



**T·MAX™** 

Delivering smoother transition  
and adaptation







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and adaptation



PATENT PENDING  
REGISTERED EUROPEAN DESIGN



T·MAX has been designed around the latest in Solid State Lighting technology, captured inside: a housing that is guaranteed to last for decades within tunnel environments.

Our goal is to ensure that today's technology will still be applicable and effective in the future.

At Holophane we have aspired to design lighting products that last for decades, under the harsh conditions experienced in outdoor environments. Now we have combined scalability and technology, for one of the most challenging and toughest conditions in industrial and road lighting applications.

T·MAX has a diverse range of lumen packages and photometric distributions. The T·MAX concept provides a complete solution for tunnel applications in a variety of mounting options. With this wide range of possibilities we can now specifically address every installation scenario that a planner faces when working in tunnel lighting.

### Optics / light source

- Lumen package from **4,000 lm to 52,000 lm**
- 9 Distribution options
- Colour temperature 4000 K
- Class I
- Designed to **IP66**
- **IK09** suitable for high pressure jet cleaning
- Available with a range of mounting & bracket options
- **IP68 IP69K** Cable gland

### Approvals

CE

IP66 light engines (EN 60529)

IP66 gear compartment (EN 60529)

Ta -40°C to +50°C

For further information please visit  
[www.holophane.co.uk](http://www.holophane.co.uk)



## T-MAX family



**Single module**

4.000 lm - 15.000 lm  
@ 4000 K



**Single module**

23.000 lm - 26.000 lm  
@ 4000 K



**Double module**

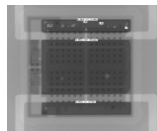
30.000 lm - 52.000 lm  
@ 4000 K



# Technical specifications

## Vacuum welding

In order to ensure the quality and long life of T-MAX in the toughest conditions the PCB is welded with a revolutionary method that improves heat transfer and resistance to vibrations.

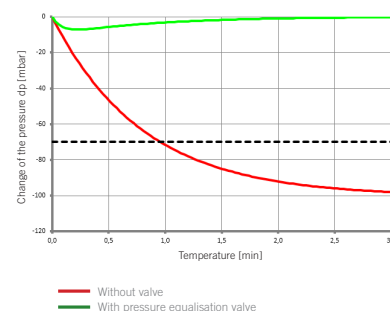


This method is used in medicine, aerospace, military and many other applications.

## Pressure equalisation valve

The T-MAX has a pressure equalisation valve that balances the internal / external pressure while preventing the penetration of solid and liquid contaminants, thus extending the life of the joints and the internal electronic elements.

The below graph highlights the differences in the internal pressure of the module due to a significant change in temperature.



Luminaire is IP66 - According to EN 60529.

Driver compartment (GBOX) - IP66.

IP68 / IP69K connector and cable gland.

According to EN 62262, IK09 impact protection.



## Transient overvoltage protector

T-MAX includes the E-protec system, an element that offers maximum safety standards to protect the electronic parts of the luminaire against overvoltages of up to 10KV/KA, ensuring a longer projected life.



## Cable: Plug & Play

The connection between luminaire and equipment is made through an isolated and flexible EPR aerial cable of halogen-free polyurethane, equipped with IP68 connector for quick connection.



## High-pressure cleaning

With an IP69K rating T-MAX has been designed to be hosed down on site during maintenance.



## Sealed for life

The luminaire has been designed around a 'sealed for life' concept to deliver a life of 100,000 hours. This ensures that during the installation or maintenance process there is no requirement to open the luminaire housing.



## Designed for dirty environments

T-MAX is the only LED solution on the market that prevents the accumulation of dirt, debris and dust by minimizing the negative effect on heat dissipation. The natural movement of the air passing between the ventilation channels causes dirt and debris not to be deposited on the surface ensuring optimal performance is maintained in the system.



Up to  
159 lm/W



#### Materials

- Body and driver compartment: Profiles in anodized 6060 T6 extruded aluminium
- Side covers: pressure die-cast **LM6 aluminium (EN AC-44100 AISI112)** with low copper content (<0.1%).
- Enclosure: Tempered glass cover, flat (4 mm).
- Optics: Acrylic lenses specially designed for PMMA LEDs

#### Weight

From 5.9 Kg to 23.5 Kg depending on configuration.

\* Double module with integrated GBOX.

