

## Intelligent LED Driver (Constant Voltage)

- Small size and light weight. Adopt SAMSUNG/COVESTRO V0 flame resistant polycarbonate protective housings.
- The clamshell design and screwless type for strain-relief. The design of dismountable end cap allows you to adjust the length of housing depending on your needs.
- With soft-on and fade-in dimming function, enhancing your visual comfort.
- The whole dimming process is flicker-free with high frequency exemption level.
- Dimming from 0~100%, down to 0.1%.
- Automatically recognize 0-10V and 1-10V input signals.
- Ultra-low consumption of 0-10V ports < 0.05mA.
- The secure and reliable design for signal isolation.
- Innovative thermal management technology protects the power life intelligently.
- Overheat, over voltage , overload, short circuit protection and automatic recovery.
- Suitable for indoor light applications of I/II/III type.
- Up to 50,000-hour life time.
- 5-year warranty (Rubycon capacitor).

4 in1 DIM  
• 0-10V •PWM  
• 1-10V •RX

**T-PWM**  
Dimming Technology

**Flicker Free**  
IEEE 1789

Dimmable:  
■■■■■■■■■■  
1:1000



**UL**  
E497951  
Type TL 85/82,3°C

**FC**

**CCC**

**CE**

**RoHS**

**SELV**

**Class 2**

**110**

**Overload protection**

**Overload protection**

**Overload protection**

**Overload protection**

**Overload protection**

0-10V  
PUSH DIM

Overheat protection

Over voltage protection

Overload protection

Short circuit protection

The certification icon represents on-going certification applications only, and final certification qualification is subject to actual products.

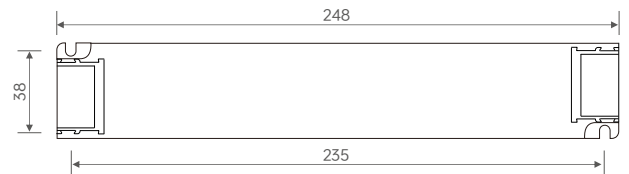
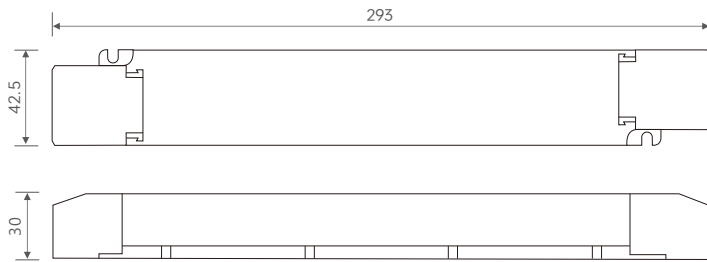
## Technical Specs

