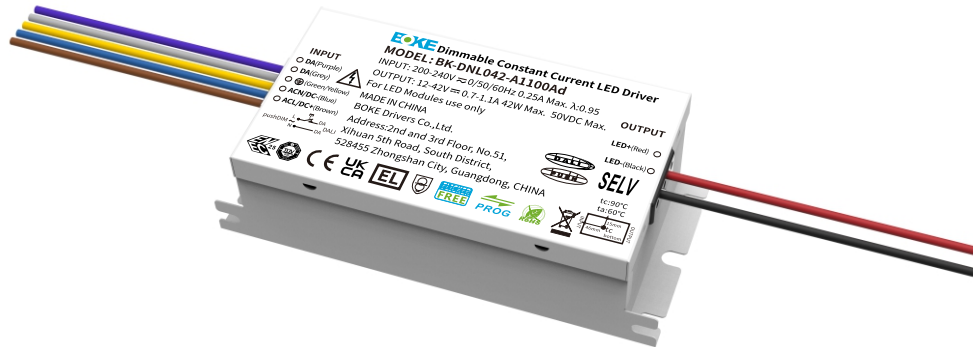


Constant current built-in dimming driver

DNL Series suffix d(DALI-2+pushDIM+DALI programmable)



Features

- Support DALI-2+pushDIM dimming interface
- The output current programming configuration of the driver can be realized through the DALI interface
- Soft dimming and flicker-free at any brightness, meets the new requirements of ErP certification
- Using HPC patented technology, at any dimming level, the brightness of the lights is the same
- Standby power input<0.5W, meets the requirements of ErP certification
- High PF, high efficiency, low THD
- Intelligent LED hot-plug protection function
- SELV and Class I design, suitable for use inside of the luminaires
- Passed CE,ENEC,UKCA,RCM,DALI-2,EL and other certifications
- IP20 protection grade, indoor use
- Nominal life-time up to 100,000 h
- 5.5-year guarantee

Interfaces

- DALI-2(DALI-2 DT6)
- PUSH(pushDIM)

Functions

- Support central emergency application (dimming normal or fixed output of programming under in DC input)
- Support self-contained emergency application
- Programming via DALI (EasySet)
- Protective features (short-circuit, overload, no-load, hot plug-in protection)

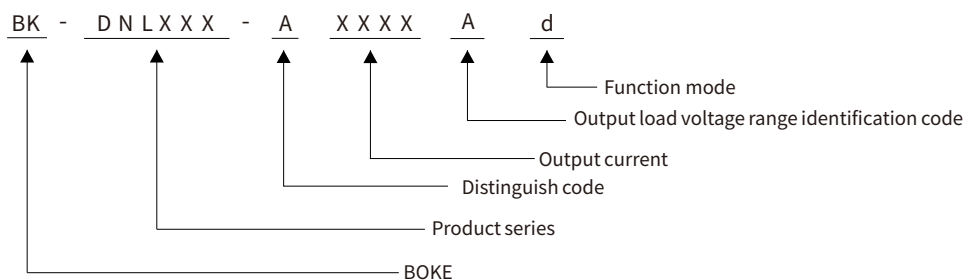
Suitable for lights

- Suitable for lights with built-in drivers such as downlight, rail lights, bracket lights

Typical applications

- LED indoor lighting
- LED office lighting
- LED commercial lighting

Model coding rules of DNL series



Function list

Model	Suffix	Wired dimming		Advanced functions				Device Configuration
		DALI-2	pushDIM	AOC	EL	CLO	corridorDIM	DALI interfaces
BK-DNL010-A BK-DNL022-A	d	√	√	√				√
BK-DNL036-A BK-DNL042-A	DP	√	√	√	√	√	√	√

* The description in this specification is only applicable to the products with the suffix d and the model are DNL036-A and DNL042-A .

Model list

Model	Input voltage	Output power	Output voltage	Output current	Dimension
BK-DNL010-AxxxxAd	200-240VAC/DC	10.8W MAX.	12-25/30/36/42VDC	0.1-0.35A	L84*W44*H25mm
BK-DNL010-AxxxxADP	200-240VAC/DC	10.8W MAX.	12-25/30/36/42VDC	0.1-0.35A	L84*W44*H25mm
BK-DNL022-AxxxxAd	200-240VAC/DC	22.8W MAX.	12-38/40/42VDC	0.25-0.6A	L86*W52*H29mm
BK-DNL022-AxxxxADP	200-240VAC/DC	22.8W MAX.	12-38/40/42VDC	0.25-0.6A	L86*W52*H29mm
BK-DNL036-AxxxxAd	200-240VAC/DC	37.8W MAX.	12-42VDC	0.5-0.9A	L111*W52.9*H30mm
BK-DNL036-AxxxxADP	200-240VAC/DC	37.8W MAX.	12-42VDC	0.5-0.9A	L111*W52.9*H30mm
BK-DNL042-AxxxxAd	200-240VAC/DC	42W MAX.	12-38/40/42VDC	0.7-1.1A	L111*W52.9*H30mm
BK-DNL042-AxxxxADP	200-240VAC/DC	42W MAX.	12-38/40/42VDC	0.7-1.1A	L111*W52.9*H30mm

* The description in this specification is only applicable to the products with the suffix d and the model are DNL036-A and DNL042-A .