#### Optical distributions

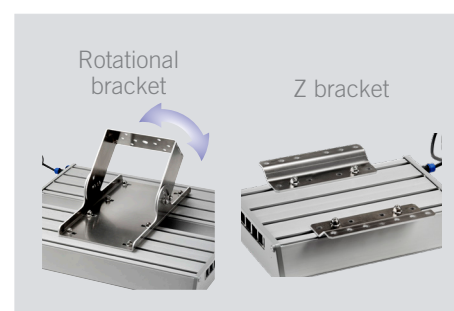
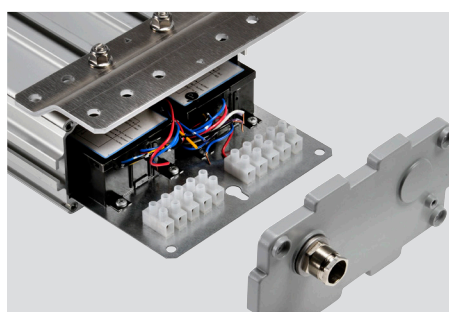
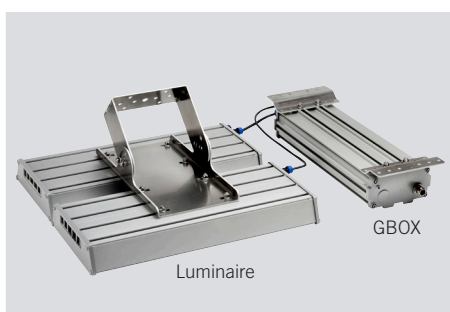
Latest generation of optics that offer an excellent distribution of light. Available up to 9 different distributions.

#### Light source

Using between 6 and 52 high-performance, high-efficiency LEDs delivering a luminous flux range between 4,000 and 52,000 lm, colour temperature 4000 K (neutral white) CRI 70.

#### Finish

Body in anodized aluminium.  
Side covers in RAL-9006 smooth gloss (metallic silver).  
Polyester powder coating.



## Options for driver mounting

The driver is supplied in a specially designed gear compartment to house the equipment (GBOX), which can be installed attached to the luminaire or separately.

## Maintenance

Although the luminaire has been designed to guarantee a “sealed for life” system, the equipment and luminaire are accessible in case there is an LED module or driver update required.

Access to the equipment on the side is done through 4 stainless Allen screws. The cover is designed to ensure IP66 sealing.

## Mounting

Two types of mounting systems:

- Rotational Bracket: for the luminaire. They allow an angle of up to 150° every 5°.
- Z-Bracket: Z-shaped for the luminaire and the equipment box.

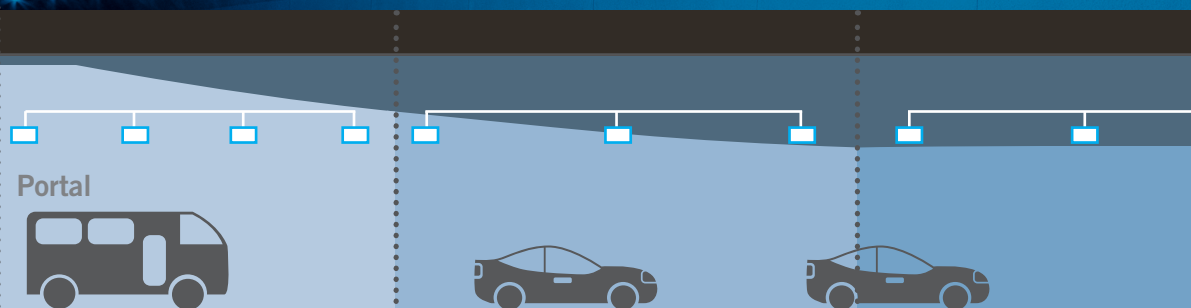
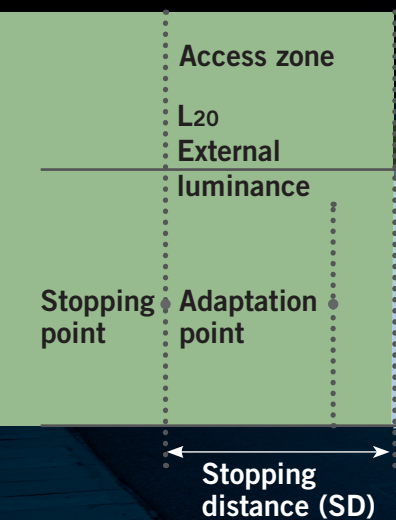
See installation examples on pages 10-11.



# Tunnel lighting with T-MAX

## by Holophane

The principal hazards for drivers passing through tunnels are found in the transition zones, where lighting has to prevent the so-called 'black hole effect' at the tunnel entrance and the 'glare effect' at the tunnel exit, allowing drivers to approach the tunnel and travel through it safely and comfortably.



T-MAX has been designed to provide sufficient levels of active and passive safety at all times of day and night, offering drivers a degree of visual comfort which is at least equal to conditions on the open road.

**The photometric characteristics of a lighting system capable of meeting the safety requirements imposed by international standards and that T-MAX accomplish are:**

- A suitable level of luminance, with even distribution across road surfaces and tunnel walls.
- Reduced glare.
- Reduced flicker.



