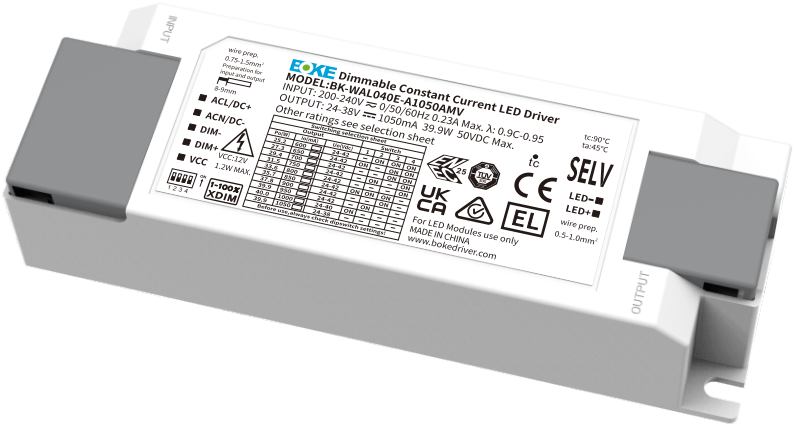
Constant current independent dimmable driver
WAL(E) Series suffix MV(XDIM dimming+12V auxiliary power)

The dimming interface is non isolated, cannot be connected to a dimmer for use. It is only suitable for dimming sensors, and one sensor is paired with one driver



Features

- Support XDIM dimming+12V auxiliary power
- Provide 12V 100mA auxiliary power supply to power control module or sensor
- Auxiliary 12V supports fast power-down feature
- Multi-level current output can be realized DIP-switch, easier to adjust the luminaire power
- 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
- Standby power input<0.5W, meets the ErP requirements of new certification
- High PF, high efficiency, low THD
- Screw-free and pressing type strain relief, easier install
- Independent input and output strain relief, stronger wiring
- SELV and Class II design, suitable for use side of the luminaires
- Compliance with CE, ENEC,UKCA,RCM,EL and other certifications
- IP20 protection grade, indoor use
- Nominal life-time up to 100,000 h
- 5.5-year guarantee

Interfaces

- XDIM-DC
- VCC Auxiliary power(12V,100mA)

Functions

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

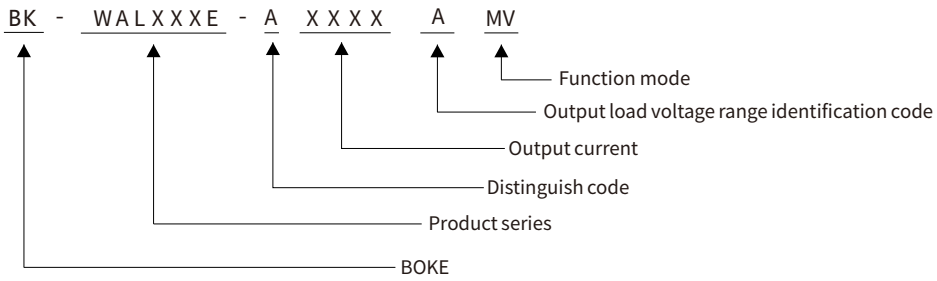
Suitable for lights

- Suitable for luminaries with independent drivers such as downlights, spotlights, panel lights, etc

Typical applications

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

Model coding rules of WAL(E) series



Function list

Model	Suffix	DIP switch	Wired dimming		Aux power
			XDIM-1-10V DC	XDIM-PWM	12V
BK-WAL022E-A BK-WAL040E-A BK-WAL060E-A	**MV**	√	√		√
	YV	√		√	√

*The description in this specification is only applicable to the products with the suffix MV and the model are WAL022E-A,WAL040E-A,WAL060E-A.

Model list

Model	Input voltage	Output power	Output voltage	Output current	Dimension
BK-WAL022E-A0600AMV BK-WAL022E-A0600AYV	200-240VAC/DC	22.8W MAX.	24-42VDC	0.225-0.6A	L117*W45.5*H29mm
BK-WAL040E-A1050AMV BK-WAL040E-A1050AYV	200-240VAC/DC	40W MAX.	24-42VDC	0.6-1.05A	L137*W46*H30mm
BK-WAL060E-A1650AMV BK-WAL060E-A1650AYV	200-240VAC/DC	62.7W MAX.	24-42VDC	1.1-1.65A	L157.5*W50.5*H30mm

*The description in this specification is only applicable to the products with the suffix MV and the model are WAL022E-A,WAL040E-,WAL060E-A.

