

OMS LED DIVISION

OMS IS REGULAR MEMEBER OF



OMS Ltd, as an innovative and progressive producer of lighting solutions is committed to respond to market trends before they become a part of daily life.

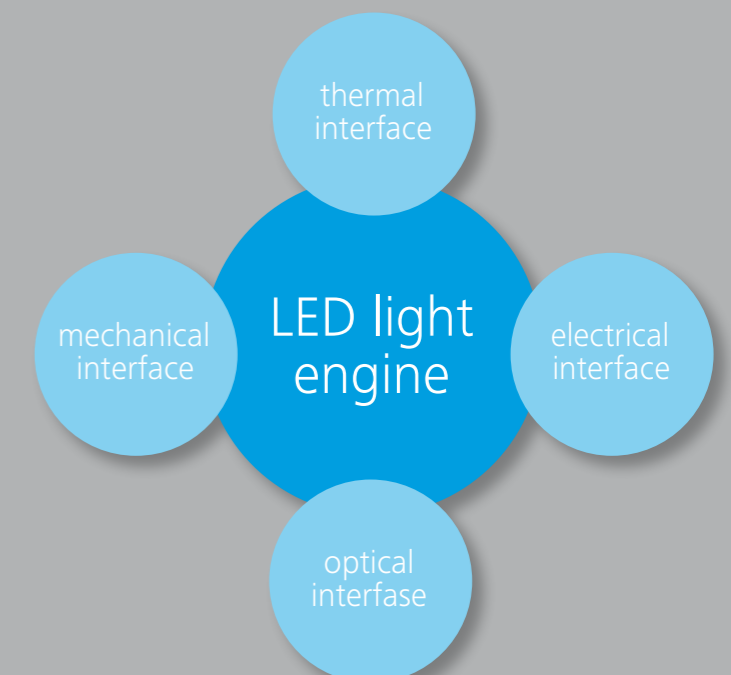
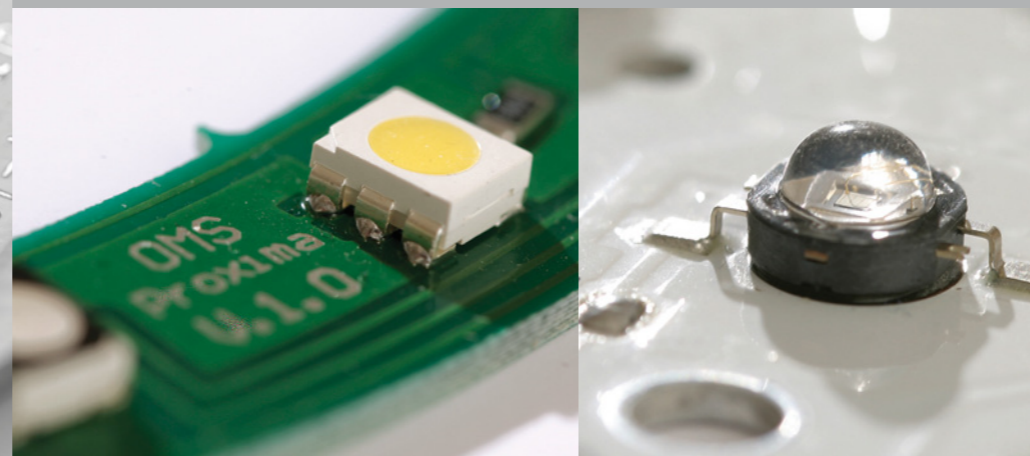
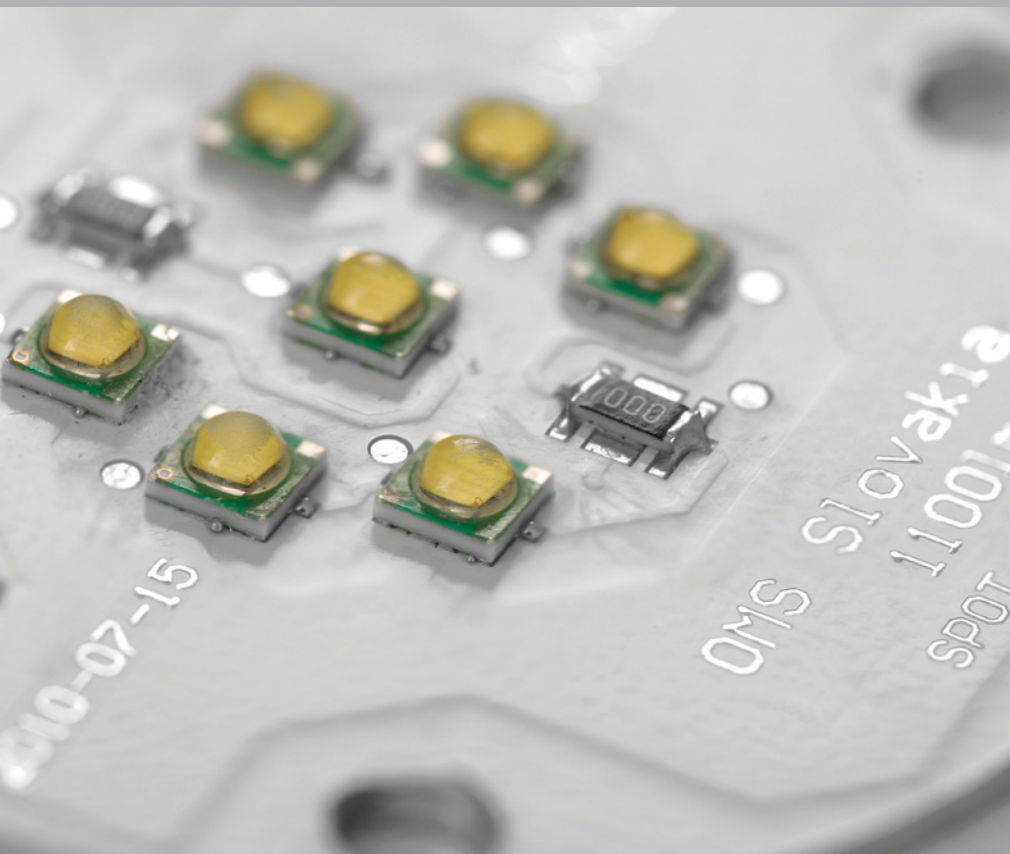
In order to ensure an adequate attention to LED-based lighting solutions, OMS has formed a new R&D division with a clear objective: **bring LED ideas into the real customer solutions**. LED team consists of experts in technology, design, and construction, as well as trade and communication specialists, who work all together to develop LED solutions which are comfortable for our customers. These efforts have already brought first LED fruits in several product categories ranging from indoor to outdoor.

Zhaga is an industry-wide cooperation aimed at the development of standard specifications for the interfaces of LED light engines.

An LED light engine is an LED module with defined interfaces that do not depend on the type of LED technology used inside the light engine.

Zhaga will enable **interchangeability** between products made by diverse manufacturers.

Interchangeability is achieved by defining interfaces for a variety of application-specific light engines. Zhaga standards will cover the physical dimensions, as well as the photometric, electrical and thermal behaviour of LED light engines.









LED

SUSPENDED



SUSPENDED

REBELL L LED 14 	TUBUS PHACT LED 16 	TUBUS VISION PENDANT LED 18 	BECRUX LG SUS LED 20 	VARIO MODUL MINI LED 2 22 	AVANT OPAL LED 24 						
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MODULAR TRACK SYSTEM





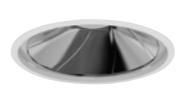


MODULAR TRACK SYSTEM

AVANT LINE OPAL LED 28 	TRACK LOTUS LED 30 	TRACK STARTRACK LED 32 	TRACK CANOPUS LED 34 	TRACK PERSEUS LED 36 	VARIO TRACK 11 LED 40 	VARIO TRACK 12 LED 40 					
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CEILING RECESSED



CEILING RECESSED

ACRUX LED 44 	BECRUX LED 46 	BECRUX LG PV LED 48 	DECRUX LED 50 	GACRUX PV LED 52 	INDIRECT VEGA LED 54 	DOWNLIGHT POLLUX LED 58 	DOWNLIGHT VISION LED 60 	DOWNLIGHT PORRIMA LED 64 	DOWNLIGHT CYGNUS LED 66 	DOWNLIGHT PHOENIX LED 68 
DOWNLIGHT POLARIS LED 70 	FUTURO 12 LED 72 	FUTURO 14 LED 72 	FUTURO 22 LED 72 							

CEILING SURFACED



CEILING SURFACED















TUBUS VISION LED 76 	BECRUX LG AS LED 78 	GACRUX ASN LED 80 								
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WALL MOUNTED/RECESSED



WALL MOUNTED/RECESSED

VARIO MINI LED 1 84 	VARIO MINI LED 2 84 	AVANT OPAL WM LED 86 	FURUD LED 88 	HADAR LED 88 						
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	Lamp Voltage Napätie
	Lamp Voltage Napätie
	LED LED
	Electronic ballast Elektronický predradník
	Electronic ballast, class A2 Elektronický predradník, trieda A2
	Analog electronic ballast 1-10V Analogový elektronický predradník 1-10V
	Digital electronic ballast DSI Digitálny elektronický predradník DSI
	Digital electronic ballast DALI Digitálny elektronický predradník DALI
	Dimmable electronic ballast DMX Stmievateľný elektronický predradník DMX
	Digital electronic ballast – phase dimming Digitálny elektronický predradník – fázové stmievanie
	Emergency unit Núdzová jednotka
	Fixture which can be installed on normally flammable surfaces Svietidlo je možné montovať na normálne horľavý povrch
	Impact resistance IK XX Ochrana proti mechanickým nárazom IK XX
	Protection degree IP XX Krytie IP XX

RECEPTION

SUSPENDED





REBELL

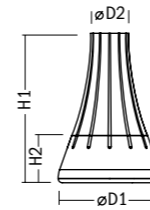
Mounting Montáž	Suspended	Závesné
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Small backside reflector Diffuser	Malý vrchný reflektor Difúzor
Light distributions Distribúcia svetla	Direct	Priama
Wiring Elektrická výbava	Electronic control gear On request: Dimmable electronic control gear (EEL=A1 DALI/DMX) Thermal management (passive – version with 1100 lm, active – version with 2000, 3000 lm)	Elektronický predradník Na požiadanie: Stmievateľný elektronický predradník (EEL=A1 DALI/DMX) Chladenie (pasívne – verzia s 1100 lm, aktívne – verzia s 2000, 3000 lm)
Materials Materiál	Luminaire housing: injected polycarbonate, polyamid Reflector: anodized aluminium Diffuser: injected opal/clear polycarbonate Ring: injected polycarbonate	Teleso svietidla: vstrekovaný polykarbonát, polyamid Reflektor: anodizovaný hliník Difúzor: vstrekovaný opalový/citry polykarbonát Obruč: vstrekovaný polykarbonát
Surface finish Povrchová úprava	Various color variants	Rôzne farebné varianty
Accessories Príslušenstvo	Chain suspension On request: Safety ignitor Reflector cover	Retazový záves Na požiadanie: Bezpečnostný zapalovač Kryt reflektora

VERSION BASIC 1 black housing white opal diffuser small backside reflector		VERSION BASIC 2 grey housing white opal diffuser small backside reflector		VERSION BASIC 3 white housing white opal diffuser small backside reflector	
VERSION BASIC 4 white opal housing sea-blue diffuser small backside reflector		VERSION EXCLUSIVE 1 shiny white housing shiny white diffuser (white inside) small backside reflector		VERSION EXCLUSIVE 2 shiny black housing shiny black diffuser (white inside) small backside reflector	
REFLECTOR COVER 		CHAIN SUSPENSION 			

STANDARD



ON REQUEST

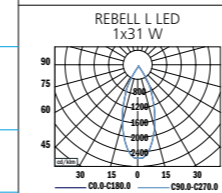


Type	version			optic		lamp	dimensions			
	basic	industrial	exclusive	main L reflector	small L reflector		D1	D2	H1	H2
REBELL L	•	-	•	-	•	LED	378	140	549	173
REBELL L	•	-	•	-	•	LED	378	140	549	173
REBELL L	•	-	•	-	•	LED	378	140	549	173
REBELL L	•	-	•	-	•	LED	378	140	549	173
REBELL L	•	-	•	-	•	LED	378	140	549	173

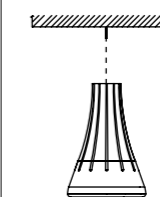
Type	power (W)	light output (lm)	color rendering index (CRI)(Ra)	color temperature (CCT)(K)	dimming (%)
	16	1100	80	3000	10-100*
	18	1100	80	4000	10-100*
	29	2000	80	3000	10-100*
	31	2000	80	4000	10-100*
	49	3000	80	4000	10-100*

*Optional

Photometry
Fotometria



Mounting
Montáž



**TUBUS
PHACT**

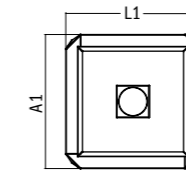
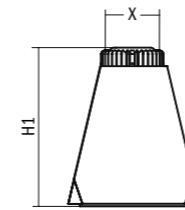
POLISHED
LED



STANDARD



ON REQUEST



TUBUS

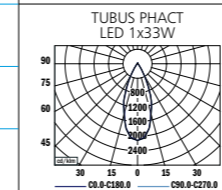
Design by JAROSLAVA POLÁKOVÁ OMS

Mounting Montáž	Suspended	Závesné
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Reflector	Reflektor
Light distribution Distribúcia svetla	Direct	Priama
Wiring Elektrická výbava	Electronic control gear Thermal management (passive – version with 1100 lm, active – version with 2000, 3000 lm) On request: Dimmable electronic control gear (EEI=A1 – DALI, DMX)	Elektronický predradník Chladenie (pasívne – verzia s 1100 lm, aktívne – verzia s 2000, 3000 lm) Na požiadanie: Stmievateľný elektronický predradník (EEI=A1 – DALI, DMX)
Materials Materiál	Housing: sheet steel Reflector: anodized aluminium sheet	Teleso: Ocelový výlisok Reflektor: anodizovaný hliníkový plech
Surface finish Povrchová úprava	Housing: RAL 9006 with metallic effect, RAL 9003 white (on request)	Teleso: RAL 9006 s metalickým efektom, RAL 9003 biela (na požiadanie)
Accessories Príslušenstvo	Suspension accessories	Závesné príslušenstvo

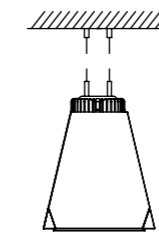
Type	optic	light output	power	color rendering index	color temperature	dimming	dimensions			fixing point
	POLISHED	(lm)	(W)	CRI (Ra)	CCT (K)	(%)	A1	L1	H1	X
TUBUS PHACT	•	1100	18	80	3000	10-100*	286	286	346	123
TUBUS PHACT	•	1100	16	80	4000	10-100*	286	286	346	123
TUBUS PHACT	•	2000	33	80	3000	10-100*	286	286	346	123
TUBUS PHACT	•	2000	29	80	4000	10-100*	286	286	346	123
TUBUS PHACT	•	3000	49	80	4000	10-100*	286	286	346	123

* Optional

Photometry
Fotometria



Mounting
Montáž



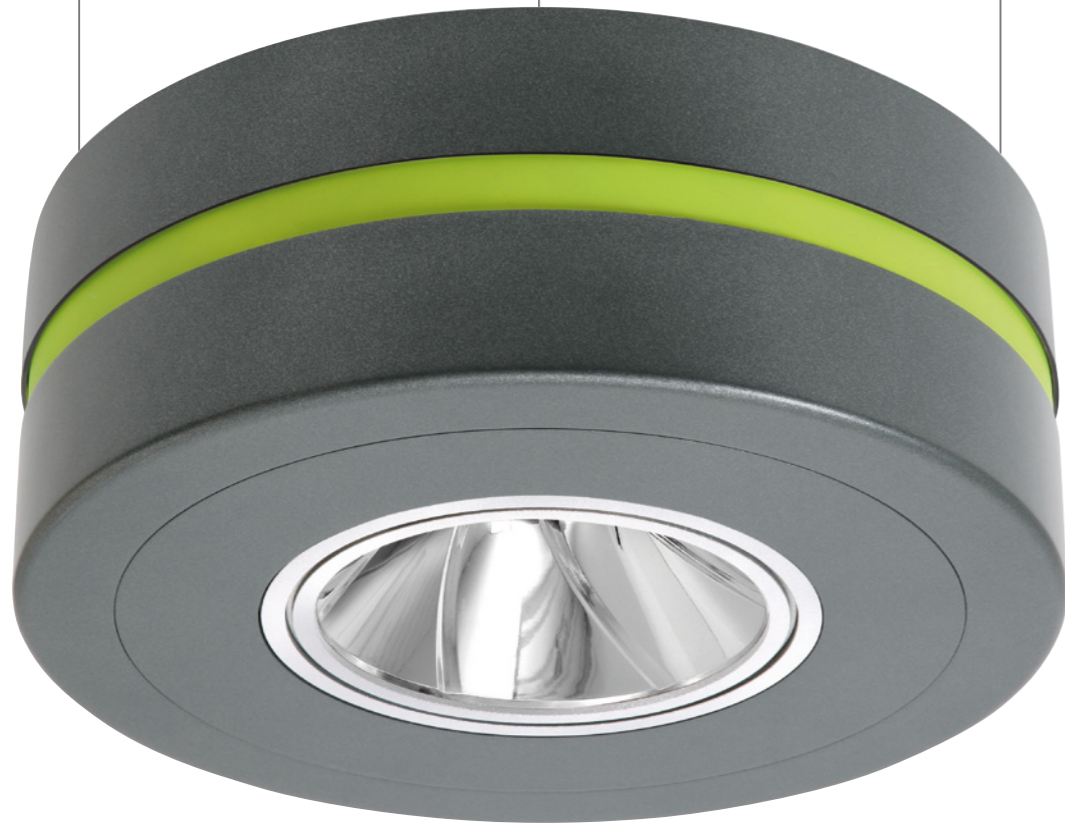
Suspensions
Závesy

SUSPENSION 36



**TUBUS VISION
PENDANT**

LED
DIR

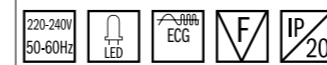


TUBUS

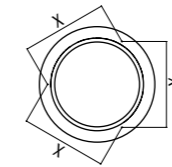
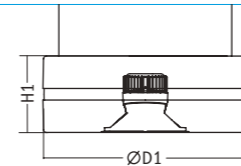
Design by PETER BAKO INDUSTRIAL PRODUCT DESIGN

Mounting Montáž	Suspended	Závesné
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Reflector	Reflektor
Light distribution Distribúcia svetla	Direct	Priama
Wiring Elektrická výbava	Electronic control gear On request: Dimmable electronic control gear (EEL=A1 – DALI) Thermal management (passive – version with 1100 lm, active – version with 2000, 3000 lm)	Elektronický predradník Na požiadanie: Stmievateľný elektronický predradník (EEL=A1 – DALI) Chladenie (pasívne – verzia s 1100 lm, aktívne – verzia s 2000, 3000 lm)
Materials Materiál	Housing: polycarbonate Reflector: PC – evaporative coating (polished/white) Decorative ring: polycarbonate	Teleso: polykarbonát Reflektor: PC – vákuovo pokovaný (leštený/biely) Dekoratívna obruč: polykarbonát
Surface finish Povrchová úprava	Housing: grey (RAL 9006), other colors on request Decorative ring: yellow opal, other colors on request	Teleso: šedá (RAL 9006), ostatné farby na požiadanie Dekoratívna obruč: žltý opál, ostatné farby na požiadanie
Accessories Príslušenstvo	Suspension accessories On request: Decorative elements and glasses (see page VISION ACCESSORIES 62 – 63)	Závesné príslušenstvo Na požiadanie: Dekoračné prvky a sklá (viď stranu PRÍSLUŠENSTVO VISION 62 – 63)

STANDARD



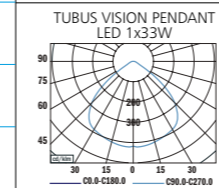
ON REQUEST



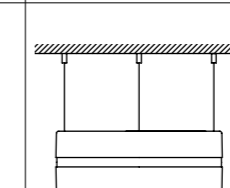
Type	lumen output	power	color	light color	dimming	dimensions		opening
	(lm)	(W)	accuracy CRI (Ra)	CCT (K)	(%)	D1	H1	X
TUBUS VISION PENDANT	1100	16	80	4000	10-100*	442	188	346
TUBUS VISION PENDANT	1100	18	80	3000	10-100*	442	188	346
TUBUS VISION PENDANT	2000	29	80	4000	10-100*	442	188	346
TUBUS VISION PENDANT	2000	33	80	3000	10-100*	442	188	346

*Optional

Photometry
Fotometria



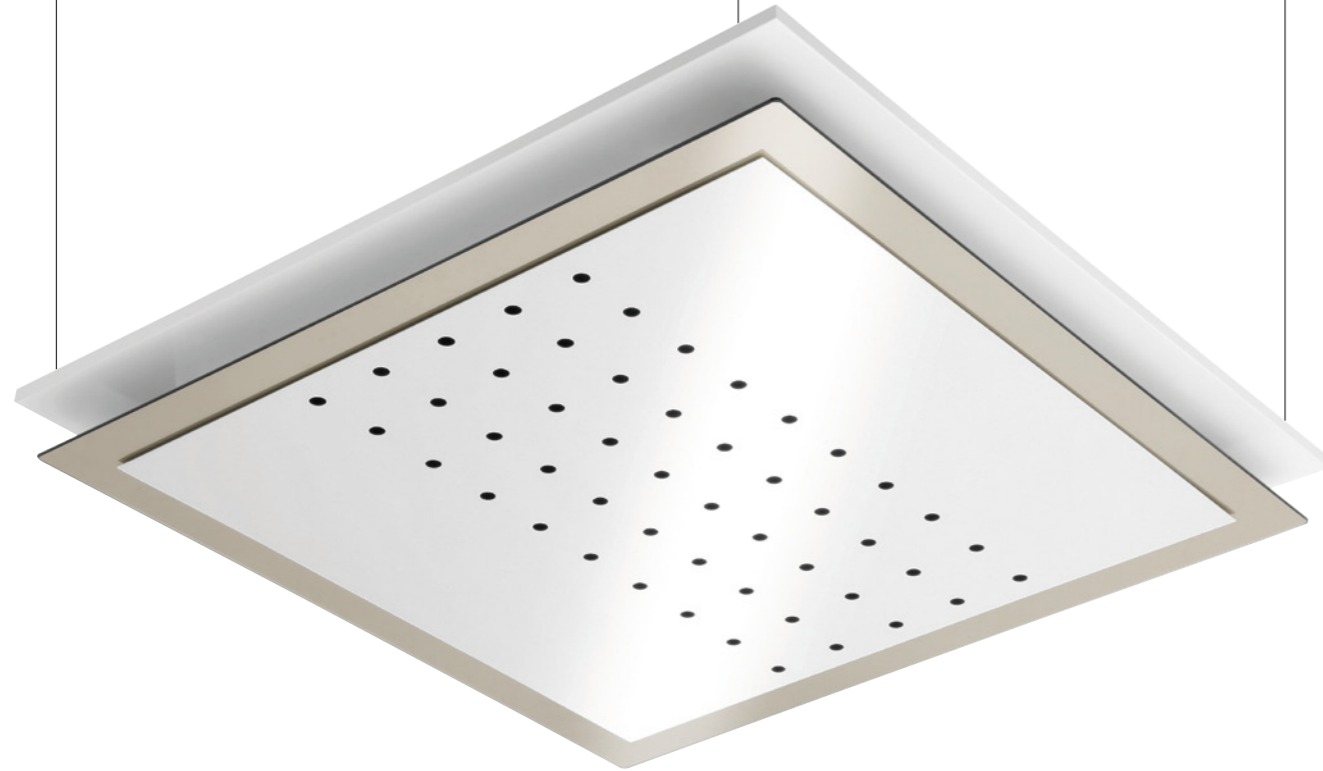
Mounting
Montáž



Suspensions
Závesy

SUSPENSION 32





BECRUX LG

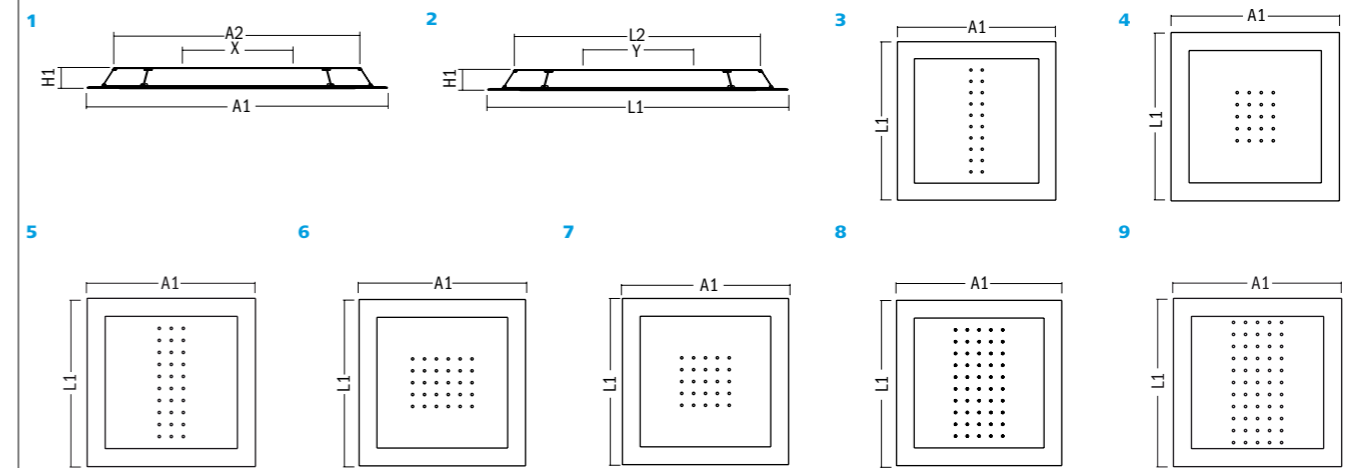
Design by GIUGIARO

Mounting Montáž	Suspended	Závesné
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Lenses	Šošovky
Light distributions Distribúcia svetla	Direct/indirect	Priama/nepriama
Wiring Elektrická výbava	Electronic control gear (EEI=A2) On request: Dimmable electronic control gear (EEI= A1 – DMX) Passive thermal management	Elektronický predradník (EEI=A2) Na požiadanie: Stmievateľný elektronický predradník (EEI= A1 – DMX) Pasívne chladienie
Materials Materiál	Housing: sheet steel Shade: polished stainless steel Decorative frame: mirror glass Reflector: anodized aluminium	Teleso: oceľový plech Tienidlo: lesklý nerezový plech Dekoratívny rámik: zrkadlové sklo Reflektor: anodizovaný hliník
Surface finish Povrchová úprava	Housing: white (RAL 9003), metallic	Teleso: biela (RAL 9003), kovová
Accessories Príslušenstvo	Accessory suspensions	Závesné príslušenstvo