Technical data

Product model	BK-DNL036-A0900Ad
Output parameters	
Regulation method	Constant Current
Rated output current range	0.7-0.9A
Rated output voltage range	12-42VDC
Rated output power	37.8W Max
Output current adjustment	EasySet programming
Output current ripple LF	±2%
Output current accuracy	±1%
Linear regulation	±1%
Load regulation	±1%
No load output voltage	50VDC
Flicker-free(typical)	Flickering percent(IEEE 1789)=0.116%(100Hz), Flicker index(IEEE 1789)=0.000(100Hz), Pst LM = 0.000, SVM = 0.003, (The above parameters are obtained from testing the panel lights)
Input parameters	
Rated input voltage range	200-240VAC 200-240VDC
Input voltage range	180-264VAC 180-264VDC
Input voltage shock	<380 V AC
Input current	<0.22A (Rated input voltage)
Input frequency	0/50/60Hz
Input PF/Input DF(typical)	PF: 0.98, DF: 0.98 ,see the electrical values below for details
Input THD(typical)	7% ,see the electrical values below for details
Efficiency(typical)	89.5% ,see the electrical values below for details
In-rush current(typical)	2.425A peak ,202us duration(50 % Ipeak), see the description below for details
Start/Switchover/Turn off	<0.7s(AC start),<0.7s(DC start),<0.3s(AC/DC switchover),<0.5s(Turn off)
Switching cycles	> 100,000 switching cycles
Power consumption(typical)	Full load(Pin):42.2W, No load(Pno): N/A, On stand-by(Psb) : <0.5W, Network stand-by(Pnet) : N/A
Safety	
Withstand voltage	I/P-O/P:3750VAC,I/P-FG:1750VAC,O/P-FG:500VAC ,I/P-DALI: 1500V AC ,O/P-DALI: 1500V AC.
Mains surge capability	L-N:2KV,L-FG/N-FG:2KV(90°/270° , 5 times each with an interval of 60s)(Performance criterion:A)
Leakage current(typical)	0.3mA
Isolation resistance	I/P-O/P:100MΩ/500Vdc/25°C/70% RH
Control interface	
DALI dimming port	Voltage range: 9.5-22.5V, typical 16V, interface current consumption: 1.8mA
pushDIM dimming port	Voltage range: 180-264V 47/63Hz
1-10V 3in1 dimming port	N/A
Auxiliary power supply	N/A
Dimming range	1-100%
Dimming drive mode	AM(amplitude modulation)
Emergency support	
Central emergency system	Supported
Self-contained emergency	Supported
Environment & Life time	
Operating temperature	Ta=-20-60°C
Case temperature	Tc=90°C
Operating humidity	5-85% RH, not condensed
Storage temp./humidity	-40-80°C, 5-85% RH, not condensed
IP grade	IP20
MTBF	500,000H,MIL-HDBK-217F(25°C)
Life-time	Nominal life-time up to 100,000 h, see the description below for details
Vibration resistant	10~500Hz,5G 12min./1cycle,period for 72min. each along X,Y,Z axes
Acoustic Noise	<25dB(30cm, Normal operation)
Environmental protection	RoHS
Certifications and standards	
Certification	CE,ENEC,UKCA,RCM,CCC,DALI-2,EL
Safety	EN61347-1, EN61347-2-13, EN62384
EMC	EN55015, EN61000-3-2 , EN61000-3-3, EN61000-4-2,3,4,5,6,8,11, EN61547
DALI-2	IEC 62386-101(DALI-2), IEC 62386-102(DALI-2), IEC 62386-207(DALI-2)
EL	Compatible IEC 61347-2- 13 Annex J , compatible with EN 60598-2-22 and EN 50172
RF	N/A

Remarks

1.By default, all parameter are measured at 230VAC input, full load and 25°C of ambient temperature.

Technical data

Product model	BK-DNL042-A1000Ad	BK-DNL042-A1050Ad	BK-DNL042-A1100Ad	
Output parameters				
Regulation method	Constant Current	Constant Current	Constant Current	
Rated output current range	0.5-1A	1.05A	1.1A	
Rated output voltage range	12-42VDC	12-40VDC	12-38VDC	
Rated output power	42W Max	42W Max	41.8W Max	
Output current adjustment	EasySet programming			
Output current ripple LF	±2%			
Output current accuracy	±1%			
Linear regulation	±1%			
Load regulation	±1%			
No load output voltage	50VDC			
Flicker-free(typical)	Flickering percent(IEEE 1789)=0.141%(100Hz), Flicker index(IEEE 1789)=0.000(100Hz), Pst LM = 0.000, SVM = 0.004, (The above parameters are obtained from testing the panel lights)			
Input parameters				
Rated input voltage range	200-240VAC 200-240VDC			
Input voltage range	180-264VAC 180-264VDC			
Input votage shock	<380 V AC			
Input current	<0.25A (Rated input voltage)			
Input frequency	0/50/60Hz			
Input PF/Input DF(typical)	PF: 0.99, DF: 0.99 ,see the electrical values below for details			
Input THD(typical)	5% ,see the electrical values below for details			
Efficiency(typical)	89.5% ,see the electrical values below for details			
In-rush current(typical)	2.825A peak ,174us duration(50 % Ipeak), see the description below for details			
Start/Switchover/Turn off	<0.7s(AC start),<0.7s(DC start),<0.3s(AC/DC switchover),<0.5s(Turn off)			
Switching cycles	> 100,000 switching cycles			
Power consumption(typical)	Full load(Pin):46.9W, No load(Pno): N/A, On stand-by(Psb) : <0.5W, Network stand-by(Pnet) : N/A			
Safety				
Withstand voltage	I/P-O/P:3750VAC,I/P-FG:1750VAC,O/P-FG:500VAC ,I/P-DALI: 1500V AC ,O/P-DALI: 1500V AC.			
Mains surge capability	L-N:2KV,L-FG/N-FG:2KV(90°/270°, 5 times each with an interval of 60s)(Performance criterion:A)			
Leakage current(typical)	0.5mA			
Isolation resistance	I/P-O/P:100MΩ/500Vdc/25°C/70% RH			
Control interface				
DALI dimming port	Voltage range: 9.5-22.5V, typical 16V, interface current consumption: 1.8mA			
pushDIM dimming port	Voltage range: 180-264V 47/63Hz			
1-10V 3in1 dimming port	N/A			
Auxiliary power supply	N/A			
Dimming range	1-100%			
Dimming drive mode	AM(amplitude modulation)			
Emergency support				
Central emergency system	Supported			
Self-contained emergency	Supported			
Environment & Life time				
Operating temperature	Ta=-20-60°C			
Case temperature	Tc=90°C			
Operating humidity	5-85% RH, not condensed			
Storage temp./humidity	-40-80°C, 5-85% RH, not condensed			
IP grade	IP20			
MTBF	500,000H,MIL-HDBK-217F(25°C)			
Life-time	Nominal life-time up to 100,000 h, see the description below for details			
Vibration resistant	10~500Hz,5G 12min./1cycle,period for 72min. each along X,Y,Z axes			
Acoustic Noise	<25dB(30cm, Normal operation)			
Environmental protection	RoHS			
Certifications and standards				
Certification	CE,ENEC,UKCA,RCM,CCC,DALI-2,EL			
Safety	EN61347-1, EN61347-2-13, EN62384			
EMC	EN55015, EN61000-3-2 , EN61000-3-3, EN61000-4-2,3,4,5,6,8,11, EN61547			
DALI-2	IEC 62386-101(DALI-2), IEC 62386-102(DALI-2), IEC 62386-207(DALI-2)			
EL	Compatible IEC 61347-2- 13 Annex J , compatible with EN 60598-2-22 and EN 50172			
RF	N/A			

