

# CATALOGUE

**TUNABLE WHITE/HCL  
LIGHTING SYSTEMS**

**Beghelli**

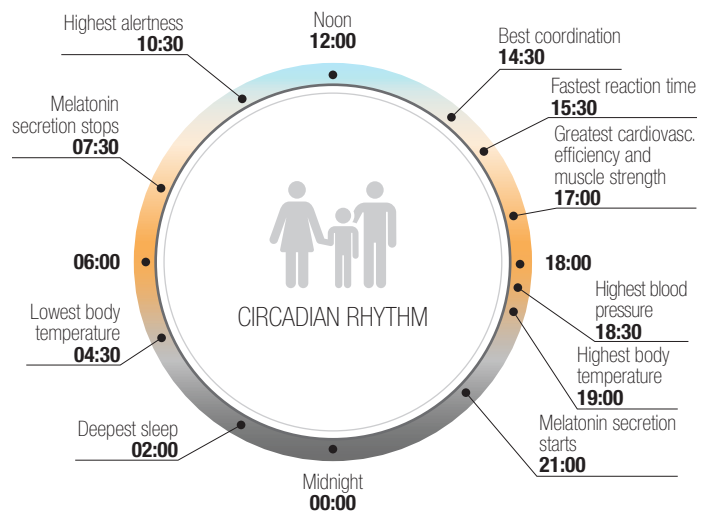
# HCL HUMAN CENTRIC LIGHTING

## Daylight, a natural regulator of our organism



Thanks to evolution, our lives and our activities are driven by the natural day-night cycle. Throughout the day, when plenty of natural light is available, we are active and perform all our activities, such as school, work, hobbies and entertainment. The evening is a period when the light fades and gradually weakens. With darkness comes the time for a needed rest.

Our everyday cycle developed as an adaptation to the environment that surrounds us. Scientific research has confirmed that compliance with the natural day-night cycle is not only a practical thing but it is also deeply rooted in our nature. Type of light affects the human organism, the production of vitamins and production of melatonin that regulates sleep, therefore has a direct impact on mood and health of our bodies.



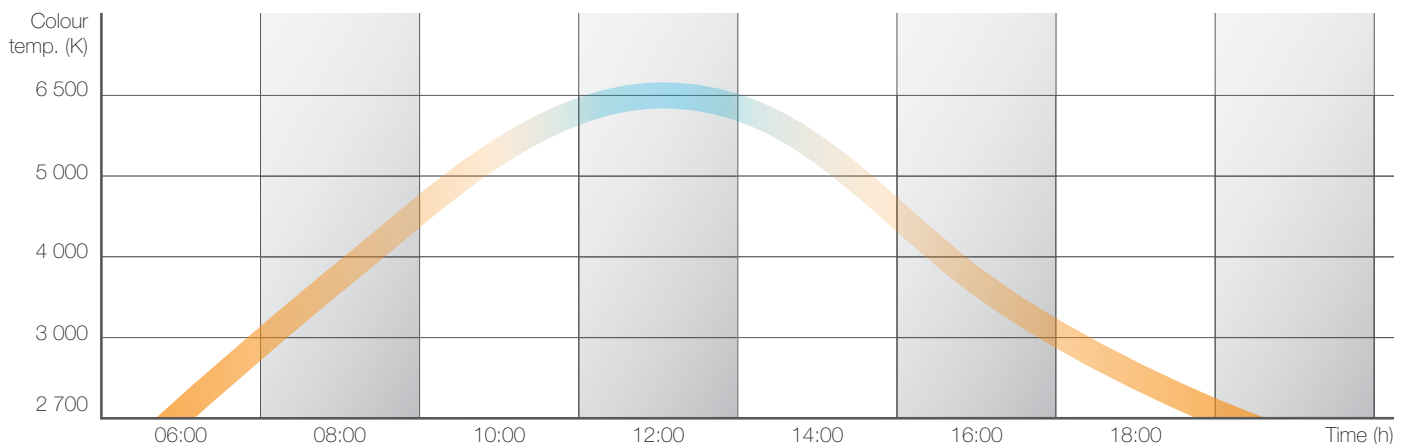
The principle of HCL is to imitate the natural daylight in the interior with the use of artificial luminaires.



About **80% of our sensory impressions are registered through our eyes.** And it is a quality of light that determines how well we see and perceive our surrounding. Lighting type has a key impact on our eyesight and it directly affects our **mental and physical well-being.**

Natural daylight changes dynamically throughout the day in terms of intensity and colour temperature. And this has a direct impact on our biological rhythm which is called the Circadian cycle, that controls human biological clocks. For its proper functioning and thus our health it is necessary to follow the preset cycles of the human

body. **The colour temperature of natural light develops** from 1 900 K (at sunrise) to 7 000 K (at noon) during the day. In the evening, it gradually decreases to the value around 2 700 K. It is a signal for the human organism to prepare for sleep.

