

■ **Features**

- Input voltage: 90-305Vac
- Built-in active PFC function 0.98 Typ.
- Efficiency: up to 88% Typ.
- Built-in Lightning protection
- Three in one dimming operation mode(Isolated 0-10V Dimming / Clock Dimming(CLK)/PWM Dimming/ Dim to off)
- Auxiliary Power:12V/300mA max.
- Protection: OVP, SCP, OTP
- Full Power at 65%Iomax~100%Iomax (Constant Power)
- IP66 design,Suitable for Built-in Use
- UL Type HLfor use in a class I, Division 2 hazardous (Classified) location luminaires
- Comply with FCC rules
- ATEX&IECEX certificate



Version: A6

■ **Specification**

Model		MU060H105AQ_MB P/N:
Input	Efficiency(120Vac)(Typ.)Note.1	85.0%
	Efficiency(230Vac)(Typ.)Note.1	88.0%
	Voltage Range (V)Note.2	90~305Vac, OR 125~ 300Vdc (Derating may be need under low inputs, Refer to 'Derating Curve')
	Voltage Rate (V)Note.2	100Vac-277Vac
	Frequency Range (Hz)	47-63
	Power Factor(Typ.)	>0.95 with 80%~100% full load,at 230Vac 0.90(Typ.) with 60%~100% full load,at 100Vac-277Vac/60Hz
	THD(Typ.)	<15% at 220VAC input 50Hz,80%~100% full load <20% at 100Vac-277Vac/60Hz input ,60%~100% full load
	AC Current(Typ.)	0.8A at 100VAC input, 0.35A at 230VAC
	Inrush Current(Max.)	10A at Vin≤120Vac 25°C Cold Start
	Leakage Current(Max.)	0.75mA at 277VAC/60Hz input
Output	Voltage range (V) Note. 4	86-24
	Output Current Range(mA)	70-1050
	Rated Power (W)	60(max)
	Output Current Set Range	6.5%Io_max~100%Io_max
	Constant Power Output Set Range	65%Io_max~100%Io_max
	Ripple&Noise Current (Typ.)	10% max. ((PK-AV) /AV) with LED default mode and full load)
	Current Tolerance (Imax)	±5%
	Line Regulation (Imax)	±3%
	Load Regulation (Imax)	±5%
	Turn on delay Time	<0.5s, at 120-277Vac
Dimming Control	12Vdc Output Voltage (Vdc)	10.8Vmin~13.2Vmax.
	12Vdc Output Current(Vdc)	300mA max.
	0~10V/DIM+ Voltage	Absolute maximum voltage -10Vmin~20Vmax
	0~10V/DIM+ Short Current	280uA~450uA (DIM+)=0)
	Dim-to-off (Typ.)	Default: input ≤1V, output current 10%; input≥8.5V, output current 100%; input≤0.5V, Dimming off; input ≥0.8V,Dimming on
Protection	DIMMING FUNCTION	Default is 0-10V dimming mode.others dimming ways like PWM/CLK Dimming can set by software configuration
	Over Voltage(V)	130VDC Typ. No damage.The power supply shall be self-recovery when the fault is removed.
	Short Circuit	Protection type: Constant current limiting.
	Over Temperature	Decreases output current,returning to normal after over temperature is removed.
Environment	Operating Temp.	-40~+70°C (Refer to 'Derating Curve')
	Operating Humidity	20~95%RH, non-condensing
	Tc	90°C max
	Storage Temp., Humidity	-40~+85°C , 10~95%RH
	Temp. Coefficient	0.03%/°C (0~50°C)
Safety & EMC	Vibration	10-500Hz,5G 12min/cycle. period for 72min each along X、 Y、 Z axes
	Safety Standard	UL8750, UL1012, CSA C22.2 NO.107.1, IEC61347-1, IEC61347-2-13, IEC60079-0, IEC60079-18
	Withstand Voltage	I/P-O/P:3.75KVAC I/P-FG:1.875KV O/P-FG:1.5KV I/P-DIM:3.75KVAC O/P-DIM:1.875KV
	Isolation Resistance	I/P-O/P, I/P-FG, O/P-FG:100M Ohms/500Vdc/25°C/70%RH
	EMC Emission	EN55015/FCC Part 15 Class B, EN61000-3-2 Class C, EN61000-3-3
Others	EMC Immunity	EN61000-4-2,3,4,5,6,8,11 (Surge L,N-FG 6KV,L-N 4KV) ,EN61547
	MTBF	300,000 Hours,measured at full load,25°C ambient temperature
	Lifetime	50,000 Hours at Tc 75°C(Refer to'Life Time VS. Tcase (Ref.)')
	Dimension	171.6x70x44 mm (LxWxH)
	Weight	0.9kg(Typ.)

