## Module CLE G3 ADV
Modules CLE ADVANCED

**Product description**

- Ideal for ceiling-mounted and wallmounted luminaires
- LED system solution consisting of the LED module, the control gear with integrated emergency function and SWITCH sensor
- Based on circular and TC-DD fluorescent lamps
- Efficacy of the module up to 181 lm/W
- SO version is compatible with SWITCH Sensor HF 5BP
- Integrated separate emergency LEDs with CLE G3 190/220/315 controlled by EM powerLED
- High colour rendering index CRI > 80
- Small colour tolerance MacAdam 3③
- Small luminous flux tolerances
- Colour temperatures 2,700, 3,000 and 4,000 K
- Push terminals for quick and simple wiring
- Simple installation (e.g. screws)
- Long life-time: 50,000 hours
- 5-year guarantee

**Standards**, page 6

**For colour temperatures and tolerances,** page 10

CLE G3 160mm 3000lm ADV

CLE G3 190mm 1500lm ADV EM SO

CLE G3 220mm 1500lm ADV EM

CLE G3 220mm 1500lm ADV EM SO

CLE G3 315mm 4000lm ADV EM

CLE G3 315mm 4000lm ADV EM SO

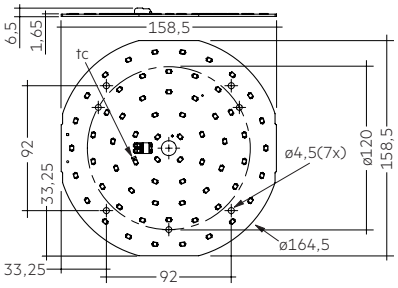
Typische Anwendung

RoHS

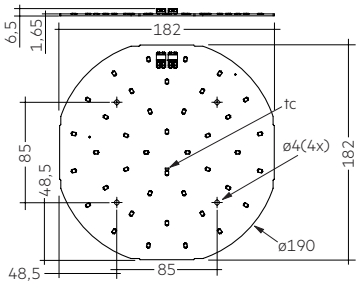
**Module CLE G3 ADV**
Modules CLE ADVANCED

### Technical data

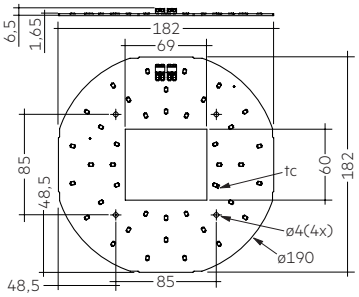
| | |
|---|---|
| Beam characteristic | 120° |
| Ambient temperature range | -25 … +45 °C |
| tp rated | 65 °C |
| tc | 85 °C |
| Irated for CLE 160mm | 350 mA |
| Irated for CLE 190/220mm | 350 mA |
| Irated for CLE 315mm | 600 mA |
| Imax for CLE 160mm | 850 mA |
| Imax for CLE 190/220mm | 700 mA |
| Imax for CLE 315mm | 1,200 mA |
| Max. permissible LF current ripple for CLE 160mm | 1,000 mA |
| Max. permissible LF current ripple for CLE 190/220mm | 800 mA |
| Max. permissible LF current ripple for CLE 315mm | 1,400 mA |
| Max. permissible peak current for CLE 160mm | 1,200 mA / max. 10 ms |
| Max. permissible peak current for CLE 190/220mm | 960 mA / max. 10 ms |
| Max. permissible peak current for CLE 315mm | 1,680 mA / max. 10 ms |
| Max. working voltage for insulation① | 60 V SELV |
| Insulation test voltage | 0.5 kV |
| ESD classification | severity level 1 |
| Risk group (EN 62471:2008) | RG0 |
| Type of protection | IP00 |



