Constant current independent dimmable driver
PUL-A Series suffix P (PUSH)

Features

- Support PUSH dimming mode
- 4-level current output can be realized by DIP-switch
- Soft dimming and flicker-free at any brightness
- Using HPC patented technology at any dimming level, the brightness between lights is same
- Dimming range 1~100%, output current accuracy 1%
- Standby power input<0.5W, meets the requirements of ErP certification
- High PF, high efficiency, low THD
- Screw-free and pressing type strain relief, supports thicker cables and is easier to install
- Independent input and output strain relief, stronger wiring
- SELV and Class II design, suitable for use outside of the light
- Passed ENEC-TUV,CE,RCM,CCC and other certifications
- IP20 protection grade, indoor use
- Nominal life-time up to 100,000 h
- 5-year guarantee

Interfaces

- PUSH(PUSH-DIM)

Functions

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

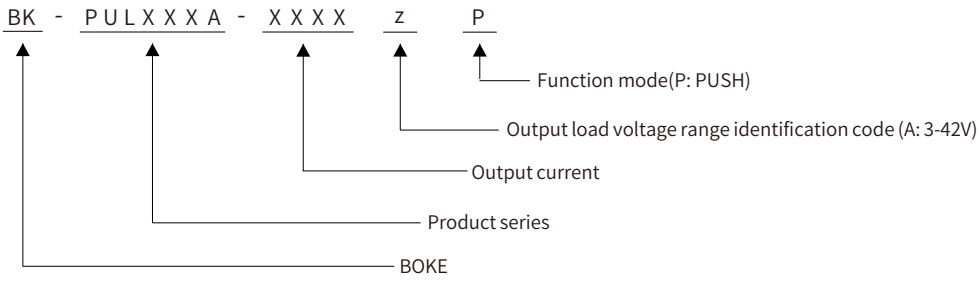
Suitable for lights

- Suitable for lights with independent drivers such as downlights, spotlights, panel lights, etc
- Not suitable for lights with built-in drivers

Typical applications

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

Model coding rules of PUL-A series



Optional dimming function selection table of PUL-A series

Model	Suffix	Wired dimming			Plug-in
		DALI-2	PUSH	1-10V 2in1	12V+PWM+GND
PUL030A PUL042A PUL060A	D	√	√	√	
	d	√	√		
	P		√	√	√
	M			√	
	Y				√
PUL010A PUL018A	d	√			
	P		√		
PUL010B PUL018B	M			√	

* The description in this specification is only applicable to the products with the suffix P and the model are PUL010A and PUL018A .

Order selection table of PUL-A series(just suffix P, 10W/18W)

Model	Input voltage	Output power	Output voltage	Output current	Dimension	Article number
BK-PUL010A-0250AP	200-240VAC	10.5W	3-42VDC	0.15-0.25A	L97.5*W44*H30mm	B-PUL010A-HF002A(independent)
BK-PUL010A-0250AP	200-240VAC	10.5W	3-42VDC	0.15-0.25A	L131.5*W44*H30mm	B-PUL010A-HF002B(built-in)
BK-PUL018A-0450AP	200-240VAC	18.0W	3-42VDC	0.30-0.45A	L97.5*W44*H30mm	B-PUL018A-HF002A(independent)
BK-PUL018A-0450AP	200-240VAC	18.0W	3-42VDC	0.30-0.45A	L131.5*W44*H30mm	B-PUL018A-HF002B(built-in)

