

Constant current independent driver

PBL(E) Series suffix SE



Features

- Multi-level current output can be realized by DIP-switch
- Flicker-free output, which meets the requirement of ErP standard
- Two-stage and isolation, more stable and safer
- Dual input terminal design, Support loop-in and loop-out wiring without junction box
- Optional Junction Box: Support up to 2.5mm² Cable and Loop-through Function
- Withstand 380VAC high voltage short-time shock
- Mains surge capability up to 2KV
- Screw-free design, easy wiring
- High PF, low THD
- Pushable strain relief design, easy to crimp and install
- Compact housing design
- Support the whole lamp grounding application
- SELV and Class II design, suitable for use outside of the luminaires
- Passed CE, ENEC, UKCA, RCM, CCC, EL and other certifications
- Nominal life-time up to 100,000 h
- 5.5-year guarantee

Functions

- Support central emergency application (100% output in DC input)
- Support self-contained emergency application
- Protective features (short-circuit, no-load, overload, over temperature protection)

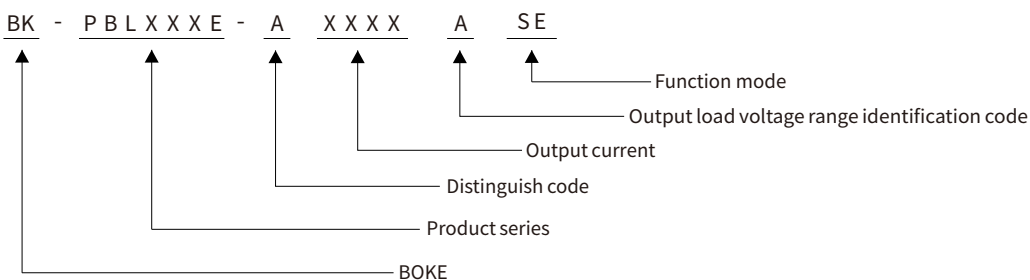
Suitable for lights

- Suitable for lights with independent drivers such as downlights, spotlights, panel lights, etc
- It is necessary to evaluate the chamber temperature of the light when it is used in the built-in

Typical applications

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

Model coding rules of PBL(E) series



Model list

Model	Input voltage	Output power	Output voltage	Output current	Dimension
BK-PBL022E-A0600ASE	200-240VAC/DC	25.2W MAX.	28-42VDC	0.3-0.6A	L123*W46*H30mm
BK-PBL040E-A1000ASE	200-240VAC/DC	40W MAX.	28-42VDC	0.5-1A	L123*W46*H30mm

