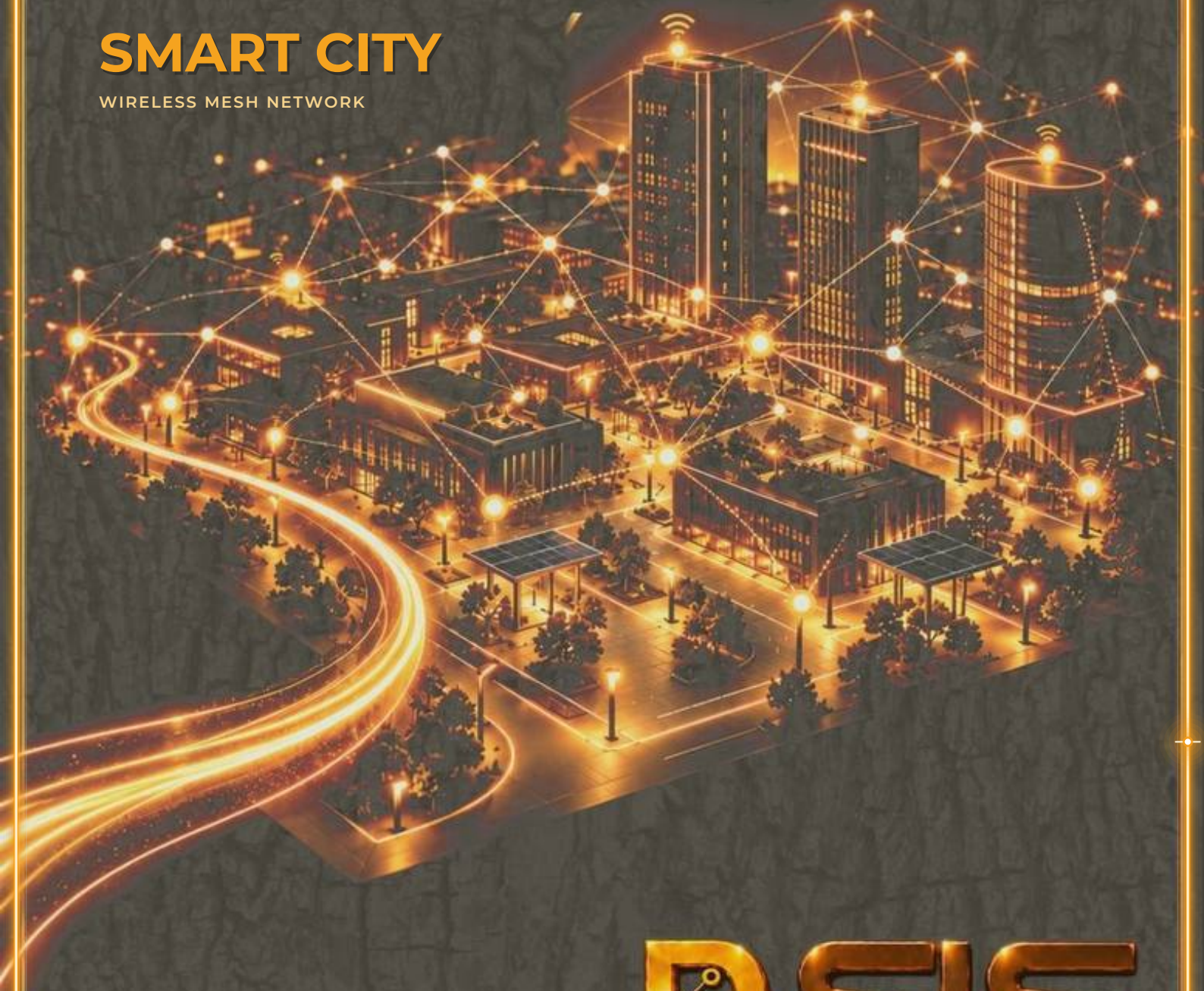
Light shapes the city of tomorrow.

STREET LIGHTING · SOLAR · CONNECTED

SMART CITY

WIRELESS MESH NETWORK



CATALOGUE D-SLS-33

2026

D-SLS

Digital-Smart Lighting Solutions

D-SLS-33 20 – 150 W · Bell Ø750

OVERVIEW · BELL Ø750 · D-SLS-33

A 750 mm bell for market halls, covered courtyards and large covered squares

D-SLS-33 — Ø750 bell, spun dome

28 050 lm
maximum luminaire flux · 150 W · 4000 K

187 lm/W
luminaire efficacy · CRI 70

Handcrafted
made one by one in the workshop

IP66 · IK08
optical unit · impact resistance

DALI-2 · D4i
programmable driver · NFC

7 years
warranty · 10 years optional

Made to order, equipped like a street light

D-SLS-33 is a long-throw pendant: a **spun and pressed Ø 750 mm** aluminium dome, 505 mm high, with a perforated cooling chimney, made to order in our workshop. Inside is the technical core of D-SLS street lights: LED modules with indirect reflectors under tempered glass, a **DALI-2 D4i + DT8** driver, a 10 kV SPD and a Zhaga socket for LidarMesh remote management.

Market halls

Market halls, covered markets and courtyards.

Covered squares

Galleries, forecourts and large volumes.

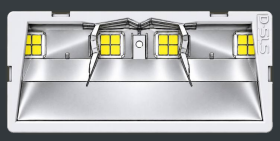
Pendant

On M22 threaded rod, tensioned cable or bracket arm.

D-SLS-33 · NEW EMBEDDED TECHNOLOGIES

Indirect inter-reflection reflector, LiDAR node, D4i · DALI-2 · Thread — the range's connected platform

Indirect reflector (inter-reflection) — reflectance ≥ 98 %



Satin aluminium reflector optics, the LED is never seen directly: reflected light, anti-glare, no PMMA lens. Reflectance ≥ 98 %, ULOR 0 %, asymmetric road distribution. One-piece LED matrix, removable by screws.

New technologies used

LiDAR node
presence detection, counting, Zhaga D4i socket underneath

Static detection
integrated mmWave radar — presence without motion

Thread mesh network
IPv6, self-healing, TALQ 2.7.1

Tunable White
2700 → 6500 K controlled via D4i + DT8

Certified interfaces

THREAD · TALQ 2.7.1 · ZHAGA BOOK 18 · NFC · DALI-2 · D4i

D4i

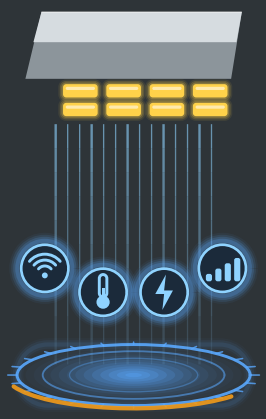
Intelligence serving urban lighting

Interoperability
D4i-compliant for open ecosystems

Power and data over the same cable
standardised interface

Smart sensors
detection, counting, energy monitoring

Predictive maintenance
real-time diagnostics and remote management



DALI+

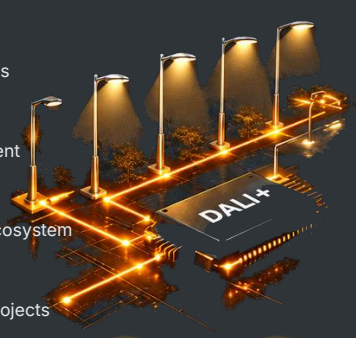
Advanced, scalable management

Precise control
dimming and lighting scenarios

Multi-device
group and address management

Interoperability
certified multi-brand DALI+ ecosystem

Flexibility
suited to current and future projects



Scenarios · Schedule · Control · Supervision

D-SLS-33 — the six connected functions

TUNABLE WHITE · LIDAR AI · MESH NETWORK · SECURE VPN · SELF-HEALING OTA · AI ANTI-THEFT

TECHNOLOGIES

PRODUCT ARCHITECTURE · D-SLS-33 · SIX KEY POINTS

A fully dismountable luminaire: everything can be replaced on site, without special tools

1 Ø 750 mm dome

Spun and pressed aluminium, 505 mm high — colour defined on order.