Technical data

Product model	BK-PUL010A-0250AP	
Output parameters		
Regulation method	Constant Current	
Rated output current	0.15-0.25A	
Rated output voltage	3-42V	
Rated output power	10.5W Max	
Output current adjustment	DIP S.W(4 levels)	
Output current ripple LF	±1%	
Output current accuracy	±2%	
Linear regulation	±1%	
Load regulation	±1%	
No load output voltage	50V	
Flicker-free(typical)	Modulation depth =0.752% (5976 kHz), Pst LM ⩽ 0.000, SVM ⩽ 0.002,(The above parameters are obtained from testing the panel lights)	
Input parameters		
Rated input voltage	200-240VAC 200-240VDC	
Rated input voltage	180-264VAC 180-264VDC	
Input votage shock	<380V AC, 1 h	
Input current	<0.1A (AC input)	
Input frequency	47-63Hz	
Input power factor	>0.95 (230V AC & Full load)	
Input THD	<10% (230V AC & Full load)	
Efficiency(typical)	82% (230V AC & Full load)	
In-rush current	3.32A peak ,198us duration(50 % Ipeak), see the description below for details	
Start/Switchover/Turn off	<0.6s(AC start),<0.6s(DC start),<0.3s(AC/DC switchover),<0.5s(Turn off)	
Switching cycles	> 50,000 switching cycles	
Power consumption	Full load(Pmax):10.5W, No load(Pno): N/A, On stand-by(Psb) : <0.5W, Network stand-by(Pnet) : N/A	
Safety		
Withstand voltage	I/P-O/P:3750V AC	
Mains surge capability	L-N:2KV	
Leakage current	<0.7mA (230V AC & Full load)	
Isolation resistance	I/P-O/P:100MΩ/500Vdc/25°C/70% RH	
Control interface		
DALI dimming port	N/A	
PUSH dimming port	Voltage range: 180-264V 50/60Hz	
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(Under DC input conditions)	
Self-contained emergency	Supported	
Environment & Life time		
Operating temperature	Ta=-20-60°C	
Case temperature	Tc=85°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, Full load)	
Environmental protection	RoHS	
Certifications and standards		
Certified	ENEC-TUV, RCM, EMC, CE, CCC	
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	N/A	
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.

2.The driver can not be installed inside the light. when the driver is used with the light, the EMC of the whole light needs to be tested.

Technical data

Product model	BK-PUL018A-0450AP	
Output parameters		
Regulation method	Constant Current	
Rated output current	0.3-0.45A	
Rated output voltage	3-42V	
Rated output power	18W Max	
Output current adjustment	DIP S.W(10 levels)	
Output current ripple LF	±1%	
Output current accuracy	±2%	
Linear regulation	±1%	
Load regulation	±1%	
No load output voltage	50V	
Flicker-free(typical)	Modulation depth =0.263% (5717 kHz), Pst LM ⩽ 0.000, SVM ⩽ 0.004,(The above parameters are obtained from testing the panel lights)	
Input parameters		
Rated input voltage	200-240VAC 200-240VDC	
Rated input voltage	180-264VAC 180-264VDC	
Input votage shock	<380V AC, 1 h	
Input current	<0.15A (AC input)	
Input frequency	47-63Hz	
Input power factor	>0.95 (230V AC & Full load)	
Input THD	<10% (230V AC & Full load)	
Efficiency(typical)	84% (230V AC & Full load)	
In-rush current	3.83A peak ,184us duration(50 % Ipeak), see the description below for details	
Start/Switchover/Turn off	<0.6s(AC start),<0.6s(DC start),<0.3s(AC/DC switchover),<0.5s(Turn off)	
Switching cycles	> 50,000 switching cycles	
Power consumption	Full load(Pmax):18W, No load(Pno): N/A, On stand-by(Psb) : <0.5W, Network stand-by(Pnet) : N/A	
Safety		
Withstand voltage	I/P-O/P:3750V AC	
Mains surge capability	L-N:2KV	
Leakage current	<0.7mA (230V AC & Full load)	
Isolation resistance	I/P-O/P:100MΩ/500Vdc/25°C/70% RH	
Control interface		
DALI dimming port	N/A	
PUSH dimming port	Voltage range: 180-264V 50/60Hz	
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(Under DC input conditions)	
Self-contained emergency	Supported	
Environment & Life time		
Operating temperature	Ta=-20-45°C	
Case temperature	Tc=85°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, Full load)	
Environmental protection	RoHS	
Certifications and standards		
Certified	ENEC-TUV, RCM, EMC, CE, CCC	
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	N/A	
EL	Compatible IEC 61347-2- 13 Annex J, compatible with EN 60598-2-22 and EN 50172	
RF	N/A	

