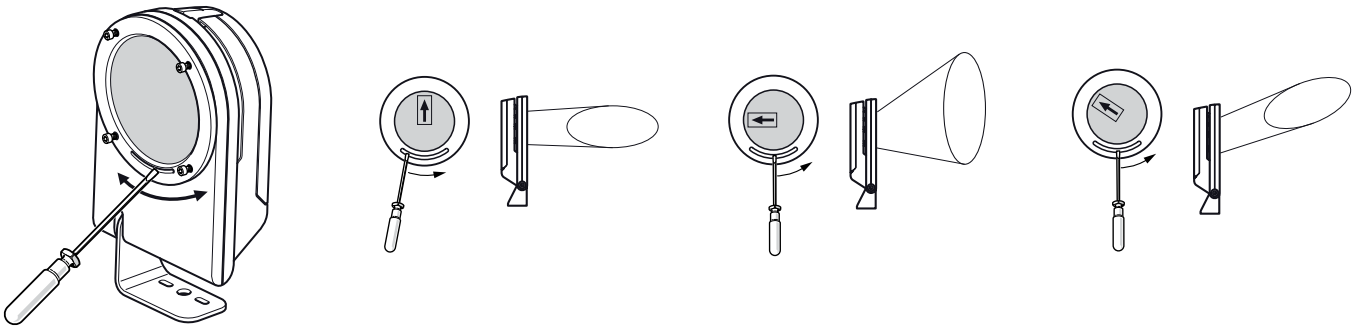
Holographic film adjustment



Materials/Finish

Body: die-cast painted aluminium EN AC 47100 DF sanded, silver grey 150
Glass: tempered glass, 4mm thick
Gasket: EPDM
Screws: stainless steel
Medium and Large high ambient temperature bodies are pre-wired with 1.5m cable.

Connection boxes for:
1 to 2 Small: die-cast painted aluminium EN AC 44100 KF sanded silver grey 150
Gasket: EPDM
Screws: stainless steel
1 to 4 Small or 1 Small RGB: die-cast painted aluminium EN AB 47100 sanded silver grey 150
Gasket: rubber/neoprene
Screws: stainless steel

Holographic films
Frame: die-cast painted aluminium EN AC 44100 KF sanded silver grey 150
Film: PC sheet (2mm) plus PC holographic film (0,27mm)

Installation/Mounting

Floodlight is fully adjustable on a stirrup. Stirrup fixed to mount by central bolt through Ø15mm hole and 2 x Ø8mm holes for the Medium and Large sizes.
Small versions fixed via central bolt hole Ø15mm and 1 x Ø8mm hole.

Aiming simplified by indicator on stirrup, locked via central Ø6mm Allen screw for all sizes.

Easy installation of a maximum of 2 accessories: holographic films plus visor or holographic films plus glare shield for Medium and Large sizes. Holographic films plus visor for the Small. No glare shield for the Small version.

Medium and Large
Easy access to power supply on the product rear for monochromatic Medium and Large sizes and manual potentiometer adjustment.
Entry via 3 Allen screws.
Easy access to power supply and DMX card on the product rear for RGB DMX Medium and Large sizes. Entry via 3 Allen screws.

Medium monochromatic: 2 cable glands for through wiring.
Medium RGB DMX: 3 cable glands. 2 for DMX IN/OUT and one for mains to enter.
Large monochromatic: 2 cable glands for through wiring.
Large RGB DMX: 4 cable glands. 2 for DMX IN/OUT and 2 for mains IN/OUT.

Small
Remote gear box for the monochromatic and RGB DMX Small versions. Entry via 4 Allen screws on the gear box for up to 2 Small floodlights and via 6 screws on the gear box for up to 4 Small floodlights.

Small monochromatic: Pre-wired with H07RNF cable, 1.5m long.
Small RGB DMX: Pre-wired with H07RNF cable, 1.5m long .

Gear box for 2 Small monochromatic: 4 cable glands including through wiring.
Gear box for 4 Small monochromatic: 6 cable glands including through wiring.
Gear box for 1 Small RGB DMX: 5 cable glands for through wiring mains and DMX.

Cable glands for Ø8-13mm cable.

Attachments and ground recessed boxes available.

No LED module replacement.

Specification

To specify state:
A range of compact floodlights in 3 sizes, offering high light outputs with a wide choice of light distributions, LED colours and accessories to cover all applications. Manual dimming on Medium and Large monochromatic versions adjustable on site. Dynamic RGB DMX versions for all sizes.
As Thorn Contrast 2 LED.

Twilight temperature of use and locations 0 - 95% humidity

Standard			
	White	Colour	RGB
Small	1A Body: + 50°C Gear boxes 1-2: + 35°C Gear boxes 1-4: + 25°C Indoor/Outdoor	700mA Body: + 50°C Gear boxes 1-2: + 35°C Gear boxes 1-4: + 25°C Indoor/Outdoor	700mA Body: + 50°C Gear boxes: + 35°C Indoor/Outdoor
Medium	1A + 25°C Indoor/Outdoor	700mA + 25°C Indoor/Outdoor	700mA + 25°C Indoor/Outdoor
Large	1A + 25°C Outdoor	700mA + 25°C Indoor/Outdoor	700mA + 25°C Indoor/Outdoor

High ambient temperature country Remote gear box Indoor and Outdoor use			
	White	Colour	RGB
Small	1A Body: + 50°C Gear boxes 1-2: + 35°C Gear boxes 1-4: + 25°C Indoor/Outdoor	700mA Body: + 50°C Gear boxes 1-2: + 35°C Gear boxes 1-4: + 25°C Indoor/Outdoor	700mA Body: + 50°C Gear boxes: + 35°C Indoor/Outdoor
Medium	1A Body: + 50°C Gear boxes: + 35°C Indoor/Outdoor	700mA Body: + 50°C Gear boxes: + 35°C Indoor/Outdoor	700mA Body: + 50°C Gear boxes: + 35°C Indoor/Outdoor
Large	700mA Body: + 50°C Gear boxes: + 35°C Indoor/Outdoor	700mA Body: + 50°C Gear boxes: + 35°C Indoor/Outdoor	700mA Body: + 50°C Gear boxes: + 25°C Indoor/Outdoor

Maximum distance from the Contrast 2 body to connection box

Standard							
	Monochromatic						DMX RGB
	Connection box for up to 2 Small		Connection box for up to 4 Small				
	1 x Small	2 x Small	1 x Small	2 x Small	3 x Small	4 x Small	1 x Small
Small	105m	10m	105m	both at 105m	2 at 10m and 1 at 105m	4 at 10m	10m

High ambient temperature country							
	Monochromatic						DMX RGB
	Connection box for up to 2 Small		Connection box for up to 4 Small				
	1 x Small	2 x Small	1 x Small	2 x Small	3 x Small	4 x Small	1 x Small
Small	105m	10m	105m	both at 105m	2 at 10m and 1 at 105m	4 at 10m	10m
Medium	100m						12m
Large	100m						18m

Flux data

Size	Light distribution		Static						Dynamic
			Simple dimming						Scenario
			Monochromatic			Whites			Tricolour
			R	G	B	3000K	4000K	6000K	RGB
Small Standard and High ambient temperature version	12°	Lumens	270	478	156	799	859	-	346
		Total Power	9W	12W	12W	14W	14W	-	18W
	32°	Lumens	235	417	136	696	748	-	302
		Total Power	9W	12W	12W	14W	14W	-	18W
	44x12°	Lumens	256	454	148	760	816	-	330
		Total Power	9W	12W	12W	14W	14W	-	18W
Medium Standard and High ambient temperature version	8°	Lumens	740	1310	429	2271	2467	2978	826
		Total Power	27W	35W	35W	46W	46W	46W	42W
	24°	Lumens	682	1207	395	2069	2254	2720	761
		Total Power	27W	35W	35W	46W	46W	46W	42W
	36°	Lumens	694	1227	402	2106	2290	2808	765
		Total Power	27W	35W	35W	46W	46W	46W	42W
	8x16°	Lumens	726	1284	420	2210	2402	2898	810
		Total Power	27W	35W	35W	46W	46W	46W	42W
	50x50°	Lumens	-	-	-	2032	2222	2682	-
		Total Power	-	-	-	46W	46W	46W	-
Large Standard	8°	Lumens	2086	3691	1208	6384	6978	8422	2328
		Total Power	76W	95W	95W	126W	126W	126W	95W
	24°	Lumens	1873	3314	1085	5555	6200	7263	2091
		Total Power	76W	95W	95W	126W	126W	126W	95W
	36°	Lumens	1918	3394	1111	5794	6333	7644	1983
		Total Power	76W	95W	95W	126W	126W	126W	95W
	8x16°	Lumens	2014	3564	1166	5906	6456	7792	2248
		Total Power	76W	95W	95W	126W	126W	126W	95W
	50x50°	Lumens	1932	3418	1118	5622	6144	7416	2156
		Total Power	76W	95W	95W	126W	126W	126W	95W
Large High ambient temperature versions	8°	Lumens	2086	3691	1208	4723	5082	6133	2328
		Total Power	76W	95W	95W	84W	84W	84W	95W
	24°	Lumens	1873	3314	1085	4260	4563	5517	2091
		Total Power	76W	95W	95W	84W	84W	84W	95W
	36°	Lumens	1918	3394	1111	4343	4673	5640	1983
		Total Power	76W	95W	95W	84W	84W	84W	95W
	8x16°	Lumens	2014	3564	1166	4560	4906	5922	2248
		Total Power	76W	95W	95W	84W	84W	84W	95W
	50x50°	Lumens	1932	3418	1118	4374	4706	5680	2156
		Total Power	76W	95W	95W	84W	84W	84W	95W

Product Focus
Contrast 2 LED NEW

Ordering Guide - Standard versions

Small
Delivered without gear box.
For monochromatic versions, two gear box options are provided: one for up to 2 small units and one for up to 4 small units.
The white versions are driven by 1A and the coloured monochromatic versions are driven by 0.7A. **Please select the correct connection box version when ordering.**
For RGB DMX versions, you need to order the power supply/DMX gear box SAP code 96261426.

Medium and Large
Delivered complete with power supply for monochromatic versions and power supply/DMX card for the RGB DMX versions. Other RGBW, RGBA and tunable white versions available on request. DALI versions on request. Other RAL on request. Other light distributions on request.

High ambient temperature versions:
Please contact your local sales representative
With this option, all products are with remote gear box. No manual dimming with potentiometer for high ambient temperature versions with remote gear. Can be used at 50°C with the remote gear box at 35°C. For the white versions, same flux output for the medium versions compared to standard versions and less flux output for the large versions. For the LED colours other than white, same flux for the standard and high ambient temperature versions.

Small - Indoor and Outdoor use

Total angle opening	Description	Wt (kg)	SAP Code
Monochromatic			
Bodies			
12°	CONTRAST 2 LED S 4L105 R/S 12° 830 NG	1.1	96261327
	CONTRAST 2 LED S 4L105 R/S 12° 840 NG	1.1	96263247
	CONTRAST 2 LED S 4L70 R/S 12° RD NG	1.1	96263250
	CONTRAST 2 LED S 4L70 R/S 12° GN NG	1.1	96263253
	CONTRAST 2 LED S 4L70 R/S 12° BU NG	1.1	96263256
32°	CONTRAST 2 LED S 4L105 R/S 32° 830 NG	1.1	96261329
	CONTRAST 2 LED S 4L105 R/S 32° 840 NG	1.1	96263248
	CONTRAST 2 LED S 4L70 R/S 32° RD NG	1.1	96263251
	CONTRAST 2 LED S 4L70 R/S 32° GN NG	1.1	96263254
	CONTRAST 2 LED S 4L70 R/S 32° BU NG	1.1	96263257
44X12°	CONTRAST 2 LED S 4L105 S/S 44x12° 830 NG	1.1	96261330
	CONTRAST 2 LED S 4L105 S/S 44x12° 840 NG	1.1	96263249
	CONTRAST 2 LED S 4L70 S/S 44x12° RD NG	1.1	96263252
	CONTRAST 2 LED S 4L70 S/S 44x12° GN NG	1.1	96263255
	CONTRAST 2 LED S 4L70 S/S 44x12° BU NG	1.1	96263258
Connection boxes			
	CONTRAST 2 LED S 2X4L70 CBOX MONO	1.7	96261898
	CONTRAST 2 LED S 4X4L70 CBOX MONO	1.2	96261899
	CONTRAST 2 LED S 2X4L105 CBOX WHITE	1.7	96261425
	CONTRAST 2 LED S 4X4L105 CBOX WHITE	1.2	96261427
RGB			
Bodies			
12°	CONTRAST 2 LED S 4L70 R/S 12° RGB NG	1.1	96261328
32°	CONTRAST 2 LED S 4L70 R/S 32° RGB NG	1.1	96263259
44X12°	CONTRAST 2 LED S 4L70 S/S 44X12° RGB NG	1.1	96263260
Connection boxes			
	CONTRAST 2 LED S CBOX RGB DMX	1.2	96261426
Accessories			
	CONTRAST 2 LED S VISOR	0.064	96261859
	CONTRAST 2 LED S LR 60X60°	0.117	96261860
	CONTRAST 2 LED S LR 1X60°	0.117	96261861
	CONTRAST 2 LED S LR 5X30°	0.117	96261862

