

Constant current independent dimmable driver  
PUL-A Series suffix M(1-10V/10V PWM)



## Features

- Support 1-10V/10V PWM dimming mode
- 10-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

- DIM(1-10V / 10V PWM )

## 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

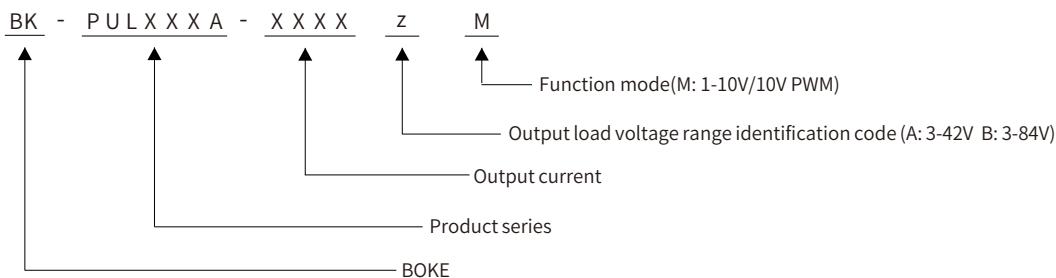
- Suitable for lights with independent drivers such as downlights, spotlights, panel lights, etc
- Not suitable for lights with built-in drivers

## 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		
		DALI-2	PUSH	1-10V 2in1
PUL030A	D	√	√	√
	d	√	√	
	P		√	√
	M			√
	d	√		
	P		√	
PUL010B	M			√
PUL018B				

\* The description in this specification is only applicable to the products with the suffix M and the model are PUL030A and PUL042A and PUL060A.

### Order selection table of PUL-A series(just suffix M, 30W/42W/60W)

Model	Input voltage	Output power	Output voltage	Output current	Dimension	Article number
BK-PUL030A-0700AM	200-240VAC	29.4W	3-42VDC	0.25-0.70A	L103*W68*H30mm	B-PUL030A-HF001
BK-PUL042A-0700BM	200-240VAC	42.0W	3-84VDC	0.25-0.70A	L103*W68*H30mm	B-PUL042A-HF013
BK-PUL042A-1100AM	200-240VAC	42.0W	3-42VDC	0.60-1.10A	L123*W79*H31mm	B-PUL042A-HF014
BK-PUL060A-2000AM	200-240VAC	61.2W	3-42VDC	0.80-2.00A	L123*W79*H31mm	B-PUL060A-HF006

**Technical data**

Product model	BK-PUL030A-0700AM
<b>Output parameters</b>	
Regulation method	Constant Current
Rated output current	0.25-0.7A
Rated output voltage	3-42V
Rated output power	29.4W 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 =0.106% (100 Hz), Pst LM ≤ 0.000, SVM ≤ 0.003,(The above parameters are obtained from testing the panel lights)
<b>Input parameters</b>	
Rated input voltage	200-240VAC 200-240VDC
Rated input voltage	180-264VAC 180-264VDC
Input votage shock	<380V AC, 1 h
Input current	<0.2A (AC input)
Input frequency	47-63Hz
Input power factor	>0.95 (230V AC & Full load)
Input THD	<10% (230V AC & Full load)
Efficiency(typical)	87% (230V AC & Full load)
In-rush current	4.33A peak ,164us 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):29.4W, No load(Pno): N/A, On stand-by(Psb) : <0.5W, Network stand-by(Pnet) : N/A
<b>Safety</b>	
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
<b>Control interface</b>	
DALI dimming port	N/A
PUSH dimming port	N/A
1-10V 2in1 dimming port	Voltage range: 0-10V, interface current consumption: 0.3mA
Auxiliary power supply	N/A
Dimming range	1-100%
Dimming drive mode	AM(amplitude modulation)
<b>Emergency support</b>	
Central emergency system	Supported(Under DC input conditions)
Self-contained emergency	Supported
<b>Environment &amp; Life time</b>	
Operating temperature	Ta=-20-45°C
Case temperature	Tc=75°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
<b>Certifications and standards</b>	
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-PUL042A-0700BM	BK-PUL042A-1100AM	
<b>Output parameters</b>			
Regulation method	Constant Current	Constant Current	
Rated output current	0.25-0.7A	0.6-1.1A	
Rated output voltage	3-84V	3-42V	
Rated output power	42W Max	42W Max	
Output current adjustment	DIP S.W(10 levels)	DIP S.W(10 levels)	
Output current ripple LF	±1%	±1%	
Output current accuracy	±2%	±2%	
Linear regulation	±1%	±1%	
Load regulation	±1%	±1%	
No load output voltage	100V	50V	
Flicker-free(typical)	Modulation depth =0.440% (100 Hz), Pst LM ≤ 0.003, SVM ≤ 0.007,(The above parameters are obtained from testing the panel lights)		
<b>Input parameters</b>			
Rated input voltage	200-240VAC	200-240VDC	
Rated input voltage	180-264VAC	180-264VDC	
Input votage shock	<380V AC, 1 h		
Input current	<0.3A (AC input)		
Input frequency	47-63Hz		
Input power factor	>0.95 (230V AC & Full load)		
Input THD	<10% (230V AC & Full load)		
Efficiency(typical)	88% (230V AC & Full load)		
In-rush current	4.88A peak ,154us 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):42W, No load(Pno): N/A, On stand-by(Psb) :<0.5W, Network stand-by(Pnet) : N/A		
<b>Safety</b>			
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		
<b>Control interface</b>			
DALI dimming port	N/A		
PUSH dimming port	N/A		
1-10V 2in1 dimming port	Voltage range: 0-10V, interface current consumption: 0.3mA		
Auxiliary power supply	N/A		
Dimming range	1-100%		
Dimming drive mode	AM(amplitude modulation)		
<b>Emergency support</b>			
Central emergency system	Supported(Under DC input conditions)		
Self-contained emergency	Supported		
<b>Environment &amp; Life time</b>			
Operating temperature	Ta=-20-45°C		
Case temperature	Tc=75°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		
<b>Certifications and standards</b>			
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**