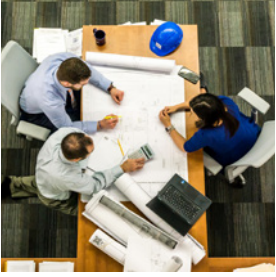


**Natural lighting is dynamic it is changing constantly throughout the day from sunrise to sunset. The change is not just in the value of colour temperature but also in colour itself and intensity.**

# Human Centric Lighting – HCL

## Pluses and uses of the Human Centric Lighting

Mainly suitable for areas where people spend much of their daytime:



### Workspaces Offices

Performance improvement



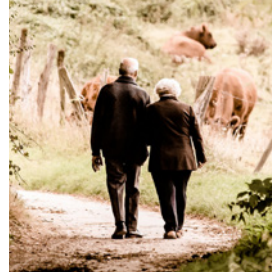
### Hospital

Impact on the psychological condition, faster healing



### Educational institutions

Higher concentration, better learning ability



### Retirement homes

Better mood, impact on daily rhythm, activity



### Homes

Better sleep, relaxation, well-being

Still more and more scientific researches confirm the influence of light on different aspects of human life. Light intensity and light spectrum play an important role in the proper functioning of the human body, not only in physical but also in a mental way. This is particularly important for areas where **high mental performance is required**.

Luminaires with Human Centric Lighting fit perfectly into offices and classrooms, where their potential can be fully exploited due to their **impact on work efficiency and learning**.

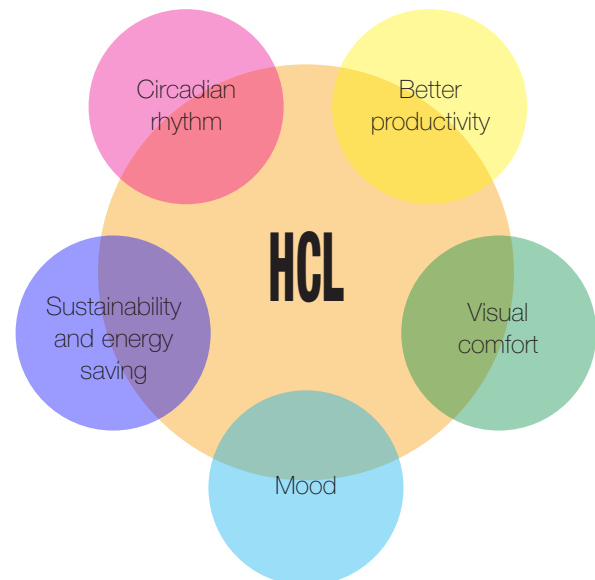
At the same time, the quality of light has an effect on the elimination of current tiredness and guarantees visual comfort. These are the basis for increasing the vigilance and vitality of employees. That is very important in the working environment.

However, the greatest benefits of HCL are evident in the health care sector. Patients are often under the influence of artificial light in the interior for longer periods of time, it is always without the possibility of change. Ensuring a natural Circadian rhythm is important not only for the **well-being of patients but also for their faster treatment**.

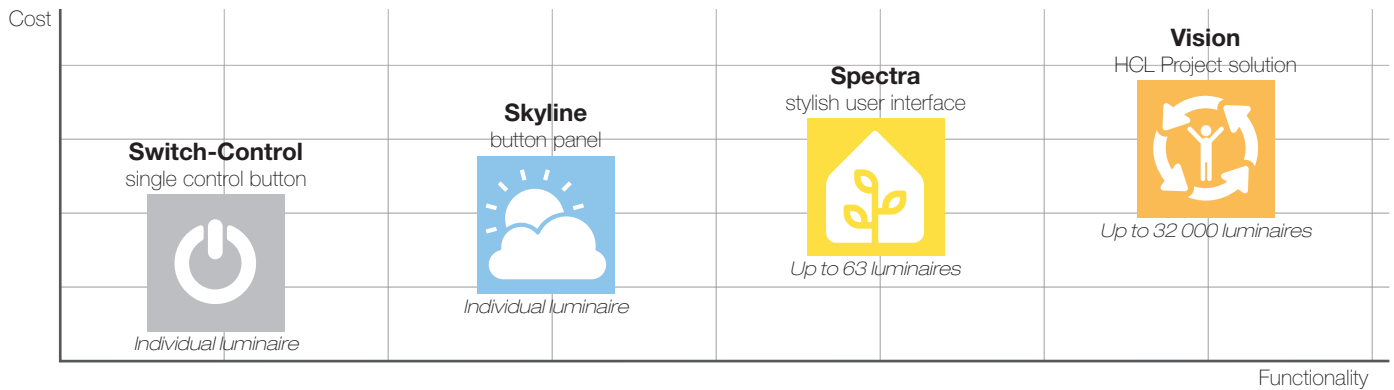
Human Centric Lighting technology, also known as biodynamic lighting, was previously used very little due to its high initial and operating costs. Thanks Beghelli, HCL technology is now available to everyone who expects countless colour temperatures and light intensity variations that mimic natural daylight.