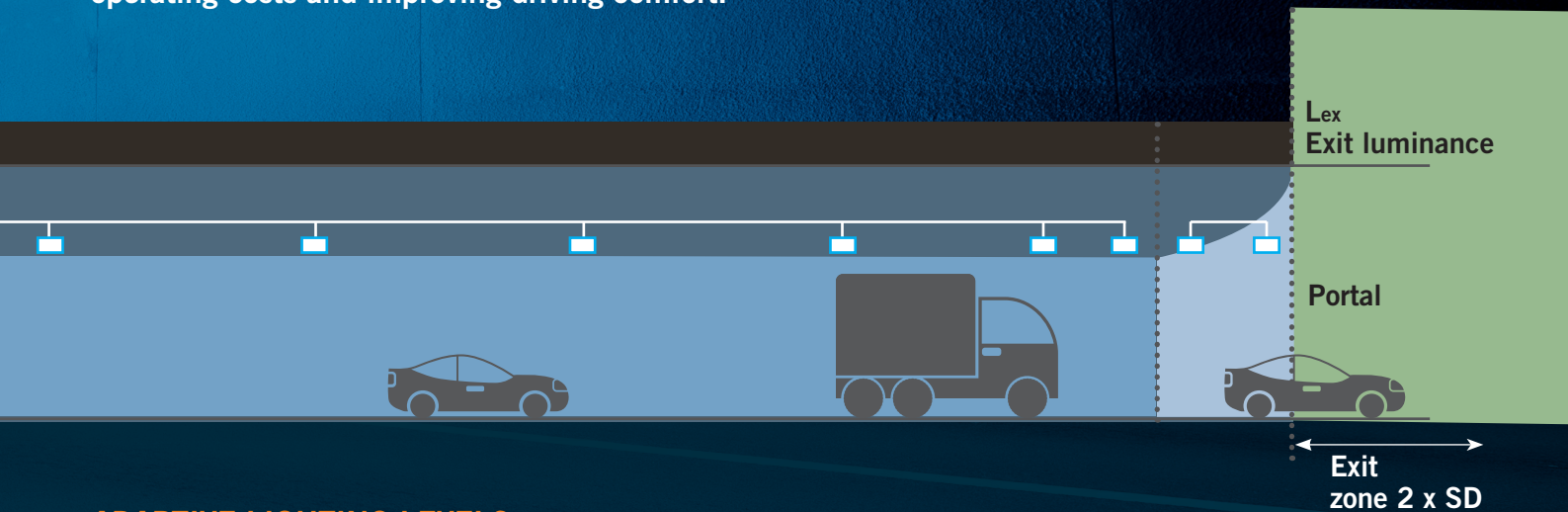
## INTEGRATED SOLUTIONS

Thanks to LED technology and modern control systems we can offer solutions for every tunnel project, from lighting design to consulting services and the commissioning of controlled lighting systems. Safety, efficiency and cost control are built into every tunnel lighting system designed by Holophane in recent decades.

## TUNNEL SAFETY

Lighting is an essential factor for the safety and visual comfort of drivers as they progress through a tunnel.

Thanks to LED technology, it is possible to regulate lighting levels inside a tunnel using pre-programmed scenarios designed to adapt lighting levels to real driving conditions in real time, thereby reducing tunnel operating costs and improving driving comfort.



