PHILIPS

Xitanium

LED driver

Datasheet

# Xitanium FULL Prog LED Xtreme drivers

## Xi FP 165W 0.2-0.7A SNLDAE 230V C170 sXt

## 9290 028 74906

### Xitanium FULL Prog LED Xtreme drivers

Philips Xitanium Full Programmable LED drivers are specifically designed to deliver the highest performance, protection and configurability. The portfolio offers both central and standalone dimming protocols further increasing the energy savings and $CO_2$ reductions achieved with LED lighting. The Xtreme technology ensures maximum robustness and protection combined with a very long lifetime.

In this product family Philips introduces new drivers in a compact form factor with state-of-the-art features, which offer high value for both OEM customers and end-users. The products can replace the existing programmable outdoor LED drivers and will bring significant improvement in programming, assembly into a luminaire and electrical performance.

### Benefits

- Ultimate robustness, offering peace of mind and lower maintenance costs
- Fully programmable LED-drivers designed for the new digital and connected lighting world
- Extended diagnostics via MultiOne
- Easy to design-in, configure and install for Class I and Class II applications
- Energy savings through high efficiency and via multiple dimming options

### Features

- High surge protection (CM/DM)
- Long lifetime and robust protection against moisture, vibration and temperature
- Configurable operating windows (AOC)
- Multiple control interfaces: DALI, AmpDim, 1-step and 3-step LineSwitch
- Autonomous dimming via integrated DynaDimmer
- Adjustable thermal protection for driver (DTL) and LED module (MTP)
- Constant Light Output (CLO)
- Adjustable Start-up Time (AST)
- Adjustable Light Output (ALO)
- End-Of-Life indicator (EOL)
- Communication through mains via coded commands
- Compliant per DALI Part 251/252/253 (select models)

### Application

- Road and street lighting
- Area lighting
- Tunnel lighting
- Industrial lighting

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## Electrical input data

| Specification item | Value | Unit | Condition |
|---|---|---|---|
| Rated input voltage range | 202…254 | $V_{ac}$ | Performance range |
| Rated input voltage | 230 | $V_{ac}$ | |
| Rated input frequency range | 47…63 | Hz | Performance range |
| Rated input current | 0.76 | A | @ rated output power @ rated input voltage |
| Max. input current | 0.9 | A | @ rated output power @ minimum performance input voltage |
| Rated input power | 177 | W | @ rated output power @ rated input voltage |
| Power factor | 0.99 | | @ rated output power @ rated input voltage |
| Total harmonic distortion | 6 | % | @ rated output power @ rated input voltage |
| Efficiency | 93 | % | @ rated output power @ rated input voltage @ max. Uout |
| Rated input voltage DC range | 186…250 | $V_{dc}$ | Performance range |
| Rated input current DC range | 0.6 | $A_{dc}$ | Performance range |
| Input voltage AC range | 80…264 | $V_{ac}$ | Safety operational range |
| Input frequency AC range | 45…66 | Hz | Safety operational range |
| Input voltage DC range | 168…275 | $V_{dc}$ | Safety operational range |
| Standby Power | 0.45 | W | |
| Isolation input to output | Double | | |