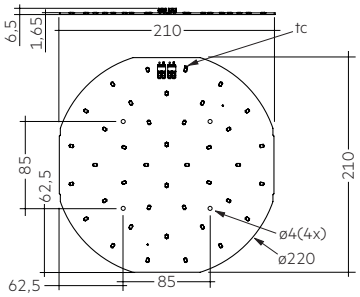

CLE G3 160mm 3000lm ADV



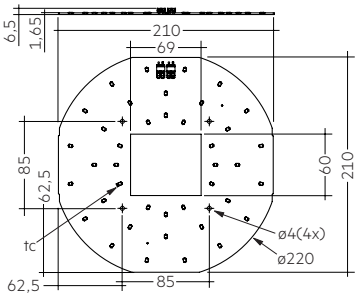

CLE G3 190mm 1500lm EM ADV



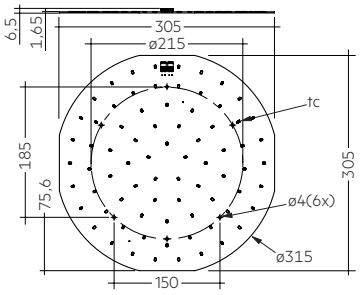

CLE G3 190mm 1500lm EM SO ADV



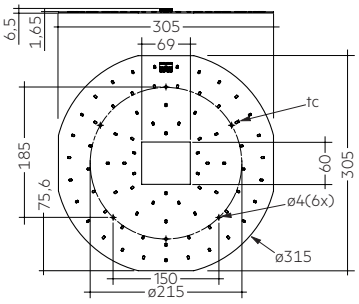

CLE G3 220mm 1500lm EM ADV




CLE G3 220mm 1500lm EM SO ADV




CLE G3 315mm 4000lm EM ADV




CLE G3 315mm 4000lm EM SO ADV

## Module CLE G3 ADV
Modules CLE ADVANCED

### Ordering data

| Type | Article number | Colour temperature | Packaging, carton | Weight per pc. |
|---|---|---|---|---|
| **CLE G3 160mm 3000lm 827 ADV** | **89603022** | 2,700 K | 50 pc(s). | 0.059 kg |
| **CLE G3 160mm 3000lm 830 ADV** | **89602856** | 3,000 K | 50 pc(s). | 0.059 kg |
| **CLE G3 160mm 3000lm 840 ADV** | **89602857** | 4,000 K | 50 pc(s). | 0.059 kg |
| **CLE G3 190mm 1500lm 827 ADV EM** | **89603023** | 2,700 K | 50 pc(s). | 0.075 kg |
| **CLE G3 190mm 1500lm 830 ADV EM** | **89602858** | 3,000 K | 50 pc(s). | 0.075 kg |
| **CLE G3 190mm 1500lm 840 ADV EM** | **89602859** | 4,000 K | 50 pc(s). | 0.075 kg |
| **CLE G3 190mm 1500lm 830 ADV EM SO** | **89602860** | 3,000 K | 50 pc(s). | 0.064 kg |
| **CLE G3 190mm 1500lm 840 ADV EM SO** | **89602861** | 4,000 K | 50 pc(s). | 0.064 kg |
| **CLE G3 220mm 1500lm 827 ADV EM** | **89603024** | 2,700 K | 50 pc(s). | 0.099 kg |
| **CLE G3 220mm 1500lm 830 ADV EM** | **89602862** | 3,000 K | 50 pc(s). | 0.099 kg |
| **CLE G3 220mm 1500lm 840 ADV EM** | **89602863** | 4,000 K | 50 pc(s). | 0.099 kg |
| **CLE G3 220mm 1500lm 830 ADV EM SO** | **89602864** | 3,000 K | 50 pc(s). | 0.088 kg |
| **CLE G3 220mm 1500lm 840 ADV EM SO** | **89602865** | 4,000 K | 50 pc(s). | 0.088 kg |
| **CLE G3 315mm 4000lm 830 ADV EM** | **89602866** | 3,000 K | 10 pc(s). | 0.208 kg |
| **CLE G3 315mm 4000lm 840 ADV EM** | **89602867** | 4,000 K | 10 pc(s). | 0.208 kg |
| **CLE G3 315mm 4000lm 830 ADV EM SO** | **89602868** | 3,000 K | 10 pc(s). | 0.199 kg |
| **CLE G3 315mm 4000lm 840 ADV EM SO** | **89602869** | 4,000 K | 10 pc(s). | 0.199 kg |

### Specific technical data

| Type[4] | Photo-metric code | Typ. luminous flux at tp = 25 °C[1] | Typ. luminous flux at tp = 65 °C[1] | Typ. forward current | Min. forward voltage at tp = 65 °C | Max. forward voltage at tp = 25 °C | Typ. power consumption at tp = 65 °C[1] | Luminous efficacy module at tp = 25 °C | Luminous efficacy module at tp = 65 °C | Luminous efficacy system at tp = 65 °C | Colour rendering index CRI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **CLE G3 160mm – Operating mode HE** | | | | | | | | | | | |
| **CLE G3 160mm 3000lm 827 ADV** | 827/359 | 2,130 lm | 1,980 lm | 350 mA | 34.1 V | 39.0 V | 12.6 W | 164 lm/W | 157 lm/W | 141 lm/W | > 80 |
| **CLE G3 160mm 3000lm 830 ADV** | 830/359 | 2,130 lm | 1,980 lm | 350 mA | 34.1 V | 39.0 V | 12.6 W | 164 lm/W | 157 lm/W | 141 lm/W | > 80 |
| **CLE G3 160mm 3000lm 840 ADV** | 840/359 | 2,350 lm | 2,190 lm | 350 mA | 34.1 V | 39.0 V | 12.6 W | 181 lm/W | 173 lm/W | 156 lm/W | > 80 |
| **CLE G3 160mm – Operating mode HO** | | | | | | | | | | | |
| **CLE G3 160mm 3000lm 827 ADV** | 827/359 | 2,950 lm | 2,750 lm | 500 mA | 35.4 V | 40.3 V | 18.7 W | 153 lm/W | 147 lm/W | 132 lm/W | > 80 |
| **CLE G3 160mm 3000lm 830 ADV** | 830/359 | 2,950 lm | 2,750 lm | 500 mA | 35.4 V | 40.3 V | 18.7 W | 153 lm/W | 147 lm/W | 132 lm/W | > 80 |
| **CLE G3 160mm 3000lm 840 ADV** | 840/359 | 3,260 lm | 3,040 lm | 500 mA | 35.4 V | 40.3 V | 18.7 W | 170 lm/W | 162 lm/W | 146 lm/W | > 80 |

[1] Tolerance range for optical and electrical data: ±10 %.

[2] If mounted with M4 screws and plastic washers.

[3] Integrated measurement over the whole module.

[4] HE … high efficiency, HO … high output.