2 Road core range

Same LED module, same driver and same Zhaga socket as the road luminaires.

3 Programmable driver

DALI-2 · D4i + DT8 via NFC, optional Tunable White.

4 Protection

IP66 optical unit, SPD 10 kV / 10 kA, stainless valve.

5 Remote management

LiDAR node and LidarMesh CMS via the Zhaga Book 18 socket.

6 Handmade

Made to order: colour, finish and engraving to specification.

ARCHITECTURE

IN BRIEF

Construction	Die-cast aluminium housing EN AC-46100 (high-pressure) — Ø 750 mm dome spun one by one in the workshop
Screen / bowl	Flat tempered glass at the base of the dome
Mounting	Pendant on M22 threaded rod or tensioned cable
Protection	IP66 · IK08 · SPD 10 kV / 10 kA · stainless pressure-equalising valve
Range	20 · 30 · 40 · 50 · 60 · 80 · 100 · 120 · 150 W

20 – 150 W	187 lm/W	IP66 · IK08	Zhaga Book 18
power range	luminaire efficacy	sealing · impact	remote management ready

PERFORMANCE & SAVINGS · DASHBOARD

≥ 95 %	> 94 %	−78 %
optical efficiency	driver efficiency	energy

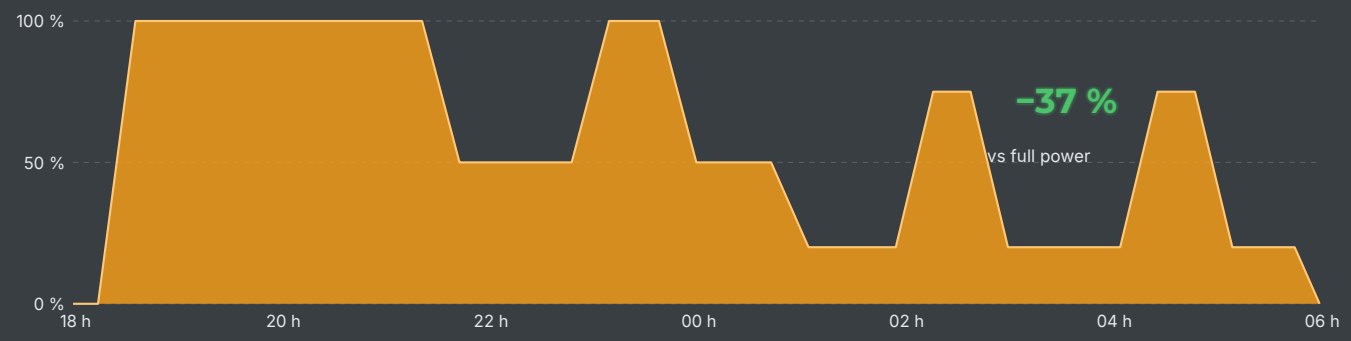
TUNABLE WHITE — CCT RANGE (TW OPTION)

2700 K WARM — COOL 6500 K

D4i + DT8 control — CRI 70 · 80 · 90 · 97, MacAdam < 3 SDCM

Fixed CCTs: 2700 · 3000 · 4000 · 5000 K

LiDAR ADAPTIVE DIMMING — TYPICAL NIGHT PROFILE



--- constant 100 % lighting

D-SLS-33 — LiDAR detection — peaks match detected passages (pedestrian, cyclist, vehicle)

ANNUAL CONSUMPTION PER POINT — 4 200 h/yr · 0.25 €/kWh

HPS 150 W (existing)	714 kWh/yr · 178 €
D-SLS-33 60 W	252 kWh/year · 63 € −65 %
D-SLS-33 60 W + LidarMesh	158 kWh/yr · 40 € −78 %

Assumptions: HPS 150 W (170 W system incl. ballast) replaced by a D-SLS-33 60 W at the same illuminance level.

≈ 10.8 years	−139 kg	zero	100 %
return on investment*	CO2 avoided per point per year	relamping — L90B10 ≥ 100 000 h	remotely controllable (TALQ 2.7.1)

Reading the dashboard

* Energy only, based on the above price and an indicative investment of €1 500 per point — excluding installation and avoided relamping; precise costing on study. Savings combine the efficacy of the LED platform (187 lm/W luminaire), optics that direct the flux onto the useful area, and managed dimming (LidarMesh) that lights at full power only when needed.

KEY BENEFITS · 8 REASONS TO CHOOSE THE D-SLS-33

Ø 750 mm dome

Ø 750 mm spun and pressed aluminium dome, perforated cooling chimney — colour defined on order.

Handmade in the workshop

Made to order: colour, finish and engraving to specification.

"Dark-light" indirect reflector

Indirect (inter-reflection) aluminium reflector ρ≥ **98 %** (ISO 7668 / DIN 5036-3): the LED is never seen directly — optical efficiency ≥ **95 %**, glare-free, no PMMA lens.

LUSSO-5050AUX LED module

Source **280 lm/W**, luminaire **187 lm/W** (4000 K · CRI 70 · Tq 25 °C), L90B10 ≥ 100 000 h (TM-21) — module replaceable on site.

NFC-programmable driver

DALI-2 and **D4i + DT8**: wirelessly adjustable output current, dim-to-off < 0.5 W, stand-alone dimming profiles, OLC compensation.

Remote management ready

Zhaga Book 18 socket: the LiDAR-ATMANI-AI node and the LidarMesh CMS platform can be added at any time, without opening the luminaire.

Full protection

Type II SPD **10 kV / 10 kA** with end-of-life indicator, **IP66**, **IK08**, stainless steel pressure-equalising valve.

7-year warranty

Extension to **10 years** (W10 option) — electronics from ENEC-certified series, product-specific EU declaration of conformity.

