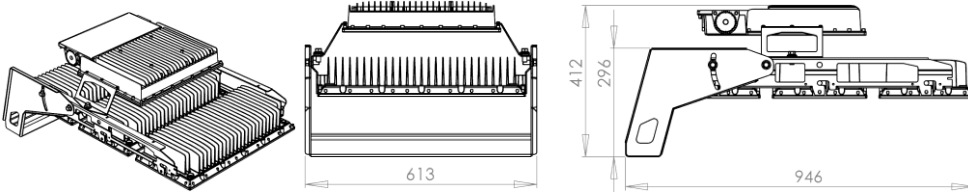


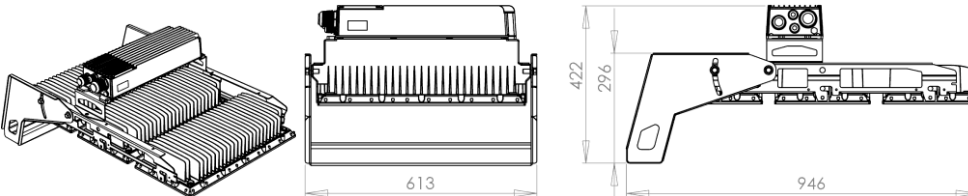
Bubo 2.0 B3 & B2 - Mounting instructions



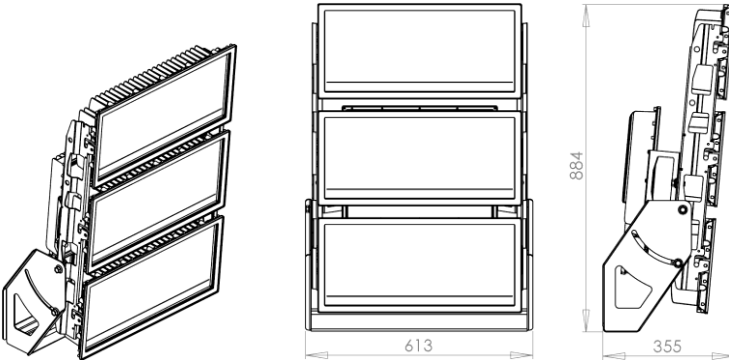
Bubo B3 Area (with BG gear: B3G)



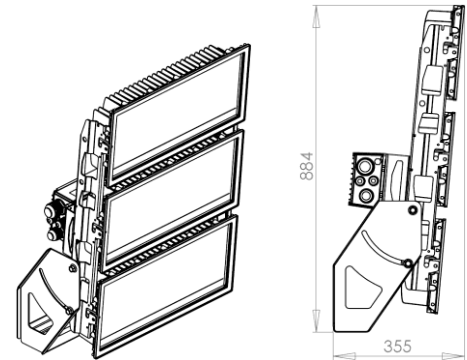
Bubo B3 Area (with BGN gear: B3GN)



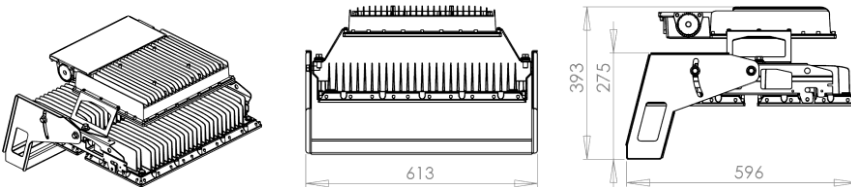
Bubo B3 Stadium (with BG gear: B3G)



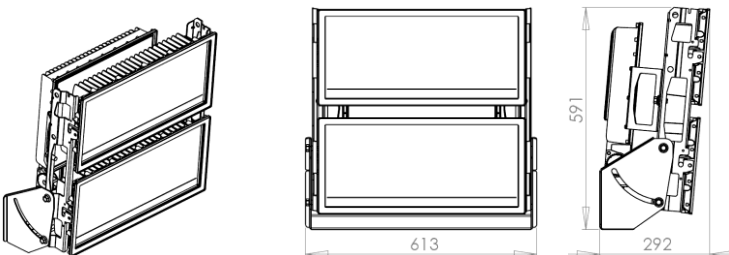
Bubo B3 Stadium (with BGN gear: B3GN)



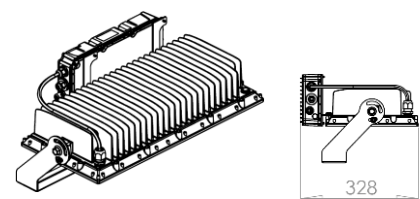
Bubo B2 Area (with BG gear: B2G)