## Specific technical data

| Type[4] | Photo-metric code | Typ. luminous flux at tp = 25 °C[1] | Typ. luminous flux at tp = 65 °C[1] | Typ. forward current | Min. forward voltage at tp = 65 °C | Max. forward voltage at tp = 25 °C | Typ. power consumption at tp = 65 °C[1] | Luminous efficacy module at tp = 25 °C | Luminous efficacy module at tp = 65 °C | Luminous efficacy system at tp = 65 °C | Colour rendering index CRI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **CLE G3 190/220mm – Operating mode HE** | | | | | | | | | | | |
| **CLE G3 190mm 1500lm 827 ADV EM** | 827/359 | 1,460 lm | 1,360 lm | 350 mA | 24.2 V | 27.5 V | 8.9 W | 159 lm/W | 152 lm/W | 137 lm/W | > 80 |
| **CLE G3 220mm 1500lm 827 ADV EM** | 827/359 | 1,460 lm | 1,360 lm | 350 mA | 24.2 V | 27.5 V | 8.9 W | 159 lm/W | 152 lm/W | 137 lm/W | > 80 |
| **CLE G3 190mm 1500lm 830 ADV EM** | 830/359 | 1,460 lm | 1,360 lm | 350 mA | 24.2 V | 27.5 V | 8.9 W | 159 lm/W | 152 lm/W | 137 lm/W | > 80 |
| **CLE G3 220mm 1500lm 830 ADV EM** | 830/359 | 1,460 lm | 1,360 lm | 350 mA | 24.2 V | 27.5 V | 8.9 W | 159 lm/W | 152 lm/W | 137 lm/W | > 80 |
| **CLE G3 190mm 1500lm 840 ADV EM** | 840/359 | 1,610 lm | 1,510 lm | 350 mA | 24.2 V | 27.5 V | 8.9 W | 175 lm/W | 169 lm/W | 152 lm/W | > 80 |
| **CLE G3 220mm 1500lm 840 ADV EM** | 840/359 | 1,610 lm | 1,510 lm | 350 mA | 24.2 V | 27.5 V | 8.9 W | 175 lm/W | 169 lm/W | 152 lm/W | > 80 |
| **CLE G3 190mm 1500lm 830 ADV EM SO** | 830/359 | 1,460 lm | 1,360 lm | 350 mA | 24.2 V | 27.5 V | 8.9 W | 159 lm/W | 152 lm/W | 137 lm/W | > 80 |
| **CLE G3 220mm 1500lm 830 ADV EM SO** | 830/359 | 1,460 lm | 1,360 lm | 350 mA | 24.2 V | 27.5 V | 8.9 W | 159 lm/W | 152 lm/W | 137 lm/W | > 80 |
| **CLE G3 190mm 1500lm 840 ADV EM SO** | 840/359 | 1,610 lm | 1,510 lm | 350 mA | 24.2 V | 27.5 V | 8.9 W | 175 lm/W | 169 lm/W | 152 lm/W | > 80 |
| **CLE G3 220mm 1500lm 840 ADV EM SO** | 840/359 | 1,610 lm | 1,510 lm | 350 mA | 24.2 V | 27.5 V | 8.9 W | 175 lm/W | 169 lm/W | 152 lm/W | > 80 |
| **CLE G3 190/220mm – Operating mode HO** | | | | | | | | | | | |
| **CLE G3 190mm 1500lm 827 ADV EM** | 827/359 | 2,000 lm | 1,860 lm | 500 mA | 25.3 V | 28.7 V | 13.3 W | 146 lm/W | 139 lm/W | 125 lm/W | > 80 |
| **CLE G3 220mm 1500lm 827 ADV EM** | 827/359 | 2,000 lm | 1,860 lm | 500 mA | 25.3 V | 28.7 V | 13.3 W | 146 lm/W | 139 lm/W | 125 lm/W | > 80 |
| **CLE G3 190mm 1500lm 830 ADV EM** | 830/359 | 2,000 lm | 1,860 lm | 500 mA | 25.3 V | 28.7 V | 13.3 W | 146 lm/W | 139 lm/W | 125 lm/W | > 80 |
| **CLE G3 220mm 1500lm 830 ADV EM** | 830/359 | 2,000 lm | 1,860 lm | 500 mA | 25.3 V | 28.7 V | 13.3 W | 146 lm/W | 139 lm/W | 125 lm/W | > 80 |
| **CLE G3 190mm 1500lm 840 ADV EM** | 840/359 | 2,200 lm | 2,060 lm | 500 mA | 25.3 V | 28.7 V | 13.3 W | 155 lm/W | 149 lm/W | 134 lm/W | > 80 |
| **CLE G3 220mm 1500lm 840 ADV EM** | 840/359 | 2,200 lm | 2,060 lm | 500 mA | 25.3 V | 28.7 V | 13.3 W | 155 lm/W | 149 lm/W | 134 lm/W | > 80 |
| **CLE G3 190mm 1500lm 830 ADV EM SO** | 830/359 | 2,000 lm | 1,860 lm | 500 mA | 25.3 V | 28.7 V | 13.3 W | 146 lm/W | 139 lm/W | 125 lm/W | > 80 |
| **CLE G3 220mm 1500lm 830 ADV EM SO** | 830/359 | 2,000 lm | 1,860 lm | 500 mA | 25.3 V | 28.7 V | 13.3 W | 146 lm/W | 139 lm/W | 125 lm/W | > 80 |
| **CLE G3 190mm 1500lm 840 ADV EM SO** | 840/359 | 2,200 lm | 2,060 lm | 500 mA | 25.3 V | 28.7 V | 13.3 W | 155 lm/W | 149 lm/W | 134 lm/W | > 80 |
| **CLE G3 220mm 1500lm 840 ADV EM SO** | 840/359 | 2,200 lm | 2,060 lm | 500 mA | 25.3 V | 28.7 V | 13.3 W | 155 lm/W | 149 lm/W | 134 lm/W | > 80 |

[1] Tolerance range for optical and electrical data: ±10 %.

[2] If mounted with M4 screws and plastic washers.

[3] Integrated measurement over the whole module.

[4] HE … high efficiency, HO … high output.

## Specific technical data

| Type[4] | Photo-metric code | Typ. luminous flux at tp = 25 °C[1] | Typ. luminous flux at tp = 65 °C[1] | Typ. forward current | Min. forward voltage at tp = 65 °C | Max. forward voltage at tp = 25 °C | Typ. power consumption at tp = 65 °C[1] | Luminous efficacy module at tp = 25 °C | Luminous efficacy module at tp = 65 °C | Luminous efficacy system at tp = 65 °C | Colour rendering index CRI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **CLE G3 190/220mm – Emergency operation at 320 mA (EM powerLED NM 1 W BASIC, EM powerLED 15 W BASIC CLE NiCd)** | | | | | | | | | | | |
| **CLE G3 190mm 1500lm 827 ADV EM** | 827/359 | 150 lm | 140 lm | 320 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 220mm 1500lm 827 ADV EM** | 827/359 | 150 lm | 140 lm | 320 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 190mm 1500lm 830 ADV EM** | 830/359 | 150 lm | 140 lm | 320 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 220mm 1500lm 830 ADV EM** | 830/359 | 150 lm | 140 lm | 320 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 190mm 1500lm 840 ADV EM** | 840/359 | 165 lm | 155 lm | 320 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 220mm 1500lm 840 ADV EM** | 840/359 | 165 lm | 155 lm | 320 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 190mm 1500lm 830 ADV EM SO** | 830/359 | 150 lm | 140 lm | 320 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 220mm 1500lm 830 ADV EM SO** | 830/359 | 150 lm | 140 lm | 320 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 190mm 1500lm 840 ADV EM SO** | 840/359 | 165 lm | 155 lm | 320 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 220mm 1500lm 840 ADV EM SO** | 840/359 | 165 lm | 155 lm | 320 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 190/220mm – Emergency operation at 350 mA (EM powerLED 1 W)** | | | | | | | | | | | |
| **CLE G3 190mm 1500lm 827 ADV EM** | 827/359 | 160 lm | 150 lm | 350 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 220mm 1500lm 827 ADV EM** | 827/359 | 160 lm | 150 lm | 350 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 190mm 1500lm 830 ADV EM** | 830/359 | 160 lm | 150 lm | 350 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 220mm 1500lm 830 ADV EM** | 830/359 | 160 lm | 150 lm | 350 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 190mm 1500lm 840 ADV EM** | 840/359 | 180 lm | 165 lm | 350 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 220mm 1500lm 840 ADV EM** | 840/359 | 180 lm | 165 lm | 350 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 190mm 1500lm 830 ADV EM SO** | 830/359 | 160 lm | 150 lm | 350 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 220mm 1500lm 830 ADV EM SO** | 830/359 | 160 lm | 150 lm | 350 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 190mm 1500lm 840 ADV EM SO** | 840/359 | 180 lm | 165 lm | 350 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 220mm 1500lm 840 ADV EM SO** | 840/359 | 180 lm | 165 lm | 350 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 190/220mm – Emergency operation at 400 mA (EM powerLED 15 W BASIC CLE NiMH)** | | | | | | | | | | | |
| **CLE G3 190mm 1500lm 827 ADV EM** | 827/359 | 180 lm | 170 lm | 400 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 220mm 1500lm 827 ADV EM** | 827/359 | 180 lm | 170 lm | 400 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 190mm 1500lm 830 ADV EM** | 830/359 | 180 lm | 170 lm | 400 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 220mm 1500lm 830 ADV EM** | 830/359 | 180 lm | 170 lm | 400 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 190mm 1500lm 840 ADV EM** | 840/359 | 200 lm | 185 lm | 400 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 220mm 1500lm 840 ADV EM** | 840/359 | 200 lm | 185 lm | 400 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 190mm 1500lm 830 ADV EM SO** | 830/359 | 180 lm | 170 lm | 400 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 220mm 1500lm 830 ADV EM SO** | 830/359 | 180 lm | 170 lm | 400 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 190mm 1500lm 840 ADV EM SO** | 840/359 | 200 lm | 185 lm | 400 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 220mm 1500lm 840 ADV EM SO** | 840/359 | 200 lm | 185 lm | 400 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 190/220mm – Emergency operation at 600 mA (EM powerLED 2 W)** | | | | | | | | | | | |
| **CLE G3 190mm 1500lm 827 ADV EM** | 827/359 | 260 lm | 245 lm | 600 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 220mm 1500lm 827 ADV EM** | 827/359 | 260 lm | 245 lm | 600 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 190mm 1500lm 830 ADV EM** | 830/359 | 260 lm | 245 lm | 600 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 220mm 1500lm 830 ADV EM** | 830/359 | 260 lm | 245 lm | 600 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 190mm 1500lm 840 ADV EM** | 840/359 | 290 lm | 270 lm | 600 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 220mm 1500lm 840 ADV EM** | 840/359 | 290 lm | 270 lm | 600 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 190mm 1500lm 830 ADV EM SO** | 830/359 | 260 lm | 245 lm | 600 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 220mm 1500lm 830 ADV EM SO** | 830/359 | 260 lm | 245 lm | 600 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 190mm 1500lm 840 ADV EM SO** | 840/359 | 290 lm | 270 lm | 600 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 220mm 1500lm 840 ADV EM SO** | 840/359 | 290 lm | 270 lm | 600 mA | – | – | – | – | – | – | > 80 |

