

lichtwerk  
inspired by light

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## Table structure

The tabular structure enables an overview of the essential features.

**Type**  
Designation of the luminaire

**LED Specification**  
Luminous flux lumen (lm)  
Colour rendering index RA  
Colour temperature Kelvin (K)

**NEW**

**Item-number** → the last digit of the article number indicates the housing colour  
543 3044 10... → ...1

Luminaire weight net (without packaging)

Type	LED Specification	P <sub>sys</sub> (W)	Driver	Item-number	Colour	Colour	Colour	kg
Sample luminaire	LED 2400lm 840 LB	20	ED	543 3044 10...	■ ...5	□ ...1	■ ...4	3
	LED 4500lm 840 LB	41	DALI	543 3144 10...	■ ...5	□ ...1	■ ...4	3

P<sub>sys</sub> | Lighting system performance

**Driver**

- ED | Electronic Driver, non dimmable
- DALI | Electronic Driver, DALI, dimmable
- DALI DT8 | Electronic Driver, DALI, dimmable, adjustable light colour
- Tast dim | dimmable via push button
- NL-B | Emergency light battery powered

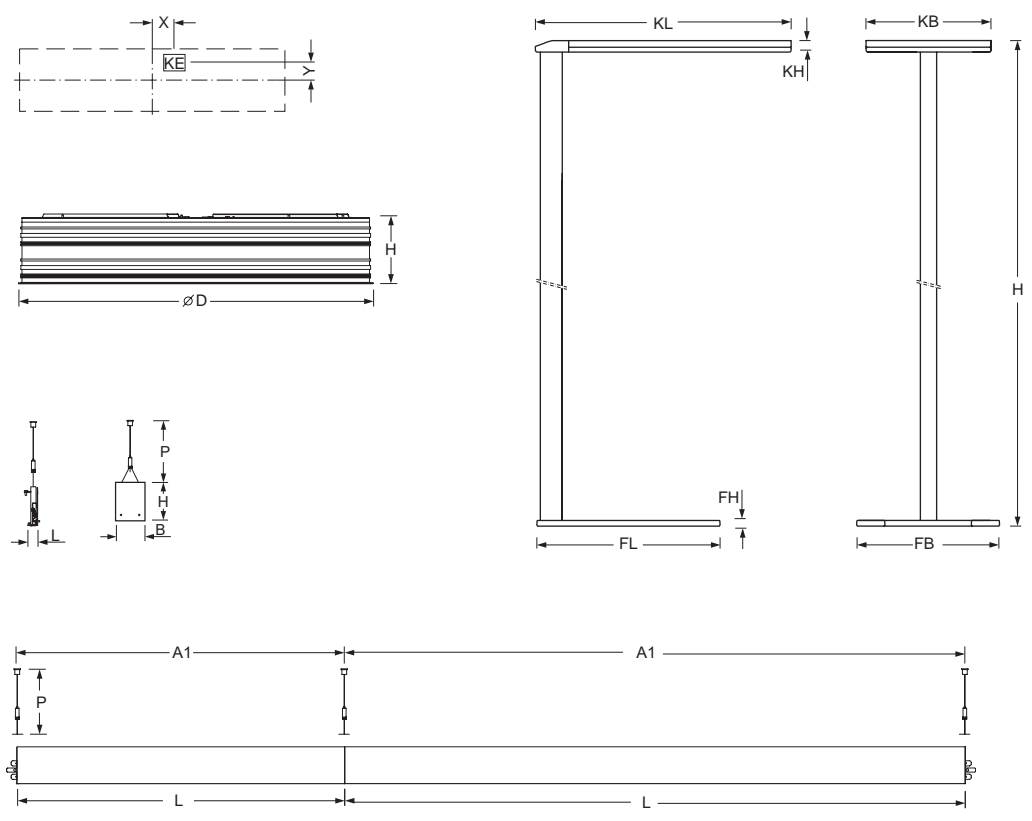
**Colour code/colour**

- | aluminium natural anodized
- | traffic white (similar RAL 9016)
- wa | withe-aluminium (similar RAL 9006)
- | deep black (similar RAL 9005)
- sg | silver grey
- | stainless steel
- cr | chrome
- si | silver
- tc | translucent
- cl | clear
- gr | grit grey















▶ Please refer to the current data for LED luminaires at [www.lichtwerk.de](http://www.lichtwerk.de)

# INDEX



### Definition of measurement table variants

- L | Length
- L | Length/Width for square luminaires
- L2 | Additional length
- B | Width
- H | Height
- ∅D | Diameter
- FL | Length of luminaire base
- FB | Width of luminaire base
- FD | Diameter of luminaire base
- T | Depth
- KE | Cable infeed
- KL | Length of luminaire head or ballast box
- KB | Width of luminaire head or ballast box
- KH | Height of luminaire head or ballast box
- KD | Diameter of luminaire head or ballast box
- A1 | Fixing distance in case of single mounting
- A2 | Fixing distance between the luminaires in case of light run mounting
- X | Distance from centre of the luminaire to the electrical feed in (x direction = length)
- Y | Distance from centre of the luminaire to the electrical feed in (y direction = width)
- SL | Length of cut for recessed luminaires
- SB | Width of cut for recessed luminaires
- SD | Diameter of cut for recessed luminaires
- e | Minimum necessary depth for luminaire mounting
- ML | Modul (axis) Length
- MB | Modul (axis) Width
- P | Wire suspension
- P min/max | Min./Max. length wire suspension
- DS min/max | Min./Max. ceiling thickness in case of suspended ceiling
-  | for ceilings with visible T-rails
-  | for cut-out ceilings

