MEAN WELL

75W Single Output Switching Power Supply

ELG-75 series

(for DA-Type only) SELV IP65 IP67 Type HL

Features

- 180~295VAC input range
- Built-in active PFC function
- No load power consumption <0.5W
- High efficiency up to 90%
- Fanless design, cooling by free air convection
- IP67 / IP65 design for indoor or outdoor installations
- Output current adjustable through output cable or internal potentiometer
- Built-in 3 in 1 dimming function for B-Type (0~10Vdc or 10V PWM signal or resistance)
- Protections: Short circuit / Over current / Over voltage / Over temperature
- Class 2 power unit
- Suitable for dry / damp / wet locations
- Type “HL” for use in class Ⅰ, Division 2 hazardous(Classified) location luminaires
- Typical lifetime>50000 hours
- 5 years warranty(Note.10)

Applications

- LED street lighting
- LED architectural lighting
- LED bay lighting
- LED floodlighting
- Class Ⅰ, Division 2 hazardous (Classified) location luminaires

Description

ELG-75 series is a 75W LED AC/DC power supply featuring the dual operating modes, constant current mode output and constant voltage mode output. Thanks to the high efficiency up to 90%, with the fanless design, the entire series is able to operate for -40℃~+85℃ case temperature under free air convection. The design of metal housing and IP67/IP65 ingress protection level allows this series to fit both indoor and outdoor applications. ELG-75 is equipped with various function options, such as dimming methodologies, so as to provide the optimal design flexibility for lighting system.

Model Encoding

ELG - 75 - 24 A

- A → Function mode option
- 24 → Output voltage
- 75 → Output wattage
- ELG → Series name

Function mode option:
- Blank : Standard model, IP67, constant current and constant voltage levels fixed
- A : Standard model, IP65, constant current and constant voltage levels adjustable through internal potentiometer
- B : Standard model, IP67, constant current level adjustable with additive 0~10Vdc, 10V PWM signal or resistance

MEAN WELL

75W Single Output Switching Power Supply ELG-75 series

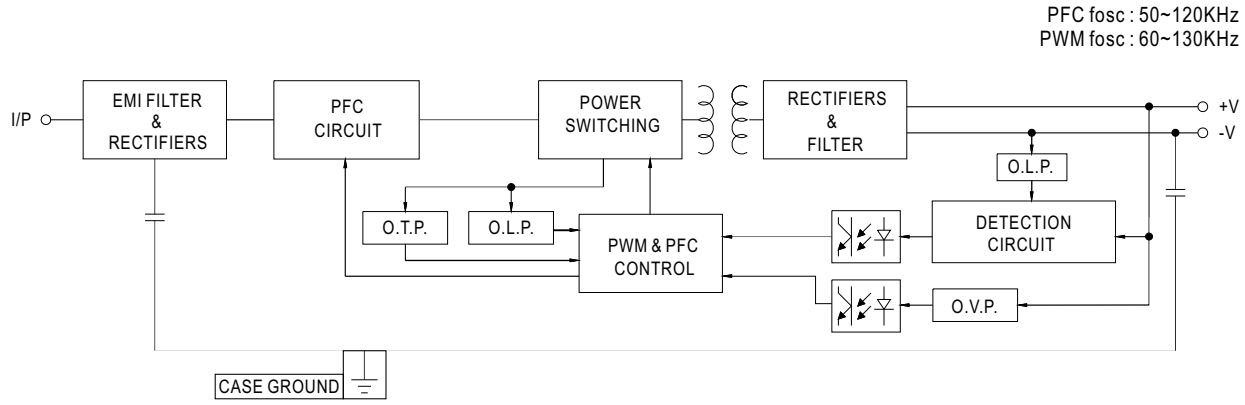
SPECIFICATION

MODEL		ELG-75-12 □	ELG-75-24 □	ELG-75-36 □	ELG-75-42 □	ELG-75-48 □
OUTPUT	DC VOLTAGE	12V	24V	36V	42V	48V
	CONSTANT CURRENT REGION Note.4	6 ~ 12V	12 ~ 24V	18 ~ 36V	21 ~ 42V	24 ~ 48V
	RATED CURRENT	5A	3.15A	2.1A	1.8A	1.6A
	RATED POWER	60W	75.6W	75.6W	75.6W	76.8W
	RIPPLE & NOISE (max.) Note.2	150mVp-p	200mVp-p	250mVp-p	250mVp-p	250mVp-p
	VOLTAGE ADJ. RANGE	Can be adjusted by internal potentiometer (for A-Type only)				
		10.8 ~ 13.2V	21.6 ~ 26.4V	32.4 ~ 39.6V	37.8 ~ 46.2V	43.2 ~ 52.8V
	CURRENT ADJ. RANGE	Can be adjusted by internal potentiometer (for A-Type only)				
		2.5 ~ 5A	1.57 ~ 3.15A	1.05 ~ 2.1A	0.9 ~ 1.8A	0.8 ~ 1.6A
	VOLTAGE TOLERANCE Note.3	±3.0%	±3.0%	±2.5%	±2.5%	±2.0%
	LINE REGULATION	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	LOAD REGULATION	±2.0%	±1.0%	±1.0%	±0.5%	±0.5%
	SETUP, RISE TIME Note.6	500ms, 100ms at 95% load 230VAC				
	HOLD UP TIME (Typ.)	10ms at 95% load 230VAC				
INPUT	VOLTAGE RANGE Note.5	180 ~ 295VAC 254 ~ 417VDC				
	FREQUENCY RANGE	47 ~ 63Hz				
	POWER FACTOR	PF≧0.95/230VAC PF≧0.92/277VAC at full load (Please refer to "Power Factor Characteristic Curve")				
	TOTAL HARMONIC DISTORTION	THD< 20% when output loading≧50% at 230VAC input and output loading≧75% at 277VAC input				
	EFFICIENCY (Typ.)	85%	88%	89%	90%	90%
	AC CURRENT	0.45A / 230VAC 0.38A/277VAC				
	INRUSH CURRENT(Typ.)	COLD START 50A(twidth=350μs measured at 50% Ipeak) at 230VAC				
	MAX. No. of PSUs on 16A CIRCUIT BREAKER	5 units (circuit breaker of type B) / 8 units (circuit breaker of type C) at 230VAC				
	LEAKAGE CURRENT	<0.75mA / 277VAC				
PROTECTION	OVER CURRENT	95 ~ 108%				
		Protection type : Constant current limiting, recovers automatically after fault condition is removed				
	SHORT CIRCUIT	Hiccup mode, recovers automatically after fault condition is removed				
	OVER VOLTAGE	14 ~ 18V	28 ~ 34V	41 ~ 48V	47 ~ 54V	54 ~ 62V
		Protection type : Shut down o/p voltage, re-power on to recovery				
	OVER TEMPERATURE	Shut down o/p voltage, re-power on to recovery				
ENVIRONMENT	WORKING TEMP.	Tcase=-40 ~ +85℃ (Refer to "Derating Curve")				
	MAX. CASE TEMP.	Tcase=+85℃				
	WORKING HUMIDITY	20 ~ 95% RH non-condensing				
	STORAGE TEMP., HUMIDITY	-40 ~ +80℃, 10 ~ 95% RH				
	TEMP. COEFFICIENT	±0.03%/℃ (0 ~ 50℃)				
	VIBRATION	10 ~ 500Hz, 5G 12min./1cycle, period for 72min. each along X, Y, Z axes				
SAFETY & EMC	SAFETY STANDARDS	UL8750(type"HL"), ENEC EN61347-1, EN61347-2-13 independent, EN62384, IP65 or IP67 approved				
	WITHSTAND VOLTAGE	I/P-O/P:3.75KVAC I/P-FG:2.0KVAC O/P-FG:1.5KVAC				
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25℃/ 70% RH				
	EMC EMISSION	Compliance to EN55015,EN61000-3-2 Class C (≧50% load) ; EN61000-3-3				
	EMC IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11; EN61547, light industry level (surge 6KV)				
OTHERS	MTBF	331Khrs min. MIL-HDBK-217F (25℃)				
	DIMENSION	180*63*35.5mm (L*W*H)				
	PACKING	0.7Kg;16pcs/12.2Kg/0.67CUFT				

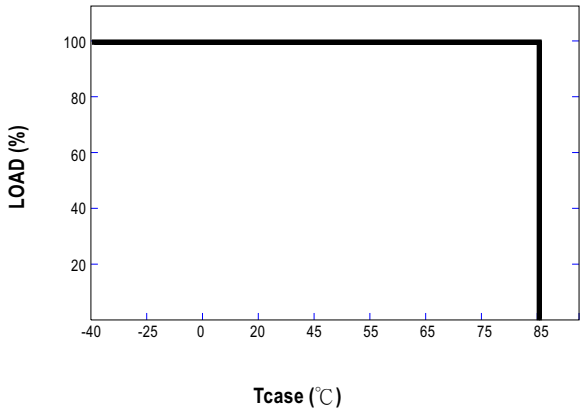
NOTE

1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature.
2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.
3. Tolerance : includes set up tolerance, line regulation and load regulation.
4. Please refer to "DRIVING METHODS OF LED MODULE".
5. Derating may be needed under low input voltages. Please check the static characteristics for more details.
6. Length of set up time is measured at cold first start. Turning ON/OFF the power supply may lead to increase of the set up time.
7. The power supply 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.
8. The model certified for CCC(GB19510.14, GB19510.1, GB17743 and GB17625.1) is an optional model . Please contact MEAN WELL for details.
9. This series meets the typical life expectancy of >50,000 hours of operation when Tcase, particularly (tc) point (or TMP, per DLC), is about 70℃ or less.
10. Please refer to the warranty statement on MEAN WELL's website at http://www.meanwell.com

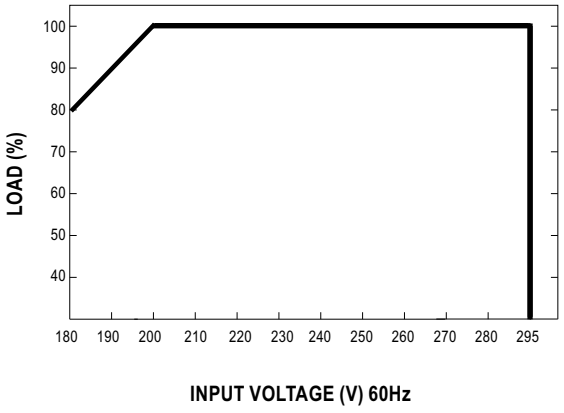
■ Block Diagram



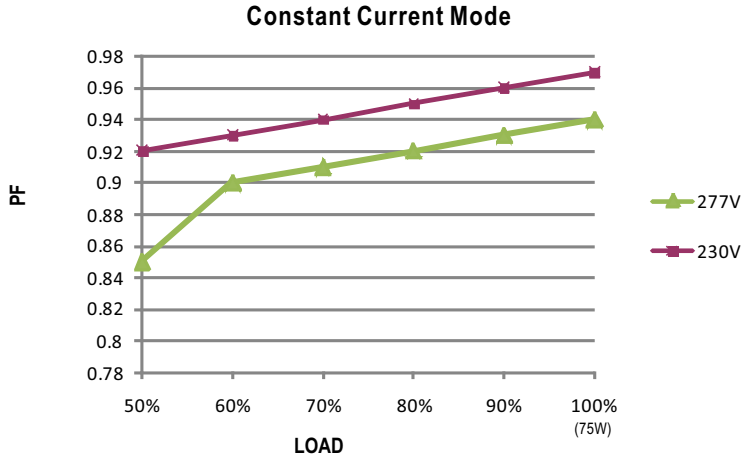
■ Derating Curve



■ Static Characteristics

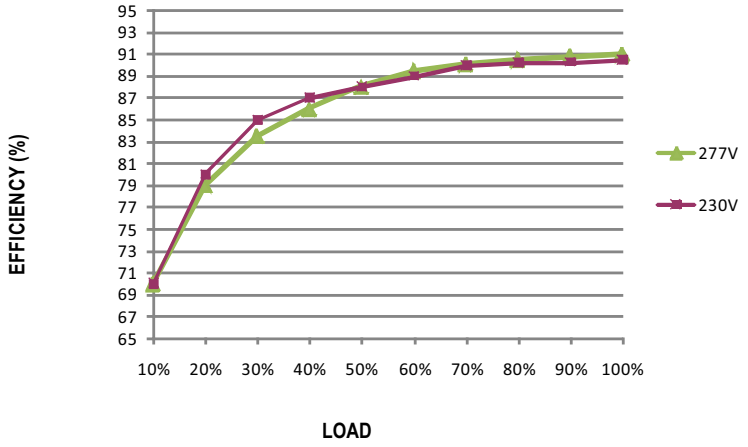


■ Power Factor Characteristic



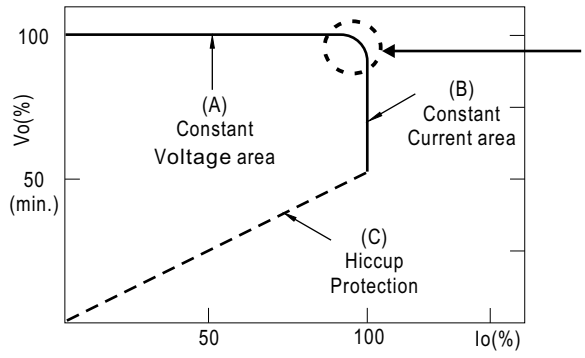
■ EFFICIENCY vs LOAD (48V Model)

ELG-75 series possess superior working efficiency that up to 90% can be reached in field applications.



■ DRIVING METHODS OF LED MODULE

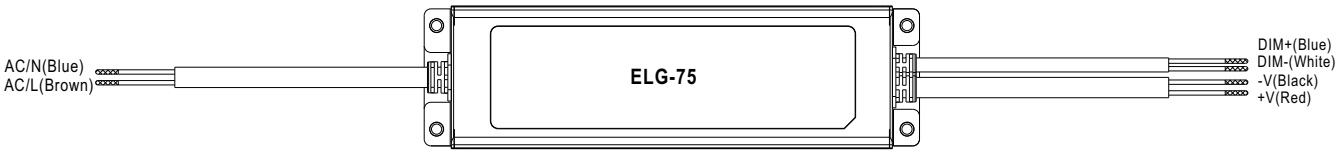
There are two major kinds of LED drive method, "direct drive" and "with LED driver".
A typical LED power supply may either work in "constant voltage mode (CV)" or "constant current mode (CC)" to drive the LEDs.
Mean Well's LED power supply with CV+ CC characteristic can be operated at both CV mode (with LED driver, at area (A) and CC mode (direct drive, at area (B).



Typical LED power supply I-V curve

In the constant current region, the highest voltage at the output of the driver depends on the configuration of the end systems.
Should there be any compatibility issues, please contact MEAN WELL.

■ DIMMING OPERATION(for B-Type only)



※ Built-in 3 in 1 dimming function, IP67 rated. Output constant current level can be adjusted through output cable by connecting a resistance or 0 ~ 10Vdc or 10V PWM signal between DIM+ and DIM-.

※ Please DO NOT connect "DIM-" to "-V".