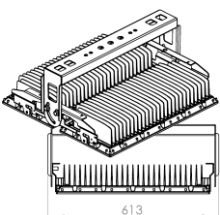
Bubo B2 Stadium (with BG gear: B2G)



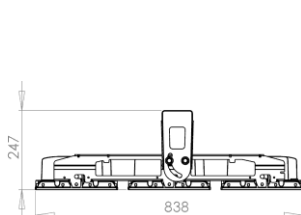
Bubo B1 Area (with BGSE gear: B1GE)



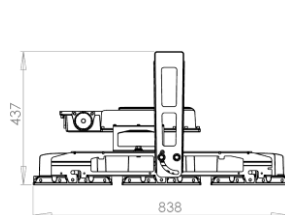
Bubo Pendant



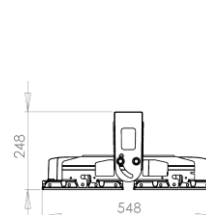
B3 Pendant S



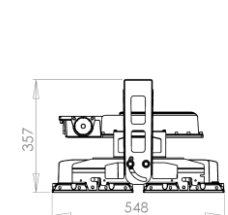
B3 Pendant L



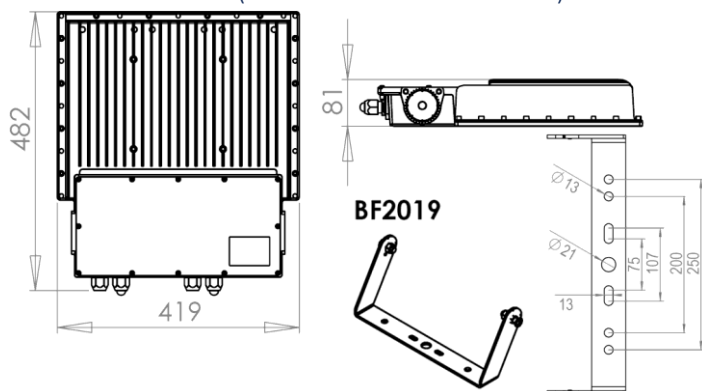
B2 Pendant S



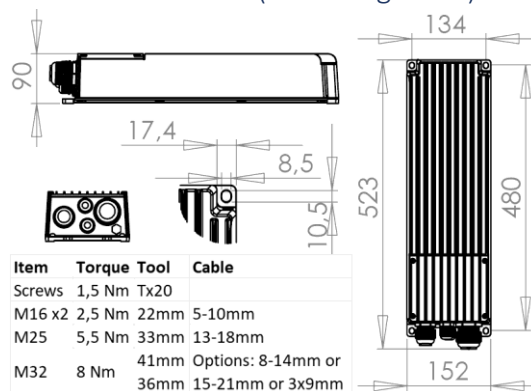
B2 Pendant L



BG Gear unit size (available bracket mount)



BGN Gear unit size (mounting holes)

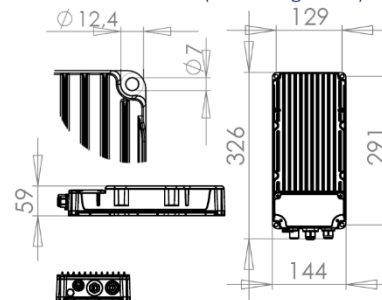


Item	Torque	Tool	Cable
Screws	1,5 Nm	Tx20	
M16 x2	2,5 Nm	22mm	5-10mm
M25	5,5 Nm	33mm	13-18mm
M32	8 Nm	41mm	Options: 8-14mm or 36mm 15-21mm or 3x9mm

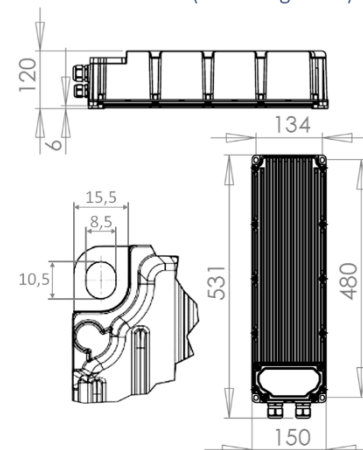
Bubo weight [kg]