Note.1: Measured at full load and steady-state temperature in 25°C ambient(Efficiency will be about 2% lower if measured immediately after startup) ; Note. 2: Derating may be needed under low input voltages , Please Refer to 'Derating Curve' ; Note. 3: All parameters NOT specially mentioned are measured at 230VAC input , rated load and 25 °C of ambient temperature ; Note. 4: refer to V/I curve. When the output current set to less than 600mA, the led driver output voltage can be up to 94V.

subject to change without notice

Page 3 of 7

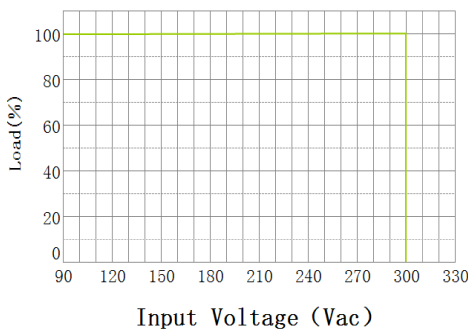
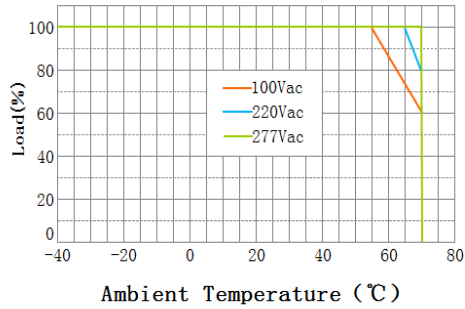
SHANGHAI MOONS' AUTOMATION CONTROL CO., LTD.

Add: No.168, Mingjia Road, Minbei Industrial Park, Shanghai 201107, P.R.China

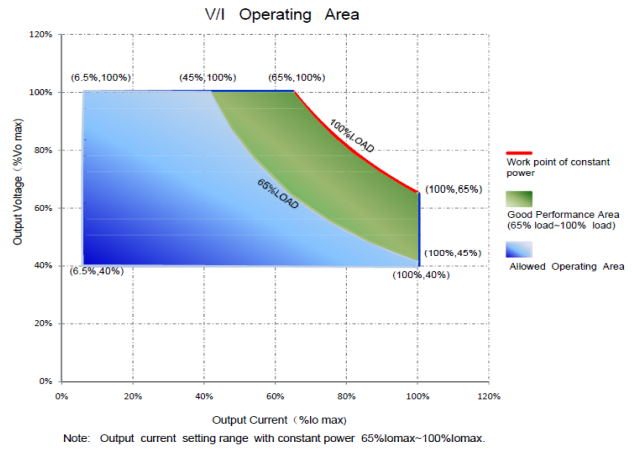
Tel: +86 (0)21 52634688 Website: www.moons.com.cn

