

Non-isolated constant current linear dimmable driver
DEN Series suffix d(DALI-2+pushDIM)



Features

- Input and output non-isolated
- Support DALI-2+pushDIM dimming mode
- Suitable for emergency lighting acc. to EN 50172
- 16-level current output can be realized by DIP-switch
- 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 luminaries is the same
- Dimming range 3~100%, output current accuracy 5%
- Standby power input < 0.5W, meets the requirements of ErP certification
- High PF, high efficiency, low THD
- Suitable for built-in use of Class I lamps
- Passed CE,ENEC,UKCA,RCM,CCC,DALI-2 and other certifications
- IP20 protection grade, indoor use
- Nominal life-time up to 100,000 h
- 5-year guarantee

Interfaces

- DALI-2(DALI-2 DT6)

Functions

- Support central emergency application (dimming normal in DC input)
- Support self-contained emergency application
- Protective features (short-circuit, no-load protection, overload protection)

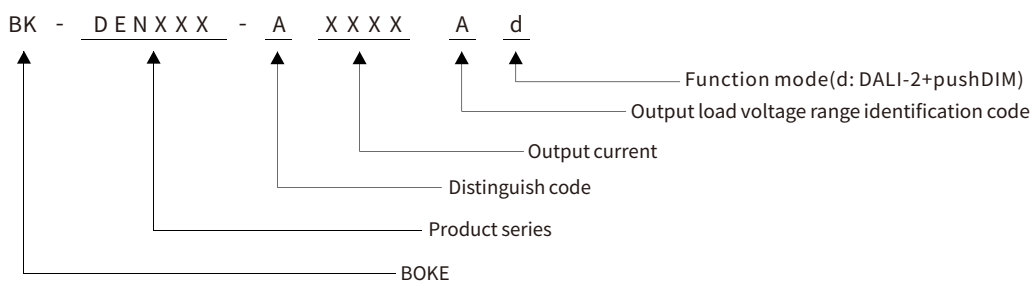
Suitable for lights

- Suitable for luminaries with built-in driver such as track light
- Not suitable for luminaries with external drivers

Typical applications

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

Model coding rules of DEN series



Function list

Model	Suffix	Wired dimming	
		DALI-2	pushDIM
BK-DEN075-A BK-DEN100-A	d	√	√

Model list

Model	Input voltage	Output power	Output voltage	Output current	Dimension	Certifications
BK-DEN075-A0450Ad	200-240VAC/DC	76.5W MAX.	54-170/180/190/200VDC	0.1-0.45A	L245*W30*H21mm	CE, ENEC, UKCA, RCM, EL, DALI-2
BK-DEN100-A0800Ad	200-240VAC/DC	100W MAX.	54-125/133/142/153/166/181/200VDC	0.25-0.8A	L285*W30*H21mm	CE, ENEC, UKCA, RCM, EL, DALI-2

Technical data

Product model	BK-DEN075-A0450Ad
Output parameters	
Regulation method	Constant Current
Rated output current range	0.1-0.45A
Rated output voltage range	54-170/180/190/200VDC
Rated output power	76.5W Max
Output current adjustment	DIP S.W(16 levels)
Output current ripple LF	±3%
Output current accuracy	±5%
Linear regulation	±3%
Load regulation	±3%
No load output voltage	300VDC
Flicker-free(typical)	Flickering percent(IEEE 1789)=0.455%, Flicker index(IEEE 1789)=0.001, Pst LM = 0.100, SVM = 0.002, (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 VAC
Input current	<0.41A (Rated input voltage)
Input frequency	0/50/60Hz
Input PF/Input DF	PF>0.95 (230V AC & Full load),DF>0.98 (230V AC & Full load)
Input THD	9% (230V AC & Full load)
Efficiency(typical)	93% (230V AC & Full load)
In-rush current	21.8A peak ,264us 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	> 50,000 switching cycles
Power consumption	Full load(Pin):81.21W, No load(Pno): N/A, On stand-by(Psb) : <0.5W, Network stand-by(Pnet) : N/A
Safety	
Withstand voltage	I/P-FG:1750VAC, I/P-DA:1500VAC
Mains surge capability	L-N:2KV,L-FG/N-FG:2KV(Performance criterion:B)
Isolation resistance	I/P-FG: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	3%-100%
Dimming drive mode	AM(amplitude modulation)
Emergency support	
Central emergency system	Supported(dimming normal in DC input)
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	
Certified	CE, ENEC, UKCA, RCM, 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-DEN100-A0800Ad
Output parameters	
Regulation method	Constant Current
Rated output current range	0.25-0.8A
Rated output voltage range	54-125/133/142/153/166/181/200VDC
Rated output power	100W Max
Output current adjustment	DIP S.W(16 levels)
Output current ripple LF	±3%
Output current accuracy	±5%
Linear regulation	±3%
Load regulation	±3%
No load output voltage	320VDC
Flicker-free(typical)	Flickering percent(IEEE 1789)=0.282%, Flicker index(IEEE 1789)=0.001, Pst LM = 0.007, 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 voltage shock	<380 VAC
Input current	<0.53A (Rated input voltage)
Input frequency	0/50/60Hz
Input PF/Input DF	PF>0.95 (230V AC & Full load),DF>0.98 (230V AC & Full load)
Input THD	7% (230V AC & Full load)
Efficiency(typical)	93% (230V AC & Full load)
In-rush current	25.28A peak ,442us 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	> 50,000 switching cycles
Power consumption	Full load(Pin):107W, No load(Pno): N/A, On stand-by(Psb) : <0.5W, Network stand-by(Pnet) : N/A
Safety	
Withstand voltage	I/P-FG:1750VAC, I/P-DA:1500VAC
Mains surge capability	L-N:2KV,L-FG/N-FG:2KV(Performance criterion:B)
Isolation resistance	I/P-FG: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	3%-100%
Dimming drive mode	AM(amplitude modulation)
Emergency support	
Central emergency system	Supported(dimming normal in DC input)
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	
Certified	CE, ENEC, UKCA, RCM, 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