	Luminaire		Bracket		
	Light Engines, Rack & Gear	Area	Stadium	Pendant L	Pendant S
Bubo B3GN	39				
Bubo B3G - 360LED	40	8,2	8,1	6,4	5,6
Bubo B3G - 288LED	41				
Bubo B2G Zhaga	31				
Bubo B2G - 240LED	29	5,0	5,1	4,0	3,6
Bubo B2G - 192LED	30				
Bubo B2GSE - 240LED	29	5,0	5,1	4,0	3,6
Bubo B2GSE - 192LED	29				
	Light Engine & Gear	Area	Floodlight	Pendant	B1G Pendant
Bubo B1G Zhaga	14,1				
Bubo B1G - 120LED	13,1				
Bubo B1G - 96LED	13,5	2,1	2,4	2,0	2,2
Bubo B1GE - 136LED	12,6				
Bubo B1GE - 120LED	12,5				
Bubo B1GE - 96LED	12,3				

BGSE Gear unit size (mounting holes)



BGE Gear unit size (mounting holes)



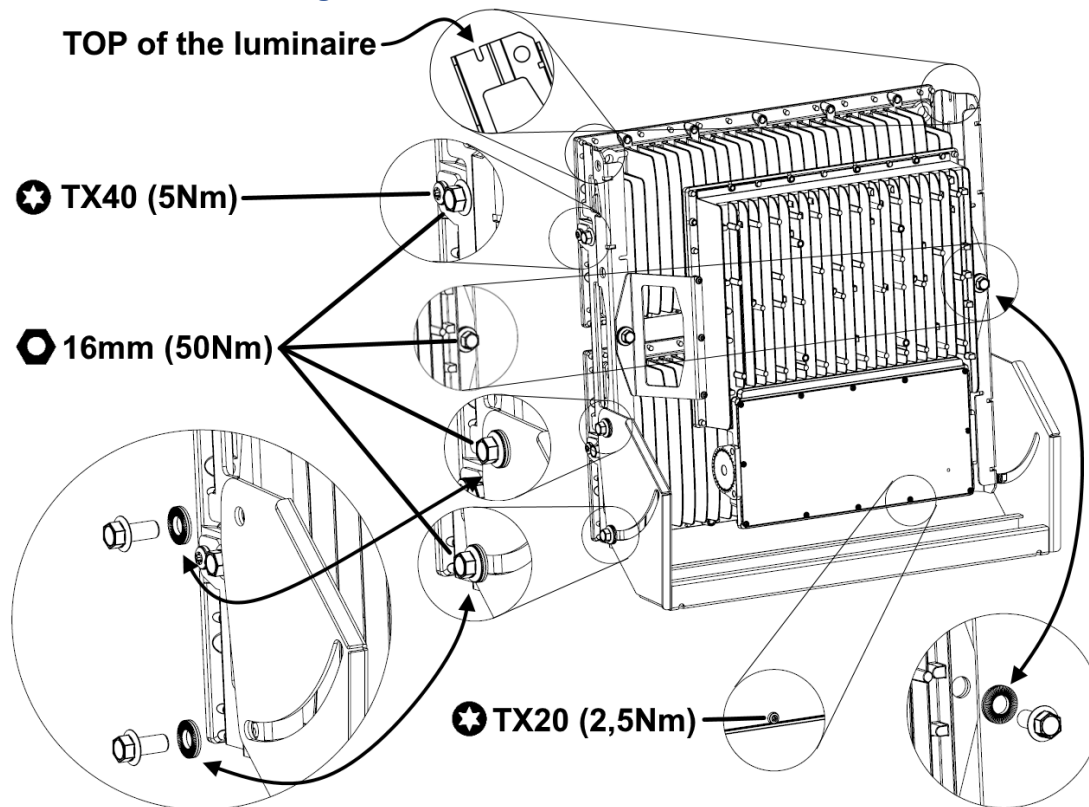
	Luminaire		Drivers			
	Light Engines & Rack	Area	BG unit	BG ZT unit	BGN unit	BGE unit
Bubo B3 - 408LED	31				7,0	
Bubo B3 - 360LED	31	8,5				6,1
Bubo B3 - 288LED	30	10,5				
Bubo B2 - 272LED	20			9,7		
Bubo B2 - 240LED	20	7,6				5,4
Bubo B2 - 192LED	20	9,0				
	Light Engine	Area	BGSE unit			
Bubo B1 - 136LED	9,2					
Bubo B1 - 120LED	9,1					
Bubo B1 - 96LED	9,0					

