

# LEDGEAR® Specification

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## GENERAL GUIDELINES

Besides the 1-10V and ON/OFF, the LEDGEAR® C4 and C5 housing also provide Phase-cut dimming for option. They are independent control gear with clip-on strain-relief cap, and output current selectable for quick installation and fewer inventories.

These LED drivers provide constant current with low flicker, it is suitable for LED modules, input voltage 220-240Vac, output 30-40Vdc@160-1000mA, can be used as 6W-45W LED module driving engine.

3pcs DIP switches equipped allows you to adjust the constant output current to work with different power LED modules. It helps to reduce the inventory and faster to projects. The push-fit terminals(2x2.5mm<sup>2</sup> Max.) help to reduce the installation time strain relief mechanical structure. DC cable is not included in the standard product ask the sales before order!



## LED Electronic Control Gear

Phase-cut Dimmable Constant Current Output

With 30-40VDC 160mA-1000mA Adjustable Output Series



### Product description

- Leading and trailing edge dimmable LED constant current independent driver
- Output current selectable between 160-350mA(Preselected 160mA); 400-700mA(Preselected 400mA); and 700-1000mA(Preselected 160mA) to work with different power LED modules
- $\pm 5\%$  output current accuracy(under maximum load)
- 90°C Maximum case operation temperature(tc-point <sup>1</sup>)
- Pending certification: ENEC, CE, CB by TUV SUD, SAA, Ctick
- Reliable, Class II, SELV output according EN 61347
- Permissible AC cable 0.75-2.5mm<sup>2</sup> wire gauge, 3.5~10mm PVC jacket diameter
- Grow wire tested 650° for 30S and 850° for 5S
- Operating temperature <sup>1</sup>: -25°C ~ +50°C, the humidity: 20% ~ 85%
- Over 50,000 hrs nominal lifespan at tc=60°C
- Protection for output open load, short circuits, over voltage and over temperature
- Five-year factory guarantee and lifetime technical support <sup>1</sup>

<sup>1</sup> Detailed data please refer to the "Specification" table .

### Features & Benefits

#### Flexibility & Optimized Inventory

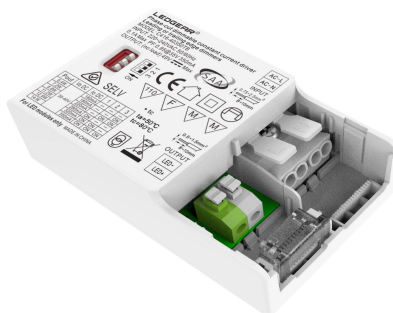
- Three models covers wattages from 6W to 45W
- Wattage selectable by 3xDIP switches.
- Push-fit secondary terminals for LED module wires

#### Human Centric Design

- Easy & Quick connection with push-fit terminals and clip-on end cap for strain relief
- Large wiring space
- Loop in and loop out function, max.2.5mm<sup>2</sup> cross section L, L, N, N stranded wire or solid wire
- Loose wiring inspection don't need to open the transparent end cap

### Housing Properties

- Casing: polycarbonate, white housing but transparent end cap
- Type of protection IP20



### Typical applications

- For spot light and downlight in retail and hospitality applications
- For panel light and area light in office and education application