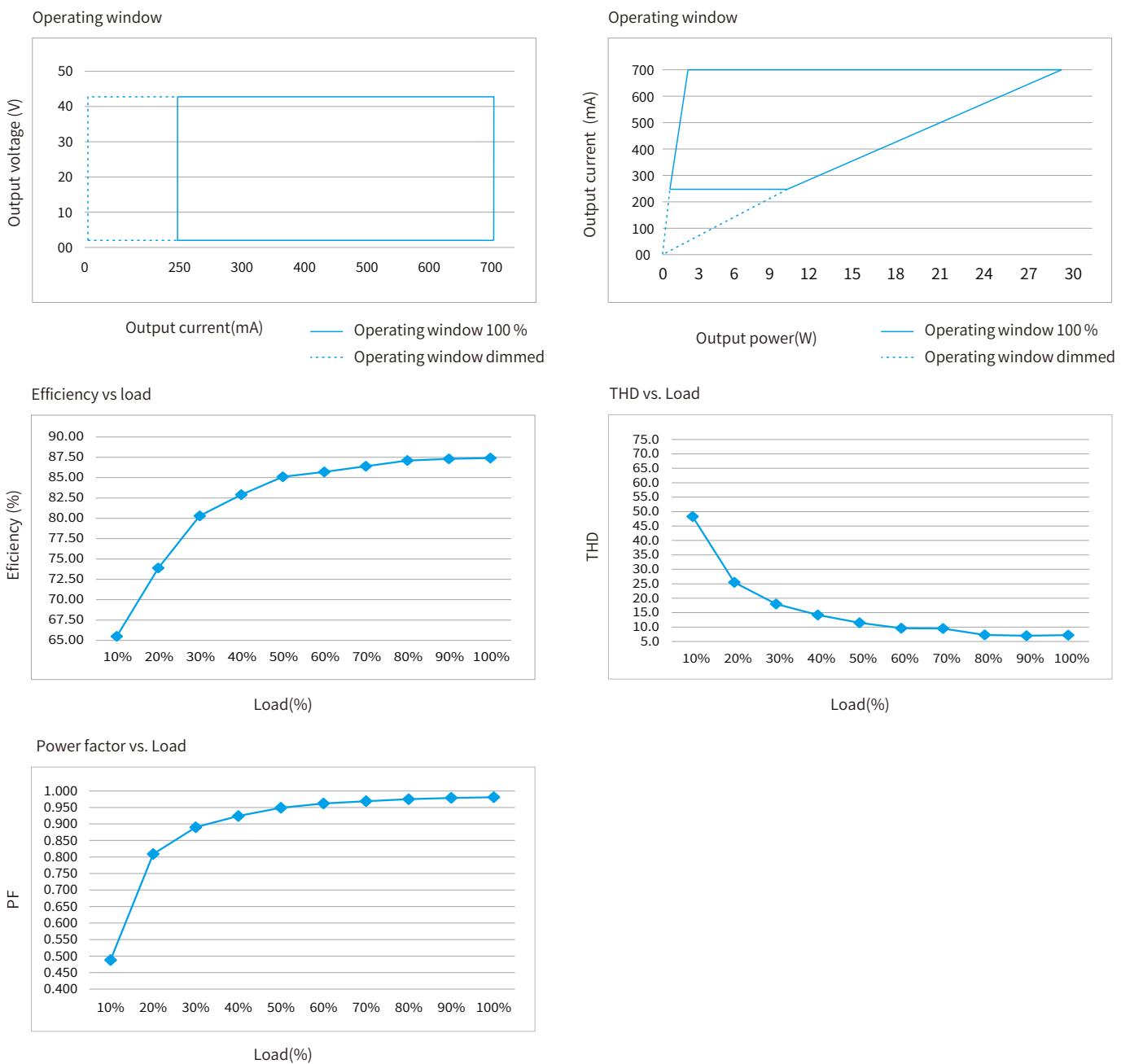
Product model	BK-PUL060A-2000AM
<b>Output parameters</b>	
Regulation method	Constant Current
Rated output current	0.8-2.0A
Rated output voltage	3-42V
Rated output power	61.2W Max
Output current adjustment	DIP S.W(10 levels)
Output current ripple LF	±1%
Output current accuracy	±2%
Linear regulation	±1%
Load regulation	±1%
No load output voltage	50V
Flicker-free(typical)	Modulation depth =0.183% (100 Hz), Pst LM ≤ 0.002, SVM ≤ 0.006,(The above parameters are obtained from testing the panel lights)
<b>Input parameters</b>	
Rated input voltage	200-240VAC 200-240VDC
Rated input voltage	180-264VAC 180-264VDC
Input votage shock	<380 VAC, 1 h
Input current	<0.4A (AC input)
Input frequency	47-63Hz
Input power factor	>0.95 (230V AC & Full load)
Input THD	<10% (230V AC & Full load)
Efficiency(typical)	90% (230V AC & Full load)
In-rush current	9.51A peak ,178us duration(50 % lpeak), 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):61.2W, No load(Pno): N/A, On stand-by(Psb) : <0.5W, Network stand-by(Pnet) : N/A
<b>Safety</b>	
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
<b>Control interface</b>	
DALI dimming port	N/A
PUSH dimming port	N/A
1-10V 2in1 dimming port	Voltage range: 0-10V, interface current consumption: 0.3mA
Auxiliary power supply	N/A
Dimming range	1-100%
Dimming drive mode	AM(amplitude modulation)
<b>Emergency support</b>	
Central emergency system	Supported(Under DC input conditions)
Self-contained emergency	Supported
<b>Environment &amp; Life time</b>	
Operating temperature	Ta=-20-45°C
Case temperature	Tc=80°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
<b>Certifications and standards</b>	
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**