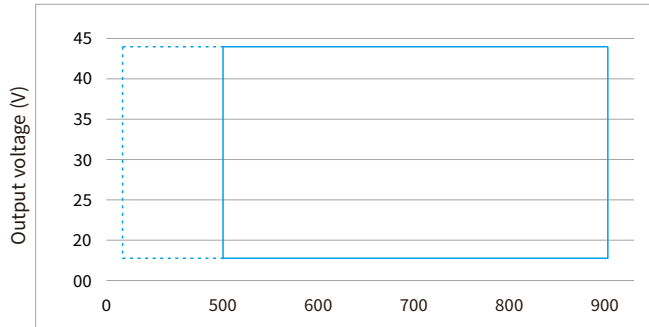
Remarks

1.By default, all parameter are measured at 230VAC input, full load and 25°C of ambient temperature.

Electrical values

BK-DNL036-A

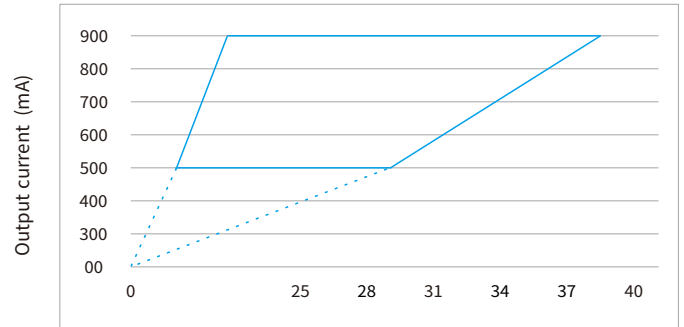
Operating window



Output current (mA)

— Operating window 100 %
 Operating window dimmed

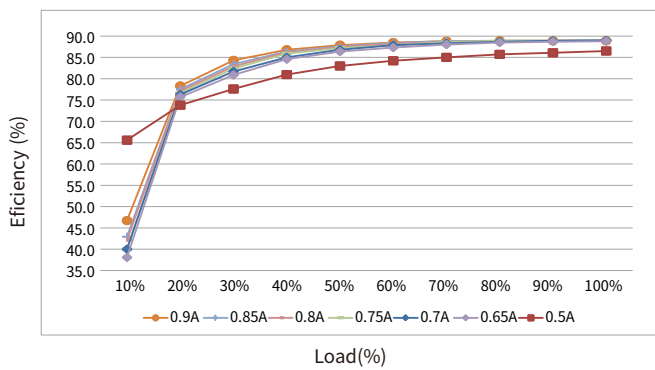
Operating window



Output power (W)

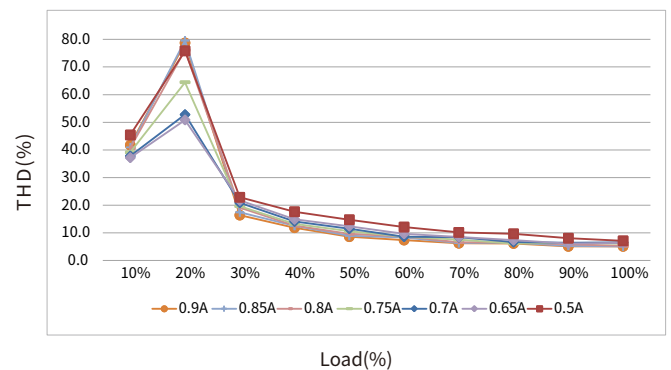
— Operating window 100 %
 Operating window dimmed

Efficiency vs load



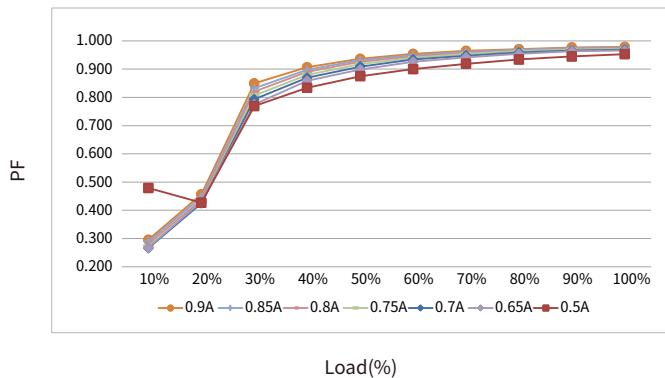
Load (%)