## MAIN ADVANTAGES

- 1 Synchronization with the natural rhythm**  
Correct lighting helps a human body synchronize with the "natural day-night rhythm". It is healthier for the biological system and it is important for the proper production of melatonin that is crucial for good sleep.
- 2 Concentration increase**  
Proper lighting keeps us alert and efficient throughout the whole day.
- 3 Health and well-being**  
Light has a key influence on our sight and it directly affects our mental and physical well-being and the health of the whole organism.



Solution that meets all individual requirements and is suitable for each installation size



## 1. Switch-Control – single control button



### Advantages:

- No additional components needed
- No complicated programming or system setup requirements
- Cheapest solution for Tunable White control

### Description

- Solution just for one luminaire
- Only basic functions – colour & intensity adjustment
- Preset can only be set externally via PC

## 2. Skyline – button panel



### Advantages:

- Solution includes 4 preset Tunable White scenes simulating different weather conditions
- No complicated programming or system setup requirements

### Description

- Solution just for one luminaire
- When using multiple luminaires in random mode, each shines in a different colour
- Additional components needed

- Simulation of natural lighting changes with light intensity and temperature adjustment
- Just for one luminaire/driver
- No complicated system setup needed, it works instantly after installation



Skyline panel

Icon	Effect	Activity – When to use	Colour Temperature	Light Output
	Calm down	High stress period	Warm white	80%
	Energise	Early morning – awakening	Cool white	100%
	Concentrating	Thinking process Presentations	Intermediate temperature	50%
	Stay alert	Normal daily work	Changing naturally	90%

# Tunable White – 4 different solutions

## 3. Spectra – stylish user interface

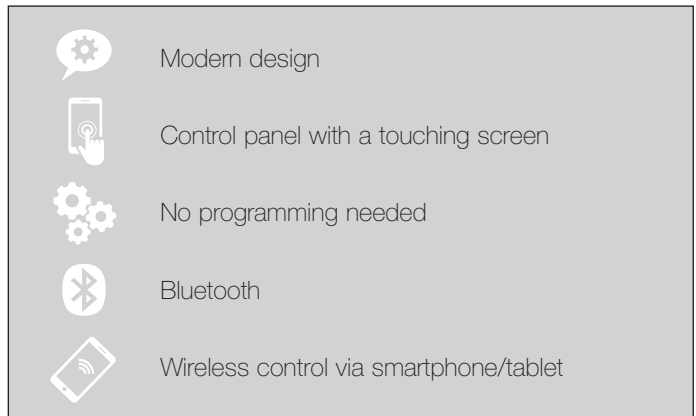


### Advantages:

- Intuitive setting of Tunable White luminaires right on the wall
- Solution for up to 63 luminaires Tunable White
- Perfect design into a normal installation box
- 4 scenes with a possibility of direct adjustment by the user
- Manual colour temperature and light intensity correction
- Bluetooth – control via smartphone/tablet
- App for iOS and Android for free

### Description

- Additional components needed



Spectra panel – different material and colour variations

## 4. Vision – HCL Project solution

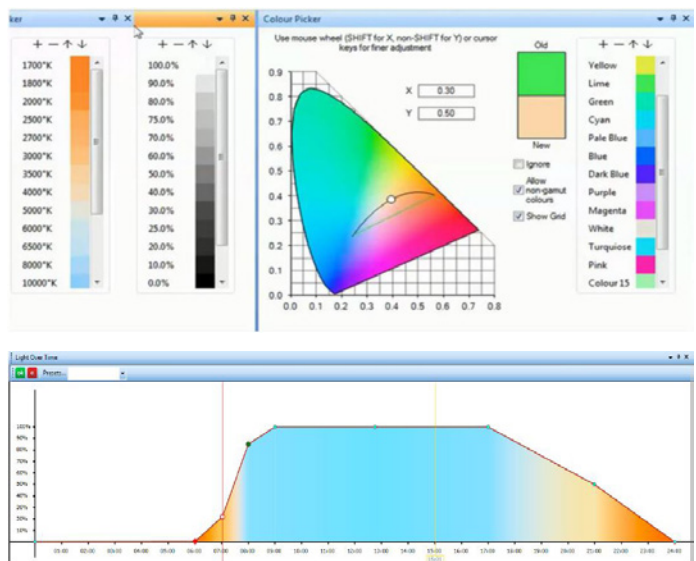


### Advantages:

- Any control options – buttons, touch panels, wireless access, schedules
- Possibility to control any number of luminaires in one system (max. 32 000)
- Possibility to set individual daily plan (according to an individual circadian rhythm of a person)
- Matching the colour temperature to the time of a day and season
- Overview of the status, consumption and failures of individual luminaires
- Customized graphical applications
- Possibility of regulation of lighting intensity according to daily contributions of light
- App for iOS and Android for free