1/3
CPS

MATERIALS & CONSTRUCTION · THE D-SLS-33 BODY

CPS technical file — 1 / 3: luminaire body materials & construction

Housing	Housing in **injected** aluminium (high-pressure die-cast) — alloy **EN AC-46100 (AlSi11Cu2(Fe))** to UNI EN 1706, EN 10204 3.1 material certificate
LED module	Removable / replaceable — **Zhaga Book 18** standard · under-driven LUSSO-5050AUX LEDs · Zhaga Book 18 sensor socket fitted as standard
Dome	**Spun and pressed** aluminium Ø 750 × H 505 mm — perforated chimney
Closure	Flat **tempered glass** at the base of the dome — access from below
Optical unit	Aluminium LED plate under flat tempered glass — IP66, removable at height
Finish	RAL colour of your choice — outdoor-grade polyester powder coating, gilding or patina optional
Fasteners	A2 stainless steel
Reflector	High-reflectance aluminium ρ≥ **98 %** (ISO 7668 / DIN 5036-3), inter-reflection — anti-iridescence textured surface, sealed optical chamber, EN 10204 3.1 material certificate
Sealing	EPDM gaskets · M20 × 1.5 stainless IP68 cable gland — IP66 optical unit
Pressure-equalising valve	Stainless steel with hydrophobic membrane — lets air through, never water or dust
Anti-corrosion treatment	Housing surface preparation before painting: alkaline degreasing, pickling and **chemical conversion passivation, then oven-cured polyester powder coating ≥ 70 µm — salt spray 500 h (ISO 9227), corrosivity C3 standard, C5-M seaside optional (MAR)**
Paint finish	Outdoor-grade polyester powder ≥ 70 µm (ISO 2360), adhesion class 0 (ISO 2409), UV resistant — C5 seaside optional (MAR)
Driver	Programmable DALI-2 / D4i + DT8 electronics — tool-free plug-in, integrated 10 kV / 10 kA SPD

MATERIALS

A fully dismountable luminaire

All wear parts — LED module, driver, SPD, gaskets — are replaced on site from the aerial platform, without removing the luminaire or returning it to the workshop. A repairable architecture compliant with EU ecodesign (EU) 2019/2020.

DOCUMENTATION

LED LM-80 files, driver datasheets and material certificates available on request for tender dossiers.

IP66 optical block sealing	**IK08** impact resistance	**A2** stainless fasteners
≥ 70 µm powder coating	**500 h** salt spray ISO 9227	**10 kV** Integrated SPD

D-SLS-33

2 /3
CPS

TECHNICAL SPECIFICATIONS · D-SLS-33

CPS technical file — 2 / 3: technical data to compare point by point with the CPS

Applications	Lighting for market halls, covered markets, courtyards, galleries and large covered squares · classes C and P (EN 13201)
Body / construction	Die-cast aluminium housing EN AC-46100 (high-pressure) — Ø 750 mm dome spun one by one in the workshop
Optical unit	**Indirect** (inter-reflection) satin aluminium reflector — total reflectance ρ≥ **98 %** (ISO 7668 / DIN 5036-3) · LED never seen directly, no PMMA lens · asymmetric road distribution
Optical efficiency	≥ **95 %** — TI ≤ 10 %
Screen / bowl	Flat tempered glass at the base of the dome
Photobiological safety	EN 62471 — risk group 0 (RG0), no UVA emission
Insulation class	Class I (standard) · class II optional
Anti-corrosion treatment	Housing surface preparation before painting: alkaline degreasing, pickling and **chemical conversion passivation**, then oven-cured polyester powder coating ≥ 70 µm — salt spray 500 h (ISO 9227), corrosivity C3 standard, **C5-M seaside** optional (MAR)
Ingress protection	**IP 66** (IEC 60529) · **IK 08** (IEC 62262)
Pressure equalisation	**Stainless-steel** pressure-equalising valve with hydrophobic membrane — no internal condensation or thermal pumping
Mounting / fixing	Pendant on M22 threaded rod or tensioned cable
Dimensions & weight	Dimensioned drawing and weight per size supplied with each offer
Wiring	Plug-in terminal block · tool-free connectors · M20 × 1.5 stainless cable gland IP68
Temperatures	Operation −30 °C / +50 °C (ta 50 °C) · storage −40 °C / +80 °C
Power supply	220 – 240 V AC · 50 / 60 Hz — 90 – 305 V AC optional
Driver	Programmable **DALI-2** · **D4i + DT8** via NFC · efficiency > 94 % · power factor > 0.95 · dim-to-off < 0.5 W
Surge protection	**Integrated type II SPD 10 kV common mode / 6 kV differential mode (10 kA), end-of-life indicator — 20 kV external SPD optional (SP20)**
Thermal controller	Thermal controller **NTC-ETM DIGITAL** — NTC probe on LED array and driver, digital threshold programmable via NFC, automatic current reduction when the threshold is exceeded
LED	Ceramic **LUSSO-5050AUX CSP TECHNOLOGIES** LED chip, under-driven — source **280 lm/W** · luminaire **187 lm/W** (4000 K · CRI 70 · Tq 25 °C)
Wattages & flux	20 · 30 · 40 · 50 · 60 · 80 · 100 · 120 · 150 W — up to **28 050 lm** (4000 K · CRI 70 · Tq 25 °C)
Colour temperatures	2700 · 3000 · **4000** · 5000 K — Tunable White 2700 – 6500 K (TW option)
CRI · MacAdam	CRI 70 (standard) · 80 · 90 · 97 — **< 3 SDCM**
Lifetime	**L90B10 ≥ 100 000 h** (IES LM-80 / TM-21) — maintenance factor 0.80 used in studies
Dimming & remote management	DALI-2 · D4i + DT8 · stand-alone profiles · **Zhaga Book 18** socket — LiDAR node and LidarMesh CMS TALQ 2.7.1 (LD option)
Warranty	**7 years** — 10 years optional (W10)

FEATURES

RoHS · IP66 · IK08 · EN 60598 · EN 62471 · DALI-2 · D4i + DT8 · Zhaga Book 18 · TALQ 2.7.1

Standards framework

Reference standards: EN IEC 60598-1:2021/A11:2022, EN 60598-2-3, EN 62493, EN 62471, EN 55015, EN 61547, EN 61000-3-2, EN 61000-3-3, EN 61000-4-5, EN 13201, IEEE 1789 — driver EN 61347-1 / EN 61347-2-13. LDT / IES files and DIALux study supplied with every offer.

3 /3
CPS

CERTIFICATIONS & STANDARDS

CPS technical file — 3 / 3: certificates, tests and standards framework

Current D-SLS certificates

ENEC	Certificate No. HN 69290740 — TÜV Rheinland InterCert Kft. · EN IEC 60598-1:2021 + EN 60598-2-3
Types covered	443 types D-SLS-a-b-cd — series 03 to 21A and 25
ENEC parameters	AC 220 – 240 V · 50/60 Hz · class I · IP66 · ta 45 °C
TÜV SÜD	Certificate No. N8A 08132 0101 — Low Voltage Directive 2014/35/EU · EN 62493
Families	D-SLS-a-b-cd — series 03 · 05 · 06 · 07 · 09 · 11B · 12A · 13 · 14 · 15 · 18 · 19 · 20 · 21A
TÜV SÜD parameters	200 – 240 V · 50/60 Hz · class II · IP66 · IK09 · ta 50 °C
This product	The D-SLS-33 uses the electronic platform (driver, SPD, LED module) of the certified series; it is covered by its own EU declaration of conformity.

Copies of certificates and test reports supplied with every tender.