Ground recessed boxes - For standard and high ambient temperature versions

Description	Wt (kg)	SAP Code
Ground recessed boxes		
CONTRAST 2 L FB GL 672X550X500	40.0	96264512
CONTRAST 2 M FB GL 430X430X490	25.4	96264513
CONTRAST 2 S FB GL 330X330X330	13.2	96264514

Contrast 2 LED S	Small version	RD	Red
Contrast 2 LED M	Medium version	GN	Green
Contrast 2 LED L	Large version	840	CRI 80 and 4000K
NG	No Gear	830	CRI 80 and 3000K
GL	Glass	860	CRI 80 and 6000K
FB	In ground box	RGB	Colour changing versions driven with DMX
BU	Blue	R/S 8°	Circular light beam 8°x8°

Medium - Indoor and Outdoor use

Total angle opening	Description	Wt (kg)	SAP Code
Monochromatic			
Floodlights			
8°	CONTRAST 2 LED M 12L105 R/S 8° 830	4.3	96261331
	CONTRAST 2 LED M 12L105 R/S 8° 840	4.3	96263223
	CONTRAST 2 LED M 12L70 R/S 8° RD	4.3	96263228
	CONTRAST 2 LED M 12L70 R/S 8° GN	4.3	96263233
	CONTRAST 2 LED M 12L70 R/S 8° BU	4.3	96263238
24°	CONTRAST 2 LED M 12L105 R/S 24° 830	4.3	96261333
	CONTRAST 2 LED M 12L105 R/S 24° 840	4.3	96263224
	CONTRAST 2 LED M 12L70 R/S 24° RD	4.3	96263229
	CONTRAST 2 LED M 12L70 R/S 24° GN	4.3	96263234
	CONTRAST 2 LED M 12L70 R/S 24° BU	4.3	96263239
36°	CONTRAST 2 LED M 12L105 R/S 36° 830	4.3	96261334
	CONTRAST 2 LED M 12L105 R/S 36° 840	4.3	96263225
	CONTRAST 2 LED M 12L70 R/S 36° RD	4.3	96263230
	CONTRAST 2 LED M 12L70 R/S 36° GN	4.3	96263235
	CONTRAST 2 LED M 12L70 R/S 36° BU	4.3	96263240
8X16°	CONTRAST 2 LED M 12L105 S/S 8X16° 830	4.3	96261335
	CONTRAST 2 LED M 12L105 S/S 8X16° 840	4.3	96263226
	CONTRAST 2 LED M 12L70 S/S 8X16° RD	4.3	96263231
	CONTRAST 2 LED M 12L70 S/S 8X16° GN	4.3	96263236
	CONTRAST 2 LED M 12L70 S/S 8X16° BU	4.3	96263241
50X50° deviation of 30°	CONTRAST 2 LED M 12L105 A/S 830	4.3	96261336
	CONTRAST 2 LED M 12L105 A/S 840	4.3	96263227
	CONTRAST 2 LED M 12L70 A/S RD	4.3	96263232
	CONTRAST 2 LED M 12L70 A/S GN	4.3	96263237
	CONTRAST 2 LED M 12L70 A/S BU	4.3	96263242
RGB			
Floodlights			
8°	CONTRAST 2 LED M 12L70 R/S 8° RGB DMX	4.5	96261332
24°	CONTRAST 2 LED M 12L70 R/S 24° RGB DMX	4.5	96263243
36°	CONTRAST 2 LED M 12L70 R/S 36° RGB DMX	4.5	96263244
8X16°	CONTRAST 2 LED M 12L70 S/S 8X16° RGB DMX	4.5	96263245
50X50° deviation 30°	CONTRAST 2 LED M 12L70 A/S RGB DMX	4.5	96263246
Accessories			
	CONTRAST 2 LED M VISOR	0.212	96261854
	CONTRAST 2 LED M LV	0.078	96261855
	CONTRAST 2 LED M LR 60X60°	0.26	96261856
	CONTRAST 2 LED M LR 1X60°	0.26	96261857
	CONTRAST 2 LED M LR 5X30°	0.26	96261858

Large - Indoor and Outdoor use for the RGB versions. Only outdoor use for the white versions.

Monochromatic			
Floodlights			
8°	CONTRAST 2 LED L 36L105 R/S 8° 830	7.5	96261337
	CONTRAST 2 LED L 36L105 R/S 8° 860	7.5	96261919
	CONTRAST 2 LED L 36L105 R/S 8° 840	7.5	96263207
24°	CONTRAST 2 LED L 36L105 R/S 24° 830	7.5	96261339
	CONTRAST 2 LED L 36L105 R/S 24° 840	7.5	96263203
	CONTRAST 2 LED L 36L105 R/S 24° 860	7.5	96263208
36°	CONTRAST 2 LED L 36L105 R/S 36° 830	7.5	96261340
	CONTRAST 2 LED L 36L105 R/S 36° 840	7.5	96263204
	CONTRAST 2 LED L 36L105 R/S 36° 860	7.5	96263209
8X16°	CONTRAST 2 LED L 36L105 S/S 8X16° 830	7.5	96261341
	CONTRAST 2 LED L 36L105 S/S 8X16° 840	7.5	96263205
	CONTRAST 2 LED L 36L105 S/S 8X16° 860	7.5	96263210
50X50° deviation of 30°	CONTRAST 2 LED L 36L105 A/S 830	7.5	96261342
	CONTRAST 2 LED L 36L105 A/S 840	7.5	96263206
	CONTRAST 2 LED L 36L105 A/S 860	7.5	96263211
RGB			
Floodlights			
8°	CONTRAST 2 LED L 36L70 R/S 8° RGB DMX	7.3	96261338
24°	CONTRAST 2 LED L 36L70 R/S 24° RGB DMX	7.3	96263212
36°	CONTRAST 2 LED L 36L70 R/S 36° RGB DMX	7.3	96263213
8X16°	CONTRAST 2 LED L 36L70 S/S 8X16° RGB DMX	7.3	96263214
50X50° deviation 30°	CONTRAST 2 LED L 36L70 A/S RGB DMX	7.3	96263215
Accessories			
	CONTRAST 2 LED L VISOR	0.433	96261849
	CONTRAST 2 LED L LV	0.167	96261850
	CONTRAST 2 LED L LR 60X60°	0.49	96261851
	CONTRAST 2 LED L LR 1X60°	0.49	96261852
	CONTRAST 2 LED L LR 5X30°	0.49	96261853

S/S 8x16°	Ellipsoidal light beam	LV	Louvre
A/S	Asymmetrical light beam	LR	Adjustable refractor holographic film
12L70	12 LEDs driven at 700mA		
CBOX MONO	Connection box for Small monochromatic LED colours except whites		
CBOX WHITE	Connection box for Small white versions		

Data is subject to change due to the continuous progress of LED characteristics. To check the effect on the luminaire, please contact us or visit our website.

Ordering Guide - High ambient temperature versions

Small
Delivered without gear box.

For monochromatic versions, two gear box options are provided: one for up to 2 small units and one for up to 4 small units.

The white versions are driven by 1A and the coloured monochromatic versions are driven by 0.7A. **Please select the correct connection box version when ordering.**

For RGB DMX versions, you need to order the power supply/DMX gear box SAP code 96261426.

Medium and large
Bodies delivered complete pre-wired with 1.5m cable.

Small - Indoor and Outdoor use

Total angle opening	Description	Wt (kg)	SAP Code
Monochromatic			
Bodies			
	CONTRAST 2 LED S 4L105 R/S 12° 830 NG	1.1	96261327
	CONTRAST 2 LED S 4L105 R/S 12° 840 NG	1.1	96263247
12°	CONTRAST 2 LED S 4L70 R/S 12° RD NG	1.1	96263250
	CONTRAST 2 LED S 4L70 R/S 12° GN NG	1.1	96263253
	CONTRAST 2 LED S 4L70 R/S 12° BU NG	1.1	96263256
	CONTRAST 2 LED S 4L105 R/S 32° 830 NG	1.1	96261329
	CONTRAST 2 LED S 4L105 R/S 32° 840 NG	1.1	96263248
32°	CONTRAST 2 LED S 4L70 R/S 32° RD NG	1.1	96263251
	CONTRAST 2 LED S 4L70 R/S 32° GN NG	1.1	96263254
	CONTRAST 2 LED S 4L70 R/S 32° BU NG	1.1	96263257
	CONTRAST 2 LED S 4L105 S/S 44x12° 830 NG	1.1	96261330
	CONTRAST 2 LED S 4L105 S/S 44x12° 840 NG	1.1	96263249
44X12°	CONTRAST 2 LED S 4L70 S/S 44x12° RD NG	1.1	96263252
	CONTRAST 2 LED S 4L70 S/S 44x12° GN NG	1.1	96263255
	CONTRAST 2 LED S 4L70 S/S 44x12° BU NG	1.1	96263258
Connection boxes			
	CONTRAST 2 LED S 2X4L70 CBOX MONO	1.7	96261898
	CONTRAST 2 LED S 4X4L70 CBOX MONO	1.2	96261899
	CONTRAST 2 LED S 2X4L105 CBOX WHITE	1.7	96261425
	CONTRAST 2 LED S 4X4L105 CBOX WHITE	1.2	96261427
RGB			
Bodies			
12°	CONTRAST 2 LED S 4L70 R/S 12° RGB NG	1.1	96261328
32°	CONTRAST 2 LED S 4L70 R/S 32° RGB NG	1.1	96263259
44X12°	CONTRAST 2 LED S 4L70 S/S 44X12° RGB NG	1.1	96263260
Connection boxes			
	CONTRAST 2 LED S CBOX RGB DMX	1.2	96261426
Accessories			
	CONTRAST 2 LED S VISOR	0.064	96261859
	CONTRAST 2 LED S LR 60X60°	0.117	96261860
	CONTRAST 2 LED S LR 1X60°	0.117	96261861
	CONTRAST 2 LED S LR 5X30°	0.117	96261862

Ground recessed boxes - For standard and high ambient temperature versions

Description	Wt (kg)	SAP Code
Ground recessed boxes		
CONTRAST 2 L FB GL 672X550X500	40.0	96264512
CONTRAST 2 M FB GL 430X430X490	25.4	96264513
CONTRAST 2 S FB GL 330X330X330	13.2	96264514

Medium - Indoor and Outdoor use

Total angle opening	Description	Wt (kg)	SAP Code
Monochromatic			
Floodlights			
8°	CONTRAST 2 LED M 12L105 R/S 8° 830 KIT	4.2	96261821
24°	CONTRAST 2 LED M 12L105 R/S 24° 830 KIT	4.2	96261822
36°	CONTRAST 2 LED M 12L105 R/S 36° 830 KIT	4.2	96261823
8X16°	CONTRAST 2 LED M 12L105 8X16° 830 KIT	4.2	96261824
50X50° deviation 30°	CONTRAST 2 LED M 12L105 A/S 830 KIT	4.2	96261825
RGB			
Floodlights			
8°	CONTRAST 2 LED M 12L70 R/S 8° RGB KIT	4.2	96261864
24°	CONTRAST 2 LED M 12L70 R/S 24° RGB KIT	4.2	96263219
36°	CONTRAST 2 LED M 12L70 R/S 36° RGB KIT	4.2	96263220
8X16°	CONTRAST 2 LED M 12L70 S/S 8X16° RGB KIT	4.2	96263221
50X50° deviation 30°	CONTRAST 2 LED M 12L70 A/S RGB KIT	4.2	96263222
Accessories			
	CONTRAST 2 LED M VISOR	0.212	96261854
	CONTRAST 2 LED M LV	0.078	96261855
	CONTRAST 2 LED M LR 60X60°	0.26	96261856
	CONTRAST 2 LED M LR 1X60°	0.26	96261857
	CONTRAST 2 LED M LR 5X30°	0.26	96261858

Large - Indoor and Outdoor use

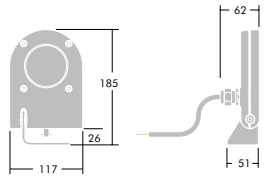
Total angle opening	Description	Wt (kg)	SAP Code
Monochromatic			
Floodlights			
8°	CONTRAST 2 LED L 36L70 R/S 8° 830 KIT	5.8	96261826
24°	CONTRAST 2 LED L 36L70 R/S 24° 830 KIT	5.8	96261827
36°	CONTRAST 2 LED L 36L70 R/S 36° 830 KIT	5.8	96261828
8X16°	CONTRAST 2 LED L 36L70 S/S 8X16° 830 KIT	5.8	96261829
50X50° deviation 30°	CONTRAST 2 LED L 36L70 A/S 830 KIT	5.8	96261830
RGB			
Floodlights			
8°	CONTRAST 2 LED L 36L70 R/S 8° RGB KIT	5.8	96261846
24°	CONTRAST 2 LED L 36L70 R/S 24° RGB KIT	5.8	96263199
36°	CONTRAST 2 LED L 36L70 R/S 36° RGB KIT	5.8	96263200
8X16°	CONTRAST 2 LED L 36L70 S/S 8X16° RGB KIT	5.8	96263201
50X50° deviation 30°	CONTRAST 2 LED L 36L70 A/S RGB KIT	5.8	96263202
Accessories			
	CONTRAST 2 LED L VISOR	0.433	96261849
	CONTRAST 2 LED L LV	0.167	96261850
	CONTRAST 2 LED L LR 60X60°	0.49	96261851
	CONTRAST 2 LED L LR 1X60°	0.49	96261852
	CONTRAST 2 LED L LR 5X30°	0.49	96261853

Contrast 2 LED S	Small version
Contrast 2 LED M	Medium version
Contrast 2 LED L	Large version
NG	No Gear
GL	Glass
FB	In ground box
BU	Blue
RD	Red
GN	Green
840	CRI 80 and 4000K
830	CRI 80 and 3000K
860	CRI 80 and 6000K
RGB	Colour changing versions driven with DMX
R/S 8°	Circular light beam 8° x8°
S/S 8x16°	Ellipsoidal light beam
A/S	Asymmetrical light beam
12L70	2LEDs driven at 700mA
CBOX MONO	Connection box for Small monochromatic LED colours except whites
CBOX WHITE	Connection box for Small white versions
LV	Louvre
LR	Adjustable refractor holographic film
KIT	High ambient temperature versions

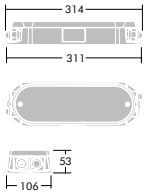
Data is subject to change due to the continuous progress of LED characteristics. To check the effect on the luminaire, please contact us or visit our website.