## Electrical output data

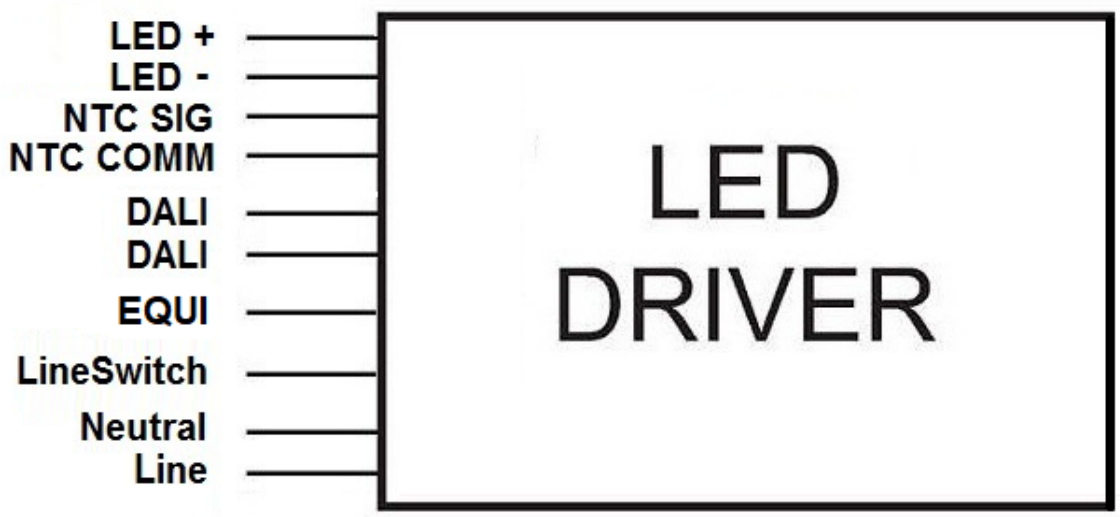
| Specification item | Value | Unit | Condition |
|---|---|---|---|
| Regulation method | Constant Current | | |
| Output voltage | 100…300 | $V_{dc}$ | |
| Output voltage max. | 340 | V | Maximum voltage at open load |
| Output current | 0.05…0.7 | A | |
| Output current min programmable | 200 | mA | |
| Output current min dimming | 53 | mA | |
| Output current tolerance ± | 5 | % | |
| Output current ripple LF | ≤ 4 | % | Ripple = peak / average < 3kHz |
| Output current ripple HF | ≤ 4 | % | |
| Output $P_{st}^{LM}$ | ≤ 0.15 | | In entire operating window |
| Output SVM | ≤ 0.07 | | In entire operating window |
| Output power | 7…165 | W | |

## Electrical data controls input

| Specification item | Value | Unit | Condition |
|---|---|---|---|
| Control method | AmpDim, Coded Mains, DALI, Dynadimmer, LineSwitch 3-step, LineSwitch single-step | | Output current amplitude dimming. Please refer to design-in guide at www.philips.com/oem for more controllability details. |
| Dimming range | 10…100 | % | For latest DALI certification status please visit: www.digitalilluminationinterface.org/products LineSwitch: Vlow: < 160Vac Vhigh: 170 … 264Vac |
| Isolation controls input to output | Double | | acc. IEC61347-1 |

## Wiring and Connections

| Specification item | Value | Unit | Type |
|---|---|---|---|
| Input wire cross-section | 0.5…1.5 / 20…16 | $mm^2$ / AWG | solid / stranded wire |
| Input wire strip length | 7.5…8.5 | mm | |
| Output wire cross-section | 0.5…1.5 / 20…16 | $mm^2$ / AWG | solid / stranded wire |
| Output wire strip length | 7.5…8.5 | mm | |
| Control wire cross-section | 0.5…1.5 / 20…16 | $mm^2$ / AWG | solid / stranded wire |
| Control wire strip length | 7.5…8.5 | mm | |
| Maximum cable length | 2.5 | m | CISPR15: between driver and LED module |
| Maximum NTC output cable length | 0.6 | m | |

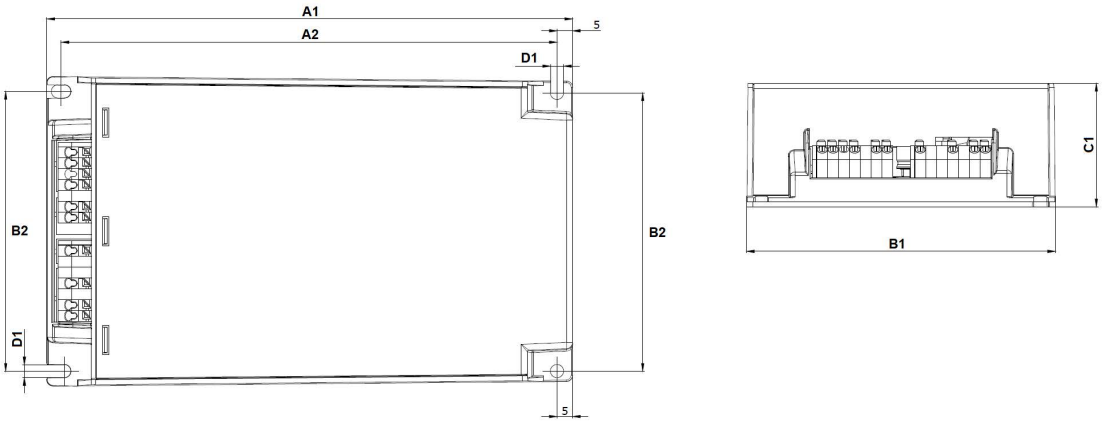



## Insulation

| Insulation per IEC61347-1 | Mains + LineSwitch | EQUI | LED + NTC | DALI |
|---|---|---|---|---|
| Mains + LineSwitch | | Reinforced | Reinforced | Reinforced |
| EQUI | Reinforced | | Basic | Reinforced |
| LED + NTC | Reinforced | Basic | | Reinforced |
| DALI | Reinforced | Reinforced | Reinforced | |