[1] Tolerance range for optical and electrical data: ±10 %.

[2] If mounted with M4 screws and plastic washers.

[3] Integrated measurement over the whole module.

[4] HE ... high efficiency, HO ... high output.

## Specific technical data

| Type[4] | Photo-metric code | Typ. luminous flux at tp = 25 °C[1] | Typ. luminous flux at tp = 65 °C[1] | Typ. forward current | Min. forward voltage at tp = 65 °C | Max. forward voltage at tp = 25 °C | Typ. power consumption at tp = 65 °C[1] | Luminous efficacy module at tp = 25 °C | Luminous efficacy module at tp = 65 °C | Luminous efficacy system at tp = 65 °C | Colour rendering index CRI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **CLE G3 315mm – Operating mode HE** | | | | | | | | | | | |
| **CLE G3 315mm 4000lm 830 ADV EM** | 830/359 | 2,790 lm | 2,600 lm | 600 mA | 26.8 V | 30.5 V | 17.0 W | 160 lm/W | 153 lm/W | 138 lm/W | > 80 |
| **CLE G3 315mm 4000lm 840 ADV EM** | 840/359 | 3,080 lm | 2,870 lm | 600 mA | 26.8 V | 30.5 V | 17.0 W | 176 lm/W | 169 lm/W | 152 lm/W | > 80 |
| **CLE G3 315mm 4000lm 830 ADV EM SO** | 830/359 | 2,790 lm | 2,600 lm | 600 mA | 26.8 V | 30.5 V | 17.0 W | 160 lm/W | 153 lm/W | 138 lm/W | > 80 |
| **CLE G3 315mm 4000lm 840 ADV EM SO** | 840/359 | 3,080 lm | 2,870 lm | 600 mA | 26.8 V | 30.5 V | 17.0 W | 176 lm/W | 169 lm/W | 152 lm/W | > 80 |
| **CLE G3 315mm – Operating mode HO** | | | | | | | | | | | |
| **CLE G3 315mm 4000lm 830 ADV EM** | 830/359 | 3,980 lm | 3,720 lm | 900 mA | 25.4 V | 32.0 V | 26.7 W | 145 lm/W | 139 lm/W | 125 lm/W | > 80 |
| **CLE G3 315mm 4000lm 840 ADV EM** | 840/359 | 4,400 lm | 4,100 lm | 900 mA | 25.4 V | 32.0 V | 26.7 W | 160 lm/W | 153 lm/W | 138 lm/W | > 80 |
| **CLE G3 315mm 4000lm 830 ADV EM SO** | 830/359 | 3,980 lm | 3,720 lm | 900 mA | 25.4 V | 32.0 V | 26.7 W | 145 lm/W | 139 lm/W | 125 lm/W | > 80 |
| **CLE G3 315mm 4000lm 840 ADV EM SO** | 840/359 | 4,400 lm | 4,100 lm | 900 mA | 25.4 V | 32.0 V | 26.7 W | 160 lm/W | 153 lm/W | 138 lm/W | > 80 |
| **CLE G3 315mm – Emergency operation at 600 mA (EM powerLED 2 W)** | | | | | | | | | | | |
| **CLE G3 315mm 4000lm 830 ADV EM** | 830/359 | 270 lm | 255 lm | 600 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 315mm 4000lm 840 ADV EM** | 840/359 | 300 lm | 280 lm | 600 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 315mm 4000lm 830 ADV EM SO** | 830/359 | 270 lm | 255 lm | 600 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 315mm 4000lm 840 ADV EM SO** | 840/359 | 300 lm | 280 lm | 600 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 315mm – Emergency operation at 1,000 mA (EM powerLED 4 W)** | | | | | | | | | | | |
| **CLE G3 315mm 4000lm 830 ADV EM** | 830/359 | 430 lm | 400 lm | 1,000 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 315mm 4000lm 840 ADV EM** | 840/359 | 475 lm | 440 lm | 1,000 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 315mm 4000lm 830 ADV EM SO** | 830/359 | 430 lm | 400 lm | 1,000 mA | – | – | – | – | – | – | > 80 |
| **CLE G3 315mm 4000lm 840 ADV EM SO** | 840/359 | 475 lm | 440 lm | 1,000 mA | – | – | – | – | – | – | > 80 |

[1] Tolerance range for optical and electrical data: ±10 %.

[2] If mounted with M4 screws and plastic washers.

[3] Integrated measurement over the whole module.