Product Focus
Contrast 2 LED NEW

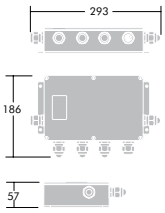
Small versions
Standard and high ambient temperatures



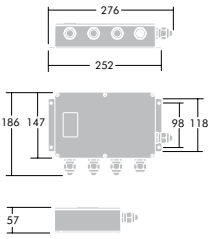
Power supply boxes



Monochromatic for 1 to 2 Small

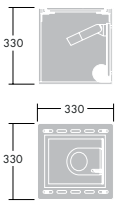


Monochromatic for 1 to 4 Small

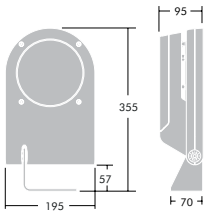


RGB

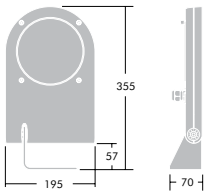
Recessed boxes



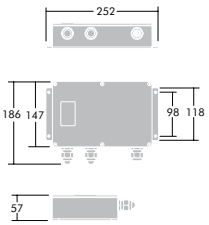
Medium versions
Standard



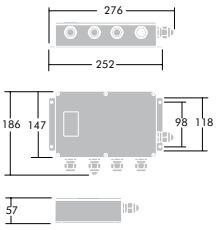
High ambient temperature



Power supply boxes

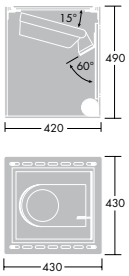


Monochromatic

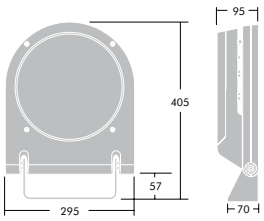


RGB

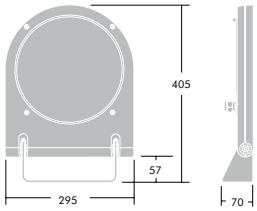
Recessed boxes



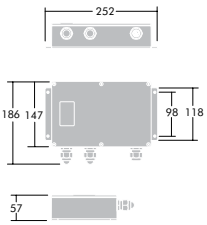
Large versions
Standard



High ambient temperature



Power supply boxes



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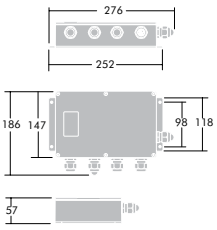
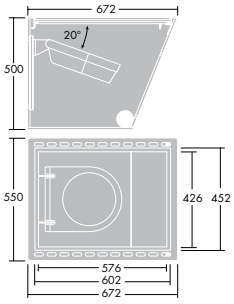
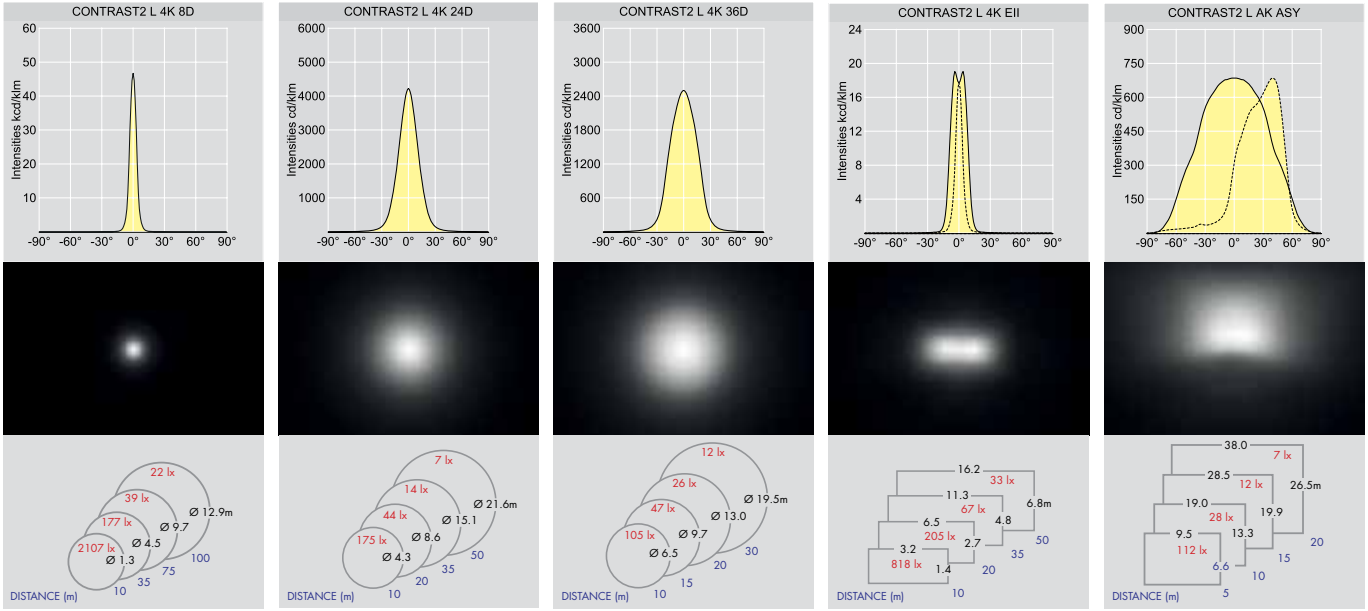


RGB DMX

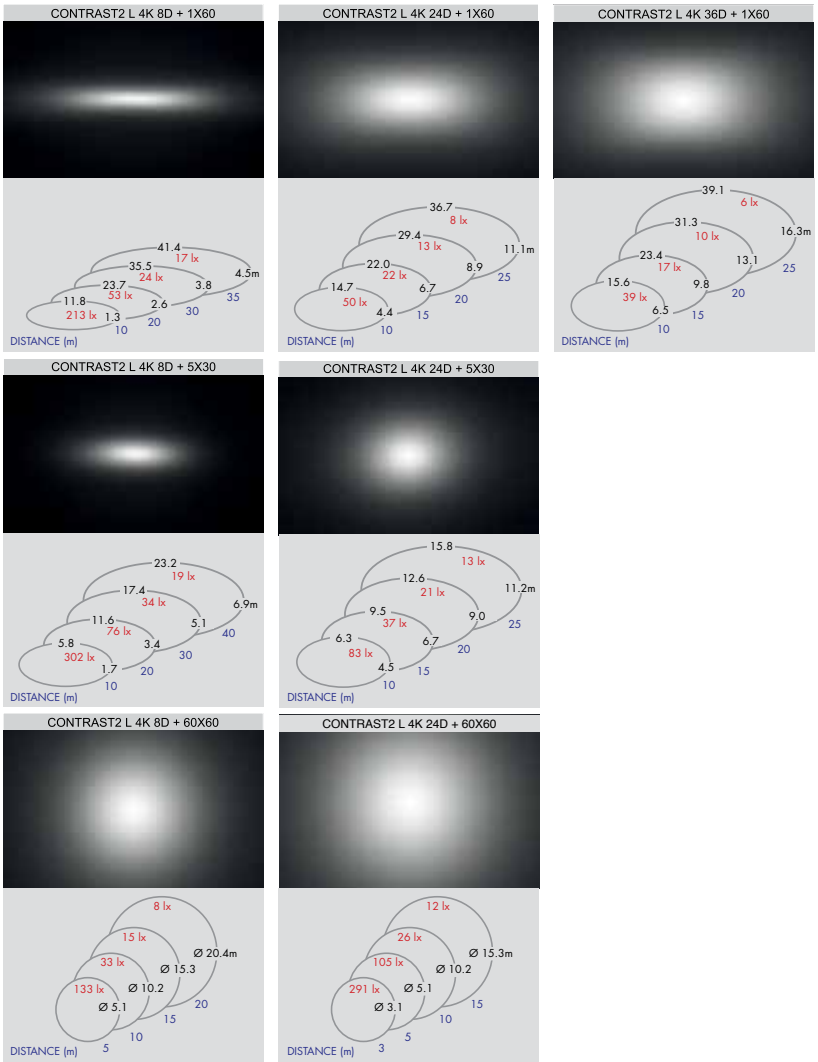
Recessed boxes



Large versions



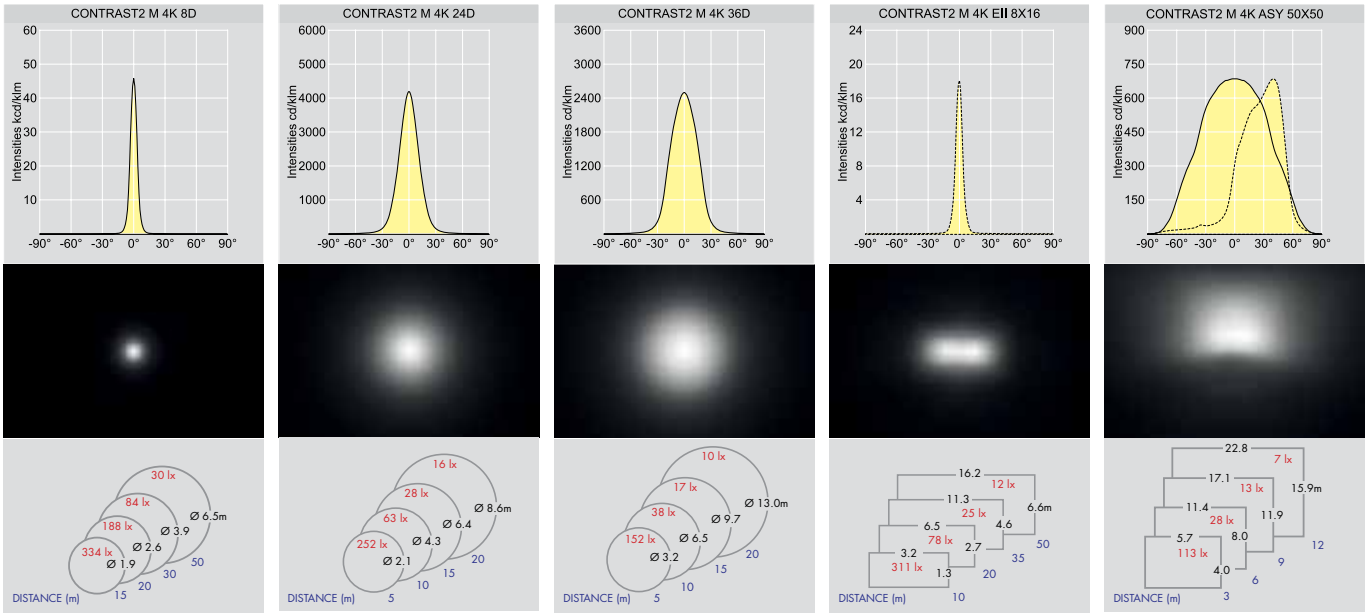
Large versions with accessory



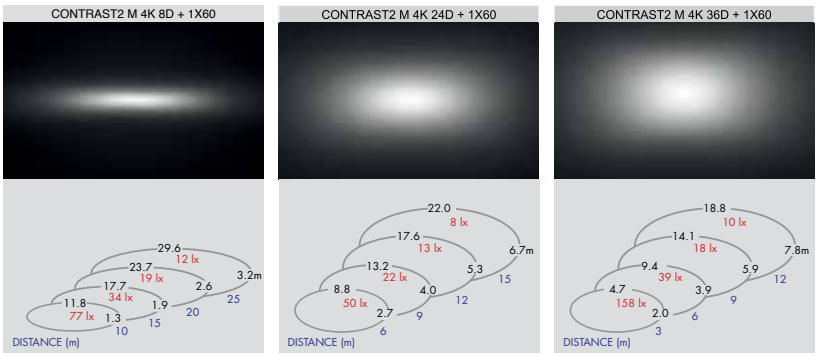
This lx value indicates an approximate value of average illuminance for the Contrast Large with 4000°K LED.
For the 3000°K version this value could be reduced about 9%. For the 6000°K version this value could be increased about 20%.

