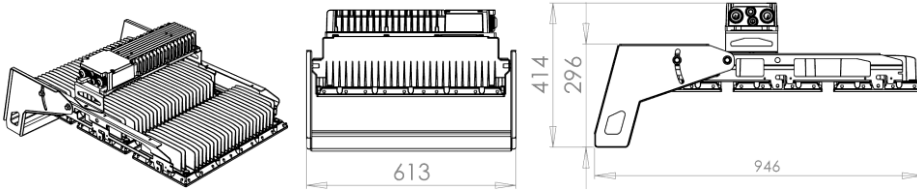


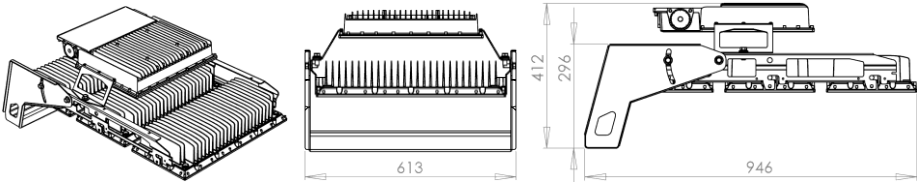
Bubo 2.0 B3 & B2 - Mounting instructions



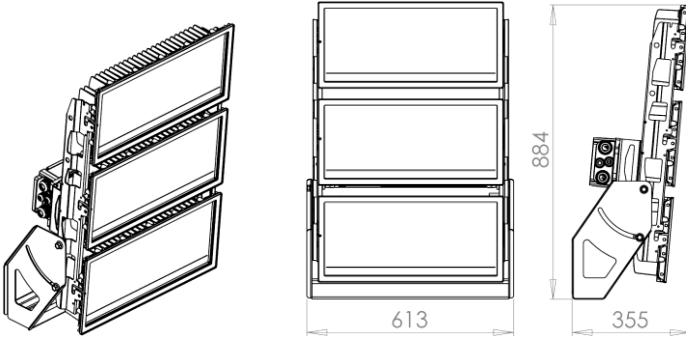
Bubo B3 Area (with BGN gear: B3GN)



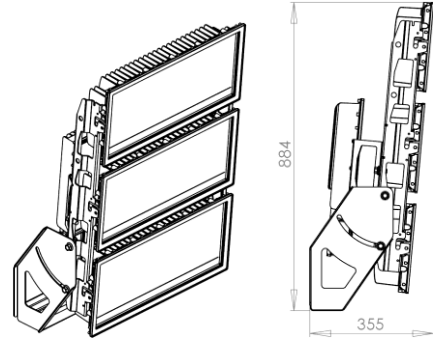
Bubo B3 Area (with BG gear: B3G)



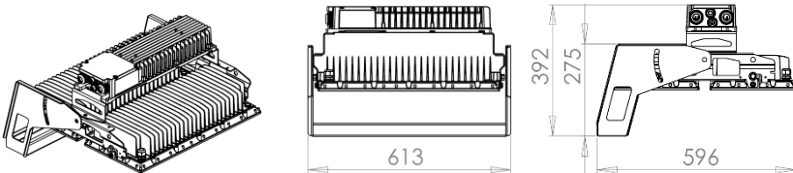
Bubo B3 Stadium (with BGN gear: B3GN)



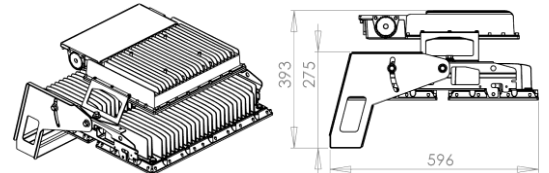
Bubo B3 Stadium (with BG gear: B3G)



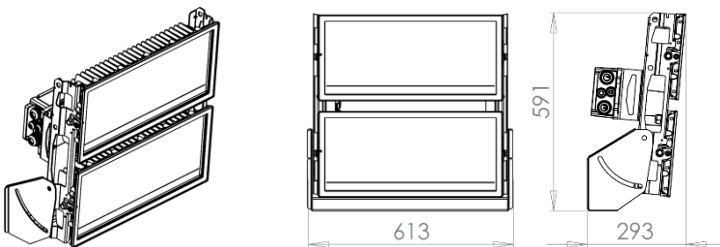
Bubo B2 Area (with BGN gear: B2GN)



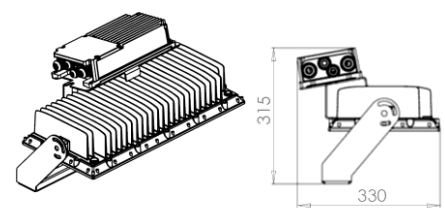
Bubo B2 Area (with BG gear: B2G)



Bubo B2 Stadium (with BGN gear: B2GN)



Bubo B1 Area (with BGSN gear: B1GN)