[4] HE … high efficiency, HO … high output.

## 1. Standards

IEC 62031
IEC 62471
IEC 62778
IEC 61547

### 1.1 Photometric code

Key for photometric code, e. g. 830 / 359

| 1st digit | | 2nd + 3rd digit | 4th digit | 5th digit | 6th digit | |
|---|---|---|---|---|---|---|
| Code | CRI | Colour temperature in Kelvin x 100 | McAdam initial | McAdam after 25% of the life-time (max.6000h) | Luminous flux after 25% of the life-time (max.6000h) | |
| | | | | | Code | Luminous flux |
| 7 | 70 – 79 | | | | 7 | ≥ 70 % |
| 8 | 80 – 89 | | | | 8 | ≥ 80 % |
| 9 | ≥90 | | | | 9 | ≥ 90 % |

### 1.2 Energy classification

| Type | Energy classification |
|---|---|
| CLE G3 ADV | A++ |

## 2. Thermal details

### 2.1 tp point, ambient temperature and life-time

The temperature at tp reference point is crucial for the light output and life-time of a LED product.

For CLE a tp temperature of 65 °C has to be complied in order to achieve an optimum between light output and life-time.

Compliance with the maximum permissible reference temperature at the tc point must be checked under operating conditions in a thermally stable state. The maximum value must be determined under worst-case conditions for the relevant application.

The tc and tp temperature of LED modules from Tridonic are measured at the same reference point.

### 2.2 Storage and humidity

| | |
|---|---|
| Storage temperature | -30 … +80 °C |

Operation only in non condensing environment.
Humidity during processing of the module should be between 30 to 70 %.

### 2.3 Thermal design and heat sink

The rated life of LED products depends to a large extent on the temperature. If the permissible temperature limits are exceeded, the life of the CLE will be greatly reduced or the CLE may be destroyed.

### 2.4 Heat sink values

**CLE G3 160mm 3000lm**

| ta | tp | Forward current | $R_{th, hs-a}$ | Cooling area |
|---|---|---|---|---|
| 25 °C | 65 °C | 350 mA | self-cooling | |
| 35 °C | 65 °C | 350 mA | self-cooling | |
| 45 °C | 65 °C | 350 mA | 2.92 K/W | 229 cm² |
| 25 °C | 65 °C | 500 mA | 3.79 K/W | 176 cm² |
| 35 °C | 65 °C | 500 mA | 2.84 K/W | 234 cm² |
| 45 °C | 65 °C | 500 mA | 1.90 K/W | 352 cm² |

**CLE G3 190/220mm 1500lm**

| ta | tp | Forward current | $R_{th, hs-a}$ | Cooling area |
|---|---|---|---|---|
| 25 °C | 65 °C | 350 mA | self-cooling | |
| 35 °C | 65 °C | 350 mA | self-cooling | |
| 45 °C | 65 °C | 350 mA | self-cooling | |
| 25 °C | 65 °C | 500 mA | self-cooling | |
| 35 °C | 65 °C | 500 mA | self-cooling | |
| 45 °C | 65 °C | 500 mA | self-cooling | |

**CLE G3 315mm 4000lm**

| ta | tp | Forward current | $R_{th, hs-a}$ | Cooling area |
|---|---|---|---|---|
| 25 °C | 65 °C | 600 mA | self-cooling | |
| 35 °C | 65 °C | 600 mA | self-cooling | |
| 45 °C | 65 °C | 600 mA | self-cooling | |
| 25 °C | 65 °C | 900 mA | self-cooling | |
| 35 °C | 65 °C | 900 mA | self-cooling | |
| 45 °C | 65 °C | 900 mA | self-cooling | |

**Notes**
The actual cooling can differ because of the material, the structural shape, outside influences and the installation situation. A thermal connection between CLE G3 and heat sink with heat-conducting paste or heat conducting adhesive film is absolutely necessary.
Additionally the CLE G3 has to be fixed on the heat sink with M3 screws to optimise the thermal connection.
Use of thermal interface material with thermal conductivity of $\lambda > 1$ W/mK and layer thickness of interface material with max. 50 µm or a similar interface material where the quotient of layer thickness and thermal conductivity b < 50 µmmK/W.

## 3. Installation / wiring

### 3.1 Electrical supply/choice of LED Driver

CLE from Tridonic are not protected against overvoltages, overcurrents, overloads or short-circuit currents. Safe and reliable operation can only be guaranteed in conjunction with a LED Driver which complies with the relevant standards.

If a LED Driver other than from Tridonic is used, it must provide the following protection:
- Short-circuit protection
- Overload protection
- Overtemperature protection

CLE must be supplied by a constant current LED Driver. Operation with a constant voltage LED Driver will lead to an irreversible damage of the module.

Wrong polarity can damage the CLE.

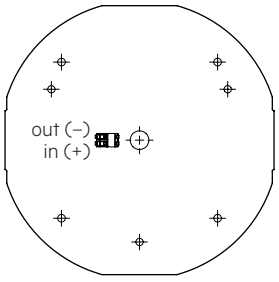
With parallel wiring tolerance-related differences in output are possible (thermal stress of the module) and can cause differences in brightness. If one module fails, the remaining modules may be overloaded.

CLE have to be operated with a SELV LED Drive.

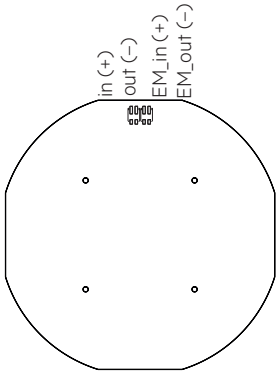
CLE are basic isolated up to 60 V SELV against ground and can be mounted directly on earthed metal parts of the luminaire. If the max. output voltage of the LED Driver (also against earth) is above 60 V SELV, an additional isolation between LED module and heat sink is required (for example by isolated thermal pads) or by a suitable luminaire construction.
At voltages > 60 V an additional protection against direct touch (test finger) to the light emitting side of the module has to be guaranteed. This is typically achieved by means of a non removable light distributor over the module.