STANDARD

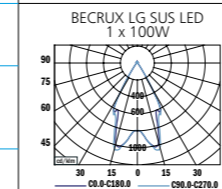


ON REQUEST

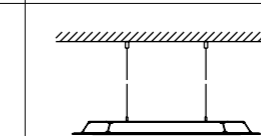


Type	color temperature				indir	power dir	power indir	led picture	dimensions				fixing			
	cool white	neutral white	warm white	warm white/ RGB cool white					A1	A2	L1	L2	H1	X	Y	
BECRUX LG SUS 28 i	•	•	•	•	•	1x28	18	350	1,2;3	700	576	700	576	49	400	400
BECRUX LG SUS 28 o	•	•	•	•	•	1x28	18	350	1,2;4	700	576	700	576	49	400	400
BECRUX LG SUS 40 i	•	•	•	•	•	1x40	18	500	1,2;3	700	576	700	576	49	400	400
BECRUX LG SUS 40 o	•	•	•	•	•	1x40	18	500	1,2;4	700	576	700	576	49	400	400
BECRUX LG SUS 42 i	•	•	•	•	•	1x42	18	350	1,2;5	700	576	700	576	49	400	400
BECRUX LG SUS 42 o	•	•	•	•	•	1x42	18	350	1,2;6	700	576	700	576	49	400	400
BECRUX LG SUS 35	•	•	•	•	•	1x35	18	350	1,2;7	700	576	700	576	49	400	400
BECRUX LG SUS 50	•	•	•	•	•	1x50	18	500	1,2;7	700	576	700	576	49	400	400
BECRUX LG SUS 60 i	•	•	•	•	•	1x60	18	500	1,2;5	700	576	700	576	49	400	400
BECRUX LG SUS 60 o	•	•	•	•	•	1x60	18	500	1,2;6	700	576	700	576	49	400	400
BECRUX LG SUS 70	•	•	•	•	•	1x70	18	350	1,2;8	700	576	700	576	49	400	400
BECRUX LG SUS 100	•	•	•	•	•	1x100	18	500	1,2;8	700	576	700	576	49	400	400
BECRUX LG SUS 77	•	•	•	•	•	1x77	18	350	1,2;9	700	576	700	576	49	400	400
BECRUX LG SUS 110	•	•	•	•	•	1x110	18	500	1,2;9	700	576	700	576	49	400	400

Photometry
Fotometria

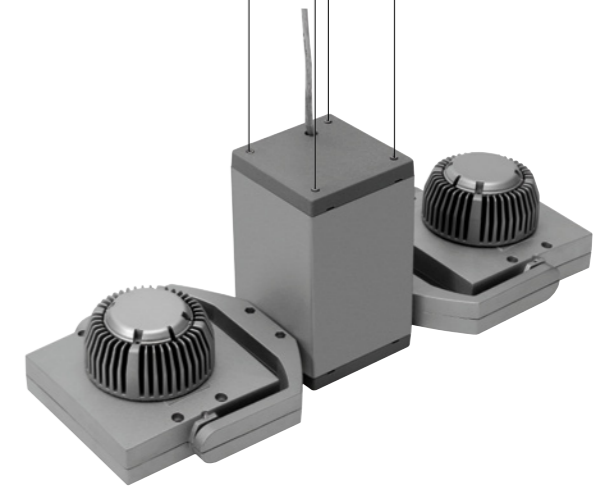
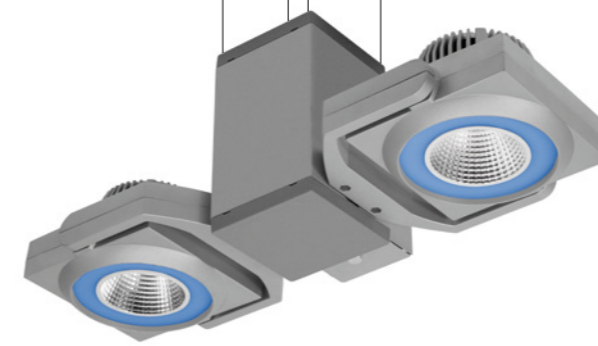


Mounting
Montáž

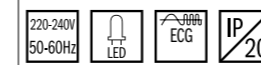


Suspensions
Závesy





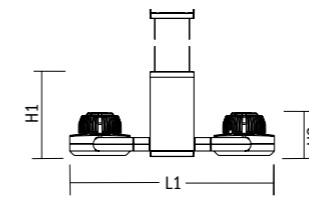
STANDARD



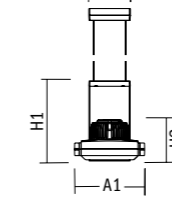
ON REQUEST



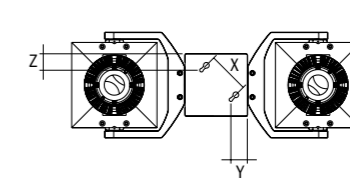
1



2



3



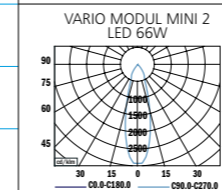
VARIO

Type	lumen output (lm)	power (W)	color accuracy CRI (Ra)	light color CCT (K)	dimming (%)	dimensions				fixing points			
						L1	A1	A2	H1	H2	X	Y	Z
VARIO MODUL MINI 2	2x1100	36	> 80	3000	10-100*	186	458	98	165	100	36	72	28
VARIO MODUL MINI 2	2x1100	34	> 80	4000	10-100*	186	458	98	165	100	36	72	28
VARIO MODUL MINI 2	2x2000	66	> 80	3000	10-100*	186	458	98	165	100	36	72	28
VARIO MODUL MINI 2	2x2000	62	> 80	4000	10-100*	186	458	98	165	100	36	72	28

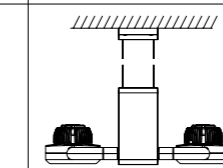
* Optional

Mounting Montáž	Suspended	Závesné
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Reflector	Reflektor
Light distribution Distribúcia svetla	Diffuser Direct	Difúzor Priama
Wiring Elektrická výbava	Electronic control gear On request: Dimmable electronic control gear (EEI=A1 – DALI, DMX) Thermal management (passive – version with 2200 lm, active – version with 4000 lm)	Elektronický predradník Na požiadanie: Stmievateľný elektronický predradník (EEI=A1 – DALI, DMX) Chladenie (pasívne – verzia s 2200 lm, aktívne – verzia s 4000 lm)
Materials Materiál	Housing: aluminium profile. Covers made of ABS Installation plate: galvanised sheet steel	Teleso: hliníkový profil, krytky z ABS Inštalácia: pozinkovaný plech
Surface finish Povrchová úprava	Housing: grey (RAL 9006) Plastic box for control gear: grey with metal pigment Blue colored ambient LED lighting behind the diffuser	Teleso: šedá (RAL 9006) Plastové predradné boxy: šedá s kovovým pigmentom Modré ambientné LED osvetlenie v difúzore
Accessories Príslušenstvo	Suspension accessories	Závesné príslušenstvo

Photometry
Fotometria



Mounting
Montáž



Suspensions
Závesy

SUSPENSION 26



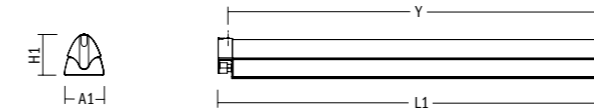
AVANT OPAL

LED



STANDARD

ON REQUEST

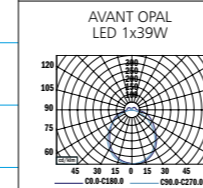


AVANT

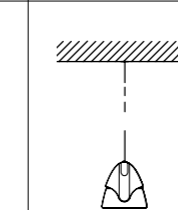
Type	optic	light output	power	color rendering index	color temperature	dimming	dimensions				fixing points	
	WHITE	(lm)	(W)	CRI (Ra)	CCT (K)	(%)	A1	A2	L1	L2	H1	Y
AVANT OPAL LED	•	3000	39	>70	4700	-	99	88	1250	104	91	120

Mounting Montáž	Suspended	Závesné
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Diffuser	Difúzor
Light distribution Distribúcia svetla	Direct	Priama
Wiring Elektrická výbava	Electronic control gear Passive thermal management	Elektronický predradník Pasívne chladenie
Materials Materiál	Housing: extruded aluminium End caps: die cast aluminium Diffuser: clear, opal – PMMA Diffuser end caps: PC/SMMA	Teleso: extrudovaný hliník Koncovky: hliníkový odliatok Difúzor: číry, opálový – PMMA Koncovky difúzora: PC/SMMA
Surface finish Povrchová úprava	Powder coat finish – grey (RAL 9006)	Prášková farba – šedá (RAL 9006)
Accessories Príslušenstvo	Suspension accessories On request: Connectors: 7-pole Wago	Závesné príslušenstvo Na požiadanie: Elektrické konektory: 7-pólové Wago

Photometry
Fotometria



Mounting
Montáž



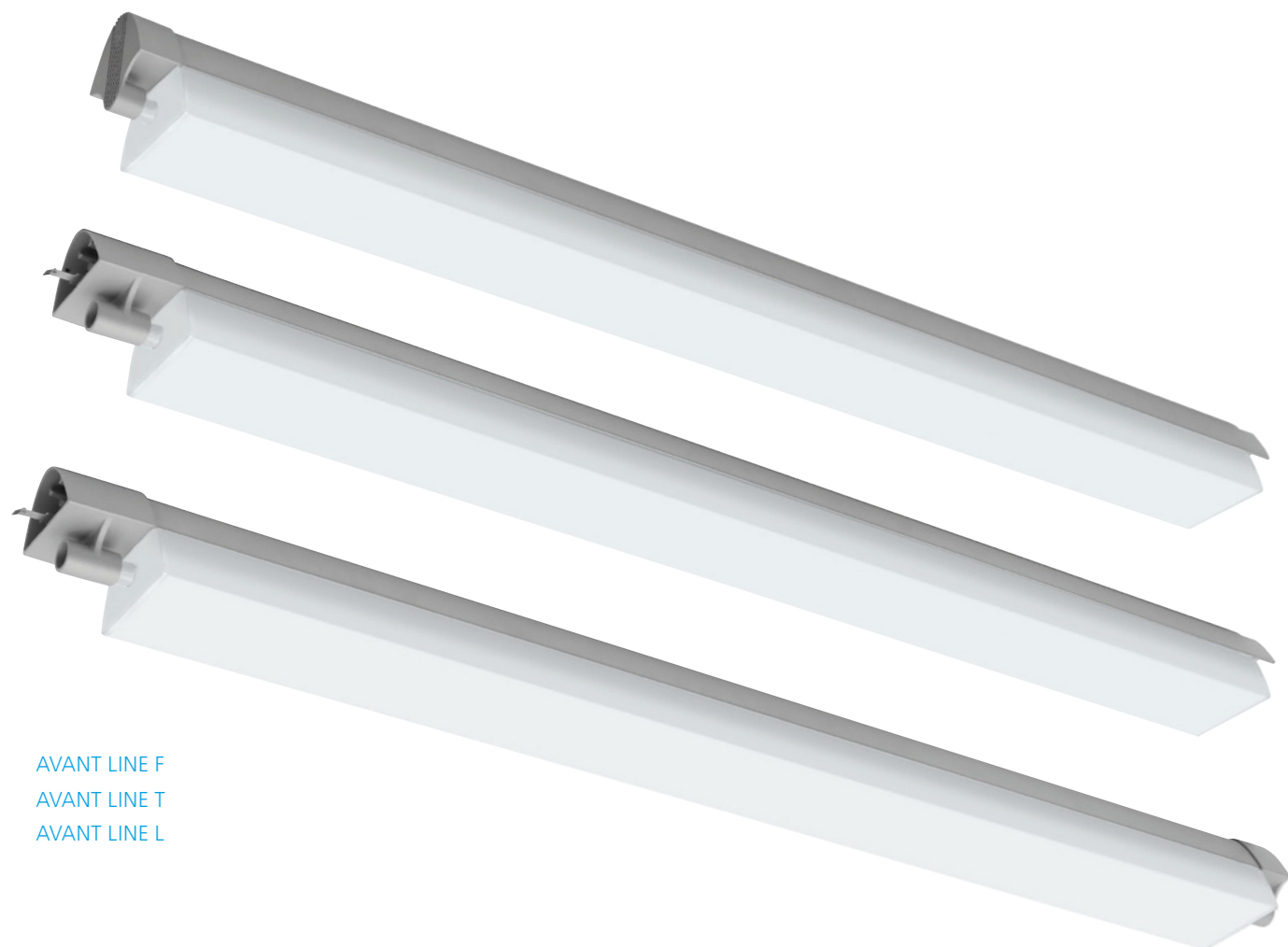
Suspensions
Závesy



SUSPENDED

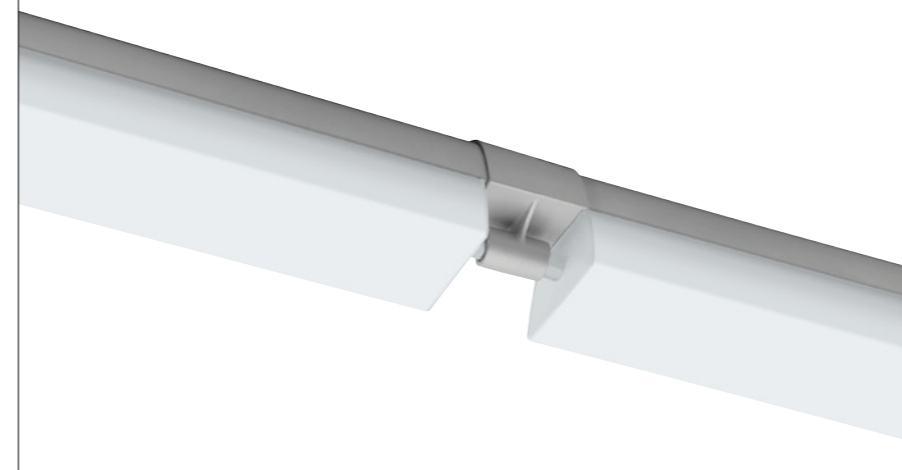


MODULAR TRACK SYSTEM



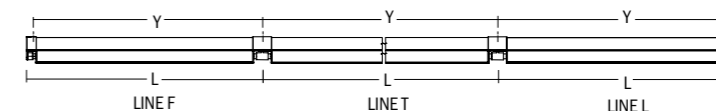
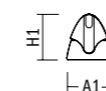
AVANT LINE F
AVANT LINE T
AVANT LINE L

AVANT



STANDARD

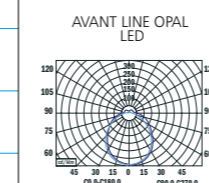
ON REQUEST



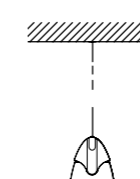
Type	optic	light output (lm)	power (W)	color rendering index CRI(Ra)	color temperature CCT(K)	dimensions								fixing points	
						A1	A2	A3	A4	L	H1	H2	H3		H4
AVANT OPAL LINE LED F	•	3000	39	>70	4700	99	143	130	88	1285	104	120	203	91	1225
AVANT OPAL LINE LED T	•	3000	39	>70	4700	99	143	130	88	1285	104	120	203	91	1250
AVANT OPAL LINE LED L	•	3000	39	>70	4700	99	143	130	88	1250	104	120	203	91	1250

Mounting Montáž	Suspended - predetermined for continuous installation.	Závesné – predurčené na priebežnú montáž
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Opal diffuser	Opálový difúzor
Light distribution Distribúcia svetla	Direct	Priama
Wiring Elektrická výbava	Electronic control gear Through wiring (T, F version) Passive thermal management	Elektronický predradník Priebežné vinutie (T, F verzia) Pasívne chladenie
Materials Materiál	Housing : extruded aluminium End caps: die cast aluminium Diffuser: clear, opal – PMMA Diffuser end caps: PC/SMMA Carrying plate: extruded aluminium	Teleso : extrudovaný hliník Koncovky: hliníkový odliatok Difúzor: číry, opálový – PMMA Koncovky difúzora: PC/SMMA Nosná doska: extrudovaný hliník
Surface finish Povrchová úprava	Powder coat finish – grey (RAL 9006)	Prášková farba – šedá (RAL 9006)
Accessories Príslušenstvo	Suspension accessories On request: Wall bracket Connectors: 7-pole Wago	Závesné príslušenstvo Na požiadanie: Konzola pre nástennú montáž Elektrické konektory: 7-pólové Wago

Photometry
Fotometria



Mounting
Montáž

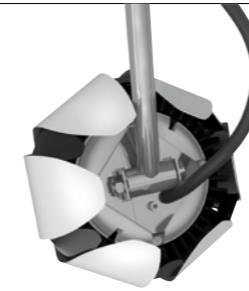
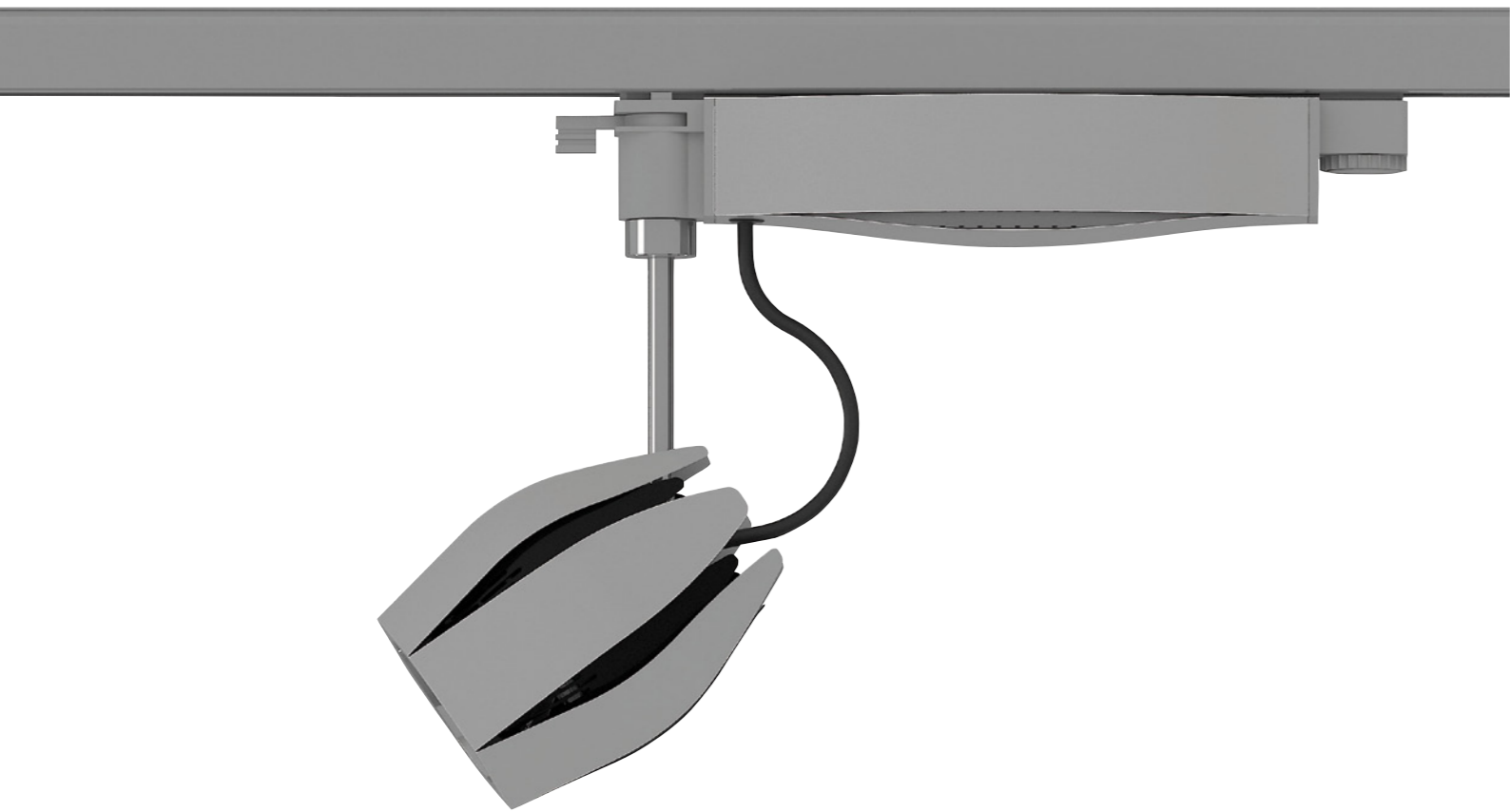


Suspensions
Závesy

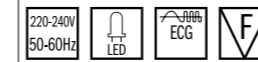
SUSPENSION 24

SUSPENSION 12/24





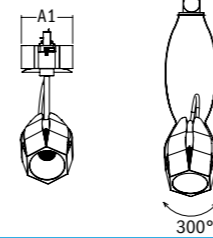
STANDARD



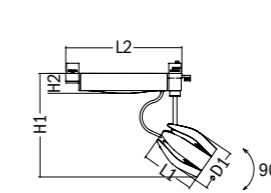
ON REQUEST



1



2



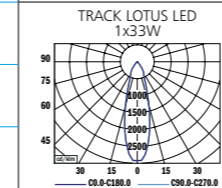
TRACK

Mounting Montáž	Suspended or ceiling surfaced lighting track system	Závesný alebo prisadený svetelný koľajnicový systém
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Reflector	Reflektor
Light distributions Distribúcia svetla	Direct	Priama
Wiring Elektrická výbava	Electronic control gear Active thermal management On request: Dimmable electronic ballast (DALI)	Elektronický predradník Aktívne chladenie Na požiadanie: Stmievateľný elektronický predradník (DALI)
Materials Materiál	Housing: sheet steel + stainless sheet steel Box: sheet steel + stainless sheet steel Reflector: facet anodized aluminium	Teleso: oceľový plech + antikorový plech Box: oceľový plech + antikorový plech Reflektor: facetový anodizovaný hliník
Surface finish Povrchová úprava	Housing: grey (RAL 9006), white (RAL 9003) on request Box: grey (RAL 9006), white (RAL 9003) on request	Teleso: šedá (RAL 9006), biela (RAL 9003) na požiadanie Box: šedá (RAL 9006), biela (RAL 9003) na požiadanie
Accessories Príslušenstvo	Various types of connections and suspension equipment (see page TRACK SYSTEM 38 – 39)	Rôzne typy spojok a závesov (viď stránku TRACK SYSTEM 38 – 39)