※ Reference resistance value for output current adjustment (Typical)

Resistance value	Single driver	Short	10KΩ	20KΩ	30KΩ	40KΩ	50KΩ	60KΩ	70KΩ	80KΩ	90KΩ	100KΩ	OPEN
	Multiple drivers (N=driver quantity for synchronized dimming operation)	Short	10KΩ /N	20KΩ /N	30KΩ /N	40KΩ /N	50KΩ /N	60KΩ /N	70KΩ /N	80KΩ /N	90KΩ /N	100KΩ /N	-----
Percentage of rated current		0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	95%~108%

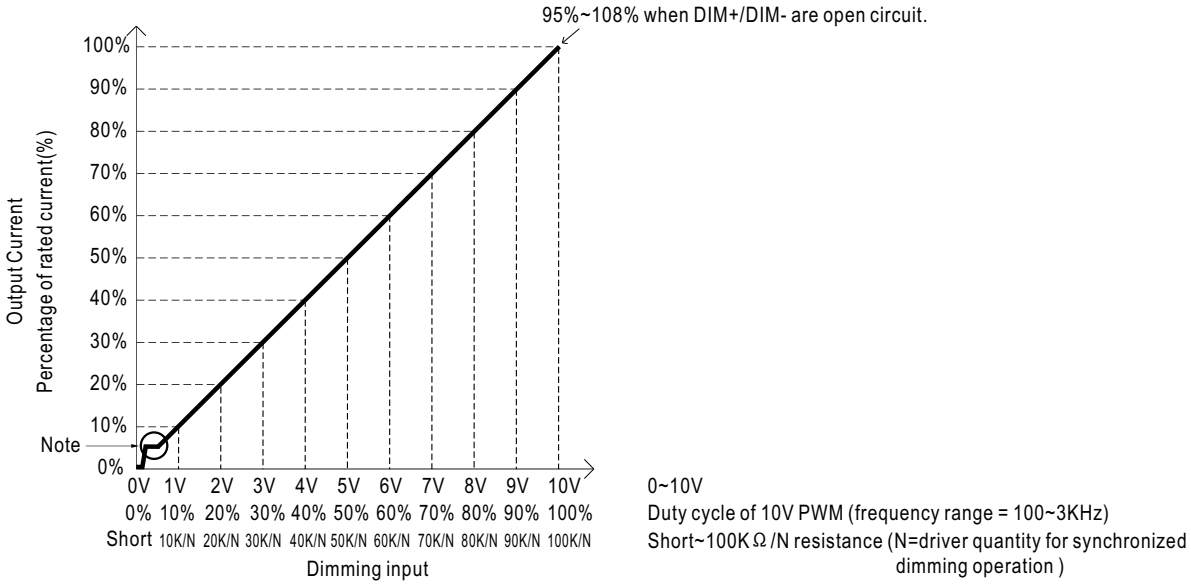
※ 0 ~ 10V dimming function for output current adjustment (Typical)

Dimming value	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN
Percentage of rated current	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	95%~108%

※ 10V PWM signal for output current adjustment (Typical): Frequency range :100Hz ~ 3KHz

Duty value	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
Percentage of rated current	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	95%~108%

◎ Dimming Characteristic

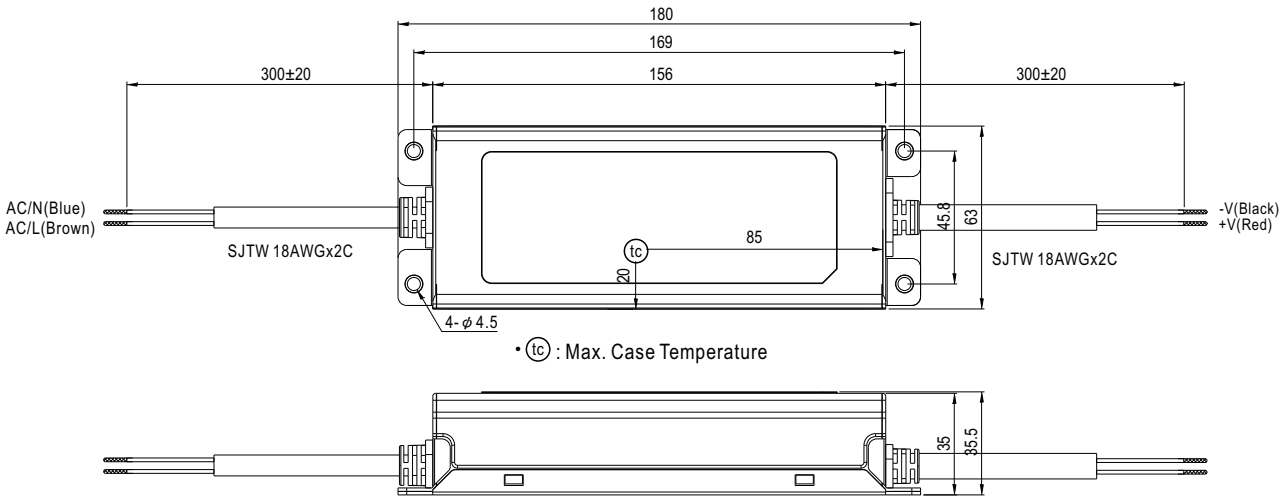


※ Note : 1. Min. dimming level is about 8%
2. The output current is not defined when 0%<Iout<8%
3. The output current could drop down to 0% when dimming input is about 0KΩ or 0Vdc, or 10V PWM signal with 0% duty cycle

■ Mechanical Specification

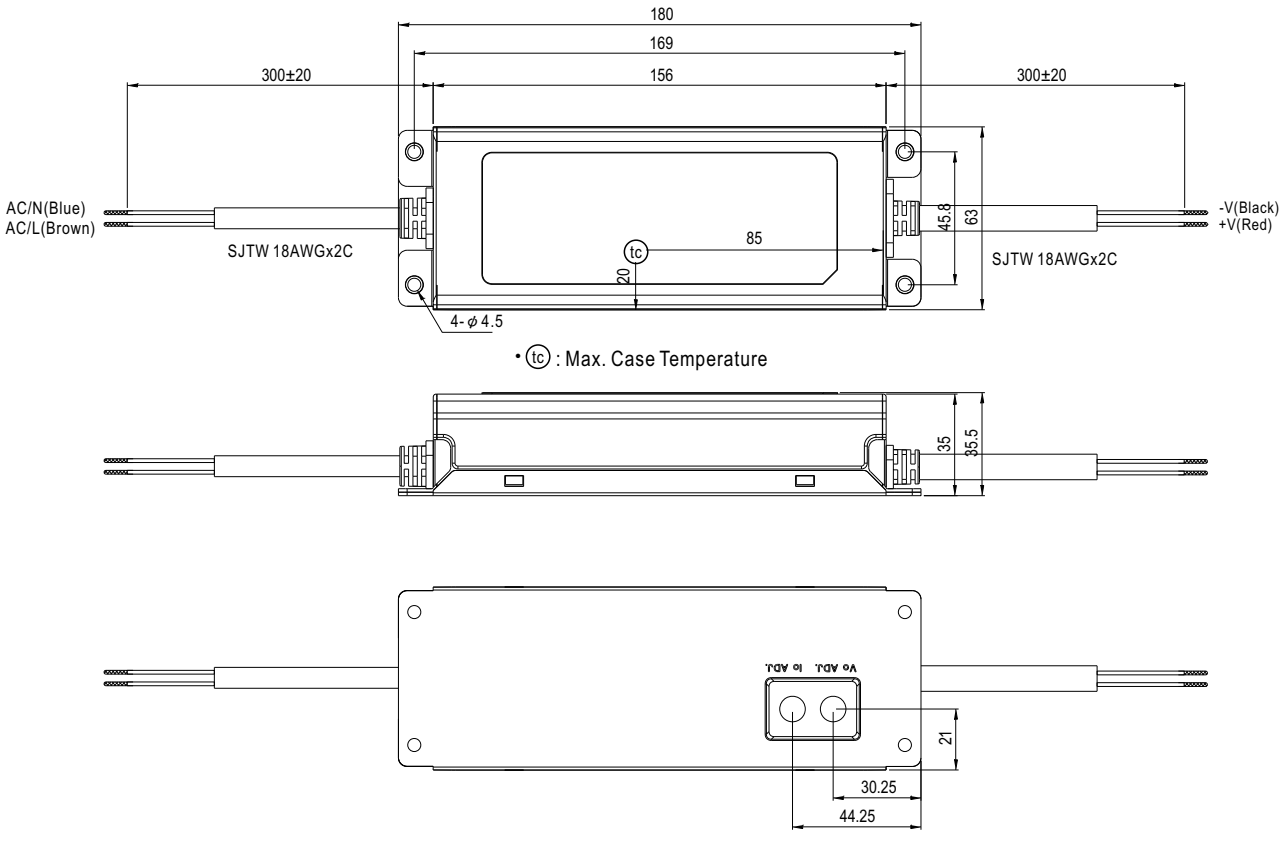
※ **Blank-Type**

CASE NO.: 243A Unit:mm



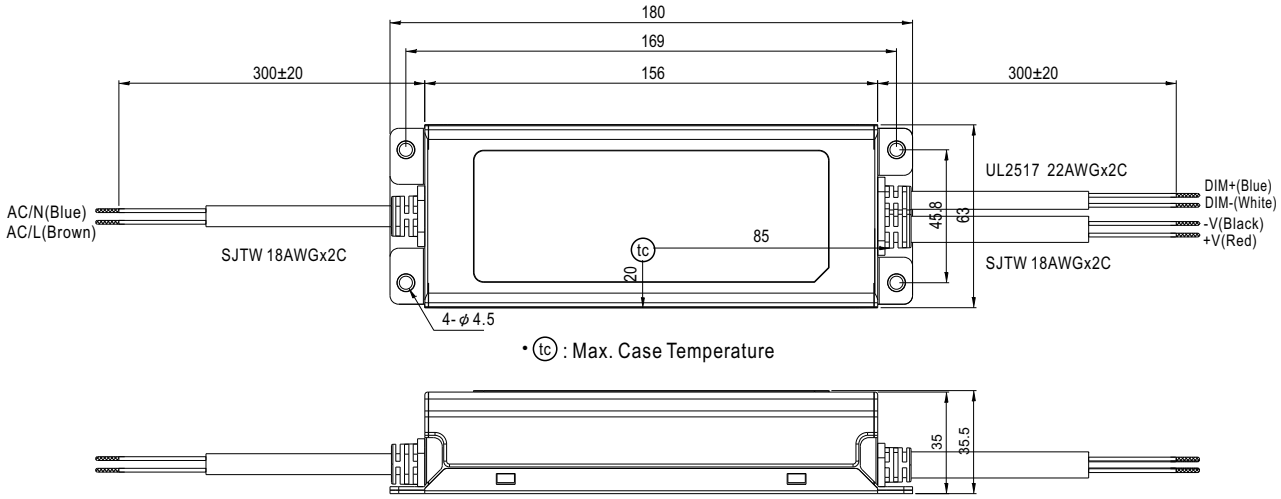
• tc : Max. Case Temperature

※ **A-Type**



• tc : Max. Case Temperature

※ **B-Type**



• (tc) : Max. Case Temperature

◎ Note: Please connect the case to FG for the complete EMC deliverance.

■ Installation Manual

Please refer to : http://www.meanwell.com/webnet/search/InstallationSearch.html

MEAN WELL

100W Single Output Switching Power Supply

ELG-100 series

(for DA-Type only) SELV IP65 IP67 Type HL

Features

- 180~295VAC input range
- Built-in active PFC function
- No load power consumption <0.5W
- High efficiency up to 91%
- Fanless design, cooling by free air convection
- IP67 / IP65 design for indoor or outdoor installations
- Output current adjustable through output cable or internal potentiometer for A-Type
- Built-in 3 in 1 dimming function for B-Type (0~10Vdc or 10V PWM signal or resistance)
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Class 2 power unit
- Suitable for dry / damp / wet locations
- Type "HL" for use in class Ⅰ, Division 2 hazardous(Classified) location luminaires
- 5 years warranty(Note.8)

Applications

- LED street lighting
- LED harbor lighting
- LED bay lighting
- LED greenhouse lighting
- Class Ⅰ, Division 2 hazardous (Classified) location luminaires

Description

ELG-100 series is a 100W LED AC/DC power supply featuring the constant current output and constant voltage output design with low output voltage. The input accepts the wide range 180~295VAC and is equipped with the active PFC function. With the high efficiency up to 91% and the heat-conducted silicone, ELG-100 is able to operate for -40℃~+90℃ case temperature under free air convection.

Model Encoding

ELG - 100 - 36 A

- A → Function mode option
- 36 → Output voltage
- 100 → Output wattage
- ELG → Series name

Function mode option:

- Blank : Standard model, IP67, constant current and constant voltage levels fixed
- A : Standard model, IP65, constant current and constant voltage levels adjustable through internal potentiometer
- B : Standard model, IP67, constant current level adjustable with additive 0~10Vdc, 10V PWM signal or resistance
- D: Optional model, IP67, Smart timer dimming function. Please contact MEAN WELL for details
- DA: Optional model, IP67, DALI function