Technical data

Product model	BK-WAL022E-A0600AMV
Output parameters	
Regulation method	Constant Current
Rated output current range	0.225-0.6A,see the DIP-switch for details
Rated output voltage range	24-42VDC,see the DIP-switch for details
Rated output power	22.8W Max,see the DIP-switch for details
Output current adjustment	DIP S.W(10 levels)
Output current ripple(typ.)	±2%(65kHz)
Output current accuracy	±2%
Linear regulation	±1%
Load regulation	±2%
No load output voltage	50VDC
Flicker-free(typ.)	Flickering percent(IEEE 1789)=0.352%(100Hz), Flicker index(IEEE 1789)=0.000(100Hz), Pst LM = 0.000, SVM = 0.005, (The above parameters are obtained from testing the panel lights)
Input parameters	
Rated input voltage range	200-240VAC 200-240VDC
Input voltage range	180-264VAC 180-264VDC
Input votage shock	<380 V AC
Input current	<0.14A (Rated input voltage)
Input frequency	0/50/60Hz
Input PF/Input DF(typ.)	PF: 0.95,DF:0.96 , see the electrical values below for details
Input THD(typ.)	15% , see the electrical values below for details
Efficiency(typ.)	86% , see the electrical values below for details
In-rush current(typ.)	8.45A peak ,270us duration(50 % Ipeak), see the description below for details
Start/Switchover/Turn off	<0.7s(AC start),<0.7s(DC start),<0.3s(AC/DC switchover),<0.5s(Turn off)
Switching cycles	> 100,000 switching cycles
Power consumption(typ.)	Full load(Pin):26.5W, No load(Pno):N/A, On stand-by(Psb) : <0.5W, Network stand-by(Pnet) : N/A
Safety	
Withstand voltage	I/P-O/P(LED):3750V AC(LED port must be short-circuited)
Mains surge capability	L-N:2KV(90°/270°, 5 times each with an interval of 60s)(Performance criterion:A)
Leakage current(typ.)	0.45mA
Isolation resistance	I/P-O/P:100MΩ/500Vdc/25°C/70%RH
Control interface	
DALI dimming port	N/A
pushDIM dimming port	N/A
XDIM dimming port	Voltage range: XDIM-DC
Auxiliary power supply	DC12V ±5% 100mA
Dimming range	1-100%(minimum current:6mA)
Dimming drive mode	AM(amplitude modulation)
Emergency support	
Central emergency system	Supported
Self-contained emergency	Supported
Environment & Life time	
Operating temperature	Ta=-20-45°C
Case temperature	Tc=90°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	
Compliance certification	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	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 luminaire. when the driver is used with the luminaire, the EMC of the whole luminaire needs to be tested.

Technical data

Product model	BK-WAL040E-A1050AMV
Output parameters	
Regulation method	Constant Current
Rated output current range	0.6-1.05A,see the DIP-switch for details
Rated output voltage range	24-42VDC,see the DIP-switch for details
Rated output power	40W Max,see the DIP-switch for details
Output current adjustment	DIP S.W(10 levels)
Output current ripple(typ.)	±2%(65kHz)
Output current accuracy	±5%
Linear regulation	±1%
Load regulation	±3%
No load output voltage	50VDC
Flicker-free(typ.)	Flickering percent(IEEE 1789)=0.154%(100Hz), Flicker index(IEEE 1789)=0.000(100Hz), Pst LM = 0.000, SVM = 0.004, (The above parameters are obtained from testing the panel lights)
Input parameters	
Rated input voltage range	200-240VAC 200-240VDC
Input voltage range	180-264VAC 180-264VDC
Input votage shock	<380 V AC
Input current	<0.23A (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.)	12% , see the electrical values below for details
Efficiency(typ.)	88.5% , see the electrical values below for details
In-rush current(typ.)	13.87A peak ,255us duration(50 % Ipeak), see the description below for details
Start/Switchover/Turn off	<0.7s(AC start),<0.7s(DC start),<0.3s(AC/DC switchover),<0.5s(Turn off)
Switching cycles	> 100,000 switching cycles
Power consumption(typ.)	Full load(Pin):45.2W, No load(Pno):N/A, On stand-by(Psb) : <0.5W, Network stand-by(Pnet) : N/A
Safety	
Withstand voltage	I/P-O/P(LED):3750V AC(LED port must be short-circuited)
Mains surge capability	L-N:2KV(90°/270°, 5 times each with an interval of 60s)(Performance criterion:A)
Leakage current(typ.)	0.45mA
Isolation resistance	I/P-O/P:100MΩ/500Vdc/25°C/70%RH
Control interface	
DALI dimming port	N/A
pushDIM dimming port	N/A
XDIM dimming port	Voltage range: XDIM-DC
Auxiliary power supply	DC12V ±5% 100mA
Dimming range	1-100%(minimum current:10.5mA)
Dimming drive mode	AM(amplitude modulation)
Emergency support	
Central emergency system	Supported
Self-contained emergency	Supported
Environment & Life time	
Operating temperature	Ta=-20-45°C
Case temperature	Tc=90°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	
Compliance certification	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	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 luminaire. when the driver is used with the luminaire, the EMC of the whole luminaire needs to be tested.