Remarks

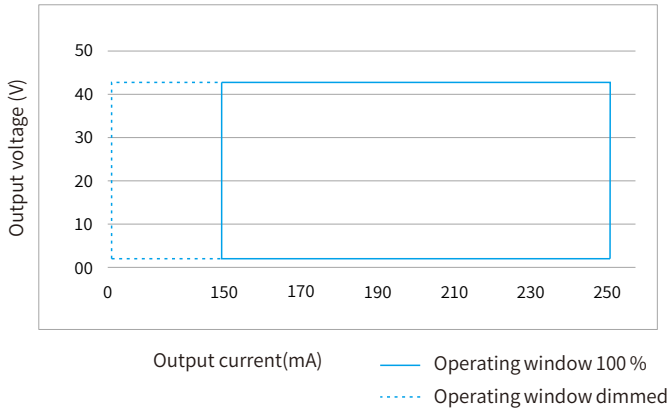
1.By default, all parameter are measured at 230VAC input, full load and 25°C of ambient temperature.

2.The driver can not be installed inside the light. when the driver is used with the light, the EMC of the whole light needs to be tested.

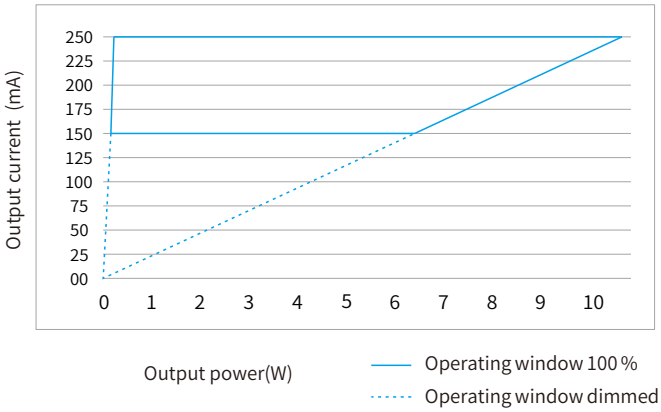
Electrical values

BK-PUL010A-0250AP

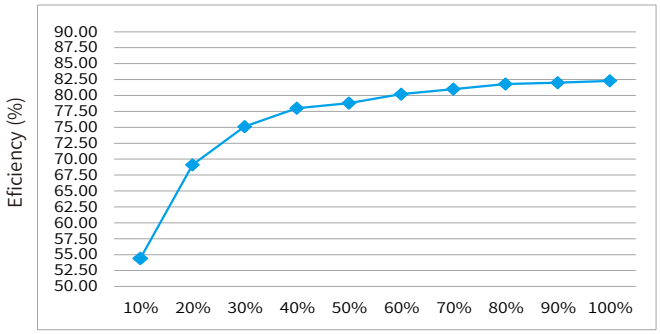
Operating window