MEAN WELL

100W Single Output Switching Power Supply

ELG-100 series

SPECIFICATION

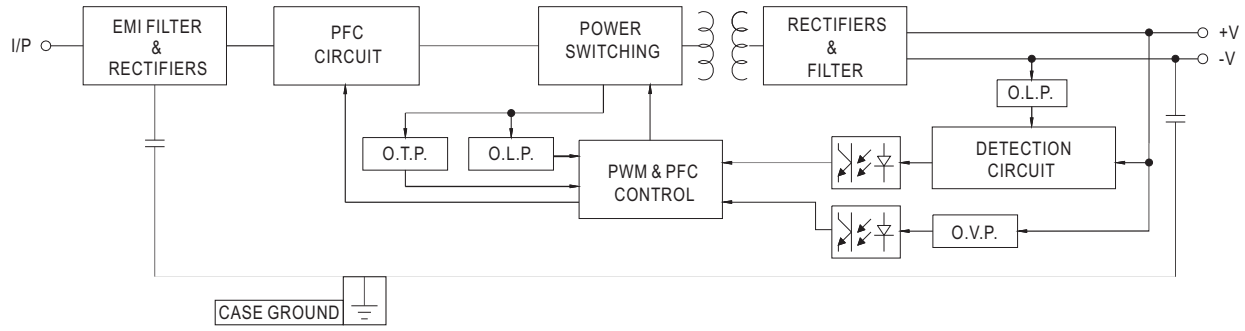
MODEL		ELG-100-24□	ELG-100-36□	ELG-100-42□	ELG-100-48□	ELG-100-54□
OUTPUT	DC VOLTAGE	24V	36V	42V	48V	54V
	CONSTANT CURRENT REGION Note.4	12 ~ 24V	18 ~ 36V	21 ~ 42V	24 ~ 48V	27 ~ 54V
	RATED CURRENT	4.0A	2.66A	2.28A	2A	1.78A
	RATED POWER	96W	95.76W	95.76W	96W	96.12W
	RIPPLE & NOISE (max.) Note.2	200mVp-p	250mVp-p	250mVp-p	300mVp-p	350mVp-p
	VOLTAGE ADJ. RANGE	Can be adjusted by internal potentiometer for A-Type only				
		21.6 ~ 26.4V	32.4 ~ 39.6V	37.8 ~ 46.2V	43.2 ~ 52.8V	48.6 ~ 59.4V
	CURRENT ADJ. RANGE	Can be adjusted by internal potentiometer for A-Type only				
		2 ~ 4A	1.33 ~ 2.66A	1.14 ~ 2.28A	1 ~ 2A	0.89 ~ 1.78A
	VOLTAGE TOLERANCE Note.3	±3.0%	±2.5%	±2.5%	±2.0%	±2.0%
	LINE REGULATION	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	LOAD REGULATION	±1.0%	±1.0%	±0.5%	±0.5%	±0.5%
	SETUP, RISE TIME Note.6	500ms, 100ms at 95% load 230VAC				
	HOLD UP TIME (Typ.)	10ms at 95% load 230VAC				
INPUT	VOLTAGE RANGE Note.5	180 ~ 295VAC				
	FREQUENCY RANGE	47 ~ 63Hz				
	POWER FACTOR	PF≧0.95/230VAC PF≧0.92/277VAC at full load (Please refer to "Power Factor Characteristic curve")				
	TOTAL HARMONIC DISTORTION	THD< 20% when output loading≧50% at 230VAC input and output loading≧75% at 277VAC input				
	EFFICIENCY (Typ.)	88%	89%	90%	90%	91%
	AC CURRENT	0.6A / 230VAC 0.5A/277VAC				
	INRUSH CURRENT(Typ.)	COLD START 60A(twidth=850μs measured at 50% Ipeak) at 230VAC				
	MAX. No. of PSUs on 16A CIRCUIT BREAKER	3 units (circuit breaker of type B) / 6 units (circuit breaker of type C) at 230VAC				
	LEAKAGE CURRENT	<0.75mA / 277VAC				
PROTECTION	OVER CURRENT	95 ~ 108%				
		Protection type : Constant current limiting, recovers automatically after fault condition is removed				
	SHORT CIRCUIT	Hiccup mode, recovers automatically after fault condition is removed				
	OVER VOLTAGE	28 ~ 34V	41 ~ 48V	47 ~ 54V	54 ~ 62V	62 ~ 72V
		Protection type : Shut down o/p voltage, re-power on to recovery				
	OVER TEMPERATURE	Shut down o/p voltage, re-power on to recovery				
ENVIRONMENT	WORKING TEMP.	Tcase=-40 ~ +90℃(Refer to "Derating Curve")				
	MAX. CASE TEMP.	Tcase=+90℃				
	WORKING HUMIDITY	20 ~ 95% RH non-condensing				
	STORAGE TEMP., HUMIDITY	-40 ~ +80℃, 10 ~ 95% RH				
	TEMP. COEFFICIENT	±0.03%/℃ (0 ~ 60℃)				
	VIBRATION	10 ~ 500Hz, 5G 12min./1cycle, period for 72min. each along X, Y, Z axes				
SAFETY & EMC	SAFETY STANDARDS	UL8750(type"HL"), EN61347-1, EN61347-2-13 independent, EN62384,IP65 or IP67 approved				
	WITHSTAND VOLTAGE	I/P-O/P:3.75KVAC I/P-FG:2.0KVAC O/P-FG:1.5KVAC				
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25℃/ 70% RH				
	EMC EMISSION	Compliance to EN55015,EN61000-3-2 Class C (≧50% loading) ; EN61000-3-3				
	EMC IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11; EN61547, light industry level (surge 6KV)				
OTHERS	MTBF	282.9Khrs min. MIL-HDBK-217F (25℃)				
	DIMENSION	199*63*35.5mm (L*W*H)				
	PACKING	0.75kg; 16pcs/13kg/0.72CUFT				

NOTE

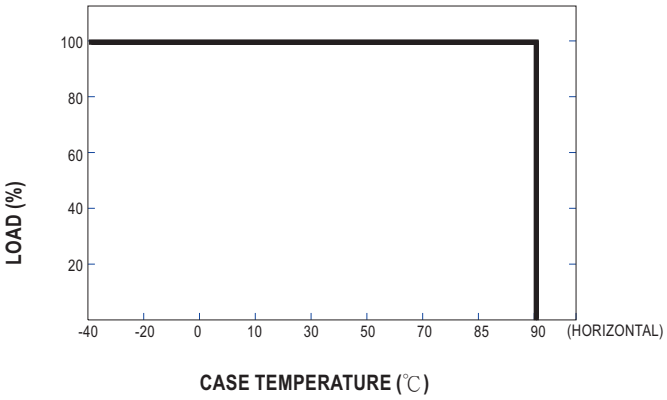
1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature.
2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.
3. Tolerance : includes set up tolerance, line regulation and load regulation.
4. Please refer to "DRIVING METHODS OF LED MODULE".
5. Derating may be needed under low input voltages. Please check the static characteristics for more details.
6. Length of set up time is measured at cold first start. Turning ON/OFF the power supply may lead to increase of the set up time.
7. The power supply 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.
8. Refer to warranty statement.

■ Block Diagram

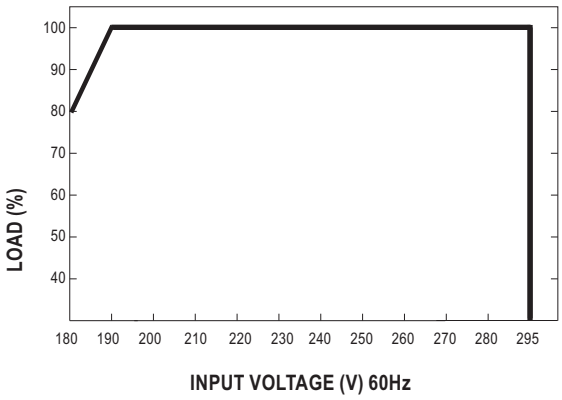
PFC fosc : 50~120KHz
PWM fosc : 60~130KHz



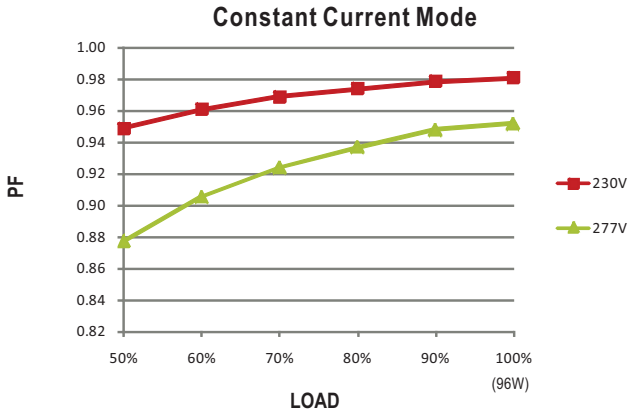
■ Derating Curve



■ Static Characteristics

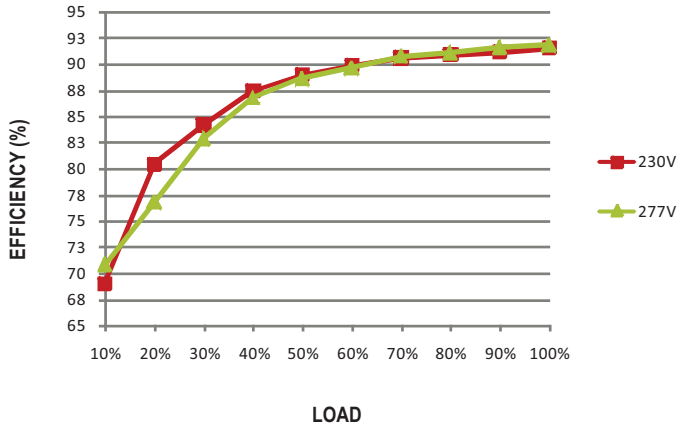


■ Power Factor Characteristic



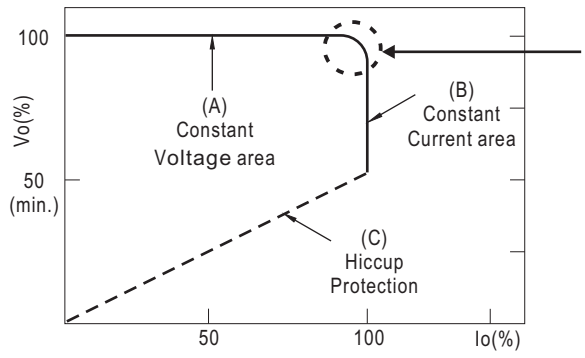
■ EFFICIENCY vs LOAD (54V Model)

ELG-100 series possess superior working efficiency that up to 91% can be reached in field applications.



■ DRIVING METHODS OF LED MODULE

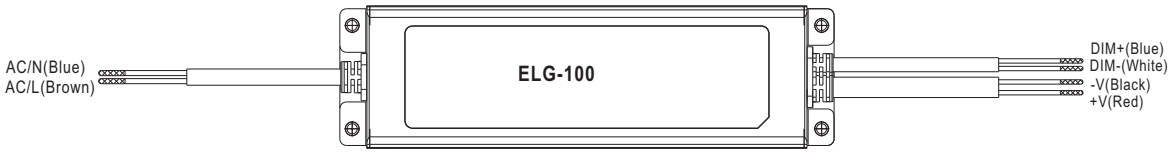
There are two major kinds of LED drive method, "direct drive" and "with LED driver".
A typical LED power supply may either work in "constant voltage mode (CV)" or "constant current mode (CC)" to drive the LEDs.
Mean Well's LED power supply with CV+ CC characteristic can be operated at both CV mode (with LED driver, at area (A) and CC mode (direct drive, at area (B).



Typical LED power supply I-V curve

In the constant current region, the highest voltage at the output of the driver depends on the configuration of the end systems.
Should there be any compatibility issues, please contact MEAN WELL.

■ DIMMING OPERATION(for B-Type only)



※ Built-in 3 in 1 dimming function, IP67 rated. Output constant current level can be adjusted through output cable by connecting a resistance or 0 ~ 10Vdc or 10V PWM signal between DIM+ and DIM-.

※ Please DO NOT connect "DIM-" to "-V".

※ Reference resistance value for output current adjustment (Typical)

Resistance value	Single driver	Short	10KΩ	20KΩ	30KΩ	40KΩ	50KΩ	60KΩ	70KΩ	80KΩ	90KΩ	100KΩ	OPEN
	Multiple drivers (N=driver quantity for synchronized dimming operation)	Short	10KΩ /N	20KΩ /N	30KΩ /N	40KΩ /N	50KΩ /N	60KΩ /N	70KΩ /N	80KΩ /N	90KΩ /N	100KΩ /N	-----
Percentage of rated current		0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	95%~108%

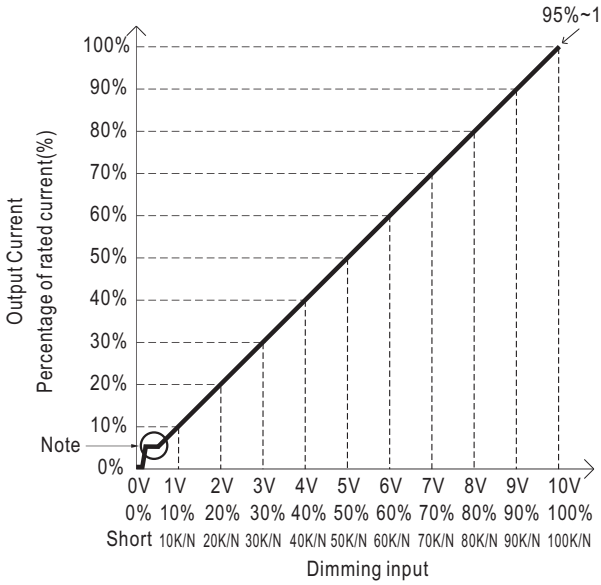
※ 0 ~ 10V dimming function for output current adjustment (Typical)

Dimming value	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN
Percentage of rated current	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	95%~108%

※ 10V PWM signal for output current adjustment (Typical): Frequency range :100Hz ~ 3KHz

Duty value	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
Percentage of rated current	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	95%~108%

◎ Dimming Characteristic



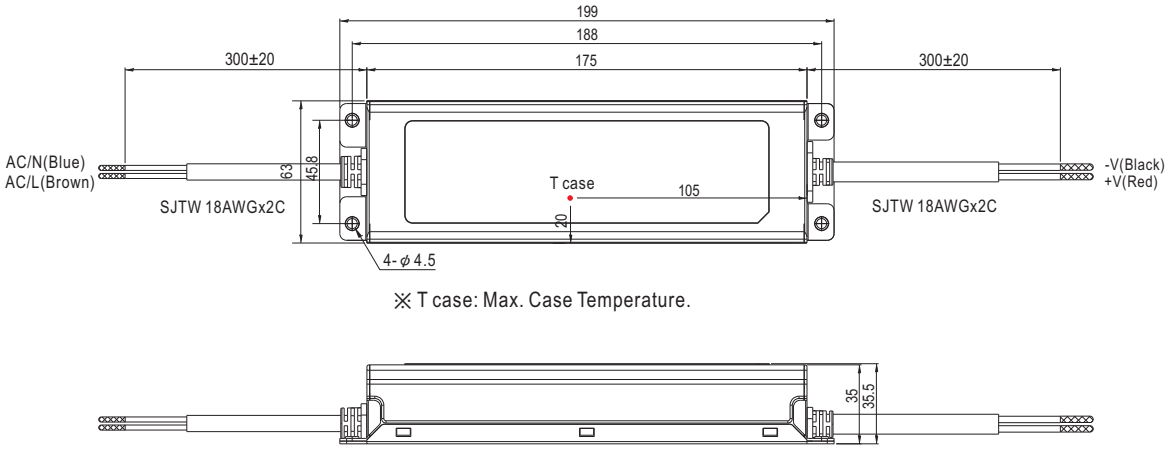
0~10V
Duty cycle of 10V PWM (frequency range = 100~3KHz)
Short~100KΩ /N resistance (N=driver quantity for synchronized dimming operation)

※ Note : 1. Min. dimming level is about 6%
2. The output current is not defined when 0%<Iout<6%
3. The output current could drop down to 0% when dimming input is about 0KΩ or 0Vdc, or 10V PWM signal with 0% duty cycle

■ Mechanical Specification

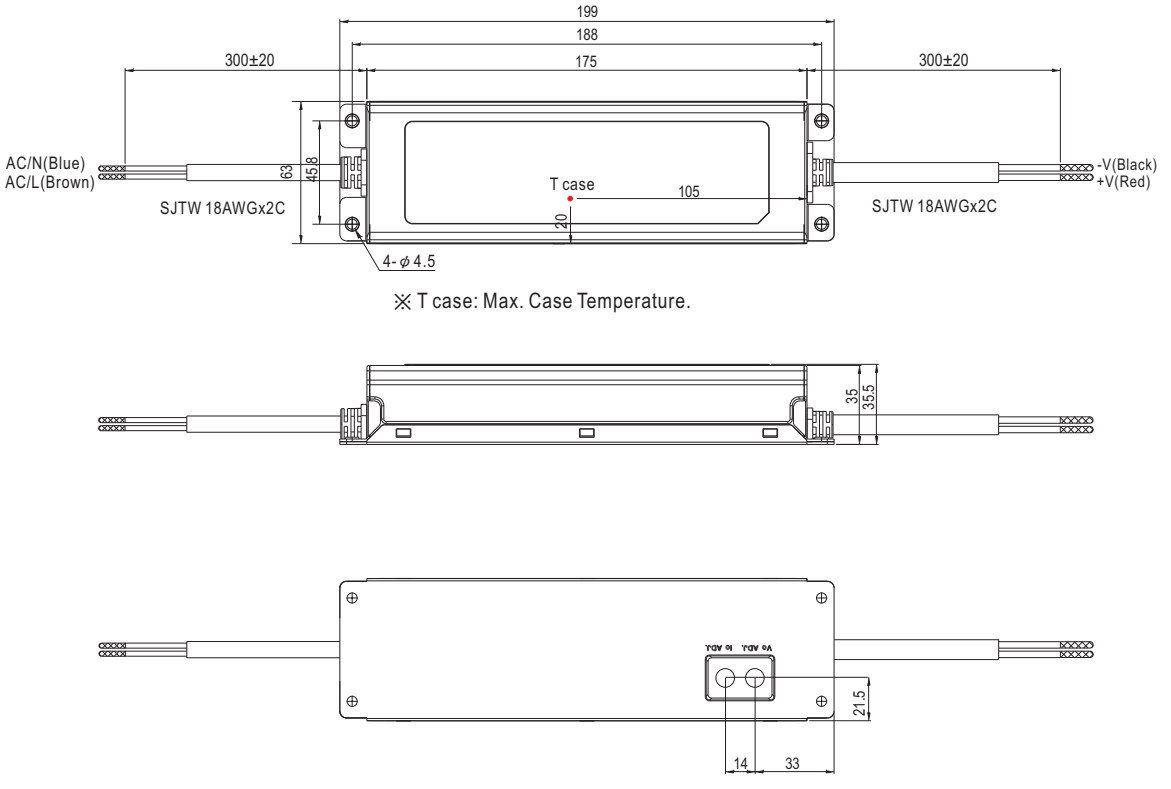
CASE NO.: 244A Unit:mm

Blank-Type/D-Type:(ELG-100-_,ELG-100-_D)