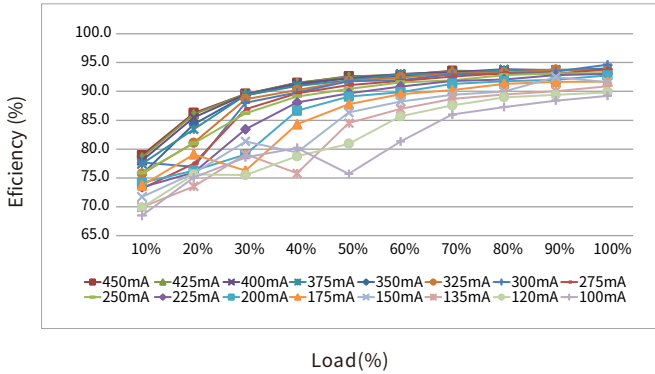
Remarks

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

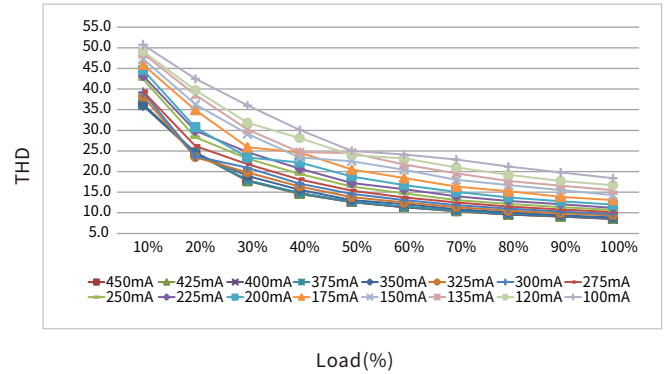
Electrical values

BK-DEN075-A0450Ad

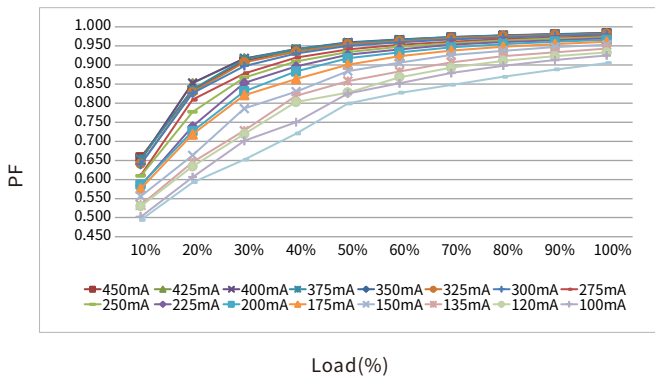
Efficiency vs. Load



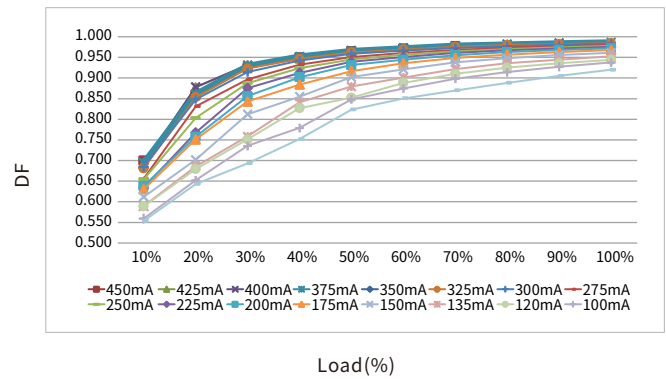
THD vs. Load



Power factor vs. Load

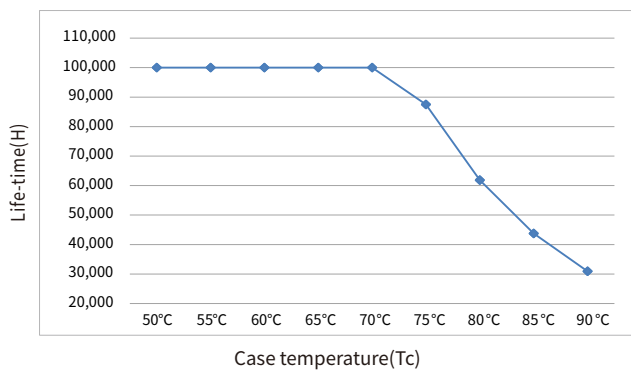


Displacement factor vs. Load



Expected life-time

Life-time vs. case temperature

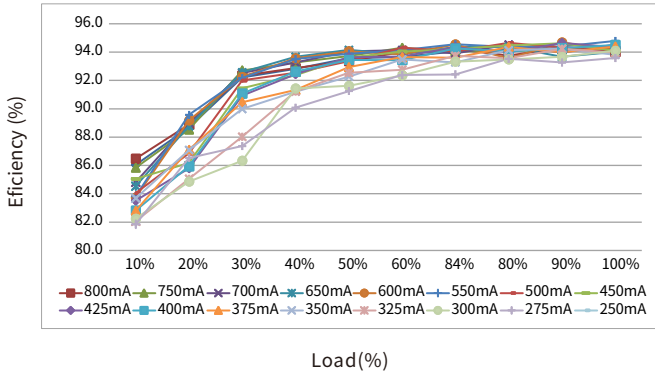


- The life-time of the LED driver is shown in the figure above (calculated based on the 90% survival rate).
- The relation of tc to ta temperature depends also on the luminaire design.