THD vs. Load



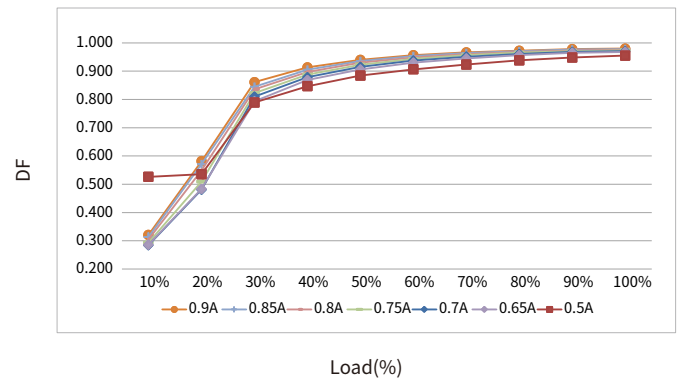
Load (%)

Power factor vs. Load



Load (%)

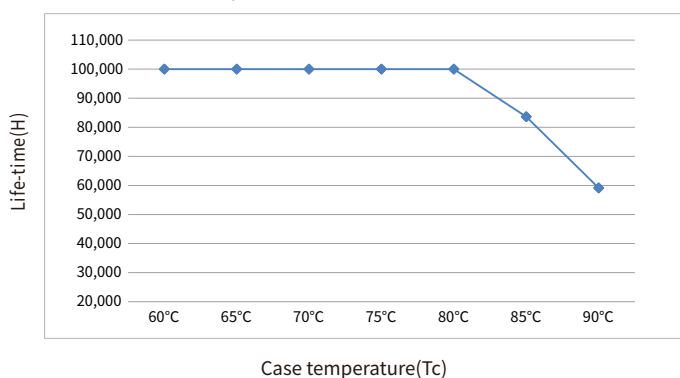
Displacement factor vs. Load



Load (%)

Expected life-time

Life-time vs. case temperature



Case temperature (Tc)

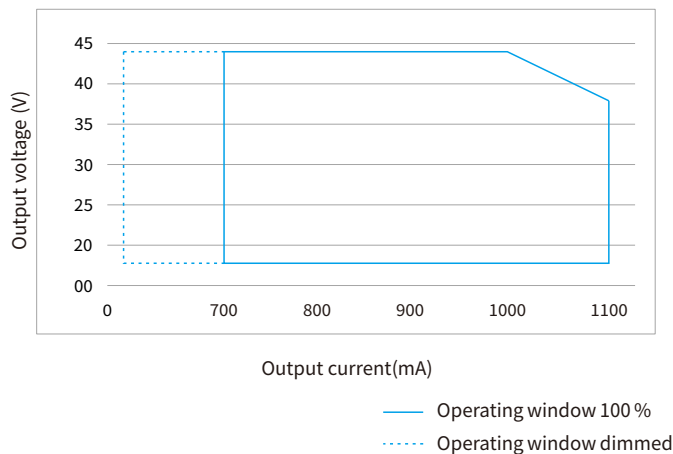
-The life-time of the LED driver is shown in the figure above
 (calculated based on the 90% survival rate).

- The relation of tc to ta temperature depends also on the luminaire design.