Technical data

Product model	BK-WAL060E-A1650AMV
Output parameters	
Regulation method	Constant Current
Rated output current range	1.1-1.65A,see the DIP-switch for details
Rated output voltage range	24-42VDC,see the DIP-switch for details
Rated output power	62.7W Max,see the DIP-switch for details
Output current adjustment	DIP S.W(10 levels)
Output current ripple(typ.)	±2%(65kHz)
Output current accuracy	±5%
Linear regulation	±5%
Load regulation	±5%
No load output voltage	50VDC
Flicker-free(typ.)	Flickering percent(IEEE 1789)=0.241%(100Hz), Flicker index(IEEE 1789)=0.000(100Hz), Pst LM = 0.000, SVM = 0.003, (The above parameters are obtained from testing the panel lights)
Input parameters	
Rated input voltage range	200-240VAC 200-240VDC
Input voltage range	180-264VAC 180-264VDC
Input votage shock	<380 V AC
Input current	<0.35A (Rated input voltage)
Input frequency	0/50/60Hz
Input PF/Input DF(typ.)	PF: 0.97,DF:0.97 , see the electrical values below for details
Input THD(typ.)	7% , see the electrical values below for details
Efficiency(typ.)	89% , see the electrical values below for details
In-rush current(typ.)	25A peak ,328us duration(50 % Ipeak), see the description below for details
Start/Switchover/Turn off	<0.7s(AC start),<0.7s(DC start),<0.3s(AC/DC switchover),<0.5s(Turn off)
Switching cycles	> 100,000 switching cycles
Power consumption(typ.)	Full load(Pin):70.4W, No load(Pno):N/A, On stand-by(Psb) : <0.5W, Network stand-by(Pnet) : N/A
Safety	
Withstand voltage	I/P-O/P(LED):3750V AC(LED port must be short-circuited)
Mains surge capability	L-N:2KV(90°/270°, 5 times each with an interval of 60s)(Performance criterion:A)
Leakage current(typ.)	0.61mA
Isolation resistance	I/P-O/P:100MΩ/500Vdc/25°C/70%RH
Control interface	
DALI dimming port	N/A
pushDIM dimming port	N/A
XDIM dimming port	Voltage range: XDIM-DC
Auxiliary power supply	DC12V ±5% 100mA
Dimming range	1-100%(minimum current:16.5mA)
Dimming drive mode	AM(amplitude modulation)
Emergency support	
Central emergency system	Supported
Self-contained emergency	Supported
Environment & Life time	
Operating temperature	Ta=-20-45°C
Case temperature	Tc=90°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	
Compliance certification	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	N/A
EL	Compatible IEC 61347-2- 13 Annex J, compatible with EN 60598-2-22 and EN 50172
RF	N/A

Remarks

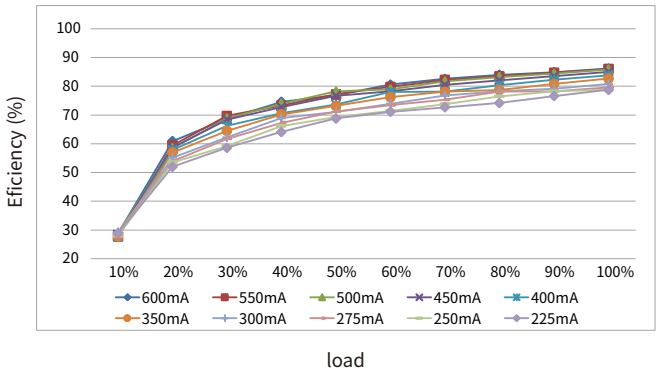
1.By default, all parameter are measured at 230VAC input, 50Hz, full load and 25°C of ambient temperature.