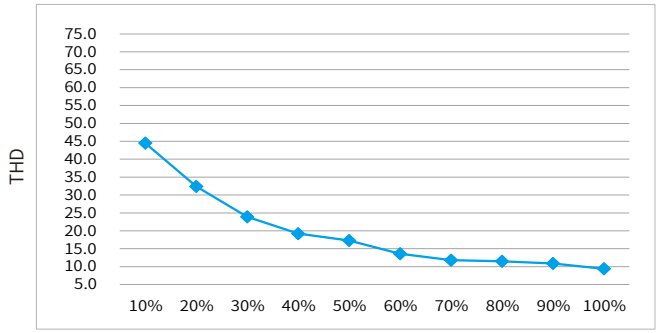
Operating window



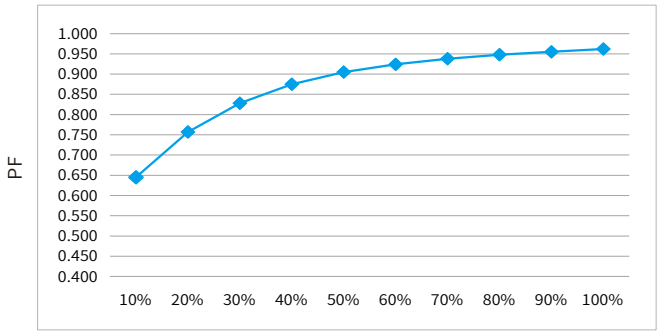
Efficiency vs load



THD vs. Load

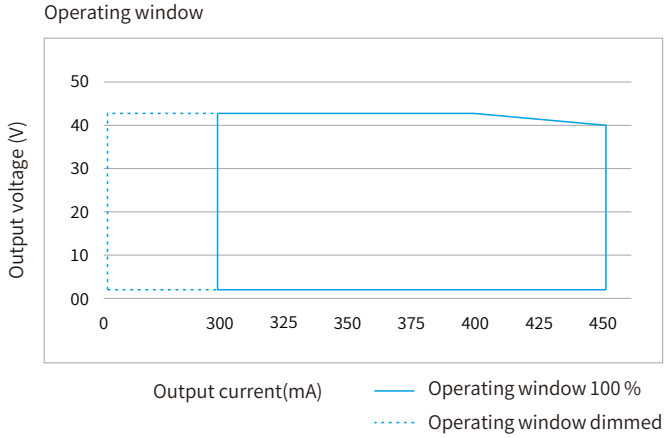


Power factor vs. Load

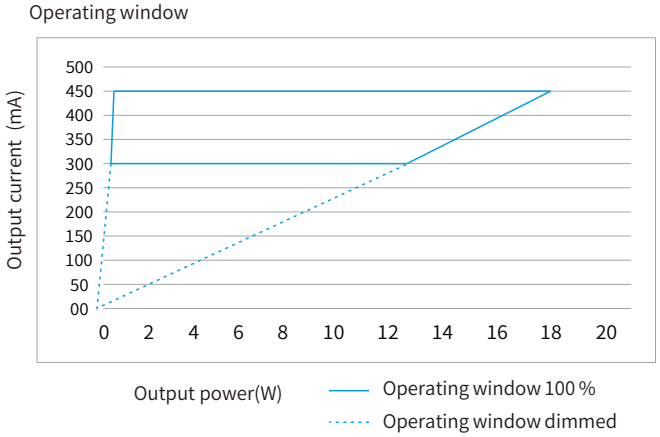


BK-PUL018A-0450AP

Operating window

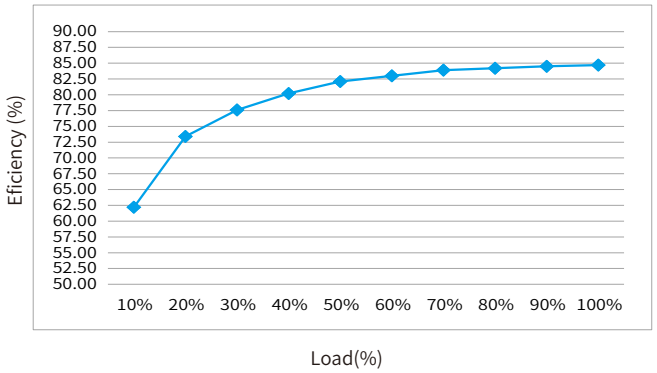


Operating window

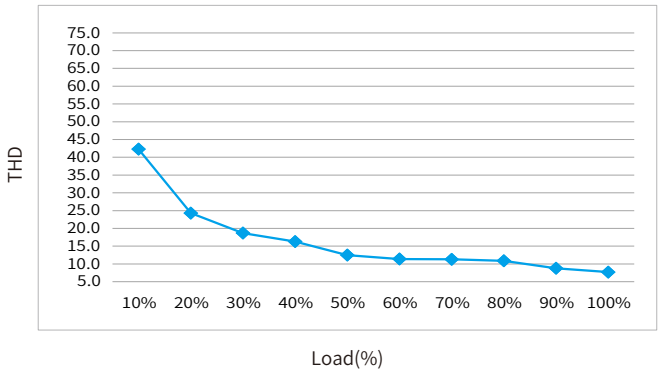


BK-PUL018A-0450AP (Continue)