Recessed luminaires	
Surface mounted luminaires	
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Phase-track and luminaires	
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# DOWNLIGHTS

# Downlights



rotara-ROET/144

P. 370



# INDEX



bota 195-BESB P. 360



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Downlights  
from other chapters



Recessed luminaires



lopia R-EG P. 24



lopia Q-EG P. 32





## bota 195-BESB

IP20   IK02    

### Housing

Housing made of sheet steel with cover ring made of pressure-cast aluminium painted traffic white (similar to RAL 9016) or grit grey (similar to RAL 7032). With mounting springs for installation without tools, suitable for ceiling thickness 10-25mm.

### Lighting technology -BESB

Direct wide distribution.

Light distribution using specular individually anodised reflector made of ultra-pure aluminium. Toolless reflector assembly via snap in spring system.

For VDU workstations according to DIN EN 12464-1,  $65^\circ < 1000\text{cd/m}^2$ .

Glare rating UGR  $\leq 19$  according to DIN EN 12464-1 by variant 1200lm and 1800lm.

Rated life time = L80 B10 50.000h.

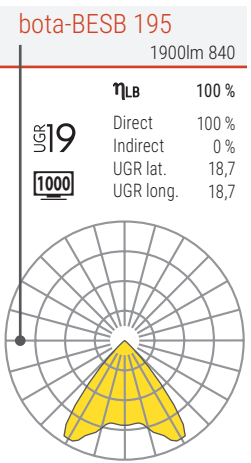
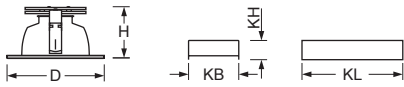
Light colour: 4000K. Optional: 3000K. Other light colours on request.

### Miscellaneous

External supply unit wired with luminaire ready for operation. Electrical connection via three-pole or for dimmable luminaires five-pole terminal with plug-in contact.



Type	LED Specification	Ceiling	DxH	KL	KB	KH	SD	e min.	DS min./max.
bota-BESB 195	LED 1300		246 x 113	167	146	48	229	165	10-25
	LED 1900		246 x 113	167	146	48	229	165	10-25
	LED 2900		246 x 117	167	146	48	229	165	10-25



Type	LED Specification	P <sub>sys</sub> (W)	Driver	Item-number	Colour	Colour	(kg)
bota-BESB 195	LED 1300lm 840	10	ED	879 0314 12...	<input type="checkbox"/> ...0	<input checked="" type="checkbox"/> ...5	0,7
	LED 1900lm 840	16	ED	879 0334 12...	<input type="checkbox"/> ...0	<input checked="" type="checkbox"/> ...5	0,8
	LED 1900lm 840	16	DALI	879 0336 62...	<input type="checkbox"/> ...0	<input checked="" type="checkbox"/> ...5	0,8
	LED 2900lm 840	23	ED	879 0354 12...	<input type="checkbox"/> ...0	<input checked="" type="checkbox"/> ...5	1,0
	LED 2900lm 840	23	DALI	879 0356 62...	<input type="checkbox"/> ...0	<input checked="" type="checkbox"/> ...5	1,0

► Please refer to the current data for LED luminaires at [www.lichtwerk.de](http://www.lichtwerk.de)





## bota 195-BESSB

IP54  IK02   $\begin{matrix} 0.20 \\ 0.20 \end{matrix}$     

### Housing

Housing made of sheet steel with cover ring made of pressure-cast aluminium painted traffic white (similar to RAL 9016) or grit grey (similar to RAL 7032). With translucent cover made of safety glass IP54. Including mounting springs for installation without tools, suitable for ceiling thickness 10-25mm.

### Lighting technology -BESSB

Direct wide distribution.

Light distribution via micro-structured, individually anodised reflector of ultra-pure aluminium. Toolless reflector assembly via snap in spring system.

Rated life time = L80 B10 50.000h.

Light colour: 4000K. Optional: 3000K. Other light colours on request.

### Miscellaneous

External supply unit wired with luminaire ready for operation. Electrical connection via three-pole or for dimmable luminaires five-pole terminal with plug-in contact.

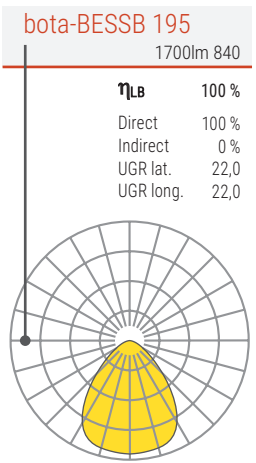
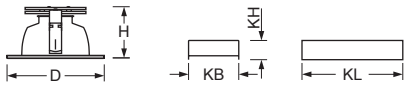


traffic white 



grit grey 

Type	LED Specification	Ceiling	DxH	KL	KB	KH	SD	e min.	DS min./max.
bota-BESSB 195	LED 1100		246 x 113	167	146	48	229	165	10-25
	LED 1700		246 x 113	167	146	48	229	165	10-25
	LED 2500		246 x 117	167	146	48	229	165	10-25