Technical data

Product model	BK-PBL022E-A0600ASE
Output parameters	
Regulation method	Constant Current
Rated output current range	0.3-0.6A, see the DIP-switch for details
Rated output voltage range	28-42VDC, see the DIP-switch for details
Rated output power	25.2W Max, see the DIP-switch for details
Output current adjustment	DIP S.W(7 levels)
Output current ripple LF	±1%
Output current accuracy	±5%
Linear regulation	±5%
Load regulation	±5%
No load output voltage	54VDC
Flicker-free(typ.)	Flickering percent(IEEE 1789)=0.240%(100Hz), Flicker index(IEEE 1789)=0.001(100Hz), Pst LM = 0.000, SVM = 0.008, (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	<380V AC
Input current	<0.15A (Rated input voltage)
Input frequency	0/50/60Hz
Input PF/Input DF(typ.)	PF:0.97 ,DF:0.98 ,see the electrical values below for details
Input THD(typ.)	9% ,see the electrical values below for details
Efficiency(typ.)	88% ,see the electrical values below for details
In-rush current(typ.)	10.7A peak ,226us duration(50 % Ipeak), see the description below for details
Start/Switchover/Turn off	<0.5s(AC start), <0.5s(DC start), <0.3s(AC/DC switchover), <0.5s(Turn off)
Switching cycles	> 100,000 switching cycles
Power consumption(typ.)	Full load(Pin):28.6W, No load(Pno): N/A, On stand-by(Psb): N/A , Network stand-by(Pnet): N/A
Safety	
Withstand voltage	I/P-O/P:3750V AC
Mains surge capability	L-N:2KV (90°/270°, 5 times each with an interval of 60s)(Performance criterion:A)
Leakage current(typ.)	0.59mA
Isolation resistance	I/P-O/P:100MΩ/500Vdc/25°C/70% RH
Control interface	
DALI dimming port	N/A
pushDIM dimming port	N/A
1-10V 3in1 dimming port	N/A
Auxiliary power supply	N/A
Dimming range	N/A
Dimming drive mode	N/A
Emergency support	
Central emergency system	Supported
Self-contained emergency	Supported
Environment & Life time	
Operating temperature	Ta=-20-50°C
Case temperature	Tc=80°C
Operating humidity	5-85% RH, non-condensing
Storage temp./humidity	-40-80°C, 5-85% RH, non-condensing
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, EL
Safety	GB/T 19510.1, GB/T 19510.213, EN61347-1, EN61347-2-13, EN62384
EMC	GB/T 17743, GB17625.1, 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, 50Hz, 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-PBL040E-A1000ASE
Output parameters	
Regulation method	Constant Current
Rated output current range	0.5-1A, see the DIP-switch for details
Rated output voltage range	28-42VDC, see the DIP-switch for details
Rated output power	40W Max, see the DIP-switch for details
Output current adjustment	DIP S.W(11 levels)
Output current ripple LF	±1%
Output current accuracy	±5%
Linear regulation	±5%
Load regulation	±5%
No load output voltage	54VDC
Flicker-free(typ.)	Flickering percent(IEEE 1789)=0.141%(100Hz), Flicker index(IEEE 1789)=0.001(100Hz), Pst LM = 0.000, 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	<380V AC
Input current	<0.22A (Rated input voltage)
Input frequency	0/50/60Hz
Input PF/Input DF(typ.)	PF:0.97 ,DF:0.98 ,see the electrical values below for details
Input THD(typ.)	8% ,see the electrical values below for details
Efficiency(typ.)	89% ,see the electrical values below for details
In-rush current(typ.)	19.6A peak ,214us duration(50 % Ipeak), see the description below for details
Start/Switchover/Turn off	<0.5s(AC start), <0.5s(DC start), <0.3s(AC/DC switchover), <0.5s(Turn off)
Switching cycles	> 100,000 switching cycles
Power consumption(typ.)	Full load(Pin):44.9W, No load(Pno): N/A, On stand-by(Psb): N/A , Network stand-by(Pnet): N/A
Safety	
Withstand voltage	I/P-O/P:3750V AC
Mains surge capability	L-N:2KV (90°/270°, 5 times each with an interval of 60s)(Performance criterion:A)
Leakage current(typ.)	0.59mA
Isolation resistance	I/P-O/P:100MΩ/500Vdc/25°C/70% RH
Control interface	
DALI dimming port	N/A
pushDIM dimming port	N/A
1-10V 3in1 dimming port	N/A
Auxiliary power supply	N/A
Dimming range	N/A
Dimming drive mode	N/A
Emergency support	
Central emergency system	Supported
Self-contained emergency	Supported
Environment & Life time	
Operating temperature	Ta=-20-45°C
Case temperature	Tc=80°C
Operating humidity	5-85% RH, non-condensing
Storage temp./humidity	-40-80°C, 5-85% RH, non-condensing
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, EL
Safety	GB/T 19510.1, GB/T 19510.213, EN61347-1, EN61347-2-13, EN62384
EMC	GB/T 17743, GB17625.1, 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

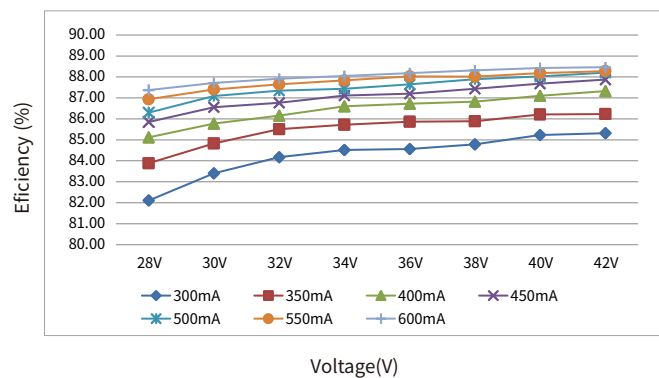
Remarks

- 1.By default, all parameter are measured at 230VAC input, 50Hz, 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.