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## PARAMETERS

MODEL		C416-40350TB	C532-40700TB	C545-401000TB
Output	DC voltage range	30-40V	30-40V	30-40V(Iout<1000mA) 30-40V(Iout=1000mA)
	Rated current	160-350mA (selectable, preselected 160mA)	400-700mA (selectable, preselected 400mA)	700-1000mA (selectable, preselected 700mA)
	Maximum power	14W	28W	38W
	Current tolerance	±5%	±5%	±5%
	Ripple voltage <sup>2</sup>	1.05Vp-p	1.85Vp-p	2.4Vp-p
	Ripple current	110mA p-p	300mA p-p	450mA p-p
	Line regulation	±3%	±5%	±4%
	Load regulation	±5%	±8%	±8%
	Flicker percentage <sup>3</sup>	<12%	<18%	<20%
	Starting time	<500mS	<500mS	<500mS
	Turn off time	<1.0S	<1.0S	<1.0S
	Noise <sup>4</sup>	<22dB	<22dB	<22dB
Input	Voltage	Rated:220-240Vac; Range:198-264Vac;		
	Frequency	Rated:50-60Hz; Range:47-63Hz;		
	Power factor	≥0.9; (Rated voltage input, rated max. current output conditions)		
	I-THD <sup>5</sup>	≤20%	≤15%	≤18%
	Efficiency <sup>6</sup>	≥80%	≥85%	≥87%
	AC current	100mA max.	180mA max.	230mA max.
	Inrush current <sup>7</sup>	1.5A	3A	4A
	Inrush current time	50uS	50uS	60uS
	Leakage current	<1mA	<1mA	<1mA
ON/OFF switches cycle	>100,000	>100,000	>100,000	
Protection	Over current	Constant current limiting, recovers automatically after fault condition is removed		
	Over voltage	Shut down output voltage, with auto-recovery or re-power on to recovery		
	Over temperature	Shut down output voltage, recovers automatically after temperature goes down		
	Short circuit	Constant current limiting, recovers automatically after fault condition is removed		
Safety & EMC	Safety standards	EN61347-2-13; Design refer to TUV EN60950-1, TUV EN61347-1		
	Withstand voltage	I/P-O/P:3KVac	I/P-FG:1.5KVac	O/P-FG: 500Vdc
	Isolation resistance	I/P-O/P, I/P-FG, O/P-FG:100M Ohms/500Vdc/25°C/75%RH		
	EMC emission <sup>8</sup>	EN55015B, EN55022 Class B, EN61000-3-2, EN61000-3-3		
	EMC immunity	EN61000-4-2, EN61547, EN55024, EN-61000-4-5 Surge immunity Line-Earth: 2KV, L Line- N Line:1KV (≥25W); Line-Earth:1KV, L Line- N Line:0.5KV(<25W)		
Environment	Ambient temperature range <sup>9</sup>	-25°C ~ +50°C	-25°C ~ +50°C	-25°C ~ +45°C
	Max. case temperature(tc) <sup>10</sup>	80°C	80°C	85°C
	Relative humidity range	20% ~ 85%RH	20% ~ 85%RH	20% ~ 85%RH
	Storage temperature range	-40°C ~ +80°C	-40°C ~ +80°C	-40°C ~ +80°C
Connection	AC Connector	Looping Push-fit Terminals L, L, N, N; 0.75-2.5 mm <sup>2</sup> cross-section Looping Push-fit Terminals L, L, N, N; 0.75-2.5 mm <sup>2</sup> cross-section		
	DC Connector	On request		
	Output wire(type, length)	On request		