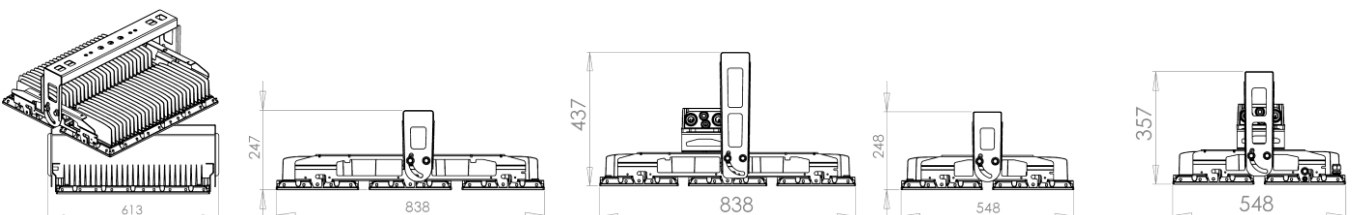
Bubo Pendant

B3 Pendant S

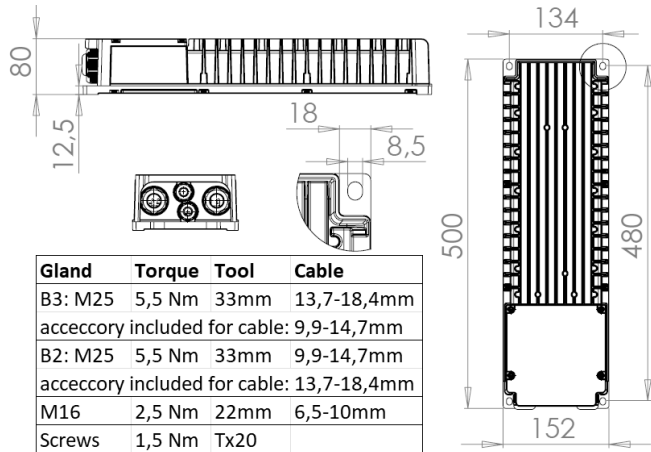
B3 Pendant L

B2 Pendant S

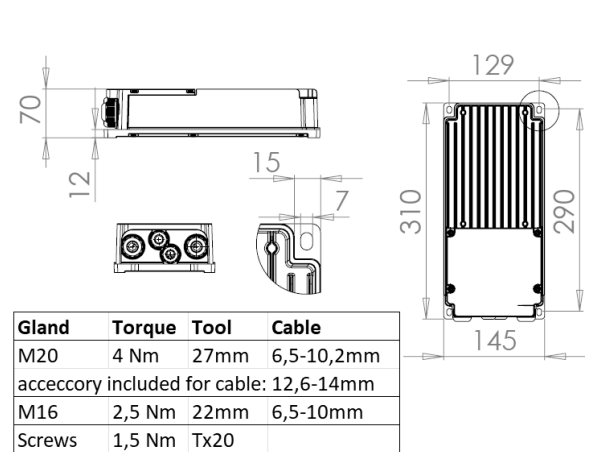
B2 Pendant L



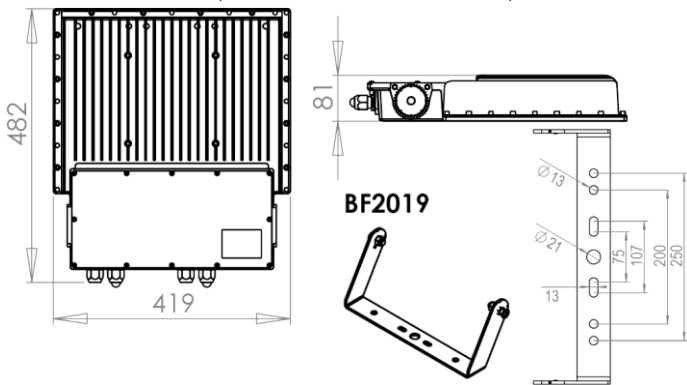
BGN Gear unit size (mounting holes)



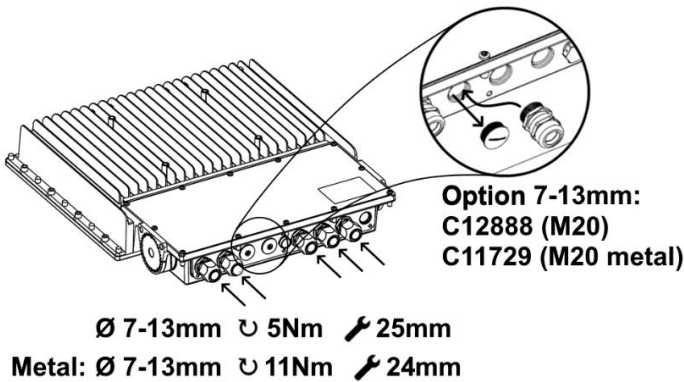
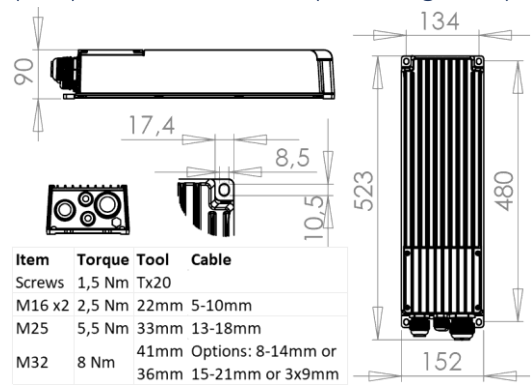
BGSN Gear unit size (mounting holes)



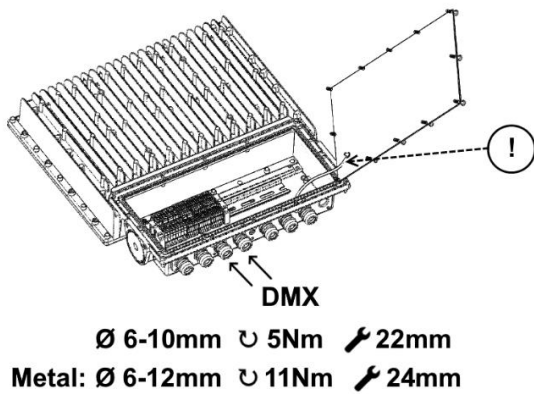
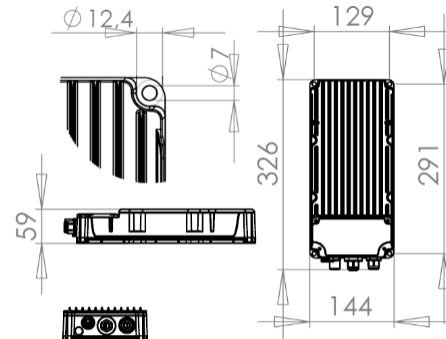
BG Gear unit size (available bracket mount)



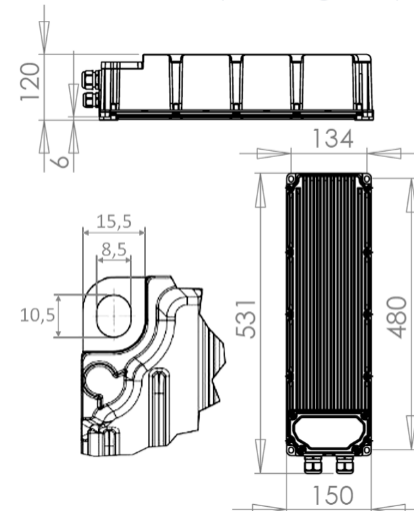
(OLD) BGN Gear unit size (mounting holes)



BGSE Gear unit size (mounting holes)



BGE Gear unit size (mounting holes)



Bubo weight [kg]

	Luminaire	Bracket			
	Light Engines, Rack & Gear	Area	Stadium	Pendant L	Pendant S
Bubo B3GN Zhaga	39,1	8,2	8,1	6,4	5,6
Bubo B3GN	38,7				
Bubo B3G - 360LED	40,0				
Bubo B2GN Zhaga	26,5	5,0	5,1	4,0	3,6
Bubo B2GN	26,2				
Bubo B2G - 240LED	28,6				
	Light Engine & Gear	Area	Floodlight	Pendant	B1GN Pendant
Bubo B1GN Zhaga	14,1	2,1	2,4	2,0	2,2
Bubo B1GN	13,8				
Bubo B1G Zhaga	14,1				
Bubo B1G - 120LED	13,1				
Bubo B1G - 96LED	13,6				
Bubo B1GE	12,6				

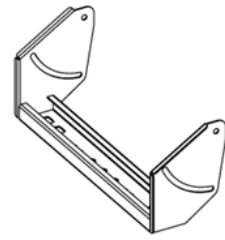
	Luminaire	Drivers			
	Light Engines & Rack	BGN unit	BG ZT unit	BG unit	BGE unit
Bubo B3 - 408LED	30,8	6,4		8,5	6,1
Bubo B3 - 360LED	30,7				
Bubo B3 - 288LED	30,5				
Bubo B2 - 272LED	20,3	5	9,7	7,6	5,4
Bubo B2 - 240LED	20,3				
Bubo B2 - 192LED	20,1				
	Light Engine	BGSN unit		BGSE unit	
Bubo B1 - 136LED	9,2	3,1			3,1
Bubo B1 - 120LED	9,1				
Bubo B1 - 96LED	9,1				

Weights are valid for standard models. Customer-specific changes may affect the weights.