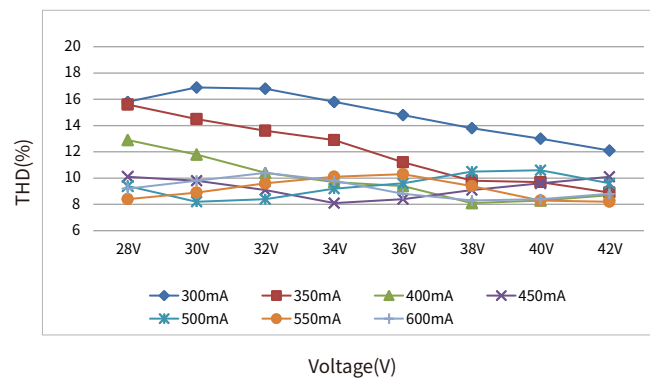
Electrical values

BK-PBL022E-A0600ASE

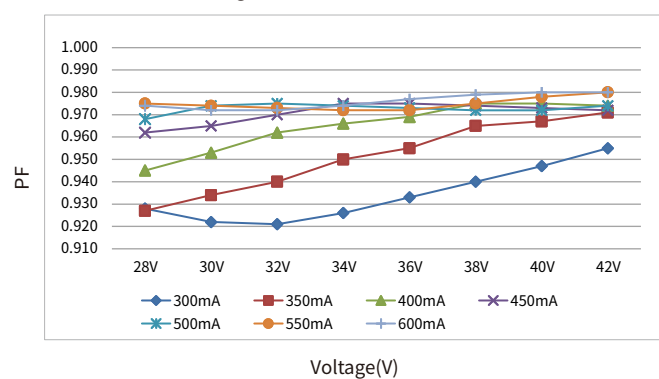
Efficiency vs voltage



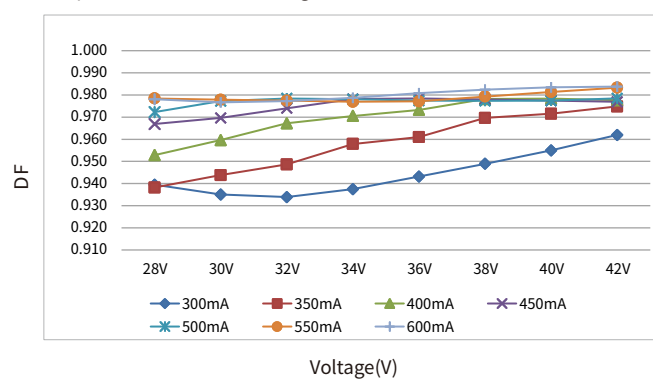
THD vs. voltage



Power factor vs. voltage

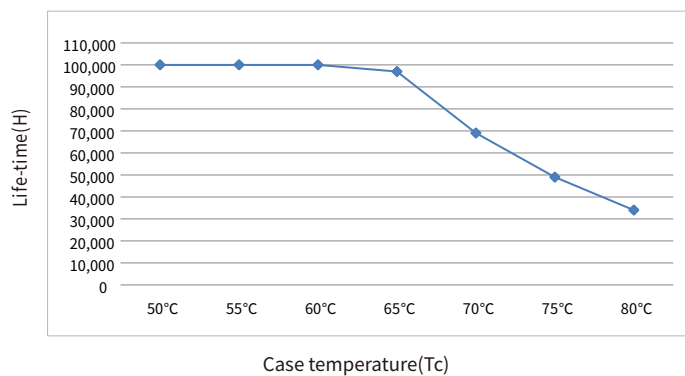


Displacement factor vs. voltage



Expected life-time

Life-time vs. case temperature

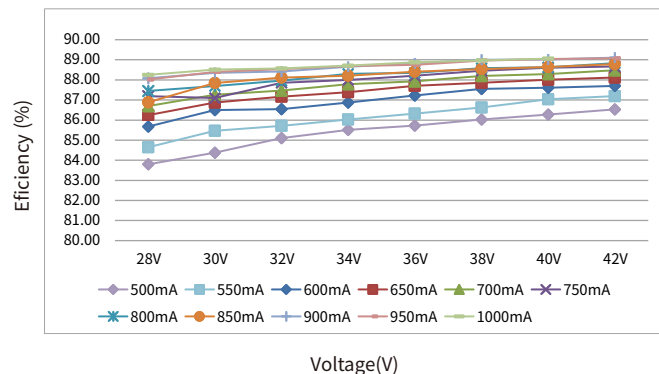


- The life-time of the LED driver is shown in the figure above (calculated based on the 90% survival rate).
- The relation of t_c to t_a temperature depends also on the luminaire design.