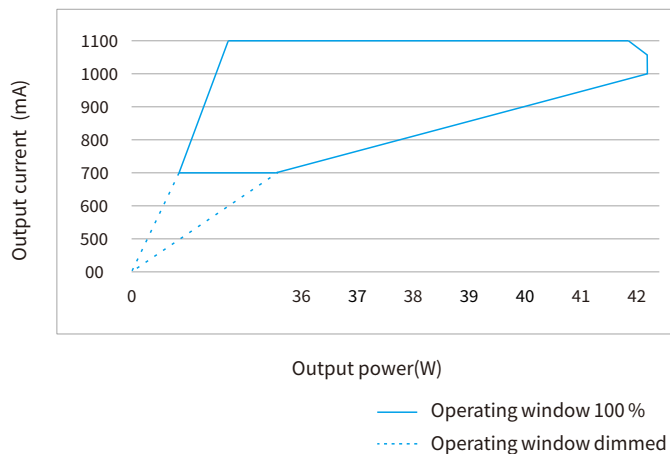
Electrical values

BK-DNL040-A

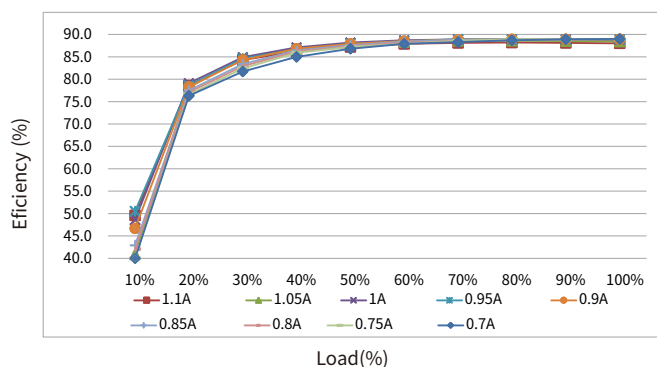
Operating window



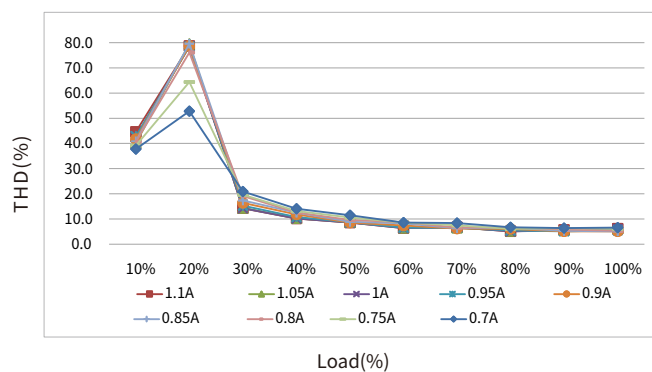
Operating window



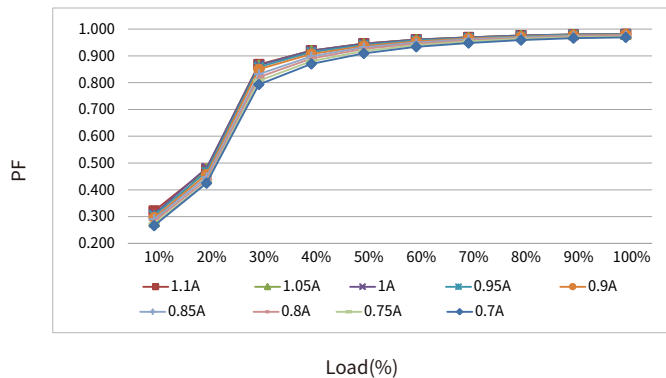
Efficiency vs load



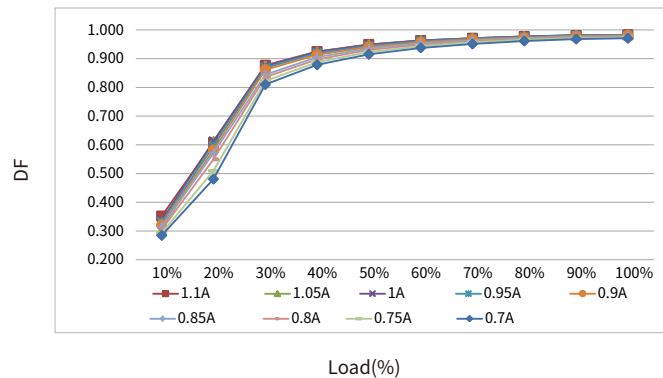
THD vs. Load



Power factor vs. Load

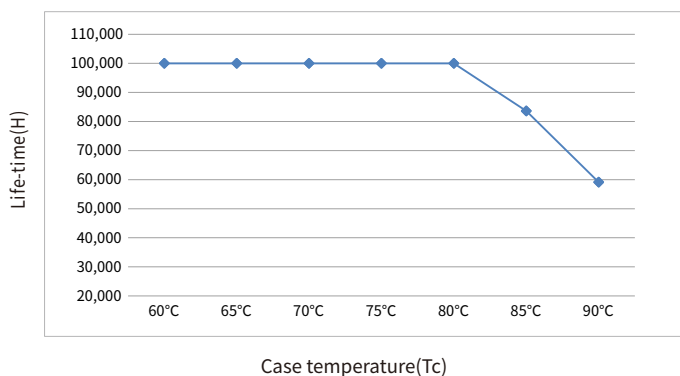


Displacement factor vs. Load



Expected life-time

Life-time vs. case temperature

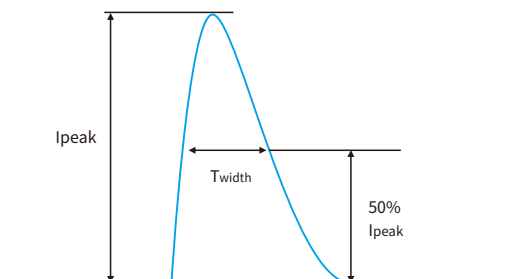


-The life-time of the LED driver is shown in the figure above
 (calculated based on the 90% survival rate).

- The relation of tc to ta temperature depends also on the luminaire design.

Surge

Model	I _{peak}	Twidth	Condition	Relative number of MCB/pcs														
				B10	B13	B16	B20	B25	C10	C13	C16	C20	C25	D10	D13	D16	D20	D25
BK-DNL036-A	2.825A	188us	AC 230V, Full load, Cold start, T _a ≤ 30°C, MCB is not installed side by side	36	47	58	73	91	36	47	58	73	91	36	47	58	73	91
BK-DNL042-A	2.912A	174us		33	43	52	65	82	33	43	52	65	82	33	43	52	65	82



Remarks

- The number of drives mounted under different MCBs in the table is the maximum value. Please do not exceed this number during installation.
- Calculation uses typical values from ABB series S200 as a reference.
- Different brands and models of miniature circuit breakers, the number of drives mounted will be slightly different.
- If the ambient temperature of the MCB installation exceeds 30°C or multiple MCBs are installed side by side, the number of drives mounted will be reduced and the calculation needs to be recalculated.
- Electrician's usually consider Type B for household lighting and Type C for commercial lighting application.

Functions

Output hot plug-in protection

- This function is used to prevent LED light that are far below the driver's no-load voltage burnout when hot plugged into a powered driver output.
- This function can be enabled or disabled through the programming interface. If enabled, when the LED light is connected to the powered driver, the LED light will not light up, you can restart the drive to restore normal. If disabled, when the LED light is connected to the powered driver, the LED light will turn on or off according to the current brightness level.
- Please refer to the parameters configure in the "Device configuration" section for information on whether the default factory settings are enabled.
- Factory default Enabled or not please check the "Device configuration" section.

- Note:

When the hot plug-in protection is enable, the following applications may not achieve the expected effect:

1. When the output of the driver is connected to the color temperature switch:
When the switch is used to change the color temperature, the hot plug-in protection of the driver will be triggered, and the LED will not be lit.
2. When the LED driver is used in conjunction with a self-contained (independent) emergency control device:
Use the self-check test switch of the emergency control device to test the emergency function and when exiting the emergency mode, the driver's hot plug-in protection will be triggered and the LED will not be lit. The above two application drivers should turn off the hot plug-in protection function in order to achieve good working results.

Output short-circuit behaviour

- Output short-circuit will not damage the driver.
After removing the short circuit fault, the driver will automatically resume output.

Output no-load operation

- Output no-load will not damage the driver.
Please turn off the driver first if you need to connect the LED load.

Output overload protection

- The LED driver turns off the output if the output voltage range is exceeded.
The output will be activated again after restart the LED driver .

Driver restart method

There are two ways to restart the driver:

- Through the AC input: disconnect the AC of the driver and power it again.
- Through dimming interface.
DALI: send "OFF" command first, then send "MAX" command.
pushDIM: short press pushbutton two times, then long press pushbutton.