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

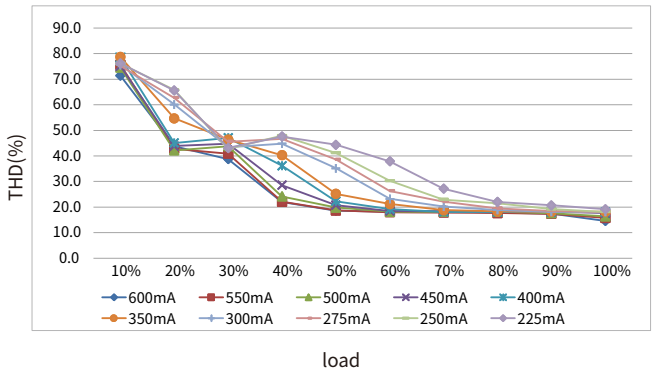
Electrical values

BK-WAL022E-A0600AMV

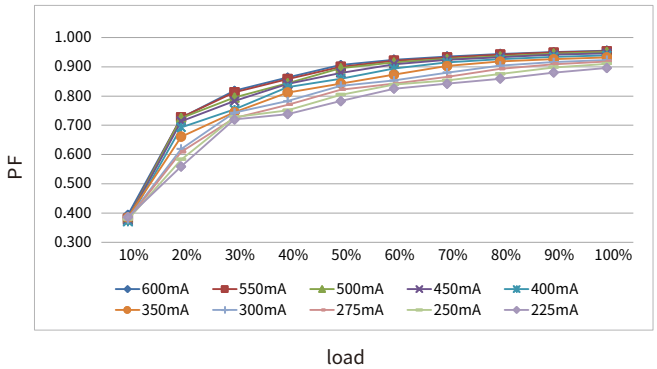
Efficiency vs load



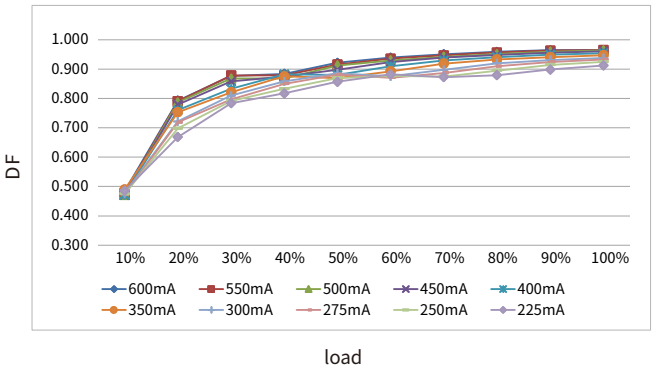
THD vs. load



Power factor vs. Voltage

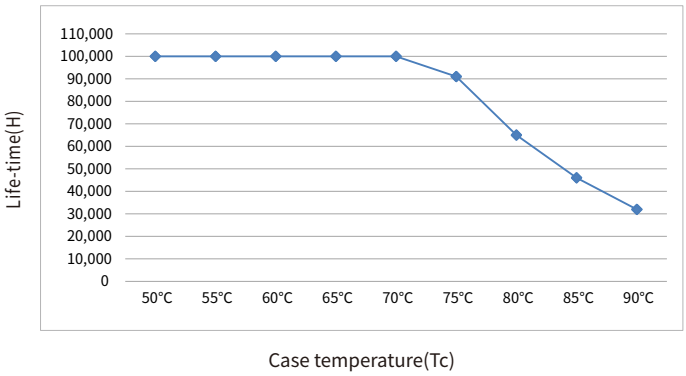


Displacement factor vs. Voltage



Expected life-time

Life-time vs. case temperature



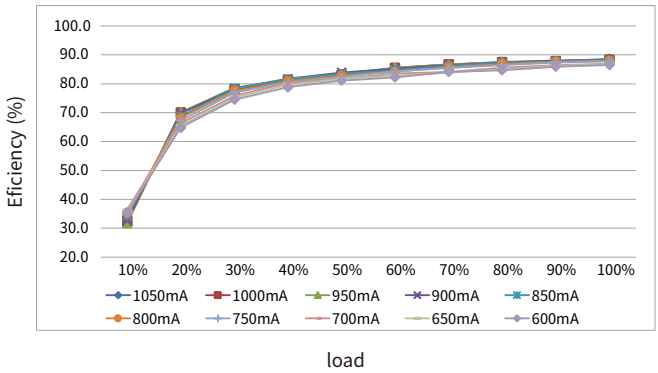
-The life-time of the LED driver is shown in the figure above (calculated based on the 90% survival rate).

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

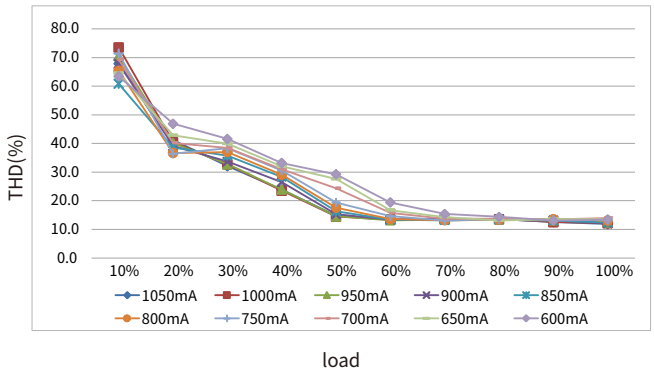
Electrical values

BK-WAL040E-A1050AMV

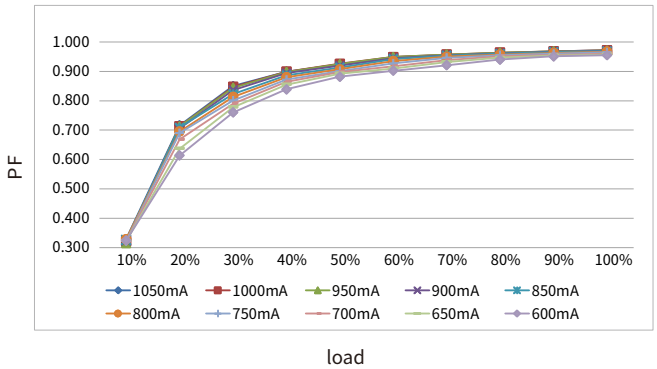
Efficiency vs load



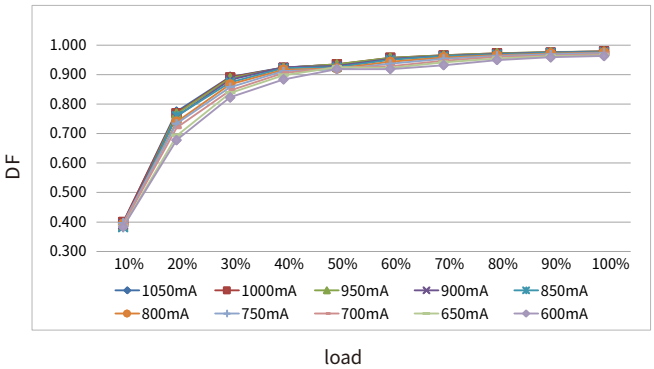
THD vs. load



Power factor vs. Voltage

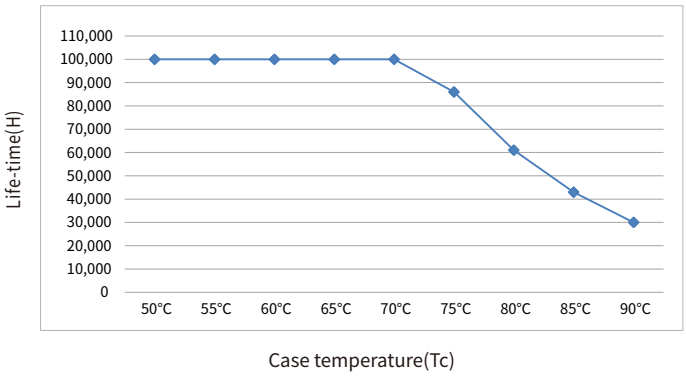


Displacement factor vs. Voltage



Expected life-time

Life-time vs. case temperature



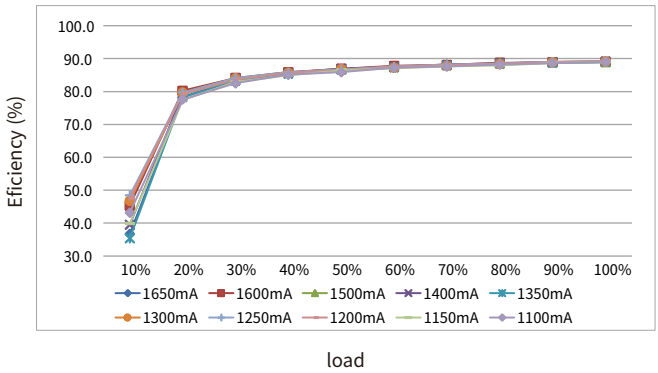
-The life-time of the LED driver is shown in the figure above (calculated based on the 90% survival rate).