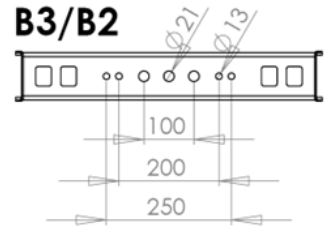
Bubo Aw [m²]

	Bracket Style	Drivers	Installation angle															
			0deg			5deg		10deg		25deg		40deg		65deg		85deg		
			Top	Front	Side	Front	Side	Front	Side	Front	Side	Front	Side	Front	Side	Front	Side	
Bubo B3	Area	With BGN Gear unit	0,54	0,14	0,15	0,19	0,15	0,23	0,16	0,28	0,16							
		With BG Gear unit	0,54	0,13	0,16	0,18	0,17	0,22	0,17	0,32	0,17							
		Luminaire only	0,52	0,10	0,12	0,14	0,13	0,18	0,13	0,32	0,13							
Bubo B3	Stadium	With BGN Gear unit									0,29	0,15	0,39	0,15	0,46	0,16	0,50	0,16
		With BG Gear unit									0,34	0,15	0,39	0,15	0,48	0,16	0,50	0,16
		Luminaire only									0,34	0,12	0,39	0,12	0,46	0,12	0,49	0,13
Bubo B2	Area	With BGN Gear unit	0,36	0,13	0,10	0,17	0,11	0,20	0,11	0,25	0,11							
		With BG Gear unit	0,36	0,12	0,11	0,16	0,12	0,19	0,12	0,25	0,12							
		Luminaire only	0,33	0,09	0,08	0,11	0,08	0,13	0,08	0,21	0,09							
Bubo B2	Stadium	With BGN Gear unit									0,25	0,11	0,29	0,11	0,31	0,11	0,35	0,11
		With BG Gear unit									0,27	0,11	0,31	0,11	0,33	0,12	0,35	0,12
		Luminaire only									0,22	0,07	0,26	0,08	0,30	0,08	0,33	0,09
Bubo B1	Area	With BGSN Gear unit	0,17	0,10	0,05	0,10	0,05	0,10	0,05	0,12	0,04							
		With BGS Gear unit	0,19	0,08	0,04	0,09	0,04	0,10	0,04	0,12	0,04							
		Luminaire only	0,15	0,07	0,03	0,08	0,03	0,09	0,03	0,11	0,03							
Bubo B1	Flood	With BGSN Gear unit	0,17	0,10	0,05	0,10	0,05	0,10	0,05	0,12	0,05	0,15	0,05	0,16	0,04	0,19	0,04	
		With BGS Gear unit	0,19	0,09	0,05	0,10	0,05	0,10	0,05	0,13	0,05	0,17	0,05	0,20	0,04	0,21	0,04	
		Luminaire only	0,15	0,08	0,04	0,09	0,04	0,10	0,04	0,12	0,04	0,14	0,03	0,16	0,03	0,17	0,03	