Adjustable output current (AOC)

- The output current of the driver can be adjusted within a certain range, and can be selected through the EasySet configuration software.

Configuration programming(EasySet)

- The programming configuration of the driver is realized using the BOKE EasySet programming suite and through the driver's DALI interface or NFC interface.
- Please see the "Device configuration" section.
- More information about the EasySet programming suite can be found at www.bokedriver.com.

Insulation between circuits

Isolation	Input	Output	DALI	PUSH	Case
Input	-	Double	Basic	-	Basic
Output	Double	-	Double	Double	Basic
Case	Basic	Basic	Basic	Basic	-

Label

DNL036-A

BOKE Dimmable Constant Current LED Driver
MODEL: BK-DNL036-A0900Ad

INPUT
○ DA(Purple) 
○ DA(Grey) 
○ (Green/Yellow)
○ ACN/DC-(Blue)
○ ACL/DC+(Brown)

MADE IN CHINA
BOKE Drivers Co.,Ltd.
Address:2nd and 3rd Floor, No.51,
Xihuan 5th Road, South District,
528455 Zhongshan City, Guangdong, CHINA

OUTPUT
LED+(Red) ○
LED-(Black) ○

SELV

INPUT: 200-240V $\approx$ 0/50/60Hz 0.22A Max. λ :0.95
OUTPUT: 12-42V $\approx$ 0.5-0.9A 37.8W Max. 50VDC Max.
For LED Modules use only
tc:90°C
ta:60°C

pushDIM L N DA DALI

DNL042-A

BOKE Dimmable Constant Current LED Driver
MODEL: BK-DNL042-A1100Ad

INPUT
○ DA(Purple) 
○ DA(Grey) 
○ (Green/Yellow)
○ ACN/DC-(Blue)
○ ACL/DC+(Brown)

MADE IN CHINA
BOKE Drivers Co.,Ltd.
Address:2nd and 3rd Floor, No.51,
Xihuan 5th Road, South District,
528455 Zhongshan City, Guangdong, CHINA

OUTPUT
LED+(Red) ○
LED-(Black) ○

SELV

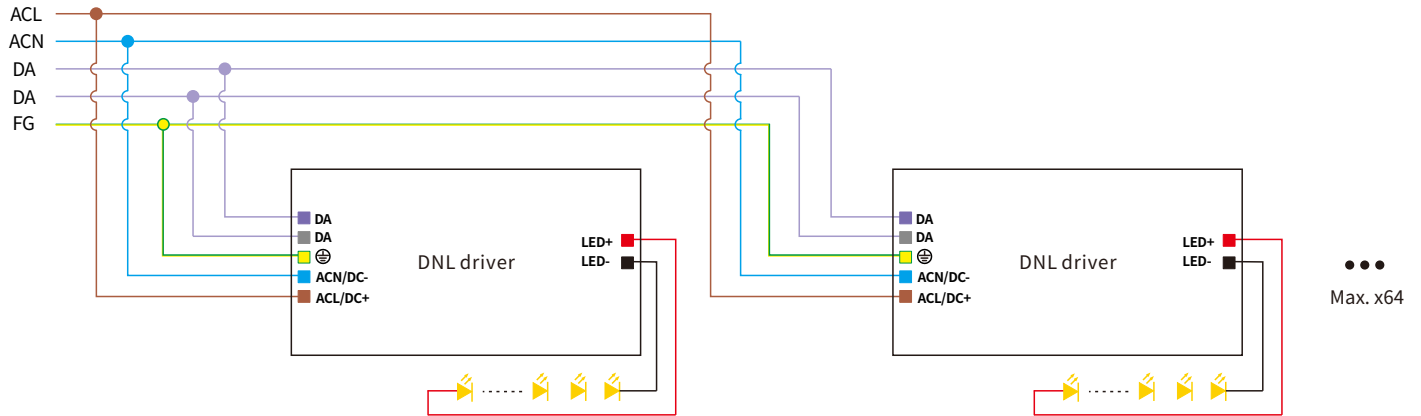
INPUT: 200-240V $\approx$ 0/50/60Hz 0.25A Max. λ :0.95
OUTPUT: 12-42V $\approx$ 0.7-1.1A 42W Max. 50VDC Max.
For LED Modules use only
tc:90°C
ta:60°C

pushDIM L N DA DALI

DALI dimming application

Wiring diagram



Switch to the DALI dimming mode

- After installation according to the wiring diagram of DALI dimming application, the driver will automatically switch to the DALI control mode after receiving any DALI command.

Remarks:

- Standard DALI control line voltage range: 9.5V to 22.5V, type 16V.
- The two DALI control lines polarity-reversible.
- Max. 64 DALI drivers per DALI control line.
- The maximum distance length of the DALI control line is 300m at $2 \times 1.5\text{mm}^2$.
- DALI bus can be wired together with any mains voltage cables, but separate wiring is recommended.
- The configuration parameters of the driver can be set through the DALI configuration tool or DALI application controller during installation, such as setting device address, group address, power-on level, bus-failure level, scene level, fade time, dimming curve, etc.

Please refer to the table below

Cable size	Distance
$2 \times 0.50\text{mm}^2$	max.100m
$2 \times 0.75\text{mm}^2$	max.150m
$2 \times 1.00\text{mm}^2$	max.200m
$\geq 2 \times 1.50\text{mm}^2$	max.300m

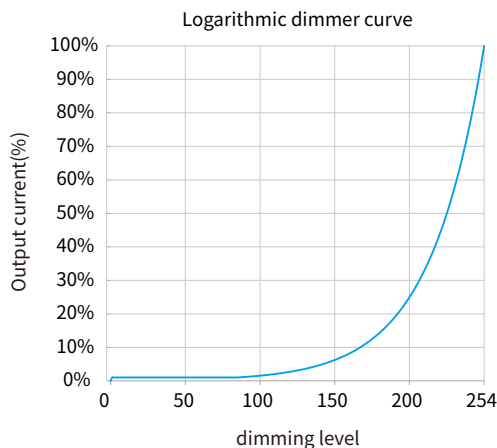
Power-on level :

When the driver is in DALI-2 dimming mode, the factory default level after each power-on is the brightest.