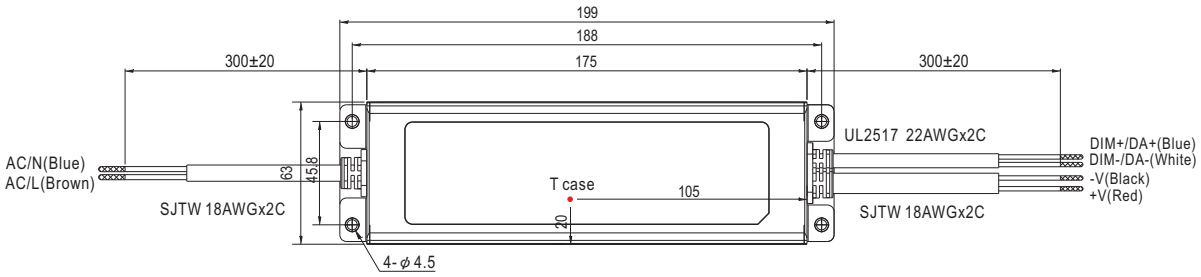
※ T case: Max. Case Temperature.

A-Type:(ELG-100-_A)



※ T case: Max. Case Temperature.

B-Type/DA-Type:(ELG-100-_B/ELG-100-_DA)



※ T case: Max. Case Temperature.

■ Installation Manual

Please refer to : http://www.meanwell.com/webnet/search/InstallationSearch.html

MEAN WELL

150W Single Output Switching Power Supply

ELG-150 series

(for DA-Type only) SELV IP65 IP67 Type HL

Features

- 180~295VAC input range
- Built-in active PFC function
- No load power consumption <0.5W(Note.6)
- High efficiency up to 91%
- Fanless design, cooling by free air convection
- IP67 / IP65 design for indoor or outdoor installations
- Output current adjustable through output cable or internal potentiometer for A-Type
- Built-in 3 in 1 dimming function for B-Type (0~10Vdc or 10V PWM signal or resistance)
- Protections: Short circuit / Over current / Over voltage / Over temperature
- Suitable for dry / damp / wet locations
- Type "HL" for use in class Ⅰ, Division 2 hazardous(Classified) location luminaires
- 5 years warranty(Note.9)

Applications

- LED street lighting
- LED harbor lighting
- LED bay lighting
- LED floodlighting
- Class Ⅰ, Division 2 hazardous (Classified) location luminaires

Description

ELG-150 series is a 150W LED AC/DC power supply featuring the dual operating modes, constant current mode output and constant voltage mode output. Thanks to the high efficiency up to 91%, with the fanless design, the entire series is able to operate for -40℃~+90℃ case temperature under free air convection. The design of metal housing and IP67/IP65 ingress protection level allows this series to fit both indoor and outdoor applications. ELG-150 is equipped with various function options, such as dimming methodologies, so as to provide the optimal design flexibility for lighting system.

Model Encoding

ELG - 150 - 24 A

- A → Function mode option
- 24 → Output voltage
- 150 → Output wattage
- ELG → Series name

Function mode option:

- Blank : Standard model, IP67, constant current and constant voltage levels fixed
- A : Standard model, IP65, constant current and constant voltage levels adjustable through internal potentiometer
- B : Standard model, IP67, constant current level adjustable with additive 0~10Vdc, 10V PWM signal or resistance
- D: Optional model, IP67, Smart timer dimming function. Please contact MEAN WELL for details
- DA: Optional model, IP67, DALI function
- BE: Optional model, IP67, B-Type model with additive auxiliary power.

MEAN WELL

150W Single Output Switching Power Supply ELG-150 series

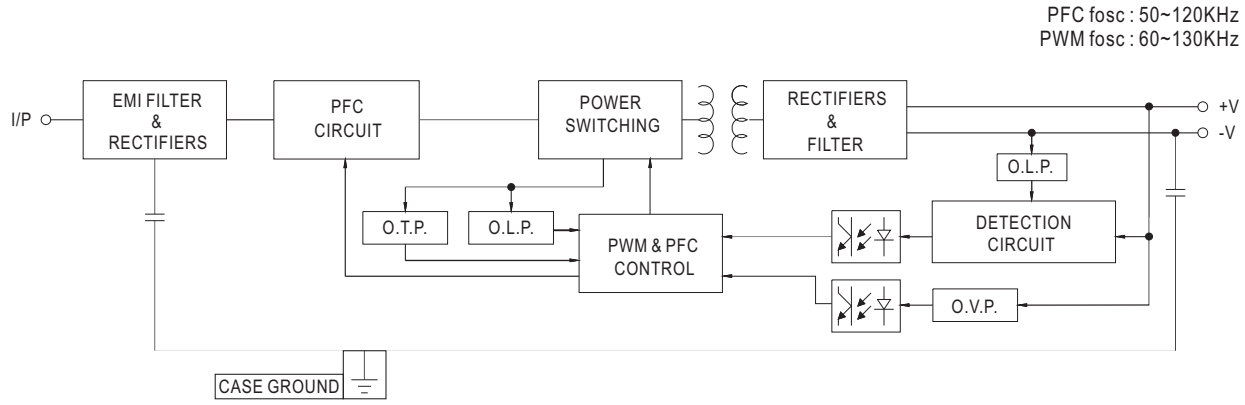
SPECIFICATION

MODEL		ELG-150-12□	ELG-150-24□	ELG-150-36□	ELG-150-42□	ELG-150-48□	ELG-150-54□
OUTPUT	DC VOLTAGE	12V	24V	36V	42V	48V	54V
	CONSTANT CURRENT REGION Note.4	6 ~ 12V	12 ~ 24V	18 ~ 36V	21 ~ 42V	24 ~ 48V	27 ~ 54V
	RATED CURRENT	10A	6.25A	4.17A	3.57A	3.13A	2.8A
	RATED POWER	120W	150W	150.1W	150W	150.2W	151.2W
	RIPPLE & NOISE (max.) Note.2	150mVp-p	200mVp-p	250mVp-p	250mVp-p	250mVp-p	350mVp-p
	VOLTAGE ADJ. RANGE	10.8 ~ 13.2V	21.6 ~ 26.4V	32.4 ~ 39.6V	37.8 ~ 46.2V	43.2 ~ 52.8V	49 ~ 58V
		Can be adjusted by internal potentiometer (for A-Type only)					
	CURRENT ADJ. RANGE	5 ~ 10A	3.2 ~ 6.25A	2.1 ~ 4.17A	1.8 ~ 3.57A	1.56 ~ 3.13A	1.4 ~ 2.8A
		Can be adjusted by internal potentiometer (for A-Type only)					
	AUXILIARY POWER	Nominal 15V(deviation 11.5~16.5V), 0.4A (for BE-Type only)					
	VOLTAGE TOLERANCE Note.3	±3.0%	±3.0%	±2.5%	±2.5%	±2.0%	±2.0%
	LINE REGULATION	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	LOAD REGULATION	±2.0%	±1.0%	±1.0%	±0.5%	±0.5%	±0.5%
	SETUP, RISE TIME Note.7	500ms, 100ms at 95% load 230VAC					
	HOLD UP TIME (Typ.)	10ms at 95% load 230VAC					
INPUT	VOLTAGE RANGE Note.5	180 ~ 295VAC 255 ~ 417VDC					
	FREQUENCY RANGE	47 ~ 63Hz					
	POWER FACTOR	PF≧0.95/230VAC PF≧0.92/277VAC at full load (Please refer to "Power Factor Characteristic" curve)					
	TOTAL HARMONIC DISTORTION	THD< 20% when output loading≧50% at 230VAC input and output loading≧75% at 277VAC input					
	EFFICIENCY (Typ.)	88%	89%	90%	90%	90%	91%
	EFFICIENCY (for BE-Type only)	87.5%	88.5%	89.5%	89.5%	89.5%	90.5%
	AC CURRENT	0.9A / 230VAC 0.7A/277VAC					
	INRUSH CURRENT(Typ.)	COLD START 65A(twidth=550μs measured at 50% Ipeak) at 230VAC					
	MAX. No. of PSUs on 16A CIRCUIT BREAKER	3 units (circuit breaker of type B) / 6 units (circuit breaker of type C) at 230VAC					
	LEAKAGE CURRENT	<0.75mA / 277VAC					
PROTECTION	OVER CURRENT	95 ~ 108%					
		Protection type : Constant current limiting, recovers automatically after fault condition is removed					
	SHORT CIRCUIT	Hiccup mode, recovers automatically after fault condition is removed					
	OVER VOLTAGE	14 ~ 18V	28 ~ 34V	41 ~ 48V	47 ~ 54V	54 ~ 62V	59 ~ 68V
		Protection type : Shut down o/p voltage, re-power on to recovery					
	OVER TEMPERATURE	Shut down o/p voltage, re-power on to recovery					
ENVIRONMENT	WORKING TEMP.	Tcase=-40 ~ +90℃ (Refer to "Derating Curve")					
	MAX. CASE TEMP.	Tcase=+90℃					
	WORKING HUMIDITY	20 ~ 95% RH non-condensing					
	STORAGE TEMP., HUMIDITY	-40 ~ +80℃, 10 ~ 95% RH					
	TEMP. COEFFICIENT	±0.03%/℃ (0 ~ 50℃)					
	VIBRATION	10 ~ 500Hz, 5G 12min./1cycle, period for 72min. each along X, Y, Z axes					
SAFETY & EMC	SAFETY STANDARDS	UL8750(type"HL"), EN61347-1, EN61347-2-13 independent, EN62384, IP65 or IP67 approved					
	WITHSTAND VOLTAGE	I/P-O/P:3.75KVAC I/P-FG:2.0KVAC O/P-FG:1.5KVAC					
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25℃/ 70% RH					
	EMC EMISSION	Compliance to EN55015,EN61000-3-2 Class C (≧50% loading) ; EN61000-3-3					
	EMC IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11; EN61547, light industry level (surge 6KV), criteria A					
OTHERS	MTBF	313.66Khrs min. MIL-HDBK-217F (25℃)					
	DIMENSION	219*63*35.5mm (L*W*H)					
	PACKING	0.88Kg ; 16pcs/15.4kg/0.77CUFT					

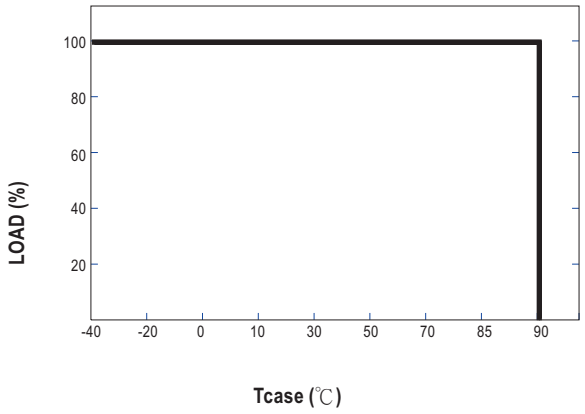
NOTE

1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature.
2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.
3. Tolerance : includes set up tolerance, line regulation and load regulation.
4. Please refer to "DRIVING METHODS OF LED MODULE".
5. Derating may be needed under low input voltages. Please check the static characteristics for more details.
6. Except for BE-Type.
7. Length of set up time is measured at cold first start. Turning ON/OFF the power supply may lead to increase of the set up time.
8. The power supply 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. Refer to warranty statement.

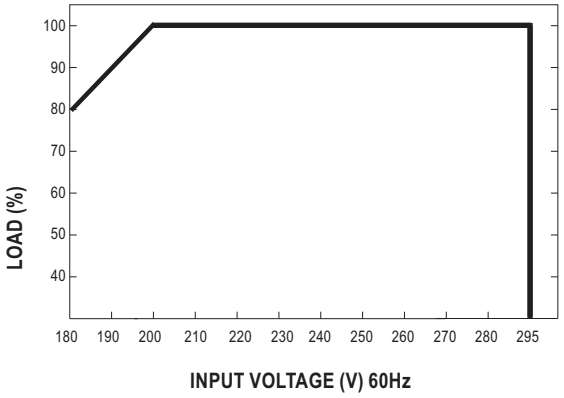
■ Block Diagram



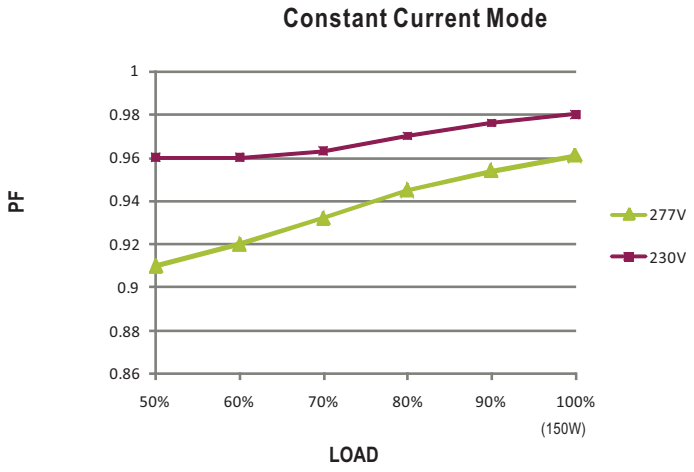
■ Derating Curve



■ Static Characteristics

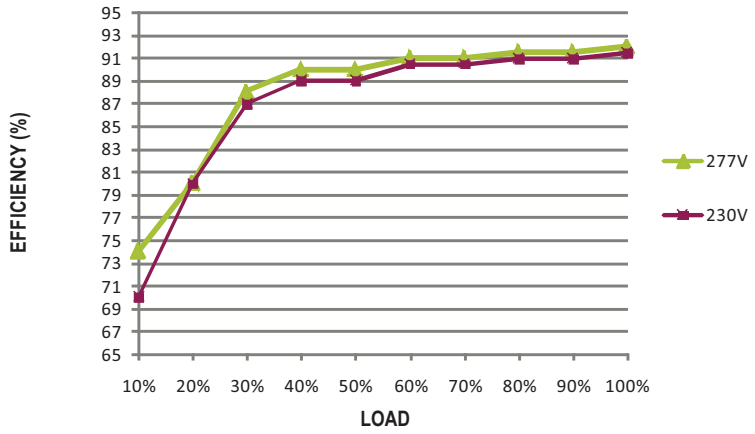


■ Power Factor Characteristic



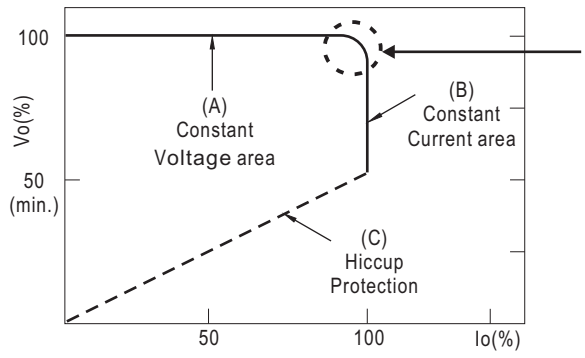
■ EFFICIENCY vs LOAD (54V Model)

ELG-150 series possess superior working efficiency that up to 91% can be reached in field applications.