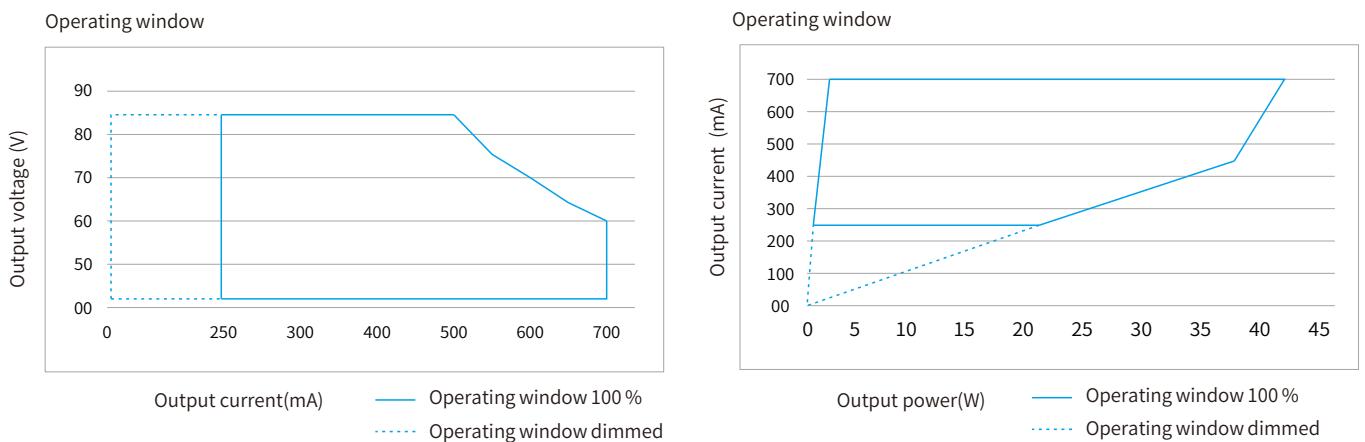
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- 2.The driver can not be installed inside the light. when the driver is used with the light, the EMC of the whole light needs to be tested.