### 3.2 Wiring

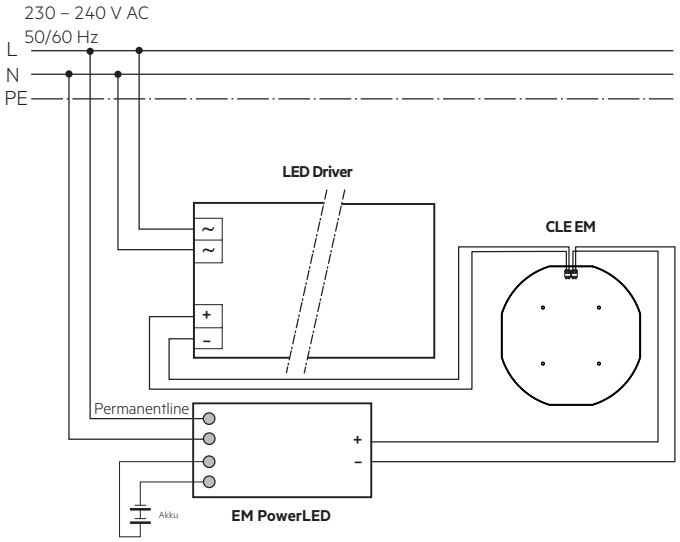
CLE G3 160mm

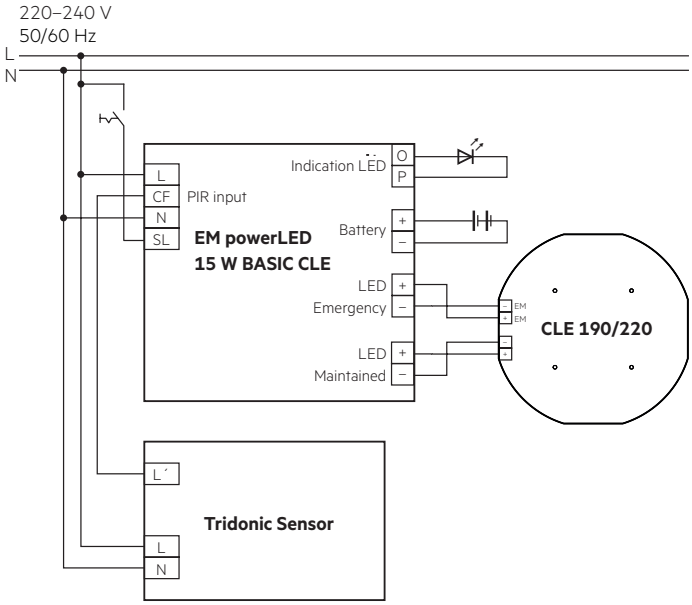



CLE G3 190/220/315mm



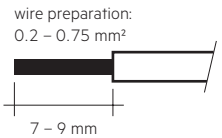

**Wiring example**




### 3.3 Wiring type and cross section

The wiring can be solid cable with a cross section of 0.2 to 0.75 mm².
For the push-wire connection you have to strip the insulation (7–9 mm).
Loosen wire through twisting and pulling.




Press down the “push button” and remove the cable from front.

### 3.4 Mounting instruction

None of the components of the CLE (substrate, LED, electronic components etc.) may be exposed to tensile or compressive stresses.

Max. torque for fixing: 0.5 Nm.

The LED modules are mounted with 4 screws per module.
In order not to damage the modules only rounded head screws and an additional plastic flat washer should be used.

Chemical substance may harm the LED module. Chemical reactions could lead to colour shift, reduced luminous flux or a total failure of the module caused by corrosion of electrical connections.

Materials which are used in LED applications (e.g. sealings, adhesives) must not produce dissolver gas. They must not be condensation curing based, acetate curing based or contain sulfur, chlorine or phthalate. Avoid corrosive atmosphere during usage and storage.

### 3.5 EOS/ESD safety guidelines

The device / module contains components that are sensitive to electrostatic discharge and may only be installed in the factory and on site if appropriate EOS/ESD protection measures have been taken. No special measures need be taken for devices/modules with enclosed casings (contact with the pc board not possible), just normal installation practice. Please note the requirements set out in the document EOS / ESD guidelines (Guideline_EOS_ESD.pdf) at: http://www.tridonic.com/esd-protection

## 4. Life-time

### 4.1 Life-time, lumen maintenance and failure rate

The light output of an LED Module decreases over the life-time, this is characterized with the L value.
L70 means that the LED module will give 70 % of its initial luminous flux. This value is always related to the number of operation hours and therefore defines the life-time of an LED module.

As the L value is a statistical value and the lumen maintenace may vary over the delivered LED modules.
The B value defines the amount of modules which are below the specific L value, e.g. L70B10 means 10 % of the LED modules are below 70 % of the inital luminous flux, respectivly 90 % will be above 70 % of the initial value. In addition the percentage of failed modules (fatal failure) is characterized by the C value.

The F value is the combination of the B and C value. That means for F degradation and complete failures are considered, e.g. L70F10 means 10 % of the LED modules may fail or be below 70 % of the initial luminous flux.

### 4.2 Lumen maintenance

CLE G3 160mm

| Forward current | tp temperature | L90 / F10 | L90 / F50 | L80 / F10 | L80 / F50 | L70 / F10 | L70 / F50 |
|---|---|---|---|---|---|---|---|
| 350 mA | 45 °C | 35,000 h | 49,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h |
| 350 mA | 55 °C | 44,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h |
| 350 mA | 65 °C | >50,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h |
| 500 mA | 45 °C | 42,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h |
| 500 mA | 55 °C | 49,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h |
| 500 mA | 65 °C | >50,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h |

CLE G3 190/220mm

| Forward current | tp temperature | L90 / F10 | L90 / F50 | L80 / F10 | L80 / F50 | L70 / F10 | L70 / F50 |
|---|---|---|---|---|---|---|---|
| 350 mA | 45 °C | 37,000 h | 49,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h |
| 350 mA | 55 °C | 46,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h |
| 350 mA | 65 °C | >50,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h |
| 500 mA | 45 °C | 38,000 h | 49,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h |
| 500 mA | 55 °C | 47,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h |
| 500 mA | 65 °C | >50,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h |

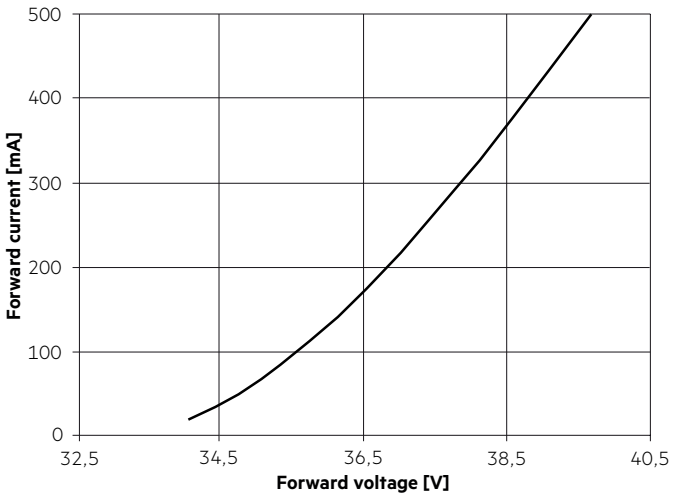
CLE G3 315mm

| Forward current | tp temperature | L90 / F10 | L90 / F50 | L80 / F10 | L80 / F50 | L70 / F10 | L70 / F50 |
|---|---|---|---|---|---|---|---|
| 600 mA | 45 °C | 35,000 h | 49,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h |
| 600 mA | 55 °C | 45,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h |
| 600 mA | 65 °C | >50,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h |
| 900 mA | 45 °C | 38,000 h | 49,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h |
| 900 mA | 55 °C | 47,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h |
| 900 mA | 65 °C | >50,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h | >50,000 h |