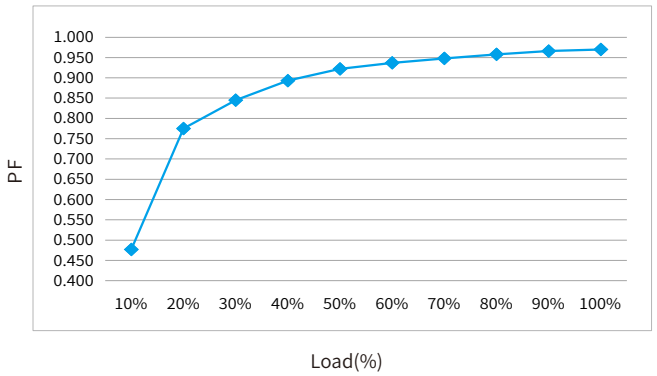
Efficiency vs load



THD vs. Load



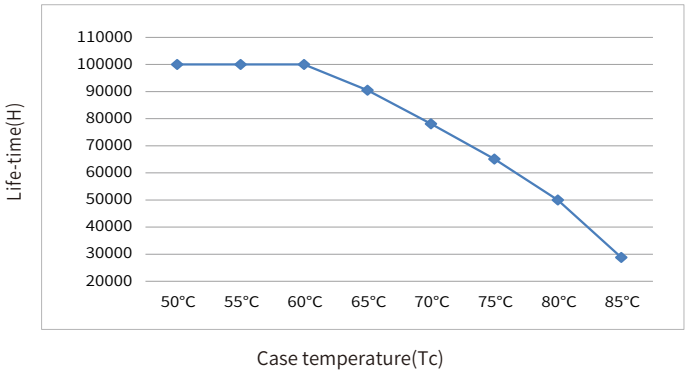
Power factor vs. Load



Expected life-time

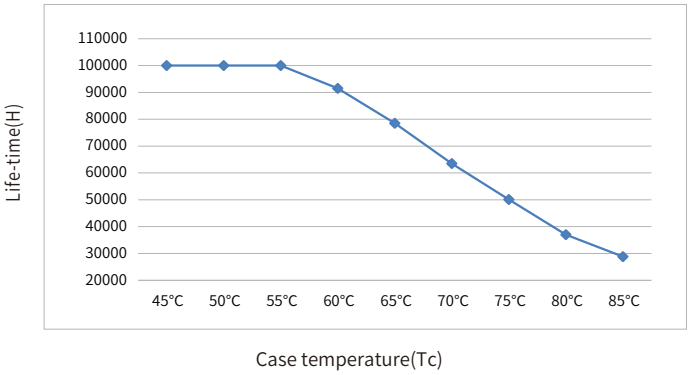
BK-PUL010A-0250AP

Life-time vs. case temperature



BK-PUL018A-0450AP

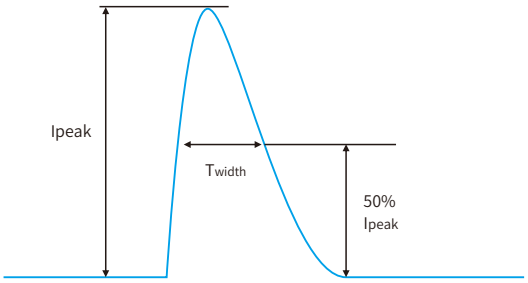
Life-time vs. case temperature



-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														
				B10	B13	B16	B20	B25	C10	C13	C16	C20	C25	D10	D13	D16	D20	D25
BK-PUL010A-0250AP	3.32A	198us	AC 230V,Full load, Cold start,Ta≤30°C, MCB is not installed side by side	95	123	152	192	237	122	159	195	244	305	122	159	195	244	305
BK-PUL018A-0450AP	3.83A	184us		73	95	117	146	182	73	95	117	146	182	73	95	117	146	182