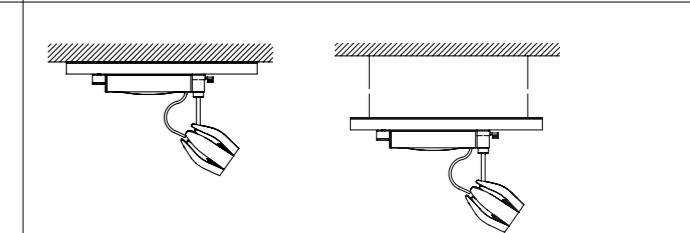
Type	optic	light output	power	color rendering index	color temperature	dimming*	dimensions					
	REFLECTOR	(lm)	(W)	(CRI (Ra))	CCT (K)		D1	A1	L1	L2	H1	H2
TRACK LOTUS LED	•	1100	17	>80	4000	10-100*	106	98	138	297	265	51
TRACK LOTUS LED	•	1100	18	>80	3000	10-100*	106	98	138	297	265	51
TRACK LOTUS LED	•	2000	31	>80	4000	10-100*	106	98	138	297	265	51
TRACK LOTUS LED	•	2000	33	>80	3000	10-100*	106	98	138	297	265	51

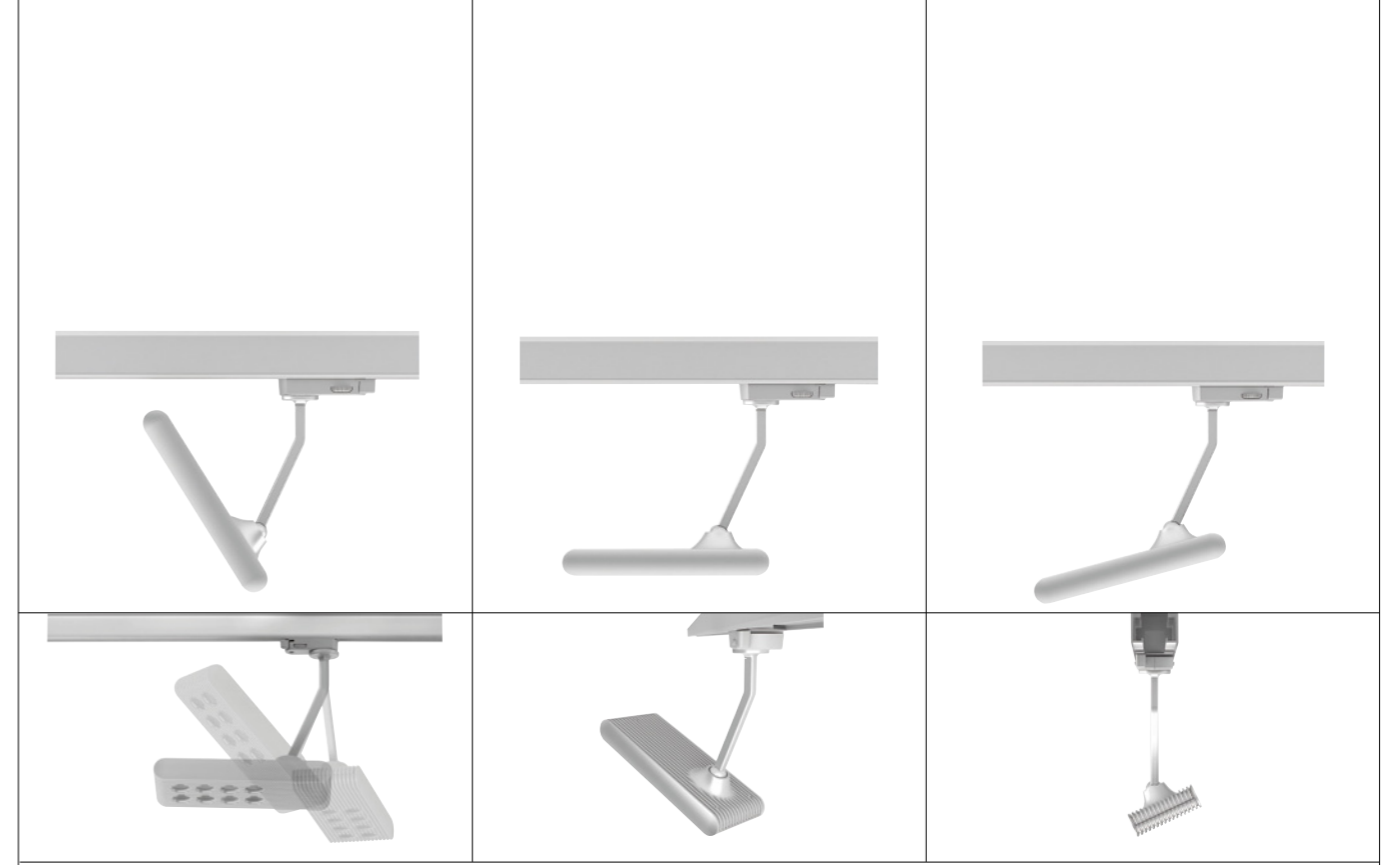
* Optional

Photometry
Fotometria



Mounting
Montáž



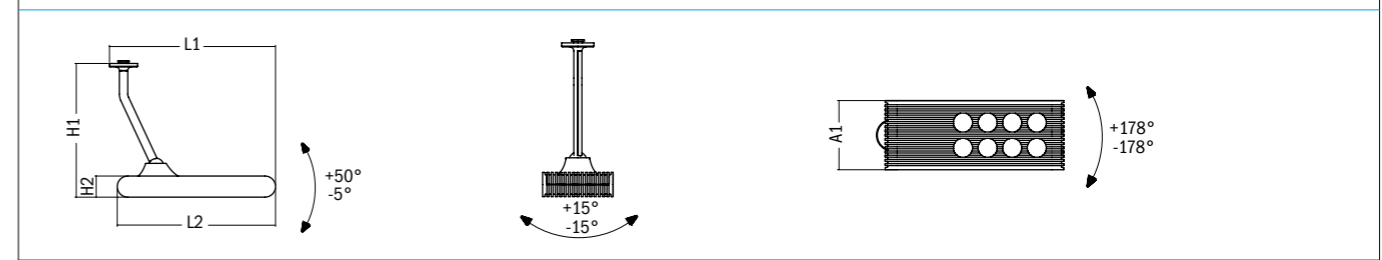


STANDARD ON REQUEST









Type	light output (lm)	power (W)	color rendering index CRI (Ra)	color temperature CCT (K)	dimensions				
					A1	L1	L2	H1	H2
TRACK STARTRACK	600	10	>80	2700	87	236	225	190	30
TRACK STARTRACK	600	10	>80	4000	87	236	225	190	30
TRACK STARTRACK	600	10	>80	5600	87	236	225	190	30

TRACK

Design by ATELIÉR PELCL

Mounting Montáž	Suspended or ceiling surfaced lighting track system	Závesný alebo prisadený svetelný koľajnicový systém
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Lenses	Šošovky
Light distributions Distribúcia svetla	Direct	Priama
Wiring Elektrická výbava	Electronic control gear Passive thermal management	Elektronický predradník Pasívne chladenie
Materials Materiál	Housing: die cast aluminium Lens: polycarbonate	Teleso: tlakovo liaty hliník Šošovka: polykarbonát
Surface finish Povrchová úprava	Housing: natural elox	Teleso: prírodný elox
Accessories Príslušenstvo	Various types of connections and suspension equipment (see page TRACK SYSTEM 38 – 39)	Rôzne typy spojok a závesov (viď stránku TRACK SYSTEM 38 – 39)

Photometry
Fotometria

Mounting
Montáž





TRACK

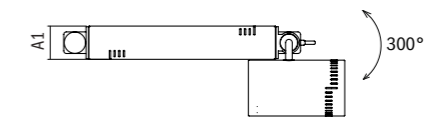
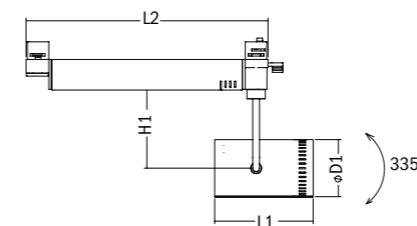
Design by Matej Bílík, Anton Zetocha OMS

Mounting Montáž	Suspended or ceiling surfaced lighting track system	Závesný alebo prisadený svetelný koľajnicový systém
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Reflector	Reflektor
Light distributions Distribúcia svetla	Direct	Priama
Wiring Elektrická výbava	Electronic control gear Active thermal management	Elektronický predradník Aktívne chladenie
Materials Materiál	Housing: extruded aluminium profile Box: sheet steel Mounting bracket: chrome steel tube Reflector: aluminium faceted	Teleso: extrudovaný hliníkový profil Box: oceľový plech Držiak telesa: chrómovaná oceľová trubica Reflektor: hliníkový, fazetovaný
Surface finish Povrchová úprava	Housing: grey (RAL 9006 Elox) Box: grey (RAL 9006 Elox)	Teleso: šedá (RAL 9006 Elox) Box: šedá (RAL 9006 Elox)
Accessories Príslušenstvo	Various types of connections and suspension equipment (see page TRACK SYSTEM 38 – 39)	Rôzne typy spojok a závesov (viď stránku TRACK SYSTEM 38 – 39)



STANDARD

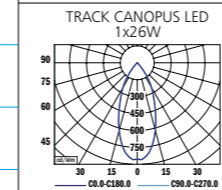
ON REQUEST



Type	optic	light output (lm)	power (W)	color rendering index CRI (Ra)	color temperature CCT (K)	dimensions				
						D1	A1	L1	L2	H1
TRACK CANOPUS	•	1000	26	80	2700	84	50	145	356	115
TRACK CANOPUS	•	1000	26	80	3000	84	50	145	356	115
TRACK CANOPUS	•	1000	26	80	4000	84	50	145	356	115

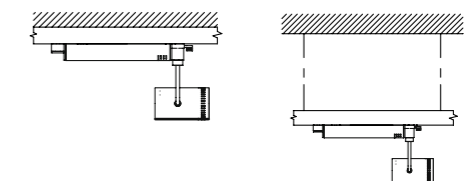
Photometry

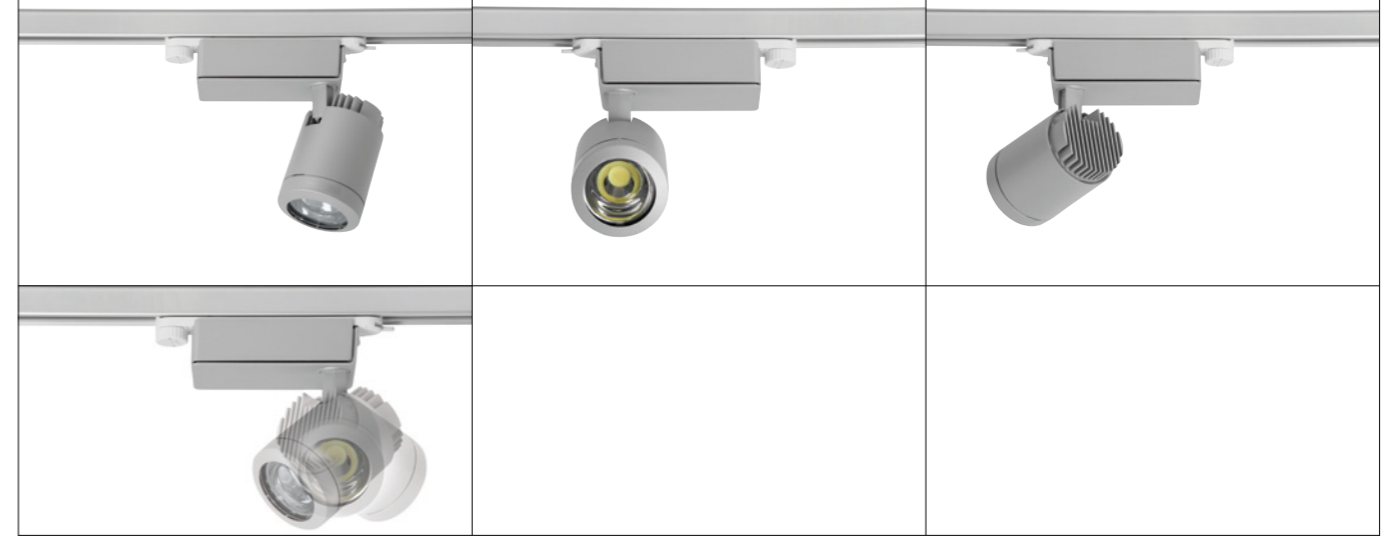
Fotometria



Mounting

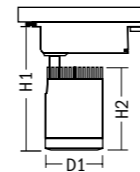
Montáž





STANDARD

ON REQUEST

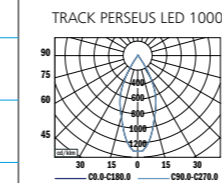


TRACK

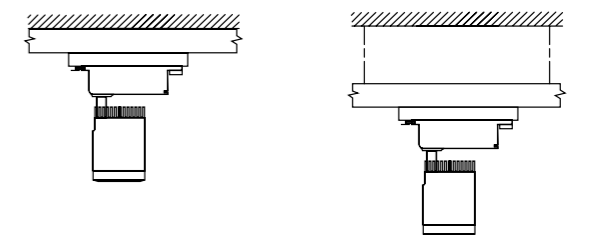
Mounting Montáž	Suspended or ceiling surfaced lighting track system	Závesný alebo prisadený svetelný kolajnicový systém
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Reflector	Reflektor
Light distributions Distribúcia svetla	Direct	Priama
Wiring Elektrická výbava	Electronic control gear Passive thermal management	Elektronický predradník Pasívne chladenie
Materials Materiál	Housing: die-cast aluminium Reflector: aluminium Safety glass: clear hardened	Teleso: tlakovo liaty hliník Reflektor: hliník Bezpečnostné sklo: číre kalené
Surface finish Povrchová úprava	Grey (RAL 9006)	Šedá (RAL 9006)
Accessories Príslušenstvo	Various types of connections and suspension equipment (See page TRACK SYSTEM 38 – 39)	Rôzne typy spojok a závesov (Viď stranu TRACK SYSTEM 38 – 39)

Type	optic	power	light output	color rendering index	color temperature	dimensions			weight
	reflector	(W)	(lm)	CRI(Ri)	CCT(K)	D1	H1	H2	(kg)
TRACK PERSEUS LED	•	1x8,5W	400	>80	3000K	96	200	136	1,7
TRACK PERSEUS LED	•	1x18W	700	>80	3000K	96	200	136	1,7
TRACK PERSEUS LED	•	1x20W	1000	>80	3000K	96	200	136	1,7

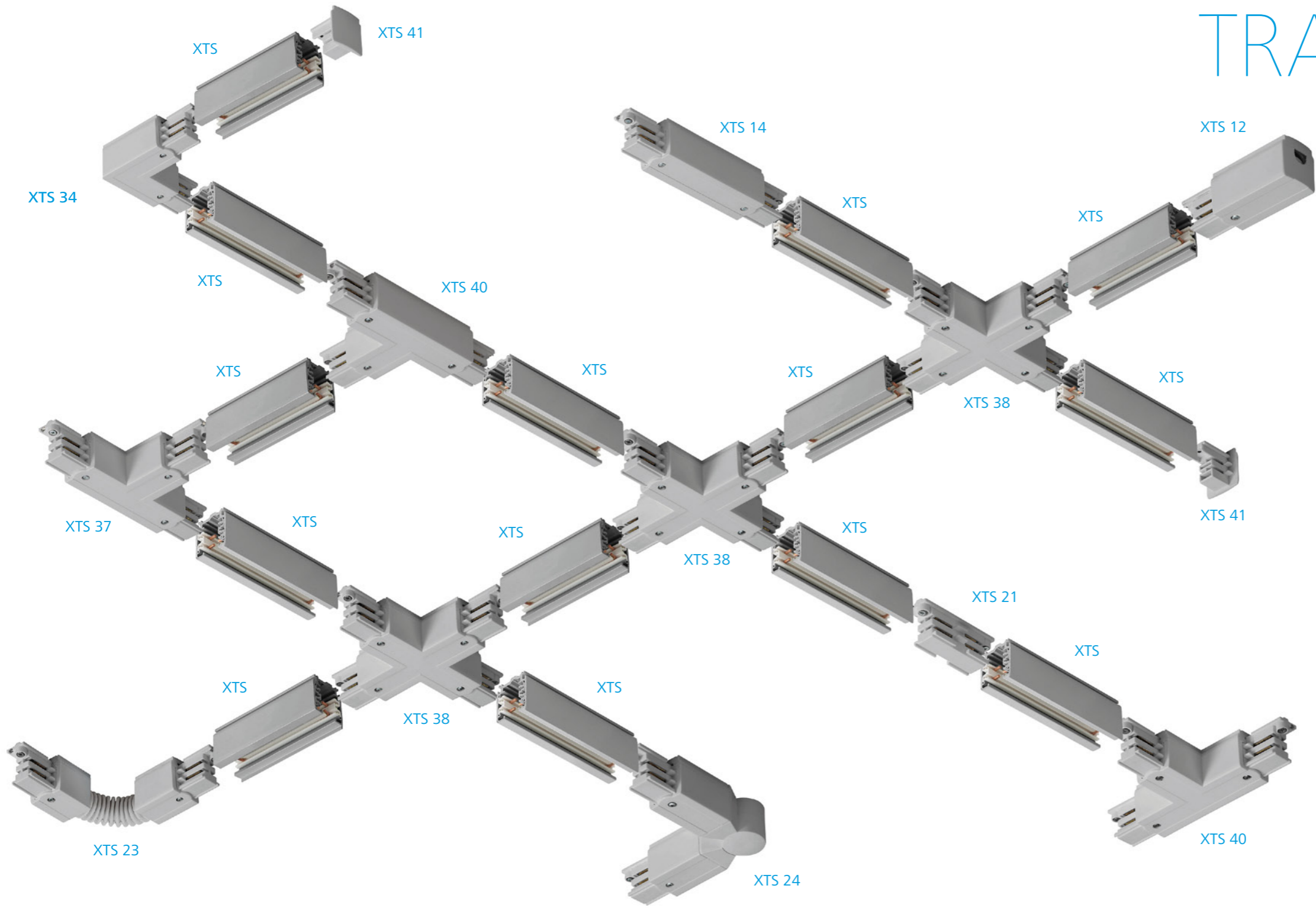
Photometry
Fotometria



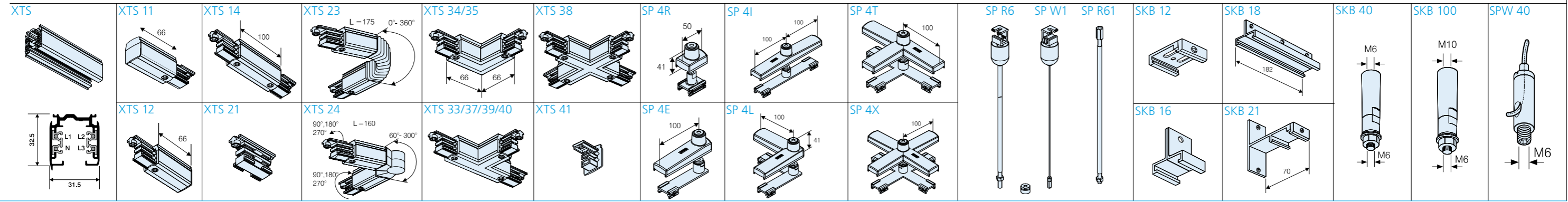
Mounting
Montáž

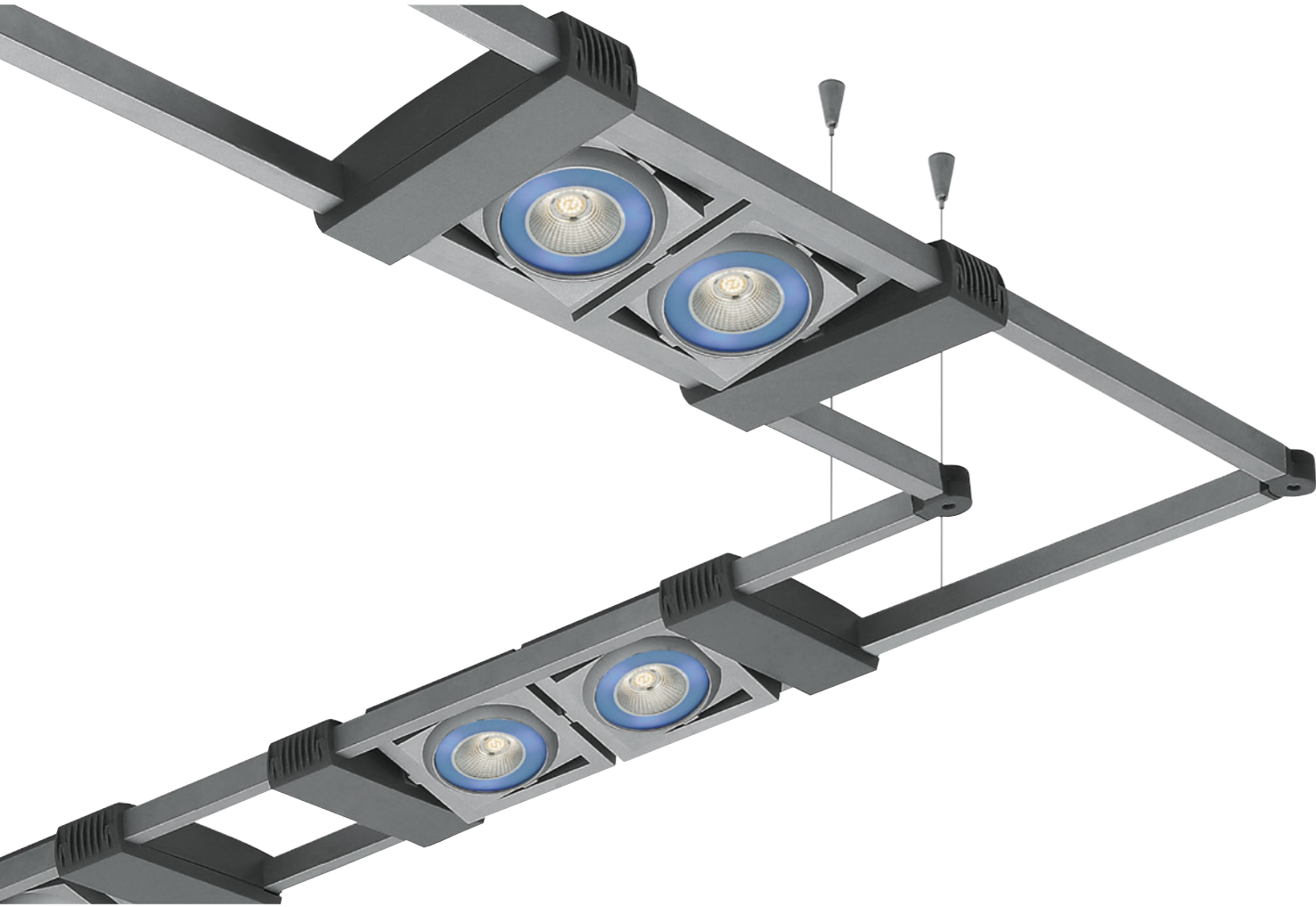


TRACK SYSTEM



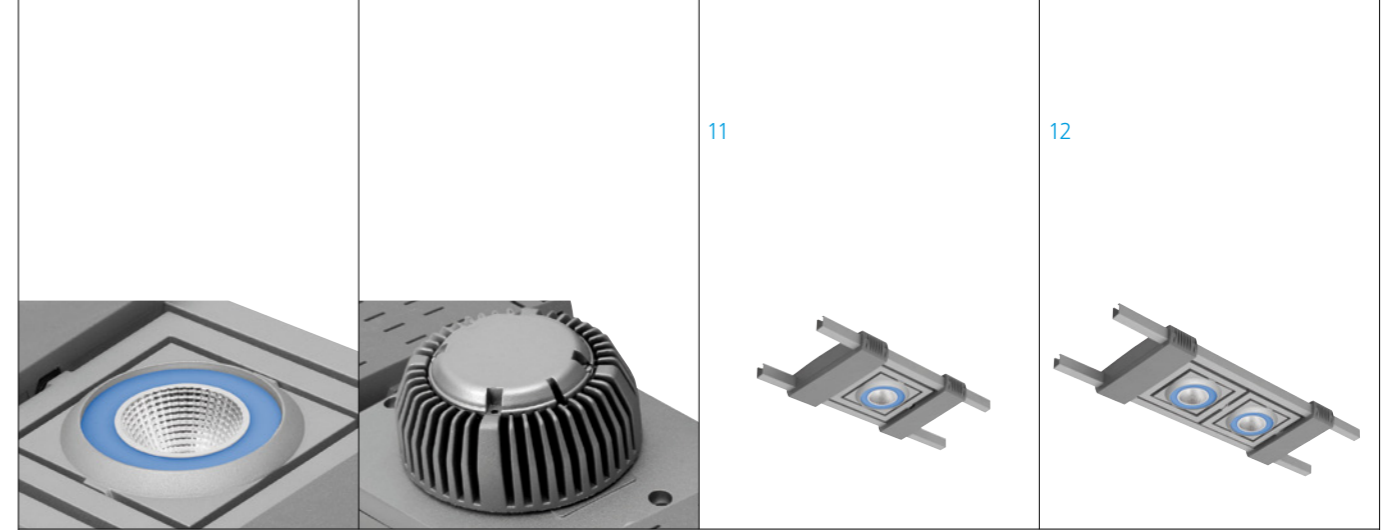
XTS	Track	Koľajnica
XTS 11	End feed	Koncovka
XTS 12	End feed, mirror image	Koncovka opačná
XTS 14	Middle feed	Spojka koľajnice
XTS 21	Straight connector	Priebežný konektor
XTS 23	Flexible corner connector	Ohybný rohový konektor
XTS 24	Adjustable corner connector	Nastaviteľný rohový konektor
XTS 34/35	L - connector	L - konektor
XTS 33/37/39/40	T - connector	T - konektor
XTS 38	X - connector	X - konektor
XTS 41	End cap	Koncovka
SP 4R	Point clamp suspension	Bodový záves
SP 4E	End feed suspension	Koncový záves
SP 4I	Middle feed suspension	Stredový záves
SP 4L	L - feed suspension	L - záves
SP 4T	T - feed suspension	T - záves
SP 4X	X - feed suspension	X - záves
SP R6	Rod suspension set	Týčový záves
SP W1	Wire suspension set	Lankový záves
SP R61	Rod extension set	Predĺžovacia tyč
SKB 12	Ceiling clamp	Stropný úchyt
SKB 16	Suspension clamp	Úchyt pre záves
SKB 18	Support	Úchyt
SKB 21	Wall bracket	Nástenný držiak
SKB 40	Height adjusting sleeve, adjustable to 20 mm	Výškovo nastaviteľný držiak, nastaviteľný o 20 mm
SPW 40	Cable holder	Držiak kábla