Type	LED Specification	P <sub>sys</sub> (W)	Driver	Item-number	Colour	Colour	
bota-BESSB 195	LED 1100lm 840	10	ED	879 1314 12...	<input type="checkbox"/> ...0	<input checked="" type="checkbox"/> ...5	0,9
	LED 1700lm 840	16	ED	879 1334 12...	<input type="checkbox"/> ...0	<input checked="" type="checkbox"/> ...5	1,0
	LED 1700lm 840	16	DALI	879 1336 62...	<input type="checkbox"/> ...0	<input checked="" type="checkbox"/> ...5	1,0
	LED 2500lm 840	23	ED	879 1354 12...	<input type="checkbox"/> ...0	<input checked="" type="checkbox"/> ...5	1,3
	LED 2500lm 840	23	DALI	879 1356 62...	<input type="checkbox"/> ...0	<input checked="" type="checkbox"/> ...5	1,3

► Please refer to the current data for LED luminaires at [www.lichtwerk.de](http://www.lichtwerk.de)















## vico-ESO

IP44    

### Housing

Housing made of pressure-cast aluminium, painted traffic white (similar to RAL 9016). Aluminium heat sink for effective passive cooling and recessed opal diffuser panel to break up the ceiling appearance. With fixing springs for installation without tools, suitable for ceiling thickness of 10mm-20mm.

### Lighting technology -ESO

Direct wide distribution.

Light distribution via satined opal diffuser.




Rated life time = L80 B10 50.000h.

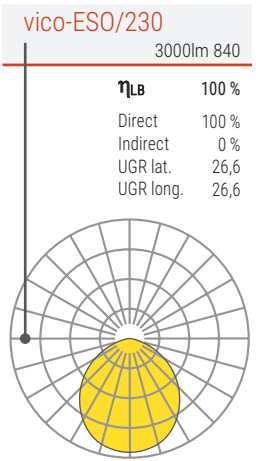
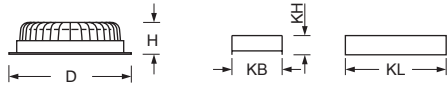
Light colour: 4000K or 3000K. Other light colours on request.

### Miscellaneous

External driver, wired with luminaire ready for operation.

Electrical connection via 0,7m long connection line, 2x0,75mm<sup>2</sup> or for dimmable luminaires 2x0,5mm<sup>2</sup> + 2x0,75mm<sup>2</sup>.

Type	Ceiling	DxH	KL	KB	KH	e min.	SD	DS min./max.
vico-ESO/140		140 x 45	240	30	21	95	125	10-20
vico-ESO/190		190 x 59	240	30	21	110	175	10-20
vico-ESO/230		230 x 59	240	30	21	110	215	10-20



Type	LED Specification	P <sub>sys</sub> (W)	Driver	Item-number	Colour	$\Omega$ [kg]
vico-ESO/140	LED 1500lm 830	16	ED	379 1114 140	<input type="checkbox"/>	0,6
	LED 1500lm 830	16	DALI	379 1116 640	<input type="checkbox"/>	0,6
	LED 1500lm 840	16	ED	379 1104 140	<input type="checkbox"/>	0,6
	LED 1500lm 840	16	DALI	379 1106 640	<input type="checkbox"/>	0,6
vico-ESO/190	LED 2000lm 830	21	ED	379 2114 140	<input type="checkbox"/>	0,9
	LED 2000lm 830	21	DALI	379 2116 640	<input type="checkbox"/>	0,9
	LED 2000lm 840	21	ED	379 2104 140	<input type="checkbox"/>	0,9
	LED 2000lm 840	21	DALI	379 2106 640	<input type="checkbox"/>	0,9
vico-ESO/230	LED 3000lm 830	31	ED	379 3114 140	<input type="checkbox"/>	1,2
	LED 3000lm 830	31	DALI	379 3116 640	<input type="checkbox"/>	1,2
	LED 3000lm 840	31	ED	379 3104 140	<input type="checkbox"/>	1,2
	LED 3000lm 840	31	DALI	379 3106 640	<input type="checkbox"/>	1,2

► Please refer to the current data for LED luminaires at [www.lichtwerk.de](http://www.lichtwerk.de)

Accessories	Type	Details	Item-number	$\Omega$ [kg]
Mounting reinforcing	vico-ESO 140	Insert for mineral fibre ceilings for vico-ESO 140; 625x625	379 1000 000	1,2
	vico-ESO/6 140	Insert for mineral fibre ceilings for vico-ESO/6 140; 600x600	379 1600 000	1,2
	vico-ESO 190	Insert for mineral fibre ceilings for vico-ESO 190; 625x625	379 2000 000	1,2
	vico-ESO/6 190	Insert for mineral fibre ceilings for vico-ESO/6 190; 600x600	379 2600 000	1,2
	vico-ESO 230	Insert for mineral fibre ceilings for vico-ESO 230; 625x625	379 3000 000	1,2
	vico-ESO/6 230	Insert for mineral fibre ceilings for vico-ESO/6 230; 600x600	379 3600 000	1,2









## rotara-ROET/144

IP20      

### Housing

Housing made of pressure-cast aluminium, heat sink for effective passive cooling; powder-coated; round body. Reflector unit gimbal-mounted, with fixing springs for installation without tools, suitable for ceiling thickness 10mm-20mm.

### Lighting technology -ROET

Direct narrow distribution.