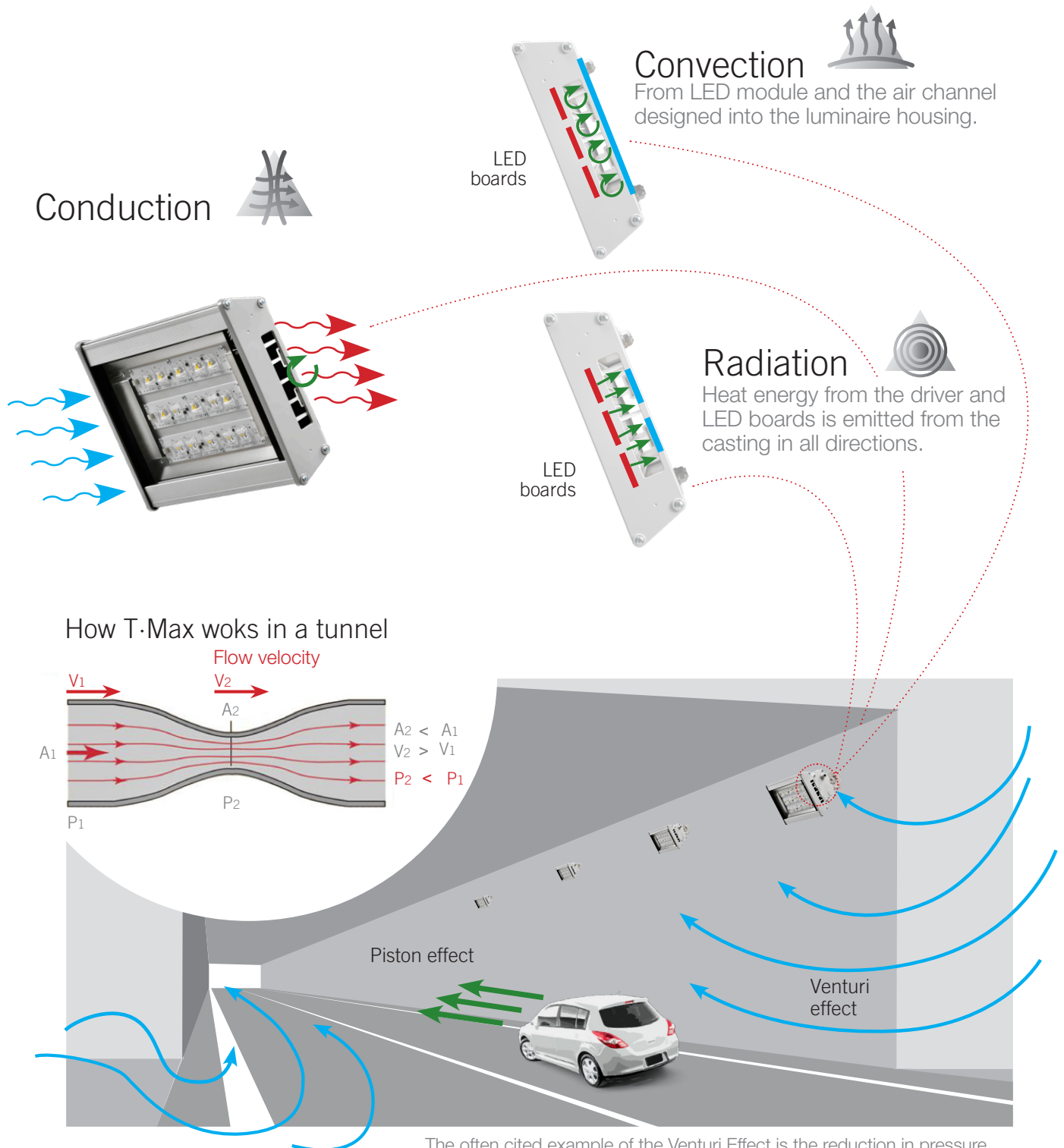
## ADAPTIVE LIGHTING LEVELS

T-MAX by Holophane significantly improves safety for drivers inside tunnels by meeting requirements on artificial lighting, and by taking into account the progressive adjustment of vision and the different levels of lighting required over the tunnel trajectory.



# Excellent thermal management

T-MAX has been extruded with ventilation channels. It uses the natural movement of air by convection of heat from critical electrical components. It takes advantage of the constant wind flow in the tunnel to manage the heat and is further improved by the piston effect (Venturi effect).



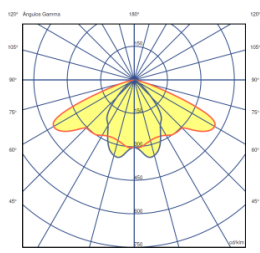
The often cited example of the Venturi Effect is the reduction in pressure which occurs when the fluid speed increases.



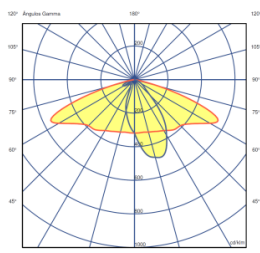
# Extreme uniformity of light

## Diversity of optical distributions

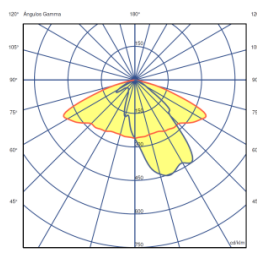
It has 10 photometric distributions used for the environments in which this type of luminaire is installed, it can be adapted to all needs:



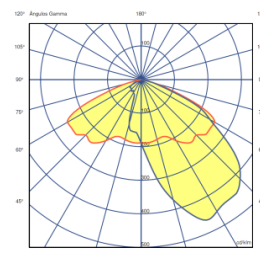
TMX.L1L1



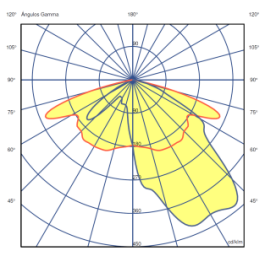
TMX.L1L5



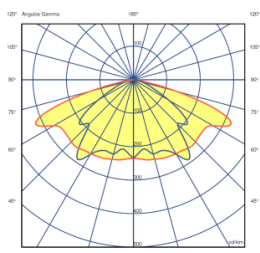
TMX.L1L6



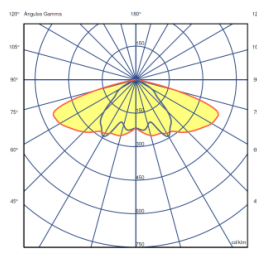
TMX.L1L7



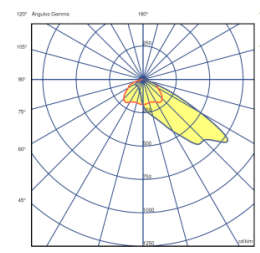
TMX.L5L6



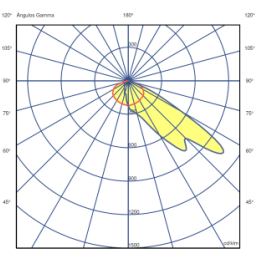
TMX.L6L6



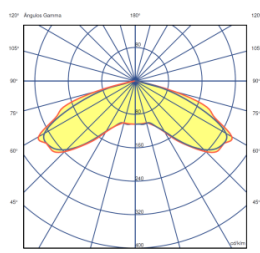
TMX.L7L7



TMX.L8L7



TMX.L8X2



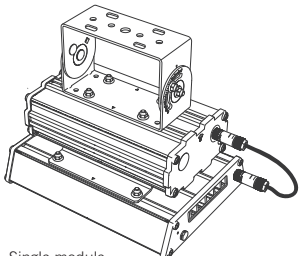
TMX.L1X2

# Modular design

Different mounting options depending on the installation

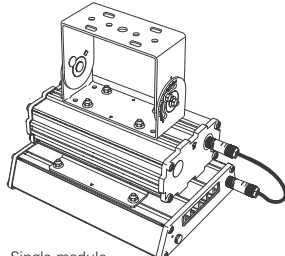
## GBOX attached to the luminaire

**Fixing method  
1L4**



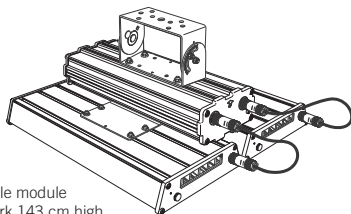
Single module  
OL fork 143 cm high

**Fixing method  
IS4 (1N9)**

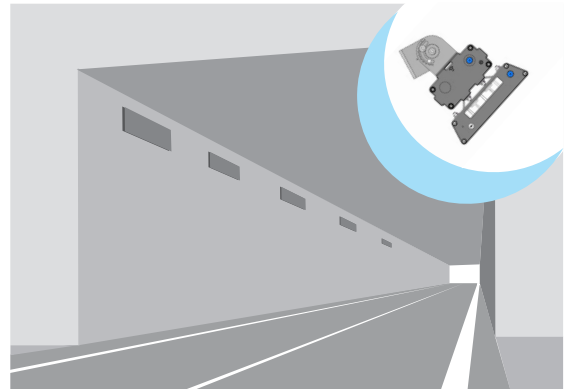


Single module  
OSL fork 225 cm high

**Fixing method  
2L4**

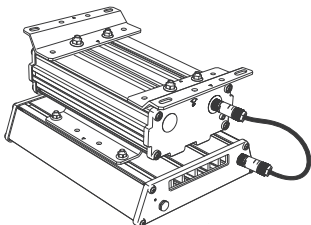


Double module  
OL fork 143 cm high



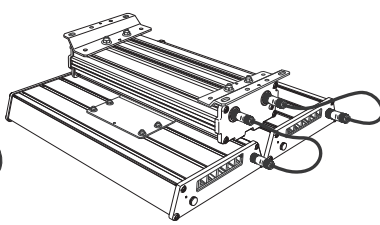
Example of assembly with GBOX attached to the luminaire.

**Fixing method  
IZ4**

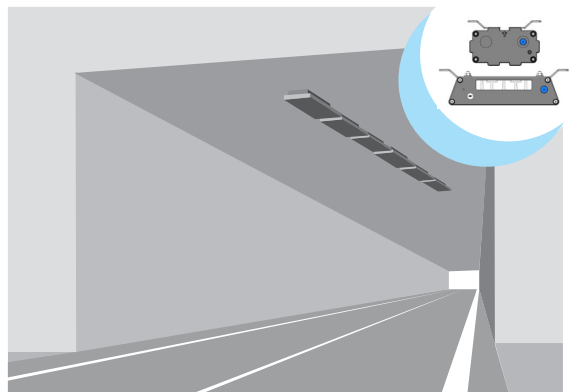


Single module

**Fixing method  
ZZ4**



Single module

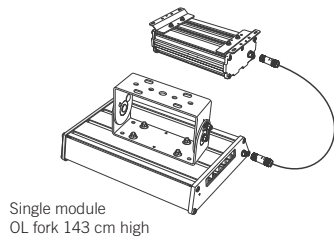


Example of assembly with GBOX attached to the luminaire.

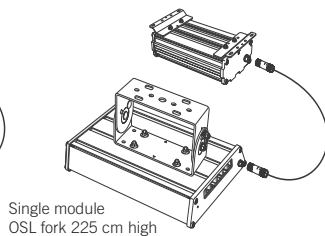


## GBOX separated from the luminaire

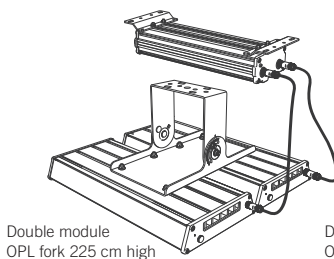
**Fixing method  
1L9**



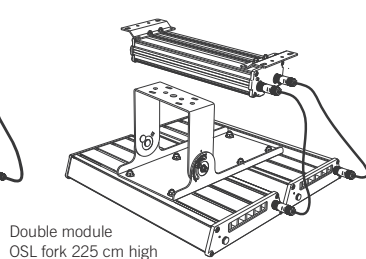
**Fixing method  
1S9 (1T9)**



**Fixing method  
2L9**

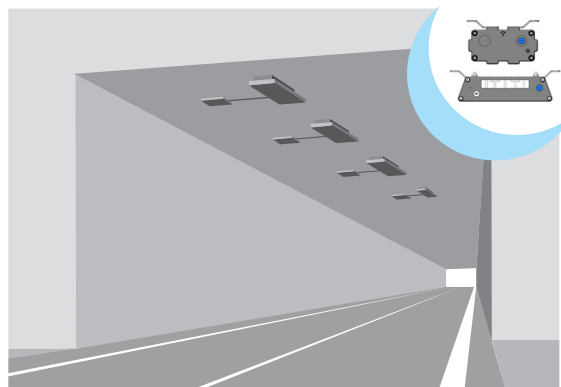
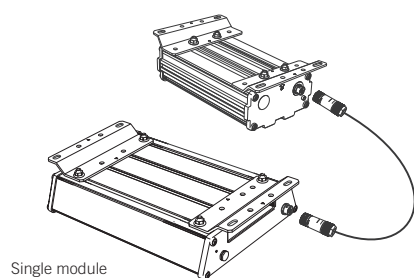