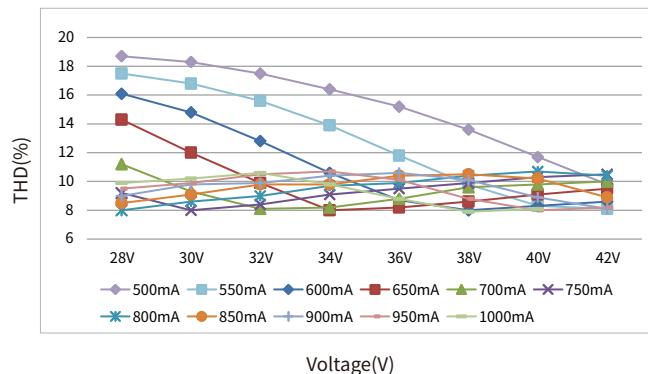
Electrical values

BK-PBL040E-A1000ASE

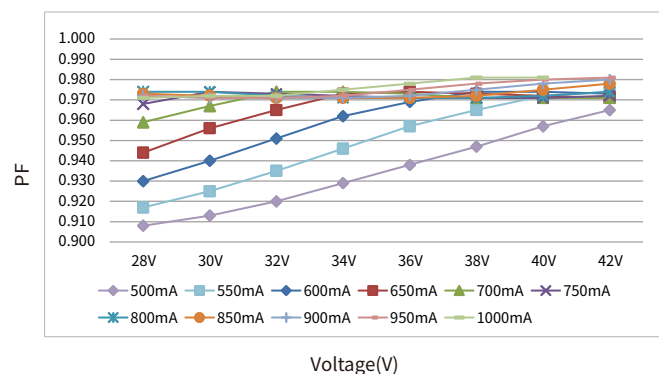
Efficiency vs voltage



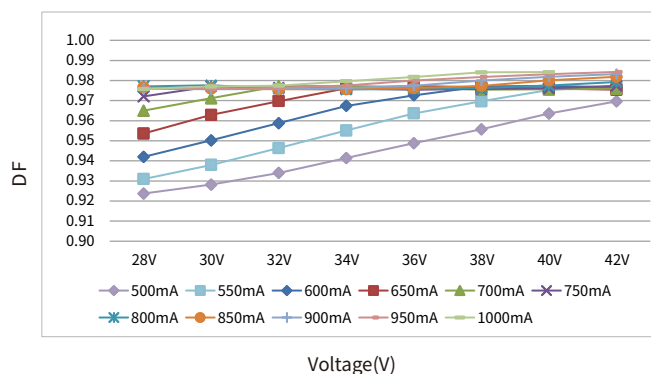
THD vs. voltage



Power factor vs. voltage

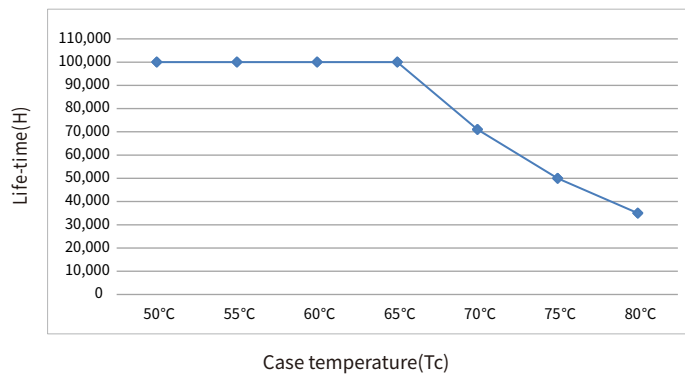


Displacement factor vs. voltage



Expected life-time

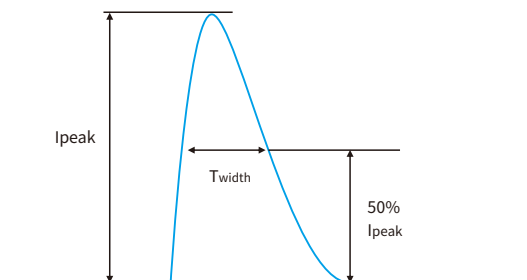
Life-time vs. case temperature



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

Surge

Model	Ipeak	Twidth	Condition	Relative number of MCB/pcs														
				B10	B13	B16	B20	B25	C10	C13	C16	C20	C25	D10	D13	D16	D20	D25
BK-PBL022E-A0600ASE	10.7A	226us	AC 230V, Full load, Cold start, $T_a \leq 30^\circ\text{C}$, MCB is not installed side by side	29	38	47	59	73	49	64	78	98	122	63	82	101	126	158
BK-PBL040E-A1000ASE	19.6A	214us		17	22	27	34	43	28	37	45	57	71	40	52	64	80	100



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

- 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 .

Output over temperature

- When the operating temperature exceeds the over temperature protection point inside the power supply IC, the power supply enters protection state such as output derating, output hiccup or output shutdown. After the external temperature is normal, restart and resume operation.

Driver restart method