■ DRIVING METHODS OF LED MODULE

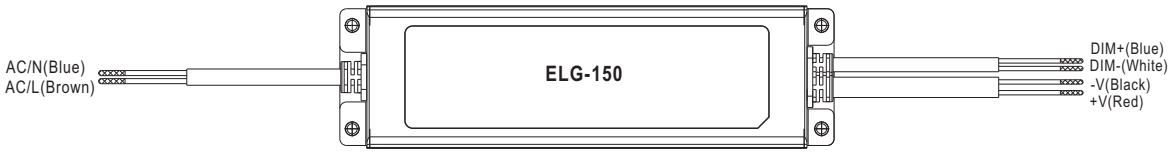
There are two major kinds of LED drive method, "direct drive" and "with LED driver".
A typical LED power supply may either work in "constant voltage mode (CV)" or "constant current mode (CC)" to drive the LEDs.
Mean Well's LED power supply with CV+ CC characteristic can be operated at both CV mode (with LED driver, at area (A) and CC mode (direct drive, at area (B).



Typical LED power supply I-V curve

In the constant current region, the highest voltage at the output of the driver depends on the configuration of the end systems.
Should there be any compatibility issues, please contact MEAN WELL.

■ DIMMING OPERATION(for B-Type only)



※ Built-in 3 in 1 dimming function, IP67 rated. Output constant current level can be adjusted through output cable by connecting a resistance or 0 ~ 10Vdc or 10V PWM signal between DIM+ and DIM-.

※ Please DO NOT connect "DIM-" to "-V".

※ Reference resistance value for output current adjustment (Typical)

Resistance value	Single driver	Short	10KΩ	20KΩ	30KΩ	40KΩ	50KΩ	60KΩ	70KΩ	80KΩ	90KΩ	100KΩ	OPEN
	Multiple drivers (N=driver quantity for synchronized dimming operation)	Short	10KΩ /N	20KΩ /N	30KΩ /N	40KΩ /N	50KΩ /N	60KΩ /N	70KΩ /N	80KΩ /N	90KΩ /N	100KΩ /N	-----
Percentage of rated current		0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	95%~108%

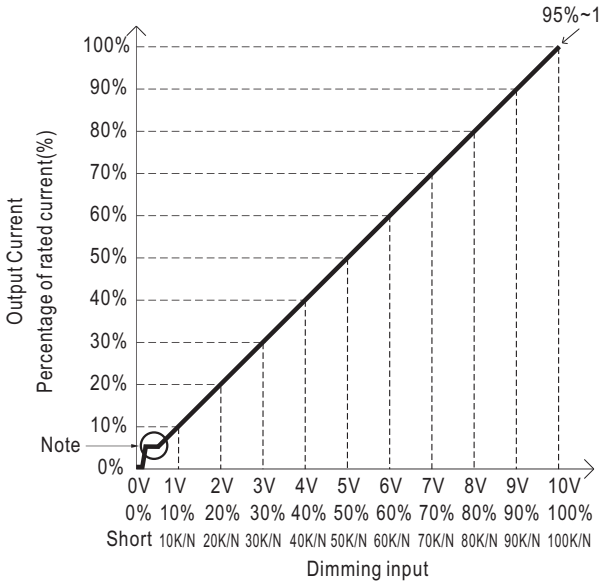
※ 0 ~ 10V dimming function for output current adjustment (Typical)

Dimming value	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN
Percentage of rated current	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	95%~108%

※ 10V PWM signal for output current adjustment (Typical): Frequency range :100Hz ~ 3KHz

Duty value	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
Percentage of rated current	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	95%~108%

◎ Dimming Characteristic



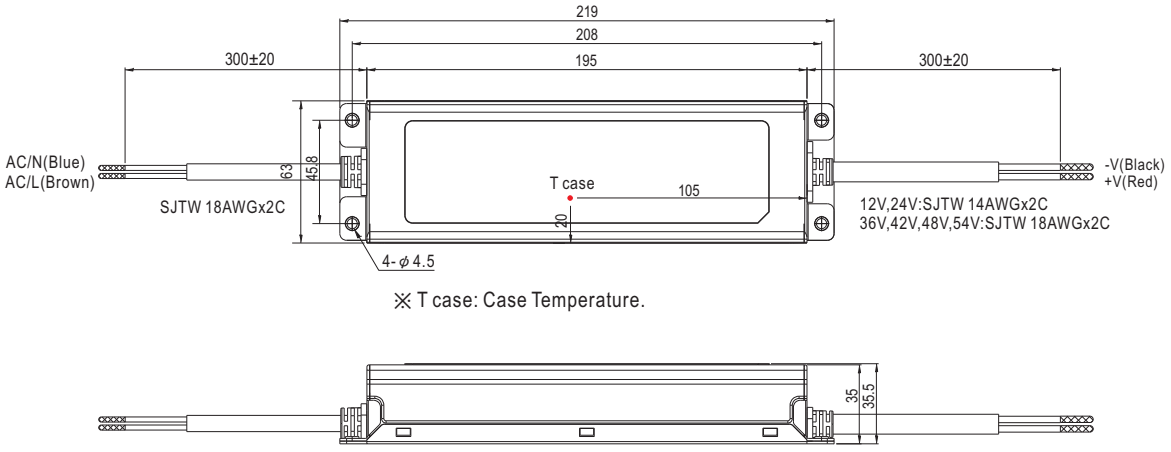
0~10V
Duty cycle of 10V PWM (frequency range = 100~3KHz)
Short~100KΩ /N resistance (N=driver quantity for synchronized dimming operation)

※ Note : 1. Min. dimming level is about 6%
2. The output current is not defined when 0%<Iout<6%
3. The output current could drop down to 0% when dimming input is about 0KΩ or 0Vdc, or 10V PWM signal with 0% duty cycle

■ Mechanical Specification

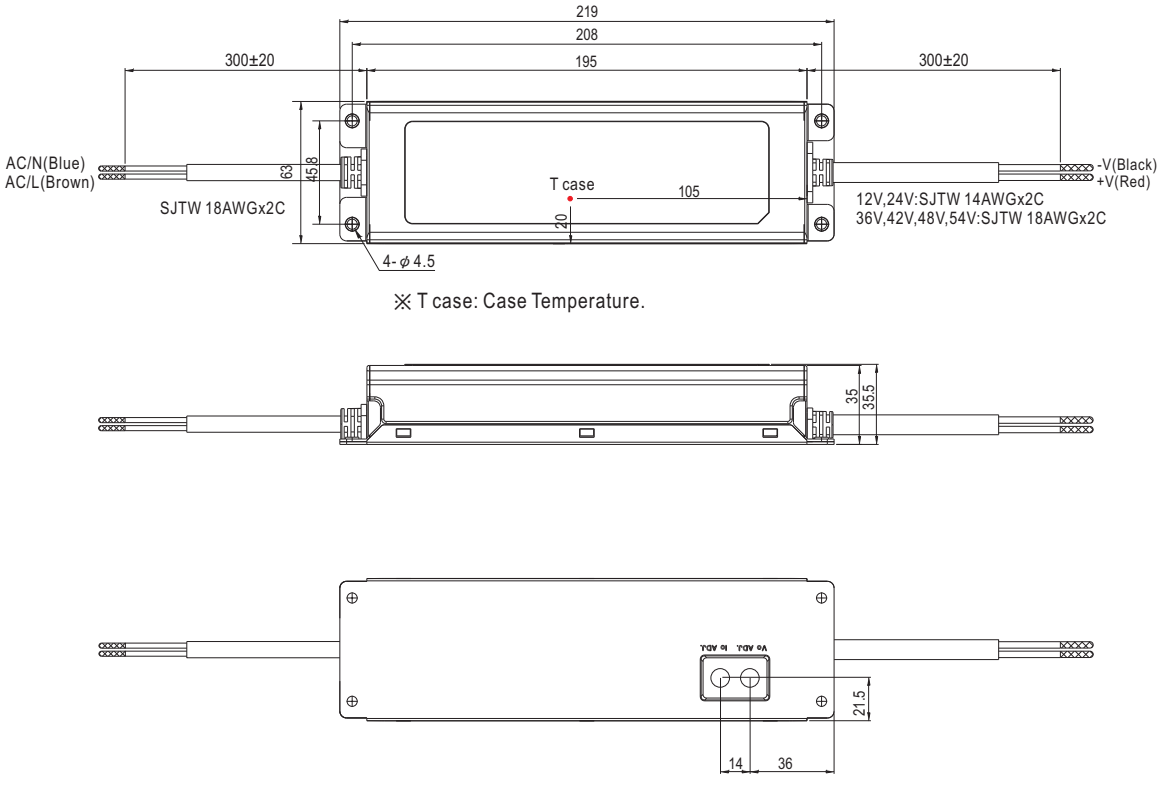
CASE NO.: 237A Unit:mm

Blank-Type/D-Type:(ELG-150-_,ELG-150-_D)



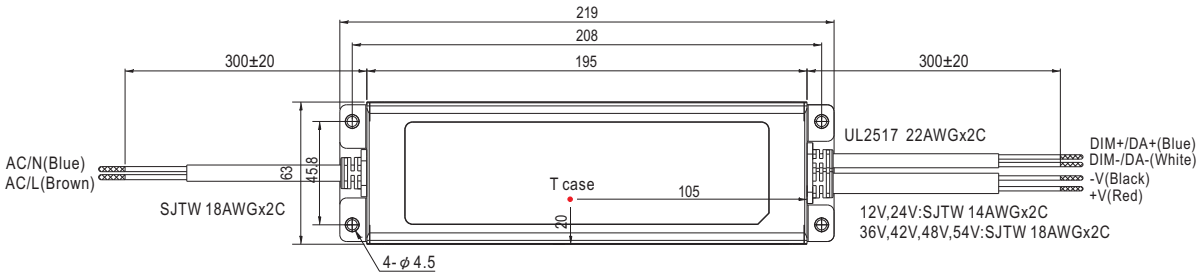
※ T case: Case Temperature.

A-Type:(ELG-150-_A)



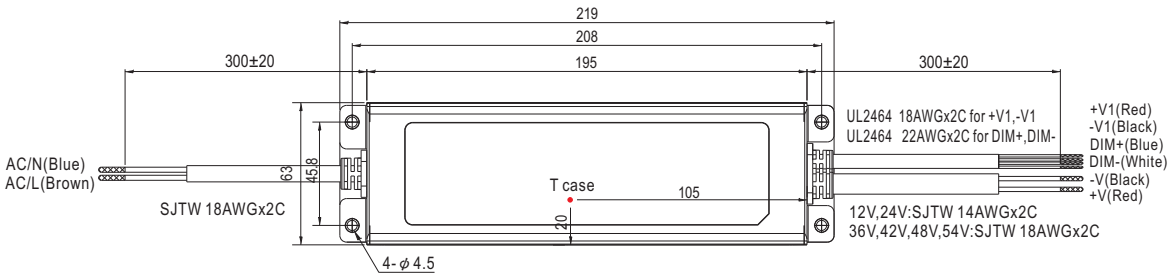
※ T case: Case Temperature.

B-Type/DA-Type:(ELG-150-_B / ELG-150-_DA)



※ T case: Case Temperature.

BE-Type:(ELG-150-_BE)



※ T case: Case Temperature.

■ Installation Manual

Please refer to : http://www.meanwell.com/webnet/search/InstallationSearch.html

144~200W Constant Voltage + Constant Current LED Driver ELG-200 series

(for DA-Type only) SELV IP65 IP67 Type HL US 18 IS 15885(Part 2/Sec13) R-41027766 (for 12/12B/24/24B/36/36A /42A/48/48A/54A only) CB

Features

- Constant Voltage + Constant Current mode output
- Metal housing design with functional Ground
- Built-in active PFC function
- No load / Standby power consumption <0.5W
- IP67 / IP65 rating for indoor or outdoor installations
- Function options: output adjustable via potentiometer; 3 in 1 dimming (dim-to-off); Smart timer dimming; DALI
- Typical lifetime>50000 hours
- 5 years warranty

Applications

- LED street lighting
- LED architectural lighting
- LED bay lighting
- LED floodlighting
- Type “HL” for use in Class I, Division 2 hazardous (Classified) location.

Description

ELG-200 series is a 200W AC/DC LED driver featuring the dual mode constant voltage and constant current output. ELG-200 operates from 100～305VAC and offers models with different rated voltage ranging between 12V and 54V. Thanks to the high efficiency up to 93%, with the fanless design, the entire series is able to operate for -40℃ ~ +90℃ case temperature under free air convection. The design of metal housing and IP67/IP65 ingress protection level allows this series to fit both indoor and outdoor applications. ELG-200 is equipped with various function options, such as dimming methodologies, so as to provide the optimal design flexibility for LED lighting system

Model Encoding

ELG - 200 - 24 A - □

- Input wiring type { Blank:2-wire input for standard model / 3Y:3-wire input for standard model
- Function mode option
- Rated output voltage(12/24/36/42/48/54V)
- Rated wattage
- Series name

Type	IP Level	Function	Note
Blank	IP67	Io and Vo fixed.	In Stock
A	IP65	Io and Vo adjustable through built-in potentiometer.	In Stock
B	IP67	3 in 1 dimming function (0~10Vdc, 10V PWM signal and resistance)	In Stock
AB	IP65	Io and Vo adjustable through built-in potentiometer & 3 in 1 dimming function (0~10Vdc, 10V PWM signal and resistance)	In Stock
DA	IP67	DALI control technology.	In Stock
Dx	IP67	Built-in Smart timer dimming function by user request.	By request
D2	IP67	Built-in Smart timer dimming and programmable function.	In Stock