Light distribution via matt segmented reflector made of highly-efficient MIRO-SILVER aluminium with an reflection ratio of 99,8%; beam angle 30°; clear safety glass.

For VDU workstations  $65^\circ < 3000\text{cd/m}^2$ ,  $\text{UGR} \leq 19$  according to DIN EN 12464-1.

Rated life time = L80 B10 50.000h.

Light colour: 4000K or 3000K. Other light colours on request.


### Miscellaneous

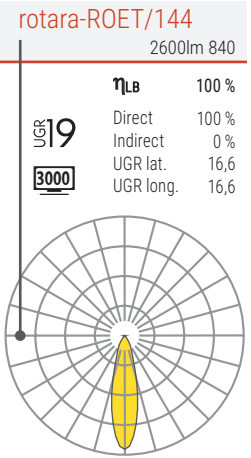
External driver, wired with luminaire ready for operation.


Electrical connection via 0,7m long connection line,  $2 \times 0,75\text{mm}^2$  or for dimmable luminaires  $2 \times 0,5\text{mm}^2 + 2 \times 0,75\text{mm}^2$ .

### Accessories

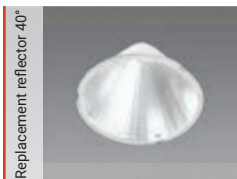
Replacement reflector 40°, highly specular faceted must be ordered separately.

Type	Ceiling	DxH	KL	KB	KH	e	SD	DS min./max.
ROET/144		138x94	115	53	23	140	120	10-20



Type	LED Specification	$\alpha$	P <sub>sys</sub> (W)	Driver	Item-number	Colour	
rotara-ROET/144	LED 2500lm 830	30°	23	ED	337 0034 130	<input type="checkbox"/>	0,4
	LED 2500lm 830	30°	23	DALI	337 0036 630	<input type="checkbox"/>	0,4
	LED 2600lm 840	30°	23	ED	337 0044 130	<input type="checkbox"/>	0,4
	LED 2600lm 840	30°	23	DALI	337 0046 630	<input type="checkbox"/>	0,4

► Please refer to the current data for LED luminaires at [www.lichtwerk.de](http://www.lichtwerk.de)



Accessories	Type	Details	Item-number	Colour	
Replacement reflector	RO/144-LED 40°	Beam angle 40°, for ROE./144	321 4014 140	<input type="checkbox"/>	0,1











## rotara-ROET/160

IP20      

### Housing

Housing made of pressure-cast aluminium, heat sink for effective passive cooling; powder-coated; round body. Reflector unit gimbal-mounted, with fixing springs for installation without tools, suitable for ceiling thickness 10mm-20mm.

### Lighting technology -ROET

Direct narrow distribution.

Light distribution via highly specular faceted reflector made of highly-efficient MIRO-SILVER aluminium with an reflection ratio of 99,8%; beam angle 30°; clear safety glass.

For VDU workstations  $65^\circ < 1000\text{cd/m}^2$ ,  $\text{UGR} \leq 19$  according to DIN EN 12464-1.

Rated life time = L80 B10 50.000h.

Light colour: 4000K or 3000K. Other light colours on request.


### Miscellaneous

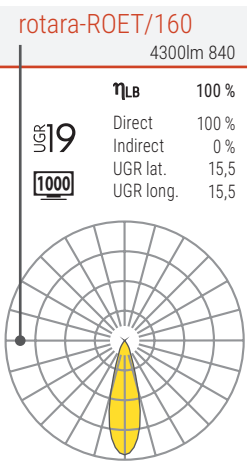
External driver, wired with luminaire ready for operation.

Electrical connection via 0,7m long connection line,  $2 \times 0,75\text{mm}^2$  or for dimmable luminaires  $2 \times 0,5\text{mm}^2 + 2 \times 0,75\text{mm}^2$ .

### Accessories

Replacement reflector 60°, matt segmented must be ordered separately.

Type	Ceiling	DxH	KL	KB	KH	e	SD	DS min./max.
ROET/160		182x119	170	45	35	160	170	10-20



Type	LED Specification	α	P <sub>sys</sub> (W)	Driver	Item-number	Colour	kg
rotara-ROET/160	LED 4100lm 830	30°	36	ED	337 0054 130	<input type="checkbox"/>	1,7
	LED 4100lm 830	30°	36	DALI	337 0056 630	<input type="checkbox"/>	1,7
	LED 4300lm 840	30°	36	ED	337 0064 130	<input type="checkbox"/>	1,7
	LED 4300lm 840	30°	36	DALI	337 0066 630	<input type="checkbox"/>	1,7

► Please refer to the current data for LED luminaires at [www.lichtwerk.de](http://www.lichtwerk.de)



Accessories	Type	Item-number	Colour	kg
Replacement reflector	RO/160-LED 60° Beam angle 60°, for ROE./160	321 5014 140	<input type="checkbox"/>	0,1





H





Öle

Flaschenweine







## rotara-ROEQT/144

IP20      

### Housing

Housing made of pressure-cast aluminium, heat sink for effective passive cooling; powder-coated; square body. Reflector unit gimbal-mounted, with fixing springs for installation without tools, suitable for ceiling thickness 10mm-20mm.

### Lighting technology -ROEQT

Direct narrow distribution.