### Description

- Additional components needed
- System specification and configuration must be always tailored

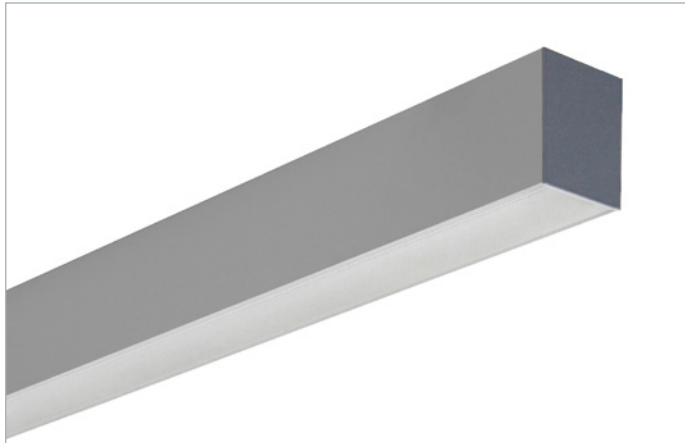


Unlimited possibilities according to customer requirements

Following luminaires support all four solutions (Switch-control, Skyline, Spectra and Vision).

# Atomic TOP LED HCL 1,2m

Ceiling and suspended LED luminaire



## GENERAL CHARACTERISTICS

**Power supply** 198–264 VAC, 176–280 VDC

**Standard** EN 60598-1, EN 60598-2-1, EN 60598-2-22 (fundamental requirements), EN62471 (Photobiological hazard)

**Protection grade** IP40, IK05

**Working temp.** -20 ÷ +40°C

**Mounting** ceiling, suspended mounting

**Body** anodized aluminium profile with steel endings in grey

**Screen** microprismatic or opal optics

**Driver** DALI LED driver for Tunable White

**Control gear** 100 000 h

**Lifetime\*\***

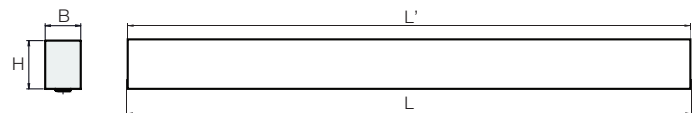
**Luminous flux** > 80 000 (L80B20)

**maintenance\*\***

**Colour deviation** 3 SDCM

**Colour Temp.** 2 700–6 500 K

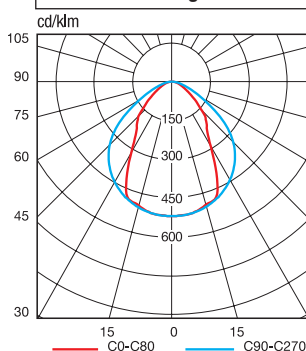
\*\* At a reference working temperature of 25°C



Length "L" including endings  
Length "L'" profile without endings

• Dimensions (mm) •				Weight kg
L	B	H	L'	
1137	60	81,5	1134	2,6

## Polar Diagram



## Accessories

to be ordered separately

Order code	Description
<b>99-0275</b>	WIRE SUSPENSION, 1 pc, 200 cm (for one luminaire 2 pcs needed)
<b>99-0095</b>	TRANSPARENT POWER CABLE 200 cm (5x 1.5 mm <sup>2</sup> )



## Human Centric Lighting (HCL)

The effects of lighting on the biological rhythm of the human body have a direct impact on comfort, productivity and health in indoor environments. The model that should be followed is that dictated by nature with regard to light intensity, colour and direction, in harmony with our internal biological clock.

## Atomic TOP LED Human Centric Lighting (HCL)



Order code	Description	LED Power W	Colour Temp. K	Colour rendering	Power consumption Max W	N° LEDs	Flux of LEDs lm (Tj=25°C)	Flux of fixture lm	Luminous efficiency lm/W	Energy Class	Packaging
<b>T03-10140HW</b>	Atomic TOP LED 2700–6500K 1,2m	17	4000	>80	20	64	2400	1900	95	A+	1
<b>T03-10140HZ</b>	Atomic TOP LED 2700–6500K 1,2m	17	4000	>80	20	64	2400	1700	85	A+	1
<b>T03-10141HW</b>	Atomic TOP LED 2700–6500K 1,2m	30	4000	>80	34	128	4700	3100	91	A+	1
<b>T03-10141HZ</b>	Atomic TOP LED 2700–6500K 1,2m	30	4000	>80	34	128	4700	2700	79	A+	1

R<sub>a</sub>>90 on request, Z – opal cover, W – microprismatic cover





# Atomic TOP LED HCL 1,2m

Recessed LED luminaire

Atomic TOP LED is a luminaire of a new generation characterized by a very good lighting efficiency, which ensures the high comfort of illumination. Housing is made of anodized aluminium profile with steel endings. The luminaire is equipped with a microprismatic diffuser ensures very high efficiency. It provides a very good visual comfort with no glare. It fits perfectly in offices, conference and training rooms, lecture halls as well as exhibition spaces and showrooms.