| Model        |                               | LM-60-24-U1A2                                                                                                |                | LM-60-12-U1A2                                                             |  |
|--------------|-------------------------------|--------------------------------------------------------------------------------------------------------------|----------------|---------------------------------------------------------------------------|--|
| OUTPUT       | Output Voltage                | 24Vdc                                                                                                        |                | 12Vdc                                                                     |  |
|              | Output Voltage Range          | 24Vdc±0.5Vdc                                                                                                 |                | 12Vdc±0.5Vdc                                                              |  |
|              | Output Current                | Max. 2.5A                                                                                                    |                | Max. 5A                                                                   |  |
|              | Output Power                  | Max. 60W                                                                                                     |                |                                                                           |  |
|              | Output Power Range            | 0-60W                                                                                                        |                |                                                                           |  |
|              | Strobe Level                  | High frequency exemption level                                                                               |                |                                                                           |  |
|              | PWM Frequency                 | 3600Hz                                                                                                       |                |                                                                           |  |
|              | Dimming Range                 | 0~100%, down to 0.1%                                                                                         |                |                                                                           |  |
|              | Overload Power Limitation     | ≥102%                                                                                                        |                |                                                                           |  |
|              | Ripple & Noise                | Switch ripple≤100mV, noises≤200mV                                                                            |                | Switch ripple≤200mV, noises≤400mV                                         |  |
| INPUT        | Dimming Interface             | 0-10V(1-10V/10V PWM/RX), Push DIM                                                                            |                |                                                                           |  |
|              | Input Voltage                 | 120-277Vac                                                                                                   |                |                                                                           |  |
|              | Frequency                     | 50/60Hz                                                                                                      |                |                                                                           |  |
|              | Input Current                 | 0.6A/120Vac, 0.35A/230Vac, 0.3A/277Vac                                                                       |                |                                                                           |  |
|              | Power Factor                  | PF>0.99/120Vac, PF>0.95/230Vac, PF>0.9/277Vac (at full load)                                                 |                |                                                                           |  |
|              | THD                           | 120Vac@THD < 5%, 230Vac@THD < 7%, 277Vac@THD < 10% (at full load)                                            |                |                                                                           |  |
|              | Efficiency (typ.)             | 91%                                                                                                          |                | 90%                                                                       |  |
|              | Standby Power Loss            | <0.5W                                                                                                        |                |                                                                           |  |
|              | Inrush Current                | Cold start 45A/230Vac (Test twidth = 840us under 50% Ipeak)                                                  |                |                                                                           |  |
|              | Anti Surge                    | L-N: 2KV                                                                                                     |                |                                                                           |  |
|              | Leakage Current               | Max. 0.5mA                                                                                                   |                |                                                                           |  |
| ENVIRONMENT  | Working Temperature           | ta: -20~50°C tc: 85°C                                                                                        |                |                                                                           |  |
|              | Working Humidity              | 20-95%RH, non-condensing                                                                                     |                |                                                                           |  |
|              | Storage Temperature, Humidity | -40~80°C, 10-95%RH                                                                                           |                |                                                                           |  |
|              | Temperature Coefficient       | ±0.03%/°C(-20~50°C)                                                                                          |                |                                                                           |  |
|              | Vibration                     | 10~500Hz, 2G 12min/1cycle, 72 min for X, Y and Z axes respectively                                           |                |                                                                           |  |
| PROTECTION   | Overheat Protection           | Intelligently adjust or turn off the output current if the PCB temperature ≥110°C, and recover automatically |                |                                                                           |  |
|              | Overvoltage Protection        | Shut down the output when non-load voltage≥28V, and recover automatically                                    |                | Shut down the output when non-load voltage≥14V, and recover automatically |  |
|              | Overload Protection           | Shut down the output when current load≥102%, and recover automatically                                       |                |                                                                           |  |
|              | Short Circuit Protection      | Enter hiccup mode if short circuit occurs, and recover automatically                                         |                |                                                                           |  |
| SAFETY & EMC | Withstand Voltage             | I/P-O/P: 3750Vac                                                                                             |                |                                                                           |  |
|              | Isolation Resistance          | I/P-O/P: 100MΩ/500VDC/25°C/70%RH                                                                             |                |                                                                           |  |
|              | Safety Standards              | UL                                                                                                           | America        | UL8750                                                                    |  |
|              |                               | CUL                                                                                                          | Canada         | CSA C22.2 NO. 250. 13                                                     |  |
|              |                               | CE                                                                                                           | European Union | EN61347-1, EN61347-2-13, EN62384                                          |  |
|              |                               | CCC                                                                                                          | China          | GB19510.1, GB19510.14, GB19510.213                                        |  |
|              | EMC Emission                  | UL                                                                                                           | America        | FCC part 15                                                               |  |
|              |                               | CE                                                                                                           | European Union | EN55015, EN61000-3-2, EN61000-3-3, EN61547                                |  |
|              |                               | CCC                                                                                                          | China          | GB/T17743, GB17625.1                                                      |  |
|              | EMC Immunity                  | EN61000-4-2,3,4,5,6,8,11, EN61547                                                                            |                |                                                                           |  |
|              | Strobe Test Standard          | IEEE 1789                                                                                                    |                |                                                                           |  |
| OTHERS       | Gross weight(G.W)             | 285g±10g                                                                                                     |                |                                                                           |  |
|              | Dimensions                    | 293×42.5×30mm(L×W×H)                                                                                         |                |                                                                           |  |
|              | Package size                  | 296×44×33mm(L×W×H)                                                                                           |                |                                                                           |  |
|              | Carton Size                   | 315×230×215mm(L×W×H) 30pcs/ctn 9.35kg±5%/ctn                                                                 |                |                                                                           |  |

\* The driver is suitable for connecting resistor current-limiting LED fixture (e.g. LED strip). The inrush current will be dozens of times increased if connecting built-in constant current IC current-limiting LED fixtures, the driver will activate the overloaded protection (hiccups flickering). When you order, please remark controlling the constant current LED fixture (e.g. MR16 lamp, underground light, LED wall washer, constant current LED strip, etc.), so that we can prepare them with special procedures.