- Through the AC input: disconnect the AC of the driver and power it again.

Insulation between circuits

Isolation	Input	Output	Case
Input	-	Double	Double
Output	Double	-	Basic
Case	Double	Basic	-

Label

BK-PBL022E-A0600ASE

INPUT (输入)
MODEL (型号): BK-PBL022E-A0600ASE
 Input (输入): 200-240V $\approx$ 0.5/60Hz 0.15A Max. λ : 0.9C-0.98
 Output (输出): 28-42V $\approx$ 600mA 25.2W Max. 54VDC Max.
 For Australia and New Zealand, the marking label with 0.75-1.5
 Other ratings see selection sheet
 Preparation for input and output: 8-9mm

Output (输出)

Po(W)	Io(mA)	Uo(Vdc)	Switch (开关)
12.60	300	28-42	1 2 3 4
14.70	350	28-42	ON -- -- --
16.80	400	28-42	ON ON -- --
18.90	450	28-42	-- ON ON --
21.00	500	28-42	-- -- ON ON
23.10	550	28-42	-- ON ON ON
25.20	600	28-42	ON ON ON ON

For LED Modules use only
 MADE IN CHINA 中国制造
 www.bokedriver.com
 BOKE Drivers Co., Ltd.
 Address: 2nd and 3rd Floor,
 No. 51, Xihuan 5th Road,
 South District,
 528455 Zhongshan City,
 Guangdong, CHINA

Output (输出)
 LED+
 LED-
 0.5-1.0
 SELV

BK-PBL040E-A1000ASE

INPUT (输入)
MODEL (型号): BK-PBL040E-A1000ASE
 Input (输入): 200-240V $\approx$ 0.5/60Hz 0.22A Max. λ : 0.9C-0.98
 Output (输出): 28-40V $\approx$ 1000mA 40W Max. 54VDC Max.
 For Australia and New Zealand, the marking label with 0.75-1.5
 Other ratings see selection sheet
 Preparation for input and output: 8-9mm

Output (输出)