144~200W Constant Voltage + Constant Current LED Driver ELG-200 series

SPECIFICATION

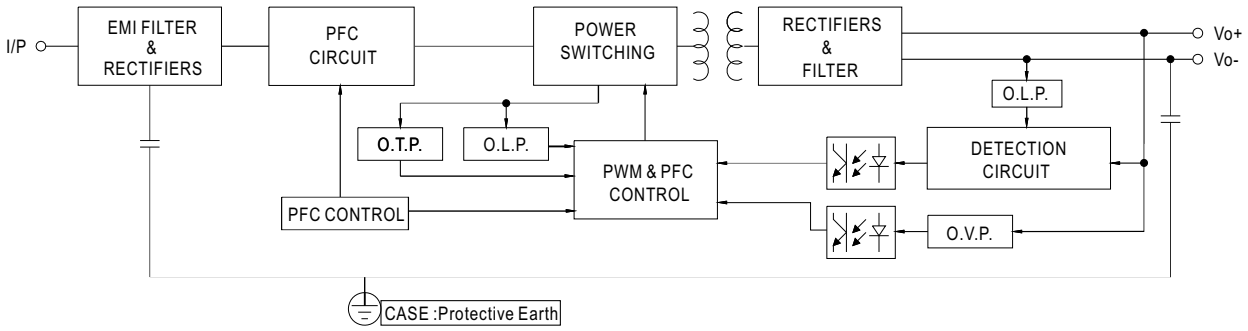
MODEL		ELG-200-12 □	ELG-200-24 □	ELG-200-36 □	ELG-200-42 □	ELG-200-48 □	ELG-200-54 □
OUTPUT	DC VOLTAGE	12V	24V	36V	42V	48V	54V
	CONSTANT CURRENT REGION Note.2	6 ~ 12V	12 ~ 24V	18 ~ 36V	21 ~ 42V	24 ~ 48V	27 ~ 54V
	RATED CURRENT	16A	8.4A	5.55A	4.76A	4.16A	3.72A
	RATED POWER	200VAC ~ 305VAC					
		192W	201.6W	199.8W	199.9W	199.68W	200.88W
		100VAC ~ 180VAC					
		144W	150W	149.76W	149.94W	149.76W	150.12W
	RIPPLE & NOISE (max.) Note.3	150mVp-p	200mVp-p	250mVp-p	250mVp-p	250mVp-p	350mVp-p
	VOLTAGE ADJ. RANGE	Adjustable for A/AB-Type only (via built-in potentiometer)					
		11.2 ~ 12.8V	22.4 ~ 25.6V	33.5 ~ 38.5V	39 ~ 45V	44.8 ~ 51.2V	50 ~ 57V
	CURRENT ADJ. RANGE	Adjustable for A/AB-Type only (via built-in potentiometer)					
		8 ~ 16A	4.2 ~ 8.4A	2.78 ~ 5.55A	2.38 ~ 4.76A	2.08 ~ 4.16A	1.86 ~ 3.72A
	VOLTAGE TOLERANCE Note.4	±3.0%	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%
	LINE REGULATION	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	LOAD REGULATION	±2.0%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	SETUP, RISE TIME Note.6	500ms, 100ms/230VAC, 1000ms, 100ms/115VAC					
	HOLD UP TIME (Typ.)	10ms/ 230VAC 10ms/ 115VAC					
INPUT	VOLTAGE RANGE Note.5	100 ~ 305VAC 142 ~ 431VDC (Please refer to "STATIC CHARACTERISTIC" section)					
	FREQUENCY RANGE	47 ~ 63Hz					
	POWER FACTOR	PF≧0.97/115VAC, PF≧0.95/230VAC, PF≧0.92/277VAC@full load (Please refer to "POWER FACTOR (PF) CHARACTERISTIC" section)					
	TOTAL HARMONIC DISTORTION	THD< 20%(@load≧50%/115VC,230VAC; @load≧75%/277VAC) (Please refer to "TOTAL HARMONIC DISTORTION(THD)" section)					
	EFFICIENCY (Typ.)	90%	92%	92%	92.5%	93%	93%
	AC CURRENT	1.8A / 115VAC 1.2A / 230VAC 1.0A/277VAC					
	INRUSH CURRENT(Typ.)	COLD START 60A(twidth=510μs measured at 50% Ipeak) at 230VAC; Per NEMA 410					
	MAX. No. of PSUs on 16A CIRCUIT BREAKER	4 units (circuit breaker of type B) / 6 units (circuit breaker of type C) at 230VAC					
	LEAKAGE CURRENT	<0.75mA / 277VAC					
	NO LOAD / STANDBY POWER CONSUMPTION Note.7	No load power consumption <0.5W for Blank / A / Dx / D-Type Standby power consumption <0.5W for B / AB / DA-Type					
PROTECTION	OVER CURRENT	95 ~ 108%					
		Constant current limiting, recovers automatically after fault condition is removed					
	SHORT CIRCUIT	Hiccup mode, recovers automatically after fault condition is removed					
	OVER VOLTAGE	13.5 ~ 18V	27 ~ 34V	42 ~ 49V	47 ~ 54V	54 ~ 63V	60 ~ 67V
		Shut down output voltage, re-power on to recover					
	OVER TEMPERATURE	Shut down output voltage, re-power on to recover					
ENVIRONMENT	WORKING TEMP.	Tcase=-40 ~ +90℃ (Please refer to " OUTPUT LOAD vs TEMPERATURE" section)					
	MAX. CASE TEMP.	Tcase=+90℃					
	WORKING HUMIDITY	20 ~ 95% RH non-condensing					
	STORAGE TEMP., HUMIDITY	-40 ~ +90℃, 10 ~ 95% RH					
	TEMP. COEFFICIENT	±0.03%/℃ (0 ~ 50℃)					
	VIBRATION	10 ~ 500Hz, 5G 12min./1cycle, period for 72min. each along X, Y, Z axes					
SAFETY & EMC	SAFETY STANDARDS	UL8750(type"HL"), CSA C22.2 No. 250.13-12;IEC/EN/AS/NZS 61347-1, IEC/EN/AS/NZS 61347-2-13 independent, EN62384; EAC TP TC 004;BIS IS15885(for 12/12B/24/24B/36/36A/42A/48/48A/54A only);GB19510.14,GB19510.1; IP65 or IP67; KC KN61347-1,KN61347-2-13 approved					
	DALI STANDARDS	Compiy with IEC62386-101,102,207 for DA-Type only					
	WITHSTAND VOLTAGE	I/P-O/P:3.75KVAC I/P-FG:2.0KVAC O/P-FG:1.5KVAC					
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25℃/ 70% RH					
	EMC EMISSION	Compliance to EN55015,EN61000-3-2 Class C (@load≧50%) ; EN61000-3-3;GB17625.1,GB17743;EAC TP TC 020; KC KN15,KN61547					
	EMC IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11; EN61547, light industry level (surge immunity Line-Earth 6KV, Line-Line 4KV);EAC TP TC 020; KC KN15,KN61547					
OTHERS	MTBF	826.7K hrs min. Telcordia SR-332 (Bellcore) ; 200.8Khrs min. MIL-HDBK-217F (25℃)					
	DIMENSION	244*71*37.5mm (L*W*H)					
	PACKING	1.22Kg; 12pcs / 15.2Kg / 0.72CUFT					

NOTE

1. All parameters NOT specially mentioned are measured at 230VAC input, rated current and 25℃ of ambient temperature.
2. Please refer to "DRIVING METHODS OF LED MODULE".
3. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.
4. Tolerance : includes set up tolerance, line regulation and load regulation.
5. De-rating may be needed under low input voltages. Please refer to "STATIC CHARACTERISTIC" sections for details.
6. Length of set up time is measured at first cold start. Turning ON/OFF the driver may lead to increase of the set up time.
7. No load/standby power consumption is specified for 230VAC input.
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. This series meets the typical life expectancy of >50,000 hours of operation when Tcase, particularly (tc) point (or TMP, per DLC), is about 70℃ or less.
10. Please refer to the warranty statement on MEAN WELL's website at http://www.meanwell.com
11. The ambient temperature derating of 3.5℃/1000m with fanless models and of 5℃/1000m with fan models for operating altitude higher than 2000m(6500ft).
12. For any application note and IP water proof function installation caution, please refer our user manual before using. https://www.meanwell.com/Upload/PDF/LED_EN.pdf

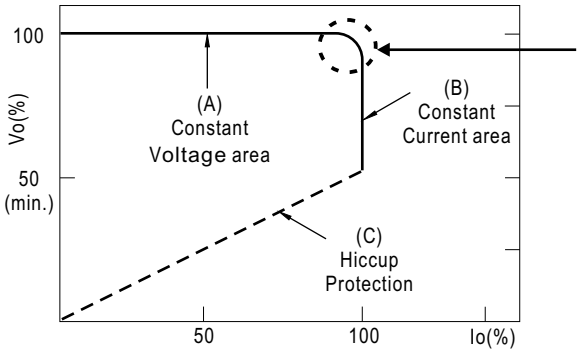
■ Block Diagram

PFC fosc : 50~120KHz
PWM fosc : 60~130KHz



■ DRIVING METHODS OF LED MODULE

※ This series is able to work in either Constant Current mode (a direct drive way) or Constant Voltage mode (usually through additional DC/DC driver) to drive the LEDs.

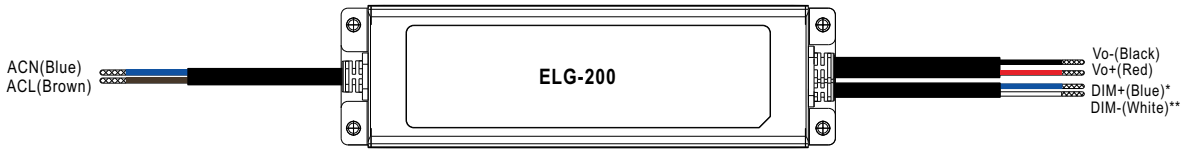


Typical output current normalized by rated current (%)

In the constant current region, the highest voltage at the output of the driver depends on the configuration of the end systems.

Should there be any compatibility issues, please contact MEAN WELL.

■ DIMMING OPERATION

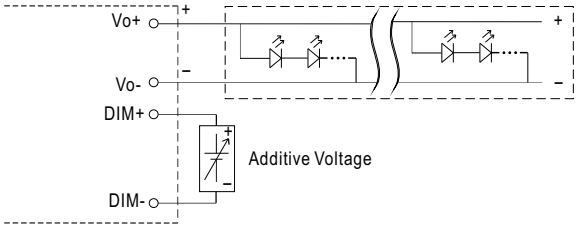


* DIM+ for B/AB-Type
DA+ for DA-Type
PROG+ for D2-Type
* *DIM- for B/AB-Type
DA- for DA-Type
PROG- for D2-Type

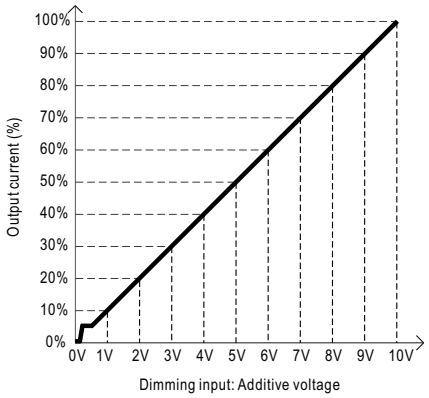
※ 3 in 1 dimming function (for B/AB-Type)

- Output constant current level can be adjusted by applying one of the three methodologies between DIM+ and DIM-: 0 ~ 10VDC, or 10V PWM signal or resistance.
- Direct connecting to LEDs is suggested. It is not suitable to be used with additional drivers.
- Dimming source current from power supply: 100μA (typ.)

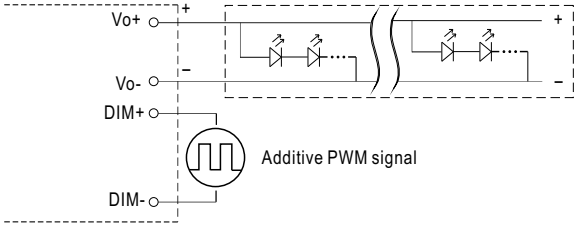
◎ Applying additive 0 ~ 10VDC



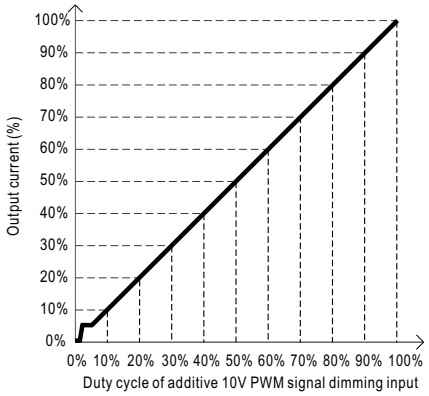
"DO NOT connect "DIM- to Vo-"



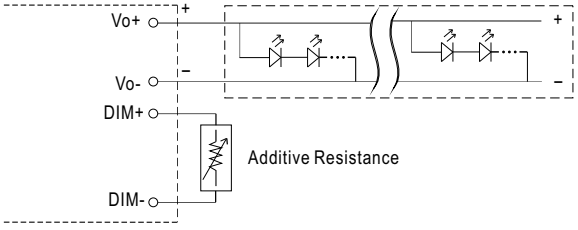
◎ Applying additive 10V PWM signal (frequency range 100Hz ~ 3KHz):



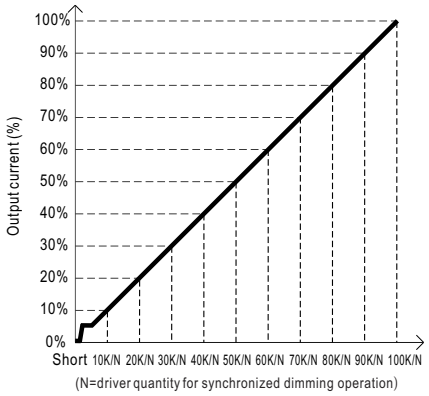
"DO NOT connect "DIM- to Vo-"



◎ Applying additive resistance:



"DO NOT connect "DIM- to Vo-"



Note : 1. Min. dimming level is about 8% and the output current is not defined when 0%< Iout<8%.
2. The output current could drop down to 0% when dimming input is about 0kΩ or 0Vdc, or 10V PWM signal with 0% duty cycle.

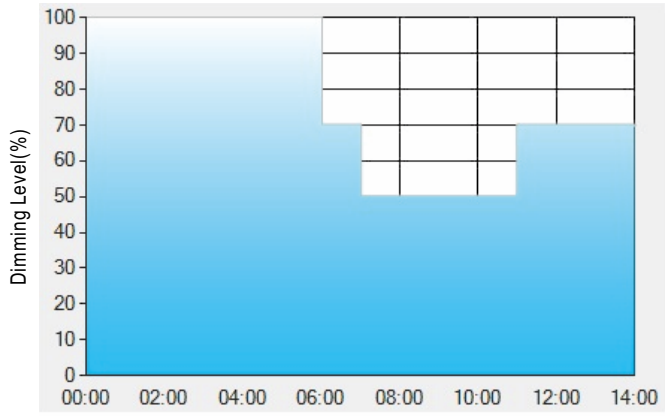
※ **DALI Interface (primary side; for DA-Type)**

- Apply DALI signal between DA+ and DA-.
- DALI protocol comprises 16 groups and 64 addresses.
- First step is fixed at 8% of output.

※ **Smart timer dimming function (for Dxx-Type by User definition)**

MEAN WELL Smart timer dimming primarily provides the adaptive proportion dimming profile for the output constant current level to perform up to 14 consecutive hours. 3 dimming profiles hereunder are defined accounting for the most frequently seen applications. If other options may be needed, please contact MEAN WELL for details.