■ **Operating Curve**

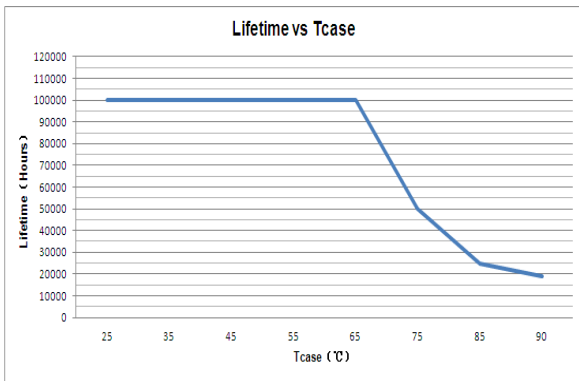
Derating Curve



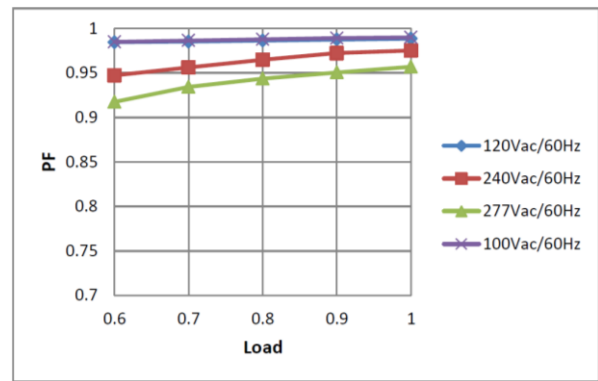
V/I Curve



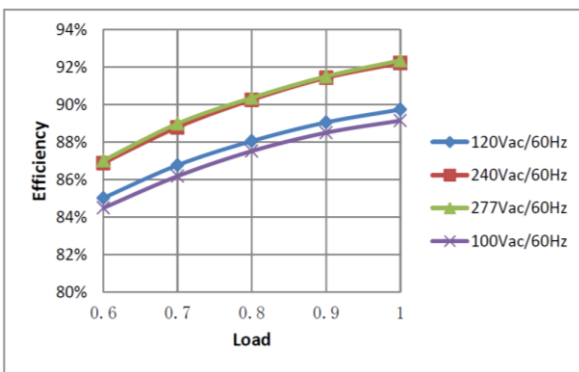
Lifetime vs. Case Temperature



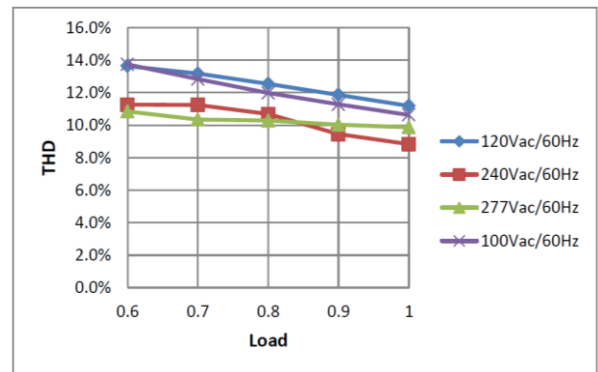
Power Factor Curve



Efficiency VS. Load Curve (typ.)

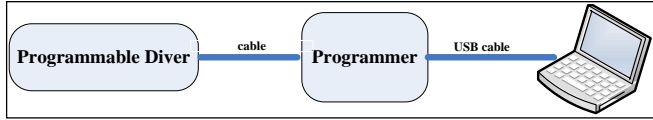


THD Curve



■ Instruction

1.Field Programmable Topology



The programmable driver can be programmed by using special PC software and the programmer module.

2.Dimming Interface Description

Pin description

Pin	Name	Value	Description
1	Vaux 12V	10.8V-13.2V	Passive dimmers power supply
2	Dim+/Program	0-10V	Dimming/Programming input
3	Dim-	0V	DC Ground

PROGRAMMING INTERFACE

- 1 Vaux 12V / YE(黄色)
- 2 Dim+ / PU(紫色)
- 3 Dim- / GR(灰色)

3.Dimming Software Function Instruction

■ Adjustable Output Current(AOC)

Adjustable Output Current(AOC)

Module Current mA

Max Current mA Power W

Users can set the rated current between 7%*Max Current and 100%*Max Current.