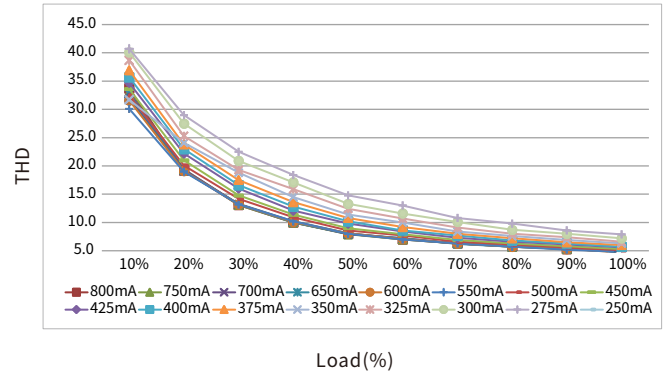
Electrical values

BK-DEN100-A0800Ad

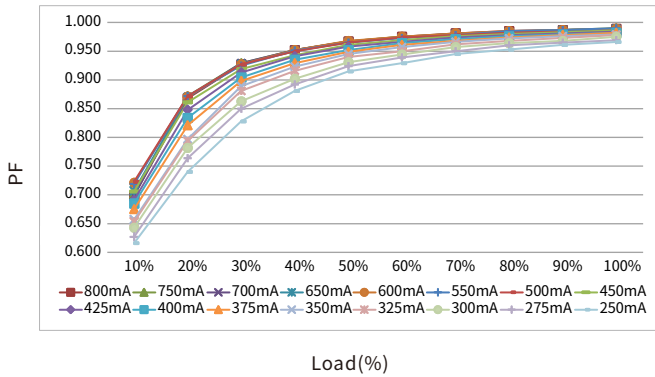
Efficiency vs. Load



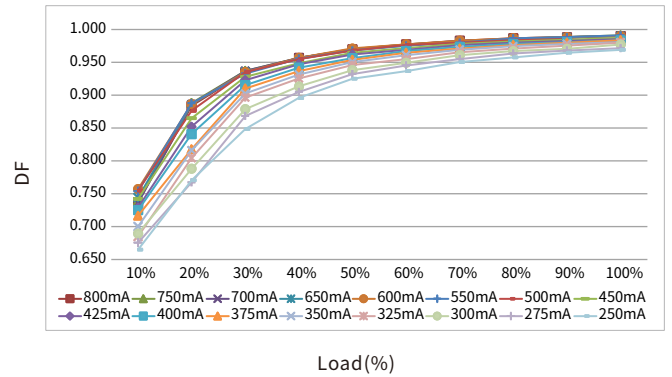
THD vs. Load



Power factor vs. Load

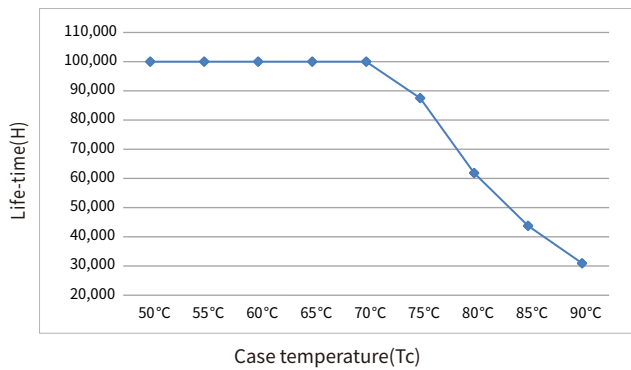


Displacement factor vs. Load



Expected life-time

Life-time vs. case temperature

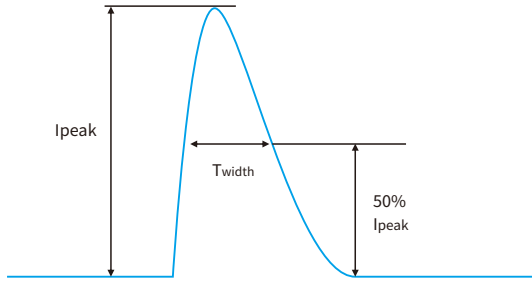


-The life-time of the LED driver is shown in the figure above (calculated based on the 90% survival rate).

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

Surge

Model	Ipeak	Twidth	Condition	Relative number of MCB														Unit: pcs
				B10	B13	B16	B20	B25	C10	C13	C16	C20	C25	D10	D13	D16	D20	
BK-DEN075-A0450Ad	21.8A	264us	AC 230V, Full load, Cold start, Ta ≤ 30°C, MCB is not installed side by side	11	14	17	21	26	18	23	28	35	44	20	25	31	39	49
BK-DEN100-A0800Ad	25.28A	442us		5	7	8	10	13	8	11	14	17	21	15	19	23	29	36



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 short-circuit behaviour

- In case of a short-circuit at the LED output ,the LED output is switched off.
- After restart of the LED driver ,the output will be activated again.

Output no-load operation

- The LED driver will not be damaged in no-load operation.
- The output will be deactivated and is therefore free of voltage.
- If a LED load is connected , the device has to be restarted before the output will be activated again.

Output overload protection