## Electrical values

### BK-PUL030A-0700AM

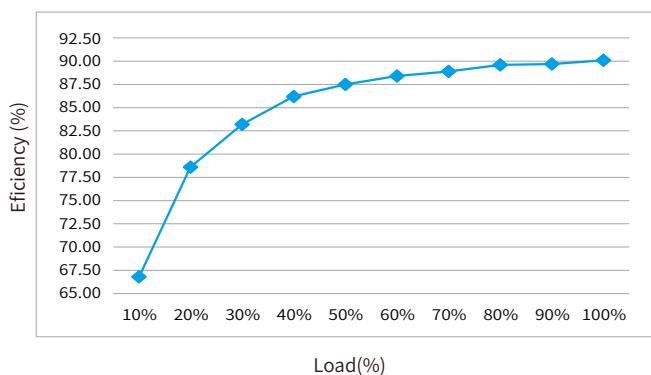


### BK-PUL042A-0700BM

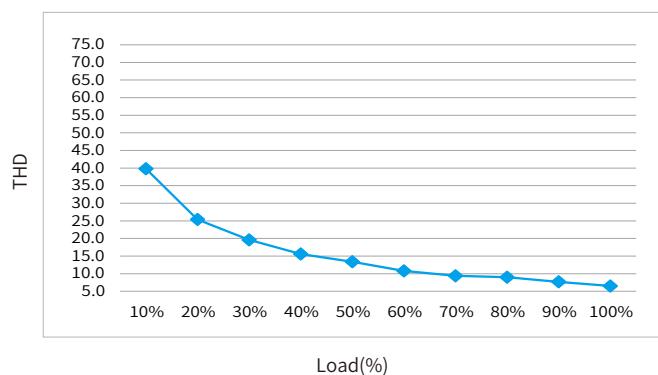


**BK-PUL042A-0700BM (Continue)**

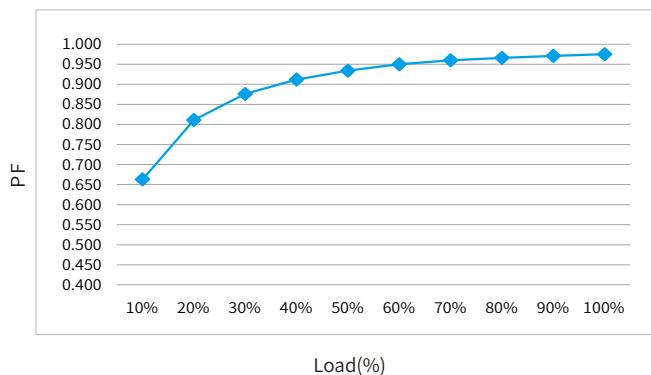
Efficiency vs load



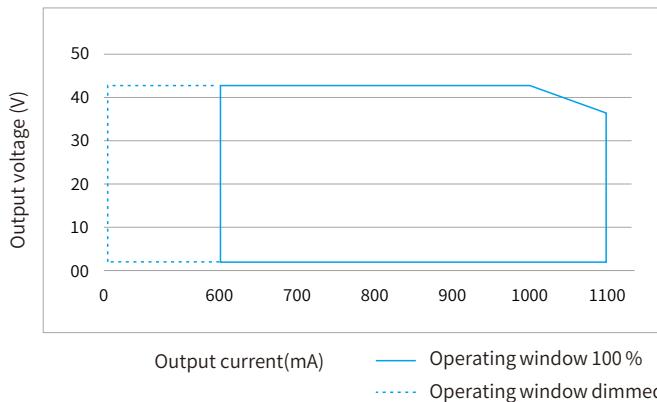
THD vs. Load



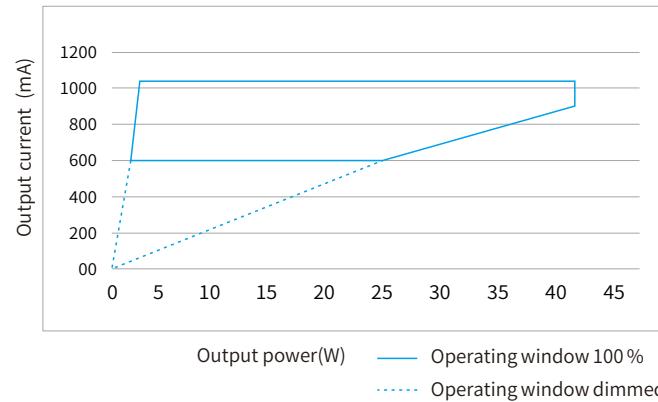
Power factor vs. Load


**BK-PUL042A-1100AM**

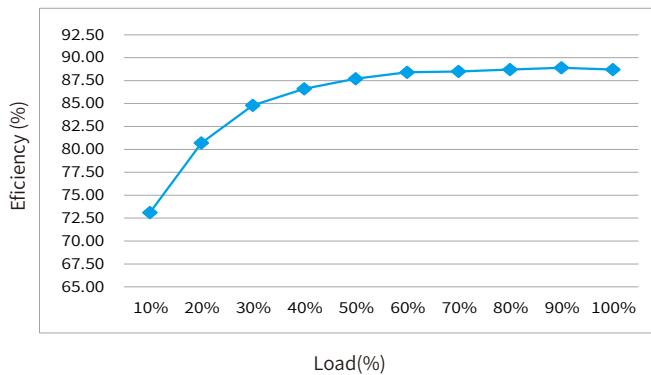
Operating window



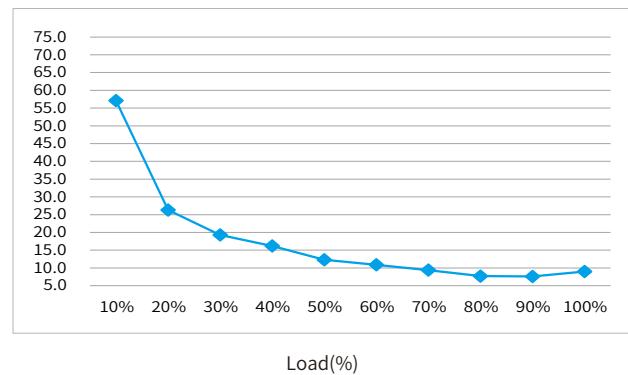
Operating window



Efficiency vs load

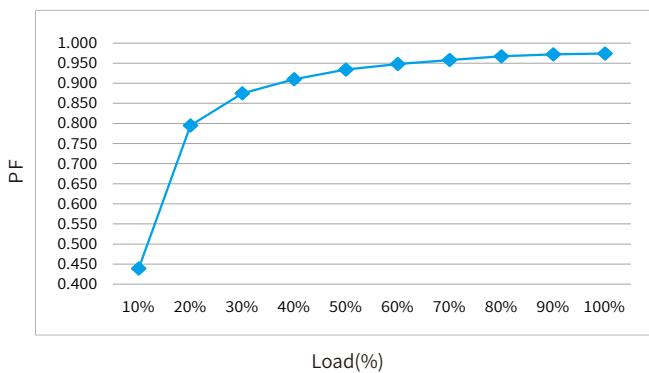


THD vs. Load

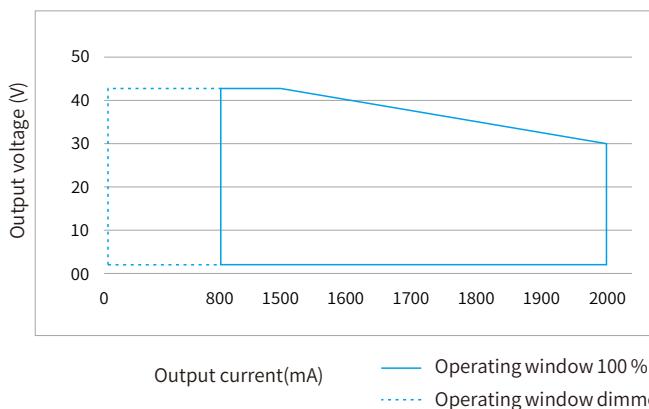


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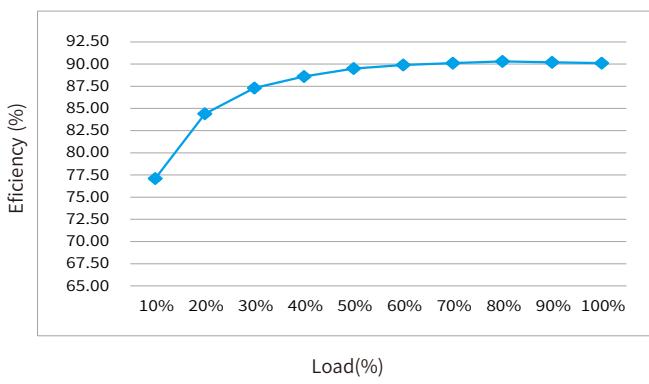
Power factor vs. Load