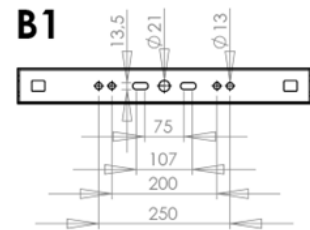
Fixation Bracket detail



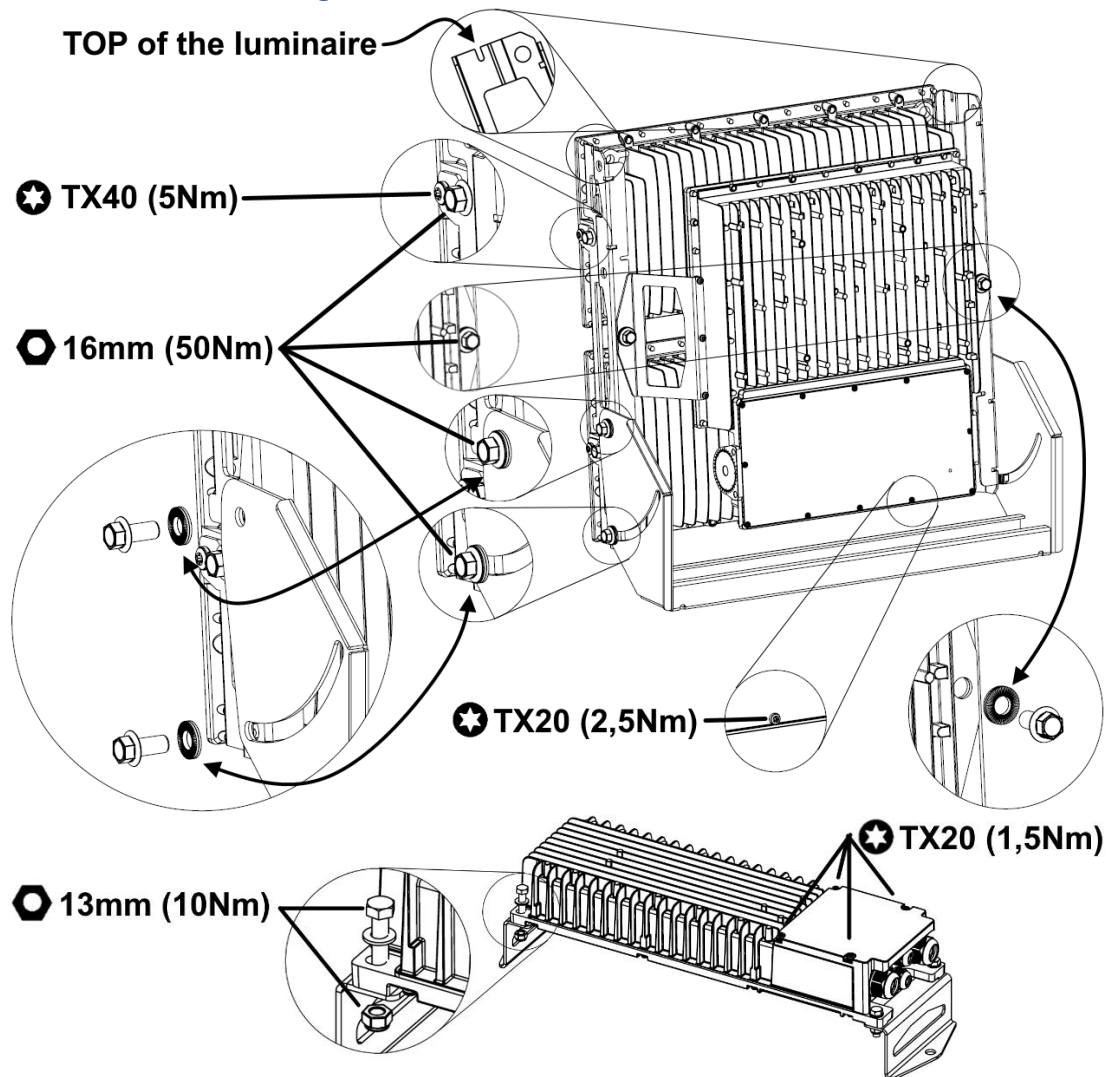
B3/B2



B1



Installation – Mounting



Use M20 bolt and washer – Tighten to **100Nm** (Recommended washer according to DIN9021)
or use 2 pieces M12 bolts with washers – Tighten to **50Nm**.

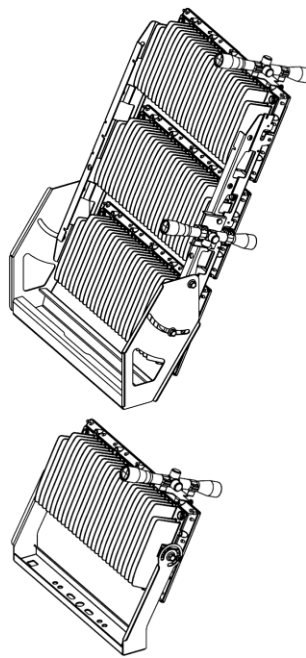
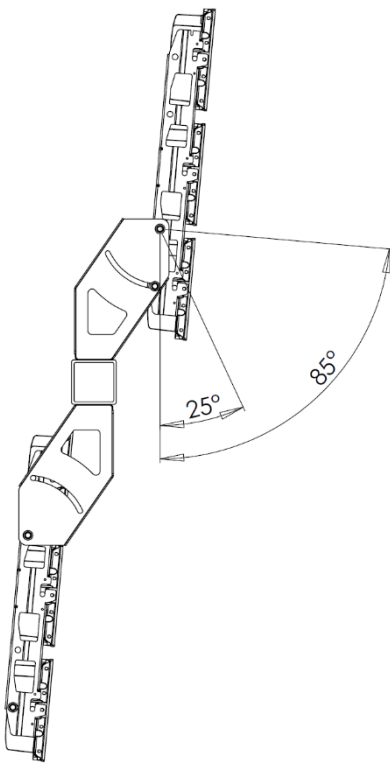
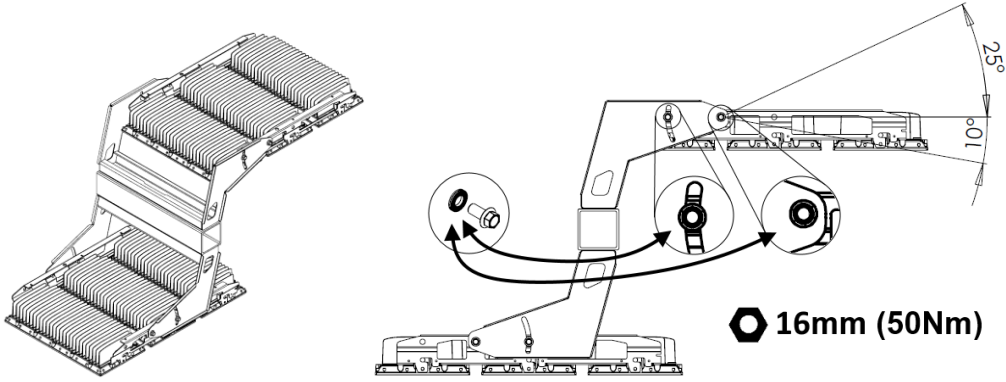
In case of using only one fixation point and if the luminaire is higher than 3m, the use of a 2nd fixing security system is advised.

- EN: Use safety wire in moving or vibrating installations.
- FI: Käytä turvavaijeria liikkuvissa tai tärisävissä asennuksissa.
- SE: Använd säkerhetsvajer i rörliga eller vibrerande installationer.
- DE: Bei beweglichen oder vibrierenden Anlagen Sicherheitsdraht verwenden.

Adjusting luminaire angle

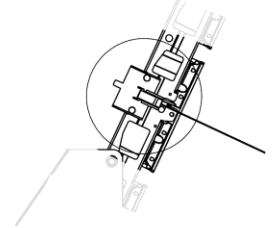
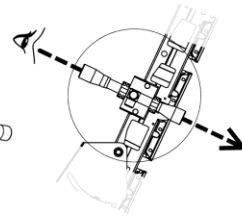
- I. After finding the right alignment
- II. Tighten aim locking bolts
- III. Tighten the main axle bolts

Bracket adjustment range



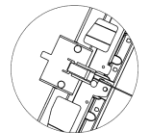
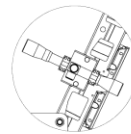
Precision Aiming Device

Laser



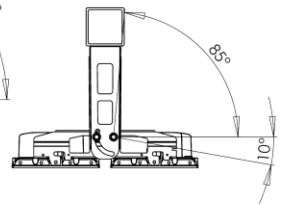
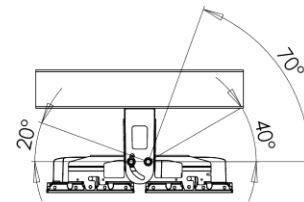
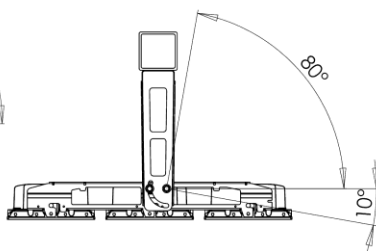
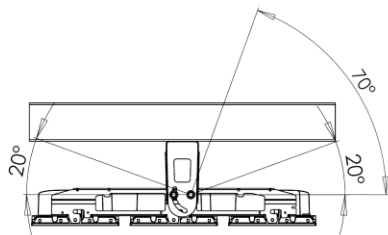
BA2007