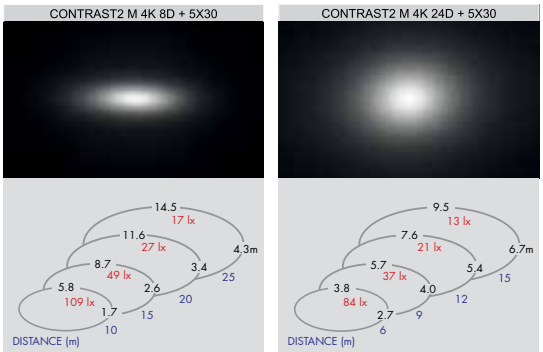
Product Focus
Contrast 2 LED NEW

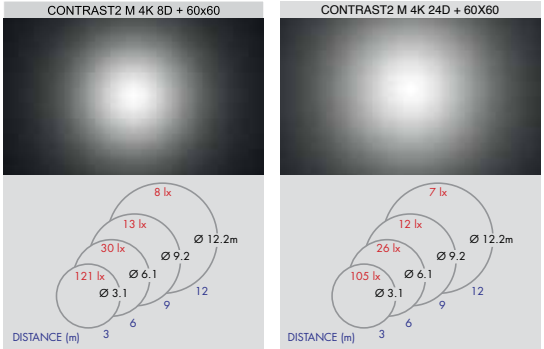
Medium versions



Medium versions with accessory

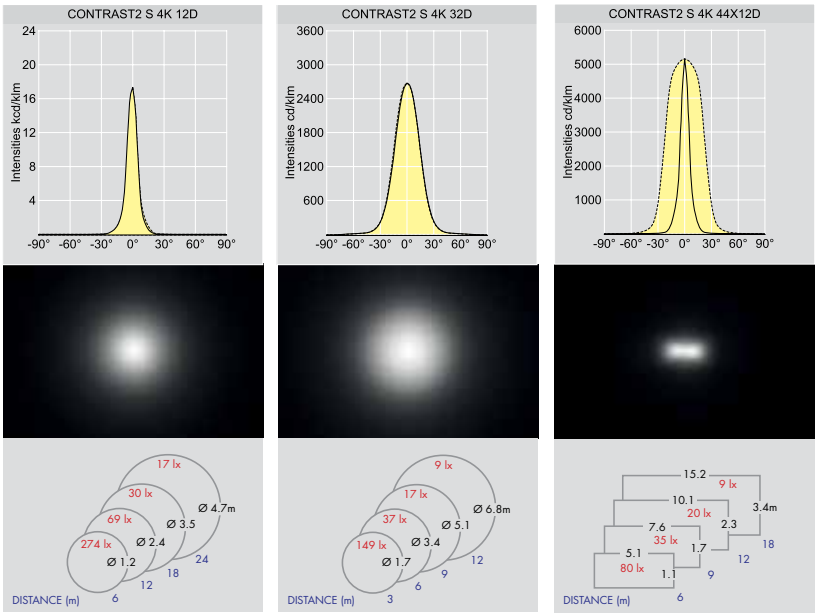




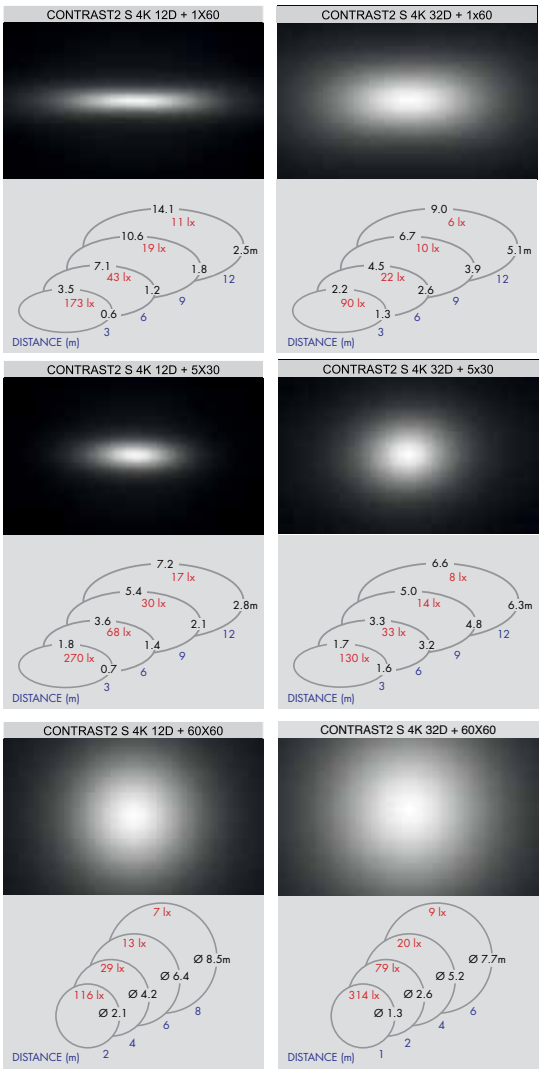


This lx value indicates an approximate value of average illuminance for the Contrast Medium with 4000°K LED.
For the 3000°K version this value could be reduced about 9%.

Small versions

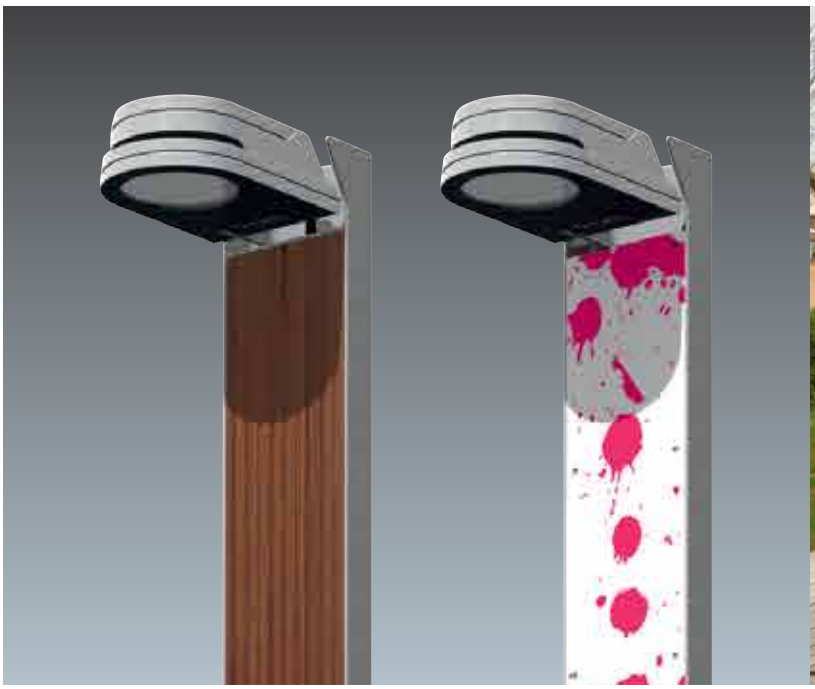


Small versions with accessory



This lx value indicates an approximate value of average illuminance for the Contrast Small with 4000°K LED.
For the 3000°K version this value could be reduced about 9%.

Product Focus
Contrast 2 LED NEW



An aesthetically innovative modern pedestrian column with customisation options to enrich individual project identity

- Unique shape complements the innovative design of Contrast 2 LED
- Wooden or metal infills available. The metal sheets can be printed for project customisation (Fig. C, D, E and F)
- Diagonal cut-out at the top of the column allows a tilting angle of up to 60° for flexible light placement (Fig. A & B)
- The bottom of the column features a multifunctional diagonal cut profile, which aside from serving a technical function, can be customised with either sublimation transfer or the addition of clear or bright colour reflection when Contrast 2 LED is switched on

Materials

Column in steel S235.
The pole is of a rectangular to a semi-rectangular shape in:
Galvanized steel
Powder coated steel with 1 RAL
Powder coated steel with 2 RAL which can be outside/inside or the stand up part only.

The semi-rectangular shape can be filled with wood or metallic insert with customised sublimation transfer.

For more information, contact your Thorn sales representative.

Dimensions

Heights: 4m, 5m and 6m
4/5m: section 200 x 120mm.
6m: section 300 x 150mm.
Door dimensions: 500 x 90mm on the mast rear.

Installation

Easy installation with 2 screws using the standard stirrups of Contrast 2 LED.

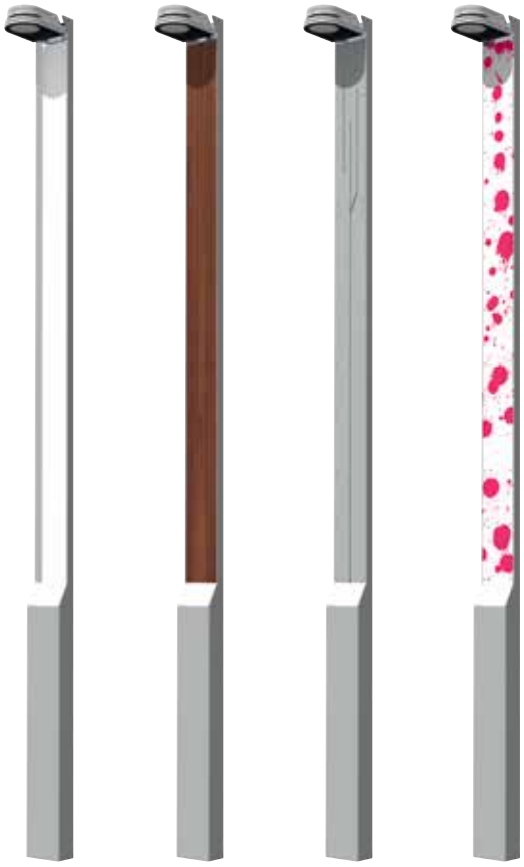


Fig. C | Fig. D | Fig. E | Fig. F

Fig. A - The top of the column showing the cut out profile

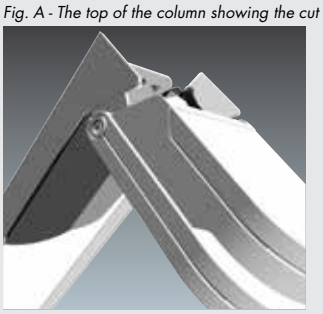
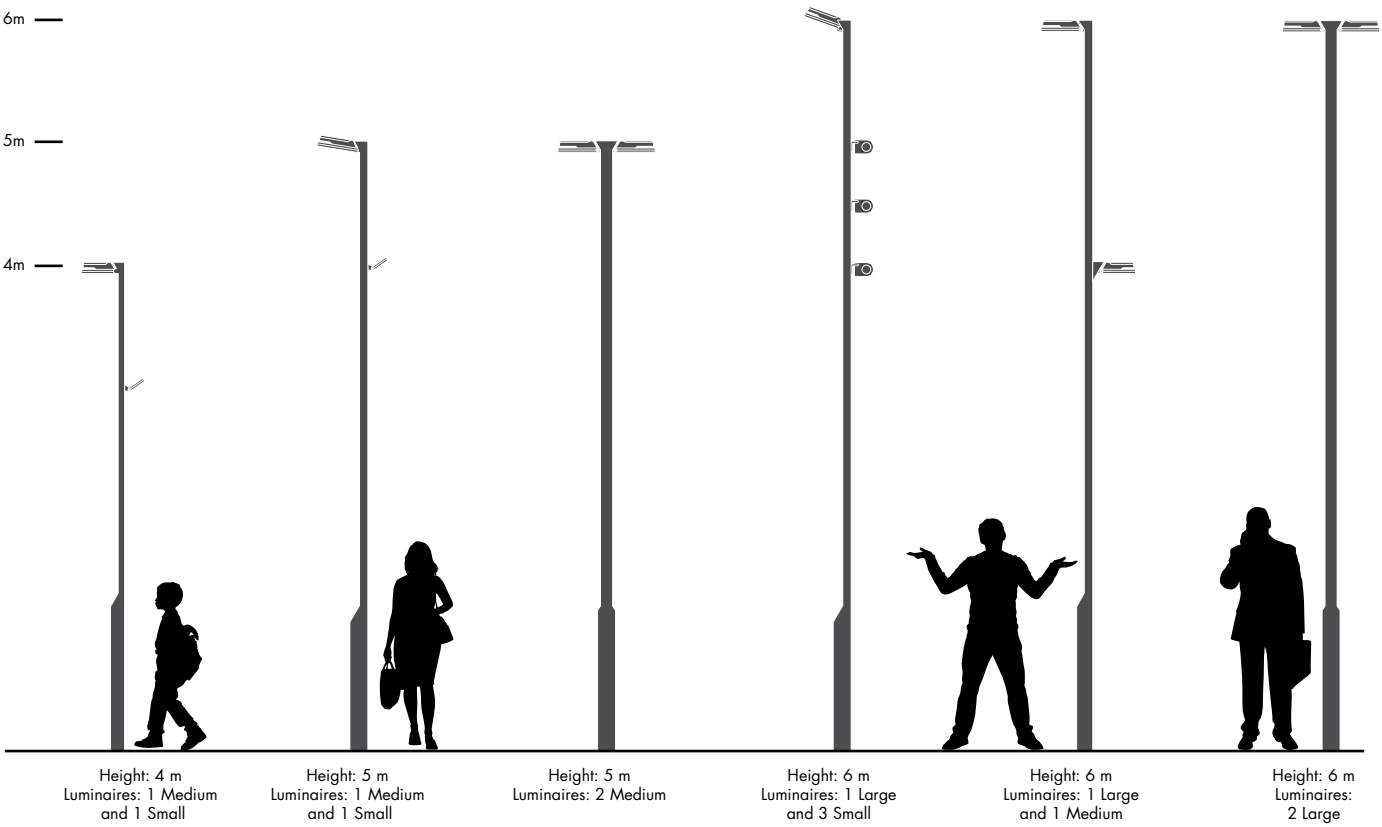