Additional tests

- **IP66 / IP67** — IEC 60529 depending on family
- **IK08 / IK09** — IEC 62262 (impact resistance)
- **EN 62471** — photobiological safety RG0
- **EN 61000-4-5** — surge immunity 10 kV / 6 kV
- **EMC** — EN 55015 · EN 61547 · EN 61000-3-2 / -3-3
- **LM-80 / TM-21** — lifetime ≥ 100 000 h L90B10

Standards framework

Luminaire safety
EN IEC 60598-1 · EN 60598-2-3 · EN 60598-2-5

Photobiology
EN 62471

Electromagnetic compatibility
EN 55015 · EN 61547 · EN 61000-3-2 · EN 61000-3-3 · EN 61000-4-5

Protection
EN 60529 (IP) · EN 62262 (IK)

Application
EN 13201 (public lighting) · UNI 11248 (classes M, C, P) · CIE 150 (light pollution)

Control & interoperability
IEC 62386 (DALI-2 · D4i) · Zhaga Book 18 · TALQ 2.7.1

Lifetime
IES LM-80 · IES TM-21 · IES LM-79 · UNI EN 13032-1

European directives
2014/35/EU (low voltage) · 2014/30/EU (EMC) · 2011/65/EU (RoHS)

RoHS · IP66 · IK08 · EN 60598 · EN 62471 · DALI-2 · D4i + DT8 · Zhaga Book 18 · TALQ 2.7.1

Compliance dossier

The above parameters are those stated on the current ENEC certificate and TÜV SÜD attestation; the product features on the previous pages reflect the luminaire's current commercial definition. Compliant with Directives 2014/35/EU, 2014/30/EU and 2011/65/EU; EU declaration of conformity, ENEC certificate, IP / IK reports and photometric files attached to every tender file.

Documents supplied with every offer

ENEC certificate
Certificate No. HN 69290740 and test report — TÜV Rheinland InterCert

TÜV SÜD attestation
Certificate No. N8A 08132 0101 — series 03 (cigar-type column)

EU declaration
EU Declaration of Conformity — Directives 2014/35/EU · 2014/30/EU · 2011/65/EU

IP / IK reports
IP67 / IP66 to IEC 60529 · IK09 / IK10 to IEC 62262, per family

LED lifetime
LM-80 reports and IES TM-21 projection of LED modules

Photometry
LDT / IES files per reference and CCT · DIALux / Relux calculation report

TYPE TESTS & ROBUSTNESS

TYPE TESTS

Temperature rise	ta 50 °C — EN 60598-1 § 12: driver tc and LED module tp, values corrected to the reference ambient.
Sealing	IP 66 — IEC 60529 (dust · powerful water jets).
Mechanical impact	IK 08 — IEC 62262 (5 joules), on assembled luminaire.
Vibration	IEC 60068-2-6 — according to the suspension method: M22 threaded rod, tensioned cable or bracket arm.
Surges	10 kV / 10 kA — EN 61000-4-5; replaceable type II SPD with end-of-life indicator — optional 20 kV external SPD.
Photometry	EN 13032 / LM-79 — LDT and IES files per reference and per CCT.
Long-term flux	LM-80 + TM-21 — L90B10 ≥ 100 000 h.
Corrosion	ISO 9227 salt spray — 500 h on coating and fasteners.

ROBUST PRODUCT — DESIGN CHOICES

Construction	High-pressure die-cast aluminium housing EN AC-46100 — Ø 750 mm dome spun piece by piece in the workshop.
Screen / bowl	Flat tempered glass at the base of the dome.
Fasteners	A2 stainless steel

TESTS

Repairability

The D-SLS-33 is designed to be **repairable on site**: LED module, driver and SPD are replaced individually, without removal or special tools. This architecture meets the circular-economy requirements of EU ecodesign and extends the useful life of the installation well beyond the warranty.

ta 50 °C	5 J	500 h	10 kV / 10 kA
operating ambient temperature	IK08 on assembled luminaire	salt spray ISO 9227	surge immunity

LED MODULE LIFETIME · IES TM-21 PROJECTION

LM-80-21 report · 18 000 h · 180 samples · 0 failures · 55 to 105 °C · 160 mA per LED in operation

An under-driven LED, an over-sized warranty

D-SLS luminaires use a high-power ceramic LED chip **LUSSO-5050AUX** driven at only **160 mA**, i.e. 19 % of the test current: the junction runs far from its limits, less heat must be dissipated and ageing becomes almost imperceptible. The chip maker's LM-80 tests, run at 850 mA and up to 105 °C, still show **96 % of initial flux after 100 000 hours**; under real operating conditions, flux loss over ten years is below 2 %. This performance reserve allows D-SLS to commit to **7 years on parts, labour and travel, extendable to 10 years**, with 90 % guaranteed flux (L90).

PROJECTED LED MODULE LIFETIME

SOLDER POINT TEMPERATURE Ts	FLUX AT 100 000 h	L97	L96	L90	L80
55 °C	97,8 %	≈ 130 000 h	≈ 170 000 h	≈ 418 000 h	≈ 868 000 h
85 °C	97,4 %	≈ 114 000 h	≈ 150 000 h	≈ 372 000 h	≈ 779 000 h
100 °C	96,8 %	≈ 94 000 h	≈ 124 000 h	≈ 312 000 h	≈ 655 000 h

TM-21 reportable values (cap 6 × 18 000 h): L96 · L90 · L80 > 108 000 h at all temperatures; L97 > 108 000 h at 55 and 85 °C. Highlighted row: envelope operating condition adopted for the warranty — **L96B10 at 100 000 h**. 100 °C obtained by Arrhenius interpolation between the 85 °C and 105 °C datasets.

Reading note

An LED does not "burn out": it slowly loses light. Its lifetime is therefore measured by the **number of hours after which it still retains a given percentage of its initial light**. That is what the figure after the "L" means:

- **L97** = operating hours before the LED drops to 97 % of its initial light (3 % loss).
- **L96** = 96 % of light remaining (4 % loss).
- **L90** = 90 % of light remaining (10 % loss) — the usual reference in specifications.
- **L80** = 80 % of light remaining (20 % loss) — the conventional "end of life" threshold for an LED.

Ts is the temperature measured at the LED solder point on its board: the lower it is, the longer the LED lasts. A well-cooled luminaire runs at around 55 – 85 °C; 100 °C is the worst case used for the warranty.

Reading example: at Ts 100 °C, after **100 000 hours** (about 23 years at 12 h per night), the LED still delivers **96.8 %** of its initial light; it would take **312 000 hours** (over 70 years) to fall to 90 %.

CALCULATION CHAIN — LUSSO-5050AUX LED + ALUMINIUM REFLECTOR

280 lm/W	× 92 %	× 78 %	× 93 %	= 187 lm/W
LED source · 160 mA · Tq 25 °C	thermal factor Ts 85 °C	reflector 86.26 % · glazing	driver efficiency	published luminaire · 180 lm/W at ta 50 °C

187 lm/W calculated and published at Tq 25 °C · 180 lm/W at ta 50 °C — 150 W → 28 050 lm · 60 W → 11 220 lm · flux tolerance ±7 %.