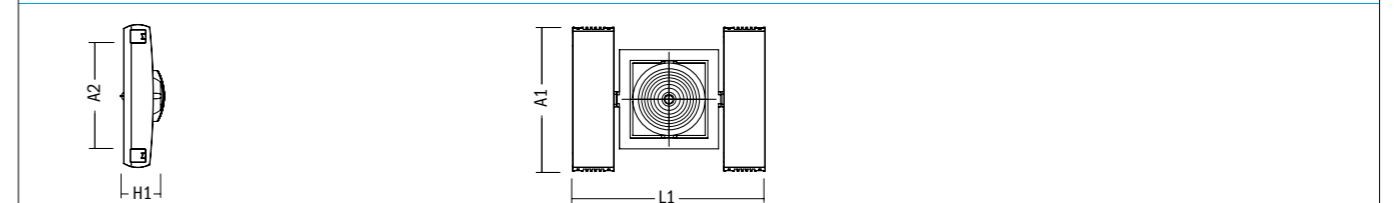


VARIO

Mounting Montáž	Suspended lighting track system	Závesný svetelný kofajnicový systém
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Reflector	Reflektor
Light distribution Distribúcia svetla	Direct	Priama
Wiring Elektrická výbava	Electronic control gear Passive thermal management	Elektronický predradník Pasívne chladenie
Materials Materiál	Housing: the base of the system consists of two supporting aluminium profiles Aluminium profile ends: ABS Cyclac Profile connectors: galvanised metal Plastic boxes for control gear: ABS Cyclac Installation plate: galvanised sheet steel	Teleso: základ systému tvoria dva nosné hliníkové profily Koncovky hliníkových profilov: ABS Cyclac Spojky profilov: pozinkovaný plech Plastové predradné boxy: dve šírky boxu, ABS Cyclac Inštalčná doska: pozinkovaný plech
Surface finish Povrchová úprava	Housing: grey (RAL 9006) Plastic box for control gear, aluminium profile ends: grey with metal pigment	Teleso: šedá (RAL 9006) Plastové predradné boxy, koncovky hliníkových profilov: šedá s kovovým pigmentom
Accessories Príslušenstvo	Blue colored ambient LED lighting behind the diffuser On request: VARIO track system accessories: 1. VCB, 2. VRĚ, 3. VRC, 4. VR, 5. VRS, 6. VRJ	Modré ambientné LED osvetlenie v difúzore Na požiadanie: Príslušenstvo pre závesný systém VARIO: 1. VCB, 2. VRĚ, 3. VRC, 4. VR, 5. VRS, 6. VRJ

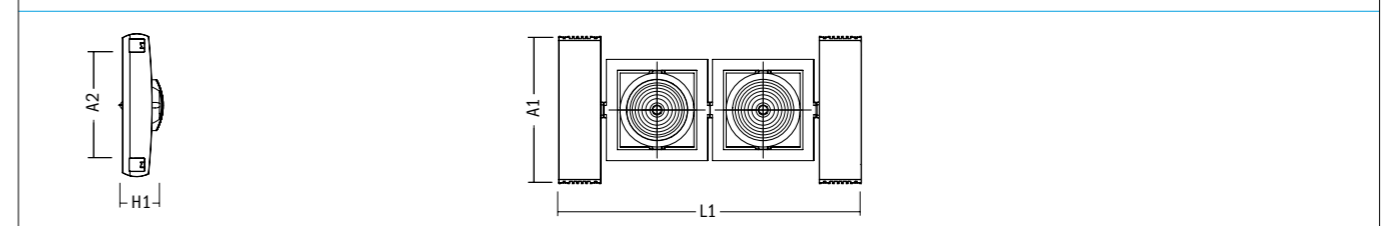


STANDARD	ON REQUEST
    	



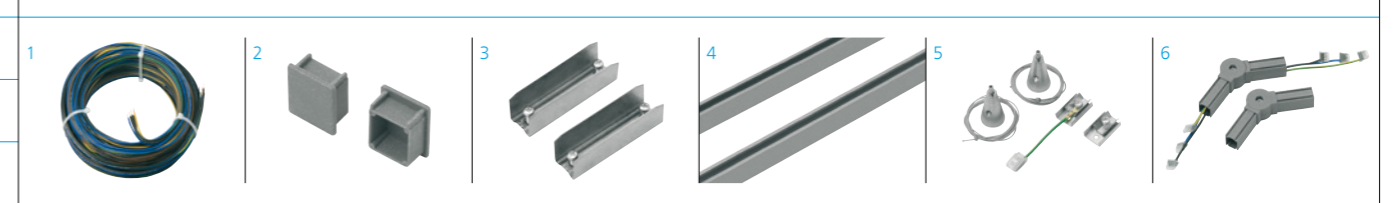
Type	lumen output (lm)	power (W)	colour accuracy CRI (Ra)	light color CCT (K)	dimming	dimensions				weight (kg)
						A1	A2	L1	H1	
VARIO TRACK 11 LED	1100	18	> 80	3000	10-100*	269	200	359	77	2,7
VARIO TRACK 11 LED	1100	17	> 80	4000	10-100*	269	200	359	77	2,7
VARIO TRACK 11 LED	2000	33	> 80	3000	10-100*	269	200	359	77	2,7
VARIO TRACK 11 LED	2000	31	> 80	4000	10-100*	269	200	359	77	2,7

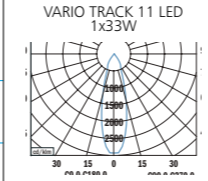
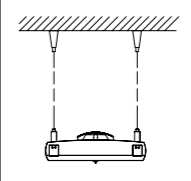
* Optional



Type	lumen output (lm)	power (W)	colour accuracy CRI (Ra)	light color CCT (K)	dimming	dimensions				weight (kg)
						A1	A2	L1	H1	
VARIO TRACK 12 LED	2x1100	36	> 80	3000	10-100*	269	200	553	77	2,7
VARIO TRACK 12 LED	2x1100	34	> 80	4000	10-100*	269	200	553	77	2,7
VARIO TRACK 12 LED	2x2000	66	> 80	3000	10-100*	269	200	553	77	2,7
VARIO TRACK 12 LED	2x2000	62	> 80	4000	10-100*	269	200	553	77	2,7

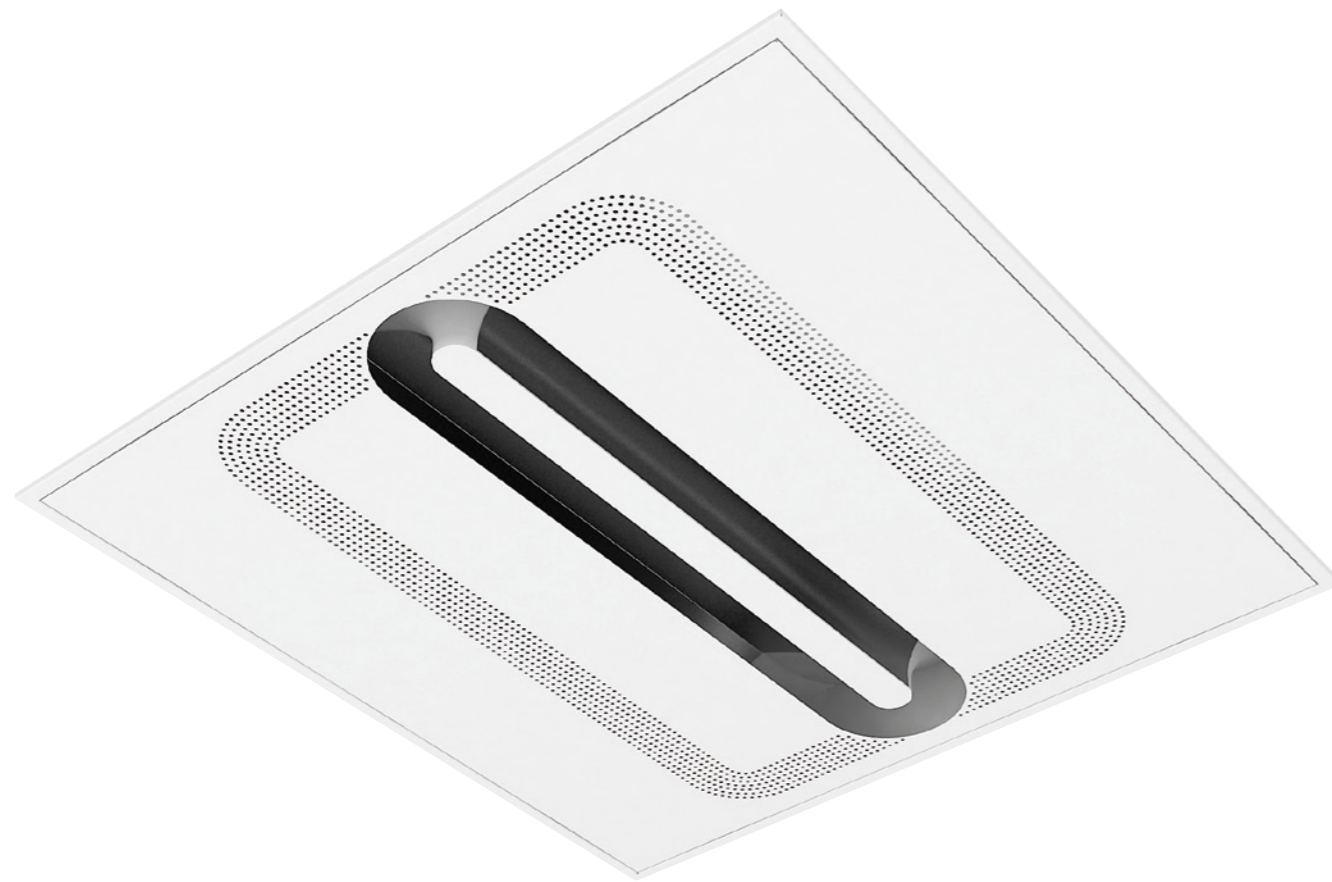
* Optional



Photometria Fotometria	Mounting Montáž
	



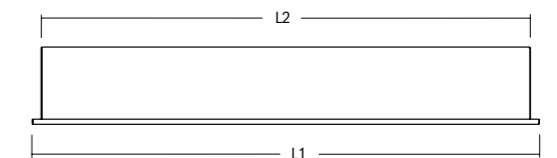
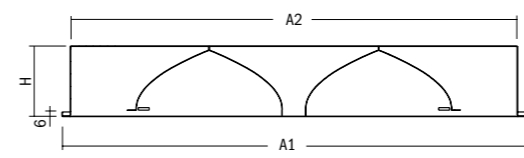
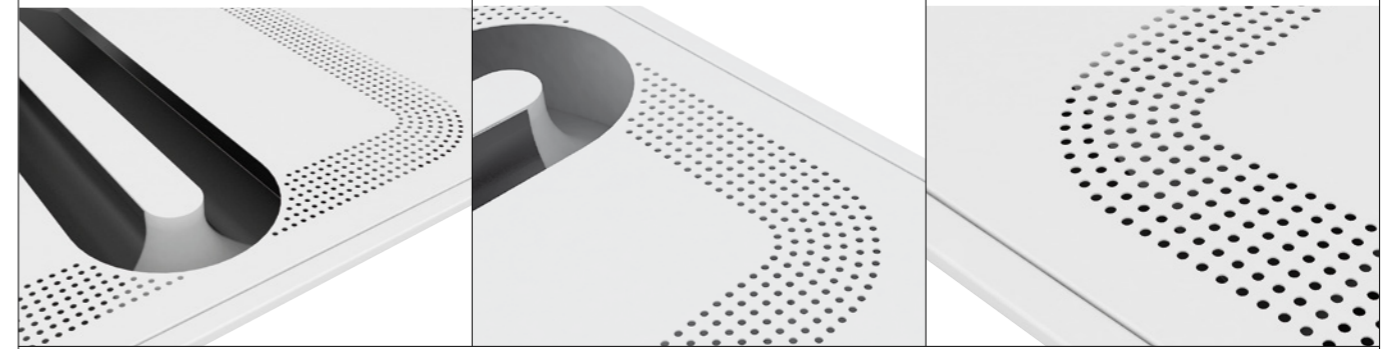
CEILING RECESSED



ACRUX

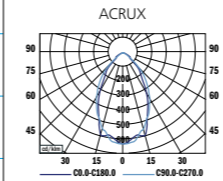
Design by ANTON ZETOCHA OMS

Mounting Montáž	Ceiling recessed	Vsadené do stropu
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Reflector	Reflektor
Light distributions Distribúcia svetla	Direct	Priama
Wiring Elektrická výbava	Electronic control gear Passive thermal management	Elektronický predradník Pasívne chladienie
Materials Materiál	Housing: sheet steel Shade: sheet steel Reflector: anodized mat aluminium	Teleso: oceľový plech Tienidlo: oceľový plech Reflektor: anodizovaný matný hliník
Surface finish Povrchová úprava	Housing: white (RAL 9003) Shade: white (RAL 9003)	Teleso: biela (RAL 9003) Tienidlo: biela (RAL 9003), iné farby na požiadanie
Accessories Príslušenstvo	Mounting bracket	Držiak do sadrokartónových podhládov

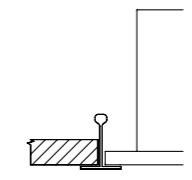


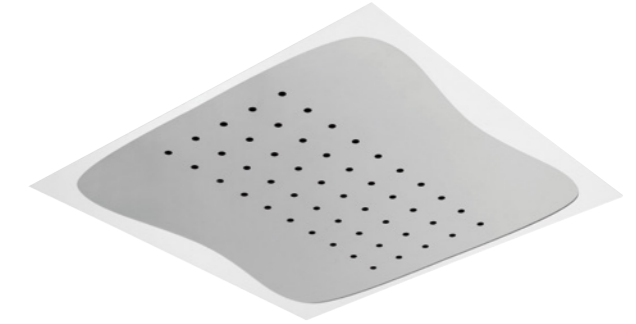
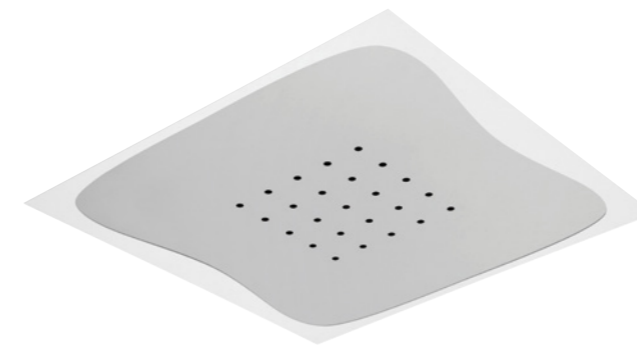
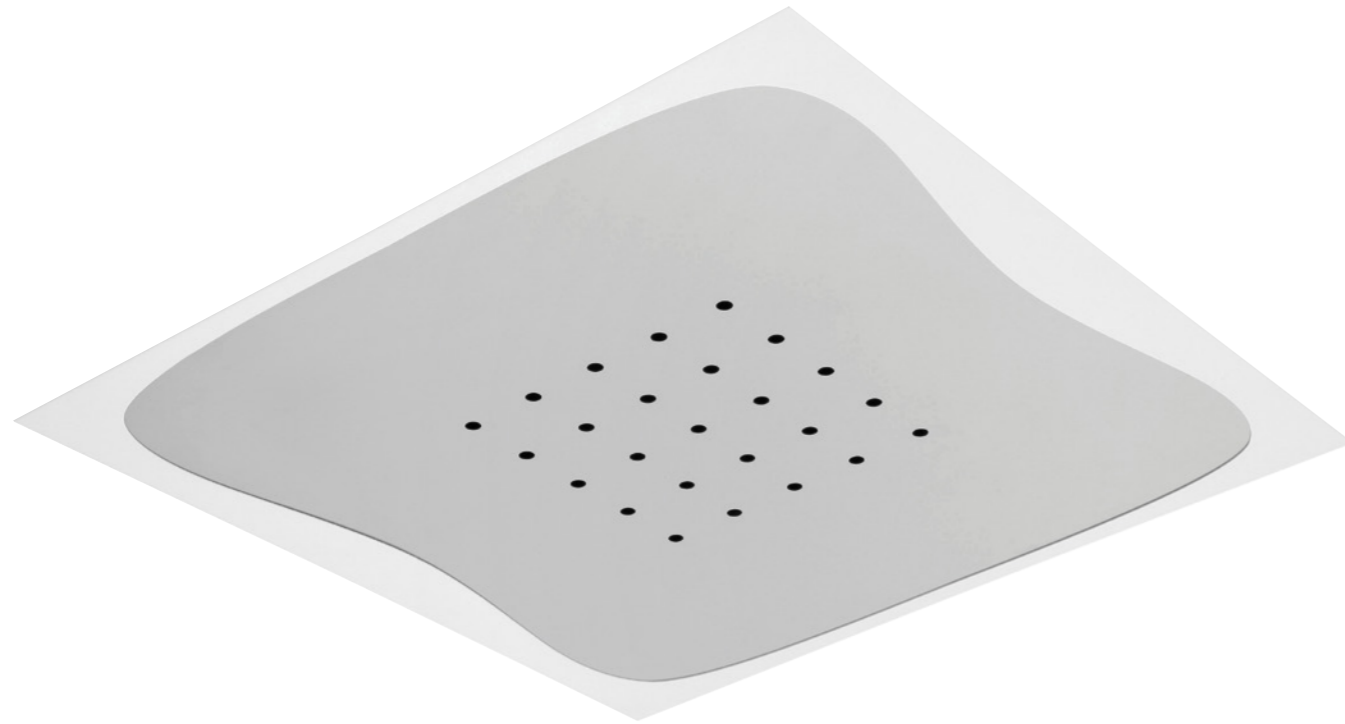
Type	light output (lm)	power (W)	color rendering index CRI(Ra)	color temperature CCT(K)	dimensions				
					A1	A2	L1	L2	H
ACRUX LED	3300	85	>80	3000	595	574	595	574	91

Photometry
Fotometria



Mounting
Montáž

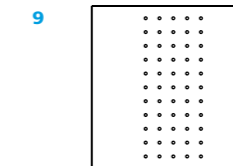
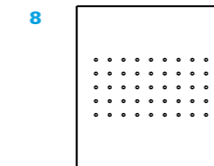
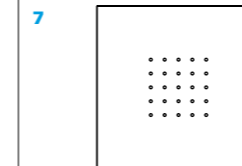
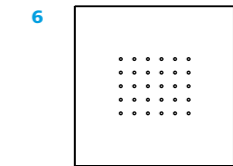
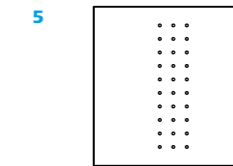
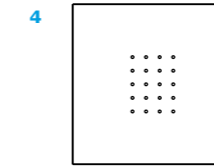
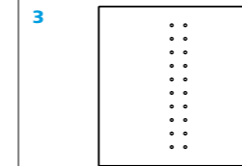
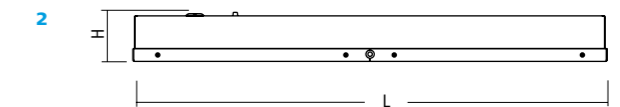
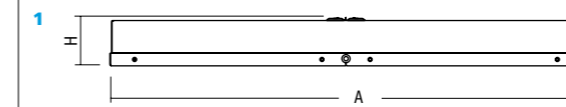




STANDARD



ON REQUEST



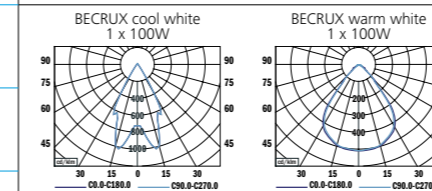
BECRUX

Design by GIUGIARO

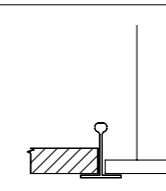
Mounting Montáž	Ceiling recessed	Vsadené do stropu
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Lenses	Šošovky
Light distributions Distribúcia svetla	Direct	Priama
Wiring Elektrická výbava	Electronic control gear (EEI=A2) On request: Dimmable electronic control gear (EEI= A1 – DMX) Passive thermal management	Elektronický predradník (EEI=A2) Na požiadanie: Stmievateľný elektronický predradník (EEI= A1 – DMX) Pasívne chladenie
Materials Materiál	Housing: sheet steel Shade: polished stainless steel Decorative frame: sheet steel	Teleso: oceľový plech Tienidlo: lesklý nerezový plech Dekoratívny rámik: oceľový plech
Surface finish Povrchová úprava	Housing: mettalic Decorative frame: white (RAL 9003), other colors on request	Teleso: kovová Dekoratívny rámik: biela (RAL 9003), iné farby na požiadanie
Accessories Príslušenstvo	Mounting bracket	Držiak do sadrokartónových podhľadov