Fig. B - Tilting angle of up to 60° for flexible light placement

Diagonal cut profile

Top of column



Product Focus
Contrast 2 LED NEW

An aesthetically innovative square conical column providing decoration and function

- Innovative square conical column providing a decorative alternative to the classic cylindrical frame
- The column is available plain or with six flat notches. The notches support Contrast 2 LED fixation and add further decorative appeal to scenic applications (Fig. A and B)
- Floodlight orientation can be adjusted according to the required effect
- The high column can accommodate four large Contrast 2 LED luminaires as standard, with additional quantities available depending on the installation environment
- Various fixation types with frames available for a wide range of applications (Fig. C & D) plus mast extension

Materials

Column in steel S235. Supplied in 1 part for 10m and 2 parts for upper versions. Galvanised steel and powder coated steel with 1 RAL

For more information, contact your Thorn sales representative.

Dimensions

10m with base section: 210 x 210mm
12m with base section: 255 x 255mm
14m with base section: 300 x 300mm
Door dimensions: 500 x 90mm

Installation

Easy installation with 2 screws using the standard stirrups of Contrast 2 LED.

For installation of more than 4 Contrast 2 LED, contact your Thorn sales representative for a validation study.

Fig. A Fig. B Fig. C Fig. D

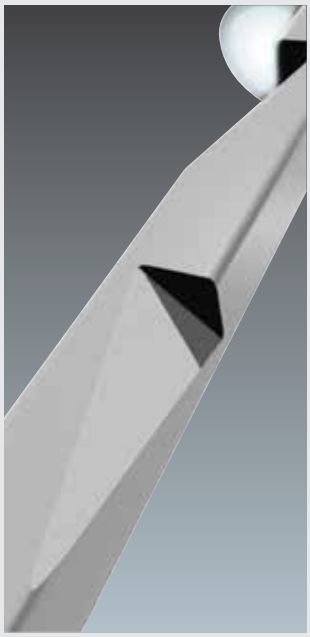


Fig. A and B - The notches support Contrast 2 LED

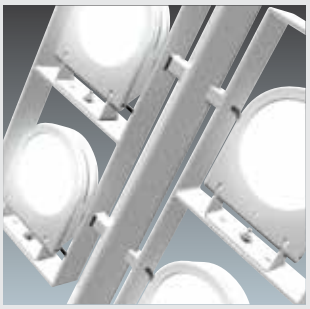


Fig. E

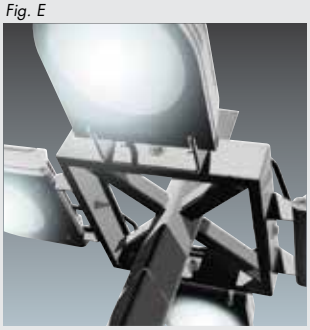
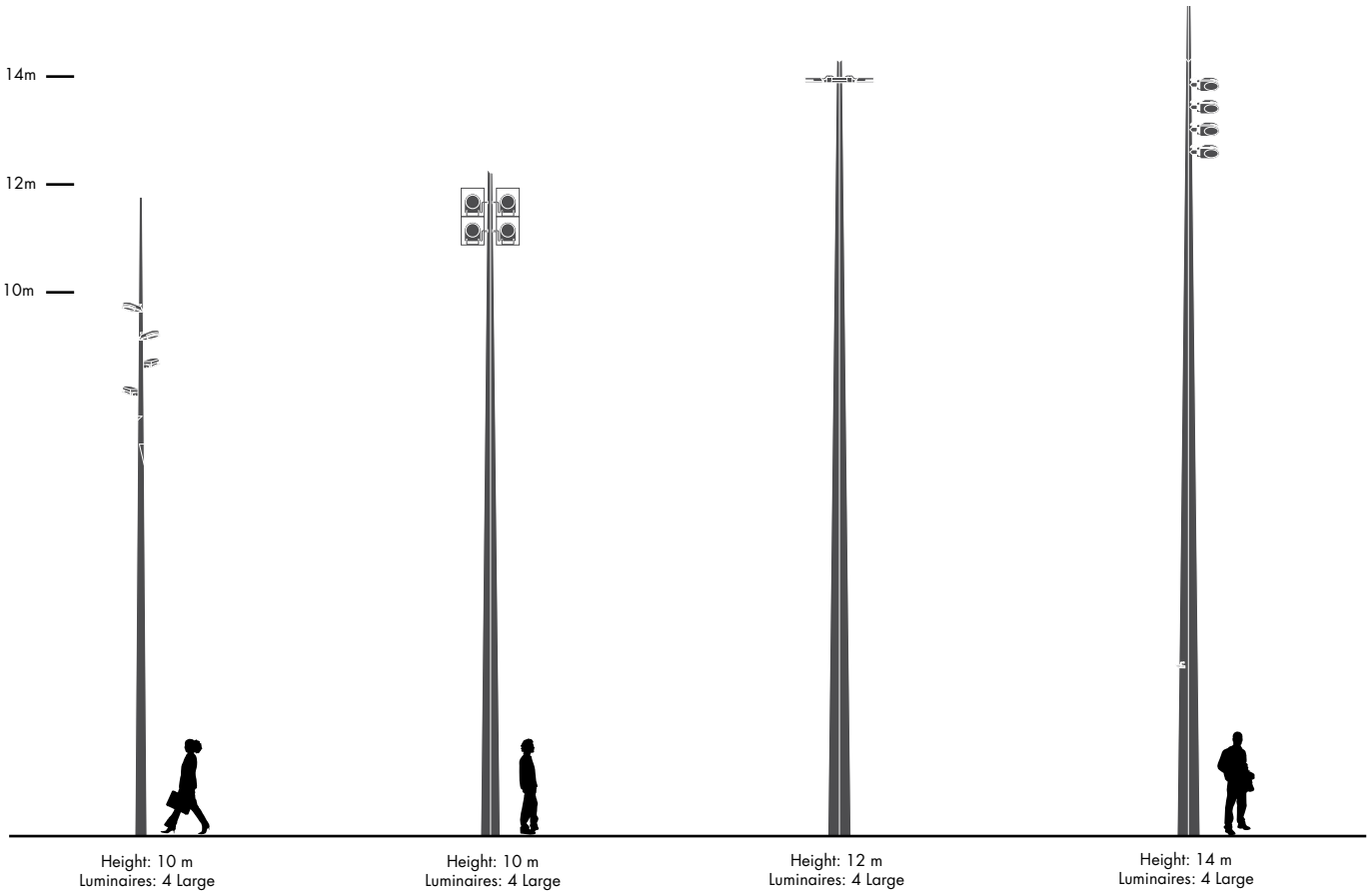


Fig. F



Ways of lighting

These sections are a guide to applications and suitable luminaires with brief comments where considered useful. Because of the wide range of applications it is necessary to analyse the visual requirements of each and choose the lamps and luminaires carefully in order to produce the best results.

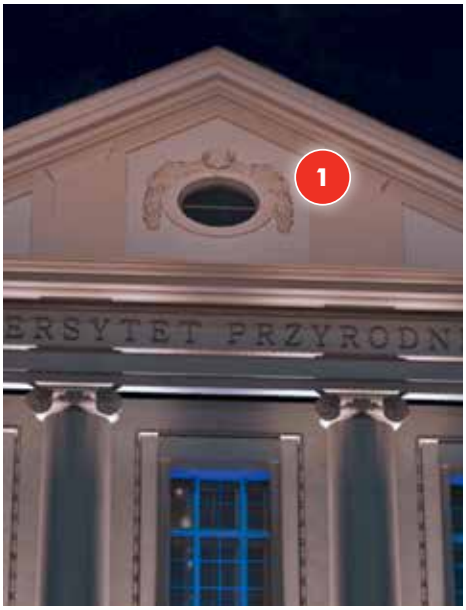
The most common applications can be grouped into five general categories:

1. Off-set
2. Accentuation
3. Wall washing
4. Guidance
5. Light effects

Thorn can offer several luminaire types to produce attractive and dramatic results economically. Broadly classified according to the way in which the light is distributed or controlled they include: floodlights, spotlights, linear wall grazers, wall washers, ground and wall recessed units (shielded, un-shielded and directional), colour changers and columns. The majority are offered with a wide selection of styles, finishes, sizes and attachments. Additionally, digital control units are offered to produce specific LED colours or create colour changing LED effects. Where rapid scene or dynamic colour change is required use DMX protocol controls and luminaires. For slower scene change or simple dimming DALI is an alternative.


UNIWERSYTET PRZYRODNICZY
1
2
3
1

1 Offset




Castel Sant'Angelo, IT. | Qba

Lighting from a distance to highlight vertical structures

In the case of a building facade where there is an opportunity to "off-set" equipment some distance away, lighting from the main direction of view will create a flat appearance to the building. Whereas setting the lighting to come onto the building at a glancing angle with respect to the main direction of view will produce strong shadows and marked highlights, consequently the building will be given the appearance of depth.

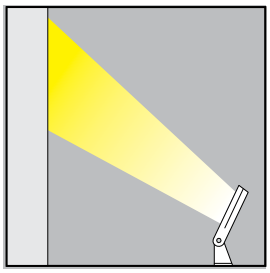
Completeness of floodlighting is important in that the whole building and its setting should be revealed. This may include the return walls to the main facade, the roof and the full height of any projection from the roof such as chimneys or adjacent walls, trees or shrubbery. The main floodlights usually need supplementing to give completeness and avoid a 'floating' appearance. Buildings can appear to float if the base of the building is shadowed or under lit. Wherever possible, luminaires should be hidden from view by being installed behind existing structures or purpose-built features, or recessed in ground boxes.

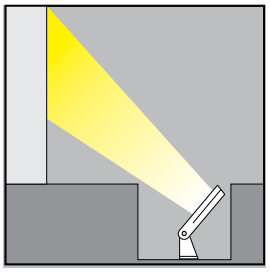
Great medieval and classic architecture is characterised by facades with predominantly vertical characteristics. The style can be emphasised by applying illumination from the left and right side of the facade using medium beam floodlights. Generally, due to fairly light coloured surface material, the shadows formed by sharply oblique lighting are too strong and create too distinct a contrast. In-fill lighting from the opposite direction using wide-beam floodlights will reduce the contrast and soften the appearance.

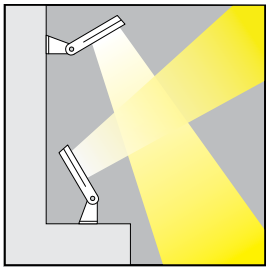
In contrast, many modern high rise office and hotel blocks have a markedly horizontal emphasis, often including elements that project slightly, like window ledges or continuous bands that run across the facade from one side of the building to the other. Floodlights placed close to the facade and aimed upward will produce bands of dark shadow above the projection. Supplementary lighting may be placed upon the ledge to soften or eliminate the shadow, or alternatively, the floodlights have to be moved away from a close-offset position so that a greater distance exists between the facade and the light source.

With spec-built office blocks and factory units, facades that are basically flat are often encountered. The achievement of any shadow effects may only be possible by placing the luminaires at exceptionally close-offset positions as a certain unevenness in the brightness patterns across the facade could produce a degree of visual interest. Alternatively, luminaires may be able to be installed at the top of the building directing narrow beams of light downwards. Another possibility is to place low power luminaires at suitable positions at different levels of the building directed downwards or sideways. Beware of glass facades which reflect light directly into the sky and yet show little or no luminance themselves.

Floodlights including the new Contrast 2 LED can also be used with accessories to create different types of light beams.