## LED Electronic Control Gear

Phase-cut Dimmable Constant Current Output

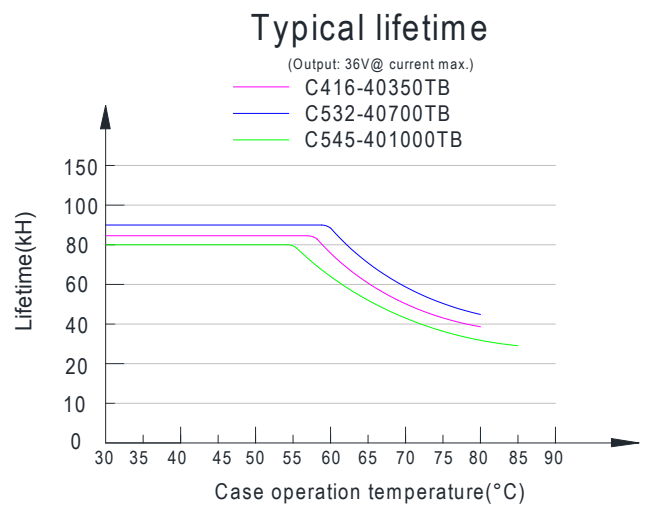
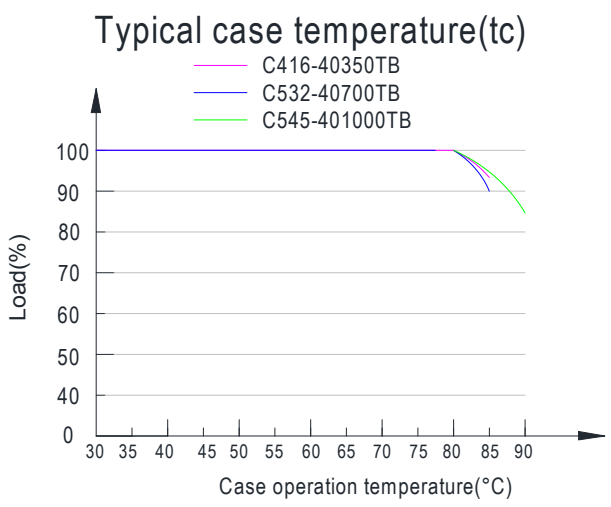
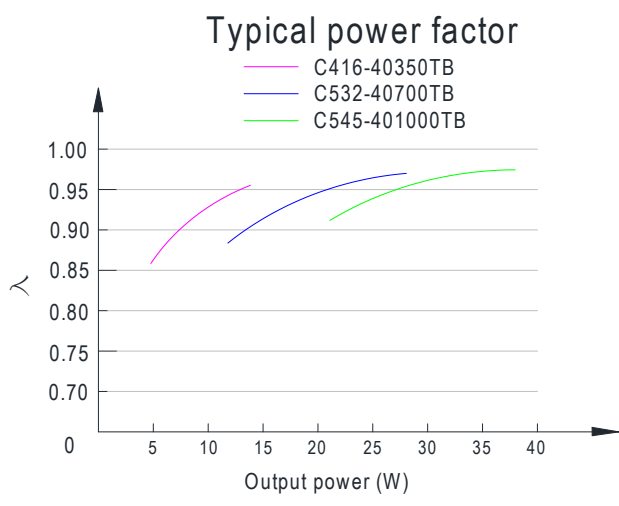
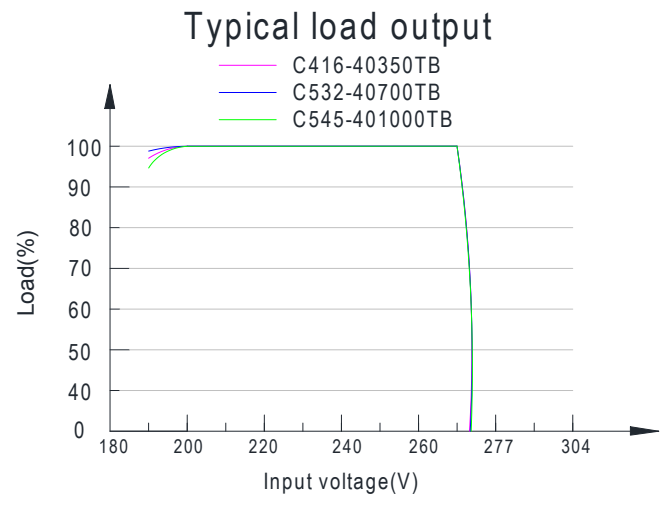
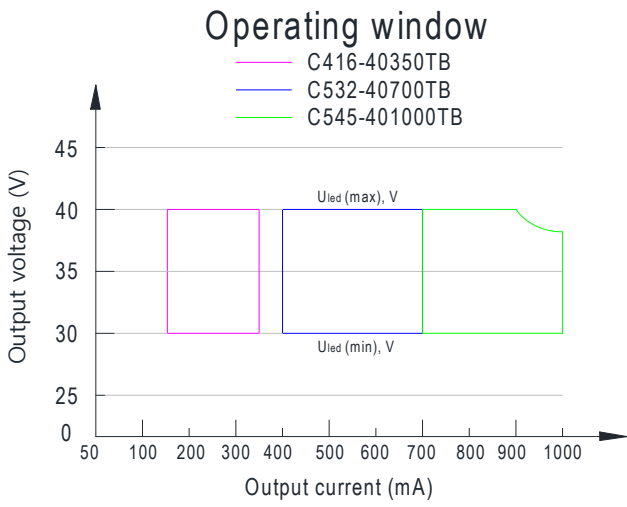
With 30-40VDC 160mA-1000mA Adjustable Output Series