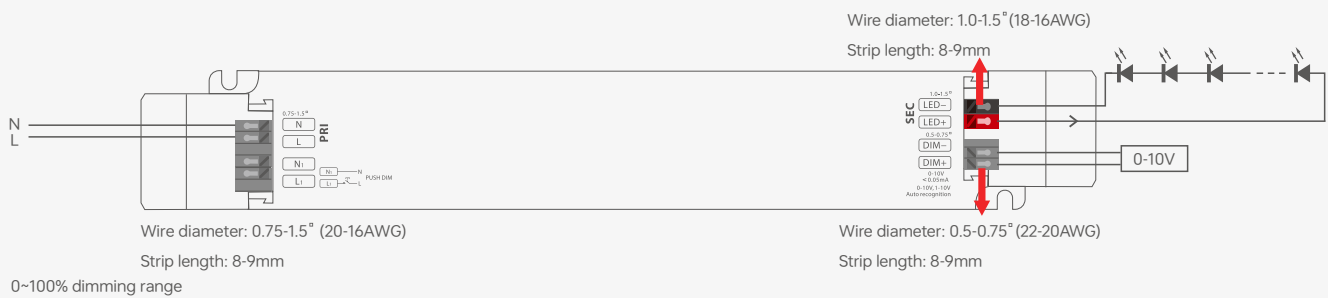
## Product Size

Unit: mm

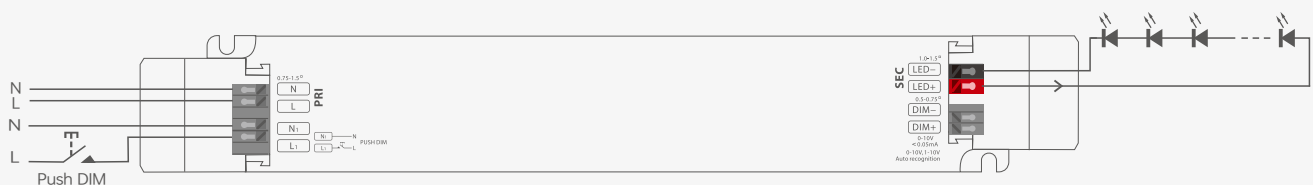


## Wiring Diagram

## 0-10V Connection



## Push DIM Connection



0~100% dimming range  
Short press to turn on/off  
Long press to dim

- \* Push Dim is invalid under DC voltage input.
- \* Dimming interface priority: 0-10V first , Push DIM next.

## Push DIM



## Operation Instructions

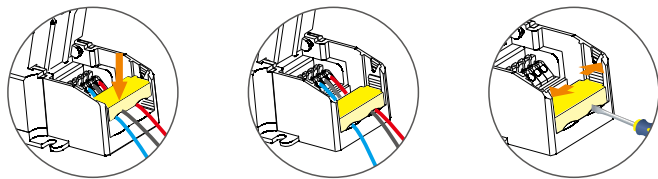
- Short press: on/off control.
- Long press: Adjust brightness +/-; with each subsequent long press, the brightness will adjust in the opposite direction.
- Dimming memory: When switched on again, the light will return to the previously set brightness level.

### Synchronous Dimming Reset Operation for Multiple PUSH DIM Dimming Drivers

Long press the dimming push button for more than 15 seconds, all drivers will output 100% brightness.

## Protective Housing Application Diagram

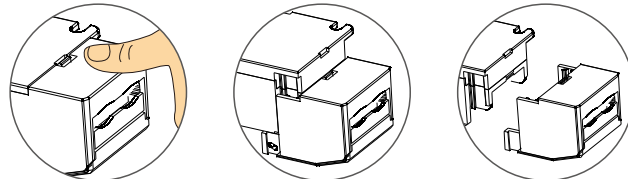
Tension plate



Push the tension plate down to fix the electric wires.

Push the side plate outwards and remove the tension plate by prying it up with a tool at the same time.