**BK-PUL060A-2000AM**

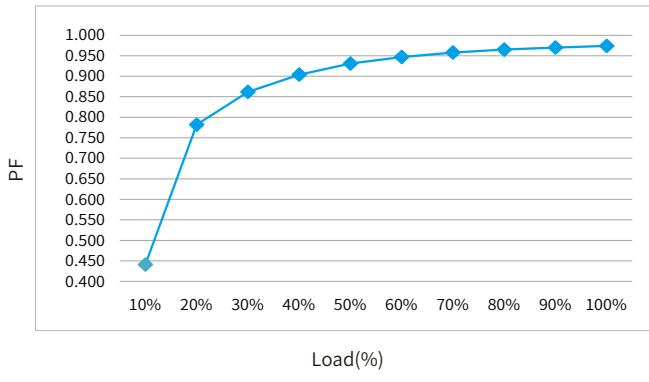
Operating window



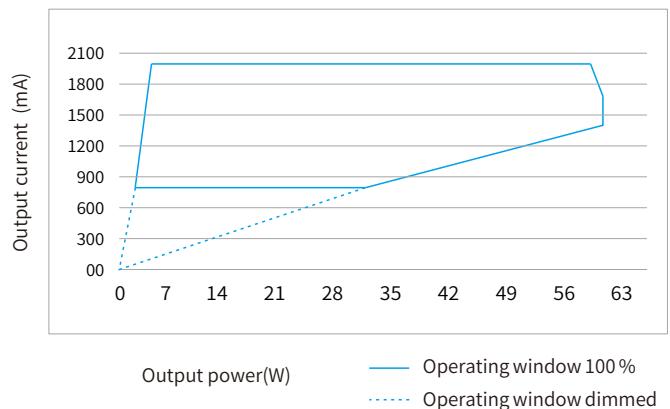
Efficiency vs load



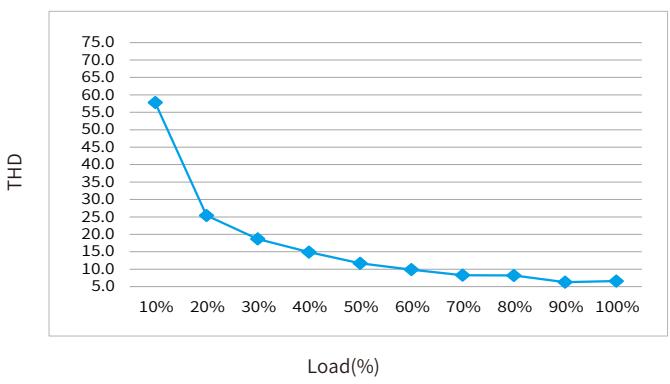
Power factor vs. Load



Operating window



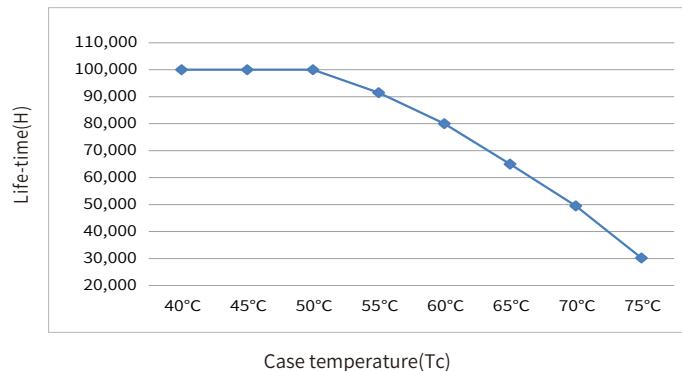
THD vs. Load



## Expected life-time

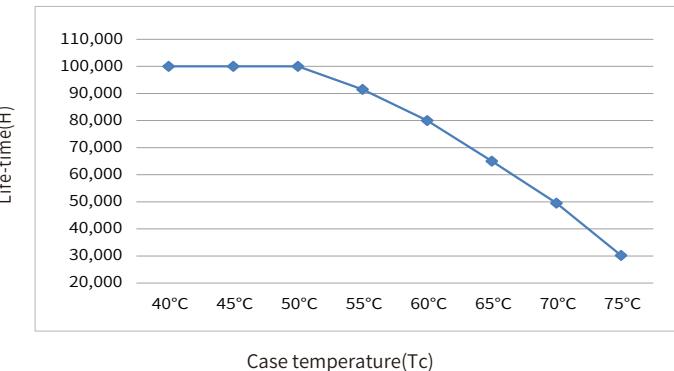
### BK-PUL030A-0700AM

Life-time vs. case temperature



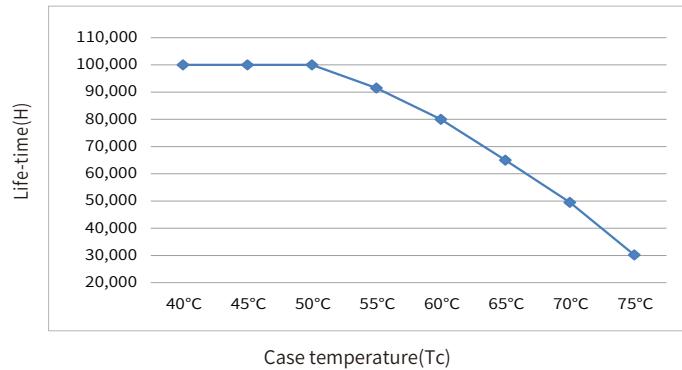
### BK-PUL042A-0700BM

Life-time vs. case temperature



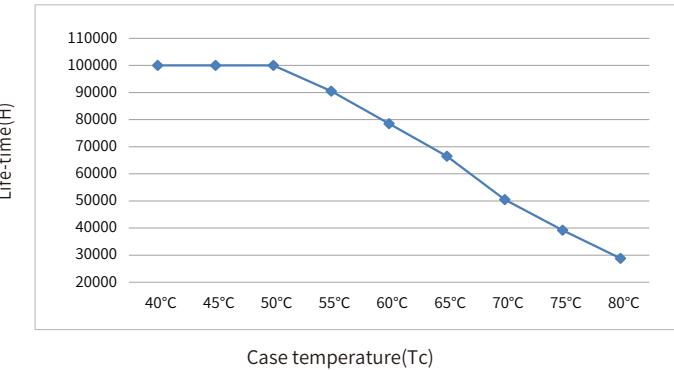
### BK-PUL042A-1100AM

Life-time vs. case temperature



### BK-PUL060A-2000AM

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).

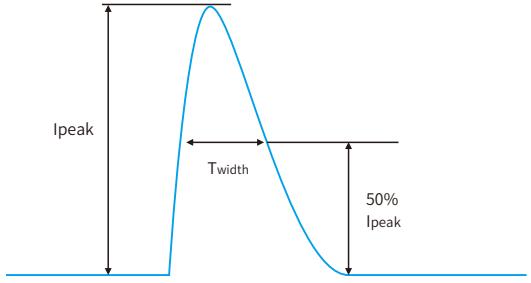
- The relation of tc to ta temperature depends also on the luminaire design.