**Fixing method  
2S9**



Example of assembly with GBOX separated from the luminaire.

**Fixing method  
1Z9**



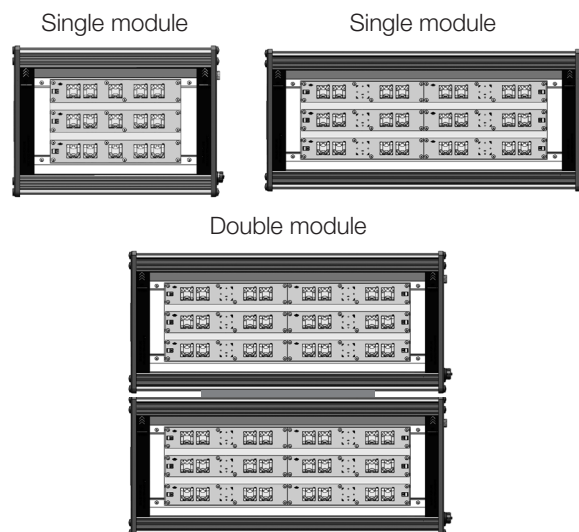
Example of assembly with GBOX separated from the luminaire.

# T•MAX™

## Extreme flexibility

The luminaire consists of 3 parts:

Luminaire  
Sealed body with led module

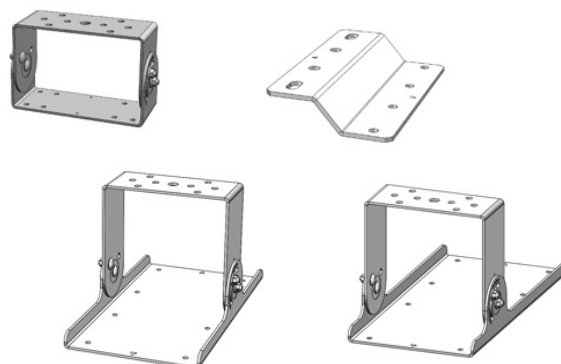


Connector  
(Easy installation)



The selection of cables depends on the distance between the luminaire and the equipment.

Fixing method  
(Flexibility of mountings)