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

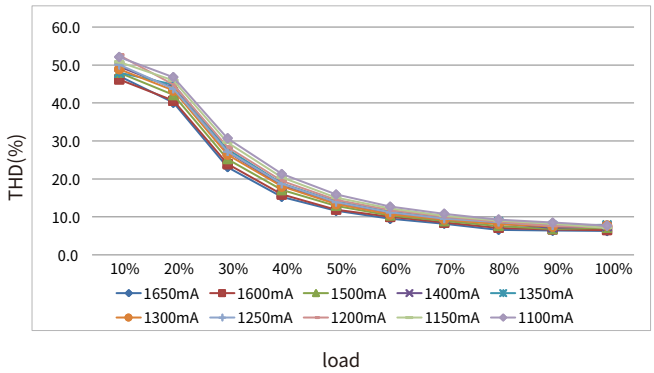
Electrical values

BK-WAL060E-A1650AMV

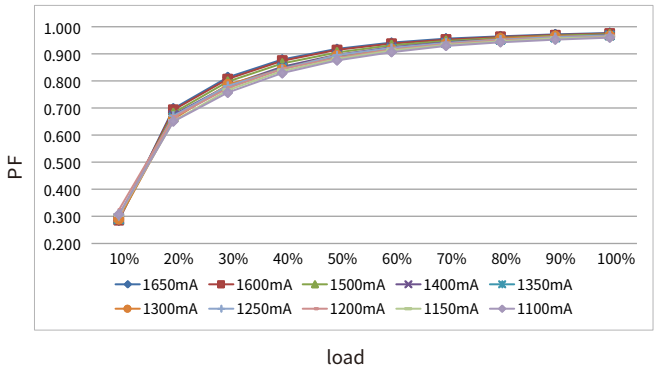
Efficiency vs load



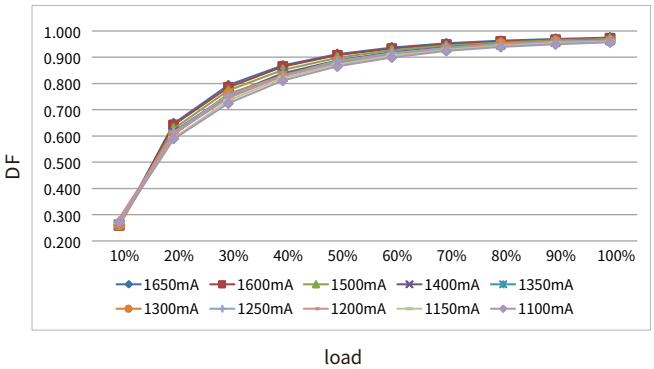
THD vs. load



Power factor vs. Voltage

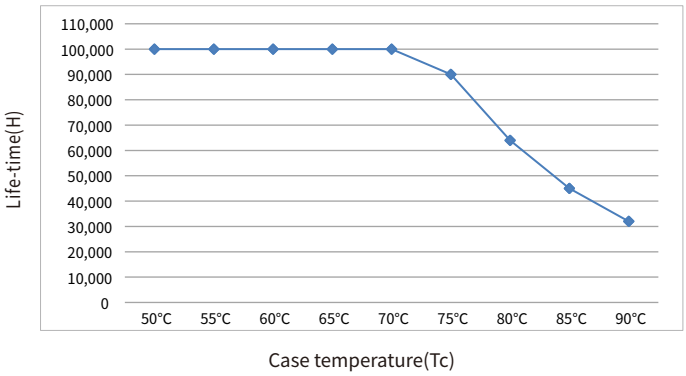


Displacement factor vs. Voltage



Expected life-time

Life-time vs. case temperature

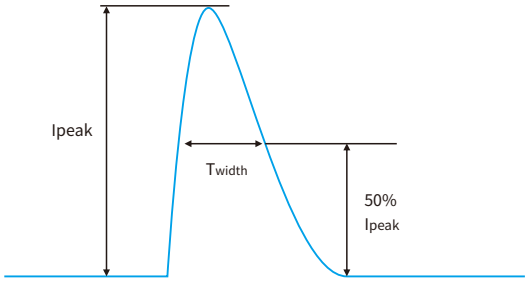


-The life-time of the LED driver is shown in the figure above (calculated based on the 90% survival rate).

- The relation of tc to ta 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-WAL022E-A	8.45A	270us	AC 230V,Full load, Cold start,Ta≤30°C, MCB is not installed side by side	30	39	48	60	75	50	65	80	99	124	67	88	108	135	168
BK-WAL040E-A	13.87A	255us		20	26	32	39	49	33	43	53	66	82	39	51	63	79	99
BK-WAL060E-A	25A	328us		8	11	13	16	20	14	18	22	27	34	25	33	41	51	63



Remarks

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

Functions

Output hot plug-in protection

- This function is used to prevent LED light that are far below the driver's no-load voltage burnout when hot plugged into a powered driver output.
- This product comes with a default hot plug protection function at the factory and cannot be turned off.