Po(W)	Io(mA)	Uo(Vdc)	Switch (开关)
21.00	500	28-42	1 2 3 4
23.10	550	28-42	ON -- -- --
25.20	600	28-42	ON ON -- --
27.30	650	28-42	-- ON ON --
29.40	700	28-42	-- -- ON ON
31.50	750	28-42	ON -- -- ON
33.60	800	28-42	-- ON -- ON
35.70	850	28-42	-- -- ON ON
37.80	900	28-42	ON -- ON ON
39.90	950	28-42	-- ON ON ON
40.00	1000	28-40	ON ON ON ON

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 Guangdong, CHINA

Output (输出)
 LED+
 LED-
 0.5-1.0
 SELV

DIP-switch & output current

BK-PBL022E-A0600ASE

Output			1	2	3	4
Prated(w)	Irated(mA)	Voltage(Vdc)				
12.60	300	28-42	--	--	--	--
14.70	350	28-42	ON	--	--	--
16.80	400	28-42	ON	ON	--	--
18.90	450	28-42	--	ON	ON	--
21.00	500	28-42	--	--	ON	ON
23.10	550	28-42	--	ON	ON	ON
25.20	600 ★	28-42	ON	ON	ON	ON

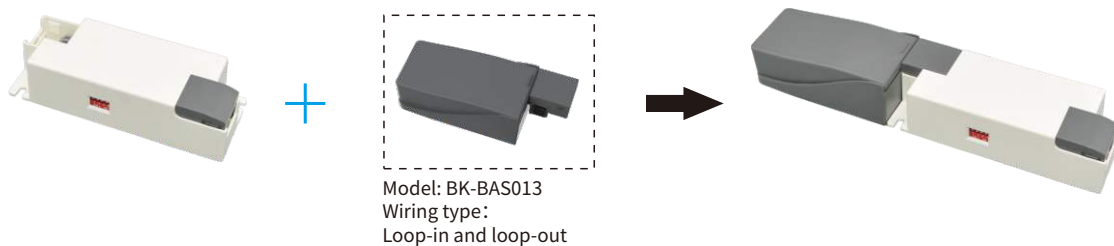
BK-PBL040E-A1000ASE

Output			1	2	3	4
Prated(w)	Irated(mA)	Voltage(Vdc)				
21.00	500	28-42	--	--	--	--
23.10	550	28-42	ON	--	--	--
25.20	600	28-42	--	ON	--	--
27.30	650	28-42	--	--	ON	--
29.40	700	28-42	--	--	--	ON
31.50	750	28-42	ON	--	--	ON
33.60	800	28-42	--	ON	--	ON
35.70	850	28-42	--	--	ON	ON
37.80	900	28-42	ON	--	ON	ON
39.90	950	28-42	--	ON	ON	ON
40.00	1000 ★	28-40	ON	ON	ON	ON

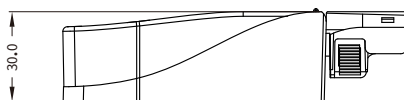
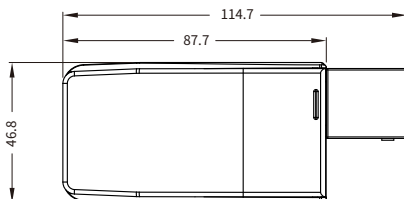
Remarks:

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

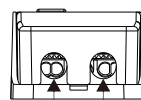
Optional accessories (See the parts specification for details)



size(mm)

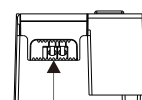
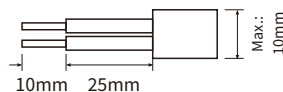


Cable diameter limit



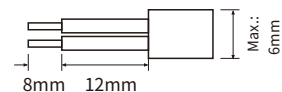
The allowable diameter of the input cable sheath is 2-10mm