# Configuration data

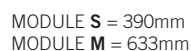
## SERIES

TMX	TMAX - TUNNEL LUMINAIRE								
Code		LED GENERATION							
.3		Series 3							
Code		LAMP TYPE							
.L044		LED light engine producing c.4,000 lm with a nominal 4,000K colour temperature			Small Single Version (6LED)				
.L054		LED light engine producing c.5,000 lm with a nominal 4,000K colour temperature			Small Single Version (6LED)				
.L064		LED light engine producing c.6,000 lm with a nominal 4,000K colour temperature			Small Single Version (8LED)				
.L084		LED light engine producing c.8,000 lm with a nominal 4,000K colour temperature			Small Single Version(10LED)				
.L104		LED light engine producing c.10,000 lm with a nominal 4,000K colour temperature			Small Single Version (10LED)				
.L154		LED light engine producing c.15,000 lm with a nominal 4,000K colour temperature			Small Single Version (14LED)				
.L234		LED light engine producing c.23,000 lm with a nominal 4,000K colour temperature			Large Single Version (22LED)				
.L264		LED light engine producing c.26,000 lm with a nominal 4,000K colour temperature			Large Single Version (26LED)				
.L304		LED light engine producing c.30,000 lm with a nominal 4,000K colour temperature			Large Double Version (44LED)				
.L464		LED light engine producing c.46,000 lm with a nominal 4,000K colour temperature			Large Double Version (44LED)				
.L524		LED light engine producing c.52,000 lm with a nominal 4,000K colour temperature			Large Double Version (52LED)				
.L043		LED light engine producing c.4,000 lm with a nominal 3,000K colour temperature			Small Single Version (6LED)				
.L053		LED light engine producing c.5,000 lm with a nominal 3,000K colour temperature			Small Single Version (6LED)				
.L063		LED light engine producing c.6,000 lm with a nominal 3,000K colour temperature			Small Single Version (8LED)				
.L083		LED light engine producing c.8,000 lm with a nominal 3,000K colour temperature			Small Single Version (8LED)				
.L103		LED light engine producing c.10,000 lm with a nominal 3,000K colour temperature			Small Single Version (10LED)				
.L153		LED light engine producing c.15,000 lm with a nominal 3,000K colour temperature			Small Single Version (14LED)				
.L233		LED light engine producing c.23,000 lm with a nominal 3,000K colour temperature			Large Single Version (22LED)				
.L263		LED light engine producing c.26,000 lm with a nominal 3,000K colour temperature			Large Single Version (26LED)				
.L303		LED light engine producing c.30,000 lm with a nominal 3,000K colour temperature			Large Double Version (52LED)				
.L463		LED light engine producing c.46,000 lm with a nominal 3,000K colour temperature			Large Double Version (44LED)				
.L523		LED light engine producing c.52,000 lm with a nominal 3,000K colour temperature			Large Double Version (52LED)				
Code		OPTICAL DISTRIBUTION							
.L1L1		Throw. 60° spread. 15° (Type II)							
.L1L5		Throw. 65° spread. 15° (Type II)							
.L1L6		Throw. 65° spread. 15°/35° (Type II)							
.L1L7		Throw. 60° spread. 15°/45° (Type III)							
.L1X2		Throw. 60° spread. 60° (Type VS)							
.L5L6		Throw. 70° spread. 20° (Type III)							
.L6L6		Throw. 70° spread. 35°/50° (Type II)							
.L7L7		Throw. 70° spread. 30° (Type II)							
.L8L7		Throw. 45° spread. 55° (Type III)							
.L8X2		Throw. 65° spread. 40°/55° (Type III)							
Code		OPTIONAL: CONTROL GEAR							
.LRD		LED dimmable DALI protocol							
.ANF		LED dimmable 1-10V							
Code		COLOUR							
.C9		Grey smooth gloss (RAL 9006)							
.RAL****		Color RAL (customer's choice)							
Code		FIXING METHOD							
.1L4		Short Rotatable Bracket (GBOX attached to luminaire) supplied with 40cm cable from luminaire to GBOX							
.1L9		Short Rotatable Bracket (GBOX separate from luminaire with Z-bracket) supplied with 90cm cable from luminaire to GBOX							
.1S4		Long Rotatable Bracket (GBOX attached to luminaire) supplied with 40cm cable from luminaire to GBOX							
.1S9		Long Rotatable Bracket (GBOX separate from luminaire with Z-bracket) supplied with 90cm cable from luminaire to GBOX							
.1Z4		Fixed Z-bracket (GBOX attached to luminaire) supplied with 40cm cable from luminaire to GBOX							
.1Z9		Fixed Z-bracket (GBOX separate from luminaire Z-bracket) supplied with 90cm cable from luminaire to GBOX							
.2L4		Short Rotatable Bracket (GBOX attached to luminaire) supplied with 40cm cable from luminaire to GBOX							
.2L9		Long Rotatable Bracket (GBOX separate from luminaire with Z-bracket) supplied with 90cm cable from luminaire to GBOX							
.2Z4		Fixed Z-bracket (GBOX attached to luminaire) supplied with 40cm cable from luminaire to GBOX							
.2S9		Long Rotatable Offset Bracket (GBOX separate from luminaire with Z-bracket) supplied with 90cm cable from luminaire to GBOX							
.1N4		Fixed Horizontal Bracket (GBOX attached to luminaire) supplied with NEMA Base + 40cm cable from luminaire to GBOX.							
.2N4		Fixed Horizontal Bracket (GBOX attached to luminaire) supplied with NEMA Base + 40cm cable from luminaire to GBOX.							
.1N9		Long Rotatable Bracket (GBOX separate from luminaire with fixed horizontal bracket & NEMA Base) supplied with 90cm cable from luminaire to GBOX							
.2N9		Long Rotatable Offset Bracket (GBOX separate from luminaire with fixed horizontal bracket & NEMA Base) supplied with 90cm cable from luminaire to GBOX							
.1T9		Fixed Z-bracket (GBOX separate from luminaire with fixed horizontal bracket & NEMA Base) supplied with 90cm cable from luminaire to GBOX							
Code		OPTIONAL: OVERVOLTAGE PROTECTION SYSTEM							
.C-PROTEC		10kV/10kA Surge Protection							
Code		OPTIONAL: VOLTAGE							
.CII		Class II							
Code		OPTIONAL: PHOTOCELLS							
.T5		Complete with 5-pin dimming NEMA ANSI C136.41 socket (suitable photocell/node supplied by others)							
.T5T		Complete with 5-pin dimming NEMA ANSI C136.41 socket (photocell/node supplied by others) with weather proof locking top.							
.T7		Complete with 7-pin dimming NEMA ANSI C136.41 socket (suitable photocell/node supplied by others)							
.T7T		Complete with 7-pin dimming NEMA ANSI C136.41 socket (photocell/node supplied by others) with weather proof locking top.							
TMX	3	.L044	.L1L1	.LRD	.C9	.1L4	.C-PROTEC	.CII	.T5

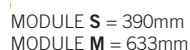
(1) This version together with the LRTSC team will be managed under special order

(2) This version is valid for availability once the dimensions of the equipment board and the length of the installation are facilitated.