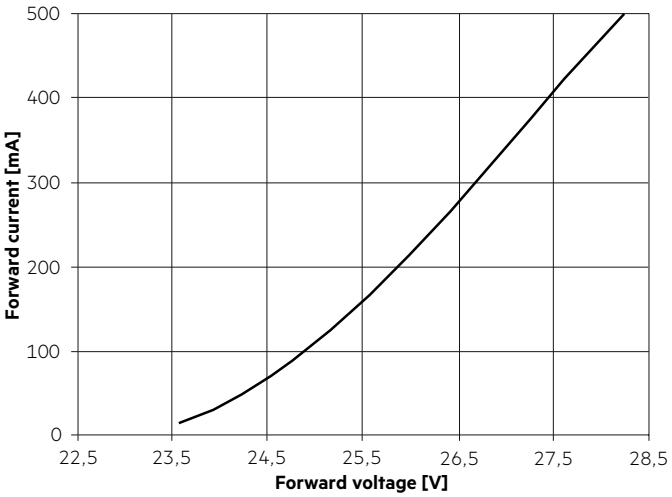
## 5. Electrical values

### 5.1 Typ. forward voltage vs. forward current

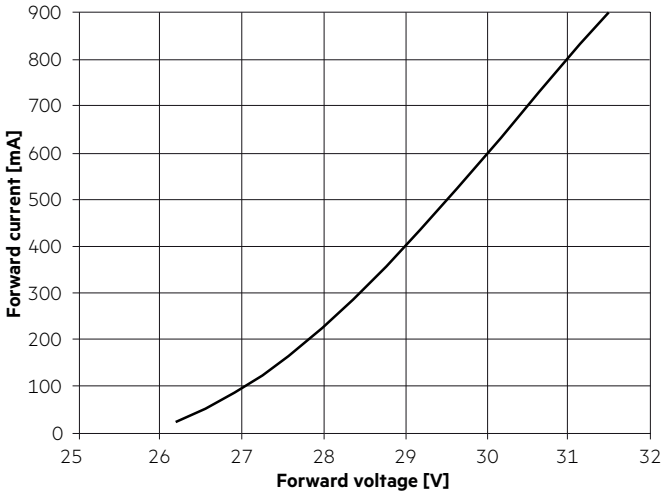
CLE G3 160mm



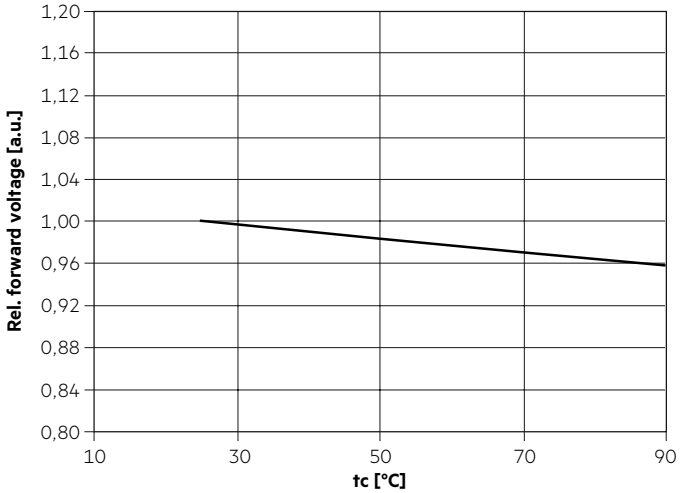

CLE G3 190/220mm




CLE G3 315mm




### 5.2 Forward voltage vs. tp temperature




The diagrams based on statistic values. The real values can be different.

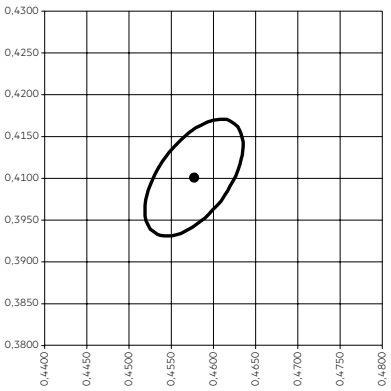
## 6. Photometric charcteristics

### 6.1 Coordinates and tolerances according to CIE 1931

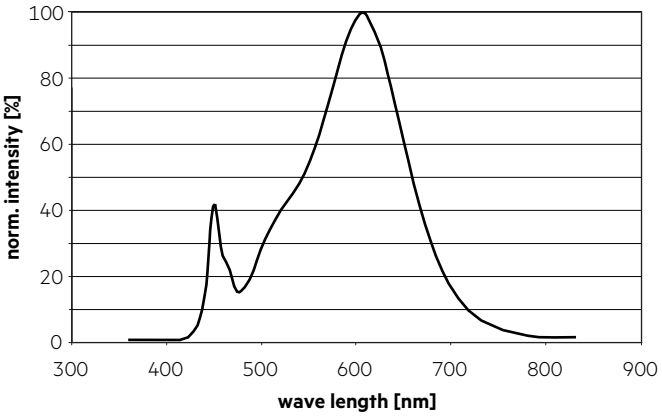
The specified colour coordinates are measured integral by a current impulse with Irated of the module and a duration of 100 ms.
The ambient temperature of the measurement is ta = 25 °C.
The measurement tolerance of the colour coordinates are ± 0.01.