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

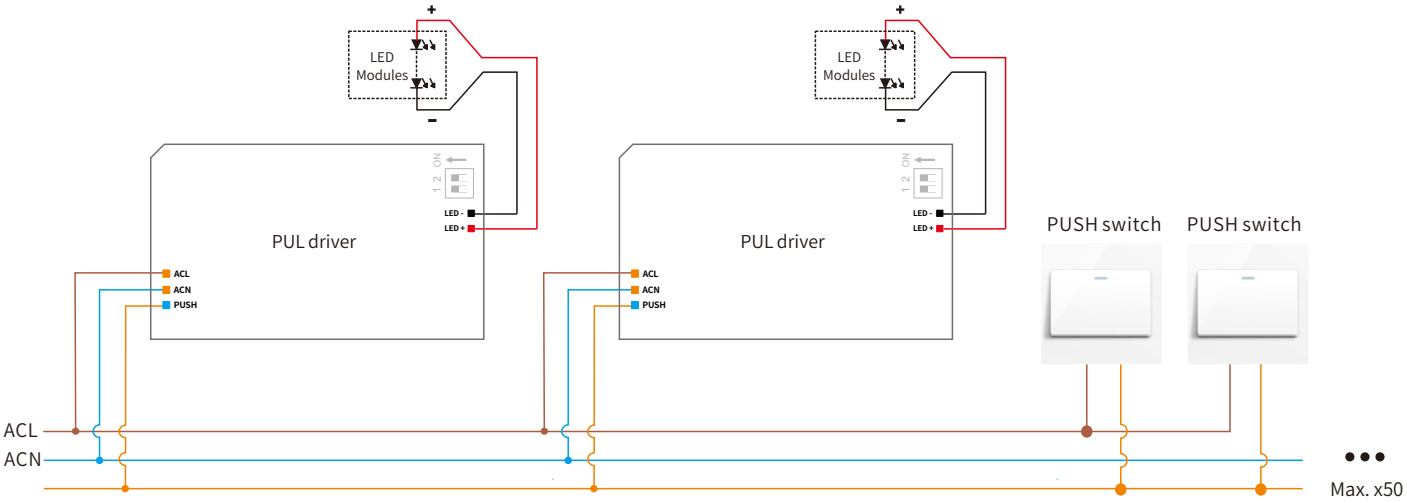
- In case of a short-circuit at the LED output ,the LED output is switched off.
- After restart of the LED driver ,the output will be activated again.
- The restart can either be done via mains reset or via interface (PUSH-DIM).

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.
- The restart can either be done via mains reset or via interface (PUSH-DIM).

PUSH dimming application

Wiring diagram



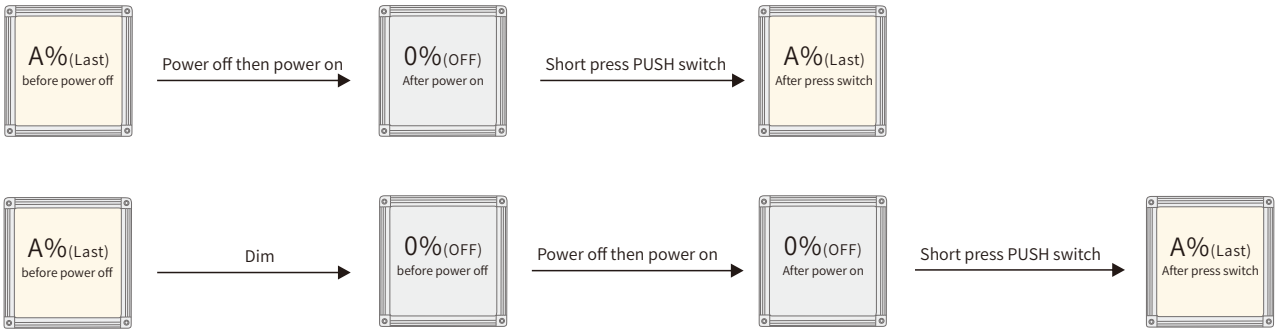
Remarks:

Max. 50 PUSH drivers per PUSH control line.