The power-on level can be set through the DALI configuration tool or DALI application controller during installation, and can be set to memory or fixed any brightness (such as off, darkest, 50%, etc.).

Note: The recommended setting for the default factory power-on level of the DALI-2 driver is the brightest in the DALI-2 standard.

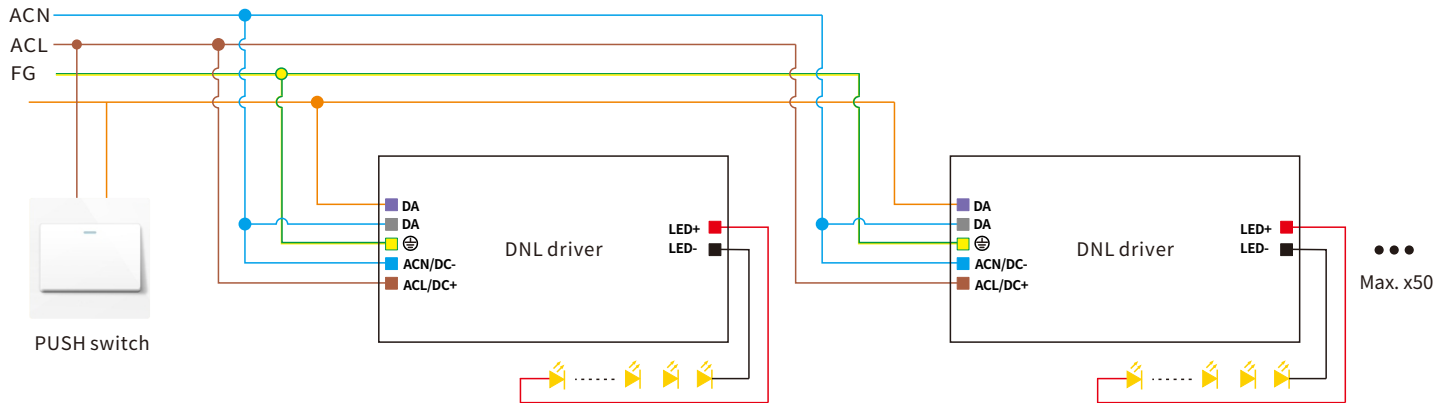
Dimming curve



Remarks: The dimming curve can be selected by DALI configuration. The default is logarithmic dimming curve.

pushDIM dimming application

Wiring diagram



Switch to the pushDIM dimming mode

- After installation according to the wiring diagram of pushDIM dimming application, short press the pushbutton 1 times, the driver will automatically switch to the pushDIM dimming mode.

Remarks:

Max. 50 drivers per pushDIM control line.

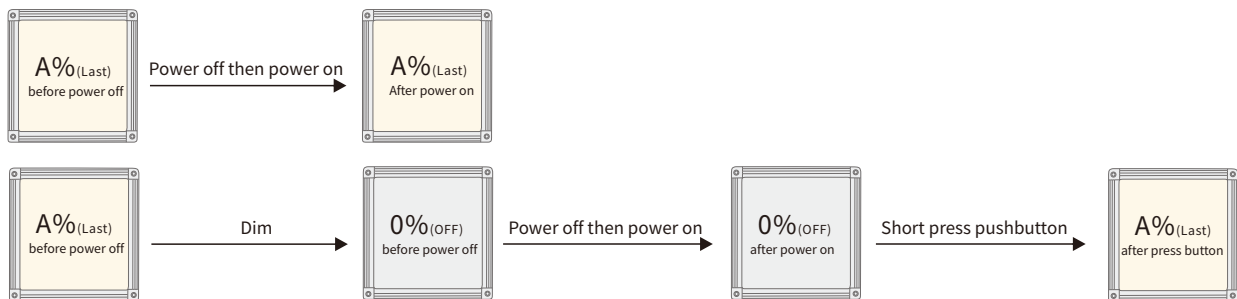
Turn on or turn off: short press pushbutton for 0.2-1s.

Dimming: long press pushbutton for 1-5s.

Power on status: after power on, the light state will be the same as the lighting on state.

If the light is on before power on, the light will be on after power on again, brightness will be the same as the last lighting on brightness.

If the light is off before power off, the light will be off after power on again, short press the pushbutton, then the light will be on, the brightness will be the same as the last brightness.



Multiple lights synchronize control operation

method 1:

Step 1: long press the pushbutton, confirm each light is on.

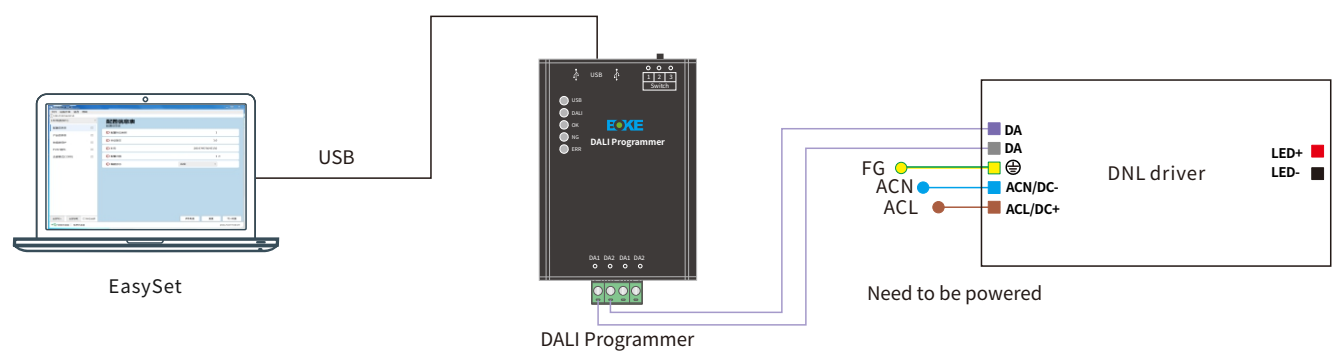
Step 2: short press the pushbutton, confirm each light is off.