Light distribution via matt segmented reflector made of highly-efficient

MIRO-SILVER aluminium with an reflection ratio of 99,8%;

beam angle 30°; clear safety glass.

For VDU workstations  $65^{\circ} < 3000\text{cd/m}^2$ ,  $\text{UGR} \leq 19$  according to DIN EN 12464-1.

Rated life time = L80 B10 50.000h.

Light colour: 4000K or 3000K. Other light colours on request.

### Miscellaneous


External driver, wired with luminaire ready for operation.

Electrical connection via 0,7m long connection line,  $2 \times 0,75\text{mm}^2$

or on dimmable luminaires  $2 \times 0,5\text{mm}^2 + 2 \times 0,75\text{mm}^2$ .

### Accessories

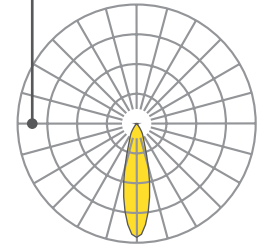
Replacement reflector 40°, highly specular faceted must be ordered separately.


Type	Ceiling	LxBxH	KL	KB	KH	e	SLxSB	DS min./max.
ROEQT/144		151x151x94	115	53	23	140	135x135	10-20



rotara-ROEQT/144  
2600lm 840

UGR	$\eta_{LB}$	
19	100 %	Direct 100 %
		Indirect 0 %
3000		UGR lat. 16,6
		UGR long. 16,6



Type	LED Specification	$\alpha$	P <sub>sys</sub> (W)	Driver	Item-number	Colour	
rotara-ROEQT/144	LED 2500lm 830	30°	23	ED	338 0034 130	<input type="checkbox"/>	0,4
	LED 2500lm 830	30°	23	DALI	338 0036 630	<input type="checkbox"/>	0,4
	LED 2600lm 840	30°	23	ED	338 0044 130	<input type="checkbox"/>	0,4
	LED 2600lm 840	30°	23	DALI	338 0046 630	<input type="checkbox"/>	0,4

► Please refer to the current data for LED luminaires at [www.lichtwerk.de](http://www.lichtwerk.de)



Accessories	Type	Details	Item-number	Colour	
Replacement reflector	RO/144-LED 40°	Beam angle 40°, for ROE./144	321 4014 140	<input type="checkbox"/>	0,1









## rotara-ROEQT/160

IP20      

### Housing

Housing made of pressure-cast aluminium, heat sink for effective passive cooling; powder-coated; square body. Reflector unit gimbal-mounted, with fixing springs for installation without tools, suitable for ceiling thickness 10mm-20mm.

### Lighting technology -ROEQT

Direct narrow distribution.

Light distribution via highly specular faceted reflector made of highly-efficient MIRO-SILVER aluminium with an reflection ratio of 99,8%; beam angle 30°; clear safety glass.

For VDU workstations  $65^\circ < 1000\text{cd/m}^2$ ,  $\text{UGR} \leq 19$  according to DIN EN 12464-1.

Rated life time = L80 B10 50.000h.

Light colour: 4000K or 3000K. Other light colours on request.


### Miscellaneous

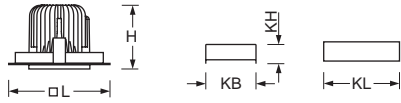
External driver, wired with luminaire ready for operation.

Electrical connection via 0,7m long connection line,  $2 \times 0,75\text{mm}^2$  or on dimmable luminaires  $2 \times 0,5\text{mm}^2 + 2 \times 0,75\text{mm}^2$ .

### Accessories

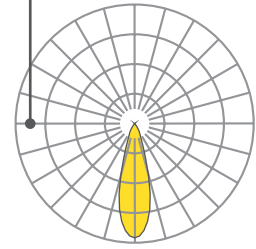
Replacement reflector 60°, matt segmented must be ordered separately.


Type	Ceiling	LxBxH	KL	KB	KH	e	SLxSB	DS min./max.
ROEQT/160		175x175x119	170	45	35	160	155x160	10-20



rotara-ROEQT/160  
4300lm 840


UGR		$\eta_{LB}$	1000
Direct	100 %	100 %	
Indirect	0 %		
UGR lat.	15,5		
UGR long.	15,5		



Type	LED Specification	$\alpha$	P <sub>sys</sub> (W)	Driver	Item-number	Colour	
rotara-ROEQT/160	LED 4100lm 830	30°	36	ED	338 0054 130	<input type="checkbox"/>	1,7
	LED 4100lm 830	30°	36	DALI	338 0056 630	<input type="checkbox"/>	1,7
	LED 4300lm 840	30°	36	ED	338 0064 130	<input type="checkbox"/>	1,7
	LED 4300lm 840	30°	36	DALI	338 0066 630	<input type="checkbox"/>	1,7

► Please refer to the current data for LED luminaires at [www.lichtwerk.de](http://www.lichtwerk.de)



Accessories	Type	Item-number	Colour	
Replacement reflector	RO/160-LED 60° Beam angle 60°, for ROE./160	321 5014 140	<input type="checkbox"/>	0,1