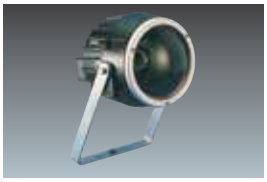




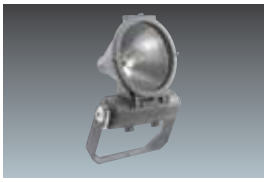


Torre Alemanna, IT. © Fabio Baraldi, Architect: Vincenzo Russo | Corniche

Product range For more information on your desired product please select from below:

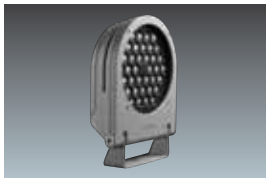


OSQ
www.thornlighting.com/OQSE

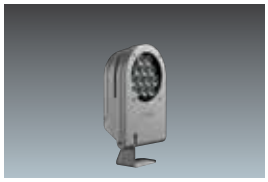


Contrast R
www.thornlighting.com/CONR

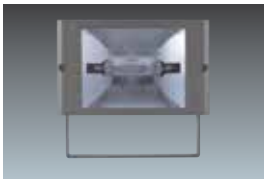
Contrast C
www.thornlighting.com/CONC



Contrast 2 LED (Large)
www.thornlighting.com/CON2



Contrast 2 LED (Medium)
www.thornlighting.com/CON2

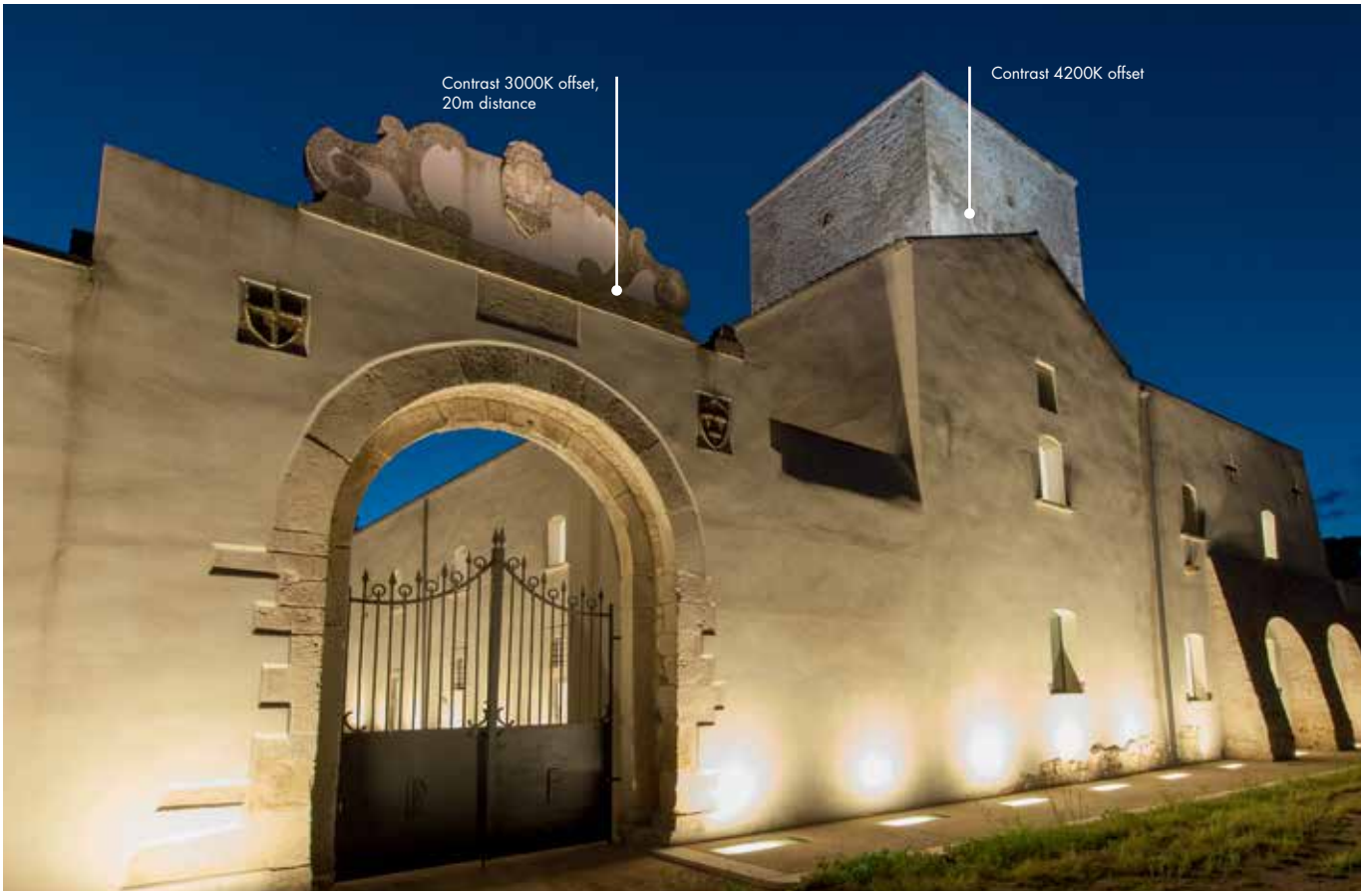


Qba
www.thornlighting.com/QBAL

Sensa DMX
www.thornlighting.com/SEND

Please note: Accessories can be added to create different beam effects

1 Offset
Project Examples



Torre Alemanna, IT. © Fabio Baraldi | Contrast LED + accessory

Ville de Brionne, FR. © Agence Luminocité | Contrast, QBA, E/Fact and Band

Avignon Bridge, FR. © Christophe Canadell Noctabene | Satin, Qba LED and Contrast LED

Theatre of Phenix, Valenciennes, FR. Concepto Agency | Contrast LED

Foggia Cathedral, IT. © Fabio Baraldi | Contrast LED, Qba, Corniche, Graffiti, D-CO LED

2 Accentuation

Revealing form and structural detail

When lighting statues or sculpture, modelling is usually important to reveal the form and details of the structure and make it stand out from its surroundings. The main differentiation between natural daylight and artificial floodlighting is that daylight always has a downward direction, while floodlighting can be aimed from almost any direction, but is more usually these days aimed upwards. This means that features on the surface of a structure will have shadows reversed from the daytime view, and a structure can take on a very different appearance at night as a result.

Establishing a principle viewing position is an important first step. Once agreed then a typical treatment is to use a key light at about 45°, if that is possible, with a less intense softer fill in light from the other side. An even more three dimensional effect can be given by introducing back lighting, although care is needed not to cause glare to observers at the preferred viewing position. Just using a key light alone can look harsh and stark. In the situation where there is an object that people are expected to walk around then lighting from three directions could be appropriate given slightly stronger emphasis in one direction. (Fig.1)

Works in light coloured materials are normally revealed best when brighter than the background, but dark statues, like bronzes, are often better in silhouette.

The shadows of a lit object can in some circumstances be part of the overall effect. Where different coloured light sources are being used shadows from one light source can be lit and coloured by another light source. Shadows can help to define the three-dimensional form of an object or building and create a contrast between highlights in the field of view. (Fig. 2) Light directed at a fairly shallow angle, close offset, can provide strong shadows to a three-dimensional structure. These strong shadows can be softened by lighting from the opposite direction to fill in the shadows. The illuminance only needs to be a tenth to a third of the key light. (Fig. 3). Experiment on site to get the best lighting effect. In amenity areas over use of shadows should be avoided as this reduces people's sense of security within the space.

A facade is often designed to incorporate features such as balconies or galleries that may project forward or be recessed into the facade. Normally, offset floodlights are employed to prevent excessively dark shadows being formed, but if lack of available space in front of the facade prevents their use, supplementary illumination will have to be placed inside the balcony space or incorporated within the building to create the shadow.

Constraints in mounting position or specific application requirements often require a modified beam distribution or intensity. Additional beam shaping optical components are useful in getting the correct result, as is the ability to set the maximum output of the floodlight to suit to the overall scheme using in built manual dimming like Contrast 2 LED Large and Medium with manual potentiometer in monochromatic versions.

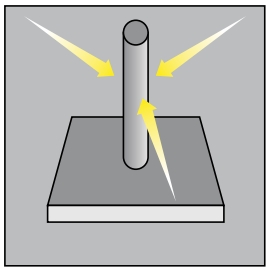


Fig. 1

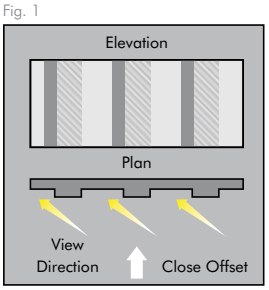


Fig. 2

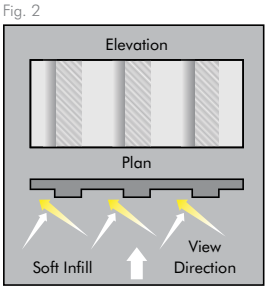


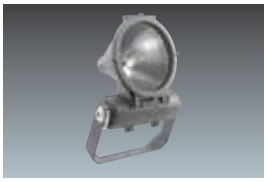
Fig. 3

Catello Ceconi Pielungo, Vito d'Asio, IT. © Fabio Baraldi

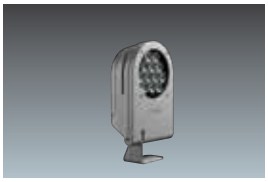
Product range For more information on your desired product please select from below:

Contrast Mini Pinspot
www.thornlighting.com/CONM

Contrast Pinspot
www.thornlighting.com/CONP

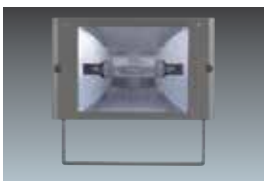


Contrast R
www.thornlighting.com/CONR



Contrast 2 LED (Medium)
www.thornlighting.com/CON2

Contrast 2 LED (Small)
www.thornlighting.com/CON2



Qba
www.thornlighting.com/QBAL

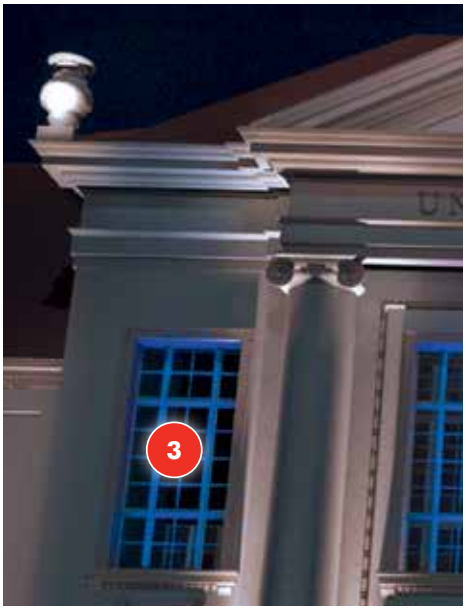
Milo
www.thornlighting.com/MILO

D-CO LED Flood
www.thornlighting.com/DCOF

Sensa DMX
www.thornlighting.com/SEND

Please note: Accessories can be added to create different beam effects

3 Wall washing



Torre Alemanna, IT. © Fabio Baraldi, Architect: Vincenzo Russo | Corniche

Providing a wash of light across surface-orientated structures

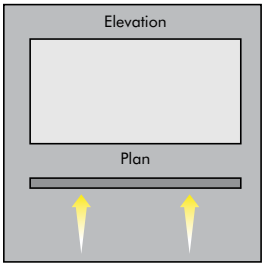
Here is a simple test you can try for yourself. Take a torch outside at night, and shine it directly at brickwork - you will see the colour and the shape of the bricks! Now place the torch close to the building surface, and direct the light across the surface – you will see the texture also. This wall washing technique is known as “grazing”, and is effective in showing details of structures, not just the texture, but also accentuating shape and form as well as adding depth. It also simplifies the lighting of architectural detail. Grazing has the added advantage for occupied buildings, such as offices and hotels, that there is very little light penetration into the building to cause annoyance or discomfort to the occupants.

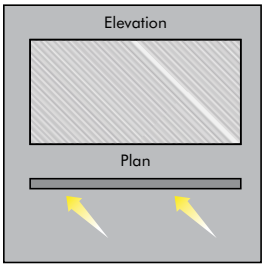
More conventional wall washing aims to maintain coherence across the whole of the façade. By mounting luminaires at regular intervals – or continuously in the case of linear luminaires – the walls are gently “washed” with even illumination. This soft, glare-free ambient lighting can create visual interest and in many situations also provide general surround lighting to the area, due to reflection.

Luminaire spacings, especially where linear units meet, and selected beam shapes play a key role in determining whether a wall is evenly illuminated or not. Distinct cut-off lines can be used purposely to help visual communication and impact the visual rhythm of a space.

Wall washing lighting usually requires a larger number of low powered luminaires than that used for greater offset distances. Wherever possible, luminaires should be recessed or hidden from view.

Floodlights like Contrast 2 LED can be used with an accessory to create an ellipsodial light beam particularly suitable for cornice wall washing.