Input wire:
 0.75-2.5mm²



The allowable diameter of the output cable sheath is 2-6mm

Output wire:
 0.5-1.0mm²

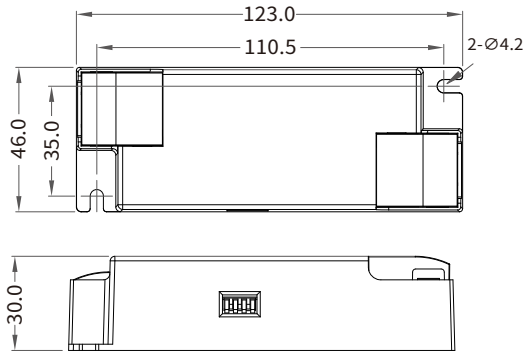


Mechanical Specification

Size(Excluding accessories)

Unit:mm

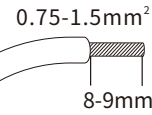
PBL022E-A/PBL040E-A



INPUT

Numbering	function	colour
1	ACL/DC+	grey
2	ACL/DC+	grey
3	ACN/DC-	grey
4	ACN/DC-	grey

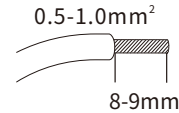
Input wire



OUTPUT

Numbering	function	colour
1	LED-	black
2	LED+	red

Output wire

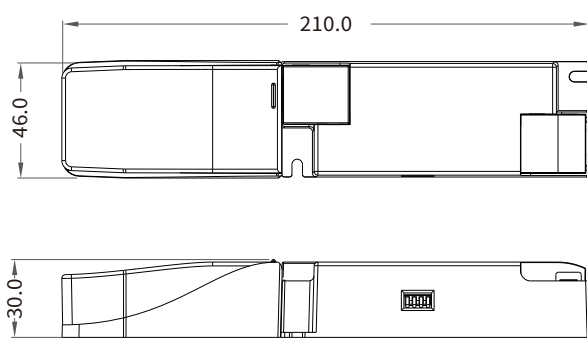


Mechanical Specification

Size(Include accessories)

Unit:mm

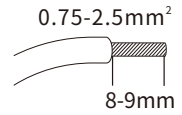
PBL022E-A/PBL040E-A



INPUT

Numbering	function	colour
1	ACN	white
	ACN	white
2	NC	white
	NC	white
3	ACL	white
	ACL	white

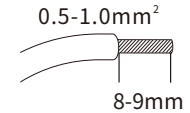
Input wire



OUTPUT

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. 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 lamp radiator).
- If the driver is used externally (it needs to be used with the power end cover), the installation of the driver should also meet the following conditions:
 - 1.The driver should be a certain distance between the drives, as shown in Figure 1.
 - 2.The driver keeps a certain distance from surrounding objects, as shown in Figure 2.

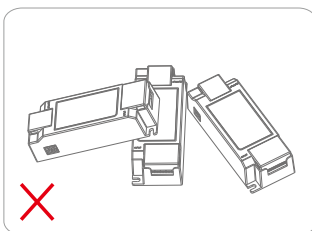


Figure 1

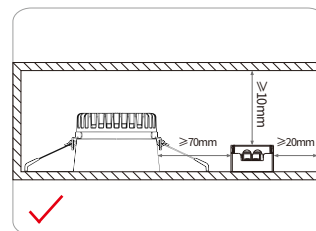
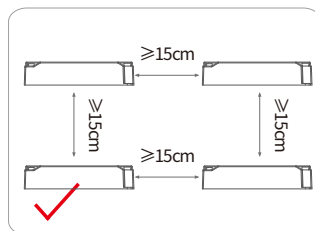