BA2009

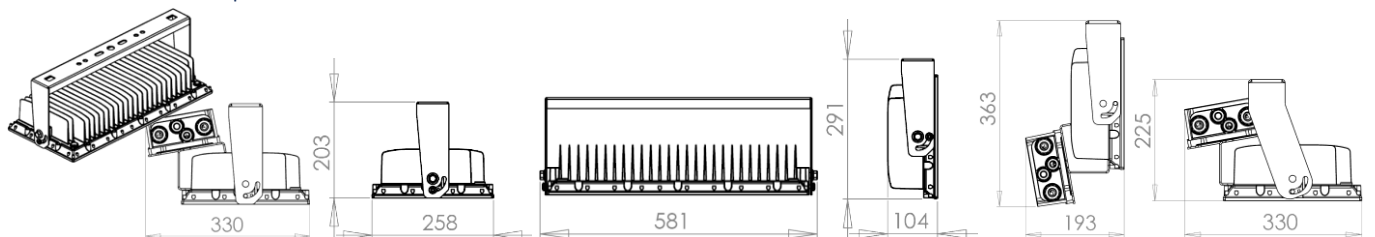


BA2008

BA2010



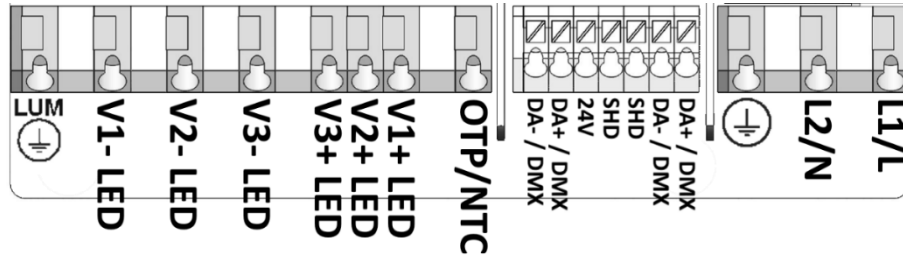
Bubo B1 & B1GN pendant brackets



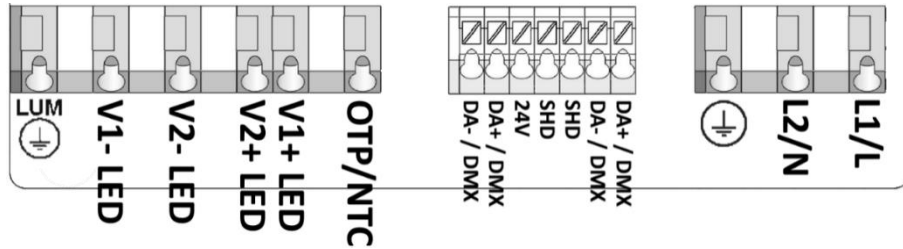
Installation – Electrical connections

AC input & LED output require 1,0-2,5mm² wires and control requires 0,75-1,5mm² wires. Strip length 0,9-1,0mm

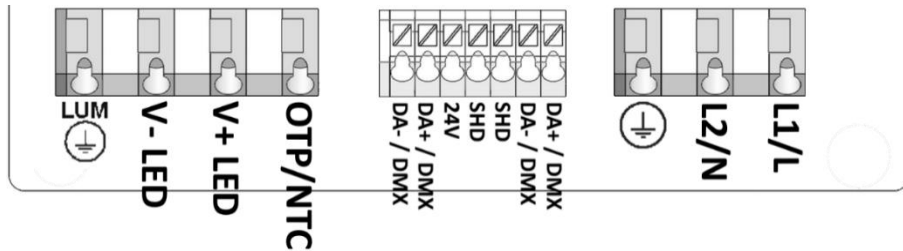
B3 BGN



B2 BGN



B1 BGSN



BL light unit standard cable wire colors:

	EN		FI	SE	DE
PE	GN-YE	GREEN-YELLOW	KE-VI	GN-GU	GN-GE
LED-	BU	BLUE	SI	BL	BL
LED+	BN	BROWN	RU	BR	BR
NTC	GY	GRAY	HA	GR	GR
NC	BK	BLACK	MU	SV	SW

BL cable with BG, BGS or BGSE gears:

	EN		FI	SE	DE
PE	GN-YE	GREEN-YELLOW	KE-VI	GN-GU	GN-GE
LED-	BU	BLUE	SI	BL	BL
LED+	BN	BROWN	RU	BR	BR
NTC-	BK	BLACK	MU	SV	SW
NTC+	GY	GRAY	HA	GR	GR

Pre-assembled installation cable wire colors:

	EN		FI	SE	DE
L	BN	BROWN	RU	BR	BR
N	BU	BLUE	SI	BL	BL
PE	GN-YE	GREEN-YELLOW	KE-VI	GN-GU	GN-GE
DA+	GY	GRAY	HA	GR	GR
DA-	BK	BLACK	MU	SV	SW

Notification regarding cables

- Make connections according to terminal markings
- Fasten all cables to luminaire housing or bracket with zip-ties (or equivalent) to prevent movement of loose cables
- Pay attention to sharp corners to prevent damage to cables
- Route cable to dip or loop lower than cable glands to prevent water from flowing to cable glands

Suitable LED cable lengths 230VAC

Cables with at least 1,0mm² conductors must be used for LED module cabling.

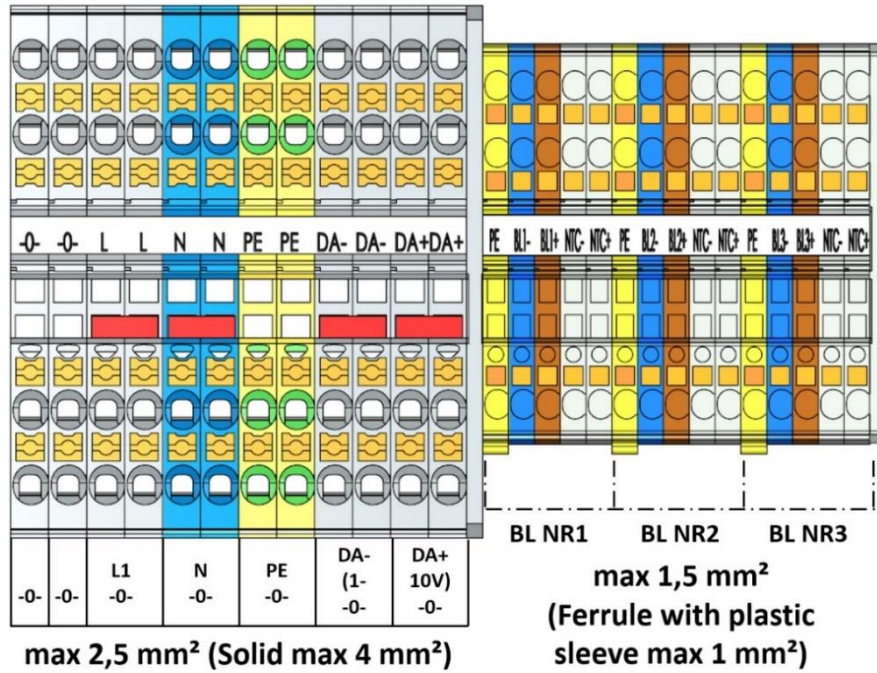
		BGN / BGSN				ZHAGA: BG / BGS	
		LED NTC WIRING	NO NTC			LED NTC WIRING	NO NTC
Bubo B3 & Bubo B2 & Bubo B1	2,5mm ²	300 m	300 m	Bubo B2	272 LED	3 m	50 m
					240 LED	3 m	50 m
	1,5mm ²	100 m	100 m	Bubo B1	136 LED	3 m	50 m
			120 LED		3 m	50 m	
		BG / BGS				BGE / BGxSE / BGSE	
		LED NTC WIRING	NO NTC			LED NTC WIRING	NO NTC
		Combined	Separate	Combined	Separate		
Bubo B3	408 LED			3 m	25 m	150 m	
	360 LED	25 m	100 m	3 m	25 m	150 m	
	288 LED	3 m	10 m	3 m	25 m	150 m	
Bubo B2	272 LED			3 m	25 m	150 m	
	240 LED	25 m	100 m	3 m	25 m	150 m	
	192 LED	3 m	10 m	3 m	25 m	150 m	
Bubo B1	136 LED			3 m	25 m	150 m	
	120 LED	25 m	100 m	3 m	25 m	150 m	
	96 LED	3 m	10 m	3 m	25 m	150 m	