## Dimensions and weight

| Specification item | Value | Unit | Tolerance (mm) |
|---|---|---|---|
| Length (A1) | 170 | mm | |
| Mounting hole distance (A2) | 160 | mm | |
| Width (B1) | 100 | mm | |
| Width (B2) | 90 | mm | |
| Height (C1) | 40 | mm | |
| Mounting hole diameter (D1) | 4.2 | mm | |
| Weight | 890 | gram | |




## Logistical data

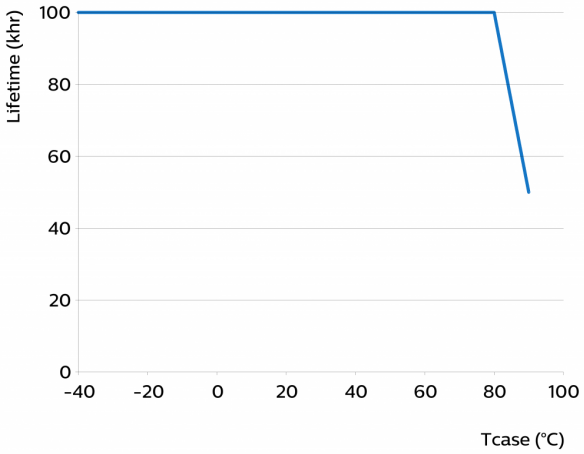
| Specification item | Value |
|---|---|
| Product name | Xi FP 165W 0.2-0.7A SNLDAE 230V C170 sXt |
| EOC | 871951436098300 |
| Logistic code 12NC | 9290 028 74906 |
| EAN1 (GTIN) | 8719514360983 |
| EAN3 (box) | 8719514360990 |
| Pieces per box | 9 |

## Operational temperatures and humidity

| Specification item | Value | Unit | Condition |
|---|---|---|---|
| Ambient temperature | -40…+55 | °C | Higher ambient temperature allowed as long as Tcase-max is not exceeded |
| Tcase-max | 90 | °C | Maximum temperature measured at $T_{case}$-point |
| Tcase-life | 80 | °C | Measured at $T_{case}$-point |
| Maximum housing temperature | 120 | °C | In case of a failure, inherent by design |
| Relative humidity | 10…90 | % | Non-condensing |

## Lifetime

| Specification item | Value | Unit | Condition |
|---|---|---|---|
| Driver lifetime | 100,000 | hours | Measured temperature at Tcase-point is Tcase-life. Maximum failures = 10% |




## Storage temperature and humidity

| Specification item | Value | Unit | Condition |
|---|---|---|---|
| Ambient temperature | -40...+85 | °C | |
| Relative humidity | 5...95 | % | Non-condensing |

## Programmable features

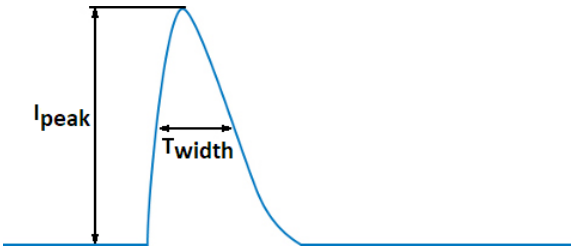
| Specification item | Available | Default setting | Condition |
|---|---|---|---|
| Set Adjustable Output Current (AOC) | Programmable, SimpleSet | 700 mA | |
| LED Module Temperature Protection (MTP) | Yes | OFF | |
| Driver Temperature Limit (DTL) | Yes | ON | |
| Adjustable Light Output (ALO) | Yes | OFF | |
| Adjustable Light Output (ALO) min level | No | | |
| Constant Light Output (CLO) | Yes | OFF | |
| Adjustable Start-up Time (AST) | Yes | 1 s | |
| DALI 253 M | Yes | — | |
| Integrated Dynadimmer | Yes | OFF | 5-step, light turn-off possible |
| LineSwitch single-step | Yes | ON | |
| LineSwitch 3-step | Yes | OFF | |
| AmpDim | Yes | OFF | |
| Min Dim Level | Yes | 10 % | |
| DC emergency (DCemDim) | Yes | ON | Default: AOC = 15%. EOFx = 10 ... 60%. No external DC rated fuse required. Internal fuse rating: T5A 250VAC/DC |
| DALI control supported at DC operation | No | | |
| End Of Life indicator (EOL) | Yes | OFF | |
| Coded Mains | Yes | OFF | |
| OEM Write Protection (OWP) | Yes | OFF | |
| Luminaire Info (DALI part 251) | Yes | — | |