- Note:

Due to the hot plug-in protection function of the driver, the following applications may not achieve the expected effect:

1. When the output of the driver is connected to the color temperature switch:
   When the switch is used to change the color temperature, the hot plug-in protection of the driver will be triggered, and the LED will not be lit.
2. When the LED driver is used in conjunction with a self-contained (independent) emergency control device:
   Use the self-check test switch of the emergency control device to test the emergency function and when exiting the emergency mode, the driver's hot plug-in protection will be triggered and the LED will not be lit.

The above two applications should use drivers without hot plug-in protection function to achieve the expected working effect.
It is recommended to choose our company's drivers without hot plug-in protection function or those that support configurable closing of hot plug-in function.

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.

Ouput over temperature

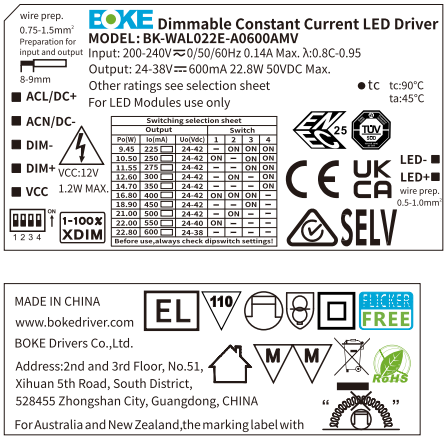
- When the operating temperature exceeds the over temperature protection point inside the power supply IC, the power supply enters protection state such as output derating,output hiccup or output shutdown. After the external temperature is normal, restart and resume operation.

Insulation between circuits

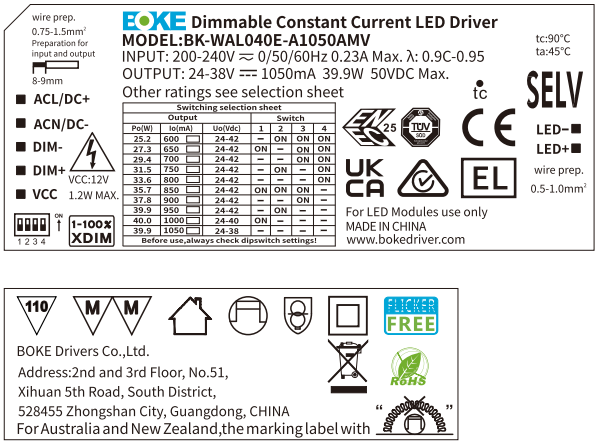
Isolation	Input	Output	Case	XDIM	VCC
Input	-	Double	Double	-	-
Output	Double	-	Basic	Double	Double
Case	Double	Basic	-	Double	Double

Label

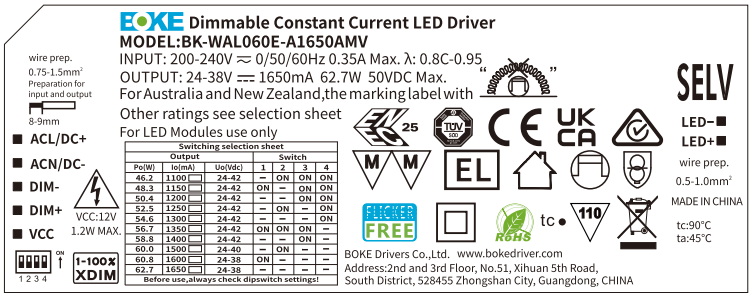
BK-WAL022E-A0600AMV



BK-WAL040E-A1050AMV



BK-WAL060E-A1650AMV



DIP-switch & output current

BK-WAL022E-A0600AMV

Output			1	2	3	4
Prated(w)	Irated(mA)	Voltage(Vdc)				
9.45	225	24-42	--	ON	ON	ON
10.50	250	24-42	ON	--	ON	ON
11.55	275	24-42	--	--	ON	ON
12.60	300	24-42	--	ON	--	ON
14.70	350	24-42	--	--	--	ON
16.80	400	24-42	ON	ON	ON	--
18.90	450	24-42	--	--	ON	--
21.00	500	24-42	--	ON	--	--
22.00	550	24-40	ON	--	--	--
22.80	600 ★	24-38	--	--	--	--

BK-WAL040E-A1050AMV

Output			1	2	3	4
Prated(w)	Irated(mA)	Voltage(Vdc)				
25.2	600	24-42	--	ON	ON	ON
27.3	650	24-42	ON	--	ON	ON
29.4	700	24-42	--	--	ON	ON
31.5	750	24-42	--	ON	--	ON
33.6	800	24-42	--	--	--	ON
35.7	850	24-42	ON	ON	ON	--
37.8	900	24-42	--	--	ON	--
39.9	950	24-42	--	ON	--	--
40.0	1000	24-40	ON	--	--	--
39.9	1050 ★	24-38	--	--	--	--