- If the output voltage range is exceeded the LED driver turns off the LED output.
- After restart of the LED driver the output will be activated again.

Driver restart method

There are two ways to restart the device:

- Through the AC input port: 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.

Insulation between circuits

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

Label

BK-DEN075-A

INPUT

- ACL/DC+
- ACN/DC-
- DA
- DA

Other ratings see below sheet
For LED Modules use only
BOKE Drivers Co., Ltd.
www.bokedriver.com
MADE IN CHINA

BOKE

Non-isolated Constant Current LED Driver
MODEL: BK-DEN075-A0450Ad
INPUT: 200-240V \approx 0/50/60Hz 0.41A Max. λ : 0.95
OUTPUT: 54-170V \approx 450mA 76.5W Max.

Switching selection sheet

Pin(w) typ.	Prated(w)	Irated(mA)	Voltage(Vdc)	Switch	1	2	3	4
22.35	20.00	100	54-200	ON	ON	ON	ON	ON
26.40	24.00	120	54-200	-	ON	ON	ON	ON
29.54	27.00	135	54-200	ON	-	ON	ON	ON
32.57	30.00	150	54-200	-	-	ON	ON	ON
37.67	35.00	175	54-200	ON	ON	-	ON	ON
43.06	40.00	200	54-200	-	ON	-	ON	ON
48.44	45.00	225	54-200	ON	-	-	ON	ON
53.42	50.00	250	54-200	-	-	-	ON	ON
58.70	55.00	275	54-200	ON	ON	ON	-	-
64.03	60.00	300	54-200	-	ON	ON	-	-
69.30	65.00	325	54-200	ON	-	ON	-	-
74.31	70.00	350	54-200	-	-	ON	-	-
79.45	75.00	375	54-200	ON	ON	-	-	-
80.59	76.00	400	54-190	-	ON	-	-	-
81.21	76.50	425	54-180	ON	-	-	-	-
81.21	76.50	450	54-170	-	-	-	-	-

Before use, always check dipswitch settings!