## Surge

Model	Ipeak	Twidth	Condition	Relative number of MCB														
				B10	B13	B16	B20	B25	C10	C13	C16	C20	C25	D10	D13	D16		
BK-PUL030A-0700AM	4.33A	164us	AC 230V,Full load, Cold start,Ta≤30°C, MCB is not installed side by side	46	60	74	92	116	46	60	74	92	116	46	60	74	92	116
BK-PUL042A-1100AM	4.88A	154us		33	43	52	65	82	33	43	52	65	82	33	43	52	65	82
BK-PUL060A-2000AM	9.51A	178us		23	30	37	46	57	23	30	37	46	57	23	30	37	46	57

## 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 (1-10V).

### 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 (1-10V).

**DIP-switch & output current**

BK-PUL030A-0700AM

Pin	Irated	Voltage	1	2	3	4
12.7W	250mA	42VDC	--	ON	ON	ON
14.9W	300mA	42VDC	ON	--	ON	ON
17.4W	350mA	42VDC	--	--	ON	ON
19.5W	400mA	42VDC	--	ON	--	ON
21.9W	450mA	42VDC	--	--	--	ON
24.3W	500mA	42VDC	ON	ON	ON	--
26.5W	550mA	42VDC	--	--	ON	--
28.9W	600mA	42VDC	--	ON	--	--
31.3W	650mA	42VDC	ON	--	--	--
33.7W	700mA <b>★</b>	42VDC	--	--	--	--

BK-PUL042A-0700BM

Pin	Irated	Voltage	1	2	3	4
23W	250mA	84VDC	--	ON	ON	ON
28W	300mA	84VDC	ON	--	ON	ON
32W	350mA	84VDC	--	--	ON	ON
37W	400mA	84VDC	--	ON	--	ON
41W	450mA	84VDC	--	--	--	ON
46W	500mA	84VDC	ON	ON	ON	--
46W	550mA	76VDC	--	--	ON	--
46W	600mA	70VDC	--	ON	--	--
46W	650mA	64VDC	ON	--	--	--
47W	700mA <b>★</b>	60VDC	--	--	--	--

BK-PUL042A-1100AM

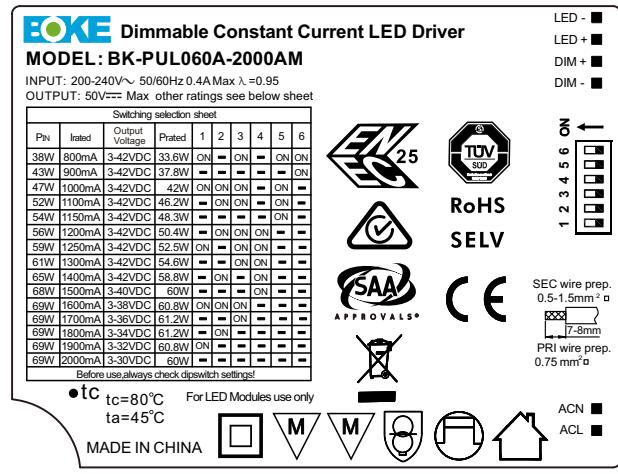
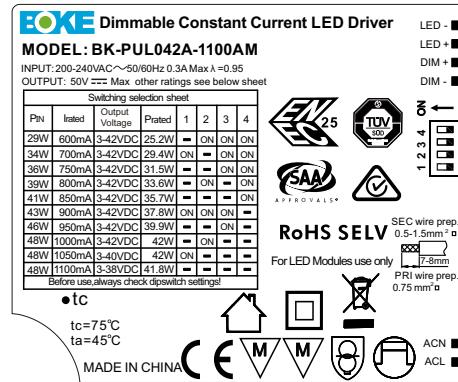
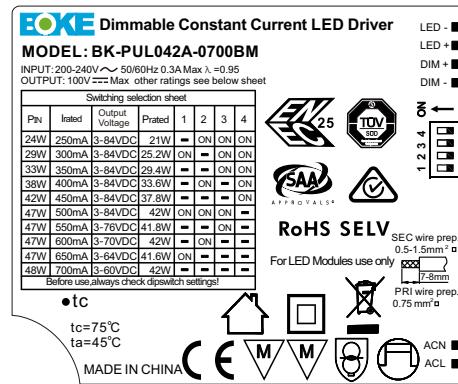
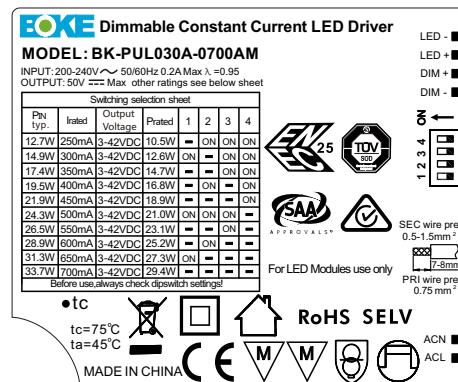
Pin	Irated	Voltage	1	2	3	4
29W	600mA	42VDC	--	ON	ON	ON
34W	700mA	42VDC	ON	--	ON	ON
36W	750mA	42VDC	--	--	ON	ON
39W	800mA	42VDC	--	ON	--	ON
41W	850mA	42VDC	--	--	--	ON
43W	900mA	42VDC	ON	ON	ON	--
46W	950mA	42VDC	--	--	ON	--
48W	1000mA	42VDC	--	ON	--	--
48W	1050mA	40VDC	ON	--	--	--
48W	1100mA <b>★</b>	38VDC	--	--	--	--

BK-PUL060A-2000AM

Pin	Irated	Voltage	1	2	3	4	5	6
38W	800mA	42VDC	ON	--	ON	--	ON	ON
43W	900mA	42VDC	--	--	--	--	--	ON
47W	1000mA	42VDC	ON	ON	ON	--	ON	--
52W	1100mA	42VDC	--	ON	ON	--	ON	--
54W	1150mA	42VDC	--	--	--	--	ON	--
56W	1200mA	42VDC	--	ON	ON	ON	--	--
59W	1250mA	42VDC	ON	--	ON	ON	--	--
61W	1300mA	42VDC	--	--	ON	ON	--	--
65W	1400mA	42VDC	--	ON	--	ON	--	--
68W	1500mA	40VDC	--	--	--	ON	--	--
69W	1600mA	38VDC	ON	ON	ON	--	--	--
69W	1700mA	36VDC	--	--	ON	--	--	--
69W	1800mA	34VDC	--	ON	--	--	--	--
69W	1900mA	32VDC	ON	--	--	--	--	--
69W	2000mA <b>★</b>	30VDC	--	--	--	--	--	--