Max. No. of PSUS(Driver supply unit) on miniature circuit breaker(MCB)	MCB TYPE A	10A	60pcs @ full load	34pcs @ full load	27pcs @ full load
		16A	96pcs @ full load	54pcs @ full load	42pcs @ full load
		20A	120pcs @ full load	67pcs @ full load	52pcs @ full load
	MCB TYPE B	10A	65pcs @ full load	36pcs @ full load	28pcs @ full load
		16A	104pcs @ full load	58pcs @ full load	45pcs @ full load
		20A	130pcs @ full load	73pcs @ full load	56pcs @ full load
	MCB TYPE C	10A	75pcs @ full load	42pcs @ full load	33pcs @ full load
		16A	120pcs @ full load	67pcs @ full load	52pcs @ full load
		20A	150pcs @ full load	84pcs @ full load	65pcs @ full load
Others	Dimming control mode		Phase-cut Dimmable	Phase-cut Dimmable	Phase-cut Dimmable
	Lifetime(hrs)@tc=60°C		> 60,000H	> 60,000H	> 50,000H
	MTBF [MIL-HDBK-217F(ta=25°C)]		257.3K Hrs min	289.8K Hrs min	206K Hrs min
	Glow wire test		850°C for 5S; 650°C for 30S	850°C for 5S; 650°C for 30S	850°C for 5S; 650°C for 30S
	Dimension L x W x H		86 x 52 x 30mm	115 x 52 x 30mm	115 x 52 x 30mm
	Warranty years		5 years	5 years	5 years
(*If demand other output voltage and output current, contact your sales consultant or contact us: <a href="http://www.kinglumi.com">www.kinglumi.com</a> )					

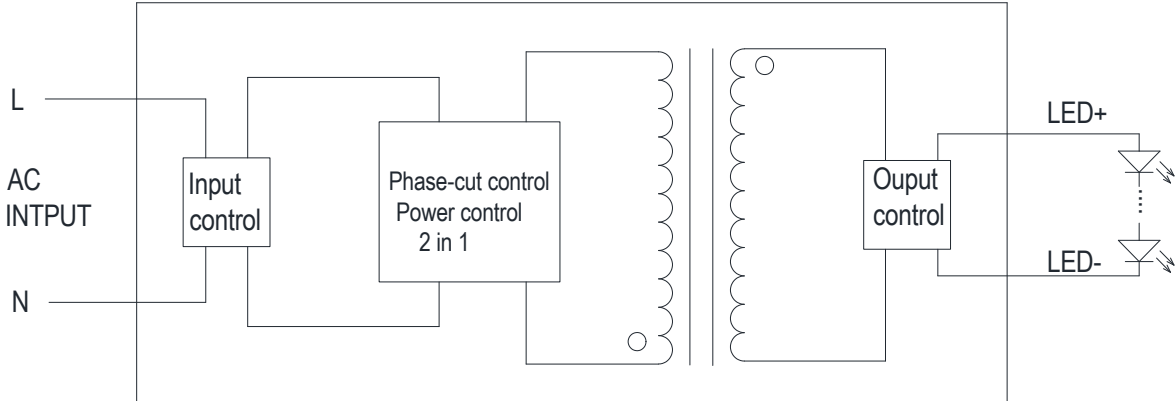
- “2” Ripple voltage is measured at 20MHz of bandwidth by using a 12” twisted pair-wire terminated with a 100nF & 47uF parallel capacitor.
- “3” The flicker for frequencies of 200 Hz or below, input voltage 230Vac , at 100% output current level and 20% output current level with dimmer attached, output current ripple is defined as  $[(I_{max} - I_{min}) / (I_{max} + I_{min})] * 100\%$ , (CEC-400-2016-018-FS, Title 24 part 6 JA8).
- “4” The noise of LED driver is defined as test data when driver tested in noise room with 50~60dB environment, and been hang in 1ft (305mm) inside chamber.
- “5” Rated voltage input, rated output current, maximum output current.
- “6” The typical efficiency is test data of output current at input @230Vac with 36V output voltage, maximum output current.
- “7” The inrush current. is test data of 230Vac input, cold start, measured at input current peak.
- “8” The driver is considered as a component that will be operated in combination with final equipment. Since EMC performance will be affected by the complete installation, the final equipment manufacturers must re-qualify EMC directive on the complete installation again.
- “9” For other than independent use, higher ta of the control gear possible as long as highest allowed tc point temperature is not exceeded.
- “10” The tc is defined as the highest permissible temperature which may occur on the outer surface of the power under normal operating conditions and at the rated voltage/current/power or the maximum of the rated voltage/current/power range, refer to “output power vs temperature” section.