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012 - 013	lichtwerk GmbH; Königsberg DE	Harter Gebäudetechnik GmbH; Gerolzhofen DE
016 - 017	lichtwerk GmbH; Königsberg DE	Haßberg Kliniken; Haßfurt DE
020 - 021	Jake Campell, Kiel DE	Heinrich-Heine-Schule, Büdelsdorf DE
024 - 025	lichtwerk GmbH; Königsberg DE	Universität; Bayreuth DE
028 - 029	lichtwerk GmbH; Königsberg DE	Maria Ward Schule; Bamberg DE
032 - 033	lichtwerk GmbH; Königsberg DE	Maria Ward Schule; Bamberg DE
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114 - 115	Steffen Spitzner; Gera DE	Centogene; Rostock DE
118 - 119	Steffen Spitzner; Gera DE	Erwin-Fischer-Schule; Greifswald DE
122 - 124	Inga Paas; Köln DE	Goldener Ring; Düsseldorf DE
126 - 127	BSD Agentur; Mainz DE	Rendering
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144 - 145	Steffen Spitzner; Gera DE	Erwin-Fischer-Schule; Greifswald DE
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152 - 152	lichtwerk GmbH; Königsberg DE	Zahnarztpraxis Dr. Ambros; Knetzgau DE
153 - 153	lichtwerk GmbH; Königsberg DE	SRAM; Schweinfurt DE
160 - 161	shutterstock; ImageFlow	Rendering lichtwerk GmbH; Königsberg DE
172 - 173	lichtwerk GmbH; Königsberg DE	Rathaus; Knetzgau DE
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186 - 187	lichtwerk GmbH; Königsberg DE	Musikakademie, Hammelburg DE
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194 - 195	lichtwerk GmbH; Königsberg DE	Harter Gebäudetechnik GmbH; Gerolzhofen DE
198 - 199	lichtwerk GmbH; Königsberg DE	Harter Gebäudetechnik GmbH; Gerolzhofen DE
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206 - 207	s.h.schroeder; Köln DE	World Conference Center; Bonn DE
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214 - 215	lichtwerk GmbH; Königsberg DE	Stadtwerke; Bad Kissingen DE
218 - 219	lichtwerk GmbH; Königsberg DE	Sanitätshaus Traub; Schweinfurt DE
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238 - 239	lichtwerk GmbH; Königsberg DE	Arztpraxis Dr. Schorb; Haßfurt DE
240 - 241	lichtwerk GmbH; Königsberg DE	Möbel Wolf; Schweinfurt DE
245 - 245	lichtwerk GmbH; Königsberg DE	Singer Ingenieur Consult GmbH; Bamberg DE
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262 - 263	H. Kaufmann; Euro Unitech Wien AT	BRUCHA; Michelhausen DE
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268 - 269	lichtwerk GmbH; Königsberg DE	Singer Ingenieur Consult GmbH; Bamberg DE
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286 - 287	lichtwerk GmbH; Königsberg DE	Musikakademie, Hammelburg DE
310 - 311	lichtwerk GmbH; Königsberg DE	AWT; Werneck DE
314 - 315	lichtwerk GmbH; Königsberg DE	Musikakademie, Hammelburg DE
326 - 327	lichtwerk GmbH; Königsberg DE	Die Energie, Veitshöchheim DE
328 - 329	lichtwerk GmbH; Königsberg DE	Musikakademie, Hammelburg DE
340 - 341	lichtwerk GmbH; Königsberg DE	Arztpraxis Dr. Schorb; Haßfurt DE
342 - 343	lichtwerk GmbH; Königsberg DE	Göhring Innenarchitektur; Lichtenfels DE
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414 - 415	Inga Paas; Köln DE	Wiehler Wasserwelt; Wiehl DE
416 - 417	Danny Gohlke; Rostock DE	DJH Prora; Rügen DE
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# GTC - Sales and delivery conditions

## 1. General

1.1 These conditions of sale apply exclusively to companies, legal persons under public law or public-law special assets in the sense of § 310 paragraph 1 BGB (German Civil Code). The following conditions of sale apply exclusively for all offers and contracts regarding the delivery of goods by lichtwerk GmbH. They also apply for all future transactions with the Orderer when dealing with legal transactions of the related kind. The Orderer recognises the conditions as binding for him for all of the business relations. Modifications and amendments must be in written form. Conflicting or deviating terms and conditions of the Orderer are not terms of the contract, even if we do not expressly object to them. This will only be content of the respective contract in cases where we expressly approve the conflicting or deviating terms and conditions in writing.

1.2 We reserve our own rights of ownership, copyright and other intellectual property rights for all cost estimates, drawings and documents that are handed over to the Orderer during the contract negotiations. They may only be disclosed to third parties with our prior written permission. If an order is not issued, all transferred documents shall be returned immediately at our request. The Orderer does not have the right to use, retain or disseminate these documents.

## 2. Conclusion of the contract and scope of services

2.1 Our offers are not-binding and without obligation. In terms of the nature and scope of delivery, they will first be binding upon our written order confirmation. If an order is to be regarded as an offer according to § 145 BGB, we can accept this within two weeks by sending an order confirmation.

2.2 Verbal agreements, in particular supplementary agreements and commitments made by our employees, require our written confirmation to be effective.

2.3 For the delivery, we reserve the right to deviations of goods compared to the documents belonging to the offers, such as catalogues, illustrations, descriptions, drawings as well as weight and dimension information, provided they are commercial and reasonable for the Orderer and in particular do not impair quality and function.