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

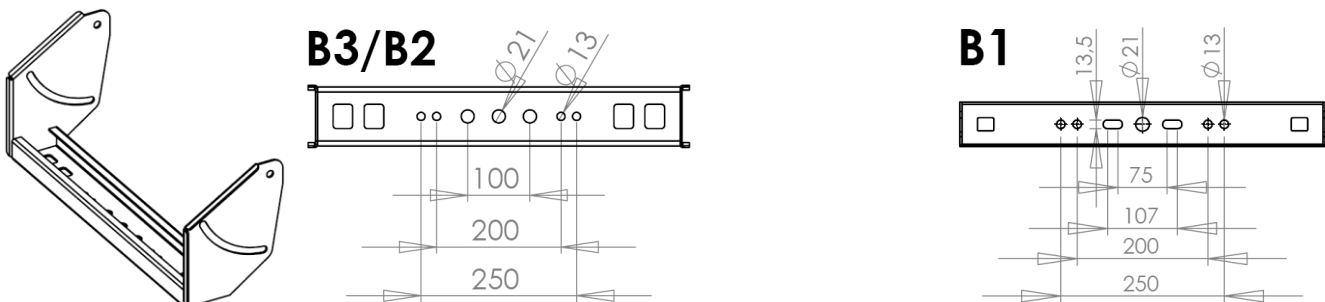
Bubo A_w [m²]

	Bracket Style	Drivers	Installation angle												
			0deg			10deg		25deg		40deg		65deg		85deg	
			Top	Front	Side	Front	Side	Front	Side	Front	Side	Front	Side	Front	Side
Bubo B3	Area	With BG Gear unit	0,54	0,13	0,16	0,22	0,17	0,32	0,17						
		Luminaire only	0,52	0,10	0,12	0,18	0,13	0,32	0,13						
	Stadium	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 BG Gear unit	0,36	0,12	0,11	0,19	0,12	0,25	0,12						
		Luminaire only	0,33	0,09	0,08	0,13	0,08	0,21	0,09						
	Stadium	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 BGS Gear unit	0,19	0,08	0,04	0,10	0,04	0,12	0,04						
		Luminaire only	0,15	0,07	0,03	0,09	0,03	0,11	0,03						
	Flood	With BGS Gear unit	0,19	0,09	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	0,10	0,04	0,12	0,04	0,14	0,03	0,16	0,03	0,17	0,03

Installation – Mounting



Fixation Bracket detail



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

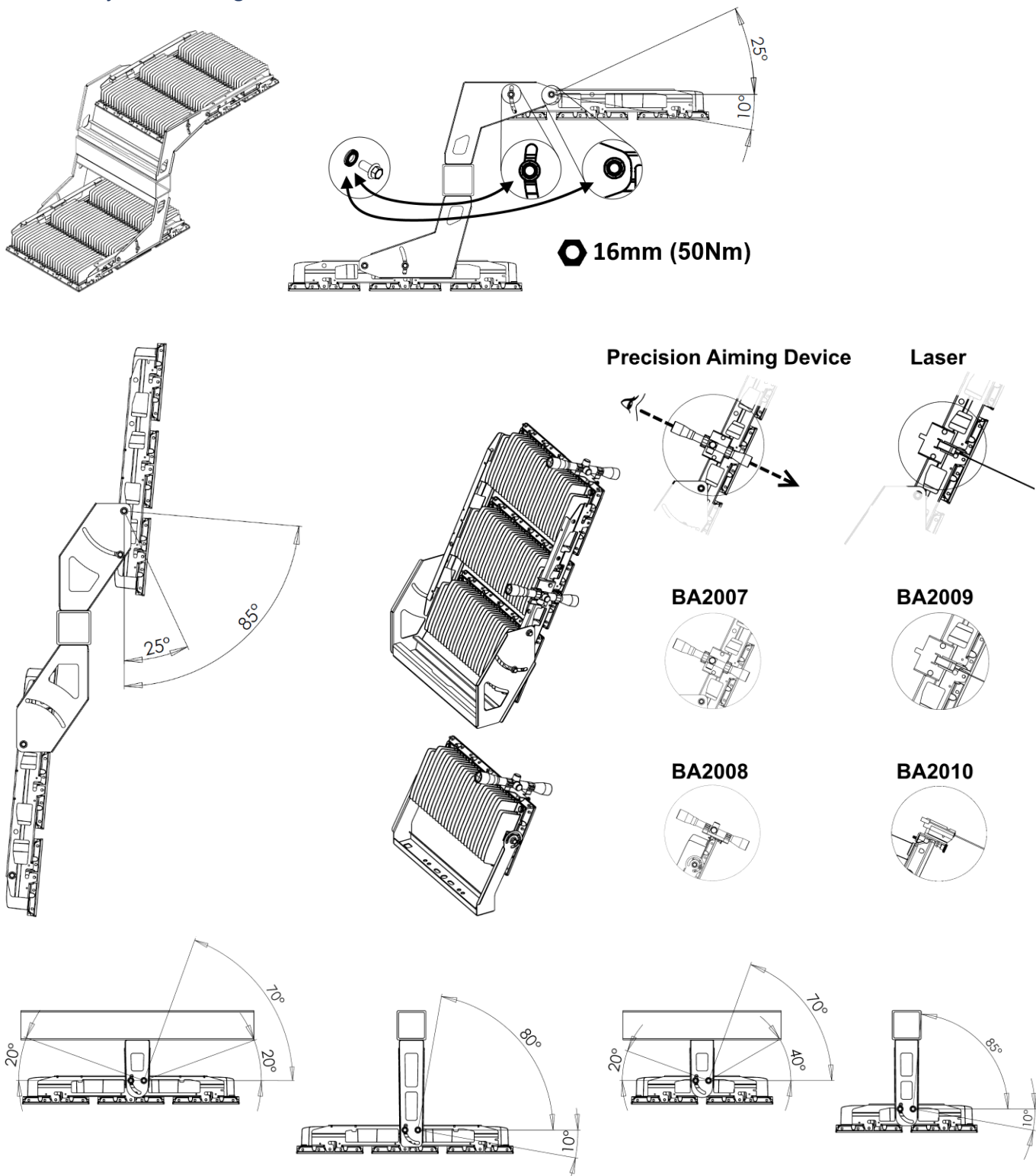
In case of using only one fixation point and if the luminaire is higher than 3m, the use of a 2nd fixing security system is advised.