Ex : ◎ D01-Type: the profile recommended for residential lighting



Set up for D01-Type in Smart timer dimming software program:

	T1	T2	T3	T4
TIME**	06:00	07:00	11:00	---
LEVEL**	100%	70%	50%	70%

**: TIME matches Operating Time in the diagram whereas LEVEL matches Dimming Level.

Example: If a residential lighting application adopts D01-Type, when turning on the power supply at 6:00pm, for instance:

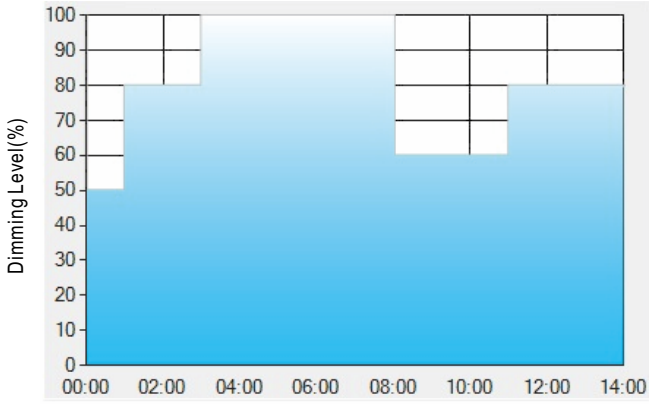
[1] The power supply will switch to the constant current level at 100% starting from 6:00pm.

[2] The power supply will switch to the constant current level at 70% in turn, starting from 0:00am, which is 06:00 after the power supply turns on.

[3] The power supply will switch to the constant current level at 50% in turn, starting from 1:00am, which is 07:00 after the power supply turns on.

[4] The power supply will switch to the constant current level at 70% in turn, starting from 5:00am, which is 11:00 after the power supply turns on. The constant current level remains till 8:00am, which is 14:00 after the power supply turns on.

Ex: ◎ D02-Type: the profile recommended for street lighting



Set up for D02-Type in Smart timer dimming software program:

	T1	T2	T3	T4	T5
TIME**	01:00	03:00	8:00	11:00	---
LEVEL**	50%	80%	100%	60%	80%

**: TIME matches Operating Time in the diagram whereas LEVEL matches Dimming Level.

Example: If a street lighting application adopts D02-Type, when turning on the power supply at 5:00pm, for instance:

[1] The power supply will switch to the constant current level at 50% starting from 5:00pm.

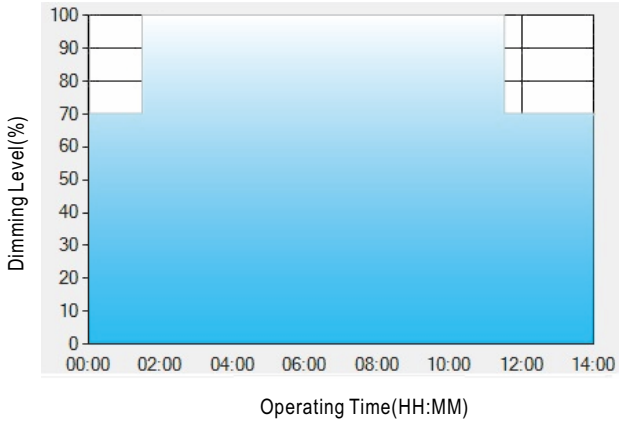
[2] The power supply will switch to the constant current level at 80% in turn, starting from 6:00pm, which is 01:00 after the power supply turns on.

[3] The power supply will switch to the constant current level at 100% in turn, starting from 8:00pm, which is 03:00 after the power supply turns on.

[4] The power supply will switch to the constant current level at 60% in turn, starting from 1:00am, which is 08:00 after the power supply turns on.

[5] The power supply will switch to the constant current level at 80% in turn, starting from 4:00am, which is 11:00 after the power supply turns on. The constant current level remains till 6:30am, which is 14:00 after the power supply turns on.

Ex: ◎ D03-Type: the profile recommended for tunnel lighting

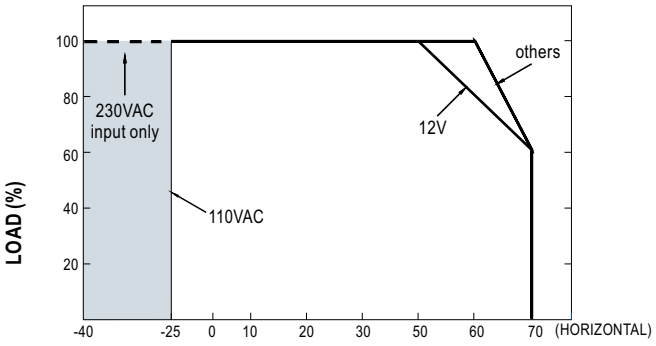


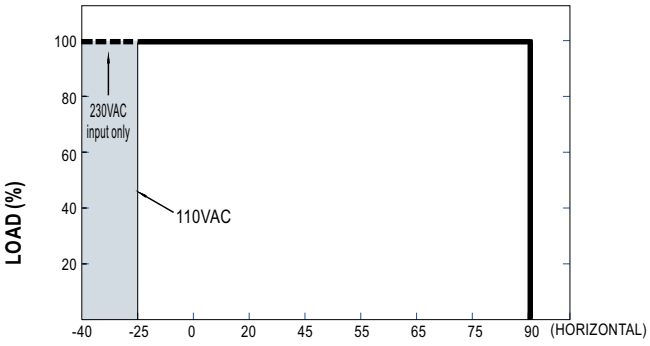
Set up for D03-Type in Smart timer dimming software program:

	T1	T2	T3
TIME**	01:30	11:00	---
LEVEL**	70%	100%	70%

**: TIME matches Operating Time in the diagram whereas LEVEL matches Dimming Level.
Example: If a tunnel lighting application adopts D03-Type, when turning on the power supply at 4:30pm, for instance:
[1] The power supply will switch to the constant current level at 70% starting from 4:30pm.
[2] The power supply will switch to the constant current level at 100% in turn, starting from 6:00pm, which is 01:30 after the power supply turns on.
[3] The power supply will switch to the constant current level at 70% in turn, starting from 5:00am, which is 11:00 after the power supply turns on.
The constant current level remains till 6:30am, which is 14:00 after the power supply turns on.

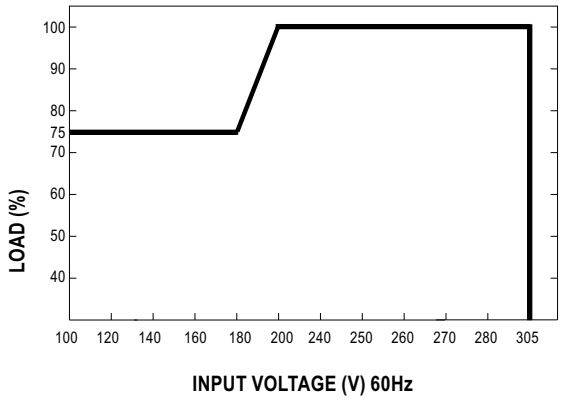
■ OUTPUT LOAD vs TEMPERATURE(Note.10)





◎ If ELG-200 operates in Constant Current mode with the rated current, the maximum workable Ta is 50℃ for 12V-model whereas 60℃ for other models.

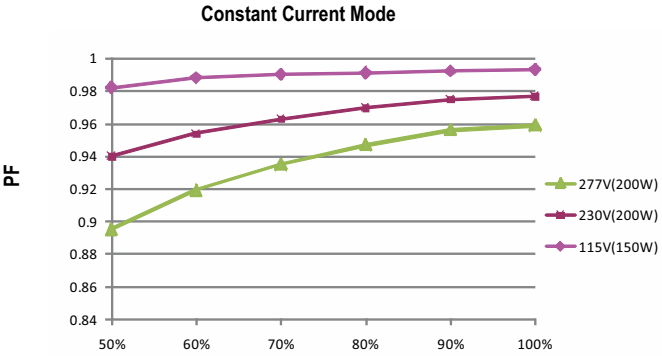
■ STATIC CHARACTERISTIC



※ De-rating is needed under low input voltage.

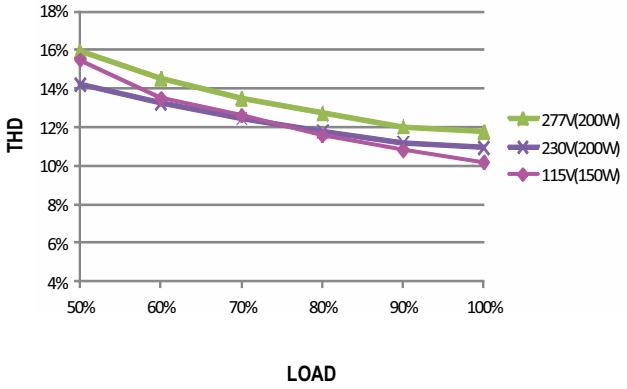
■ POWER FACTOR (PF) CHARACTERISTIC

※ Tcase at 80℃



■ TOTAL HARMONIC DISTORTION (THD)

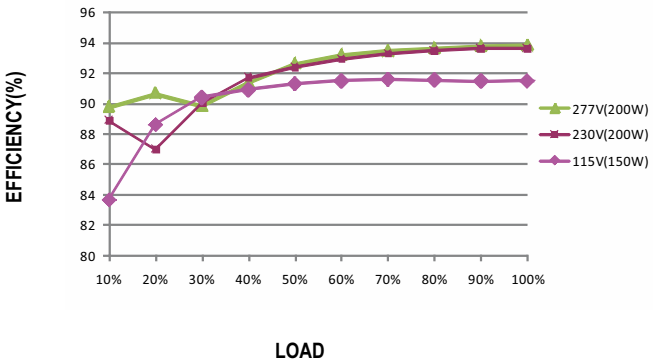
※ 48V Model, Tcase at 80℃



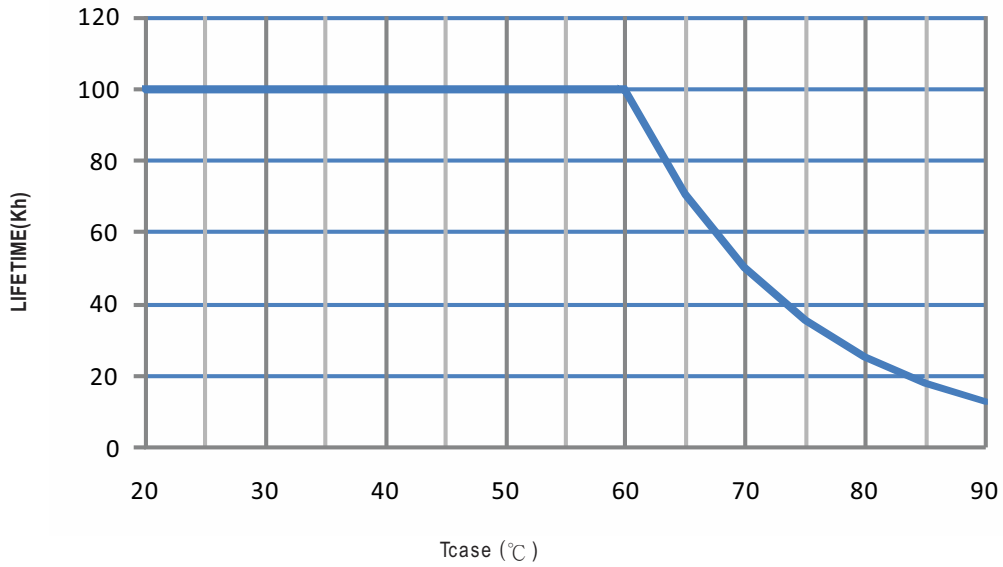
■ EFFICIENCY vs LOAD

ELG-200 series possess superior working efficiency that up to 93% can be reached in field applications.