HCL version with biodynamic colour temperature offers the possibility to select the required colour temperature (from 2700K to 6500K). Human Centric Lighting luminaires perfectly fit in offices and classrooms due to its influence on efficiency and learning ability. But the greatest benefits are mainly seen in healthcare, where the natural day rhythm is important for well-being and faster healing.

## GENERAL CHARACTERISTICS

**Power supply** 198–264 VAC, 176–280 VDC

**Standard** EN 60598-1, EN 60598-2-1, EN 60598-2-22 (fundamental requirements), EN62471 (Photobiological hazard)

**Protection grade** IP40, IK05

**Working temp.** -20 ÷ +40°C

**Mounting** recessed mounting in plaster ceilings

**Body** anodized aluminium profile with steel endings in grey

**Screen** microprismatic or opal optics

**Driver** DALI LED driver for Tunable White

**Control gear** 100 000 h

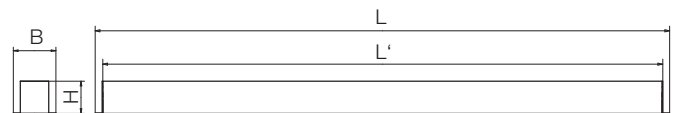
**Lifetime\*\***

**Luminous flux maintenance\*\*** > 80 000 (L80B20)

**Colour deviation** 3 SDCM

**Colour Temp.** 2 700–6 500 K

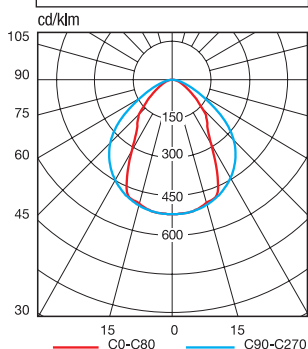
\*\* At a reference working temperature of 25°C



Length "L" including endings  
Length "L'" profile without endings  
Recess hole 65 mm × 1142 mm

• Dimensions (mm) •				Weight
L	B	H	L'	kg
1154	77	81,5	1134	2,6

## Polar Diagram



## Human Centric Lighting (HCL)

The effects of lighting on the biological rhythm of the human body have a direct impact on comfort, productivity and health in indoor environments. The model that should be followed is that dictated by nature with regard to light intensity, colour and direction, in harmony with our internal biological clock.

## Atomic TOP LED Human Centric Lighting (HCL)



Order code	Description	LED Power W	Colour Temp. K	Colour rendering	Power consumption Max W	N° LEDs	Flux of LEDs lm (Tj=25°C)	Flux of fixture lm	Luminous efficiency lm/W	Energy Class	Packaging
<b>T03-10R40HW</b>	Atomic TOP LED 2700–6500K 1,2m	17	4000	>80	20	64	2400	1900	95	A+	1
<b>T03-10R40HZ</b>	Atomic TOP LED 2700–6500K 1,2m	17	4000	>80	20	64	2400	1700	85	A+	1
<b>T03-10R41HW</b>	Atomic TOP LED 2700–6500K 1,2m	30	4000	>80	34	128	4700	3100	91	A+	1
<b>T03-10R41HZ</b>	Atomic TOP LED 2700–6500K 1,2m	30	4000	>80	34	128	4700	2700	79	A+	1