Electrical notes

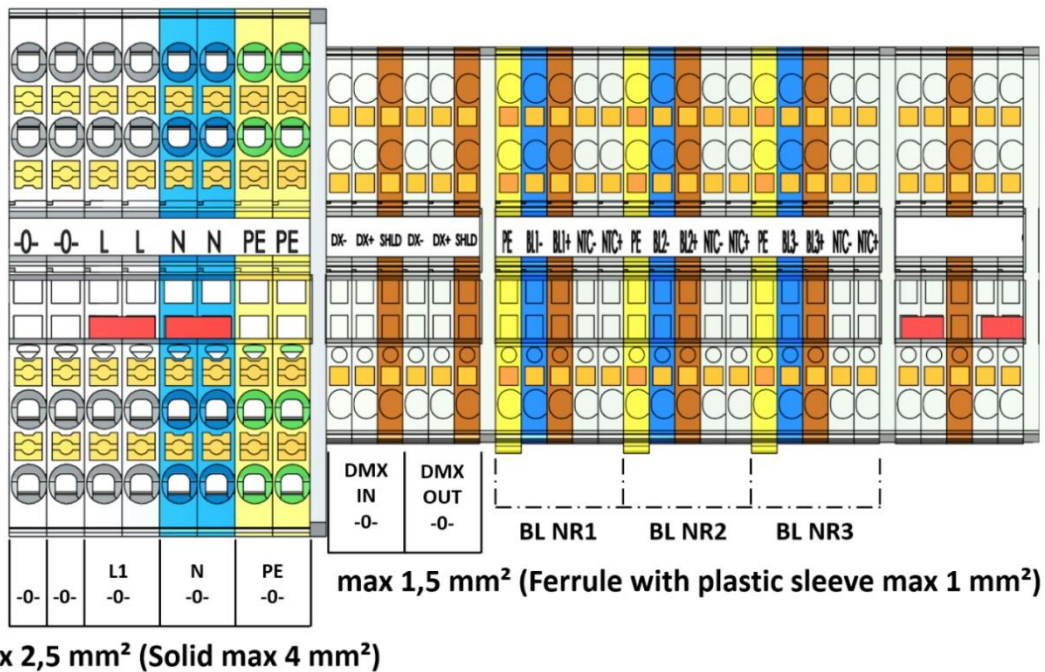
- Regarding DALI, D4i & 1-10V controls:
 - EN: Luminaire has basic insulation between Low Voltage supply and control conductors.
 - FI: Valaisimessa on peruseristys syöttöjännitteen ja ohjausjohtimien välillä.
 - SE: Armaturen har enkelisolering mellan lågvoltsförsörjningen och styrledningarna.
 - DE: Die Leuchte verfügt über eine einfache Isolation zwischen der Niederspannungsversorgung und den Steuerleitungen.
- Regarding DMX controls
 - EN: Luminaire requires one (1) address as standard. DMX-out of the last luminaire in the chain must be terminated with an 110Ω end resistor. DMX wires may not be in contact with Primary, BL or NTC wires.
 - FI: Valaisin vie yhden (1) osoitteen vakiomallisena. DMX-ketjun viimeisen valaisimen DMX-lähtö on päätettävä 110Ω vastuksella. DMX-johtimet eivät saa olla kosketuksissa verkko-, BL- tai NTC-johtimiin.
 - SE: Armaturen kräver en (1) adress som standard. DMX-avgång från den sista armaturen i kedjan avslutas med ett 110Ω ändmotstånd. DMX-ledningar får inte vara i kontakt med primär-, BL- eller NTC-ledningar.
 - DE: Leuchte benötigt standardmäßig eine (1) Adresse. Der DMX-Ausgang der letzten Leuchte in der Kette wird mit einem 110Ω-Abschlusswiderstand abgeschlossen. DMX-Drähte dürfen keinen Kontakt mit Primär-, BL- oder NTC-Drähte haben.

Electrical connections for other versions

BG DALI and 1-10V electrical connections – example 230VAC 50/60Hz



BG DMX electrical connections – example 230VAC 50/60Hz

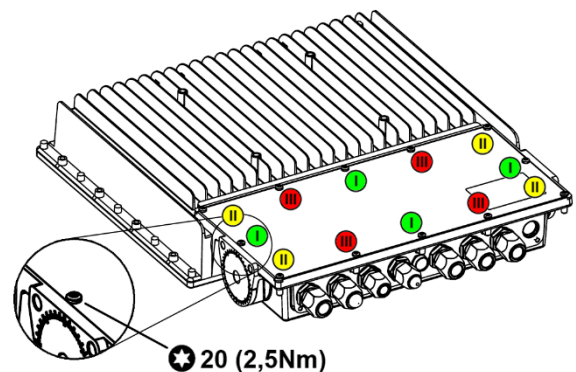


Closing the BG Gear unit

Use correct closing order and appropriate 2,5Nm torque

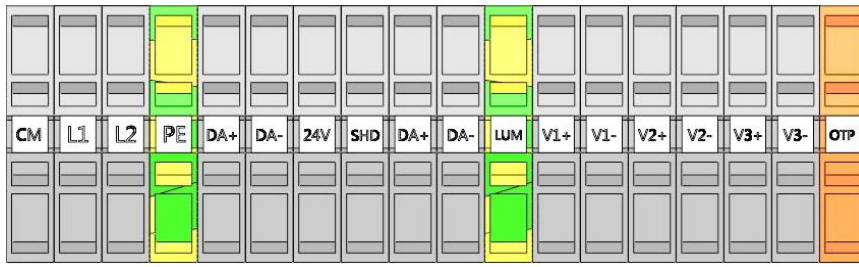
- I. Begin tightening screws from the middle of sides
- II. Tighten corners next
- III. Tighten the remaining screws

Make sure that the safety wire is not between the housing and the lid and screws for the lid are secured properly.