OUTPUT

300VDC Max.

LED+ ○

LED- ○

1 2 3 4

wire prep. 0.5-1.0mm²

8-9mm

BK-DEN100-A

INPUT

- ACL/DC+
- ACN/DC-
- DA
- DA

Other ratings see below sheet
For LED Modules use only
BOKE Drivers Co., Ltd.
www.bokedriver.com
MADE IN CHINA

BOKE

Non-isolated Constant Current LED Driver
MODEL: BK-DEN100-A0800Ad
INPUT: 200-240V \approx 0/50/60Hz 0.53A Max. λ : 0.95
OUTPUT: 54-125V \approx 800mA 100W Max.

Switching selection sheet

Pin(w) typ.	Prated(w)	Irated(mA)	Voltage(Vdc)	Switch	1	2	3	4
53.76	50.00	250	54-200	ON	ON	ON	ON	ON
59.14	55.00	275	54-200	-	ON	ON	ON	ON
64.52	60.00	300	54-200	ON	-	ON	ON	ON
69.89	65.00	325	54-200	-	-	ON	ON	ON
75.27	70.00	350	54-200	ON	ON	-	ON	ON
80.65	75.00	375	54-200	-	ON	-	ON	ON
85.56	80.00	400	54-200	ON	-	-	ON	ON
90.91	85.00	425	54-200	-	-	-	ON	ON
96.26	90.00	450	54-200	ON	ON	ON	-	-
107.0	100.0	500	54-200	-	ON	ON	-	-
106.5	99.55	550	54-181	ON	-	ON	-	-
106.5	99.60	600	54-166	-	-	ON	-	-
106.4	99.45	650	54-153	ON	ON	-	-	-
106.3	99.40	700	54-142	-	ON	-	-	-
106.7	99.75	750	54-133	ON	-	-	-	-
107.0	100.0	800	54-125	-	-	-	-	-

Before use, always check dipswitch settings!

OUTPUT

320VDC Max.

LED+ ○

LED- ○

1 2 3 4

wire prep. 0.5-1.0mm²

8-9mm

DIP-switch & output current

BK-DEN075-A0450Ad

Pin(w) typ.	Prated(w)	Irated(mA)	Voltage(Vdc)	1	2	3	4
22.35	20.00	100	54-200	ON	ON	ON	ON
26.40	24.00	120	54-200	-	ON	ON	ON
29.54	27.00	135	54-200	ON	-	ON	ON
32.57	30.00	150	54-200	-	-	ON	ON
37.67	35.00	175	54-200	ON	ON	-	ON
43.06	40.00	200	54-200	-	ON	-	ON
48.44	45.00	225	54-200	ON	-	-	ON
53.42	50.00	250	54-200	-	-	-	ON
58.70	55.00	275	54-200	ON	ON	ON	-
64.03	60.00	300	54-200	-	ON	ON	-
69.30	65.00	325	54-200	ON	-	ON	-
74.31	70.00	350	54-200	-	-	ON	-
79.45	75.00	375	54-200	ON	ON	-	-
80.59	76.00	400	54-190	-	ON	-	-
81.21	76.50	425	54-180	ON	-	-	-
81.21	76.50	450	54-170	-	-	-	-

BK-DEN100-A0800Ad

Pin(w) typ.	Prated(w)	Irated(mA)	Voltage(Vdc)	1	2	3	4
53.76	50.00	250	54-200	ON	ON	ON	ON
59.14	55.00	275	54-200	-	ON	ON	ON
64.52	60.00	300	54-200	ON	-	ON	ON
69.89	65.00	325	54-200	-	-	ON	ON
75.27	70.00	350	54-200	ON	ON	-	ON
80.65	75.00	375	54-200	-	ON	-	ON
85.56	80.00	400	54-200	ON	-	-	ON
90.91	85.00	425	54-200	-	-	-	ON
96.26	90.00	450	54-200	ON	ON	ON	-
107.0	100.0	500	54-200	-	ON	ON	-
106.5	99.55	550	54-181	ON	-	ON	-
106.5	99.60	600	54-166	-	-	ON	-
106.4	99.45	650	54-153	ON	ON	-	-
106.3	99.40	700	54-142	-	ON	-	-
106.7	99.75	750	54-133	ON	-	-	-
107.0	100.0	800	54-125	-	-	-	-

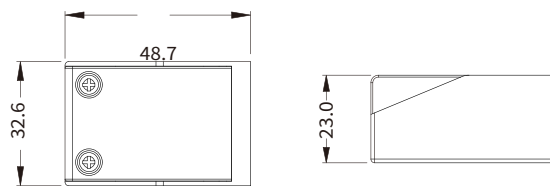
Remarks:

- ★ It means that this item is the factory default current.
- It means that this channel is OFF.