R<sub>a</sub>>90 on request, Z – opal cover, W – microprismatic cover

# Arietis LED HCL

Recessed LED luminaire IP65



## GENERAL CHARACTERISTICS

**Power supply** 198–264 VAC, 176–280 VDC

**Standard** EN 60598-1, EN 60598-2-1, EN 60598-2-22 (fundamental requirements), EN62471 (Photobiological hazard)

**Protection grade** IP65

**Working temp.** -20 ÷ +40°C

**Mounting** universal mounting into ceiling modules M600, M625 and plaster ceilings

**Body** steel sheet finished by powder technology varnishing, white RAL 9003

**Screen** microprismatic optics

**Driver** DALI LED driver for Tunable White

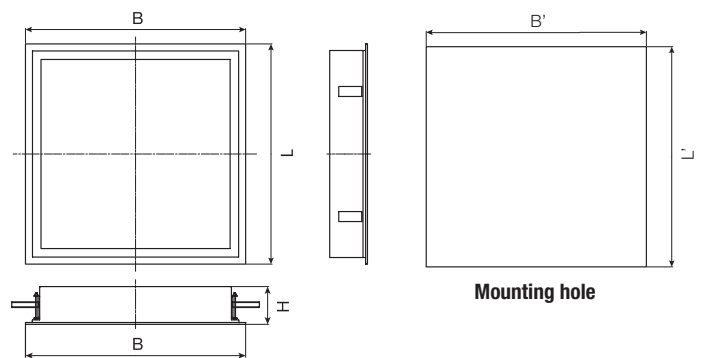
**Control gear Lifetime\*\*** 100 000 h

**Luminous flux maintenance\*\*** > 80 000 (L80B20)

**Colour deviation** 3 SDCM

**Colour Temp.** 2 700–6 500 K

\*\* At a reference working temperature of 25°C

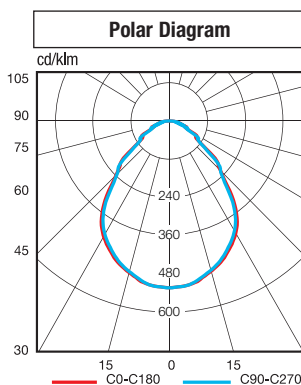


Version	• Dimensions (mm) •					Weight max kg
	L	B	H	L'	B'	
M600	595	595	102	565	565	4,5
M625	622	622	102	592	592	5,0

## Accessories

supplied

Order code	Description
-	HOLDERS



## Human Centric Lighting (HCL)

The effects of lighting on the biological rhythm of the human body have a direct impact on comfort, productivity and health in indoor environments. The model that should be followed is that dictated by nature with regard to light intensity, colour and direction, in harmony with our internal biological clock.

## Arietis LED Human Centric Lighting (HCL)



Order code	Description	LED Power W	Colour Temp. K	Colour rendering	Power consumption Max W	N° LEDs	Flux of LEDs lm (Tj=25°C)	Flux of fixture lm	Luminous efficiency lm/W	Energy Class	Packaging
<b>T02-10120HW</b>	Arietis LED 2700–6500K M600	43	4000	>80	48	264	7000	5000	104	A+	1
<b>T02-10125HW</b>	Arietis LED 2700–6500K M625	43	4000	>80	48	264	7000	5000	104	A+	1

R<sub>a</sub>>90 on request



# Salemo LED HCL

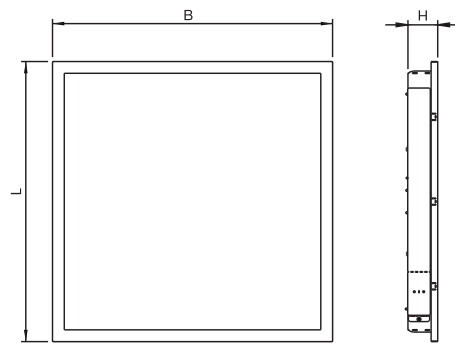
## Recessed LED luminaire



### GENERAL CHARACTERISTICS

- Power supply** 198–264 VAC, 176–280 VDC
- Standard** EN 60598-1, EN 60598-2-1, EN 60598-2-22 (fundamental requirements), EN62471 (Photobiological hazard)
- Protection grade** IP40/20
- Working temp.** -20 ÷ +40°C
- Mounting** mounting into ceiling modules M600, M625 – inlay mounting
- Body** steel sheet finished by powder technology varnishing, white RAL 9003
- Screen** opal diffuser
- Driver** DALI LED driver for Tunable White
- Control gear Lifetime\*\*** 100 000 h
- Luminous flux maintenance\*\*** > 80 000 (L80B20)
- Colour deviation** 3 SDCM
- Colour Temp.** 2 700–6 500 K

\*\* At a reference working temperature of 25°C



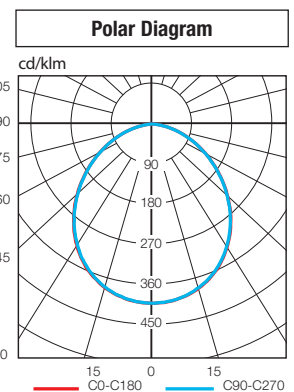
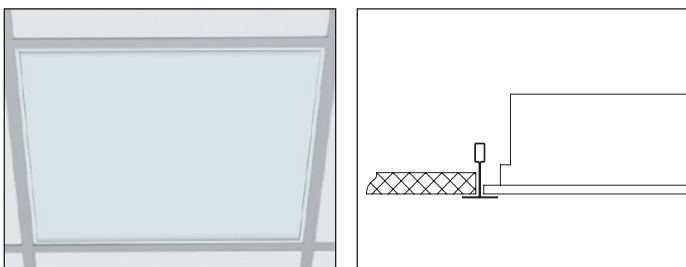
Version	• Dimensions (mm) •			Weight max kg
	L	B	H	
M600	595	595	63	4,8
M625	620	620	63	5,0



### Human Centric Lighting (HCL)

The effects of lighting on the biological rhythm of the human body have a direct impact on comfort, productivity and health in indoor environments. The model that should be followed is that dictated by nature with regard to light intensity, colour and direction, in harmony with our internal biological clock.