(OLD) BGN electrical connections 230...400VAC

Bubo DALI, D4i or DMX

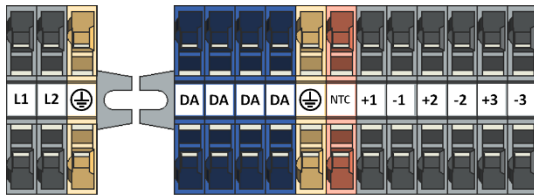


Label	Number	Description	Label	Number	Description
CM	1	Surge protection connection	LUM	11	Protection Earth for LED module
L1	2	AC input L1/L	V1+	12	BL1 LED+ Connection
L2	3	AC input L2/N	V1-	13	BL1 LED- Connection
PE	4	Protection Earth	V2+	14	BL2 LED+ Connection
DA+	5	Reused, DALI/DMX input+	V2-	15	BL2 LED- Connection
DA-	6	Reused, DALI/DMX input-	V3+	16	BL3 LED+ Connection
24V	7	24V auxiliary source	V3-	17	BL3 LED- Connection
SHD	8	DMX SHIELD	OTP	18	Thermal protection input
DA+	9	DALI/DMX reused Re-launch output+			
DA-	10	DALI/DMX reused Re-launch output-			

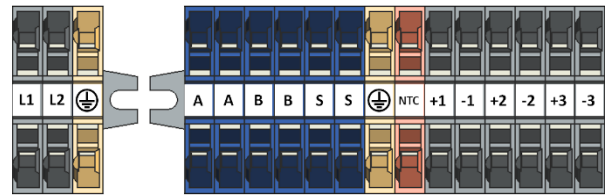
Connectors are compatible with 0,75...2,5mm² cross-section wiring

BGE electrical connections - examples 230...400VAC

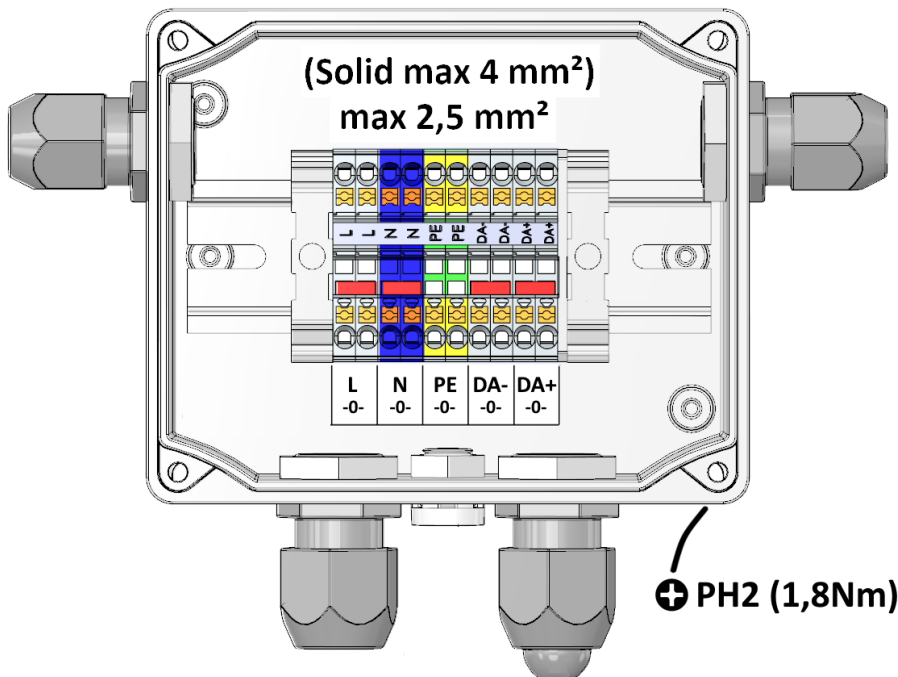
Bubo DALI



Bubo DMX



BG3SE & BG2SE DALI electrical connections - Example 230VAC 50/60Hz



Ø 7-13mm ⤴ 5Nm 🔧 25mm

General notes

- Do not stare at the operating light source. The luminaire should be positioned so that prolonged staring into the luminaire at a closer distance is not expected. The luminaire has a built-in light collimator.
- Applicable to RGB PARTY luminaire: In the lighting control standby mode (OFF), there may be a slight glow of the diodes in some installations. This is normal and does not pose a risk of damage to the luminaire or increase power consumption of the installation.
- What is condensation? It appears as small droplets of moisture inside the light. Condensation forms as gaseous moisture turns in to liquid water. It forms in the coolest parts of the luminaire, usually glass. The luminaire is designed to allow moisture to escape, but it takes time and is dependent on usage and ambient environment. Condensation does not cause a problem with normal operation of the luminaire and is not considered to be a defect.
- Operate luminaires regularly to minimize condensation formation.
- Any modification on the luminaire will cancel the warranty

Circuit breaker design charts for BGN & BGSN 230VAC ta25°C

			Number of luminaires per circuit breaker Kytkettävien valaisimien enimmäismäärä							
			TYPE B				TYPE C			
	LEDs	GEAR	10A	16A	20A	25A	10A	16A	20A	25A
Bubo B3	360...408	BGN	1	1	1	1	1	1	1	2
Bubo B2	240...272	BGN	1	1	2	2	1	1	2	3
Bubo B1	96...136	BGSN	2	3	4	5	2	3	4	6

LEDs	GEAR	Inrush current peak 230VAC 50/60Hz Käynnistysvirtapiikki 230VAC 50/60Hz	Earth leakage current Maavuotovirta
360...408	BGN	5,40A, t=8,60ms (400VAC: 11,8A, t=9,20ms) (50% of Ipeak)	1,4mA
240...272	BGN	9,30A, t=5,40ms (400VAC: 13,7A, t=6,40ms) (50% of Ipeak)	1,0mA
96...136	BGSN	8,75A, t=4,32ms (400VAC: 14,8A, t=2,24ms) (50% of Ipeak)	0,6mA