## Features

| Specification item | Value | | Condition |
|---|---|---|---|
| Open load protection | Yes | | Automatic recovering |
| Short circuit protection | Yes | | Automatic recovering |
| Over power protection | Yes | | Automatic recovering |
| Hot wiring | No | | |
| Suitable for fixtures with protection class | I and II | | per IEC60598 |
| Overtemperature protection | Yes | | Automatic recovering |
| Energy metering (DALI part 252) | Yes | | Accuracy = 10% |
| Diagnostics | Yes | | |
| Diagnostics (DALI part 253) | Yes | | |

## Inrush current

| Specification item | Value | Unit | Condition |
|---|---|---|---|
| Inrush current | 77/150 | A/µs | Input voltage 230V |
| Drivers / MCB 16A type B | ≤ 9 | pcs | Indicative value |




Please refer to the driver design in guide if you use other MCB-types.

## Driver touch current / protective conductor current

| Specification item | Value | Unit | Condition |
|---|---|---|---|
| Typical Touch Current (ins. Class II) | 0.25 | mA peak | Acc. IEC61347-1. LED module contribution not included |
| Typical Protective Conductor Current (ins. Class I) | 0.18 | mA rms | Acc. IEC60598-1. LED module contribution not included |

## Surge immunity

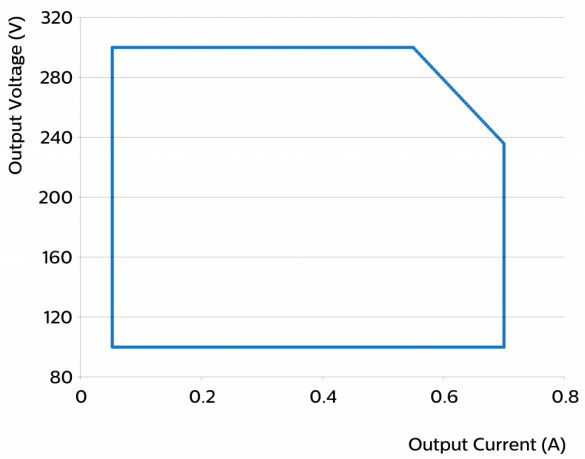
| Specification item | Value | Unit | Condition |
|---|---|---|---|
| Mains surge immunity (diff. mode) | 6 | kV | L-N, Ls-L, Ls-N, acc. IEC61000-4-5. 2 Ohm, 1.2/50us, 8/20us |
| Mains surge immunity (comm. mode) | 10 | kV | L/N/Ls - EQUI 10kV acc. EN61547; 8kV acc. IEC61000-4-5, 12 Ohm 1.2/50us,8/20us |
| Control surge immunity (diff. mode) | 1 | kV | DALI - DALI, acc. IEC61000-4-5. 2 Ohm, 1.2/50us, 8/20us |
| Control surge immunity (comm. mode) | 6 | kV | DALI - EQUI acc. IEC61000-4-5. 12 Ohm, 1.2/50us, 8/20us |
| Control surge immunity (comm. mode) | 8 | kV | DALI - L/N/Ls acc. IEC61000-4-5. 12 Ohm, 1.2/50us, 8/20us |