Turn on or turn off: pressing the PUSH switch for 0.2-1s(Short press).

Dimming: pressing the PUSH switch for 1-5s(Long press).

Power on status: after power on, the light will be off, after a short PUSH the switch, the light will light up the memory brightness before.



Multiple lights synchronize control operation

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

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

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

DIP-switch & output current

BK-PUL010A-0250AP

Switching selection sheet					
PIN typ.	Irated	Output Voltage	Prated	1	2
8.0W	150mA	3-42VDC	6.3W	ON	ON
9.2W	175mA	3-42VDC	7.35W	▬	ON
10.4W	200mA	3-42VDC	8.4W	ON	▬
12.8W	250mA ★	3-42VDC	10.5W	▬	▬
Before use,always check dipswitch settings!					

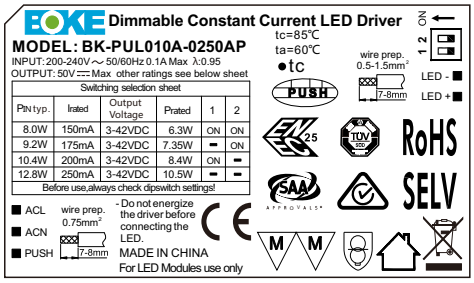
BK-PUL018A-0450AP

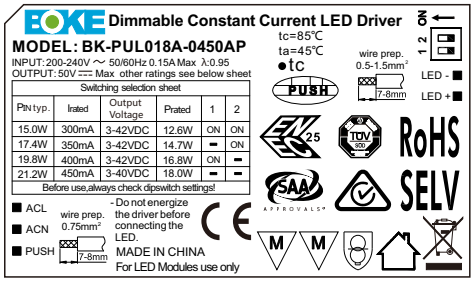
Switching selection sheet					
PIN typ.	Irated	Output Voltage	Prated	1	2
15.0W	300mA	3-42VDC	12.6W	ON	ON
17.4W	350mA	3-42VDC	14.7W	▬	ON
19.8W	400mA	3-42VDC	16.8W	ON	▬
21.2W	450mA ★	3-40VDC	18.0W	▬	▬
Before use,always check dipswitch settings!					

Remarks:

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

Label



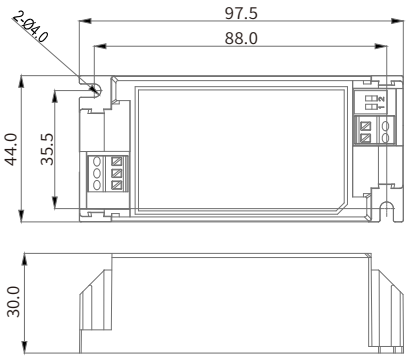


Installation

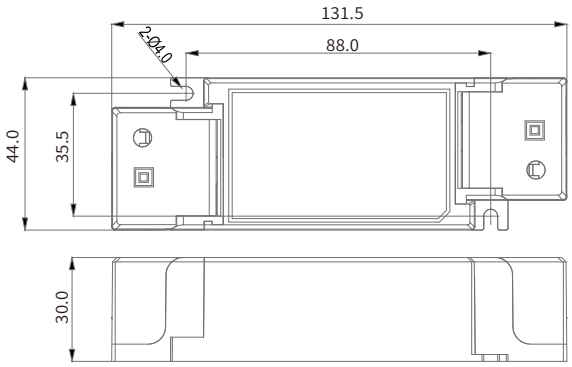
Mechanical dimensions

Unit:mm

Built-in controlgear



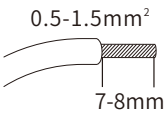
Independent controlgear



INPUT

Pin Numbering	function	colour
1	ACL	orange
2	ACN	orange
3	PUSH	blue

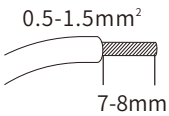
Input wire



OUTPUT

Pin Numbering	function	colour
1	LED-	black
2	LED+	red

Output wire



Installation note

Hot plug-in

- Hot plug-in is not supported due to residual output voltage of > 0 V.