Circuit breaker design charts for other versions 230VAC ta25°C

LEDs	I_{in}	GEAR	Number of luminaires per circuit breaker Kytettävien valaisimien enimmäismäärä											
			TYPE B					TYPE C						
			10A	16A	20A	25A	32A	10A	16A	20A	25A	32A		
Bubo B3	408 -	1500	8,0 A	BGN(OLD)	1	1	2	2	3	1	1	2	2	3
		1300	7,0 A	BGN(OLD)	1	1	2	2	3	1	1	2	2	3
	360 -	1400	6,7 A	BGN(OLD)	1	1	2	2	3	1	1	2	2	3
				BG	1	2	2	3	4	1	2	2	3	4
				BGE	1	1	2	2	3	1	2	2	3	4
				BGN(OLD)	1	2	2	3	4	1	2	2	3	4
		1300	6,2 A	BG	1	2	3	4	5	1	2	3	4	5
				BGN(OLD)	1	2	2	3	4	1	2	2	3	4
		1200	5,7 A	BG	1	2	3	4	5	1	2	3	4	5
				BGE	1	1	2	2	3	1	2	3	4	5
				BGN(OLD)	1	2	3	4	5	1	2	3	4	5
				BG	2	3	4	5	6	2	3	4	5	6
	1050	5,0 A	BGE	1	1	2	2	3	1	2	3	4	5	
			BGN(OLD)	1	2	2	3	4	1	2	2	3	4	
	288 -	1200	4,7 A	BG	1	2	2	3	4	2	3	4	5	6
				BGE	1	1	2	2	3	1	2	2	3	4
		1050	4,1 A	BG	1	2	2	3	4	2	3	4	5	7
				BGE	1	1	2	2	3	1	2	3	4	5
		850	3,3 A	BG	1	2	2	3	4	2	3	4	5	7
				BGE	1	1	2	2	3	1	2	3	4	5

BUBO PARTY	RGB: B3 or 3*B1	5,7 A	BGE	1	1	2	2	3	1	2	2	3	4
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LEDs	GEAR	Inrush current peak 230VAC Käynnistysvirtapiikki 230VAC	Earth leakage current Maavuotovirta
408 & 360	BGN(OLD)	5,8A, t=11,2ms, (400VAC: 12A, t=6,8ms) (50% of Ipeak)	1,7 mA
360	BG	< 12A (pulses greater than 1ms) 45A, t=170µs (10% of Ipeak)	2,0 mA
360 & 288	BGE	40A, t=2500µs (400VAC: 68A, t=2000µs) (50% of Ipeak)	2,3 mA
360 & 288	BG3SE	45A, t=1080µs (400VAC: 75A, t=1120µs) (50% of Ipeak)	0,6 mA
288	BG	39A, t=1320µs (50% of Ipeak)	0,5 mA

Circuit breaker design charts for other versions 230VAC ta25°C

	LEDs	I_{in}	GEAR	Number of luminaires per circuit breaker Kytettävien valaisimien enimmäismäärä										
				TYPE B					TYPE C					
				10A	16A	20A	25A	32A	10A	16A	20A	25A	32A	
Bubo B2	272 -	1200	4,4 A	BG D4i	1	2	3	4	5	1	2	3	4	5
	240 -	1400	4,5 A	BG	2	3	4	5	7	2	3	4	5	7
				BGE	1	2	3	4	5	2	3	4	5	7
		1200	3,9 A	BG D4i	1	2	3	4	5	2	3	4	5	6
				BG	2	4	5	6	8	2	4	5	6	8
				BGE	1	2	3	4	5	2	4	5	6	8
				BG D4i	1	2	3	4	5	2	3	4	5	7
	1050	3,4 A	BG	2	4	5	7	9	2	4	5	7	9	
			BGE	1	2	3	4	5	2	4	5	6	8	
	192 -	1200	3,2 A	BG	2	3	4	5	6	3	5	6	7	10
				BGE	1	2	3	4	5	2	4	5	6	8
		1050	2,8 A	BG	2	3	4	5	6	3	5	6	8	11
				BGE	1	2	3	4	5	2	4	5	6	8
				BG	2	3	4	5	6	3	5	6	8	11
				BGE	1	2	3	4	5	2	4	5	6	8
850	2,3 A	BG	2	3	4	5	6	3	5	6	8	11		
		BGE	1	2	3	4	5	2	4	5	6	8		

LEDs	GEAR	Inrush current peak 230VAC Käynnistysvirtapiikki 230VAC	Earth leakage current Maavuotovirta
272 & 240	BG D4i	29A, t=2ms (50% of Ipeak)	0,4 mA
240	BG	< 8A (pulses greater than 1ms) 30A, t=170µs (10% of Ipeak)	1,3 mA
240 & 192	BGE	29A, t=2000µs (400VAC: 50A, t=2000µs) (50% of Ipeak)	2,5 mA
240 & 192	BG2SE	30A, t=1080µs (400VAC: 50A, t=1120µs) (50% of Ipeak)	0,4 mA
192	BG	26A, t=1320µs (50% of Ipeak)	0,3 mA

	LEDs	I_{in}	GEAR	Number of luminaires per circuit breaker Kytettävien valaisimien enimmäismäärä										
				TYPE B					TYPE C					
				10A	16A	20A	25A	32A	10A	16A	20A	25A	32A	
Bubo B1	136 -	1400	2,6 A	BGSE	3	5	6	7	9	3	5	6	7	9
		1200	2,2 A	BGS D4i	3	5	6	7	9	3	5	7	9	11
				BGSE	3	5	7	9	11	3	5	7	9	11
	120 -	1400	2,3 A	BGS	4	6	8	10	13	4	6	8	10	13
				BGSE	3	5	7	8	11	3	5	7	8	11
		1200	2,0 A	BGS D4i	3	5	6	7	9	4	6	8	10	12
				BGS	5	8	10	13	16	5	8	10	13	16
				BGSE	4	6	8	10	13	4	6	8	10	13
				BGS D4i	3	5	6	7	9	4	7	9	11	15
	1050	1,7 A	BGS	5	9	11	14	18	5	9	11	14	18	
			BGSE	4	7	9	11	15	4	7	9	11	15	
	96 -	1200	1,6 A	BGS	4	6	8	10	13	6	10	12	15	20
				BGSE	4	7	9	12	15	5	8	10	12	16
		1050	1,4 A	BGS	4	6	8	10	13	6	11	13	17	22
				BGSE	4	7	9	12	15	5	9	11	14	18
				BGS	4	6	8	10	13	6	11	13	17	22
				BGSE	4	7	9	12	15	4	7	14	18	23
	850	1,1 A	BGS	4	6	8	10	13	6	11	13	17	22	
BGSE			4	7	9	12	15	4	7	14	18	23		

LEDs	GEAR	Inrush current peak 230VAC Käynnistysvirtapiikki 230VAC	Earth leakage current Maavuotovirta
136 & 120	BGS D4i	14,5 A, t=2 ms (50% of Ipeak)	0,2 mA
120	BGS	< 4A (pulses greater than 1ms) 15A, t=170µs (10% of Ipeak)	0,6 mA
136, 120 & 96	BGSE	15A, t=1080µs (400VAC: 25A, t=1120µs) (50% of Ipeak)	0,2 mA
96	BGS	13A, t=1320µs (50% of Ipeak)	0,2 mA