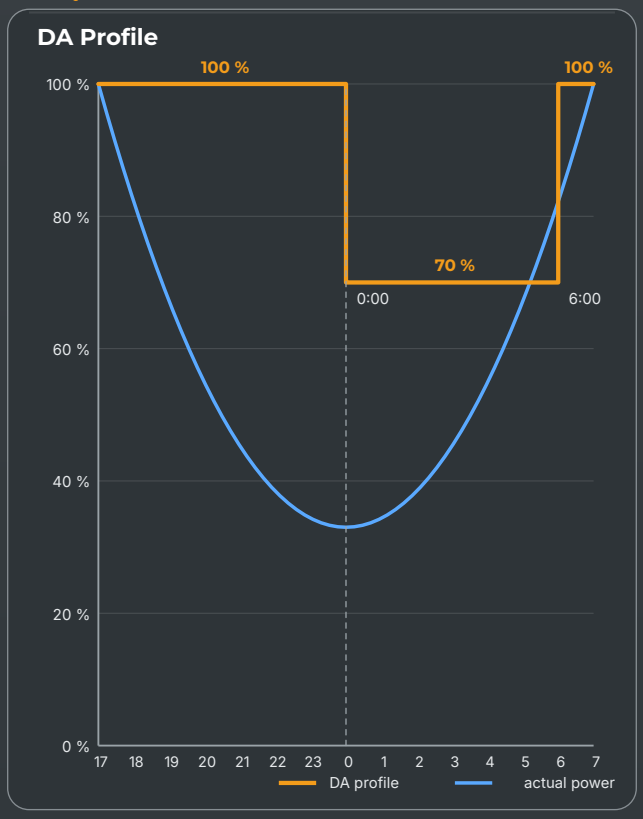
ELECTRICAL FEATURES · PROGRAMMABLE DRIVER

Power supply	220 – 240 V AC · 50 / 60 Hz (90 – 305 V AC optional · tolerance ±10 %)
LED current	350 – 1 000 mA — wirelessly adjustable via NFC (AOC: programmable output current)
Power factor	> 0.95 (full load — PLM) | > 0.98 (full load — F, DA, DAC)
Efficiency	> 94 %
Interfaces	Zhaga-certified **DALI-2** · **D4i + DT8** · NFC · PWM · 0 – 10 V
Auxiliary power supply	24 V DC / 125 mA / 3 W always on (12 V DC with option A12) · built-in 16 V DC bus (DALI-2)
Surge protection	Integrated SPD **10 kV / 10 kA** type II — 10 kV common mode / 6 kV differential mode — LED indicator and thermal fuse: load disconnection at end of life · external SPD 20 kV (SP20 option)
Lifetime	≥ 100 000 h L90B10 · ≥ 100 000 h L90 (IES TM-21)
Warranty	7 years (10 years with W10 option)

Built-in smart functions

- **Dim-to-off** — smart board standby < 0.5 W
- **3 timer modes** (Timer setup) — scheduled consumption reduction
- **OLC** Output Lumen Compensation — constant flux over service life
- **OTP** — **NTC-ETM DIGITAL** built into the driver and LED array, programmable digital thresholds
- Thermal sensing and LED module protection
- End-of-life indicator · light output compensation
- **F** (fixed) · **DA** (autonomous dimming) · **DAC** (autonomous + control) modes
- Astronomical clock and calendar profiles (LD option)

DA profile — stand-alone dimming



Example of an NFC-programmed profile: 100 % at dusk, dimmed to 70 % from 0:00 to 6:00, back to 100 % before dawn — no control wiring, matched to the actual power curve (blue).

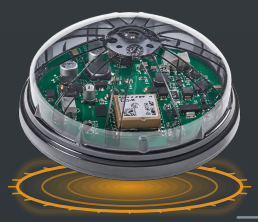
REMOTE MANAGEMENT · LidarMesh CMS & D-SLS LiDAR NODE (LD OPTION)

D-SLS smart node — Zhaga Book 18 / D4i

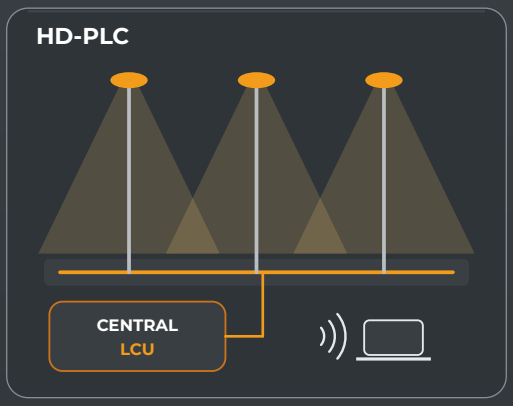
- **LiDAR presence detection** — pedestrians, cyclists, vehicles: on-demand switching and dimming
- **GPS location** · astronomical clock · calendar
- **D4i** interface: the node powers, meters and controls the driver (energy, diagnostics)
- **Thread** mesh network (IPv6) · **TALQ 2.7.1** gateway · LoRaWAN 3 – 15 km · HD-PLC 0 – 10 km
- Peripherals: surveillance camera, audio / video, environmental sensors, Internet access
- Dynamic **DMX / Art-Net** lighting for façades and ceremonies

Protocols:

D4i · DALI-2 · TALQ 2.7.1 · Thread · LoRaWAN · HD-PLC · PWM · 0 – 10 V · DMX · Art-Net



HD-PLC architecture — power line carrier



Communication over the existing power cable to the control unit — no additional network to deploy on the poles.

LidarMesh CMS — D-SLS remote management platform (D-SLS Cloud Infrastructure)

- GIS mapping of light points and cabinets
- Dimming scenarios by zone, schedule and detection
- Alarms and diagnostics: driver, SPD, temperature, voltage
- D4i energy metering, reports and export
- Predictive maintenance and work-order management
- Open TALQ 2.7.1 API — interoperable with third-party CMS

Secure role-based access, European hosting on the D-SLS Cloud Infrastructure — control from smartphone, tablet or supervision workstation.

Road scenario — four levels, zero intervention

100 %	50 %	20 %	0 %
Evening	**Quiet night**	**Standby**	**Dawn**
from sunset to 23:00 — full level per EN 13201	scheduled dimming to calendar	empty road — instant ramp-up on LiDAR detection	astronomical switch-off, driver < 0,5 W

Implementation

The LiDAR node mounts on the luminaire's Zhaga Book 18 socket — at the factory or retrofitted on an existing installation, without opening the luminaire. The D4i driver powers it and reports energy consumed, operating hours and diagnostics. Each luminaire becomes an individual measurement and control point of the LidarMesh CMS platform.

IPv6	3 – 15 km	0 – 10 km	TALQ 2.7.1
Thread mesh network	LoRaWAN range	HD-PLC power-line carrier	CMS interoperability

NETWORK, UPDATES & SUPERVISION · LD OPTION

LidarMesh CMS platform and D-SLS LiDAR node functions — optional, not included in the supply standard.

MESH NETWORK & CONNECTIVITY

Architecture	Every luminaire is an identical **TALQ 2.7.1** gateway — exposed TALQ API, DALI D4i functions, IPv6 addressing.
Mesh network	Self-organising, self-healing mesh — sized for over 10 000 nodes: if a node fails, traffic automatically routes around it.
Internet access	At the client's choice: WiFi, 4G/LTE, Ethernet or fibre — a single link serves a whole segment, with instant failover if it drops.
Network frugality	A single download per segment: updates spread hop by hop across the mesh.
Stand-alone mode	Full offline operation: lighting, DALI dimming, LiDAR detection, astronomical calendar (RTC + GPS) and local log — synchronisation resumes when the network returns.
Network security	End-to-end encrypted link (WireGuard, ChaCha20-Poly1305) up to the platform.