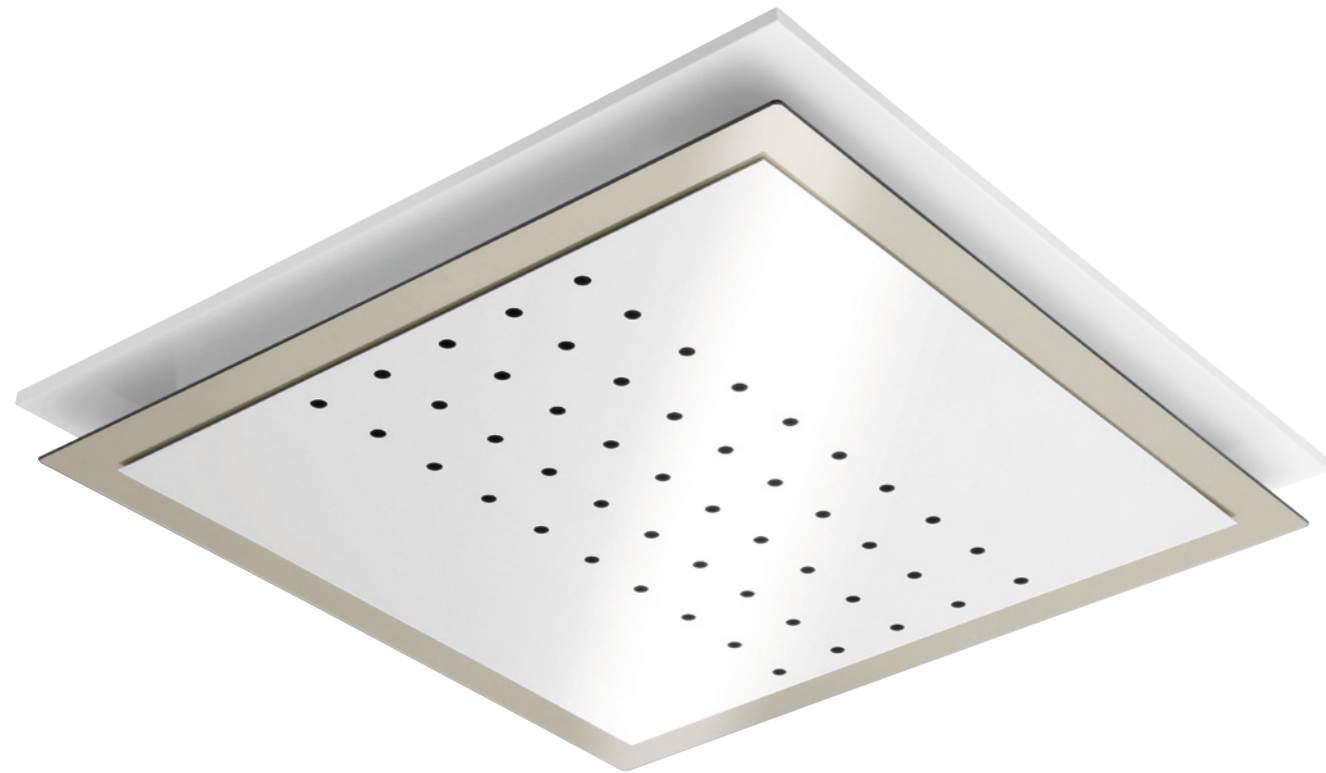
Type	color temperature				power (W)	LED (mA)	picture	dimensions		
	cool white	neutral white	warm white	warm white / cool white				A	L	H
BECRUX 28 i PV	1x28	350	1,2;3	594	594	62
BECRUX 28 o PV	1x28	350	1,2;4	594	594	62
BECRUX 40 i PV	1x40	500	1,2;3	594	594	62
BECRUX 40 o PV	1x40	500	1,2;4	594	594	62
BECRUX 42 i PV	1x42	350	1,2;5	594	594	62
BECRUX 42 o PV	1x42	350	1,2;6	594	594	62
BECRUX 35 PV	1x35	350	1,2;7	594	594	62
BECRUX 50 PV	1x50	500	1,2;7	594	594	62
BECRUX 60 i PV	1x60	500	1,2;5	594	594	62
BECRUX 60 o PV	1x60	500	1,2;6	594	594	62
BECRUX 70 PV	1x70	350	1,2;8	594	594	62
BECRUX 100 PV	1x100	500	1,2;8	594	594	62
BECRUX 77 PV	1x77	350	1,2;9	594	594	62
BECRUX 110 PV	1x110	500	1,2;9	594	594	62

Photometry
Fotometria



Mounting
Montáž





BECRUX LG

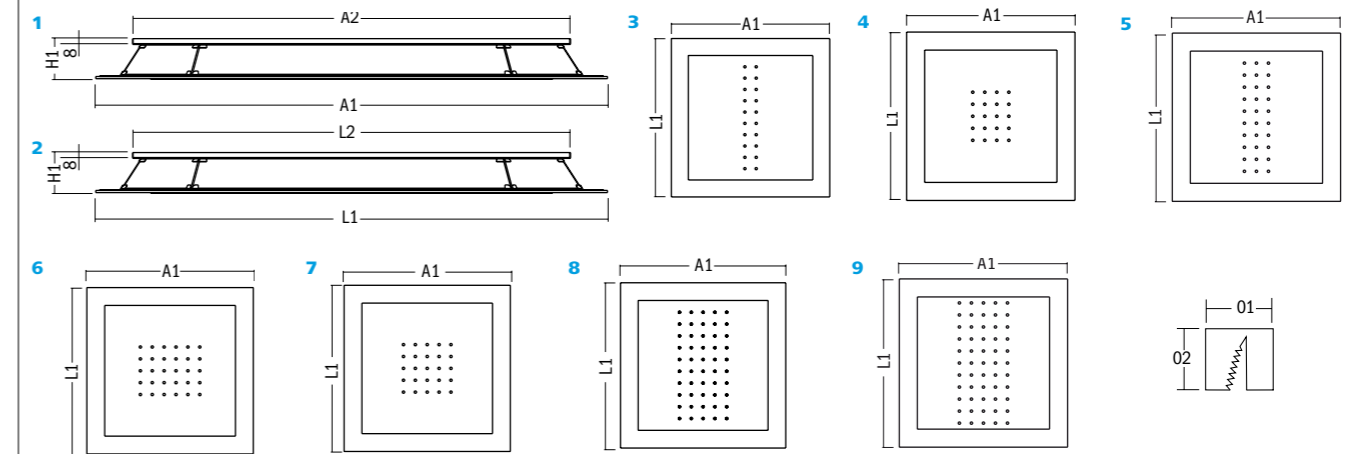
Design by GIUGIARO

Mounting Montáž	Ceiling recessed	Vsadené do stropu
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Lenses	Šošovky
Light distributions Distribúcia svetla	Direct/indirect	Priama/nepriama
Wiring Elektrická výbava	Electronic control gear (EEI=A2) On request: Dimmable electronic control gear (EEI=A1 – DMX) Passive thermal management	Elektronický predradník (EEI=A2) Na požiadanie: Stmievateľný elektronický predradník (EEI=A1 – DMX) Pasívne chladenie
Materials Materiál	Housing: sheet steel Shade: polished stainless steel Decorative frame: mirror glass Reflector: anodized aluminium	Teleso: oceľový plech Tienidlo: lesklý nerezový plech Dekoratívny rámik: zrkadlové sklo Reflektor: anodizovaný hliník
Surface finish Povrchová úprava	Housing: white (RAL 9003), metallic	Teleso: biela (RAL 9003), kovová
Accessories Príslušenstvo	Mounting bracket	Držiak do sadrokartónových podhľadov

STANDARD

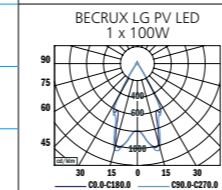


ON REQUEST

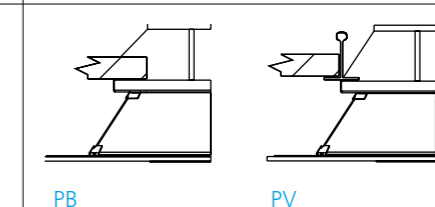


Type	color temperature					indir	power dir	power indir	led picture	dimensions				opening			
	cool white	neutral white	warm white	warm white/cool white	RGB					(W)	(W)	(mA)	A1	A2	L1	L2	H1
BECRUX LG PV 28 i	-	-	-	-	-	-	1x28	18	350	1,2;3	700	599	700	599	56	575	575
BECRUX LG PV 28 o	-	-	-	-	-	-	1x28	18	350	1,2;4	700	599	700	599	56	575	575
BECRUX LG PV 40 i	-	-	-	-	-	-	1x40	18	500	1,2;3	700	599	700	599	56	575	575
BECRUX LG PV 40 o	-	-	-	-	-	-	1x40	18	500	1,2;4	700	599	700	599	56	575	575
BECRUX LG PV 42 i	-	-	-	-	-	-	1x42	18	350	1,2;5	700	599	700	599	56	575	575
BECRUX LG PV 42 o	-	-	-	-	-	-	1x42	18	350	1,2;6	700	599	700	599	56	575	575
BECRUX LG PV 35	-	-	-	-	-	-	1x35	18	350	1,2;7	700	599	700	599	56	575	575
BECRUX LG PV 50	-	-	-	-	-	-	1x50	18	500	1,2;7	700	599	700	599	56	575	575
BECRUX LG PV 60 i	-	-	-	-	-	-	1x60	18	500	1,2;5	700	599	700	599	56	575	575
BECRUX LG PV 60 o	-	-	-	-	-	-	1x60	18	500	1,2;6	700	599	700	599	56	575	575
BECRUX LG PV 70	-	-	-	-	-	-	1x70	18	350	1,2;8	700	599	700	599	56	575	575
BECRUX LG PV 100	-	-	-	-	-	-	1x100	18	500	1,2;8	700	599	700	599	56	575	575
BECRUX LG PV 77	-	-	-	-	-	-	1x77	18	350	1,2;9	700	599	700	599	56	575	575
BECRUX LG PV 110	-	-	-	-	-	-	1x110	18	500	1,2;9	700	599	700	599	56	575	575

Photometry
Fotometria



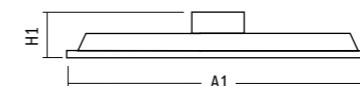
Mounting
Montáž





STANDARD

ON REQUEST

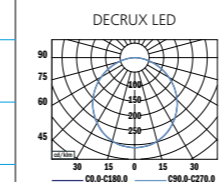


DECRUX

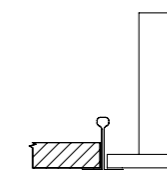
Type	optic	light output	power	color rendering index	color temperature	dimensions			
	opal	(lm)	(W)	CRI(Ra)	CCT(K)	A1	L1	H1	H2
DECRUX	•	3800	59	80	3700	595	595	75	50
DECRUX	•	4100	59	80	5300	595	595	75	50

Mounting Montáž	Ceiling recessed	Vsadené do stropu
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Diffuser	Difúzor
Light distributions Distribúcia svetla	Direct	Direct
Wiring Elektrická výbava	Electronic control gear Passive thermal management	Elektronický predradník Pasívne chladenie
Materials Materiál	Housing: extruded aluminium profile Frame: extruded aluminium profile Diffuser: opal PMMA	Teleso: extrudovaný hliníkový profil Rámik: extrudovaný hliníkový profil Difúzor: opál PMMA
Surface finish Povrchová úprava	Housing: RAL 9006 silver Frame: RAL 9006 silver	Teleso: RAL 9006 silver Rámik: RAL 9006 silver

Photometry
Fotometria



Mounting
Montáž





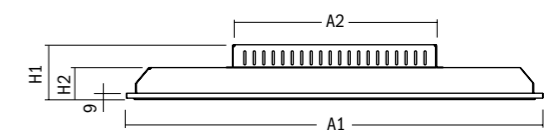
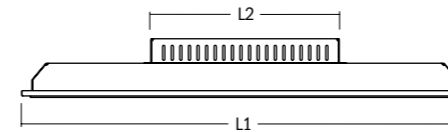
GACRUX

Mounting Montáž	Ceiling recessed	Vsadené do stropu
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Microprismatic diffuser	Mikroprizmatický difúzor
Light distributions Distribúcia svetla	Direct	Direct
Wiring Elektrická výbava	Electronic control gear Passive thermal management	Elektronický predradník Pasívne chladenie
Materials Materiál	Body: sheet steel Frame: extruded aluminium profile Diffuser: PMMA	Teleso: oceľový plech Rámik: extrudovaný hliníkový profil Difúzor: PMMA
Surface finish Povrchová úprava	Body: grey (RAL9006), white (RAL 9003) on request Frame: grey (RAL9006), white (RAL 9003) on request	Teleso: šedá (RAL 9006), biela (RAL 9003) na požiadanie Rámik: šedá (RAL 9006), biela (RAL 9003) na požiadanie
Accessories Príslušenstvo	Mounting bracket	Držiak do sadrokartónových podhládov

STANDARD

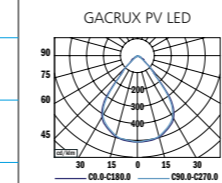


ON REQUEST

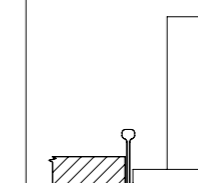


Type	optic	power (W)	light output (lm)	color rendering index CRI(Ri)	color temperature CCT(K)	dimensions					
						A1	A2	L1	L2	H1	H2
GACRUX PV	prisma	52	3600	>80	5000	595	291	595	251	78	46

Photometry
Fotometria



Mounting
Montáž



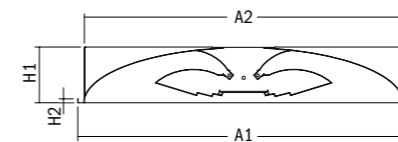


STANDARD

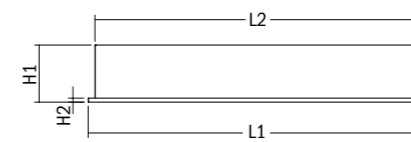
ON REQUEST



1



2

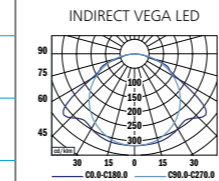


INDIRECT

Design by Matej Bilík OMS

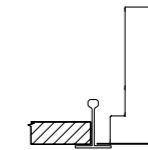
Mounting Montáž	Ceiling recessed	Vsadené do stropu
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Reflector Diffuser Shade	Reflector Difúzor Tienidlo
Light distributions Distribúcia svetla	Direct	Direct
Wiring Elektrická výbava	Electronic control gear Passive thermal management	Elektornický predradník Pasívne chladienie
Materials Materiál	Body: sheet steel Reflector: aluminium sheet Shade: extruded aluminium profile Diffuser: extruded prismatic plastic profile	Teleso: oceľový plech Reflektor: hliníkový plech Tienidlo: extrudovaný hliníkový profil Difúzor: extrudovaný prizmatický plastový profil
Surface finish Povrchová úprava	Body: white (RAL 9003) Reflector: white (RAL 9003) Shade: grey (RAL 9006) Diffuser: various colored variants	Teleso: biela (RAL 9003) Reflektor: biela (RAL 9003) Tienidlo: šedá (RAL 9006) Difúzor: rôzne farebné varianty
Accessories Príslušenstvo	Mounting brackets	Držiaky do sadrokartónových podhládov

Photometry
Fotometria



Mounting
Montáž

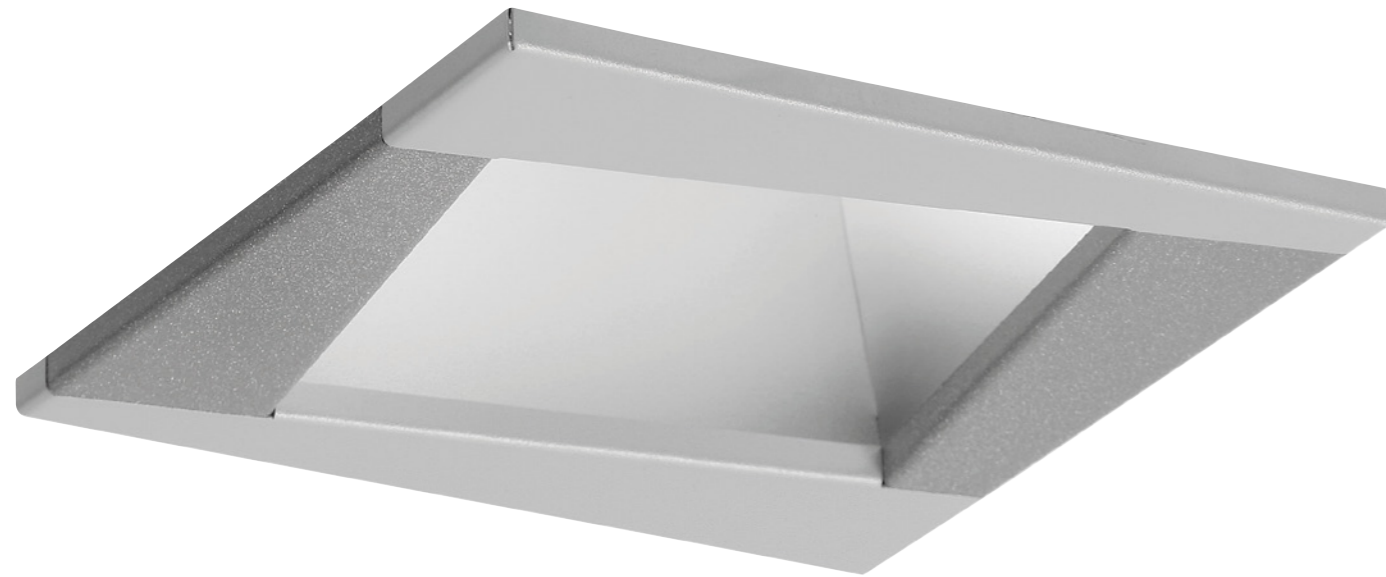
CEILING GRID 600x600





**DOWNLIGHT
POLLUX**

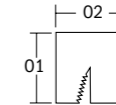
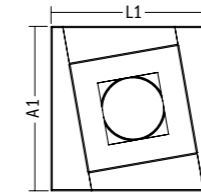
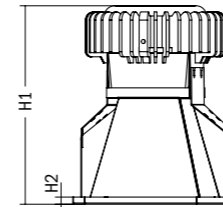
POLISHED
LED



STANDARD



ON REQUEST



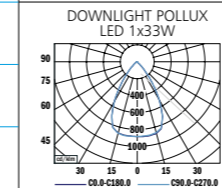
DOWNLIGHT

Design by JAROSLAVA POLÁKOVÁ, JÁN ŠTOFKO OMS

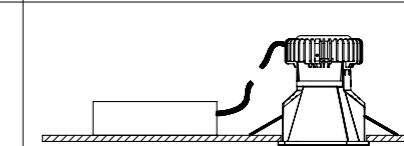
Mounting Montáž	Ceiling recessed	Vstavané do stropu
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Reflector	Reflektor
Light distribution Distribúcia svetla	Direct	Priama
Wiring Elektrická výbava	Electronic control gear Thermal management (passive – version with 1100 lm, active – version with 2000, 3000 lm) On request: Dimmable electronic control gear (EEI=A1 – DALI/DMX)	Elektronický predradník Chladenie (pasívne – verzia s 1100 lm, aktívne – verzia s 2000, 3000 lm) Na požiadanie: Stmievateľný elektronický predradník (EEI=A1 – DALI/DMX)
Materials Materiál	Housing: zinc coated sheet steel Reflector: anodized aluminium Frame 1: sheet steel Frame 2: sheet steel	Teleso: pozinkovaný oceľový plech Reflektor: anodizovaný hliník Rámik 1: oceľový plech Rámik 2: oceľový plech
Surface finish Povrchová úprava	RAL 9006, 9007	RAL 9006, 9007

Type	optic	light output	power	color rendering index	color temperature	dimming	dimensions				opening	
	POLISHED	(lm)	(W)	CRI (Ra)	CCT (K)	(%)	A1	L1	H1	H2	O1	O2
DOWNLIGHT POLLUX	•	1100	18	80	3000	10-100*	162	162	196	7	145	145
DOWNLIGHT POLLUX	•	1100	16	80	4000	10-100*	162	162	196	7	145	145
DOWNLIGHT POLLUX	•	2000	33	80	3000	10-100*	162	162	196	7	145	145
DOWNLIGHT POLLUX	•	2000	29	80	4000	10-100*	162	162	196	7	145	145
DOWNLIGHT POLLUX	•	3000	49	80	4000	10-100*	162	162	196	7	145	14

Photometry
Fotometria

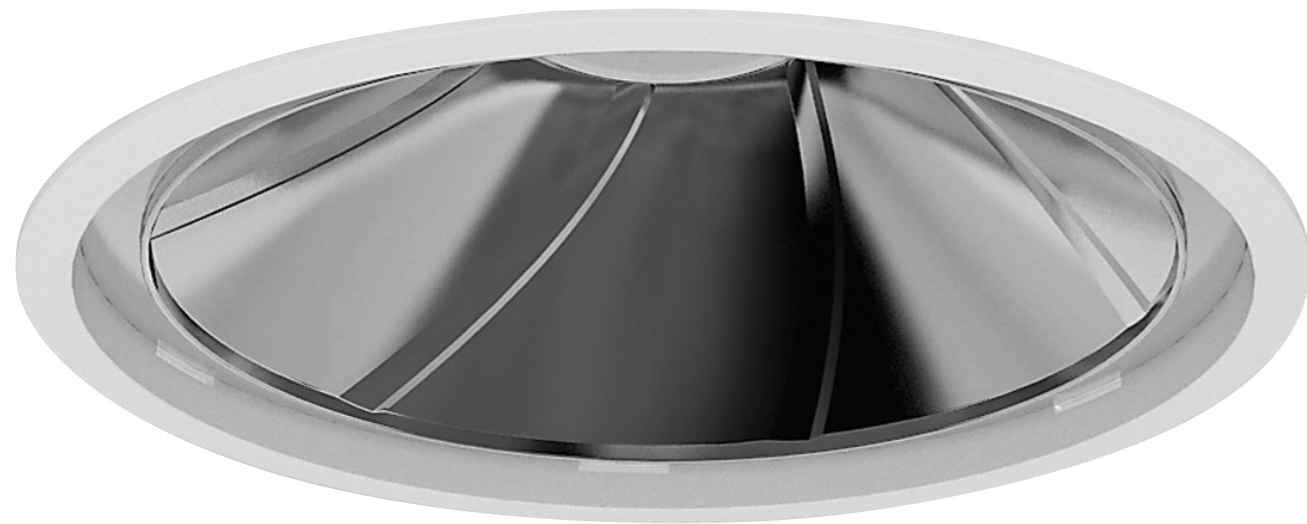


Mounting
Montáž



**DOWNLIGHT
VISION
190**

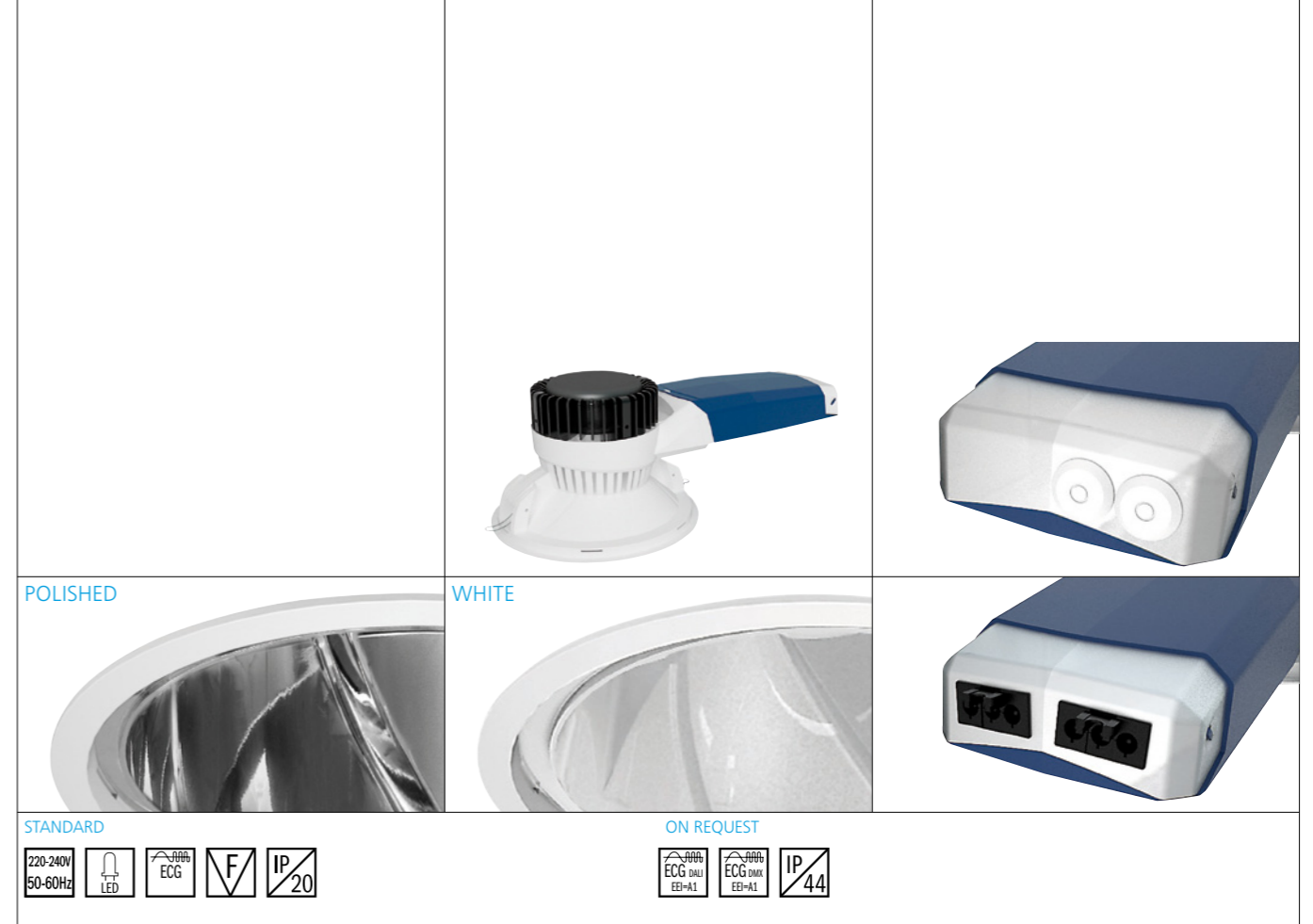
POLISHED/WHITE
LED



DOWNLIGHT

Design by PETER BAKO INDUSTRIAL PRODUCT DESIGN

Mounting Montáž	Ceiling recessed	Vstavané do stropu
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Reflector	Reflektor
Light distribution Distribúcia svetla	Direct	Priama
Wiring Elektrická výbava	Electronic control gear Thermal management (passive – version with 1100 lm, active – version with 2000, 3000 lm) On request: Dimmable electronic control gear (EEI=A1 – DALI/DMX)	Elektronický predradník Chladenie (pasívne – verzia s 1100 lm, aktívne – verzia s 2000, 3000 lm) Na požiadanie: Stmievateľný elektronický predradník (EEI=A1 – DALI/DMX)
Materials Materiál	Housing: Cover – PBT, inst. plate – zinc coated sheet Reflector: polycarbonate – evaporative coating (polished/white)	Teleso: kryt – PBT, inštalačná doska – pozinkovaný plech Reflektor: polykarbonát – vákuovo pokovený (leštený/biely)
Accessories Príslušenstvo	On request: Decorative elements and glasses (see page VISION ACCESSORIES 62 – 63) Metal installation plate for T-Bar ceiling grids Connectors: On cable: 3-pole Wieland GST 18i3, Wago Winsta 770	Na požiadanie: Dekoračné prvky a sklá (viď stranu PRÍSLUŠENSTVO VISION 62 – 63) Plechová inštalačná doska umožňujúca montáž do stropov s T profilmi Elektrické konektory: Montáž na kábel: 3-pólové Wieland GST 18i3, Wago Winsta 770