Optional accessories

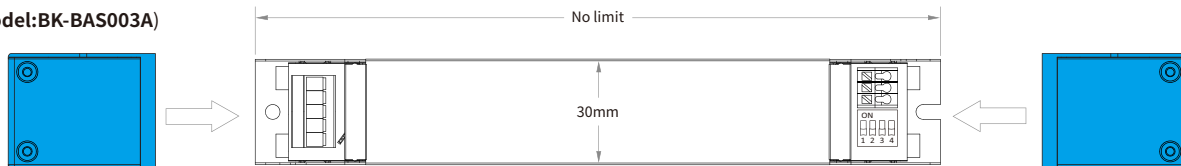


(Model: BK-BAS003A)



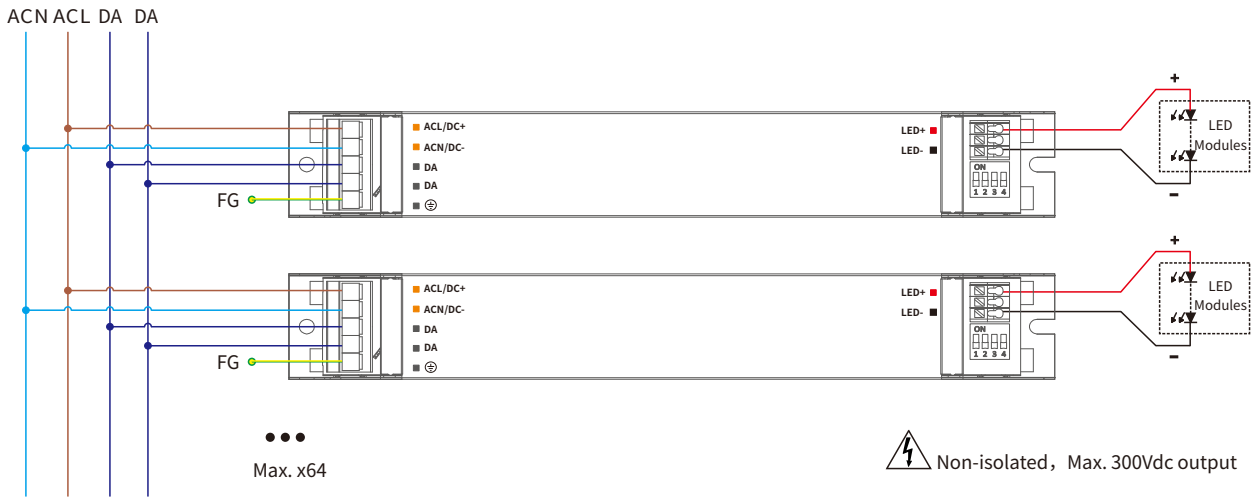
Installation diagram of accessories

(Model: BK-BAS003A)



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

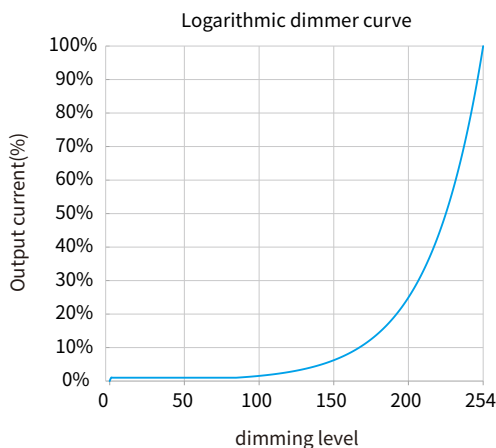
Power-on level :

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.