REMOTE UPDATES (OTA) — SELF-HEALING

Principle	Remote firmware update of the whole fleet, no site visit — dual A/B partition: a sound version always remains available.
Probation	Each new version must prove correct operation (network, DALI, supervision) within 10 minutes — otherwise it automatically rolls back to the previous version.
Rollback guards	Hardware watchdog, reboot loop, network or routing loss, silent DALI, memory fault — each guard triggers a rollback.
Canary deployment	In controlled waves 1 % → 10 % → 50 % → 100 % of the fleet — automatic halt and operator alert at the slightest rollback.
OTA security	Images signed and verified by a hardware secure element before flashing — secure boot, encrypted memory, SHA-256 integrity check, anti-rollback.

SUPERVISION & AI COPILOT

Dashboard	GPS map of every luminaire · real-time status, consumption, alarms and history · one-click DALI configuration.
AI copilot	Plain-language incident diagnosis, deployment recommendations and automatic campaign report.
Predictive maintenance	Pre-failure alert for LED module / driver / SPD — optional sensors: brightness, temperature, air quality, noise.
Energy budget	Cap set by the operator, never exceeded: self-regulation if spending drifts, per-luminaire monitoring, savings and CO2 report.

D-SLS-33 — the six connected functions

TUNABLE WHITE · LIDAR AI · MESH NETWORK · SECURE VPN · SELF-HEALING OTA · AI ANTI-THEFT

LidarMesh CMS · D-SLS PROPRIETARY REMOTE MANAGEMENT PLATFORM

Proprietary D-SLS cloud platform — no dependence on any third-party provider.

Each luminaire is a TALQ 2.7.1 gateway. The installation is managed from a web browser, with no software to install: multi-user access with differentiated permissions, open API, cloud or on-premise deployment on request.

SMART MESH NETWORK

Technology	Self-organising, self-healing mesh — over 10 000 nodes per network
Protocols	IPv6 SLAAC · Thread · TALQ 2.7.1 · DALI-2 D4i + DT8
Safety	End-to-end encrypted tunnel · secure boot · signed firmware
Connectivity	WiFi · 4G/LTE · Ethernet · fibre — a single link per segment

ENERGY BUDGET & SOLAR

Energy budget	Cap in euros or kWh set by the operator — never exceeded: real-time self-regulation, luminaire by luminaire
Solar integration	Monitoring of PV generation, storage and grid feed-in — adaptive control based on weather and reserve
Savings report	Dashboard of kWh saved / CO2 avoided / euros billed — automatic monthly report
Dynamic pricing	Lighting programme adapted to the grid tariff (off-peak / peak hours)

TALQ 2.7.1 INTEROPERABILITY

TALQ standard	TALQ 2.7.1 API exposed on every node — compatible with any third-party TALQ-certified CMS
DALI D4i functions	The 8 mandatory D4i functions (Part 102/103/251/252/253/304/306/351) + diagnostics
Schedules	Real astronomical calendars (GPS + RTC sunrise / sunset) · scenarios · manual override
Independence	The operator remains owner of its data · CSV / JSON export · portability to any other TALQ CMS

ACCESS & SERVICE

Client access	Multi-browser web interface · iOS and Android mobile app
Multi-site	Multi-municipality and multi-district management · rights delegation · full operation traceability
Hosting	D-SLS Cloud Infrastructure (European Union) · 99.9 % availability · 24/7 technical support

10 000+	99,9 %	24/7	0000
nodes per mesh network	platform availability	technical support	software to install

Stand-alone mode — no Internet

The installation remains controllable even without a connection: lighting, DALI dimming, LiDAR detection, astronomical clock and local log all work offline. Synchronisation with the platform resumes automatically when the network returns — no permanent connection is required for daily operation.

OPTIONS · COMBINABLE ORDER CODES

LD — LidarMesh remote management

LiDAR-ATMANI-AI D4i node on Zhaga Book 18 socket: presence detection, GPS, astronomical clock, TALQ 2.7.1 gateway, access to LidarMesh CMS.

M22 / CB — Rod, cable or bracket

M22 threaded rod, tensioned cable or bracket arm on a pole — matching accessories.

SP20 — External 20 kV SPD

External surge arrester cascaded with the built-in 10 kV / 10 kA SPD — high-lightning areas, overhead networks.

W10 — 10-year warranty

Standard warranty extended from 7 to 10 years, subject to project registration and compliant operating conditions.

MAR — C5 coastal anti-corrosion

Reinforced surface treatment for marine or industrial atmospheres (ISO 12944 C5), stainless fasteners.

RAL — Colour of choice

Custom RAL colour — municipal marking and co-branding on request.

TW — Tunable White

Tunable white 2700 – 6500 K controlled via D4i + DT8 — circadian and event scenarios.

A12 — 12 V DC auxiliary

12 V DC auxiliary output replacing the standard 24 V DC — supply for third-party sensors and nodes.

CAP — Expandable sensors

Air quality, noise, weather — add-on modules on the LiDAR node, data reported to LidarMesh CMS.

S3 — CRI 80 · 90 · 97 · 3 SDCM

Colour rendering above the CRI 70 standard and tighter colour binning — enhancing historic buildings.

Control

All options can be combined and are added at the end of the reference, in the order of the coding table — e.g. **D-SLS-33-50-60A-740-LD-SP20-W10**. Mechanical options are supplied fitted; the LD option is factory-installed and configured or added later on the Zhaga Book 18 socket, without opening the luminaire.

CASE STUDY · 200 MARKET-HALL BELLS

150 W HPS to replace — indicative example

−78 %	111 MWh	27 788 €
energy with LidarMesh	saved per year across the installation	of energy bill avoided each year

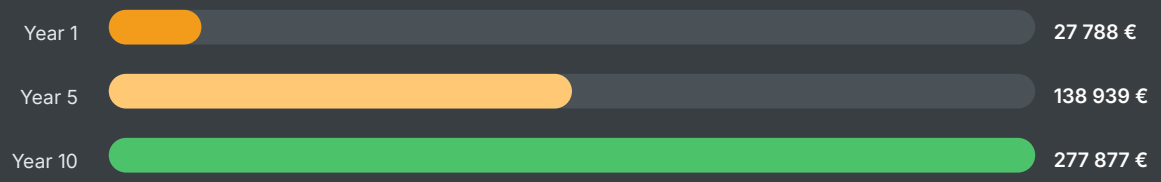
Existing fleet — HPS 150 W

- 200 points · 170 W system per point
- 142 800 kWh/yr · 35 700 € bill
- Lamp replacement every 3 to 4 years
- On/off switching, no dimming
- No remote metering or diagnostics

D-SLS-33 60 W solution

- 200 × D-SLS-33-50-60A-740
- 31 649 kWh/yr · 7 912 € with LidarMesh
- Zero relamping — L90B10 ≥ 100 000 h
- On-demand LiDAR dimming
- D4i metering per point, monthly report

CUMULATIVE SAVINGS — D-SLS-33 + LidarMesh vs HPS 150 W (in €)



Energy only — excluding avoided relamping. Indicative investment ≈ €300 000 (luminaires + nodes + platform), excl. installation: payback ≈ 10.8 years · −28 t CO2 per year.