## Application Info

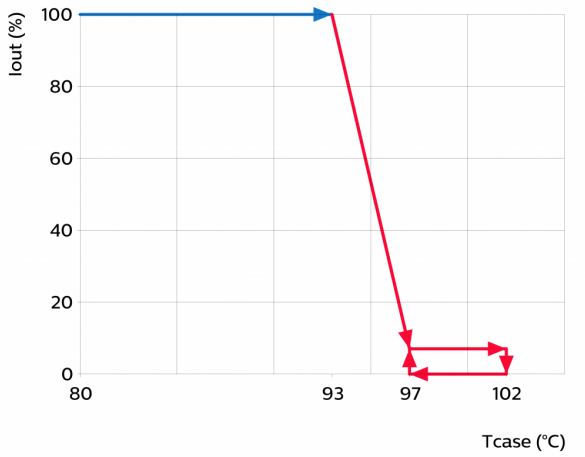
| Specification item | Value |
|---|---|
| Approval marks | CCC / CE / DALI 2 / Double-insulated Built-In / EAC / EL / ENEC / RCM / UA / UKCA / WEEE |
| Ingress Protection classification (IP) | 20 |
| Application | Outdoor |
| Mounting Type | Built-in |

## Graphs

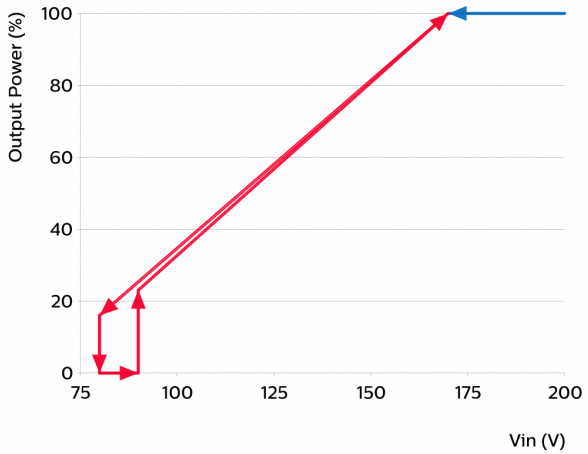
### Operating window



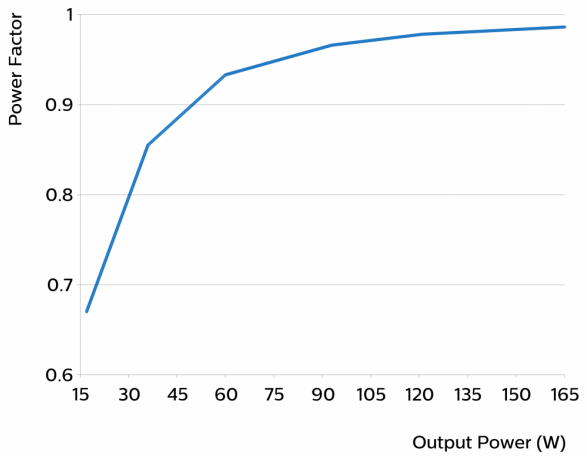

### Thermal Guard



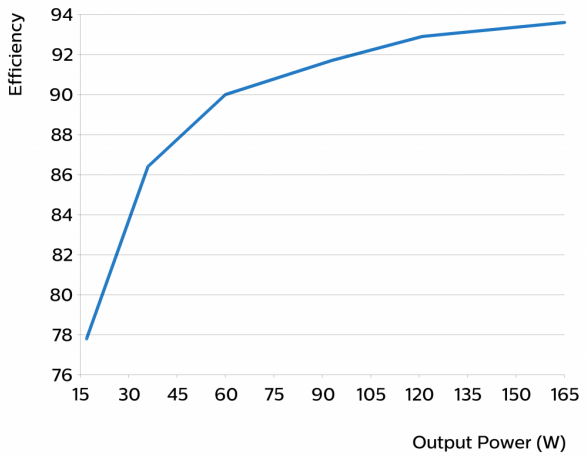

### Mains Guard



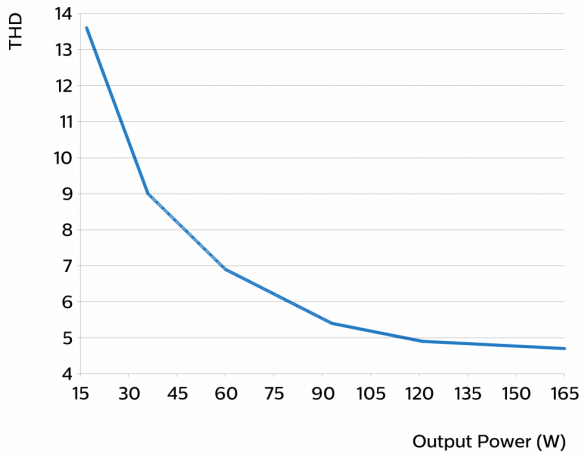
## Power factor versus output power




## Efficiency versus output power




## THD versus output power



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