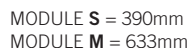
## 11L4 - SHORT ADJUSTABLE FORK WITH INTEGRATED GBOX-310



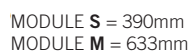
1L9 - SHORT ADJUSTABLE FORK WITH SEPARATE GBOX-310



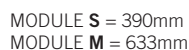
1S4 (1N9) - LONG ADJUSTABLE FORK WITH INTEGRATED GBOX-310



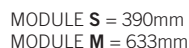
1S9 (1T9) - LONG ADJUSTABLE FORK WITH SEPARATE GBOX-310



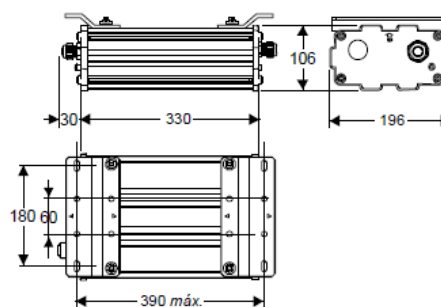
1Z4 - CENTRAL FORK FIXED WITH INTEGRATED GBOX-310



1Z9 - CENTRAL FORK FIXED WITH SEPARATE GBOX-310

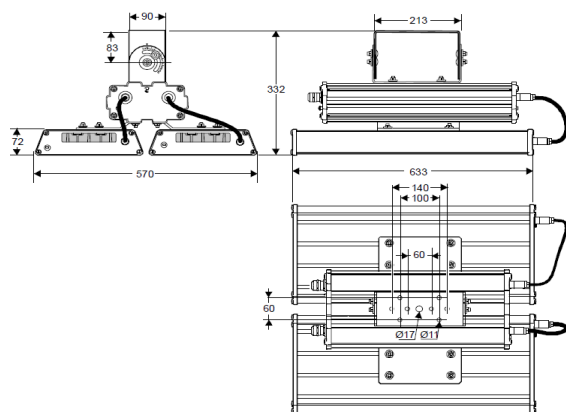


GBOX-310 FOR SIZE S / M

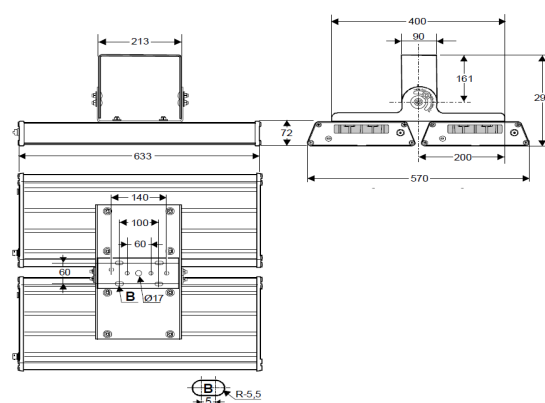


## SIZE L

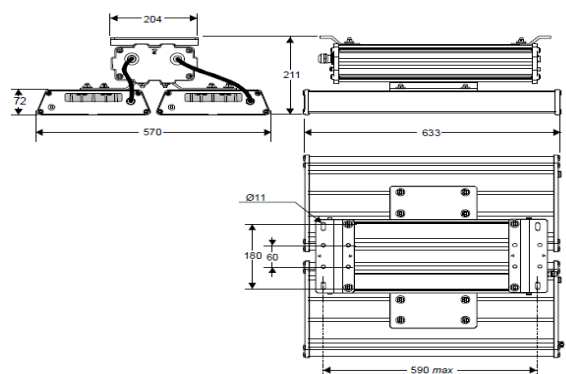
2L4 - SHORT ADJUSTABLE FORK WITH INTEGRATED GBOX-510



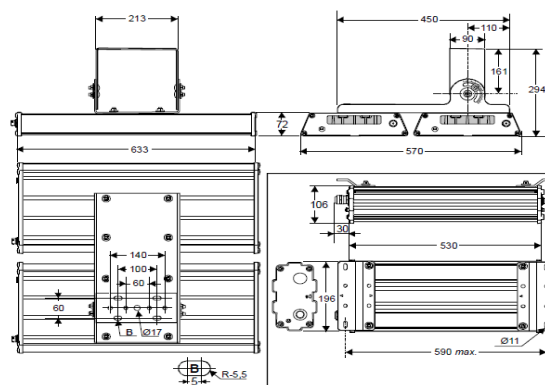
2L9 - LONG ADJUSTABLE CENTRAL FORK WITH SEPARATE GBOX-510



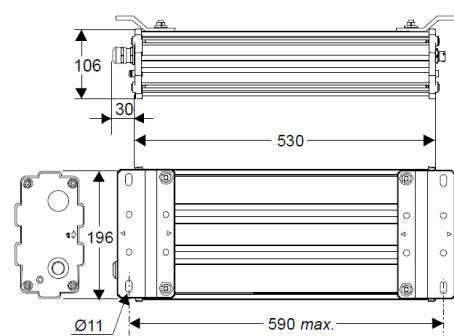
2L4 - FIXED CENTRAL FORK WITH INTEGRATED GBOX-510



2S9 - LONG ADJUSTABLE SIDE FORK WITH SEPARATE GBOX-510



GBOX-510 FOR SIZE L



dimensions in mm





**T•MAX™** 

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