## DRIVER PERFORMANCE CURVE



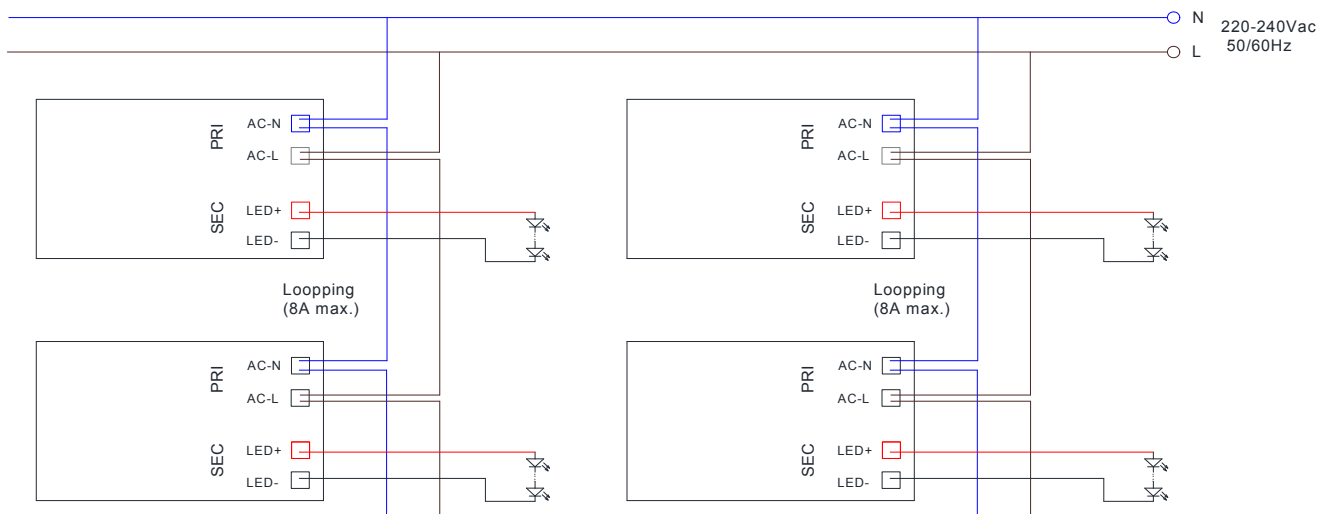
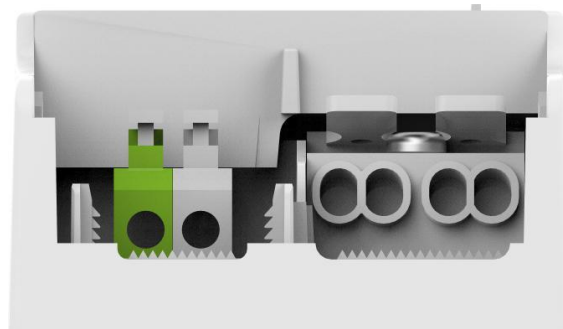
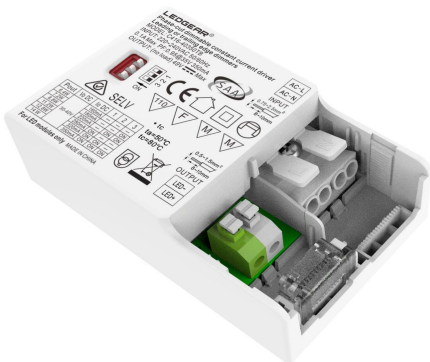
## DIAGRAM&INSTALLATION MANUAL