## 3. Prices, deliveries and terms of payment

### 3.1 Prices and delivery

3.1.1 The prices are calculated in Euro exclusive of the legal VAT, which is invoiced separately according to the valid rate. The prices are calculated according to the prices valid at date of contract conclusion; if the delivery is made more than 4 months after contract conclusion, the prices valid at date of delivery can be invoiced.

3.1.2 Principally, prices shall be ex works excluding VAT, packaging, freight costs and insurance.

3.1.3 For a net order value of €1,500.00 or more, we deliver to the delivery location free of charge within Germany, whereby we provide the goods at the delivery location ready for unloading. Starting at € 750.00, we charge half of the transportation charges for a delivery location within Germany. For a net order value below € 250.00, we charge an additional small-volume surcharge of €25.00.

### 3.2 Terms of payment

3.2.1 Our invoices are to be paid within 30 days from the date of the invoice. For payment within eight days from the invoice date, we grant a 2 % discount. A payment is considered effected if we are able to access the funds. In the case of payment by cheque, payment is only considered effected when the cheque is redeemed by us.

3.2.2 The acceptance of cheques shall only be accepted on account of performance.

3.2.3 The Orderer's right of retention, as far as it is not based on the same contractual relationship, and the offsetting with contested and not legally determined claims is excluded.

3.2.4 If the Orderer is in default of payment as a whole or a part, he is bound - notwithstanding all other rights of the supplier - to pay from that point of time on default interests to the amount of 8 % annually above the base lending rate.

3.2.5 If the Orderer ceases payments or if bankruptcy is filed or mature checks or bills of exchange are not redeemed, all claims made by the supplier are immediately due.

## 4. Delivery times and acceptance obligations

4.1 The delivery period begins with the date of written agreement about the order between Orderer and supplier.

4.2 Hindrances beyond our responsibility, in particular acts of God, war, insurrection, strikes, transport disruptions, business disruptions, lack of material, official orders and other inevitable events that delay the delivery in whole or in part automatically lengthen the delivery period by the duration of such conditions. In such cases the parties have the right to withdraw from the contract in whole or in part.

4.3 In the event of a delayed delivery for which we are responsible, the Orderer can only assert his rights arising from the delay if the grace period he granted us has passed without result. If the Orderer proves in this case that he has incurred damages caused by the delay, he can claim a delay compensation for each completed week of the delay in the amount of 0.5% for the entire duration of the delay, but not to exceed 5% of the value of the goods not delivered on time. The right of the Orderer for exercising the right of withdrawal shall remain unaffected. Further-reaching claims shall only apply in cases of intent or gross negligence where liability is mandatory.

4.4 We are entitled to make reasonable installment deliveries.

4.5 If the Orderer causes a delay of dispatch or delivery of the goods or if the Orderer is otherwise in default in accepting the delivery of goods or should the Orderer intentionally violate other obligations to co-operate, we then have the right to claim compensation for any incurred damages in this respect, including any possible additional expenditure. Rights remain reserved for more extensive claims. Insofar as such aforesaid conditions apply, the risk of accidental loss or accidental deterioration of the purchased goods passes over to the Orderer at the precise point of time in which he is in default of acceptance or payment.

## 5. Dispatch, transfer of risk, returns

5.1 The risk is passed on to the Orderer when the goods leave the factory or a warehouse. Shipping takes place uninsured at the Orderer's risk. This also applies even if free delivery is agreed and also for deliveries by our transport staff. If the shipment is delayed as a result of circumstances for which the Orderer is responsible, the risk is transferred with our notification of readiness for shipment. If the shipment is delayed at the Orderer's request or at the fault of the Orderer, then we will store the goods at the Orderer's expense. The Orderer is required to check without delay whether the goods have been damaged during transportation and to immediately inform the carrier and deliverer of any damage or loss. Shipping takes place on behalf of the Orderer.

5.2 If the supplier has no statutory obligation to accept returned goods, the Orderer may only return goods with our express written consent and provided that they are undamaged and returned in the original packaging. 30% of the invoiced amount will be deducted from the credit note to cover processing costs. All reprocessing, freight, insurance and packaging costs are charged to the Orderer. Principally, it is not possible to return custom-made products.

## 6. Retention of Title

6.1 The goods remain our property until the fulfilment of all our entitled claims against the Orderer (goods subject to retention of title), even if the individual goods have been paid for. A pledge or chattel mortgage of the reserved goods is not permissible.

6.2 In the case of the permissible resale of the reserved goods within the ordinary course of business, the Orderer assigns us already now, until payment of all our claims, as collateral for its future claims towards his customers resulting of such resale without requiring any specific further explanations. This assignment also covers balance claims resulting from existing current account relationships or at their termination of the Orderer with his customers. If the reserved goods are sold together with other goods without agreeing upon an individual price for the reserved goods, the Orderer assigns us the priority over the other claims for such part of the total price claimed which corresponds to the value invoiced by us. Until revoked, the Orderer is authorized to collect the assigned demands from the resale, he is not entitled to dispose of them otherwise, e.g. by assignment. Upon our request, the Orderer must inform his customer about the assignment and to furnish us the necessary documents for the assertion of his rights towards the customer, e.g. to deliver invoices and to provide the required details.

6.3 If the purchaser does not meet all or a part of his payment obligations within 10 days after due date, if he does not cash due checks or if an application for insolvency is filed, we have the right to withdraw from the contract and to require the return of the goods. The purchaser is obliged to procure us with the possession of the goods. The Orderer grants us or any of our authorized representatives the access to all business premises during business hours. We are entitled to use the reserved goods with the diligence of a prudent businessman and to satisfy ourselves with the offsetting of open claims with their proceeds.