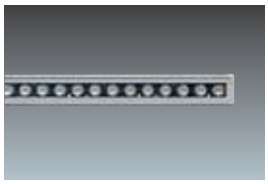
Stairs, Paris, FR «On» Agency. © Vincent Thiesson | Satin

Product range For more information on your desired product please select from below:

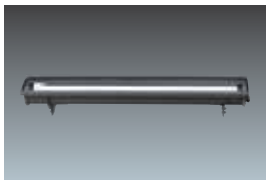
Linear floodlights

Band²
www.thornlighting.com/BAN2

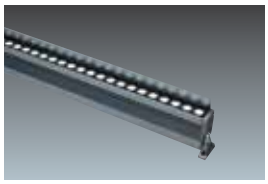
Band
www.thornlighting.com/BAND



Satin
www.thornlighting.com/SATN



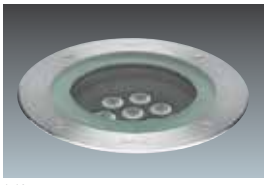
Corniche
www.thornlighting.com/CRNC



Haline²
www.thornlighting.com/HALN

Sensa DMX
www.thornlighting.com/SEND

Recessed

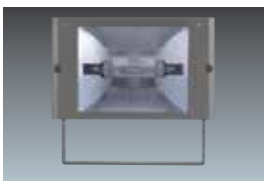


Mica
www.thornlighting.com/MICA

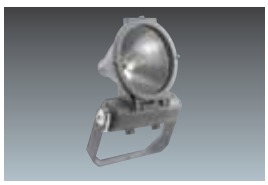
E/Fact
www.thornlighting.com/EFCT

D-CO LED Recessed
www.thornlighting.com/DCOR

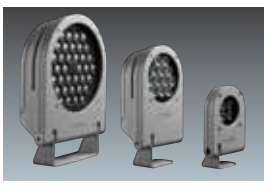
Floodlights



Qba
www.thornlighting.com/QBAL



Contrast R
www.thornlighting.com/CONR



Contrast 2 LED
www.thornlighting.com/CON2

Please note: Accessories can be added to create different beam effects

3 Wall washing
Project Examples

Torre Alemanna, IT. © Fabio Baraldi, Architect: Vincenzo Russo | Corniche

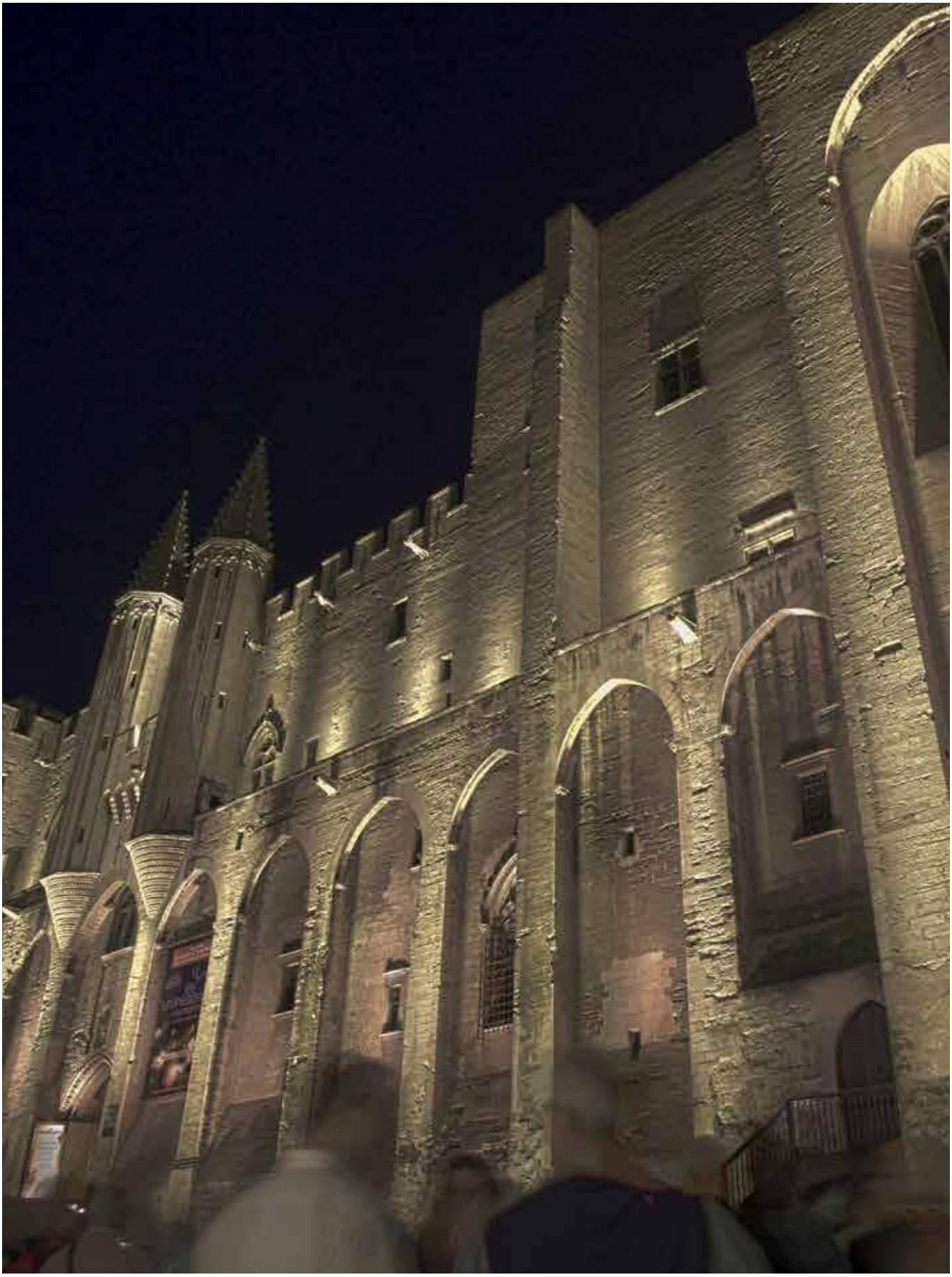
Mosquée Roubaix, FR | Mica

National Glass Centre, UK | Contrast LED

Catello Ceconi Pielungo, Vito d'Asio, IT. © Fabio Baraldi | Mica

Vallex Garden Hotel, RU | Contrast LED

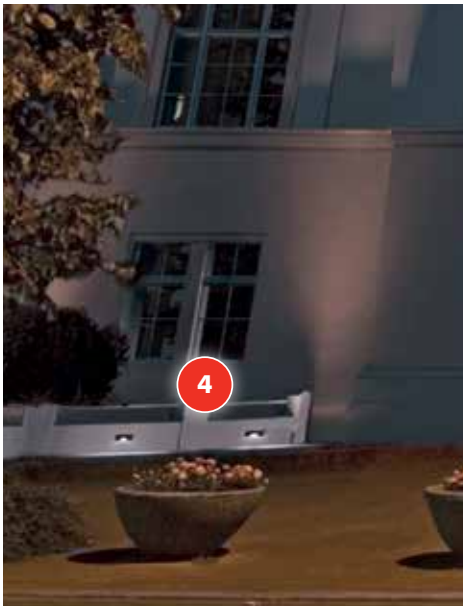
3 Wall washing
Project Examples



Le Palais des Papes, Avignon. © Christophe Canadell, Noctabene Agency | Satin

Catello Ceconi Pielungo, Vito d'Asio, IT. © Fabio Baraldi | Mica

4 Guidance



Creating guidance with ground or wall recessed lighting

Recessed luminaires can be used for defining pathways and routes for pedestrians. Where people are likely to follow a prescribed route a sequence of "beacons" can lead the eye and footsteps. For marking out routes, use minimum wattage lamps. Entrances, paths, intersections, steps and seating areas can all be marked, and precise directional control is possible to prevent light pollution. By night they guide and define routes, by day they continue to provide a visual waymark.

Recessed wall luminaires can be an attractive alternative to ground type units as well as more practical in marking changes of level. It needs to be established that a cavity can be made for the luminaires and that provision can be made for electrical connections. The shape of the luminaire, round, square or rectangular, can be selected to complement the architecture. Recessed luminaires are also less susceptible to vandalism than bollards that might be considered for pathway lighting.

A wide variety of recessed and surface mounted luminaires are now available, for ground and wall mounting. Various combinations of coloured light sources, and directional grilles can be attached allowing the creation of many different visual effects. Also, consider using directional 'windows' to direct the light output near to the horizontal.

Lighting equipment should be chosen which is in keeping with the public nature of the area.

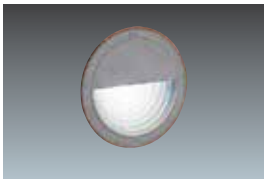
An impression of brightness, warmth and unity is desirable, particularly throughout the circulation spaces. Colour should be natural and people not inconvenienced by glare.

An aspect to take into account is the surface temperature of the luminaire. Young children could be particularly vulnerable to injury if they touch some luminaires. There are low temperature luminaire options available to avoid this possibility.

Comune di Limatola, Frazione Giardoni, IT | D-CO LED

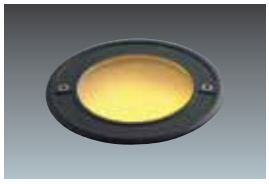
Product range For more information on your desired product please select from below:

Linn
www.thornlighting.com/LINN

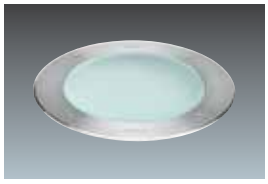


Via
www.thornlighting.com/VIAW

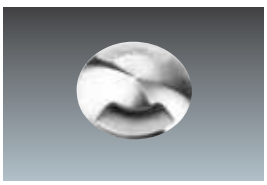
Jalon
www.thornlighting.com/JALN



E/Fact
www.thornlighting.com/EFCT



Mica
www.thornlighting.com/MICA



D-CO LED Recessed
www.thornlighting.com/DCOR

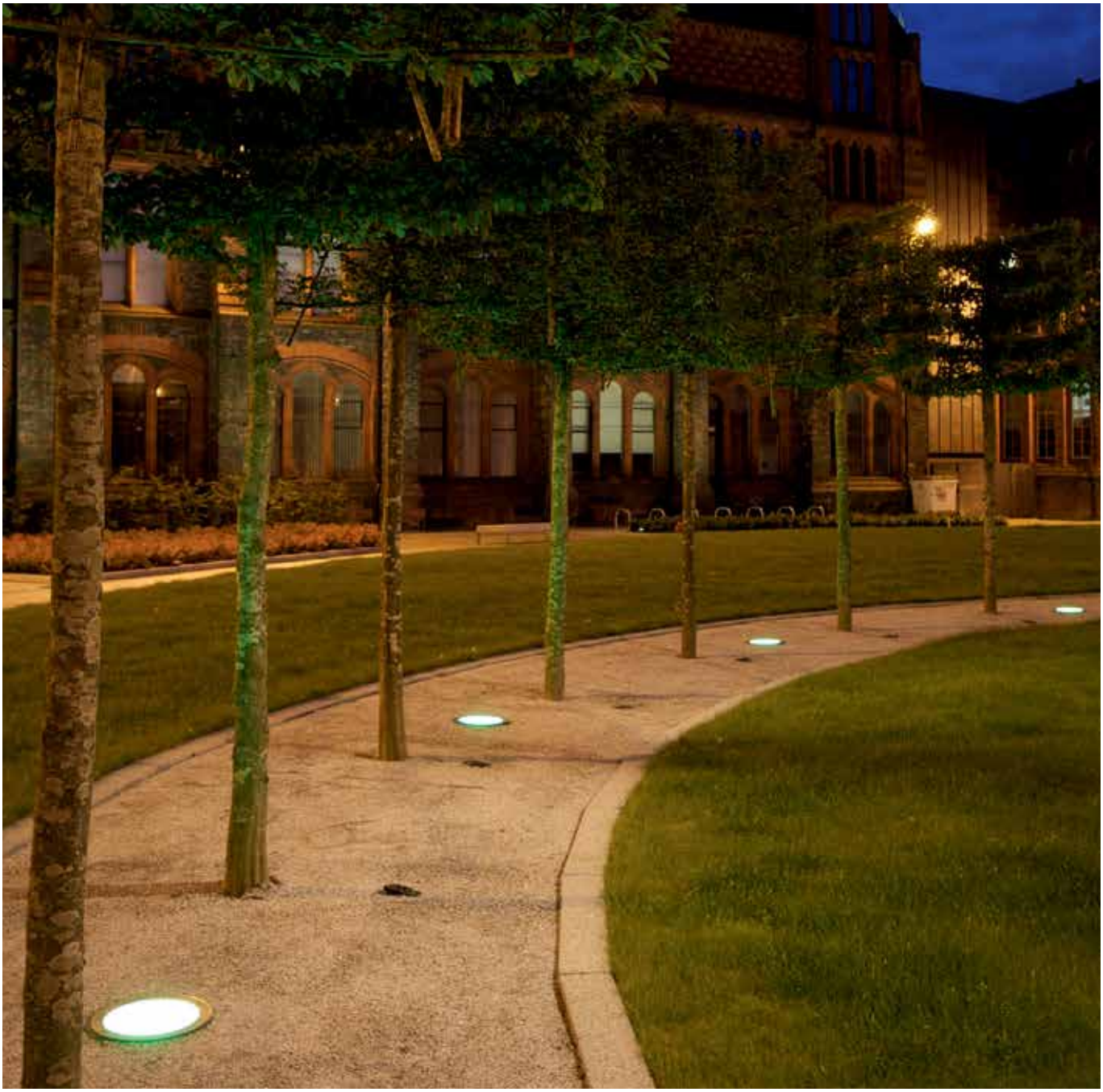
Sensa DMX
www.thornlighting.com/SEND

4 Guidance
Project Examples

Vallex Garden Hotel, RU | Band and Mica

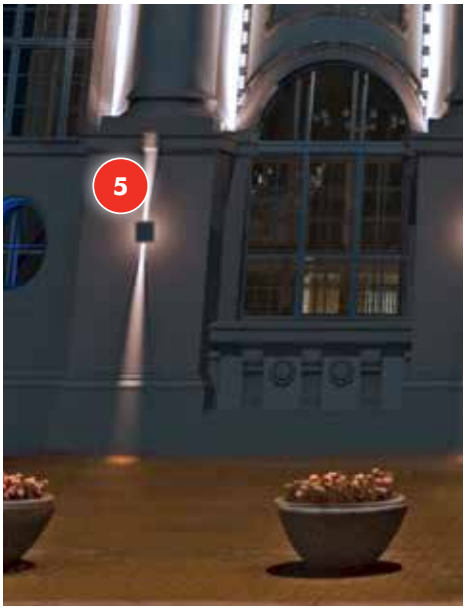
Parc de Château des Longues Allées, FR. © Adhoc | E/Fact