### Isolated circuit (Fly-back)



### Looping Circuit diagram

These LEDGEAR® drivers provides "through wiring functions" at primary for the L and N input, which allows quick looping from driver to driver and save the installation labour.



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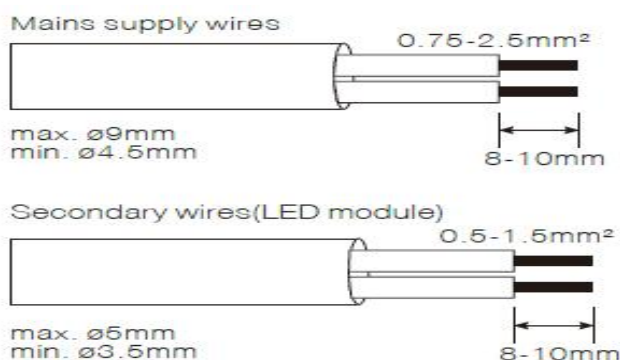
### DIP Switch Table

LEDGEAR® Driver is a multiple-stage constant current driver, selection of output current through DIP switch is exhibited below:

 C416-40350TB				 C532-40700TB				 C545-401000TB			
DIP S.W. Iout	1	2	3	DIP S.W. Iout	1	2	3	DIP S.W. Iout	1	2	3
160mA	-	-	-	400mA	-	-	-	700mA	-	-	-
180mA	-	-	ON	500mA	ON	-	-	800mA	ON	-	-
220mA	-	ON	ON	600mA	-	ON	-	900mA	-	ON	-
280mA	ON	-	-	700mA	ON	ON	-	1000mA	ON	ON	-
320mA	ON	ON	-								
350mA	ON	ON	ON								

### Wiring type and cross section

The wiring can be in stranded wires with ferrules or solid with a cross section of 0.75–2.5 mm<sup>2</sup>. Strip 8-10mm of insulation from the cables to ensure perfect operation of the push-wire terminals. Use one wire for each terminal connector only



### Wiring guidelines

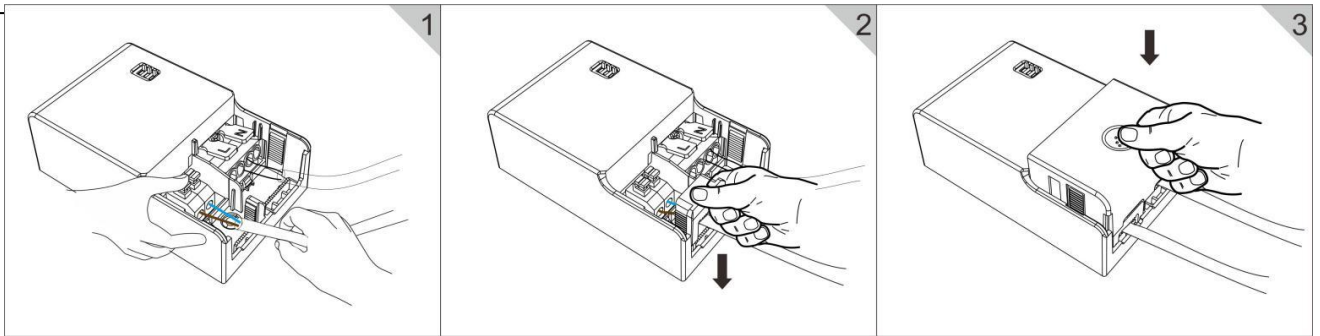
- All connections must be kept as short as possible to ensure good EMI behavior.
- Mains leads should be kept apart from LED Driver and other leads (ideally 10 – 30 cm distance).
- Secondary switching is not permitted.
- Incorrect wiring can damage LED modules.
- The wiring must be protected against short circuits to earth (sharp edged metal parts, metal cable clips, louver, etc.)