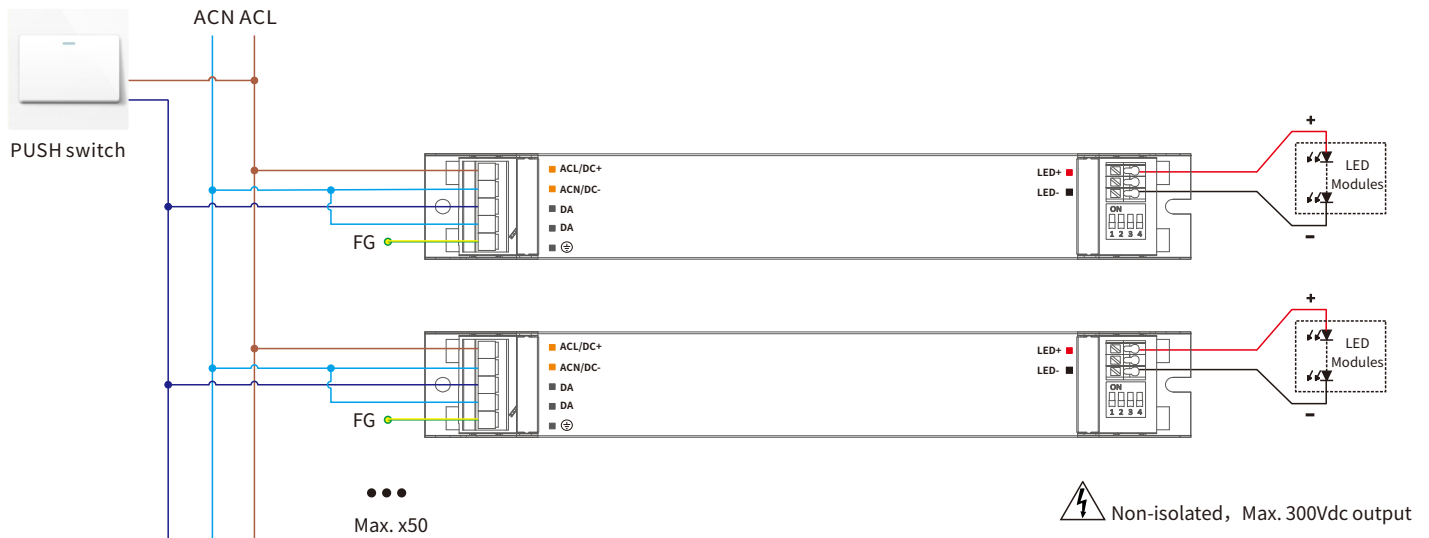
Dimming curve



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 PUSH 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.

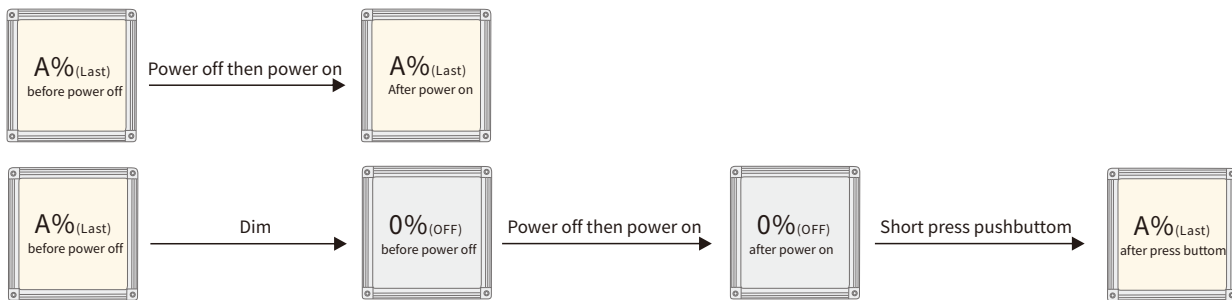
Turn on or turn off: short press pushbutton for 0.2-1s.

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 off, 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 luminaire is on.

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

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

method 2:

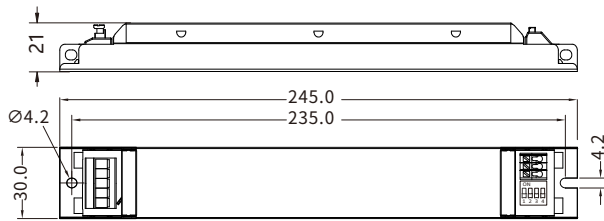
- Long press the pushbutton 15s, all lights output to the brightest state.