※ 48V Model, Tcase at 80℃



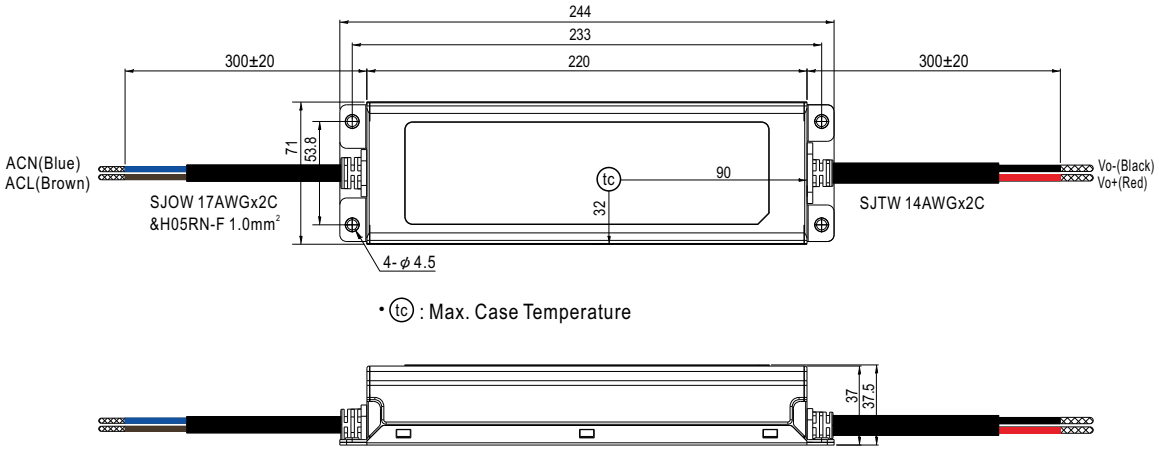
■ LIFE TIME



■ MECHANICAL SPECIFICATION

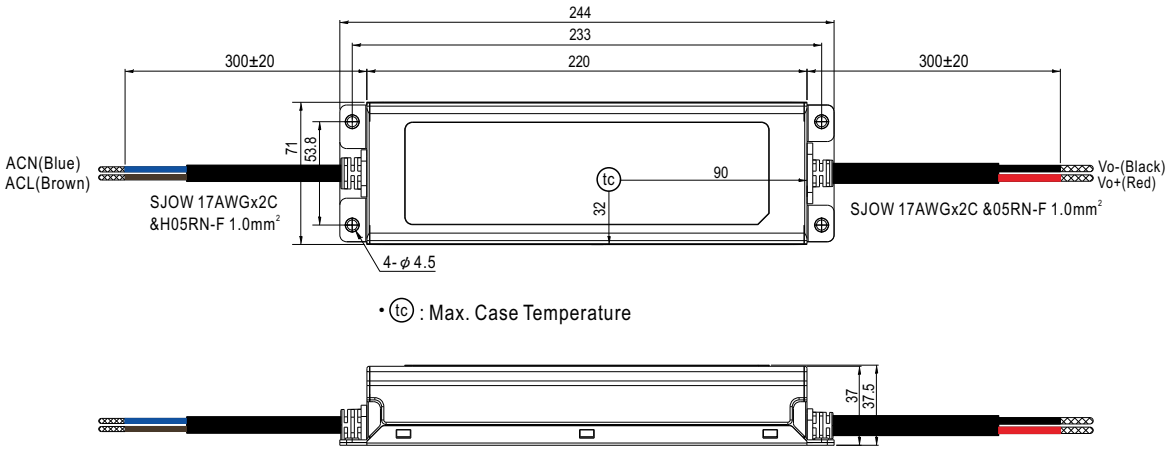
※ **Blank-Type (for 12V model)**

CASE NO.: 262A Unit:mm



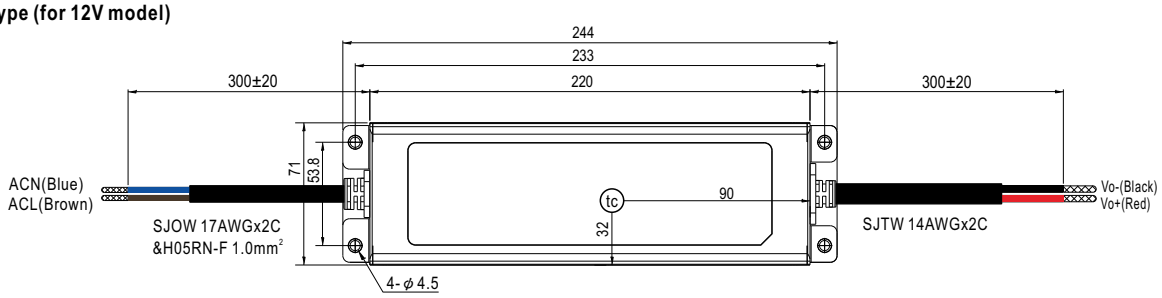
• tc : Max. Case Temperature

※ **Blank-Type (for other models)**

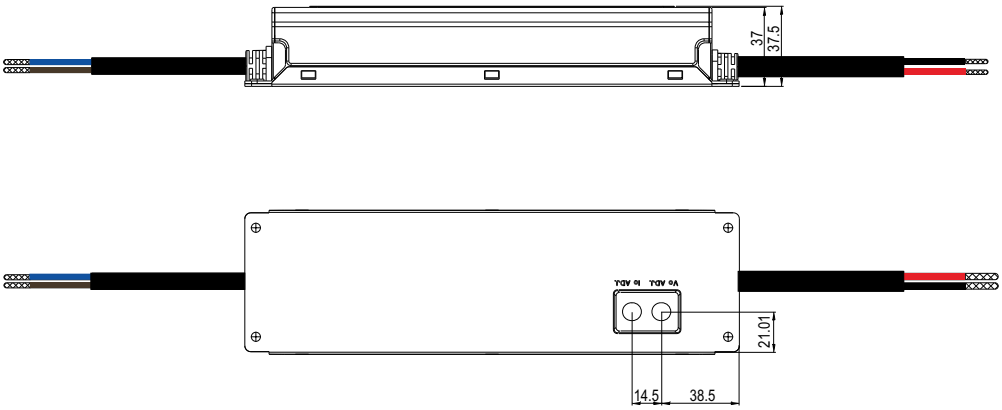


• tc : Max. Case Temperature

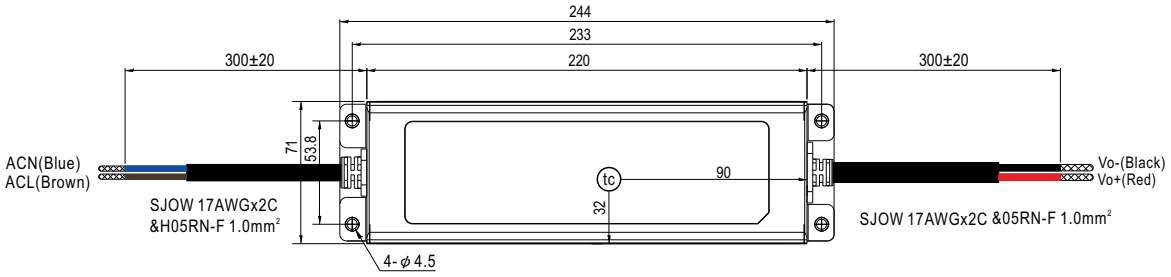
※ **A-Type (for 12V model)**



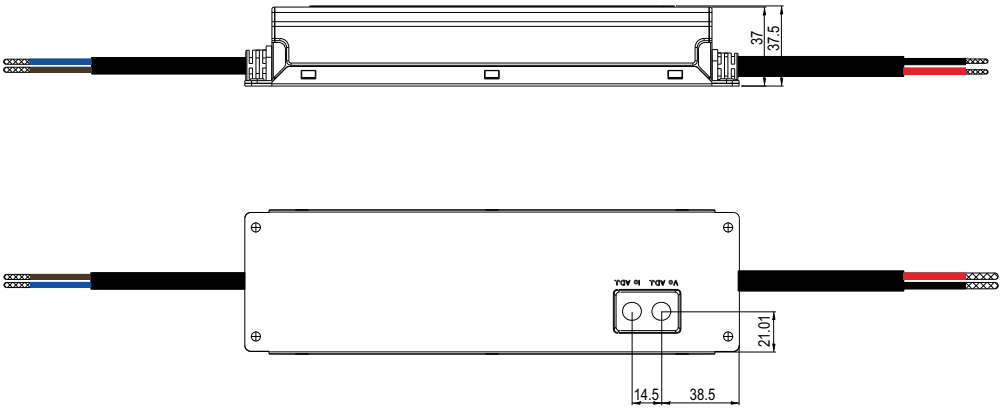
• (tc) : Max. Case Temperature



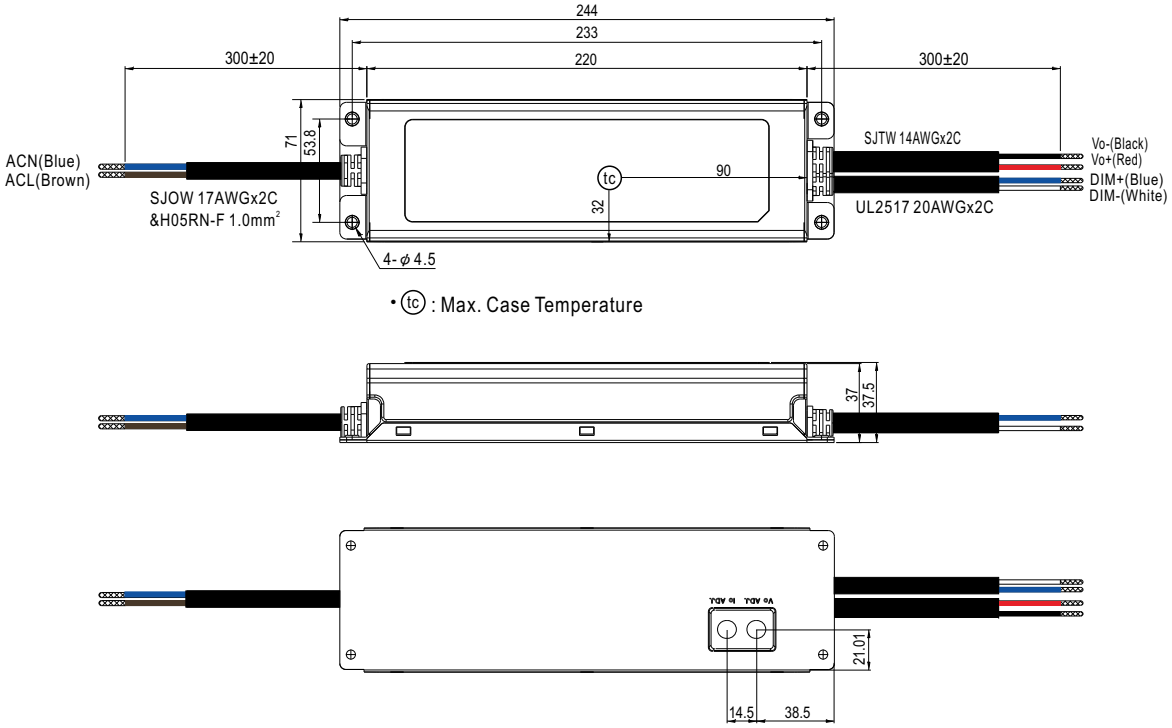
※ **A-Type (for other models)**



• (tc) : Max. Case Temperature

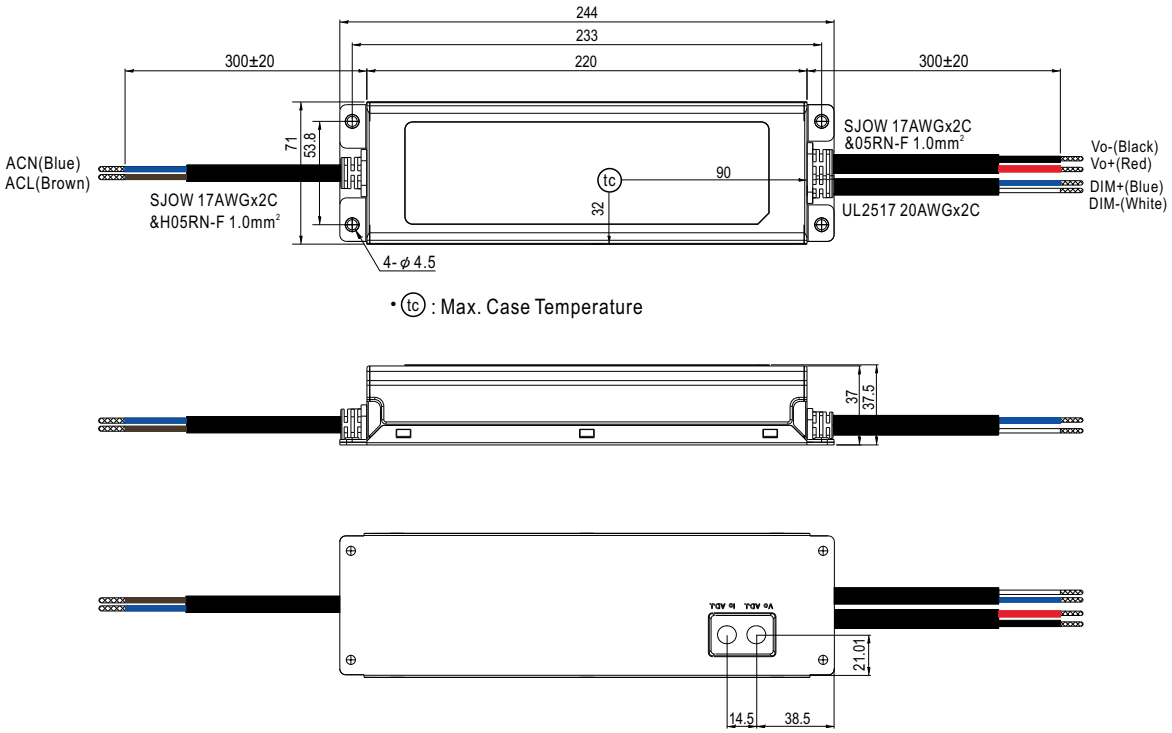


※ **AB-Type (for 12V model)**



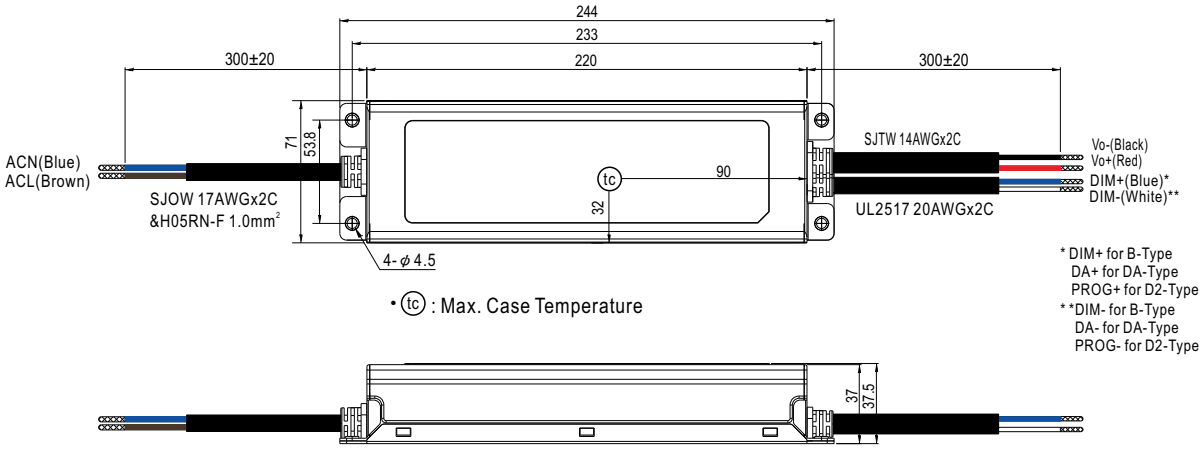
• tc : Max. Case Temperature

※ **AB-Type (for other models)**



• tc : Max. Case Temperature

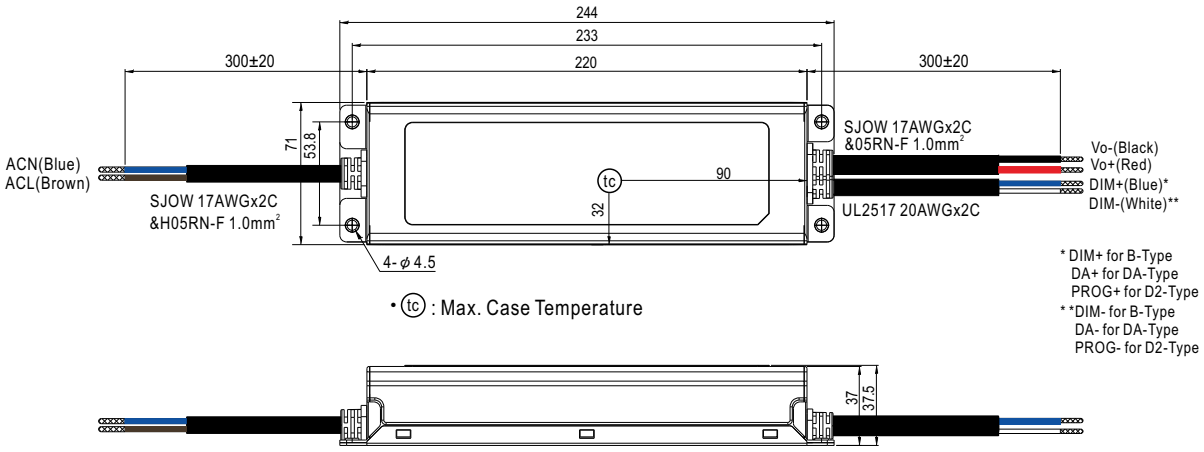
※ **B/DA/D2-Type (for 12V model)**



• tc : Max. Case Temperature

* DIM+ for B-Type
DA+ for DA-Type
PROG+ for D2-Type
* *DIM- for B-Type
DA- for DA-Type
PROG- for D2-Type

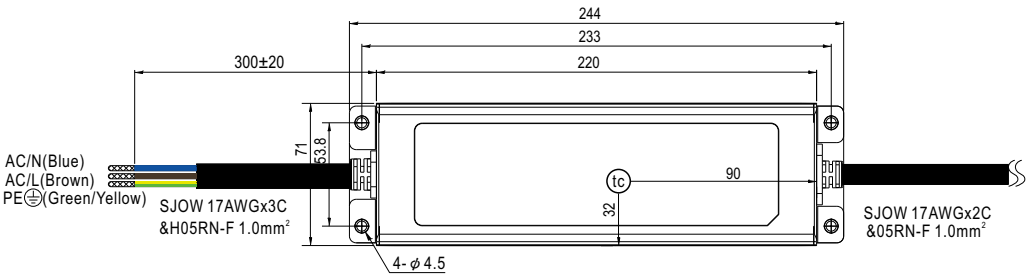
※ **B/DA/D2-Type (for other models)**



• tc : Max. Case Temperature

* DIM+ for B-Type
DA+ for DA-Type
PROG+ for D2-Type
* *DIM- for B-Type
DA- for DA-Type
PROG- for D2-Type

※ **3Y Model (3-wire input)**



• (tc) : Max. Case Temperature

◎ Note1: Please connect the case to PE for the complete EMC deliverance and safety use.
◎ Note2: Please contact MEAN WELL for input wiring option with PE.

■ INSTALLATION MANUAL

Please refer to : http://www.meanwell.com/manual.html