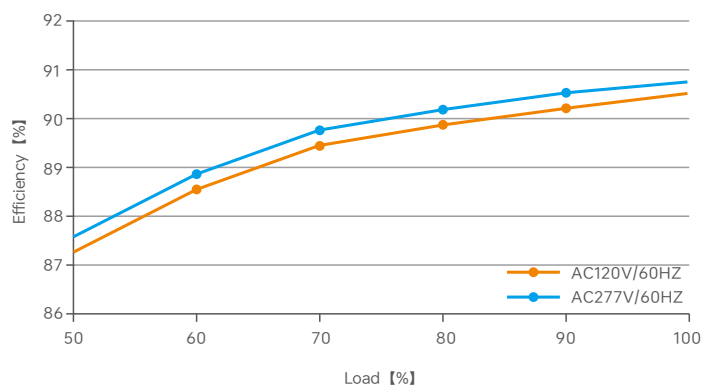
Remove the protective housing



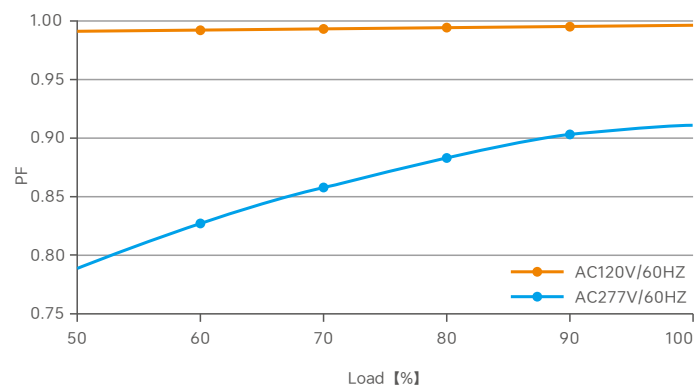
Pull the housing left and right from the bottom to remove it.