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### Release of the wiring

Press down the “push button” and remove the cable from front.

### Miniature circuit breaker application

Total continuous current of the drivers and installation environment must always be considered and taken into calculations when installing drivers behind miniature circuit breaker(MCB).

Quantity of drivers per miniature circuit breaker 16 A Type C

Based on inrush current $I_{peak}$	Typ. peak inrush current $I_{peak}$	1/2 value time, $\Delta t$	Calculated energy, $I_{peak}^2 \Delta t$
120pcs	1.5A	125 $\mu$ S	0.0029A <sup>2</sup> s
		<p><b>Example</b> calculation of total drivers amount limited by continuous current: <math>n(I_{cont}) = (16 \text{ A} (I_{nom, ta}) / \text{“nominal mains current with full load”}) \times 0.75</math>. This calculation is an example according to recommended precautions due to multiple adjacent circuit breakers (&gt; 9 MCBs) and installation environment (<math>t_a=30^\circ\text{C}</math>); variables may vary according to the use case. Both inrush current and continuous current calculations are based on "Schneider Acti9" series circuit breakers. More specific information in "Schneider Acti9" series circuit breaker documentation.</p>	

NOTE ! Type B or C MCB's are strongly recommended to use with the LED driver.

### Fixing conditions

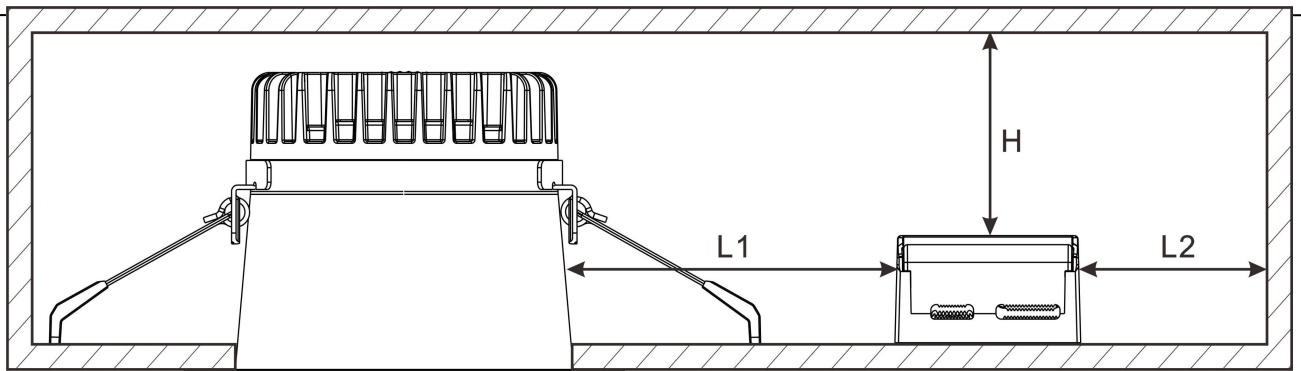
Dry, acid-free, oil-free, fat-free. It is not allowed to exceed the maximum ambient temperature ( $t_a$ ) stated on the device. Minimum distances stated below are recommendations and depend on the actual luminaire. Is not suitable for fixing in corner.