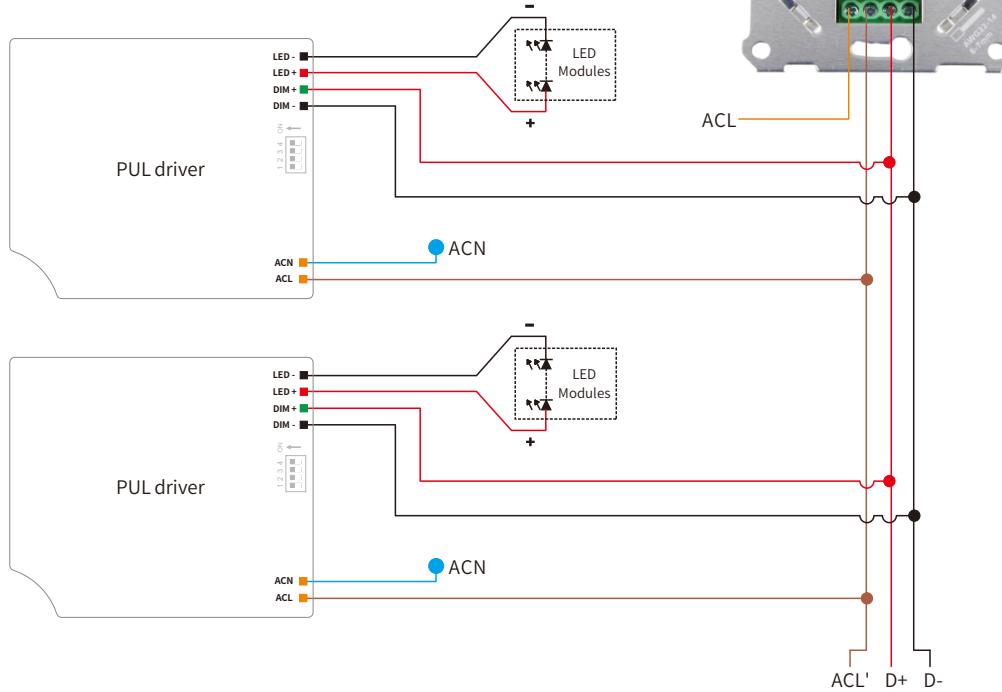
**Remarks:**

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

**Label**


## 1-10V/10V PWM dimming application

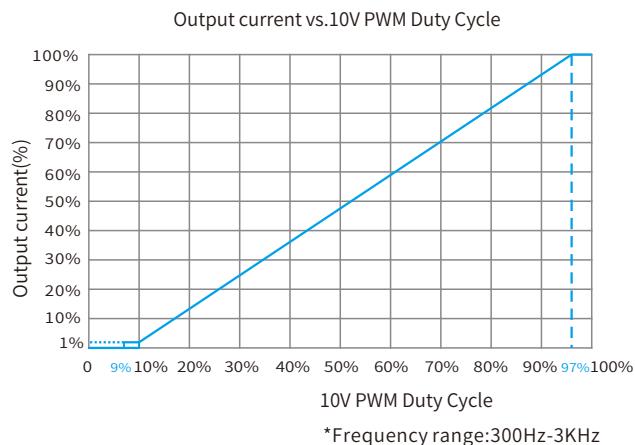
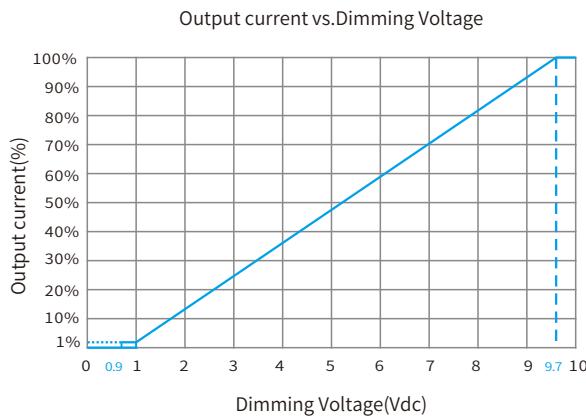
Wiring diagram



### Remarks

- Dimming interface characteristics: 0.9V and below are closed, 1V is the darkest, 10V is the brightest, 1-10V is the dimming range.
- The dimming interface distinguishes between positive and negative, DIM+ is positive, DIM- is negative, please do not reverse.
- Dimming interface does not support voltage access higher than 20V, otherwise it will cause damage to the internal components.
- When the dimming interface is open, the driver outputs the maximum current. When the interface is short-circuited, the current output is closed.
- When multiple synchronous dimming is required, the positive poles of the dimming interface of each driver are connected together, and the negative poles are connected together.
- Support passive dimmer or isolated active dimmer dimming, does not support non-isolated active dimmer dimming.
- In general, it is recommended that the number of mounted drives does not exceed 30pcs, and the wiring length does not exceed 100m.
- It is recommended that the dimming wires should not be lower than the 22AWG wire.
- Do not put the dimming wires with high voltage or interference sources. If it is unavoidable, please use the shielded wires.
- If you need a drive with 0-10V dimming characteristics, please contact BOKE.