### MOUNTING INTO CEILING MODULE M600 AND M625



### Salemo LED Human Centric Lighting (HCL)



Order code	Description	LED Power W	Colour Temp. K	Colour rendering	Power consumption Max W	N° LEDs	Flux of LEDs lm (Tj=25°C)	Flux of fixture lm	Luminous efficiency lm/W	Energy Class	Packaging
<b>T01-10100HM</b>	Salemo LED 2700–6500K M600	43	4000	>80	48	264	7000	5800	121	A+	1
<b>T01-10105HM</b>	Salemo LED 2700–6500K M625	43	4000	>80	48	264	7000	5800	121	A+	1

R<sub>a</sub>>90 on request

# Lyra LED HCL

## Recessed LED luminaire



Lyra LED is a luminaire for mounting in ceiling module M600, M625 and plaster ceilings. Its body is made of steel sheet finished by powder technology varnishing, colour white RAL 9003, with diffuser with microprismatic optics. The degree of protection is IP20. It fits perfectly in computer labs, large and small offices and lecture halls.

HCL version with biodynamic colour temperature offers the possibility to select the required colour temperature (from 2700K to 6500K). Human Centric Lighting luminaires perfectly fit in offices and classrooms due to its influence on efficiency and learning ability. But the greatest benefits are mainly seen in healthcare, where the natural day rhythm is important for well-being and faster healing.

### GENERAL CHARACTERISTICS

**Power supply** 198–264 VAC, 176–280 VDC

**Standard** EN 60598-1, EN 60598-2-1, EN 60598-2-22 (fundamental requirements), EN62471 (Photobiological hazard)

**Protection grade** IP20

**Working temp.** -20 ÷ +40°C

**Mounting** universal mounting into ceiling modules M600, M625 and plaster ceilings

**Body** steel sheet finished by powder technology varnishing, white RAL 9003

**Screen** microprismatic optics

**Driver** DALI LED driver for Tunable White

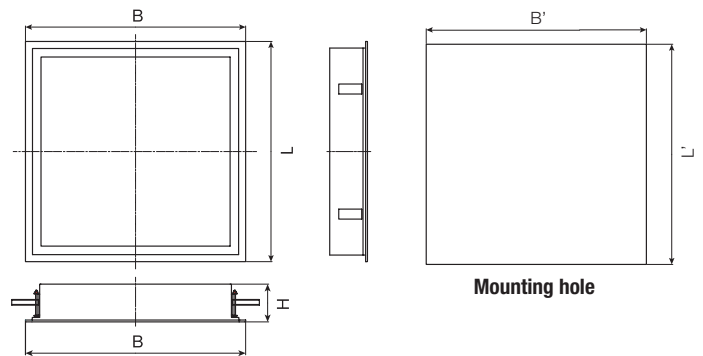
**Control gear Lifetime\*\*** 100 000 h

**Luminous flux maintenance\*\*** > 80 000 (L80B20)

**Colour deviation** 3 SDCM

**Colour Temp.** 2 700–6 500 K

\*\* At a reference working temperature of 25°C

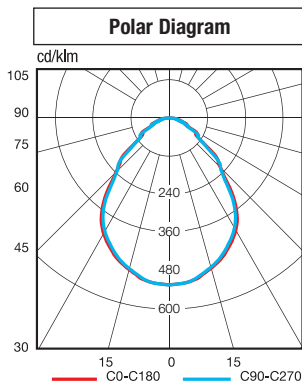


Version	• Dimensions (mm) •					Weight max kg
	L	B	H	L'	B'	
M600	595	595	60	575	575	5,0
M625	620	620	60	600	600	5,0

## Accessories

supplied

Order code	Description
99-298	STEEL HOLDERS (4pcs)



### Human Centric Lighting (HCL)

The effects of lighting on the biological rhythm of the human body have a direct impact on comfort, productivity and health in indoor environments. The model that should be followed is that dictated by nature with regard to light intensity, colour and direction, in harmony with our internal biological clock.

## Lyra LED Human Centric Lighting (HCL)



Order code	Description	LED Power W	Colour Temp. K	Colour rendering	Power consumption Max W	N° LEDs	Flux of LEDs lm (Tj=25°C)	Flux of fixture lm	Luminous efficiency lm/W	Energy Class	Packaging
T05-10160HW	Lyra LED 2700–6500K M600	43	4000	>80	48	264	7000	5000	104	A+	1
T05-10165HW	Lyra LED 2700–6500K M625	43	4000	>80	48	264	7000	5000	104	A+	1

R<sub>a</sub>>90 on request

# Application examples



Typical installation of **Atomic TOP LED HCL**. Human Centric Lighting luminaires perfectly fits into classrooms and lecture halls where their potential can be fully used due to their influence on efficiency and learning ability of students.