## LED Electronic Control Gear

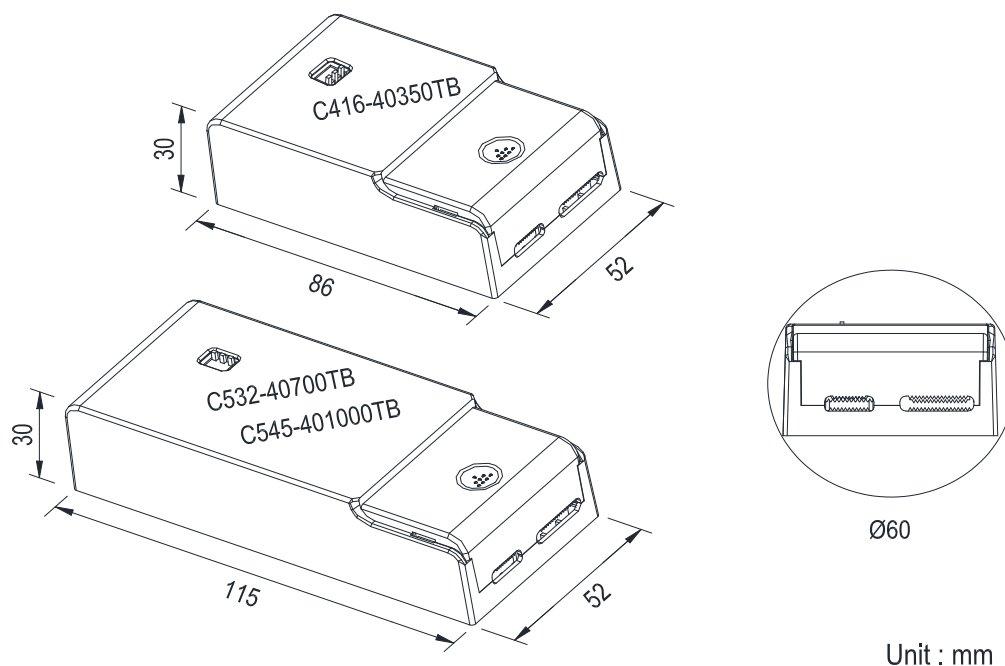
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Model	Size	L1(min.)	L2(min.)	H(min.)
C416-40350TB		70mm	20mm	20mm
C532-40700TB		70mm	20mm	20mm
C545-401000TB		120mm	20mm	30mm

## MECHANICAL



## PACKAGING

Part Number	Dimension	Gross Weight	Net Weight	Qty/Carton
C416-40350TB	300 x 190 x 215mm	8.5kg	7.3kg	50pcs
C528-40700TB	300 x 265 x 265mm	10.5kg	8.8kg	50pcs
C545-401000TB	300 x 265 x 265mm	10.5kg	8.8kg	50pcs

\* This is typical value. Due to the driver is potted with silicon, which the potting weight is uncertainly, so the consistency of product weight can't be guaranteed. Expected  $\pm 6\%$  weight deviation.

## ACCESSORIES

### Extension Cable



Order Code	One End	Another End	Length(mm)	Color
1.05.06.0412	DC5521 Female with lock	DC5521 Male with lock	500	Black
1.05.06.0413	DC5521 Female with lock	DC5521 Male with lock	500	White
1.05.06.0414	DC5521 Female with lock	DC5521 Male with lock	1000	Black
1.05.06.0415	DC5521 Female with lock	DC5521 Male with lock	1000	White

### # Ways Splitter



Order Code	One End	Another End	Length(mm)	Color
1.05.06.0417	DC5521 Male with lock	2way DC5521 Male with lock	575	White
1.05.06.0418	DC5521 Male with lock	3way DC5521 Male with lock	575	White
1.05.06.0406	DC5521 Male with lock	4way DC5521 Male with lock	100	White

### Cable Adapters Convert



Order Code	One End	Another End	Length(mm)	Color
1.05.06.0303	DC5521 Male with lock	FL4.14 Male	30	Black

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1.05.06.0416	DC5521 Male with lock	FL4.14 Male	30	White
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### Strip DC 5521 Female Connector



Order Code	One End	Another End	Length(mm)	Color
1.05.06.0420	Strip 8mm of cord, and 30mm of the cables jacket	DC5521 Female with lock	225	Black
1.05.06.0419	Strip 8mm of cord, and 30mm of the cables jacket	DC5521 Female with lock	225	White



VERSION #

#	MODIFICATIONS	Date.
1	Version 1	2020.04.14
2		
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