BK-WAL060E-A1650AMV

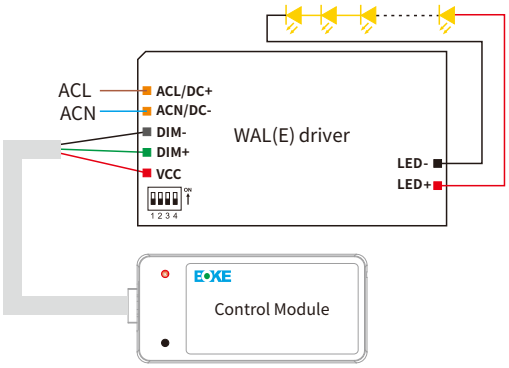
Output			1	2	3	4
Prated(w)	Irated(mA)	Voltage(Vdc)				
46.2	1100	24-42	--	ON	ON	ON
48.3	1150	24-42	ON	--	ON	ON
50.4	1200	24-42	--	--	ON	ON
52.5	1250	24-42	--	ON	--	ON
54.6	1300	24-42	--	--	--	ON
56.7	1350	24-42	ON	ON	ON	--
58.8	1400	24-42	--	--	ON	--
60.0	1500	24-40	--	ON	--	--
60.8	1600	24-38	ON	--	--	--
62.7	1650 ★	24-38	--	--	--	--

Remarks:

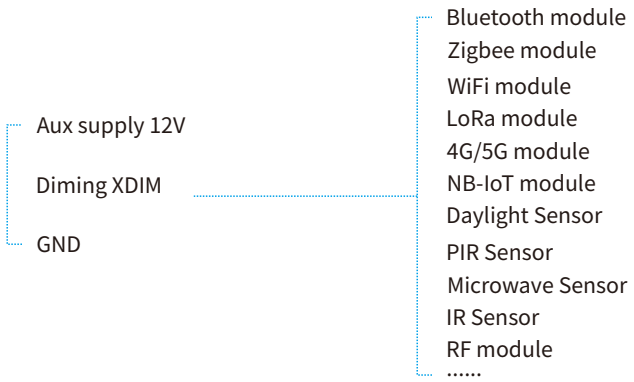
1. ★ It means that this item is the factory default current.
2. -- It means that this channel is OFF.

XDIM+12V application

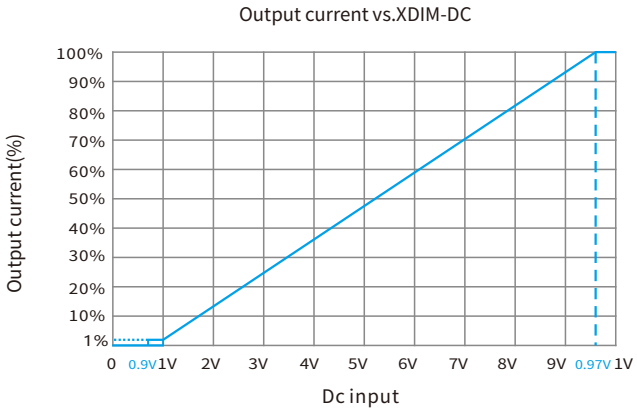
Wiring diagram



Typical applications

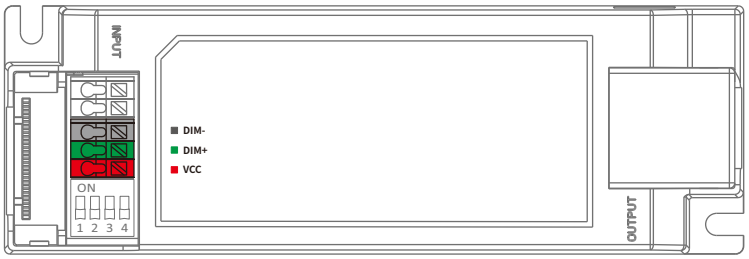


Dimming curve

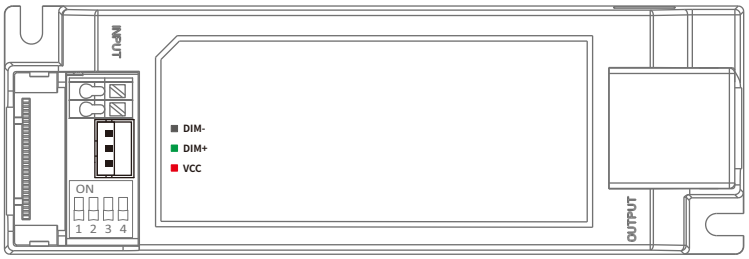


Optional dimmer terminals

Optional 1 :(Factory default)



Optional 2:

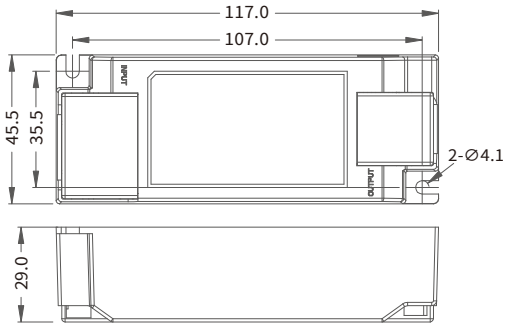


Mechanical Specification

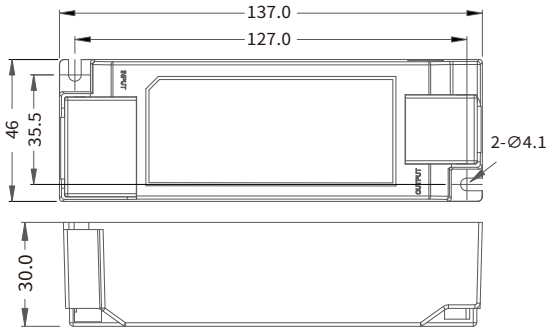
Size

Unit:mm

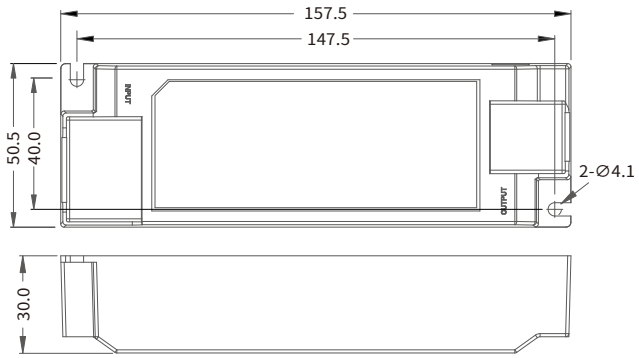
WAL022E-A



WAL040E-A



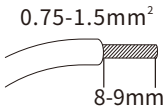
WAL060E-A



INPUT

Numbering	function	colour
1	ACL/DC+	orange
2	ACN/DC-	orange

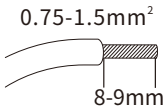
Input wire



DIMMING

Numbering	function	colour
1	DIM-	grey
2	DIM+	green
3	VCC	red

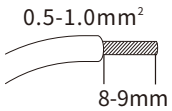
Input wire



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.
- If a LED load is connected the device has to be restarted.
- Restart can be achieved by re-powering the driver or executing a on/off command (action) through the control interface.

Installation requirements

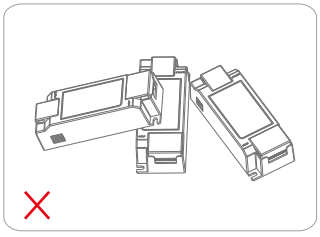
- The driver should be installed in a dry, acid-free, oil-free, fat-free environment.
- The installation ambient temperature of the driver shall not exceed the value of Ta at any time.
- The temperature of the mounting surface of the driver should be lower than the temperature of Ta.
- The driver should 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.

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 2m.
- Incorrect wiring can damage LED modules.

Replace LED module

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



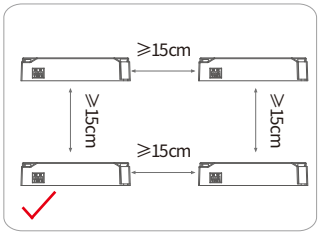


Figure 1

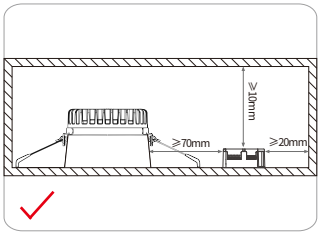
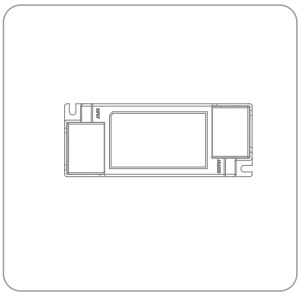


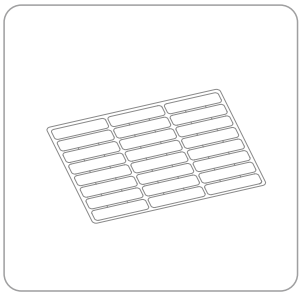
Figure 2

Packaging(Excluding accessories)

Optional 1: factory default



Product

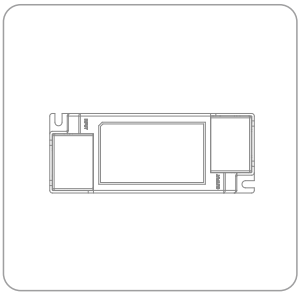


Blister

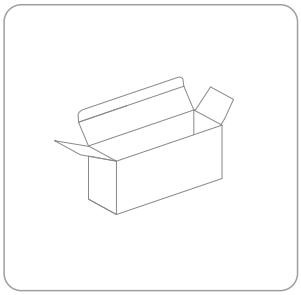
24pcs×3layer=72pcs/CTN
18pcs×3layer=54pcs/CTN

Model	Product size	Weight	Blister size	Carton size	Qty/carton	N.W	G.W
WAL022E-A	L117*W45.5*H29mm	100g	L430*W340*H47mm	L450*W350*H180mm	72pcs	7.20KG	8.51KG
WAL040E-A	L137*W46*H30mm	134g	L430*W340*H48mm	L450*W350*H180mm	54pcs	7.24KG	8.55KG
WAL060E-A	L157.5*W50.5*H30mm	192g	L430*W340*H48mm	L450*W350*H180mm	54pcs	10.4KG	11.7KG

Optional 2:



Product



Packaging

60pcs×1layer=60pcs/CTN
14pcs×4layer=60pcs/CTN
18pcs×3layer=54pcs/CTN

Model	Product size	Weight	Packaging size	Carton size	Qty/carton	N.W	G.W
WAL022E-A	L117*W45.5*H29mm	100g	L140*W35*H50mm	L345*W310*H170mm	54pcs	5.40KG	6.73KG
WAL040E-A	L137*W46*H30mm	134g	L169*W42*H55mm	L450*W350*H180mm	60pcs	8.04KG	9.33KG
WAL060E-A	L157.5*W50.5*H30mm	192g	L178*W59*H50mm	L440*W375*H222mm	56pcs	10.8KG	12.4KG

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.