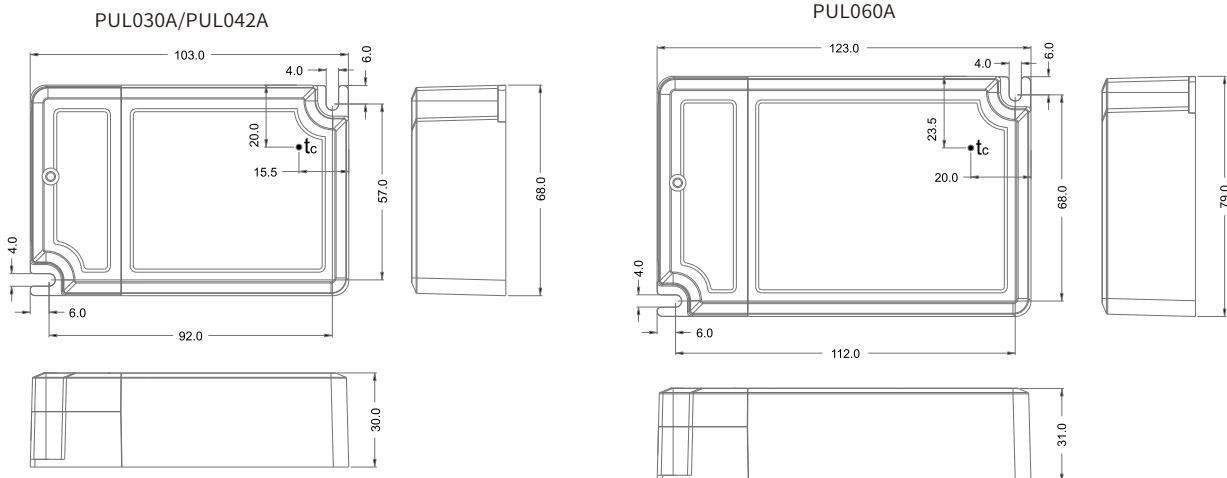
### Dimming curve



## Installation

### Mechanical dimensions

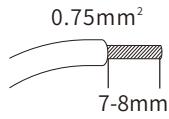
Unit:mm



### INPUT

Pin Numbering	function	colour
1	ACL	orange
2	ACN	orange

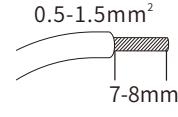
### Input wire



### OUTPUT

Pin Numbering	function	colour
1	LED-	black
2	LED+	red
3	DIM+	green
4	DIM-	black

### 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

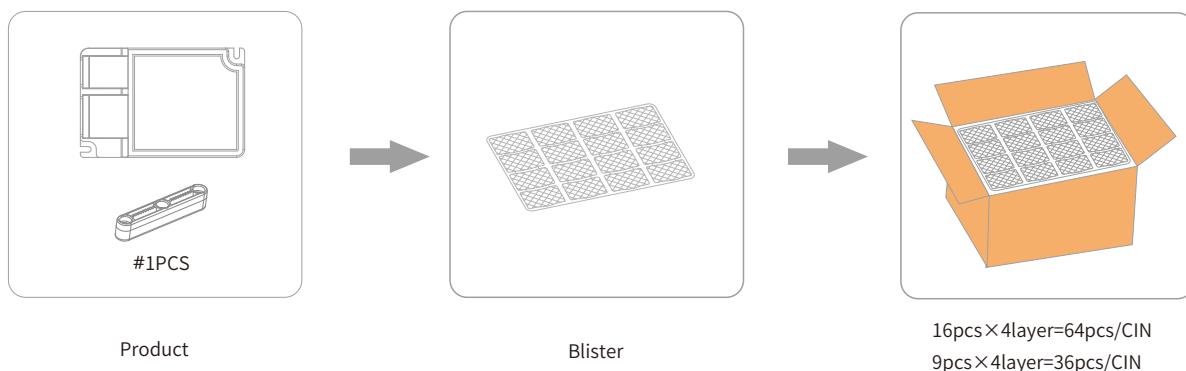
- Max. torque at the clamping screw: 0.5 Nm / M4

#### 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



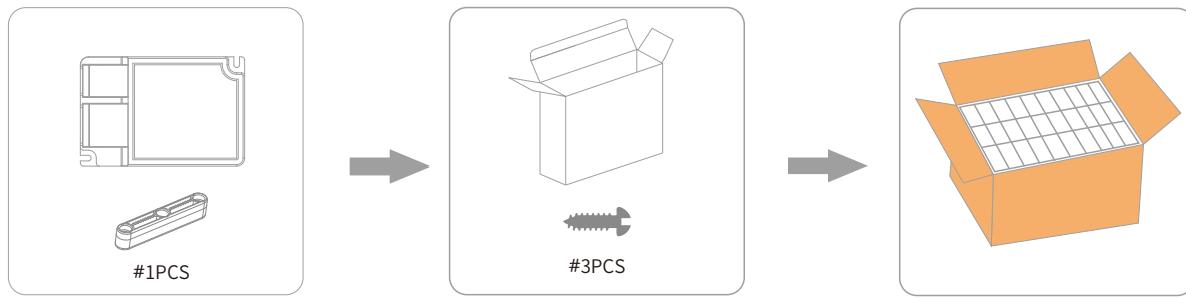
Model	Product size	Weight	Blister size	Carton size	Qty/carton	N.W	G.W
PUL030A	L103*W68*H30mm	140g	L480*W330*H40mm	L490*W340*H165mm	64 pcs	8.96kg	10.8kg
PUL042A	L103*W68*H30mm	168g	L480*W330*H40mm	L490*W340*H165mm	64 pcs	10.8kg	12.1kg
PUL060A	L123*W79*H31mm	248g	L435*W345*H40mm	L450*W350*H180mm	36 pcs	9.00kg	11.0kg



Screw

Remarks: accessories will be packed in PE bags separately

### Optional 2:



Model	Product size	Weight	Packaging size	Carton size	Qty/carton	N.W	G.W
PUL030A	L103*W68*H30mm	140g	L130*W38*H85mm	L415*W330*H190mm	48 pcs	6.8kg	9.8kg
PUL042A	L103*W68*H30mm	168g	L130*W38*H85mm	L415*W330*H190mm	48 pcs	8.1kg	11.2kg
PUL060A	L123*W79*H31mm	248g	L130*W38*H85mm	L415*W330*H190mm	48 pcs	11.9kg	14.5kg

### Additional information

- 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.
- 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.
- For more information, please send an email to [info@bokedriver.com](mailto:info@bokedriver.com).