Torre Alemanna, IT. © Fabio Baraldi | Mica, Contrast and Corniche



Liverpool University, UK | Mica

5 Light effects



Place des Epars à Chartes, FR. Reichen & Robert. Architects: Paysagist Atelier Jacqueline Osty. Lighting Design: Roger Narboni, Concepto Agency. Photo: © Xavier Boymond

Decorative lighting effects that enhance structures and landscapes

The character of architectural illumination, friendly or formal, intimate or spacious, relaxed or celebratory, depends to a great extent on the emotional reaction created by the lighting effects employed. Thus, the designer seeks to use light to dramatically reshape the architecture or natural landscape.

Outdoor lighting does not need to attempt to duplicate the daytime appearance of the building or object since the main direction of light is usually reversed. The best decorative lighting installations are those which exploit these differences rather than minimise them.

The lighting of columns provides a good example of lighting to create an effect. A row of columns can be lit from the front, side and the rear to give a silhouette. It is better to use light to bring out form than to flatten out to a two dimensional appearance.

The designer must consider the visual impact and the key viewing positions. A number of lighting techniques can then be employed, including: patterns of light, shade and colour; varying the mounting position / height of equipment; changing luminaire types and styles; and altering local illuminances. A site survey is almost always essential to establish the primary viewpoint, together with existing floor and wall textures, and to ensure that the installation does not clash with existing ambient lighting. Care must always be taken to avoid excessive glare or spill light causing annoyance or hazards.

How to create coloured lighting?
One way is to use coloured lamps, and while this is a useful solution, it has limitations as if you want to change the colour, you need to replace the lamp/luminaire. Economic constraints will probably mean that the colour is installed for a long time, with no realistic means of variation.

The more traditional method is to use lamps with a white light output, and use a colour filter on the front of the light. This has the benefit of being able to remove or change the filter. The downside is that colour filters only transmit their own colour – i.e. a blue filter stops the emission of everything except blue light, with consequently reduced amounts of light and lowering of efficiency.

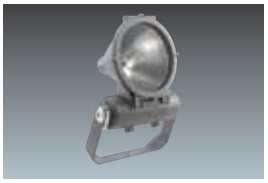
The best solution is to use dynamic colour change lighting, enabled by the use of RGB colour mixing LEDs and programmed and controlled by electronic DMX devices.

Floodlights including the new Contrast 2 LED can also be used with accessories to create different types of light beam effects on the ground.

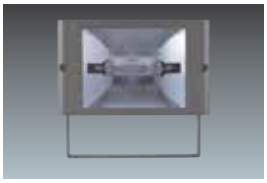
Avenue Charles de Gaulle, Pont Audemer, FR. «On» Agency © Vincent Thiesson | Contrast LED

Product range For more information on your desired product please select from below:

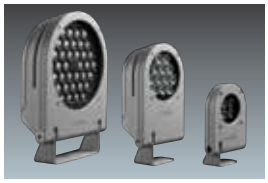
Floodlights



Contrast R
www.thornlighting.com/CONR



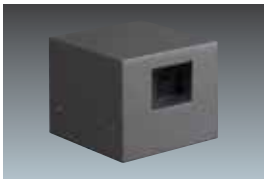
QBA
www.thornlighting.com/QBAL



Contrast 2 LED
www.thornlighting.com/CON2

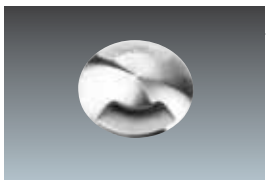
Wall mounted

Cesar
www.thornlighting.com/CESA

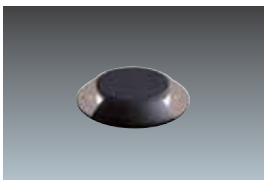


Axyl
www.thornlighting.com/AXYL

Recessed



D-CO LED Recessed
www.thornlighting.com/DCOR



Efact
www.thornlighting.com/EFCT

Mica
www.thornlighting.com/MICA

Sensa DMX
www.thornlighting.com/SEND

Please note: Accessories can be added to create different beam effects

5 Light effects
Project Examples

Cinema Majestik, Douai, FR | Axyl

Stairs, Paris, FR. «On» Agency © Vincent Thiesson | Satin

Arena, Niort, FR. Neo Light Agency | Alumet Stage

Rouen Market, FR | Alumet

Palladio, Villa Veneta IT Photo Fabio Baraldi | Alumet

Theatre of Phenix, Valenciennes, FR. Concepto Agency | Contrast LED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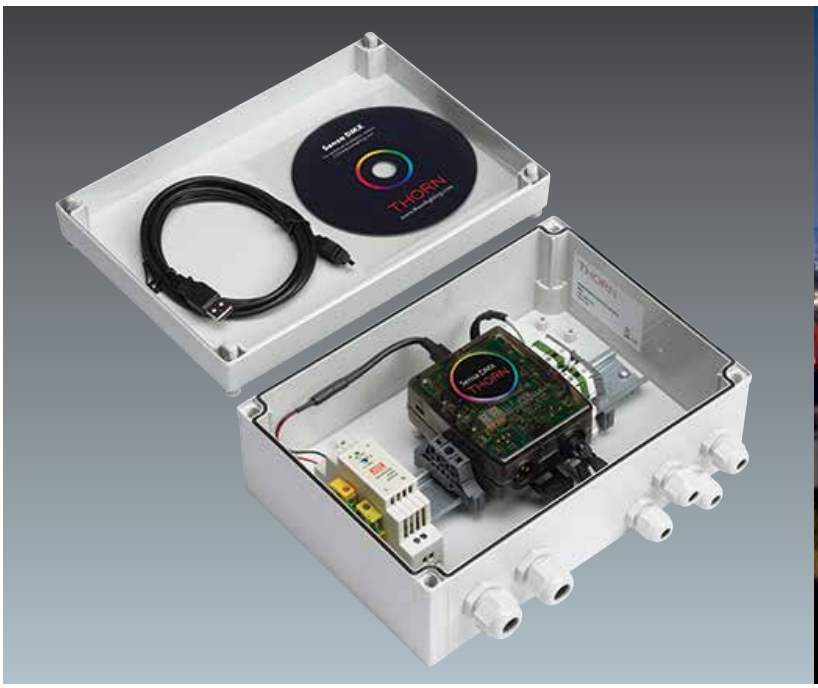
Sensa DMX NEW



Stand alone DMX controller and associated devices for the implementation of DMX networks in outdoor applications

- Simple creation and autonomous display of lighting scenarios
- Scene recall via internet astronomical clock or remote push buttons
- Simple and discreet indoor touch screen panels
- Comprehensive range of splitters and accessories

Applications

- Buildings and surrounds
- Wall washing

Design notes

Scenario recall is achieved through:

- Selection buttons on the controller itself
- Programming of the time period thanks to the internal astronomical clock and calendar
- The use of the Sensa DMX adaptor portx8 (SAP code: 96291604) and remote triggers (commutor, relays etc). Space has been allowed inside the Controller box for the adaptor port.

The use of the DMX splitter (SAP code: 96261602) between Controller and luminaires is strongly recommended for its preventative protection (lightning surge, etc), in addition to the extension potential it provides. Space has been allowed inside the Controller box for the splitter.

Default settings

The DMX Controller is supplied with 8 pre-set scenarios. This allows for the validation of the cabling of the installation, as well as the implementation of simple and immediate scenarios without the need for commissioning

Scenario number	Scenario
1	Black
2	Slow change of colours
3	Red
4	Yellow
5	Green
6	Cyan
7	Blue
8	Magenta

Sensa DMX Software

The Sensa DMX Controller box is supplied complete with the Sensa architectural lighting software CD and USB cable. The software is compatible with Windows XP/Vista/Seven 32/64-bit / 64Kb memory, 512 DMX channels, 255 scenes.

Software also available for download from: www.thornlighting.com.

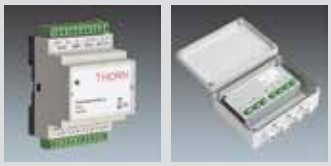
www.thornlighting.com/SEND

DMX CONTROLLERS

Stand alone DMX controller using the DMX512 protocol. Supplied with Sensa DMX software.

DMX SPLITTERS

Splitters provide preventative protection of the DMX Controllers, they also enable the extension of DMX networks both in distance and number of luminaires.



ACCESSORIES

Power supply for DIN rail splitter and DMX Controller. DMX cable specifically designed for DMX networks. The adaptor x8 enables the use of remote triggers, such as the pre-wired switch supplied with 8 preset scenarios. after. The adaptor x8 enables the use of remote triggers.

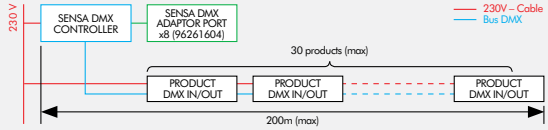
Ordering guide

	SAP Description	Description	SAP Code
	DMX Controllers		
	SENSA DMX CONTROLLER BOX IP65	Stand alone DMX Controller kit in IP65 box	96261598
	SENSA DMX CONTROLLER KIT	Stand alone DMX Controller kit for DIN rail	96261600
	SENSA DMX TS CONTROLLER BLACK	Black wall mounted touch screen DMX Controller	96261606
	SENSA DMX TS CONTROLLER WHITE	White wall mounted touch screen DMX Controller	96261599
	DMX Splitters		
	SENSA DMX SPLITTER X4	4 output DMX Splitter for DIN rail	96261602
	SENSA DMX SPLITTER X4 IP65	4 output DMX Splitter in IP65 box	96241229
	Accessories		
	SENSA DMX POWER SUPPLY	5V power supply for DIN rail	96261603
	SENSA DMX CABLE DMX512	DMX 512 cable	96261601
	SENSA DMX ADAPTOR PORT X8	8 port trigger adaptor for DIN rail	96261604
	SENSA DMX SWITCH 8 POS PREWIRED 3M	8 position pre-wired switch	96264082

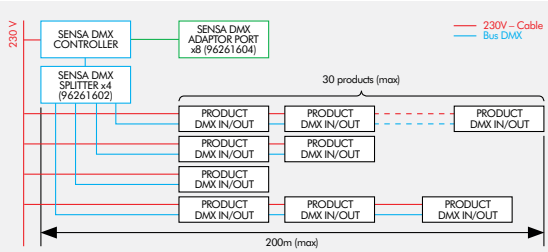
End of line terminations (¼W resistance at the end of each DMX line) are not included in the Sensa DMX Range.

Typical installation structures

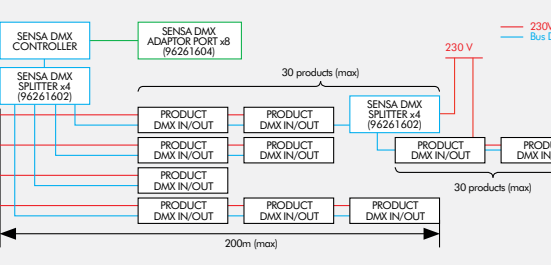
Sensa DMX for a small installation: DMX controller alone (optional adaptor port shown)



Sensa DMX for a medium installation: DMX controller with splitter (optional adaptor port shown)



Sensa DMX for a large installation: DMX controller with splitters in cascade (optional adaptor port shown)



www.thornlighting.com/SEND

THORN
LIGHTING PEOPLE

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