## Relationship Diagrams

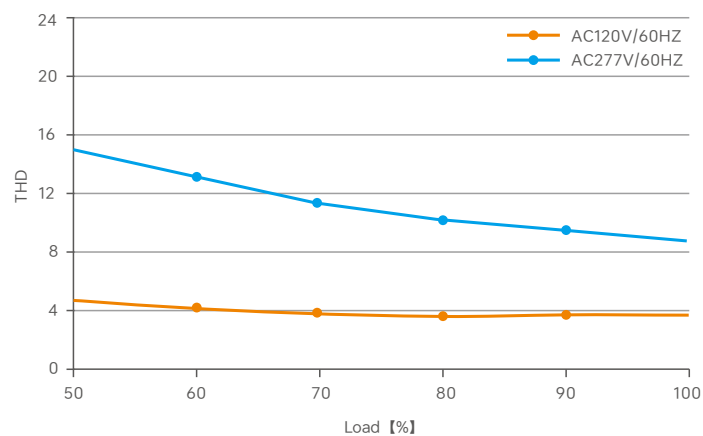
Efficiency vs Load



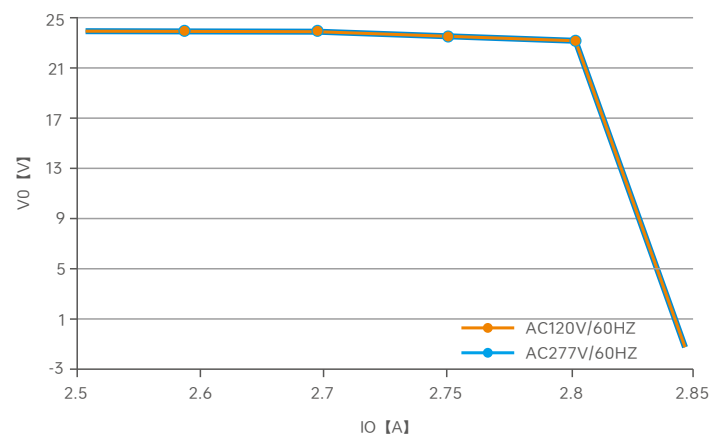
Power Factor Characteristic



THD VS Load

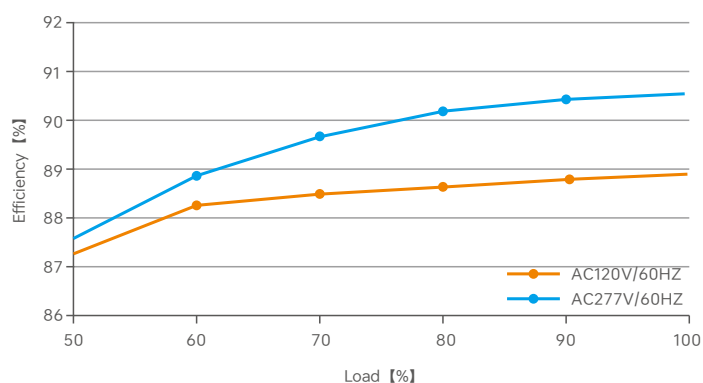


Over Load Diagram

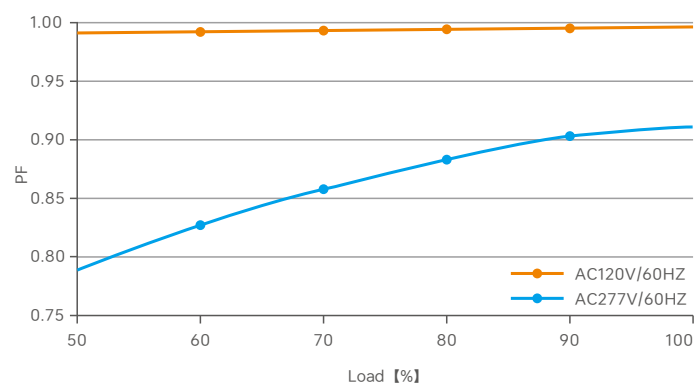


LM-60-24-U1A2

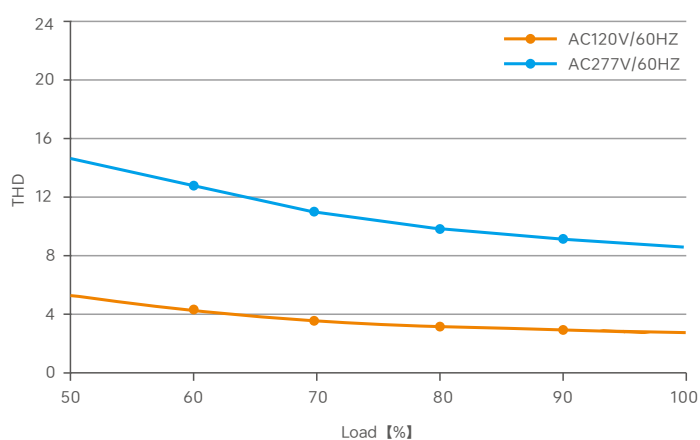
Efficiency vs Load



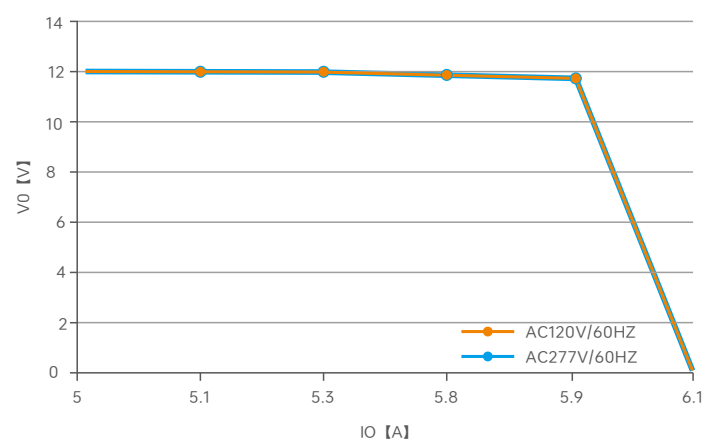
Power Factor Characteristic



THD VS Load



Over Load Diagram



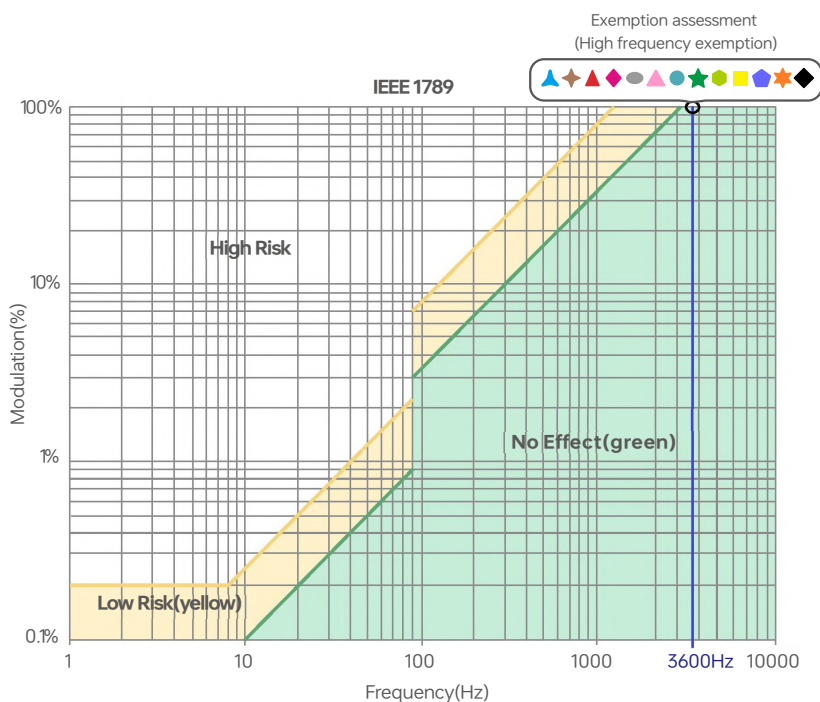
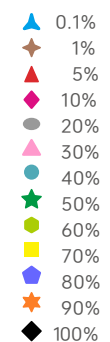
## LM-60-12-U1A2

## Flicker Test Table

IEEE 1789

| Limit Value of Modulation in Low Risk Areas  |                                                 |
|----------------------------------------------|-------------------------------------------------|
| Waveform frequency of Optical output (f)     | Limit value (%)                                 |
| $f \leq 8\text{Hz}$                          | 0.2                                             |
| $8\text{Hz} < f \leq 90\text{Hz}$            | $0.025 \times f$                                |
| $90\text{Hz} < f \leq 1250\text{Hz}$         | $0.08 \times f$                                 |
| $f > 1250\text{Hz}$                          | Exemption assessment                            |
| Limit Value of Modulation in No Effect Areas |                                                 |
| Waveform frequency of Optical output (f)     | Limit value (%)                                 |
| $f \leq 10\text{Hz}$                         | 0.1                                             |
| $10\text{Hz} < f \leq 90\text{Hz}$           | $0.01 \times f$                                 |
| $90\text{Hz} < f \leq 3125\text{Hz}$         | $(0.08/2.5) \times f$                           |
| $f > 3125\text{Hz}$                          | Exemption assessment (High frequency exemption) |

Brightness



Marks in the right chart are tested results of different current levels.  
The output frequency is 0Hz in 100% brightness and its corresponding modulation is 0%, which could not be shown in the right chart.