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. lenght of output wires is 2 m.
- Incorrect wiring can damage LED modules.

Mounting screw specifications and torque

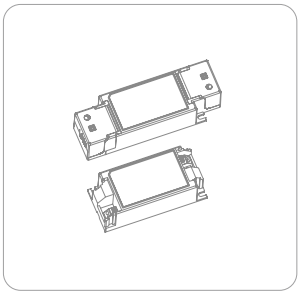
- Max. torque at the clamping screw: 0.5 Nm / M4

Replace LED module

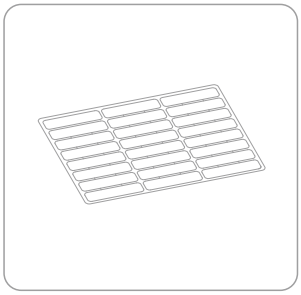
1. Mains off
2. Remove LED module
3. Wait for 5 seconds
4. Connect LED module again

Packaging

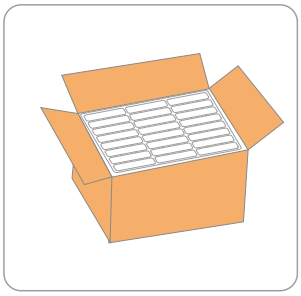
Optional 1: factory default



Product



Blister



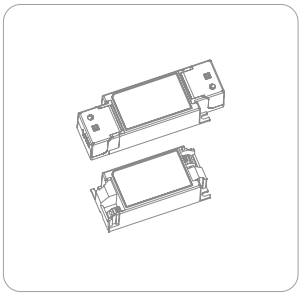
27pcs×3layer=81pcs/CIN
24pcs×3layer=72pcs/CIN

Model	Product size	Weight	Blister size	Carton size	Qty/carton	N.W	G.W
PUL010A PUL018A (Built-in)	L97.5*W44*H30mm	84g	L430*W340*H47mm	L450*W350*H180mm	81pcs	6.8KG	7.76KG
PUL010A PUL018A (Independent)	L131.5*W44*H30mm	104g	L430*W340*H47mm	L450*W350*H180mm	72pcs	7.5KG	8.5KG

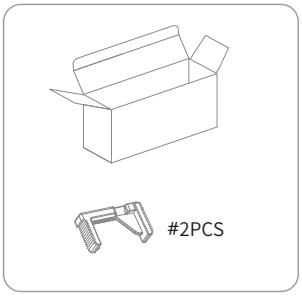
Press line

Remarks: accessories will be packed in PE bags separately

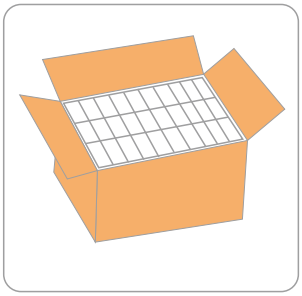
Optional 2:



Product



Packaging



30pcs×4layer=120pcs/CIN

Model	Product size	Weight	Packaging size	Carton size	Qty/carton	N.W	G.W
PUL010A PUL018A (Built-in)	L97.5*W44*H30mm	84g	L140*W35*H50mm	L440*W375*H222mm	120pcs	10.8KG	13.5KG
PUL010A PUL018A (Independent)	L131.5*W44*H30mm	104g	L140*W35*H50mm	L440*W375*H222mm	120pcs	12.48KG	15.12KG

Additional information

1. This product can only be used outside the light body, Can not be used inside of the light, and it must be used within the specified working environment.
2. The life and MTBF of the product are for reference only, and do not represent a warranty statement. If the drive has been turned on, there is no warranty.
3. For more information, please send an email to info@bokedriver.com.