**2,700 K**

| | x0 | y0 |
|---|---|---|
| Centre | 0.4578 | 0.4101 |

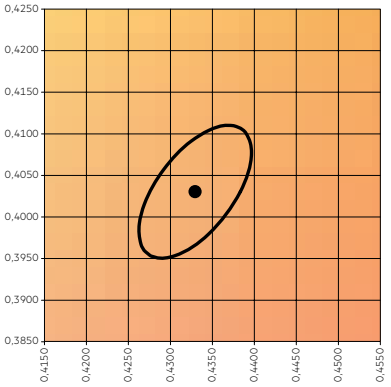



MacAdam Ellipse: 3SDCM

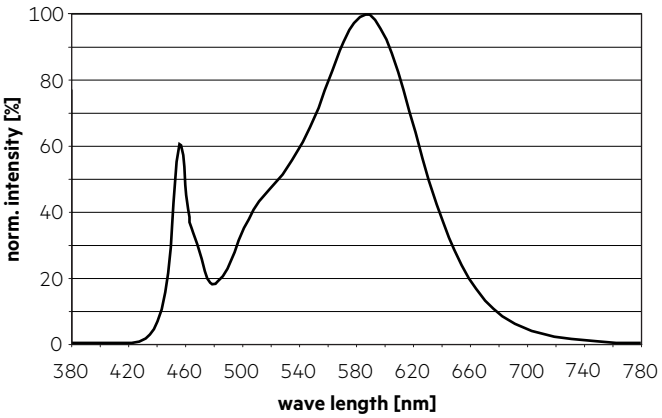



**3,000 K**

| | x0 | y0 |
|---|---|---|
| Centre | 0.4338 | 0.4030 |

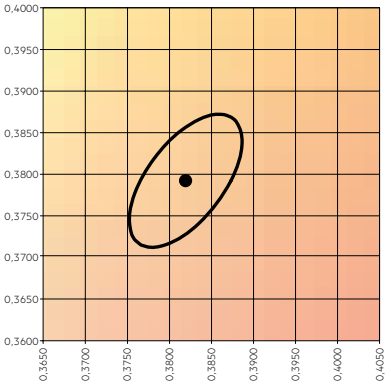



MacAdam Ellipse: 3SDCM

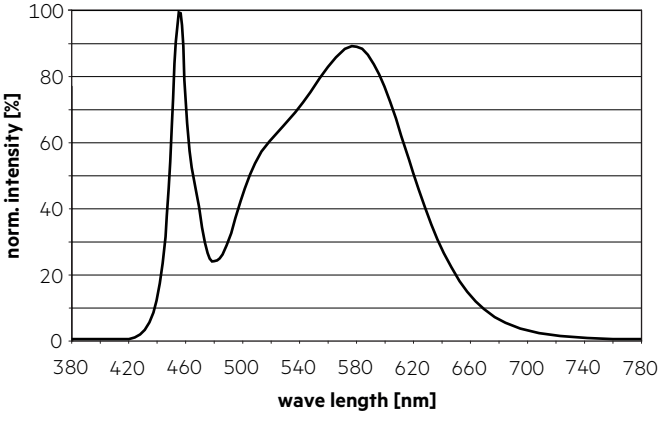



**4,000 K**

| | x0 | y0 |
|---|---|---|
| Centre | 0.3818 | 0.3797 |

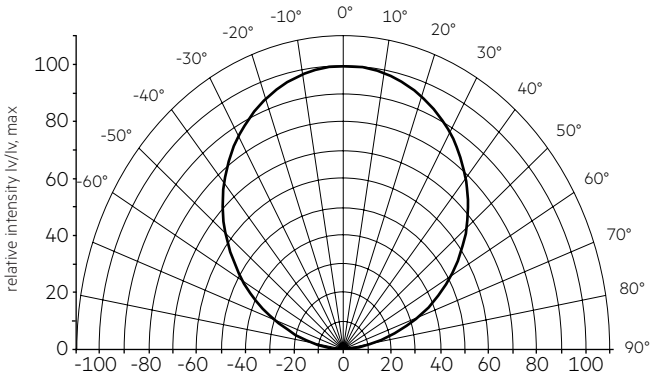



MacAdam Ellipse: 3SDCM



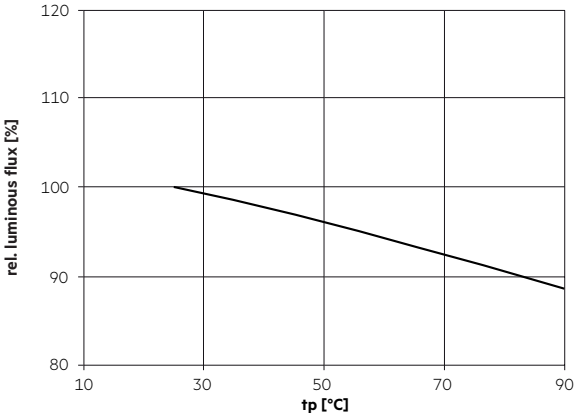
### 6.2 Light distribution

The optical design of the CLE product line ensures optimum homogenity for the light distribution.



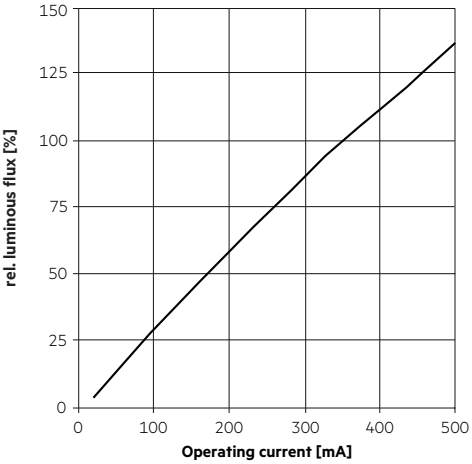

The colour temperature is measured over the complete module. The single LED light points can be outside of 3SDCM.
To ensure an ideal mixture of colours and a homogenious light distribution a suitable optic (e. g. PMMA diffuser) and a sufficient spacing between module and optic (typ. 5 cm) should be used.

### 6.3 Relative luminous flux vs. tc temperature

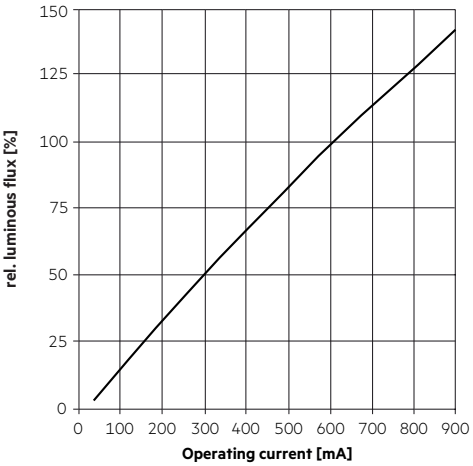



### 6.4 Relative luminous flux vs. operating current

CLE G3 160/190/220mm




CLE G3 315mm




## 7. Miscellaneous

### 7.1 Additional information

Additional technical information at www.tridonic.com → Technical Data

Guarantee conditions at www.tridonic.com → Services

Life-time declarations are informative and represent no warranty claim.