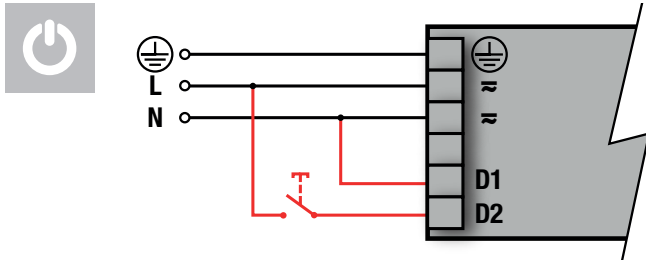


Ensuring a natural Circadian rhythm is important for the well-being and faster treatment of patients. Ceiling luminaire **Arietis LED HCL** in Human Centric Lighting version is perfect for healthcare and clean rooms applications.



Offices are usually areas where a high mental performance of employees is required. **Lyra LED HCL** fits perfectly into offices and meeting rooms. HCL luminaires guarantee high visual comfort and contribute to greater concentration and better performance.

## 1. Switch-Control – simple control button



### How it works

**Short button presses** = ON/OFF with memory of last settings

**Holding a button** with driver in setting to OFF activates the color temperature adjustment after approx. 10s, releasing the button saves the colour temperature

**Long button presses** changes the intensity of the selected colour

## 2. Skyline – button panel



### Skyline Panel

**Code: 99-0302**

DALI based multi-panel

### DALI power supply

**Code: 99-0303**

Power supply for one luminaire

## 3. Spectra – stylish user interface



### Spectra panel

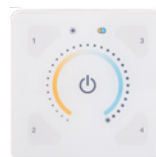
Front control panel is available in a choice of glass or plastic, black or white finish



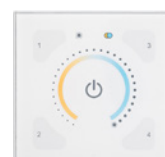
**99-0305PC**  
Material: plastic  
Colour: black



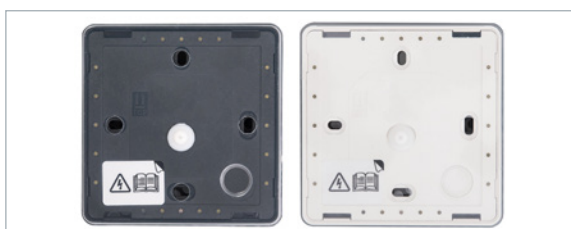
**99-0305SC**  
Material: glass  
Colour: black



**99-0305PB**  
Material: plastic  
Colour: white



**99-0305SB**  
Material: glass  
Colour: white



### DALI interface

**Code: 99-0306DI** (black colour)

**Code: 99-0306DIW** (white colour)

Size and design according to the number of luminaires



### DALI power supply

**Code: 99-0310** (up to 35 luminaires)

**Code: 99-0311** (up to 63 luminaires)

Size and design according to the number of luminaires

# Technical annex – components

## All in One Package



### Spectra Power – user interface and power supply

Package – front Spectra panel and DALI power supply, max. for 20 luminaires



**99-0307PC**  
Material: plastic  
Colour: black



**99-0307SC**  
Material: glass  
Colour: black



**99-0307PB**  
Material: plastic  
Colour: white



**99-0307SB**  
Material: glass  
Colour: white

## Example of use for Spectra – office room

### Used products

- 1 x Spectra panel – Front control panel
- 1 x DALI interface
- 1 x DALI power supply
- 1 x Ceiling DALI motion sensor
- 9 x Tunable White LED luminaires – Lyra LED HCL

SceneSet® Lighting Control App  
for smartphone and tablet



Scene selection



Colour temp. control

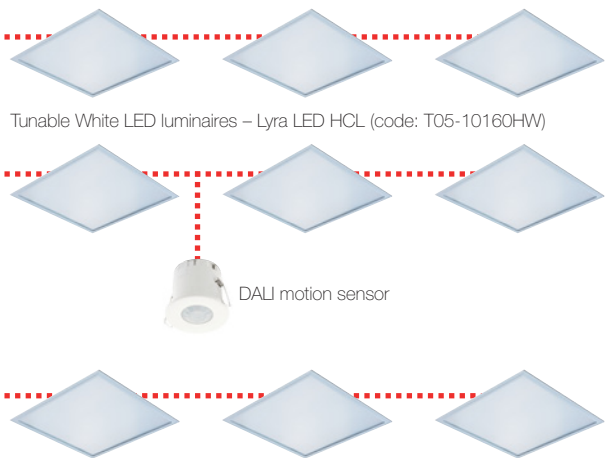
Bluetooth



Spectra panel:  
- Front control panel – plastic, black (code: 99-0305PC)  
- DALI interface (code: 99-0306DI)



DALI power supply  
(code: 99-0311)



## 4. Vision – HCL Project solution



### DALI channel ballast controller Vision

Tailor-made project solution

Project solution always designed according to specific requirements of the user