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

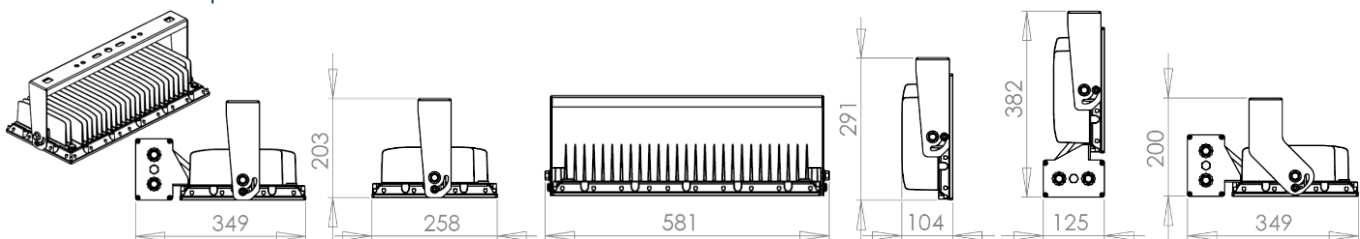
Adjusting luminaire angle

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

Bracket adjustment range

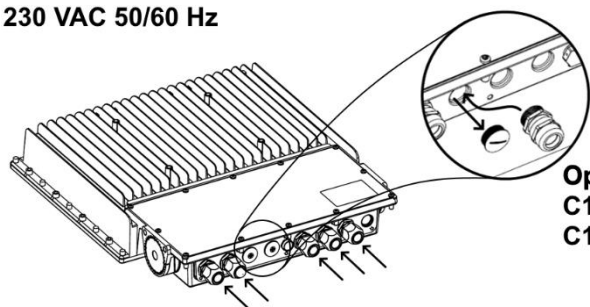


Bubo B1 & B1G pendant brackets



Installation – Electrical connections

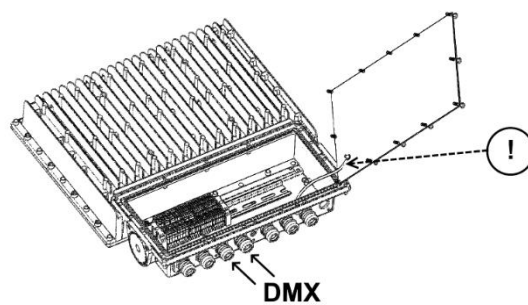
230 VAC 50/60 Hz



Option 7-13mm:
C12888 (M20)
C11729 (M20 metal)

Ø 7-13mm ∩ 5Nm 🔧 25mm

Metal: Ø 7-13mm ∩ 11Nm 🔧 24mm



DMX

Ø 6-10mm ∩ 5Nm 🔧 22mm

Metal: Ø 6-12mm ∩ 11Nm 🔧 24mm

BL light unit standard cable wire colors:

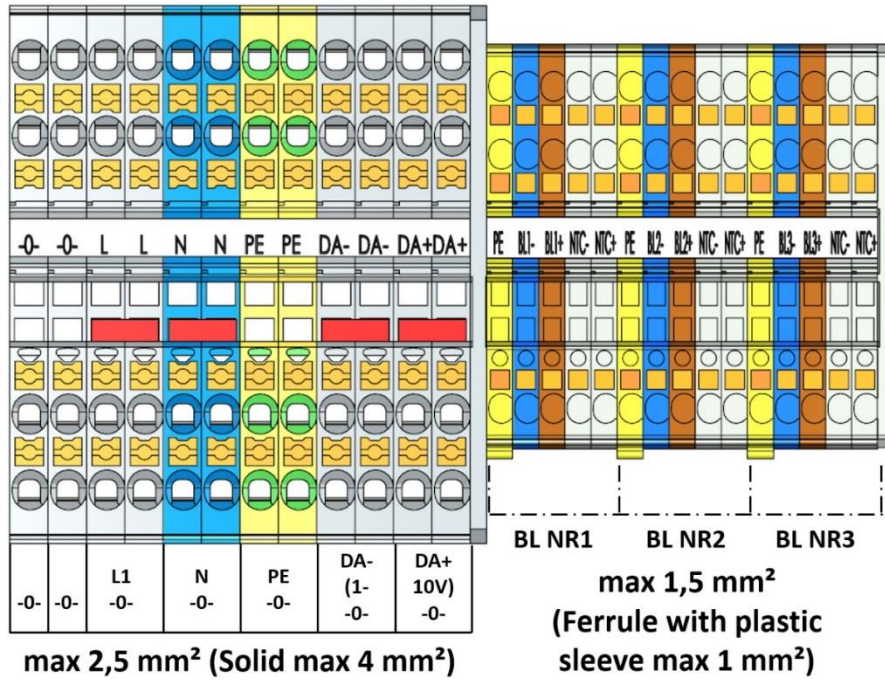
	EN		FI	SE	DE
PE	GN-YE	GREEN-YELLOW	KE-VI	GR-GU	GN-GE
LED-	BU	BLUE	SI	BL	BL
LED+	BN	BROWN	RU	BR	BR
NTC-	BK	BLACK	MU	SV	SW
NTC+	WH	WHITE	VA	VT	WS