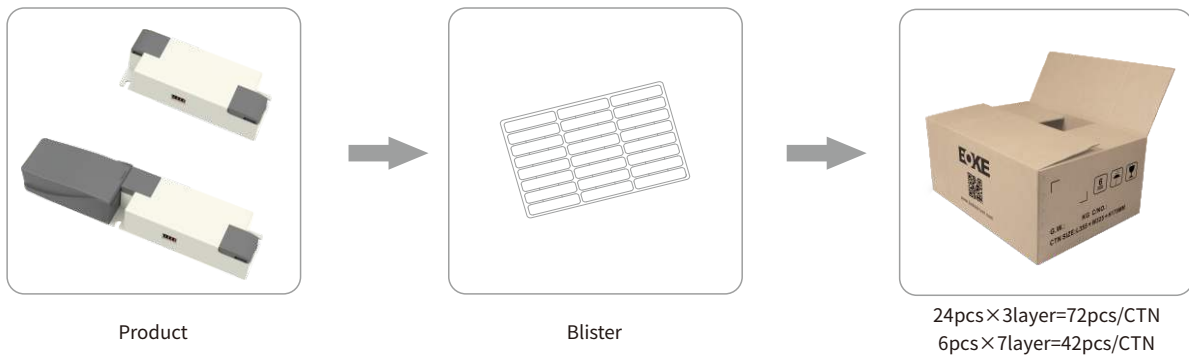
Figure 2

Replace LED module

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

Packaging

Optional 1: factory default



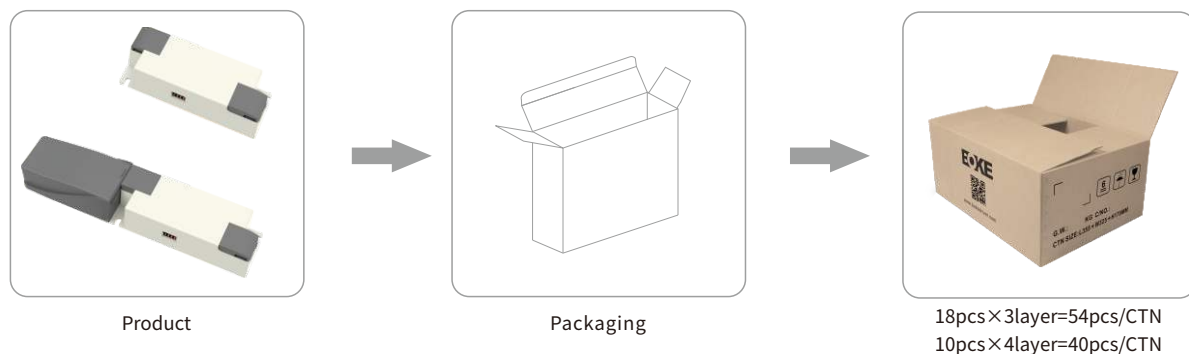
Excluding accessories

Model	Product size	Weight	Blister size	Carton size	Qty/carton	N.W	G.W
PBL022E-A	L123*W46*H30mm	105g	L430*W340*H47mm	L450*W350*H180mm	72pcs	7.56kg	8.86kg
PBL040E-A	L123*W46*H30mm	111g	L430*W340*H47mm	L450*W350*H180mm	72pcs	7.80kg	9.10kg

Include accessories

Model	Product size	Weight	Blister size	Carton size	Qty/carton	N.W	G.W
PBL022E-A	L210*W46*H30mm	148g	L450*W310*H32mm	L465*W325*H265mm	42pcs	6.22kg	7.63kg
PBL040E-A	L210*W46*H30mm	154g	L450*W310*H32mm	L465*W325*H265mm	42pcs	6.47kg	7.78kg

Optional 2



Excluding accessories

Model	Product size	Weight	Packaging size	Carton size	Qty/carton	N.W	G.W
PBL022E-A	L123*W46*H30mm	105g	L140*W35*H50mm	L345*W310*H170mm	54pcs	5.67kg	6.99kg
PBL040E-A	L123*W46*H30mm	111g	L140*W35*H50mm	L345*W310*H170mm	54pcs	5.99kg	7.32kg

Include accessories

Model	Product size	Weight	Packaging size	Carton size	Qty/carton	N.W	G.W
PBL022E-A	L210*W46*H30mm	148g	L235*W40*H70mm	L420*W250*H310mm	40pcs	5.92kg	7.43kg
PBL040E-A	L210*W46*H30mm	154g	L235*W40*H70mm	L420*W250*H310mm	40pcs	6.16kg	7.66kg

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.
3. For more information, please send an email to info@bokedriver.com.