Step 3: long press the pushbutton, confirm each light is from darkest to brightest and all the lights are synchronous.

method 2:

- Long press the pushbutton 15s, all lights output to the brightest state.

Device configuration



Software download



Note:PC supports Windows 7/Windows 10/Windows 11 32bit/64bit.

Device configuration

Configure tools and software

Type	Name	Brand	Name	Minimum version
Programmer	DALI programmer	BOKE	BK-CS01-SDL	V1.0.0
Software	PC Software	BOKE	BOKE EasySet	V1.0.0

Parameters configure

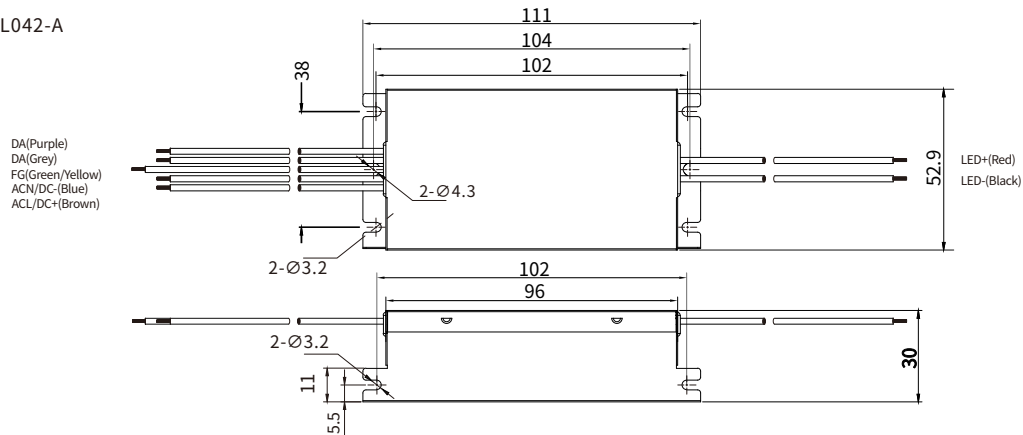
Configuration items	Factory settings	Parameter configuration	Read/Write
Product information	-	NO	Read Only
Adjustable output current(AOC)	Activated	YES	Read/Write
PUSH dimming(pushDIM)	Activated	YES	Read/Write
Hot plug-in protection(HPP)	Deactivated	YES	Read/Write
Run-time(RT)		NO	Read Only
Other parameters		YES	

Installation

Mechanical dimensions

Unit:mm

DNL036-A/DNL042-A



Input wire

Numbering	function	colour	Wire type	Wire diameter	Wire length	Strip length
1	DA	purple	VDE-REG 7997	AWG20	200mm	8mm
2	DA	grey	VDE-REG 7997	AWG20	200mm	8mm
3	FG	yellow/green	VDE-REG 7997	AWG18	240mm	8mm
4	ACN/DC-	blue	VDE-REG 7997	AWG18	200mm	8mm
5	ACL/DC+	brown	VDE-REG 7997	AWG18	200mm	8mm

Output wire

Numbering	function	colour	Wire type	Wire diameter	Wire length	Strip length
1	LED+	red	VDE-REG 7997	AWG20	150mm	8mm
2	LED-	black	VDE-REG 7997	AWG20	150mm	8mm

Installation note

Hot plug-in

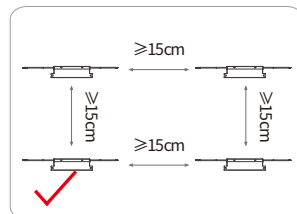
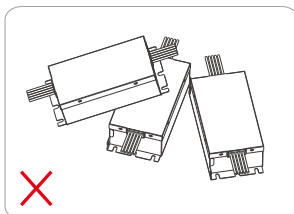
- Hot plug-in is not supported due to residual output voltage of > 0 V.
- If a LED load is connected the device has to be restarted.
- Restart can be achieved by re-powering the driver or executing a on/off command (action) through the control interface.

Wiring guidelines

- All connections must be kept as short as possible to ensure good EMI behaviour.
- Mains leads should be kept apart from LED Driver and other leads (ideally 5 – 10 cm distance)
- Max. length of output wires is 2 m.
- Incorrect wiring can damage LED modules.

Installation requirements

- The driver should be installed in a dry, acid-free, oil-free, fat-free environment.
- The installation ambient temperature of the driver shall not exceed the value of Ta at any time.
- The temperature of the mounting surface of the driver should be lower than the temperature of Ta.
- The driver should keep a certain distance from the heating stuff (such as the luminaire radiator).



Please do not stack the products. The distance between two products should be $\geq 15\text{cm}$ so as not to affect heat dissipation and the lifespan of the products.

Replace LED module

1. Mains off
2. Remove LED module
3. Wait for 5 seconds
4. Connect LED module again

Packaging



Model	Product size	Weight	Packaging size	Carton size	Qty/carton	N.W	G.W
DNL036-A	L 111*W52.9*H30mm	264.4g	L130*W38*H70mm	L410*W250*H165mm	36pcs	9.60KG	10.8KG
DNL042-A	L 111*W52.9*H30mm	270g	L130*W38*H70mm	L410*W250*H165mm	36pcs	9.72KG	11.0KG

Additional information

1. The life and MTBF of the product are for reference only, and do not represent a warranty statement.
2. For more information, please send an email to info@bokedriver.com.