Make connections according to terminal markings

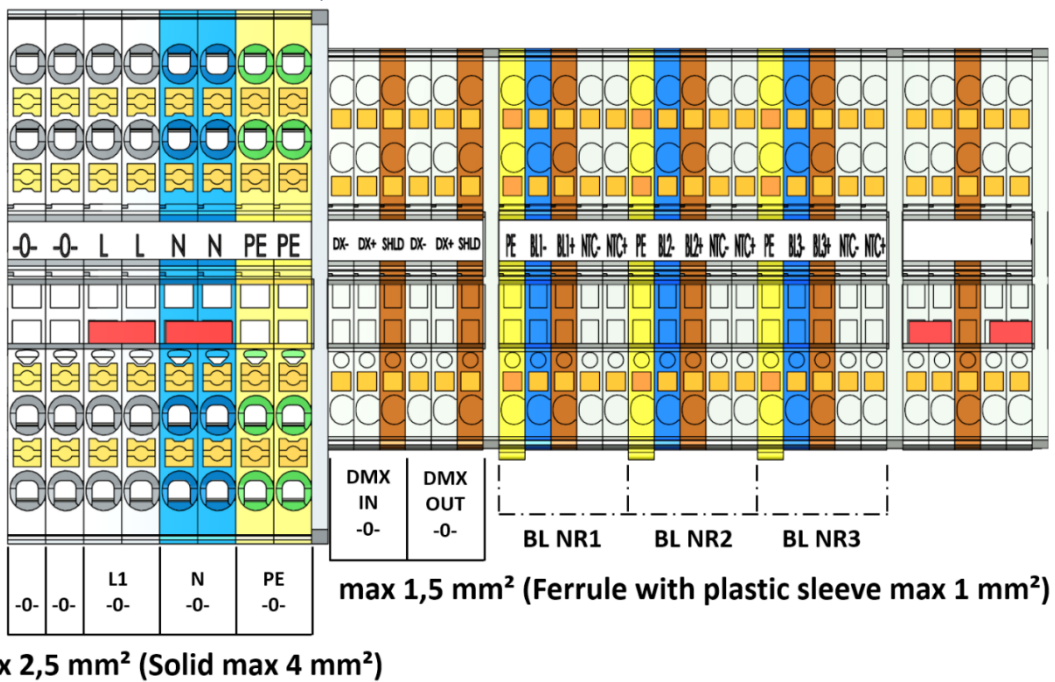
Notification regarding cables

- 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

BG DALI and 1-10V electrical connections – example



BG DMX electrical connections – example

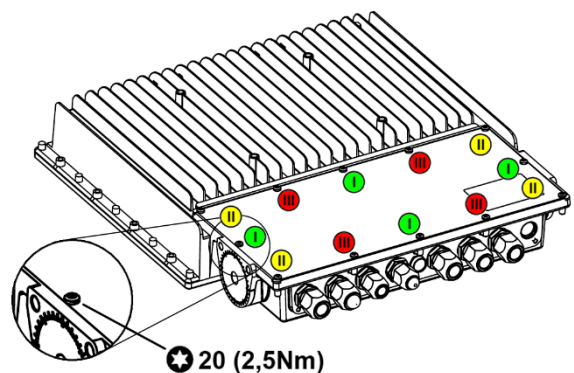


Closing the BG Gear unit

Use correct closing order and appropriate 2,5Nm torque

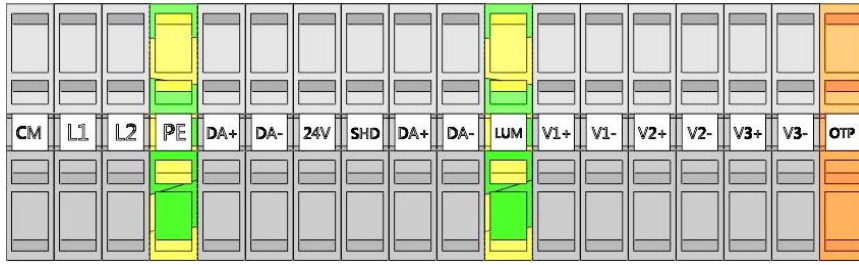
- I. Begin tightening screws from the middle of sides
- II. Tighten corners next
- III. Tighten the remaining screws

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



BGN electrical connections 230...400VAC

Bubo DALI, D4i or DMX

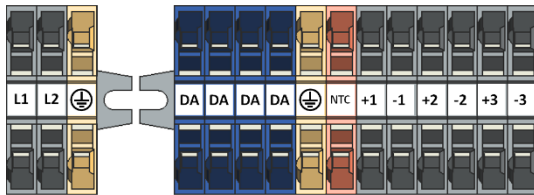


Label	Number	Description	Label	Number	Description
CM	1	Surge protection connection	LUM	11	Protection Earth for LED module
L1	2	AC input L1/L	V1+	12	BL1 LED+ Connection
L2	3	AC input L2/N	V1-	13	BL1 LED- Connection
PE	4	Protection Earth	V2+	14	BL2 LED+ Connection
DA+	5	Reused, DALI/DMX input+	V2-	15	BL2 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-			

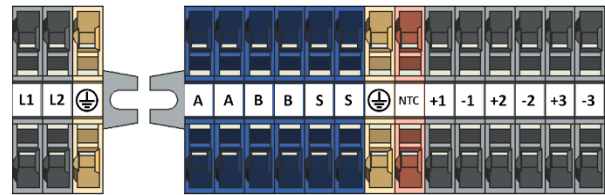
Connectors are compatible with 0,75...2,5mm² cross-section wiring