Calculation assumptions

Assumptions: 4 200 h/year · 0.25 €/kWh · 0.25 kg CO2/kWh — the D-SLS-33 60 W achieves the required EN 13201 levels when replacing 150 W HPS lamps. DIALux / Relux study supplied with every project.

PROJECT PATH · FROM ORDER TO OPERATION

01 Survey & study	02 Validation	03 Manufacturing	04 Mounting	05 Commissioning	06 Operation
DIALux / Relux · project sheet	sample · RAL colour	driver configuration in factory	bucket truck · no special tools	LidarMesh CMS · training	7 → 10 years · after-sales

THE D-SLS-33 & THE ENVIRONMENT

Responsible public lighting — respectful of biodiversity, the night sky and local residents

Light the useful area — and nothing else.

Every technical choice — optics, spectrum, control — aims to reduce light trespass and impact on wildlife: compliance with EU directives, ecodesign (EU) 2019/2020, photobiological group RG0, zero UVA emission.

OBTRUSIVE LIGHT & NEIGHBOURS

Upward flux	LED plate under the opaque dome, indirect reflector aimed at the ground: no light is emitted towards the sky.
Environmental zones	Design to CIE 150 and EN 13201 (zones E1 to E4): façade luminance, glare and upward flux verified in a DIALux study.
Scheduled switch-off	Astronomical switch-off and dimming, zone scenarios: no more space lit at full power when empty.

NOCTURNAL WILDLIFE

Tailored spectrum	2700 K and 3000 K versions: warm wavelengths attract far fewer insects than cool-white sources or discharge lamps.
Zero UV	LEDs emit no UVA / UVB radiation — insects are not attracted to the source, even at close range.
Controlled dimming	Lighting on demand: when unused, intensity drops to 10 – 30 %, limiting the attraction effect and preserving nocturnal flight cycles.
Logarithmic dimming	Smooth 0.1 – 100 % transitions per EN 62386 — no flash or abrupt gradient.

ECODESIGN & LIFE CYCLE

EU ecodesign	Compliant with Regulation (EU) 2019/2020: PstLM ≤ 1 · SVM ≤ 0.4 · light sources and drivers replaceable without tools.
Longevity	L90B10 ≥ 100 000 h: no relamping, zero lamp waste, zero mercury contamination.
CO2 avoided	Case study (200 × HPS 150 W → D-SLS-33 60 W): about 28 t of CO2 avoided per year.

RG0
photobiological group — EN 62471

0 UVA
no ultraviolet radiation

2700 K
warm “wildlife” spectrum option

References & project study

References: CIE 150 (limitation of obtrusive light) · EN 13201 and UNI 11248 (lighting classes) · ecodesign Regulation (EU) 2019/2020 · International Dark-Sky Association. Obtrusive-light study supplied with every project.

PHOTOMETRY · D-SLS-33 · FROM SOURCE TO LUMINAIRE

Indirect reflector — measurement conditions

Indirect reflector optics by inter-reflection — satin aluminium ρ≥ 98 %, the LED is never seen directly. Values in the following tables are **complete luminaire** values — driver and optics included — measured at Vin = 230 V AC, F / DA / DAC modes. The **LUSSO-5050AUX** source (280 lm/W) is underdriven: the luminaire efficacy of **187 lm/W** (4000 – 5000 K, CRI 70, Tq 25 °C) includes thermal, optical (optical efficiency ≥ 95 %) and driver (> 94 %) losses. At operating ambient ta 50 °C: **180 lm/W**. Tolerance ±7 % on flux, ±5 % on power.

280 lm/W	187 lm/W	180 lm/W	L90B10
LUSSO-5050AUX source	luminaire · Tq 25 °C	luminaire · ta 50 °C	≥ 100 000 h · TM-21

PHOTOMETRIC DATA

Optics	**Indirect** (inter-reflection) satin aluminium reflector — reflectance ρ≥ **98 %** (ISO 7668 / DIN 5036-3), LED never seen directly, no PMMA lens
Photometric files	**LDT** and **IES** per reference and colour temperature
Photobiological safety	EN 62471 — risk group 0 (RG0), no UVA emission
Lumen maintenance	LM-80 + TM-21 — L90B10 ≥ 100 000 h
Colour rendering	CRI 70 standard · 80 · 90 · 97 optional · MacAdam < 3 SDCM
Layout study	DIALux / Relux to EN 13201 (M, C, P classes), supplied with every project

A Asymmetric photometry

B Symmetrical ambient photometry

Available colour temperatures

2700 K	3000 K	4000 K	5000 K	TW
727	730	740	750	2700 – 6500 K

≥ 95 %	RG0	±7 %
optical efficiency	EN 62471 photobiological group	flux tolerance

DATA

PHOTOMETRIC TABLES · 5000 K & 4000 K · CRI 70

5000 K · CRI 70 · Vin 230 V AC · F / DA / DAC modes · Rev. 10/2026

Tq 25 °C: laboratory | ta 50 °C: operating ambient

REFERENCE	POWER* W · Tq 25 °C	EFFICIENCY lm/W · Tq 25 °C	FLUX* lm · Tq 25 °C	POWER* W · ta 50 °C	EFFICIENCY lm/W · ta 50 °C	FLUX* lm · ta 50 °C
D-SLS-33-40-20A	20	187	3 740	20	180	3 600
D-SLS-33-40-30A	30	187	5 610	30	180	5 400
D-SLS-33-50-40A	40	187	7 480	40	180	7 200
D-SLS-33-50-50A	50	187	9 350	50	180	9 000
D-SLS-33-50-60A	**60**	**187**	**11 220**	**60**	**180**	**10 800**
D-SLS-33-100-80A	80	187	14 960	80	180	14 400
D-SLS-33-100-100A	100	187	18 700	100	180	18 000
D-SLS-33-200-120A	120	187	22 440	120	180	21 600
D-SLS-33-200-150A	150	187	28 050	150	180	27 000

4000 K · CRI 70 · Vin 230 V AC · F / DA / DAC modes · Rev. 10/2026

Tq 25 °C: laboratory | ta 50 °C: operating ambient

REFERENCE	POWER* W · Tq 25 °C	EFFICIENCY lm/W · Tq 25 °C	FLUX* lm · Tq 25 °C	POWER* W · ta 50 °C	EFFICIENCY lm/W · ta 50 °C	FLUX* lm · ta 50 °C
D-SLS-33-40-20A	20	187	3 740	20	180	3 600
D-SLS-33-40-30A	30	187	5 610	30	180	5 400
D-SLS-33-50-40A	40	187	7 480	40	180	7 200
D-SLS-33-50-50A	50	187	9 350	50	180	9 000
D-SLS-33-50-60A	**60**	**187**	**11 220**	**60**	**180**	**10 800**
D-SLS-33-100-80A	80	187	14 960	80	180	14 400
D-SLS-33-100-100A	100	187	18 700	100	180	18 000
D-SLS-33-200-120A	120	187	22 440	120	180	21 600
D-SLS-33-200-150A	150	187	28 050	150	180	27 000

* Power and flux ±5 % · complete-luminaire values (driver and optics included) · Tq 25 °C: laboratory; ta 50 °C: operating ambient. LDT / IES files and DIALux / Relux calculation provided per project.