6.4 As long as the ownership has not been transferred, the Orderer is to inform us in writing immediately if the supplied item is seized or is exposed to other interventions by third parties. If the third party is unable to indemnify us for the costs of legal or out-of-court costs of a claim according to par.

771 ZPO (German Code of Civil Procedure), the Orderer is liable for our amount outstanding.

## 7. Warranty

7.1 We are liable for the defects of the goods (in the first instance under the exclusion of the Orderer's rights to back out of the contract or to reduce the purchase price) through rectification of the defect or replacement delivery at our choice. The Orderer shall grant us a reasonable time period to provide the rectification. If the supplementary performance does not work, the Orderer may basically according to his choice demand a cut of the compensation (decrease) or a cancellation of the contract. The improvement is considered failed after the second unsuccessful attempt, provided further improvement attempts are not appropriate due to the subject matter of the contract and are not reasonable to the Orderer. In case of a minor breach of contract, especially minor defects, the Orderer, however, does not have a right of cancellation.

7.2 Warranty rights of the Orderer require that the Orderer's obligations to make inspection and give notice of defects according to par. 377 HGB (German Commercial Code) have been properly fulfilled.

7.3 The Orderer must notify us concerning obvious defects within a period of 10 days after receipt of goods, otherwise the assertion of the warranty claim is excluded. Non-obvious defects must be claimed immediately when they are discovered or determined, otherwise they are deemed to be approved. For all presuppositions for claims he full burden of proof forlies with the Orderer, especially for the deficit itself, for the time period of the determination of the defect, and for the timeliness of the notice of defect.

7.4 If the Orderer, due to a deficiency in title or a material defect after failed subsequent performance, chooses to cancel the contract, he shall not be entitled to additional claims for damages due to the defect.

7.5 The warranty period amounts to one year from date of delivery of our goods to the Orderer.

7.6 The warranty obligation is void if the goods have suffered from improper handling or storage or if improper changes were made to them without the supplier's approval. We are not liable for subsequent changes to the lights, their internal circuitry, equipment or the lamps.

7.7 The condition of the goods only the product description of the manufacturer applies as agreed upon. Additional public statements or advertisements of the manufacturer do not represent a contractual statement on the nature of the goods.

7.8 In the event that the article of sale cannot be used by the Orderer as stipulated in the contract of sale as a result of negligent violation of collateral contractual duties, especially with regard to operating and maintenance instructions, we shall also be liable in accordance with paragraph 7.6.

In case of consulting we can only be held responsible if special payment was agreed in writing.

7.9 Claims made by the Customer against the Supplier for installation and disassembly costs, unless they serve to detect errors, costs of disposal and costs for hoisting devices and scaffolding shall be excluded. The Customer shall bear the costs of the necessary recommissioning, software reinstallation or software updates. Where the Supplier meets its cost absorption obligation pursuant to Article 478 of the German Civil Code with respect to other expenses necessary for supplementary performance, the Supplier shall be entitled to pay such expenses by means of a credit note for goods. A right to compensation for damages to the goods themselves shall be excluded. This does not apply, as far as compelling liability is given in cases of intent, gross negligence, lack of guaranteed product properties or the Product Liability Act.

## 8. Limitation on Liability

8.1 As far as it is not expressly stipulated otherwise in these conditions, the claims against us, our legal representatives and any person employed by us in the performance of our obligation and any vicarious agent resulting from damages, including consequential damages, which occur to the Orderer or a third party, in particular such damages resulting from fault at contract conclusion, culpable breach of an obligation and negligent and impermissible actions are excluded.

8.2 The aforesaid limitations of liability shall not affect the Orderer's product liability claims. In addition, we are liable for loss of life, physical injury and damage to health (regardless of existing limitation of liability according to the statutory provisions) that are caused by a negligent or wilful breach of duty on our part, our legal representatives or our assistants. We are liable under statutory provisions for damages that are not covered by clause 1 and that are based on fraudulent intent by us, our legal representatives or our assistants.

8.3 The Orderer's claim for damages for defect becomes time-barred after one year from date of delivery of the goods to the Orderer. This shall not apply if we can be accused of malice. In these cases, the statutory provisions apply.

## 9. Applicable law, place of jurisdiction

For these business relationships and all legal relationships between us and the Orderer, - including export contracts - the governing law of the Federal Republic of Germany applies exclusively. The application of the UN jurisdiction, concerning sales and purchase procedure, is excluded. If legally permissible, the place of jurisdiction for all disputes directly or indirectly resulting from a contractual relationship is, by our choosing, either Haßfurt or the court responsible for the Orderer's registered office. The place of fulfilment for deliveries and payments is also Haßfurt. If individual conditions of the contract including these GTC are partially ineffective or will be, the validity of the other conditions are not affected by it. The whole or partial ineffective condition should be replaced by conditions, whose economic purpose comes as close as possible to the ineffective one.



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Because of the dynamics in the technical development especially in the field of LED modules and their drivers, the information in this paper can only be a snapshot of the current state and are therefore legally not binding. Please refer to our web site for current product specifications.

We point out that the orderer recognises our delivery and payment conditions unless he/she objects in writing when sending his/her order.

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