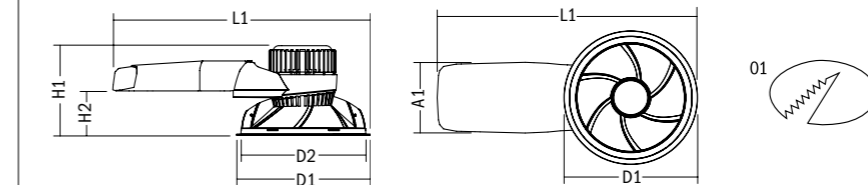


POLISHED

WHITE

STANDARD

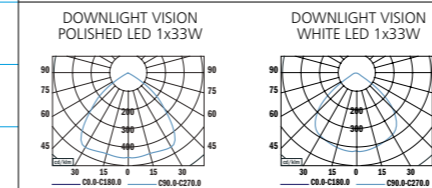
ON REQUEST



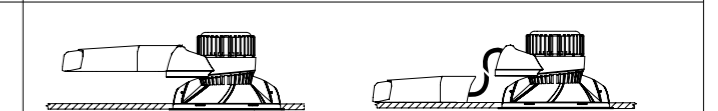
Type	optic		light output (lm)	power (W)	color rendering index CRI (Ra)	color temperature CCT (K)	dimming (%)	dimensions						opening	
	POLISHED	WHITE						D1	D2	L1	H1	H2	A1	O1	
DOWNLIGHT VISION 190 LED	•	•	1100	18	80	3000	10-100*	236	220	453	158	78	125	224	
DOWNLIGHT VISION 190 LED	•	•	1100	16	80	4000	10-100*	236	220	453	158	78	125	224	
DOWNLIGHT VISION 190 LED	•	•	2000	33	80	3000	10-100*	236	220	453	158	78	125	224	
DOWNLIGHT VISION 190 LED	•	•	2000	29	80	4000	10-100*	236	220	453	158	78	125	224	
DOWNLIGHT VISION 190 LED	•	•	3000	49	80	4000	10-100*	236	220	453	158	78	125	224	
DOWNLIGHT VISION 190 LED	•	•	1000	40	80	2700 - 6500 + RGB	10-100*	236	220	453	158	78	125	224	

* Optional

Photometry
Fotometria



Mounting
Montáž



V01 170/190/240



V011 170/190/240
CLEAR



SANDED



V09 WHITE



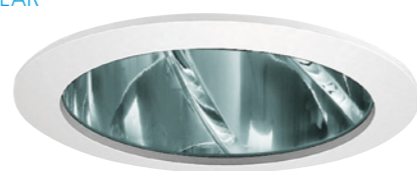
V09 METALIC



V02 170/190/240



V021 170/190/240
CLEAR



SANDED



V11



V04 V041



V03 170/190/240



Design by PETER BAKO INDUSTRIAL PRODUCT DESIGN



DOWNLIGHT

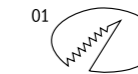
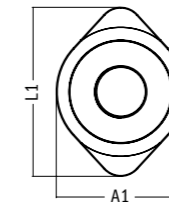
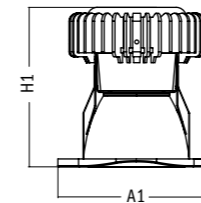
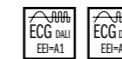
Design by JAROSLAVA POLÁKOVÁ OMS

Mounting Montáž	Ceiling recessed	Vstavané do stropu
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Reflector	Reflektor
Light distribution Distribúcia svetla	Direct	Priama
Wiring Elektrická výbava	Electronic control gear Thermal management (passive – version with 1100 lm, active – version with 2000, 3000 lm) On request: Dimmable electronic control gear (EEL=A1 – DALI/DMX)	Elektronický predradník Chladenie (pasívne – verzia s 1100 lm aktívne – verzia s 2000, 3000 lm) Na požiadanie: Stmievateľný elektronický predradník (EEL=A1 – DALI/DMX)
Materials Materiál	Housing: sheet steel Reflector: anodized aluminium Ring: sheet steel	Teleso: oceľový plech Reflektor: anodizovaný hliník Obruč: oceľový plech
Surface finish Povrchová úprava	Ring: grey (RAL 9006) – with metallic effect, white (RAL 9003)	Obruč: šedá (RAL 9006) – s kovovým efektom, biela (RAL 9003)
Accessories Príslušenstvo	On request: Metal installation plate for T-Bar ceiling grids	Na požiadanie: Plechová inštalčná doska umožňujúca montáž do stropov s T profilmi

STANDARD



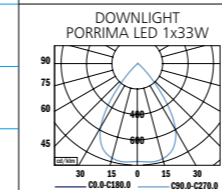
ON REQUEST



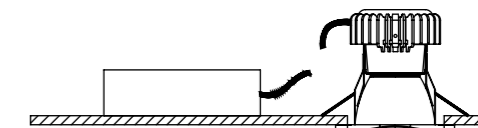
Type	optic	light output	power	color rendering index	color temperature	dimming	dimensions			opening
	POLISHED	(lm)	(W)	CRI (Ra)	CCT (K)	(%)	A1	L1	H1	O1
DOWNLIGHT PORRIMA	•	1100	18	80	3000	10-100*	159	208	162	140
DOWNLIGHT PORRIMA	•	1100	16	80	4000	10-100*	159	208	162	140
DOWNLIGHT PORRIMA	•	2000	33	80	3000	10-100*	159	208	162	140
DOWNLIGHT PORRIMA	•	2000	29	80	4000	10-100*	159	208	162	140
DOWNLIGHT PORRIMA	•	3000	49	80	4000	10-100*	159	208	162	140

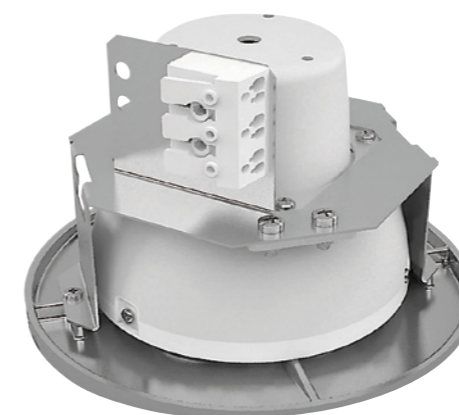
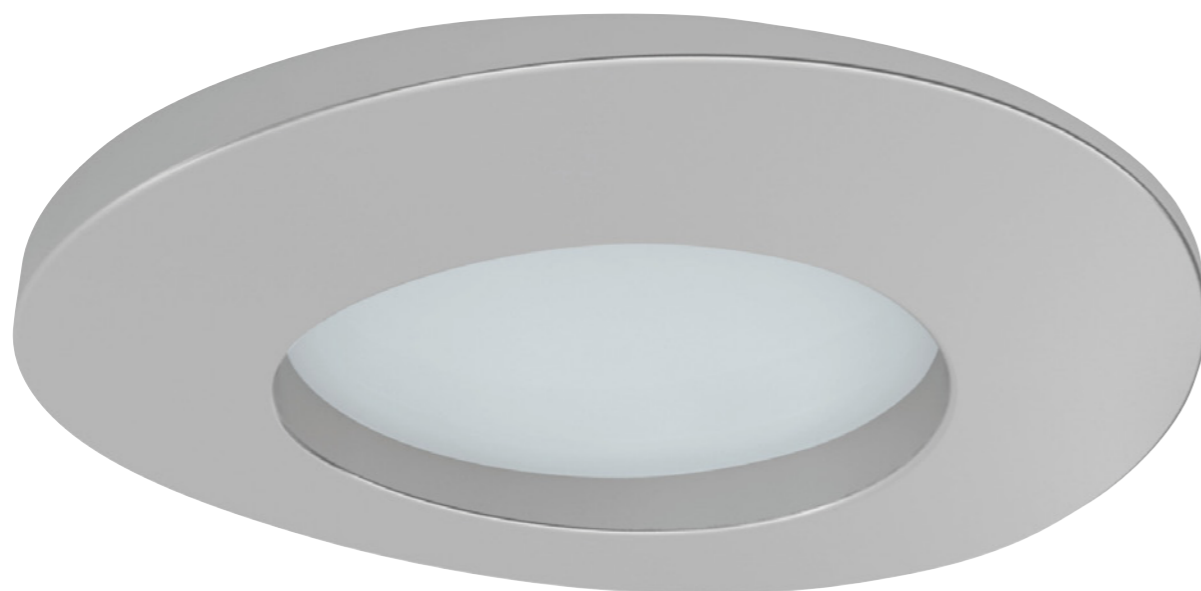
* Optional

Photometry
Fotometria



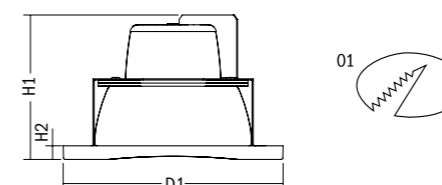
Mounting
Montáž





STANDARD

ON REQUEST



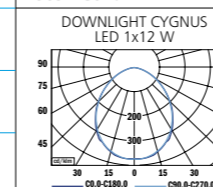
DOWNLIGHT

Design by JÁN ŠTOFKO OMS

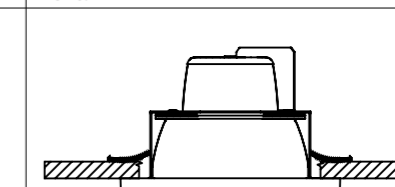
Mounting Montáž	Ceiling recessed	Vstavané do stropu
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Diffuser	Difúzor
Light distribution Distribúcia svetla	Direct	Priama
Wiring Elektrická výbava	Electronic control gear Passive thermal management	Elektronický predradník Pasívne chladenie
Materials Materiál	Housing: polycarbonate Ring: aluminium Holders: zinc coated sheet steel Diffuser: opal plast	Teleso: polykarbonát Obruč: hliník Držiaky: pozinkovaný ocelový plech Difúzor: opálový plast
Surface finish Povrchová úprava	Ring: grey (RAL 9006); white (RAL 9003) on request	Obruč: šedá (RAL 9006); biela (RAL 9003) na požiadanie
Accessories Príslušenstvo	On request: Metal installation plate for T-Bar ceiling grids	Na požiadanie: Plechová inštalčná doska umožňujúca montáž do stropov s T profilmi

Type	light output	power	color rendering index	color temperature	dimensions			opening
	(lm)	(W)	CRI (Ra)	CCT (K)	D1	H1	H2	O1
DOWNLIGHT CYGNUS	700	12	>90	2700	146	96	9	125
DOWNLIGHT CYGNUS	1100	14	>90	3000	146	96	9	125
DOWNLIGHT CYGNUS	1100	14	>90	4000	146	96	9	125

Photometry



Mounting



**DOWNLIGHT
PHOENIX
1/2/3/4/5**

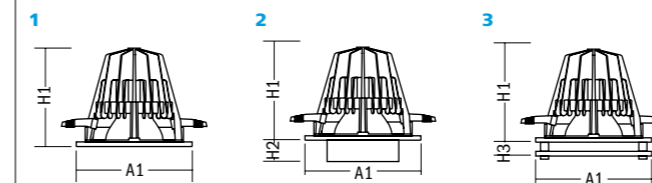
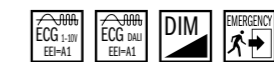
LED



STANDARD



ON REQUEST

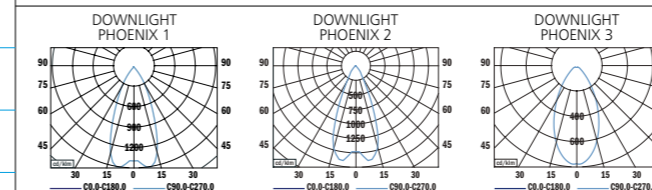


DOWNLIGHT

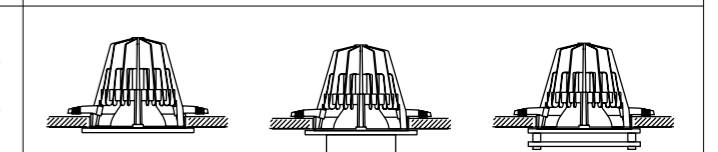
Mounting Montáž	Ceiling recessed	Vstavané do stropu
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Reflector	Reflektor
Light distribution Distribúcia svetla	Direct	Priama
Wiring Elektrická výbava	Electronic control gear Passive thermal management On request: Dimmable electronic control gear (EEI=A1 – 1-10V/Phase dimming/DALI)	Elektronický predradník Pasívne chladenie Na požiadanie: Stmievateľný elektronický predradník (EEI=A1 – 1-10V/ Fázové stmievanie/DALI)
Materials Materiál	Housing: die cast aluminium Reflector: anodized polished aluminium Ring: die cast aluminium	Teleso: tlakovo liaty hliník Reflektor: anodizovaný lesklý hliník Obruč: tlakovo liaty hliník
Surface finish Povrchová úprava	Ring: grey, white on request	Obruč: šedá, biela na požiadanie
Accessories Príslušenstvo	On request: Decorative accessories	Na požiadanie: Dekoratívne príslušenstvo

Type	optic	power	light output	color	color	dimension			
	reflector	(W)	(lm)	rendering index	temperature	A1	H1	H2	H3
DOWNLIGHT PHOENIX	•	22 (10)	1000 (580)	80	2700K	130	99	27	23
DOWNLIGHT PHOENIX	•	22 (10)	1000 (580)	80	3000K	130	99	27	23
DOWNLIGHT PHOENIX	•	22 (10)	1000 (580)	80	4000K	130	99	27	23

Photometry
Fotometria



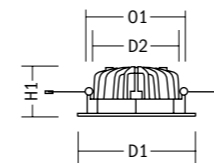
Mounting
Montáž





STANDARD

ON REQUEST

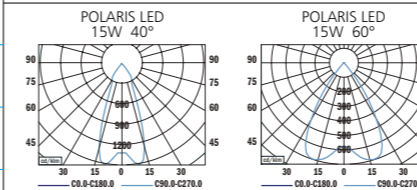


DOWNLIGHT

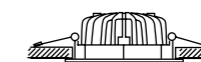
Type	optic	beam angle	light output (lm)	power (W)	color rendering index CRI (Ra)	color temperature CCT (K)	dimensions			opening
							D1	H1	D2	
DOWNLIGHT POLARIS LED	REFLECTOR	40°	700 lm	15	>85	2900 K	115	50	98	103
DOWNLIGHT POLARIS LED		60°	700 lm	15	>85	2900 K	115	50	98	103

Mounting Montáž	Ceiling recessed	Vstavané
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Reflector	Reflektor
Light distribution Distribúcia svetla	Direct	Priama
Wiring Elektrická výbava	Electronic control gear Passive thermal management	Elektronický predradník Pasívne chladenie
Materials Materiál	Housing: aluminium Lens: PC Reflector: PC	Teleso: hliník Šošovka: PC Reflektor: PC
Surface finish Povrchová úprava	Frame/housing: grey, white on request	Rámik/teleso: šedá, biela na požiadanie
Accessories Príslušenstvo	Mounting springs On request: Blue ambient light	Pružiny na uchytenie svetidla Na požiadanie: Modré ambientné osvetlenie

Photometry
Fotometria



Mounting
Montáž





12 LED



14 LED

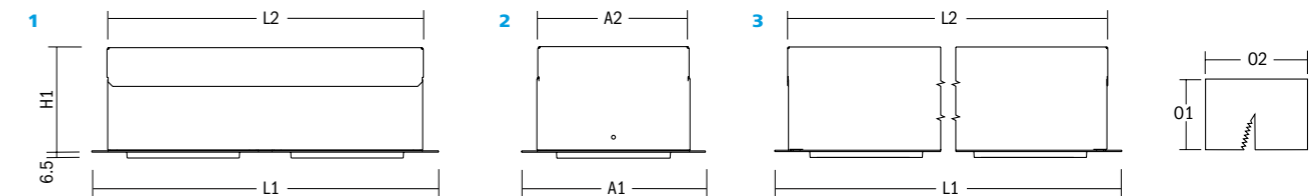


22 LED



STANDARD

ON REQUEST



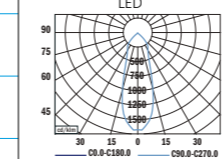
Type	optic	light output (lm)	power (W)	color rendering index CRI (Ra)	color temperature CCT (K)	picture	dimensions				opening		
							A1	A2	L1	L2	H1	O1	O2
FUTURO 12	•	2400	48	>80	3000	1,2	202	168	385	355	116	175	360
FUTURO 14	•	4800	96	>80	3000	1,2	202	168	749	712	116	175	720
FUTURO 22	•	4800	96	>80	3000	3,2	385	350	385	350	116	358	358

FUTURO

Mounting Montáž	Ceiling recessed	Vstavané do stropu
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Reflector	Reflektor
Light distribution Distribúcia svetla	Direct	Priama
Wiring Elektrická výbava	Electronic control gear Passive thermal management	Elektronický predradník Pasívny chladič
Materials Materiál	Housing: galvanised sheet steel Reflector: polished aluminium	Teleso: pozinkovaný plech Reflektor: lesklý hliník
Surface finish Povrchová úprava	Iridescence grey	Šedá perleť

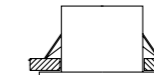
Photometry

Fotometria



Mounting

Montáž





CEILING SURFACED



TUBUS

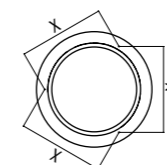
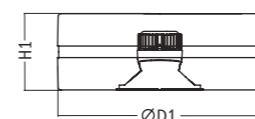
Design by PETER BAKO INDUSTRIAL PRODUCT DESIGN

Mounting Montáž	Ceiling surfaced	Prisadené na strop
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Reflector	Reflektor
Light distribution Distribúcia svetla	Direct	Priama
Wiring Elektrická výbava	Electronic control gear On request: Dimmable electronic control gear (EEL=A1 – DALI) Thermal management (passive – version with 1100 lm, active – version with 2000, 3000 lm)	Elektronický predradník Na požiadanie: Stmievateľný elektronický predradník (EEL=A1 – DALI) Chladenie (pasívne – verzia s 1100 lm, aktívne – verzia s 2000, 3000 lm)
Materials Materiál	Housing: polycarbonate Reflector: PC – evaporative coating (polished/white) Decorative ring: polycarbonate	Teleso: polykarbonát Reflektor: PC – vákuovo pokovaný (leštený/biely) Dekoratívna obruč: polykarbonát
Surface finish Povrchová úprava	Housing: grey (RAL 9006), other colors on request Decorative ring: yellow opal, other colors on request	Teleso: šedá (RAL 9006), ostatné farby na požiadanie Dekoratívna obruč: žltý opál, ostatné farby na požiadanie
Accessories Príslušenstvo	On request: Decorative elements and glasses (see page VISION ACCESSORIES 62 – 63)	Na požiadanie: Dekoračné prvky a sklá (viď stranu PRÍSLUŠENSTVO VISION 62 – 63)

STANDARD



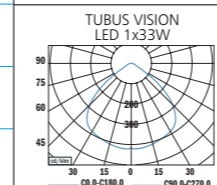
ON REQUEST



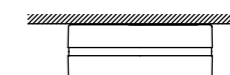
Type	lumen output	power	color	light color	dimming	dimensions		opening
	(lm)	(W)	accuracy CRI (Ra)	CCT (K)	(%)	D1	H1	X
TUBUS VISION	1100	16	80	4000	10-100*	442	177	240
TUBUS VISION	1100	18	80	3000	10-100*	442	177	240
TUBUS VISION	2000	29	80	4000	10-100*	442	177	240
TUBUS VISION	2000	33	80	3000	10-100*	442	177	240