BGE electrical connections - examples 230...400VAC

Bubo DALI



Bubo DMX



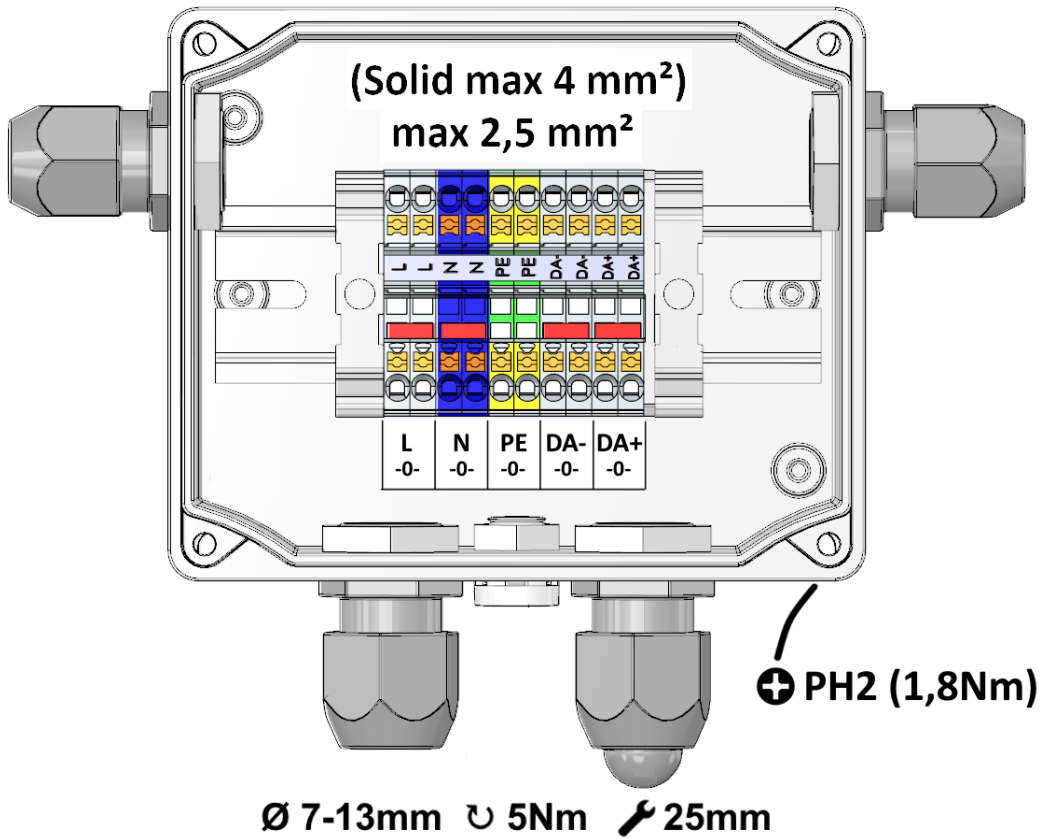
BGE SIGNALLING LED INDICATIONS

Period	Pulses	Fault description	Priority
The encoded faults are based on pulses emitted every 4 seconds	1	One or more active CCR module is not working	<div style="text-align: center;"> <p>MAXIMUM</p> <p>MINIMUM</p> </div>
	5	Firmware version of one or more CCR module is not compatible with main control board firmware	
	2	One or more output is short-circuited	
	3	One or more output is disconnected from load	
	4	Thermal derating active (output current reduction)	

Electrical notes

- Regarding DALI, D4i & 1-10V controls:
 - EN: Control circuit must be provided with cable which is insulated according to the mains voltage.
 - FI: Ohjauksiirissä on käytettävä verkkojännitteen mukaan eristettyjä johtimia.
 - SE: Styrkrets måste ha kabel som är isolerad enligt nätspänningen.
 - DE: Der Steuerkreis muss mit einem Kabel versehen sein, die entsprechend der Netzspannung isoliert ist.
- 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.

BG3SE & BG2SE DALI electrical connections - Example



Suitable LED cable lengths 230VAC

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

		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	100 m	3 m	25 m	150 m
	288 LED	3 m	10 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	100 m	3 m	25 m	150 m
	192 LED	3 m	10 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	100 m	3 m	25 m	150 m
	96 LED	3 m	10 m	10 m	3 m	25 m	150 m

		ZHAGA: BG / BGS			BGN	
		LED NTC WIRING	NO NTC		LED NTC WIRING	NO NTC
Bubo B2	272 LED	3 m	50 m	2.5mm ² wiring	300 m	300 m
	240 LED	3 m	50 m			
Bubo B1	136 LED	3 m	50 m	1.5mm ² wiring	100 m	100 m
	120 LED	3 m	50 m			

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.
- Any modification on the luminaire will cancel the warranty

Circuit breaker design charts 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	1	1	2	2	3	1	1	2	2	3
		1300	7,0 A	BGN	1	1	2	2	3	1	1	2	2	3
	360 -	1400	6,7 A	BGN	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	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	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	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	
			BG	1	2	2	3	4	2	3	4	5	6	
	288 -	1200	4,7 A	BGE	1	1	2	2	3	1	2	2	3	4
				BG	1	2	2	3	4	2	3	4	5	6
		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	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

	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	
			BG	2	3	4	5	6	3	5	6	7	10	
			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 I _{peak})	0,4 mA
240	BG	< 8A (pulses greater than 1ms) 30A, t=170μs (10% of I _{peak})	1,3 mA
240 & 192	BGE	29A, t=2000μs (400VAC: 50A, t=2000μs) (50% of I _{peak})	2,5 mA
240 & 192	BG2SE	30A, t=1080μs (400VAC: 50A, t=1120μs) (50% of I _{peak})	0,4 mA
192	BG	26A, t=1320μs (50% of I _{peak})	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	
			BGS	4	6	8	10	13	6	10	12	15	20	
			BGSE	4	7	9	12	15	5	8	10	12	16	
	96 -	1200	1,6 A	BGS	4	6	8	10	13	6	11	13	17	22
				BGSE	4	7	9	12	15	5	9	11	14	18
		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	9	11	15	
850	1,1 A	BGS	4	6	8	10	13	6	11	13	17	22		
		BGSE	4	7	9	12	15	4	7	9	11	15		

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