PHOTOMETRIC TABLES · 3000 K & 2700 K · CRI 70

3000 K · CRI 70 · Vin 230 V AC · F / DA / DAC modes · Rev. 10/2026

Tq 25 °C: laboratory | ta 50 °C: operating ambient

REFERENCE	POWER* W · Tq 25 °C	EFFICIENCY lm/W · Tq 25 °C	FLUX* lm · Tq 25 °C	POWER* W · ta 50 °C	EFFICIENCY lm/W · ta 50 °C	FLUX* lm · ta 50 °C
D-SLS-33-40-20A	20	177	3 540	20	170	3 400
D-SLS-33-40-30A	30	177	5 310	30	170	5 100
D-SLS-33-50-40A	40	177	7 080	40	170	6 800
D-SLS-33-50-50A	50	177	8 850	50	170	8 500
D-SLS-33-50-60A	**60**	**177**	**10 620**	**60**	**170**	**10 200**
D-SLS-33-100-80A	80	177	14 160	80	170	13 600
D-SLS-33-100-100A	100	177	17 700	100	170	17 000
D-SLS-33-200-120A	120	177	21 240	120	170	20 400
D-SLS-33-200-150A	150	177	26 550	150	170	25 500

2700 K · CRI 70 · Vin 230 V AC · F / DA / DAC modes · Rev. 10/2026

Tq 25 °C: laboratory | ta 50 °C: operating ambient

REFERENCE	POWER* W · Tq 25 °C	EFFICIENCY lm/W · Tq 25 °C	FLUX* lm · Tq 25 °C	POWER* W · ta 50 °C	EFFICIENCY lm/W · ta 50 °C	FLUX* lm · ta 50 °C
D-SLS-33-40-20A	20	171	3 420	20	165	3 300
D-SLS-33-40-30A	30	171	5 130	30	165	4 950
D-SLS-33-50-40A	40	171	6 840	40	165	6 600
D-SLS-33-50-50A	50	171	8 550	50	165	8 250
D-SLS-33-50-60A	**60**	**171**	**10 260**	**60**	**165**	**9 900**
D-SLS-33-100-80A	80	171	13 680	80	165	13 200
D-SLS-33-100-100A	100	171	17 100	100	165	16 500
D-SLS-33-200-120A	120	171	20 520	120	165	19 800
D-SLS-33-200-150A	150	171	25 650	150	165	24 750

Tunable White 2700 – 6500 K (TW option): efficacy depends on the programmed colour point. CRI ≥ 80 / 90 / 97 on request — dedicated tables supplied with the quote.

REPLACEMENT EQUIVALENCES · HIGH CRI & TUNABLE WHITE

DISCHARGE LAMPS → D-SLS-33

Existing lamp	System power	D-SLS-33 equivalent	Luminaire flux (4000 K)	Energy saving
Mercury vapour 125 W	137 W	D-SLS-33-40-30A	5 610 lm	−78 %
HPS 70 W	84 W	D-SLS-33-50-40A	7 480 lm	−52 %
HPS 100 W	115 W	D-SLS-33-50-50A	9 350 lm	−57 %
HPS 150 W	170 W	D-SLS-33-50-60A	11 220 lm	−65 %
HPS 250 W	275 W	D-SLS-33-100-80A	14 960 lm	−71 %
Metal halide 250 W	280 W	D-SLS-33-100-100A	18 700 lm	−64 %
HPS 400 W	430 W	D-SLS-33-200-150A	28 050 lm	−65 %

Indicative equivalences at maintained illuminance — to be confirmed by a DIALux / Relux study accounting for geometry, mounting height and the chosen maintenance factor.

CRI ≥ 90 / 97 (option S3) & Tunable White (option TW) — 60 W reference

187 lm/W
CRI 70 · 4000 – 5000 K · Tq 25 °C

CRI 80 · 90 · 97
S3 option — tables on request

< 3 SDCM
MacAdam colour binning

2700 – 6500 K
Tunable White · D4i + DT8

High colour-rendering versions keep the same optical chain; values indicative, dedicated tables supplied with the offer. The Tunable White version is controlled via D4i + DT8: efficacy depends on the programmed colour point.

EN 13201
maintained illuminance level

−52 → −78 %
of energy on retrofit

DIALux / Relux
study supplied with every project

CODING · BUILDING AN ORDER REFERENCE

D-SLS-33 code structure

D-SLS-33	–	50	–	60	–	A	–	740	–	LD
Series		Size		Power		Photometry		CCT · CRI		Options

Example: D-SLS-33-50-60A-740-LD — 60 W, 4000 K CRI 70, LidarMesh remote management.

AVAILABLE CHOICES

Power	20 · 30 · 40 · 50 · 60 · 80 · 100 · 120 · 150 W
Size	40 (20 – 30 W) · 50 (40 – 60 W) · 100 (80 – 100 W) · 200 (120 – 150 W)
Photometry	A asymmetric · B ambient symmetric
CCT · CRI	727 · 730 · 740 · 750 (CRI 70) — 8xx / 9xx at CRI 80 / 90 — TW Tunable White
Finish	RAL 9005 (standard) — colours of your choice

Combinable option suffixes

LD LidarMesh remote management	**SP20** External SPD 20 kV	**W10** 10-year warranty	**MAR** C5 anti-corrosion
A12 12 V auxiliary	**TW** Tunable White	**S3** 3 SDCM / higher CRI	**RALxxxx** colour of choice

Quotes & purchase orders

A reference fully describes the delivered configuration: it is carried as-is onto quotations, purchase orders and bills of quantities. Options are cumulative and appended in this order at the end of the reference.

WARRANTY & SERVICES

1 7-year warranty

Standard **7-year** warranty on the complete luminaire — LED module, optics, driver and SPD — for a compliant installation and an operating ambient temperature ≤ 50 °C.

2 10-year extension (W10)

With project registration at commissioning: warranty extended to **10 years**, covering flux maintenance (L90) and spare-part availability.

3 Lighting studies

DIALux / Relux photometric study to EN 13201 / UNI 11248, LDT / IES files, LED LM-80 reports and calculation notes for tender files (LM-79 reports in progress).

4 Factory configuration

LED current (NFC), DA / DAC dimming profiles, DALI-2 addresses, OTP thresholds and D4i parameters set at the factory per the project sheet — luminaires ready to install.

5 LidarMesh commissioning

Integration of light points into **LidarMesh CMS**, scenario creation, operator training and remote support.

6 Spare parts & after-sales

Zhaga Book 18 LED modules, drivers, glass and gaskets available throughout the warranty period — on-site replacement without special tools.

Sales & technical contact

E-mail	sa@d-sls.com
WhatsApp	+39 333 765 0586
Web	www.d-sls.it
Headquarters	D-SLS SRL — Via Bocchetto 6, 20123 Milano (MI), Italia — P.IVA IT14260650966

Digital Smart Lighting Solutions

D-SLS

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D-SLS-33 · 20 – 150 W

D-SLS SRL — Digital Smart Lighting Solutions

Via Bocchetto 6 · 20123 Milano (MI) · Italia · P.IVA IT14260650966

sa@d-sls.com · WhatsApp +39 333 765 0586 · www.d-sls.it

D-SLS-33 Catalogue 2026 · Rev. 10/2026 · Bell Ø750, 20 – 150 W range · Non-contractual document

D-SLS reserves the right to change specifications without notice.

www.d-sls.it

WhatsApp direct

sa@d-sls.com