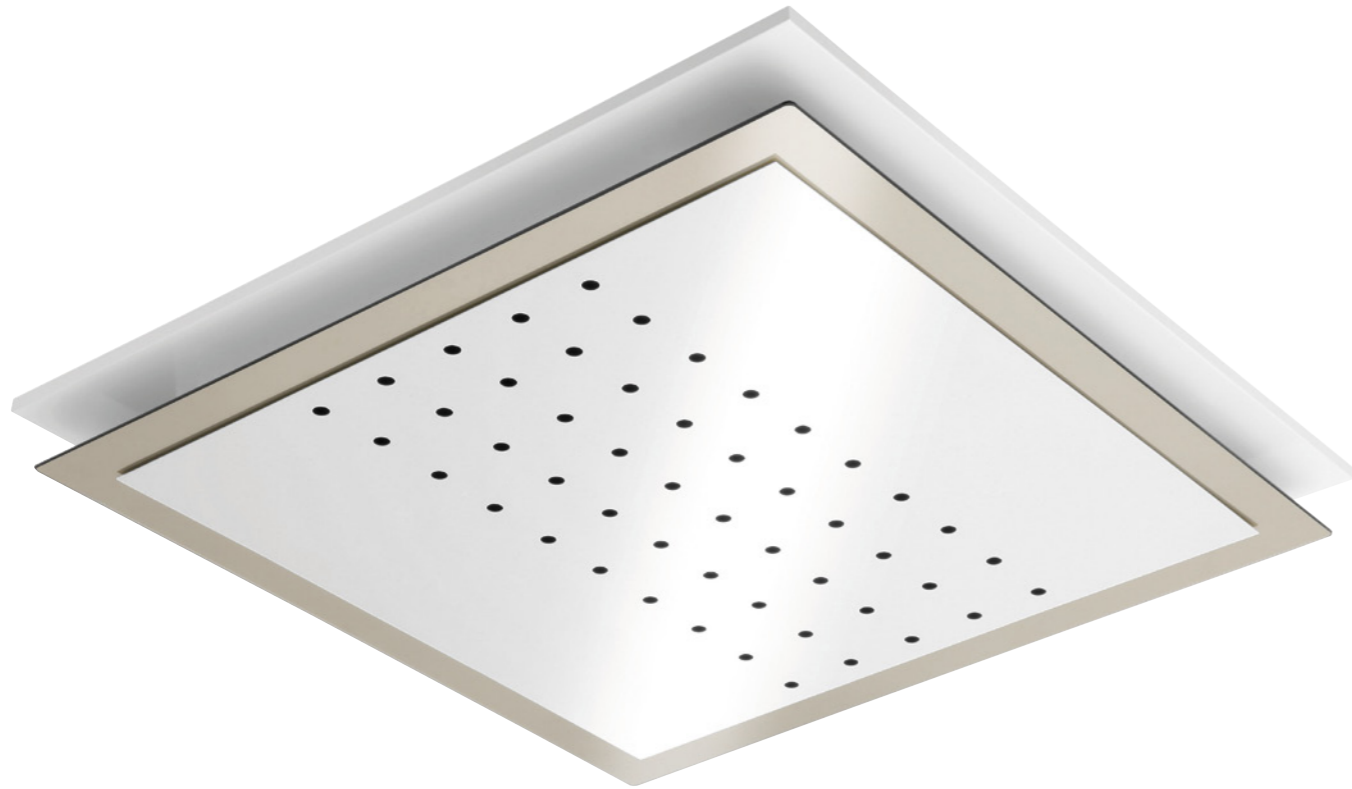
*Optional

Photometry
Fotometria



Mounting
Montáž



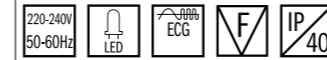


BECRUX LG

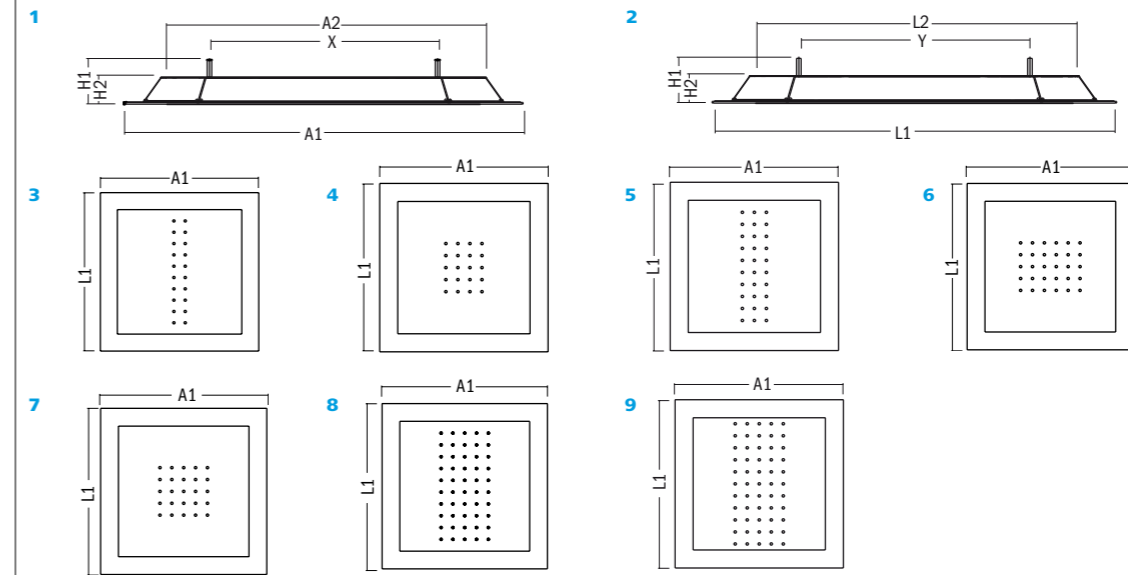
Design by GIUGIARO

Mounting Montáž	Ceiling surfaced	Prisadené na strop
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Lenses	Šošovky
Light distributions Distribúcia svetla	Direct/indirect	Priama/nepriama
Wiring Elektrická výbava	Electronic control gear (EEI=A2) On request: Dimmable electronic control gear (EEI= A1 – DMX) Passive thermal management	Elektronický predradník (EEI=A2) Na požiadanie: Stmievateľný elektronický predradník (EEI= A1 – DMX) Pasívne chladenie
Materials Materiál	Housing: sheet steel Shade: polished stainless steel Decorative frame: mirror glass Reflector: anodized aluminium	Teleso: oceľový plech Tienidlo: lesklý nerezový plech Dekoratívny rámik: zrkadlové sklo Reflektor: anodizovaný hliník
Surface finish Povrchová úprava	Housing: white (RAL 9003), metallic	Teleso: biela (RAL 9003), kovová

STANDARD

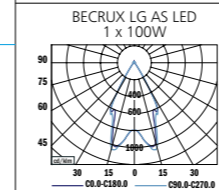


ON REQUEST

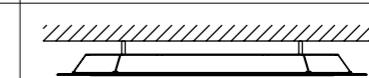


Type	color temperature					indir	power dir	power indir	led	picture	dimensions				fixing			
	cool white	neutral white	warm white	warm white/ cool white	RGB						(W)	(W)	(mA)	A1	A2	L1	L2	H1
BECRUX LG AS 28 i	1x28	18	350	1,2;3	700	545	700	545	80	48	400	400
BECRUX LG AS 28 o	1x28	18	350	1,2;4	700	545	700	545	80	48	400	400
BECRUX LG AS 40 i	1x40	18	500	1,2;3	700	545	700	545	80	48	400	400
BECRUX LG AS 40 o	1x40	18	500	1,2;4	700	545	700	545	80	48	400	400
BECRUX LG AS 42 i	1x42	18	350	1,2;5	700	545	700	545	80	48	400	400
BECRUX LG AS 42 o	1x42	18	350	1,2;6	700	545	700	545	80	48	400	400
BECRUX LG AS 35	1x35	18	350	1,2;7	700	545	700	545	80	48	400	400
BECRUX LG AS 50	1x50	18	500	1,2;7	700	545	700	545	80	48	400	400
BECRUX LG AS 60 i	1x60	18	500	1,2;5	700	545	700	545	80	48	400	400
BECRUX LG AS 60 o	1x60	18	500	1,2;6	700	545	700	545	80	48	400	400
BECRUX LG AS 70	1x70	18	350	1,2;8	700	545	700	545	80	48	400	400
BECRUX LG AS 100	1x100	18	500	1,2;8	700	545	700	545	80	48	400	400
BECRUX LG AS 77	1x77	18	350	1,2;9	700	545	700	545	80	48	400	400
BECRUX LG AS 110	1x110	18	500	1,2;9	700	545	700	545	80	48	400	400

Photometry
Fotometria



Mounting
Montáž

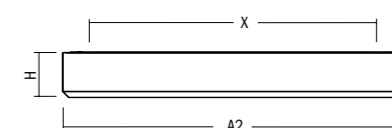
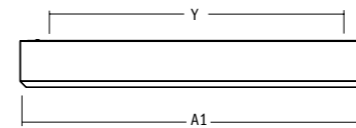




GACRUX

STANDARD

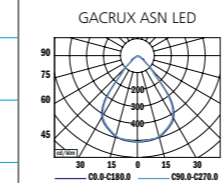
ON REQUEST



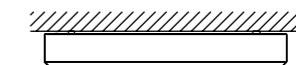
Type	optic	power	light output	color rendering index	color temperature	dimensions			fixing	
	prisma	(W)	(lm)	CRI(Ra)	CCT(K)	A1	A2	H	X	Y
GACRUX ASN	•	52	3600	>80	5000	619	619	83	342	544

Mounting Montáž	Ceiling surfaced	Prisadené na strop
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Microprismatic diffuser	Mikroprizmatický difúzor
Light distributions Distribúcia svetla	Direct	Direct
Wiring Elektrická výbava	Electronic control gear Passive thermal management	Elektronický predradník Pasívne chladenie
Materials Materiál	Body: sheet steel Frame: extruded aluminium profile Diffuser: PMMA	Teleso: oceľový plech Rámik: extrudovaný hliníkový profil Difúzor: PMMA
Surface finish Povrchová úprava	Body: grey (RAL 9006), white (RAL 9003) on request Frame: grey (RAL 9006), white (RAL 9003) on request	Teleso: šedá (RAL 9006), biela (RAL 9003) na požiadanie Rámik: šedá (RAL 9006), biela (RAL 9003) na požiadanie
Accessories Príslušenstvo	Mounting bracket	Držiak do sadrokartónových podhládov

Photometry
Fotometria



Mounting
Montáž



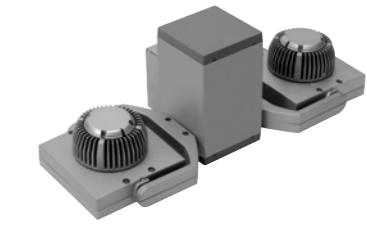
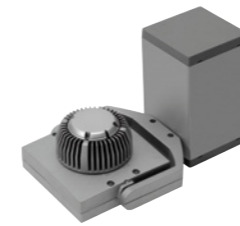
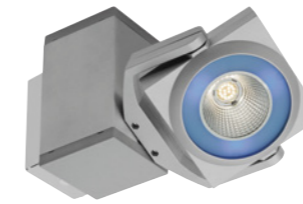


WALL MOUNTED / RECESSED

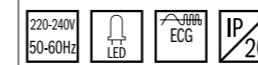


VARIO

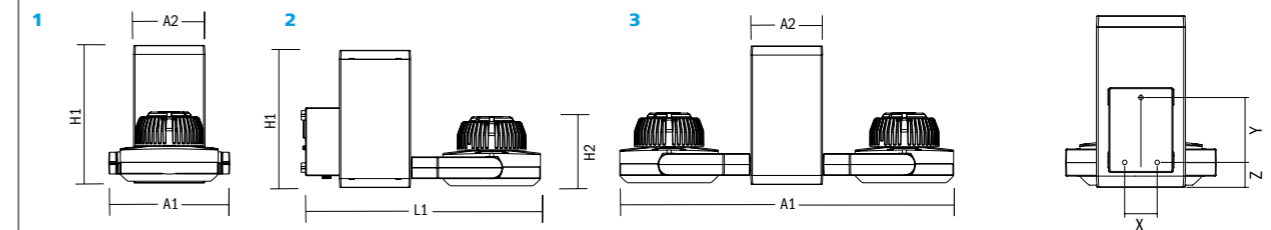
Mounting Montáž	Wall mounted	Montáž na stenu
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Reflector	Reflektor
Light distribution Distribúcia svetla	Direct	Priama
Wiring Elektrická výbava	Electronic control gear On request: Dimmable electronic control gear (EEI=A1 – DALI, DMX) Thermal management (passive – version 1100, 2200 lm, active – version 2000, 4000 lm)	Elektronický predradník Na požiadanie: Stmievateľný elektronický predradník (EEI=A1 – DALI, DMX) Chladienie (pasívne – verzia 1100, 2200 lm, aktívne – verzia 2000, 4000 lm)
Materials Materiál	Housing: aluminium profile, covers made of ABS Installation plate: galvanised sheet steel	Teleso: hliníkový profil, krytky z ABS Inštalácia: doska: pozinkovaný plech
Surface finish Povrchová úprava	Housing: grey (RAL 9006) Plastic box for control gear: grey with metal pigment	Teleso: šedá (RAL 9006) Plastové predradné boxy: šedá s kovovým pigmentom
Accessories Príslušenstvo	Blue colored ambient LED lighting behind the diffuser	Modré ambientné LED osvetlenie v difúzore



STANDARD



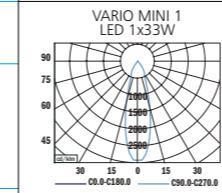
ON REQUEST



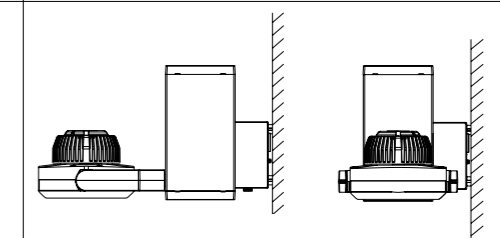
Type	lumen output (lm)	power (W)	color accuracy CRI (Ra)	light color CCT (K)	dimming	dimensions					fixing points		
						L1	A1	A2	H1	H2	X	Y	Z
VARIO MINI LED 1	1100	18	> 80	3000	10-100*	331	167	98	165	100	36	72	28
VARIO MINI LED 1	1100	17	> 80	4000	10-100*	331	167	98	165	100	36	72	28
VARIO MINI LED 1	2000	33	> 80	3000	10-100*	331	167	98	165	100	36	72	28
VARIO MINI LED 1	2000	31	> 80	4000	10-100*	331	167	98	165	100	36	72	28
VARIO MINI LED 2	2x1100	36	> 80	3000	10-100*	186	458	98	165	100	36	72	28
VARIO MINI LED 2	2x1100	34	> 80	4000	10-100*	186	458	98	165	100	36	72	28
VARIO MINI LED 2	2x2000	66	> 80	3000	10-100*	186	458	98	165	100	36	72	28
VARIO MINI LED 2	2x2000	62	> 80	4000	10-100*	186	458	98	165	100	36	72	28

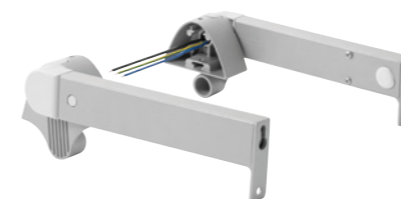
* Optional

Photometry
Fotometria



Mounting
Montáž

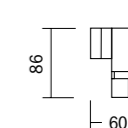
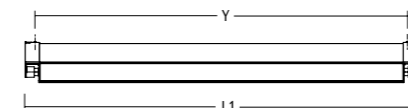
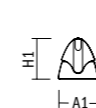




AVANT

STANDARD

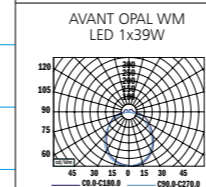
ON REQUEST



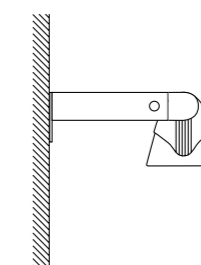
Type	optic	light output	power	color rendering index	color temperature	dimming	dimensions			fixing points		
	WHITE	(lm)	(W)	CRI (Ra)	CCT (K)	(%)	A1	A2	L1	L2	H1	Y
AVANT OPAL WM LED	•	3000	39	>70	4700	-	99	88	1250	104	91	120

Mounting Montáž	Wall mounted	Montáž na stenu
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Diffuser	Difúzor
Light distribution Distribúcia svetla	Direct	Priama
Wiring Elektrická výbava	Electronic control gear Passive thermal management	Elektronický predradník Pasívne chladenie
Materials Materiál	Housing: extruded aluminium End caps: die cast aluminium Diffuser: clear, opal – PMMA Diffuser end caps: PC/SMMA	Teleso: extrudovaný hliník Koncovky: hliníkový odliatok Difúzor: číry, opálový – PMMA Koncovky difúzora: PC/SMMA
Surface finish Povrchová úprava	Powder coat finish – grey (RAL 9006)	Prášková farba – šedá (RAL 9006)
Accessories Príslušenstvo	Wall bracket On request: Connectors: 7-pole Wago	Držiak pre nástennú montáž Na požiadanie: Elektrické konektory: 7-pólové Wago

Photometry
Fotometria

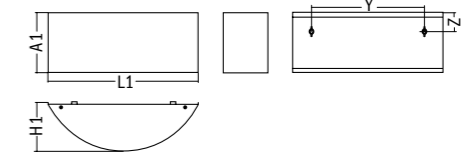
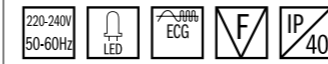


Mounting
Montáž



FURUD

LED



Mounting Montáž	Wall mounted	Prisadené na stenu
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Reflector Diffuser	Reflektor Difúzor
Light distribution Distribúcia svetla	Direct-indirect	Priame-nepriame
Wiring Elektrická výbava	Electronic control gear Passive thermal management	Elektronický predradník Pasívne chladenie
Materials Materiál	Housing: sheet steel Reflector: polished aluminium Diffuser: plastic opal	Teleso svietidla: ocelový plech Reflektor: leštený hliník Difúzor: opálový plast
Surface finish Povrchová úprava	Grey (RAL 9007); other colors on request	Šedá (RAL 9007); iné farby na požiadanie

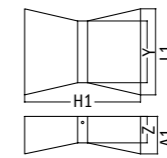
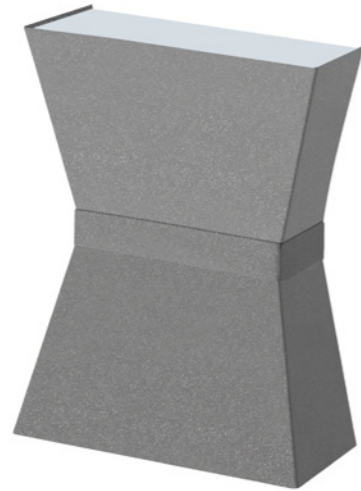
Type	optic	light output (lm)	power (W)	color rendering index CRI (Ra)	color temperature CCT (K)	dimensions			fixing points	
	REF.+DIFF.					L1	A1	H1	Y	Z
FURUD LED	•	800	12	>90	3000K	400	160	130	400	50

Photometry Fotometria	Mounting Montáž

FURUD/HADAR

HADAR

LED



Mounting Montáž	Wall mounted	Prisadené na stenu
Lamps Svetelný zdroj	LED	LED
Optical system Optický systém	Reflector Diffuser	Reflektor Difúzor
Light distribution Distribúcia svetla	Direct-indirect	Priame-nepriame
Wiring Elektrická výbava	Electronic control gear Passive thermal management	Elektronický predradník Pasívne chladenie
Materials Materiál	Housing: sheet steel Reflector: polished aluminium Diffuser: plastic opal	Teleso svietidla: ocelový plech Reflektor: leštený hliník Difúzor: opálový plast
Surface finish Povrchová úprava	Grey (RAL 9007); other colors on request	Šedá (RAL 9007); iné farby na požiadanie

Type	optic	light output (lm)	power (W)	color rendering index CRI (Ra)	color temperature CCT (K)	dimensions			fixing points	
	REF.+DIFF.					L1	A1	H1	Y	Z
HADAR LED	•	1100	15,1	>80	4000K	156	68	210	112	48

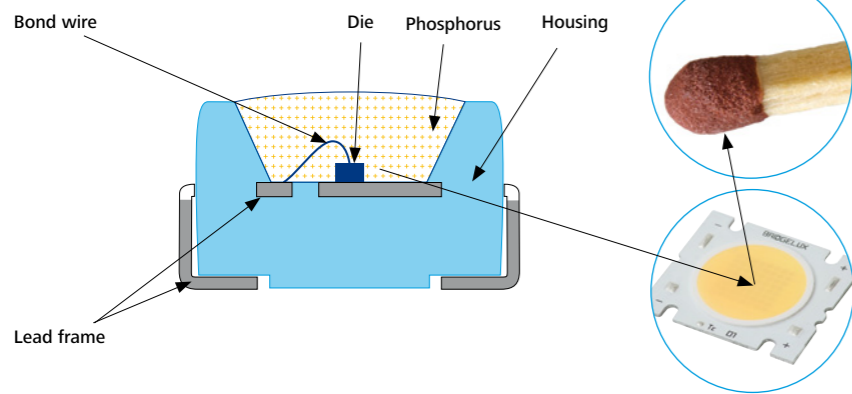
Photometry Fotometria	Mounting Montáž

1

LED (light emitting diode)

A Light Emitting Diode (LED) is a semiconductor device that emits light on certain wavelength (colour). A die (active area of LED) is encased in plastic or ceramic housing. The housing may incorporate one or many dies.

Simplified schematic of LED



The term SSL

SSL stands for Solid State Lighting. It refers to technology in which the light is emitted by solid-state electroluminescence as opposed to incandescent bulbs (which use thermal radiation). SSL is common term for LED technology being used for lighting applications.

2

Available LED lighting configurations

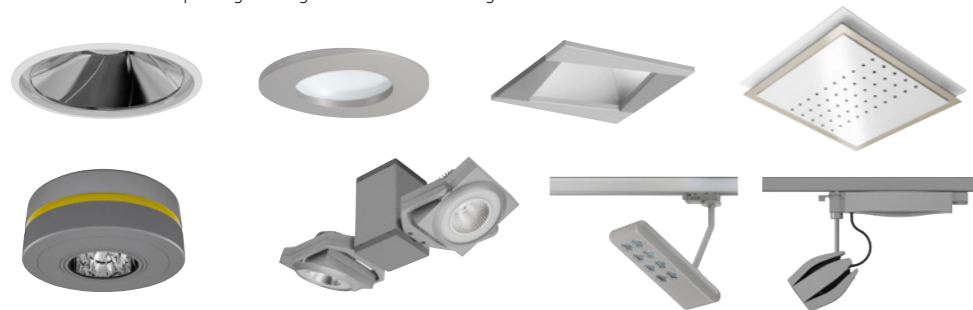
Discrete LED



LED Modules/Light engines - individual LEDs placed on a circuit board. They also may include heatsink, optics and housing as part of the assembly.



LED luminaires - a complete light fitting that uses LEDs as the light source.



3

LED characteristics



3.1 Controllability

LEDs can be integrated into the electronic control system which allows for control of colour balance and intensity, independent of each other while maintaining colour rendering accuracy. This is impossible with traditional light sources. For general illumination, LEDs have the ability to dim from 0 – 100 %.

3.2 Directionality

Due to the directional nature of their light emission, LEDs potentially have higher application efficiency than other light sources in certain lighting applications. Fluorescent and standard "bulb" shaped incandescent lamps emit light in all directions. Much of the light produced by the lamp is lost within the fixture, reabsorbed by the lamp, or escapes from the fixture in a direction that is not useful for the intended application. For many fixture types, including recessed down lights, overhead general light fixtures, and under cabinet fixtures, it is not uncommon for 40-50% of the total light output of the lamp(s) to be lost before it exits the fixture. LEDs emit light in a specific direction, reducing the need for reflectors and diffusers that can trap light. Therefore, well-designed fixtures and systems using LEDs can potentially deliver light more efficiently to the intended location.

3.3 Size

A size of LED is very small, allowing designers to create luminaires in almost any shapes and sizes required by an application.

3.4 Durability

LEDs are highly rugged. They incorporated no filament that can be damaged due to mechanical vibrations and shocks. LED light fixtures may be especially appropriate in applications with strong probability of lamp breakage.

3.5 Cold-Temperature Operation

LED performance inherently increases with an ambient temperature decrease. It makes LEDs a natural choice for cold-temperature applications, such as freezer cases, cold storage facilities, and many others.

3.6 Instant on/ Rapid Cycling

Unlike other traditional light sources such as fluorescent or metal halide lamps, LEDs reach full brightness instantly, with no re-strike delay. In general illumination, instant turn on can be desirable for both safety and convenience. In contrast with traditional light sources, LED's lifetime and lumen maintenance stays unaffected by rapid cycling. The cycling capability makes LEDs well-suited to use with all types of on-off controls, such as occupancy or daylight sensors.

3.7 No UV Emissions/Little Infrared

LEDs emit light essentially without ultraviolet (UV) and very little infrared radiation. Negligible amount of radiated heat by LEDs makes them appropriate for goods which are sensitive to heat. The lack of UV light makes them an attractive also for illumination of delicate objects such as artworks as well as materials subject to UV degradation.