Mechanical Specification

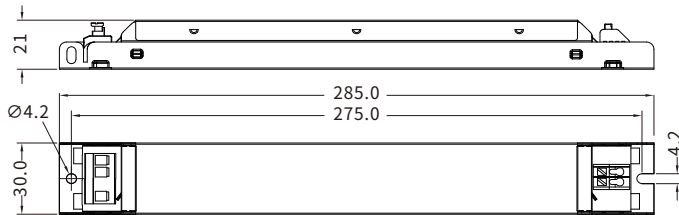
Size(Excluding accessories)

Unit:mm

DEN075



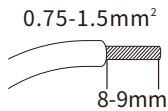
DEN100-A



INPUT

Numbering	function	colour
1	ACL/DC+	orange
2	ACN/DC-	orange
3	DA	gray
4	DA	gray
5	FG	gray

Input wire

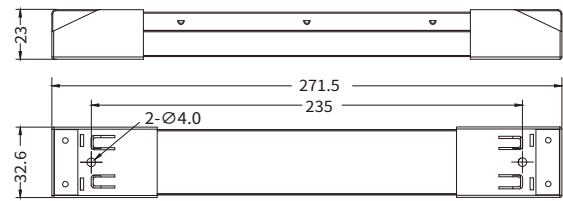


Mechanical Specification

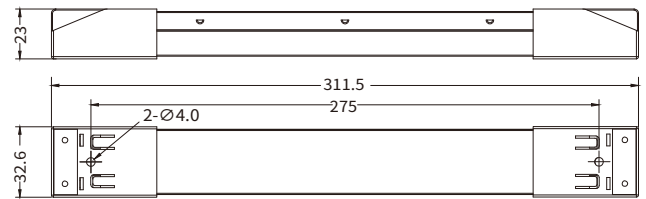
Size(Include accessories)

Unit:mm

DEN075



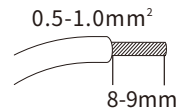
DEN100-A



OUTPUT

Numbering	function	colour
1	LED+	red
2	NG	black
3	LED-	black

Output wire



Installation note

Hot plug-in

- Hot plug-in is not supported due to residual output voltage of > 0 V and Non-isolated, high voltage output.

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 drive shall not exceed the value of Ta at any time.
- The temperature of the mounting surface of the driver should be lower than 40°C
- The driver should keep a certain distance from the heating stuff (such as the luminaire radiator).
- If the driver is used externally (it needs to be used with the accessories), the installation of the driver should also meet the following conditions:
 - 1.The driver should be a certain distance between the drivers, as shown in Figure 1.
 - 2.The driver keeps a certain distance from surrounding objects, as shown in Figure 2.

Mounting screw specifications and torque

- Max. torque at the clamping screw: 0.5 Nm / M4

Replace LED module

1. Mains off
2. Remove LED module
3. Wait for 15 seconds
4. Connect LED module again

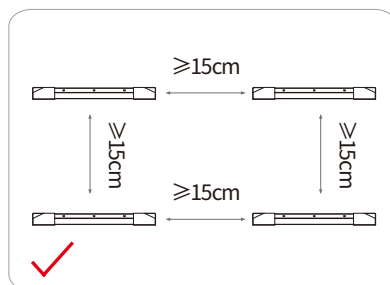
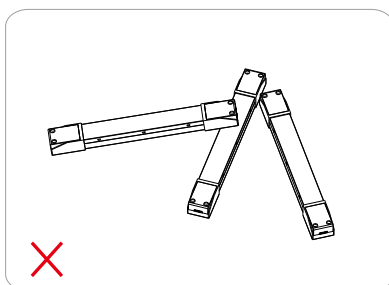


Figure 1

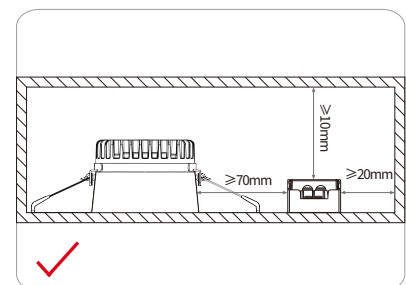
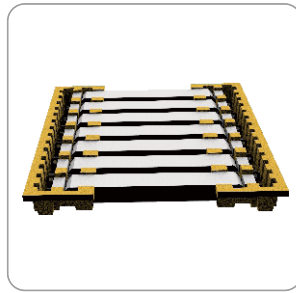


Figure 2

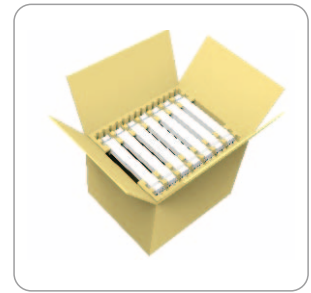
Packaging



Product



Paper tray



7pcs*5layer=35pcs/CTN
7pcs*6layer=42pcs/CTN

Model	Product size	Weight	Paper tray	Carton size	Packing	N.W	G.W
DEN075	L245*W30*H21mm	193g	L345*W75*H29mm	L355*W285*H205mm	42pcs	8.11kg	9.41kg
DEN100-A	L285*W30*H21mm	227g	L345*W75*H29mm	L355*W325*H170mm	35pcs	8.02kg	9.32kg

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.