## Attentions

- Products shall be installed by qualified professionals.
  - LTECH products are non-waterproof (special models excepted). Please avoid the sun and rain. When installed outdoors, please ensure it is mounted in a water proof enclosure.
  - Good heat dissipation will extend the working life of products. Please ensure good ventilation.
  - Please check if the working voltage used complies with the parameter requirements of products.
  - The diameter of wire used must be able to load the light fixtures you connect and ensure the firm wiring.
  - Before you power on products, please make sure all the wiring is correct in case of incorrect connection that causes damage to light fixtures.
  - If a fault occurs, please do not attempt to fix products by yourself. If you have any question, please contact your suppliers.
- \* This manual is subject to changes without further notice. Product functions depend on the goods. Please feel free to contact our official distributors if you have any question.

## Warranty Agreement

- Warranty periods from the date of delivery: 5 years.
- Free repair or replacement services for quality problems are provided within warranty periods.

Warranty exclusions below:

- Beyond warranty periods.
  - Any artificial damage caused by high voltage, overload, or improper operations.
  - Products with severe physical damage.
  - Damage caused by natural disasters and force majeure.
  - Warranty labels and barcodes have been damaged.
  - No any contract signed by LTECH.
1. Repair or replacement provided is the only remedy for customers. LTECH is not liable for any incidental or consequential damage unless it is within the law.
  2. LTECH has the right to amend or adjust the terms of this warranty, and release in written form shall prevail.

## Update Log

| Version | Updated Time | Update Content         | Updated by  |
|---------|--------------|------------------------|-------------|
| A0      | 25/03/2021   | Original version       | Weili Liu   |
| A1      | 08/09/2026   | Update laser engraving | Simin Zhong |