3.8 Environmental Impact

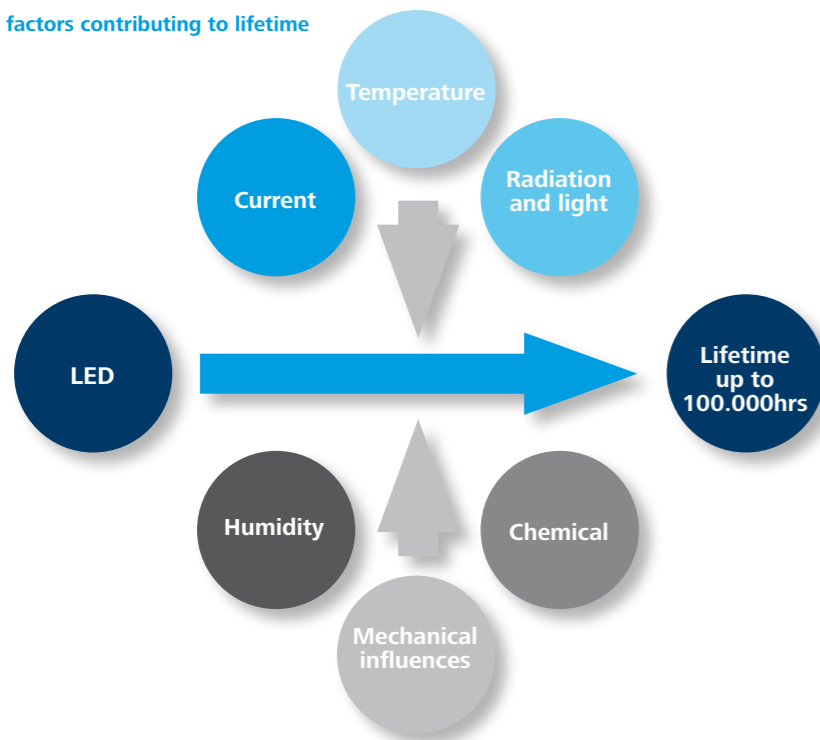
Using the LEDs reduce environmental impact in several areas. Longer lamp life means that fewer resources are required for maintenance. They also use no mercury and less phosphorus than fluorescent alternatives. These facts combined together with high efficiency make LEDs a smart choice while reducing the footprint on the nature.

3.9. Reliability & Lifetime

Unlike other light sources, LEDs don't "burn out" they just slowly lose their light output over the time. This factor is important in determining the lifespan of LEDs. Manufacturers are now stating lifetime to L70 – 70 % of lumen maintenance. Lifetimes can vary depending on operating conditions (humidity, temperature), current, and type of LED.

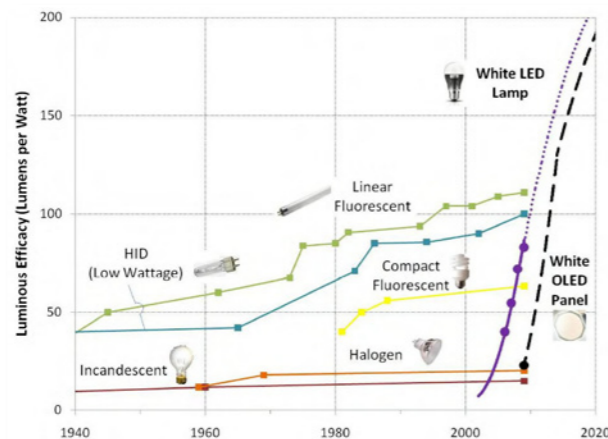
There are numerous factors, which can shorten LED lifetime, but the primary cause of lumen decrease is a heat generated by the LED junction. Heat must be removed from the device by conduction or convection. Without sufficient thermal management the device temperature will rise, and high-temperature operation will cause continuous light output decrease.

Other factors contributing to lifetime

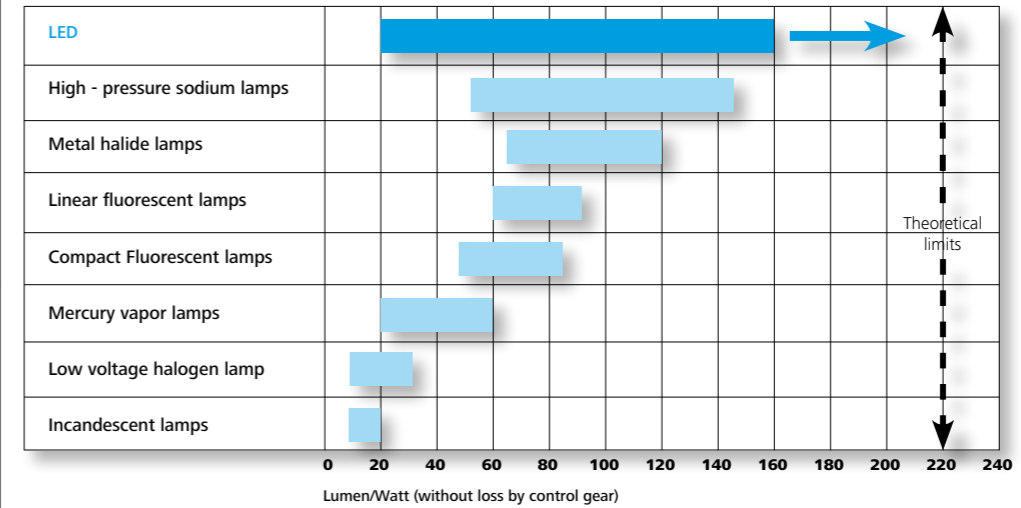


3.10 High Efficacy

The efficacy of LEDs is improving rapidly. Latest lab data show more than 200 lumens per Watt. However, in the real light fixture we have to count with several factors (control gear performance, optical losses, etc.) which reduce the overall system efficacy.



Efficacy of light sources



4

Light Output

LEDs provide much higher light output on the same input power as comparable incandescent or fluorescent sources, because of their high efficiencies. This is also because the light emitted from the LED is naturally directional, and in almost all applications less light is lost in the fixture compared to traditional light sources. Colour quality is a key challenge facing LEDs as a light source for general lighting.

4.1 Correlated Colour Temperature (CCT)

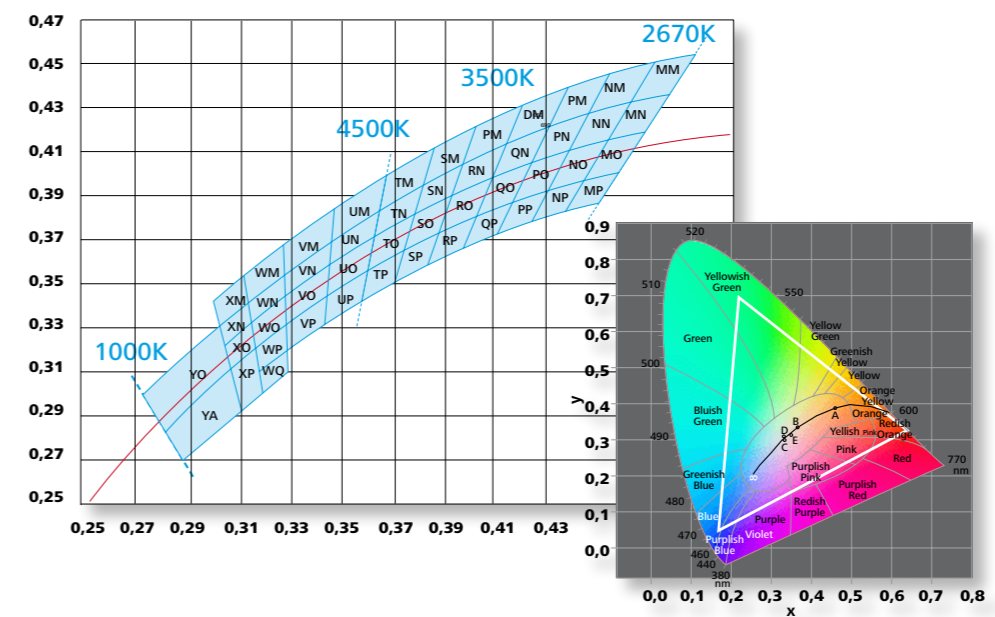
Correlated colour temperature (CCT) describes the relative colour appearance of a white light source, indicating whether it appears more yellow/gold or bluer, in terms of the range of available shades of white. The most efficient high-output white LEDs are phosphor-converted (PC) devices based on blue LEDs, characterized by very high CCTs of 5000K or above. Warmer colour temperatures are increasingly available, as improvements continue in LED efficacy, phosphor technology, and phosphor conversion efficiency. Warm white (2700K to 3000K) devices are now available at efficacies similar to CFLs.

There are two ways of producing high intensity white-light using LEDs. One is to use individual LEDs that emit primary colours i.e. red, green, and blue, and then mix the colours in ratio's to produce white light. The other is to use a phosphor material to convert monochromatic light from a blue or UV LED to broad-spectrum white light. Additional effects can be created by mixing white (phosphor converted) LEDs with primary colour LEDs.

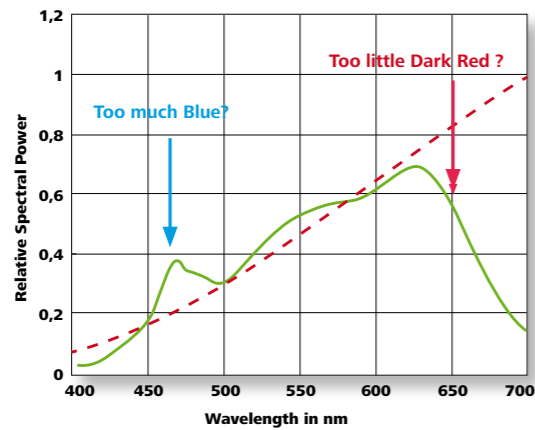
Production variations in the CCT lead to a do still of CCT points on the black body curve precise and LED manufacturers provide LEDs that fall into colour bins, above and below the black body curve.

LED manufacturers are focusing R&D effort on improvement of CCT points targeting.

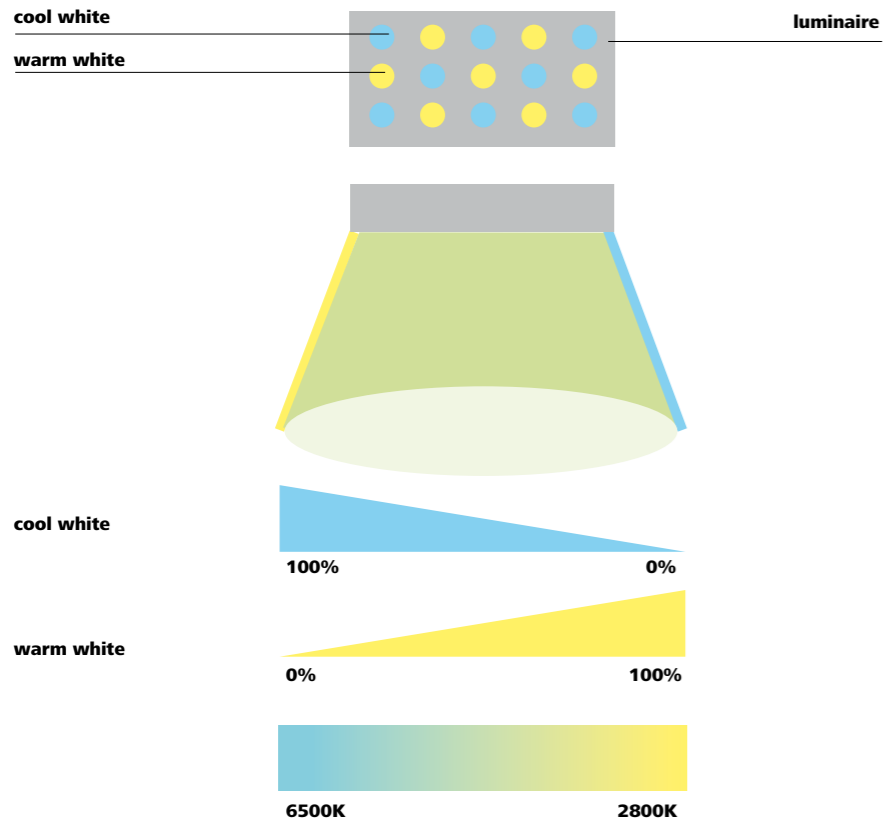
White Binning Information



- You should also consider:
- Does your application need white light of a stable colour temperature?
 - Or do you demand a tuneable colour temperature to create different effects?



Tunable white



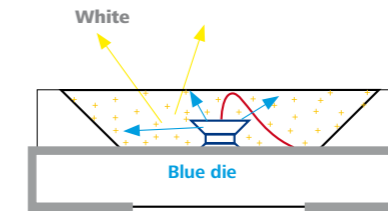
Wavelength Conversion

Blue LED + yellow phosphor: Some of the blue light from an LED is used to excite a phosphor which re-emits yellow light. The yellow light mixes with some of the blue light leaking through, resulting in the appearance of white light.

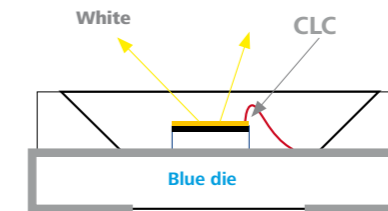
Blue LED + several phosphors: Similar to the aforementioned method, except that the blue light excites several phosphors, each of which emits a different colour. These different colours are mixed with some of the blue light leaking through, to make a white light with a broader, richer wavelength spectrum. This gives a higher colour quality light than the above-mentioned method.

Violet LED + multi phosphors: Similar to using Blue LED with several phosphors. This method gives good colour consistency over the LED lifetime.

Conventional method
Volume conversion
Converter particles dispersed in casting / molding material



New Innovative method
Chip level Conversion (CLC)
Phosphorus layer on surface emitting chip



4.2 Color Rendering Index (CRI)

The Colour Rendering Index (CRI) is a measure of the ability of a light source to render colours, relative to a reference light source. CRI may be compared only for light sources of equal CCTs.

R1		Light Greyish Red
R2		Dark Greyish Red
R3		Strong Yellow Green
R4		Moderate Yellowish Green
R5		Light Bluish Green
R6		Light Blue
R7		Light Violet
R8		Light Reddish Purple
R9		Strong Red
R10		Strong Yellow
R11		Strong Green
R12		Strong Blue
R13		Light Yellowish Pink (Human Complexion)
R15		Moderate Olive Green (Leaf Green)
R14		Japanese Complexion

4.3 Quality features in lighting

Taken together, quality features determine the quality of lighting. So it is not enough to design a lighting system on the basis of only one feature, e.g. illuminance.

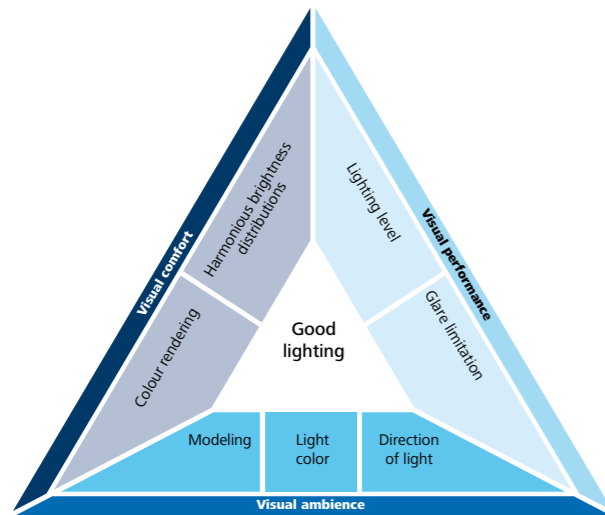
Just as the nature of occupational and recreational activities differs - e.g. reading a book, assembling miniature electronic components, executing technical drawings, running colour checks in a printing works, etc. - so they do the requirements presented by visual tasks. And those requirements define the quality criteria a lighting system needs to meet.

Careful planning and execution are prerequisites for high quality artificial lighting. This is what specific quality features determine:

- Lighting level – brightness;
- Glare limitation - vision undisturbed by either direct or indirect glare;
- Harmonious distribution of brightness - balanced illuminance;
- Light colour - the colour appearance of lamps, and in combination with
- Colour rendering - correct recognition and differentiation of colours and room ambience;
- Direction of light and modelling - identification of three-dimensional form and surface textures.

Depending on the use and appearance of a room, these quality features can be given with different weighting. The emphasis may be on:

- Visual performance, which is affected by lighting level and glare limitation;
- Visual comfort, which is affected by colour rendering and harmonious brightness distribution;
- Visual ambience, which is affected by light colour, direction of light and modelling.



5

Thermal Management

LEDs won't burn your hand when you grab the illuminated surface like some light sources, but they do produce heat. The difference is that traditional light sources radiate the heat away from the lamp in the same direction as the light, but LEDs radiate the heat in opposite direction with respect to the light rays. Thermal management is the most important aspect of successful LED-based luminaire design and have to be considered in lighting design and application as well.

Heatsinks



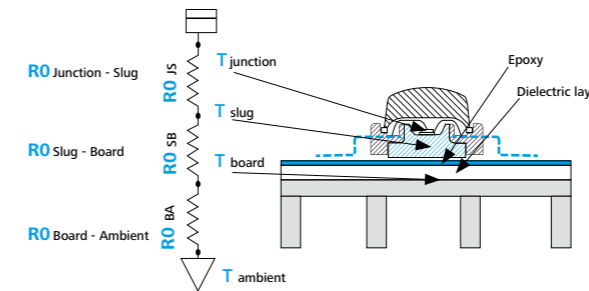
All light sources convert electric power into radiant energy and heat in various proportions. Incandescent lamps emit primarily infrared radiation (IR), with a small amount of visible light. Fluorescent and metal halide sources convert a higher portion of the input energy into visible light, but also emit IR, UV, and heat. LEDs generate little or no IR or UV, but convert around 25% (!) of the power into visible light; the rest of input energy is converted to heat that must be conducted from the LED into the underlying circuit board and subsequently to the heatsink, housing, and luminaire frame elements. The table below shows the approximate proportions in which input power is converted to heat and radiant energy (including visible light) for various light sources.

Power Conversion for "White" Light Sources

	Incandescent (60W)	Fluorescent (Typical linear CW)	Metal Halide	LED
Visible Light	8%	21%	27%	~25%
IR	73%	37%	17%	~0%
UV	0%	0%	19%	0%
Total Radiant Energy	81%	58%	63%	15-25%
Heat (Conduction + Convection)	19%	42%	37%	75-85%
Total	100%	100%	100%	100%

The conversion rate of electrons to photons in an LED is expressed as a Quantum Efficiency. Excellent LEDs today achieve a quantum efficiency of 45%. The excess energy in the form of heat is therefore required to be soaked away from the LED junction. LED manufacturers are focusing R&D effort on the Internal Quantum Efficiency (IQE) and External Quantum Efficiency (EQE) of LEDs in order to improve the efficacy (lm/W) of LEDs. The best LEDs available today are approaching 170 lm/W.

The overall objective of a well-designed lamp or luminaire is to maintain the junction temperature (T_j) below the value recommended by a manufacturer, to ensure life expectancy of the light source.



6

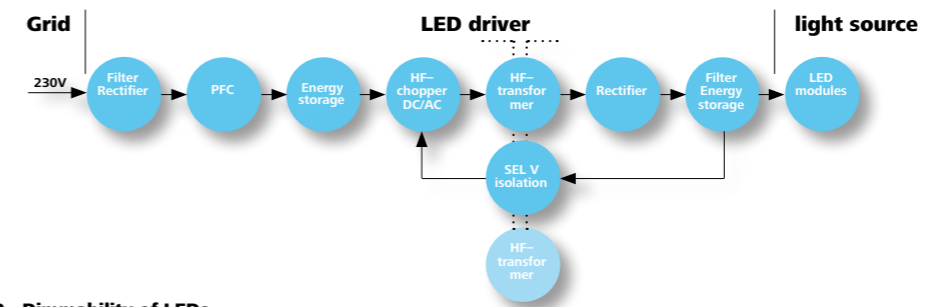
Driving the Power LED

6.1 LED Driver

LED driver (control gear) is an electronic circuitry used to "drive" the LEDs. It provides an output matching the electrical characteristics of the LEDs to be controlled. LEDs need to be driven properly to ensure their optimal performance and long lifetime. Using an appropriate driver is a key to obtain all the benefits of LED-based luminaire.

There are two types of drivers:

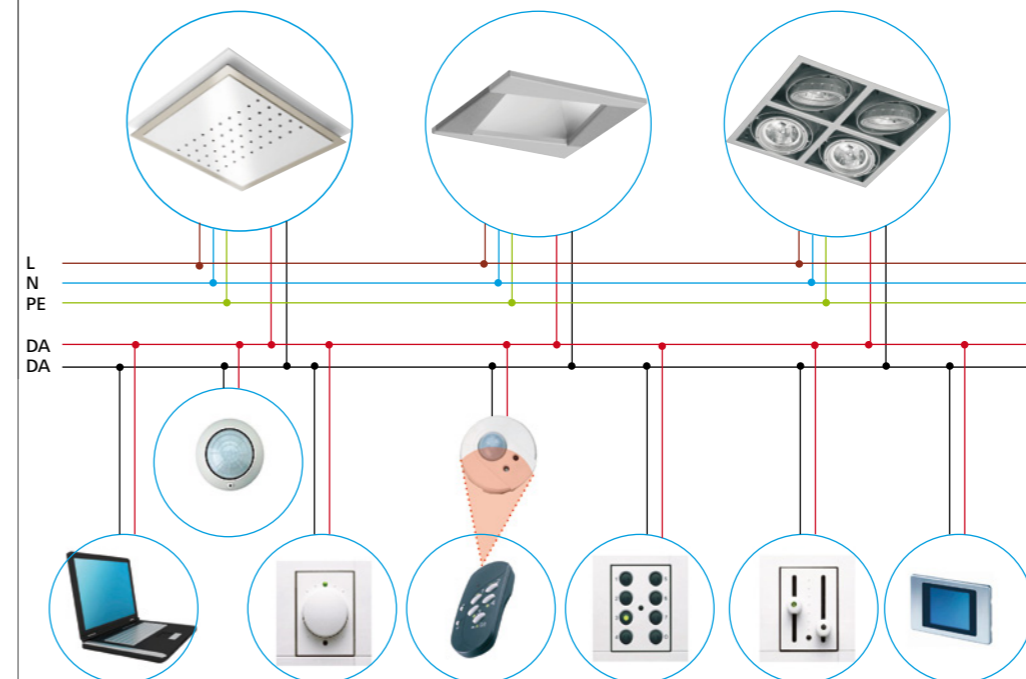
- **Constant Current**
These drivers typically consist of 350mA, 500mA, 700mA and 1A. These provide a constant regulated current to the LED
- **Constant Voltage**
These drivers typically consist of 10V, 12V and 24V. These provide constant regulated voltage.



6.2. Dimmability of LEDs

Commercial LED drivers commonly use one of two methods to dim LEDs: continuous current reduction (CCR), which decreases the forward current, or pulse-width modulation (PWM), which changes the duty cycle. PWM has been more common for LEDs because of its wide dimming range and linear relationship between light output and duty cycle. Dimming of the LEDs via PWM can be controlled using numerous dimming systems, such as 1-10 V, DMX, or DALI.

DALI wiring (different control possibilities)



7

General Illumination Applications

7.1 Offices and Office Buildings



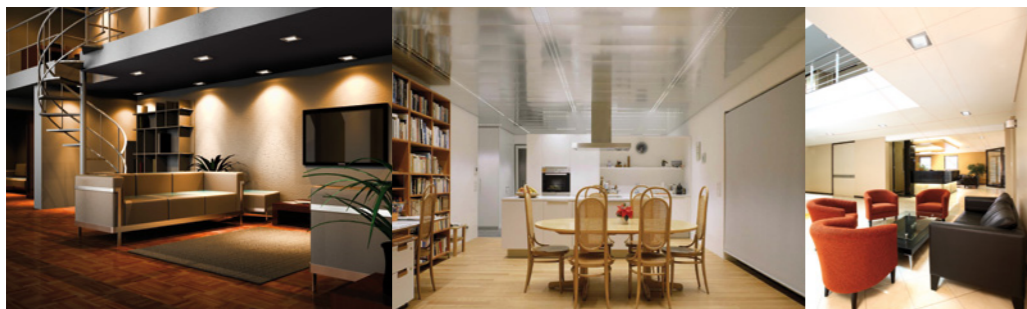
7.2 Schools



7.3 Hotels and Restaurants



7.4 Homes



7.5 Sales and Presentation



7.6 Health Care Premises



7.7 Industry



7.8 Sport



7.9 Museums, Galleries and Exhibitions