■ Adjustable Startup Time(AST)

Adjustable Startup Time (AST)

Start Fadeup Time s

Set driver's "Start Fade up Time". It means how much time the driver costs to achieve the "Module Current" that the user set. The valid value is 0s, 1s, 2s, 5s, 10s, 20s, 40s.

■ Fade Time(FT)

Fade Time(FT)

Fadeup Time s

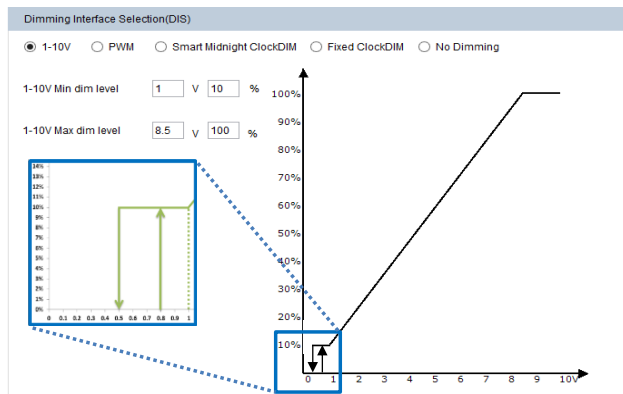
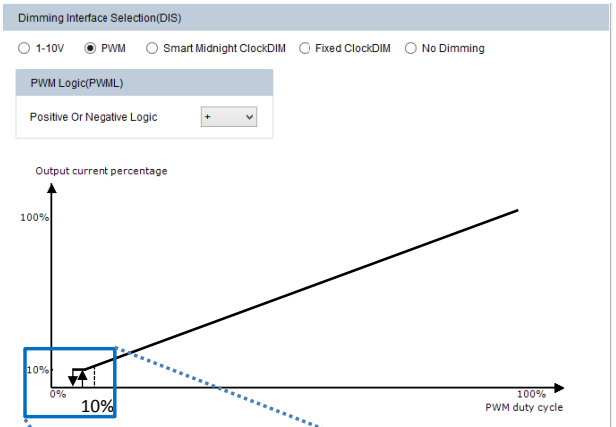
Set driver's "Fade up Time". This function is available in the Smart Midnight ClockDIM and Fixed ClockDIM mode; It means how much time the driver costs to achieve another dimming level from previous dimming level. The valid value is 0s, 1s, 2s, 5s, 10s, 20s, 40s.

■ 1-10V

Allow users to set the max and min output current and corresponding output voltage to clarify the 1-10V dimming curve. Input a 0~10V signal from 2nd pin of the dimming interface. Default: input $\leq 1V$, output current 10%; input $\geq 8.5V$, output current 100%; input $\leq 0.5V$, Dimming off; input $\geq 0.8V$, Dimming on.

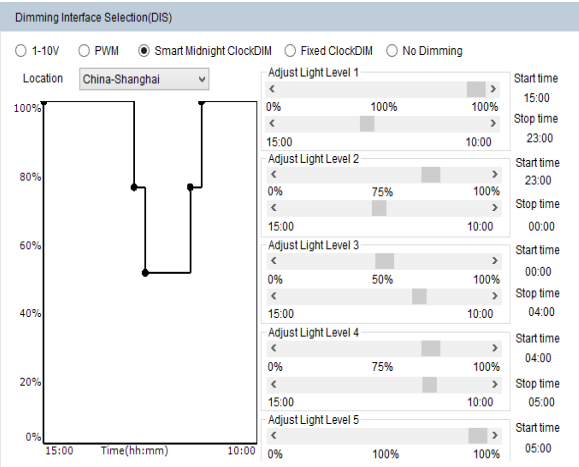
■ PWM

Input a PWM signal from the 2nd pin(Dim+/Program) of the dimming interface to change the output current. User can set "Positive Logic" or "Negative Logic" of the PWM signal. PWM duty circle: 10%~99%(it has both positive and negative logics), frequency: 500Hz~5kHz, 3V~10V is high, 0.3V~0.8V is low. Default: PWM $\leq 5\%$, Dimming off; PWM $\geq 8\%$, Dimming on.



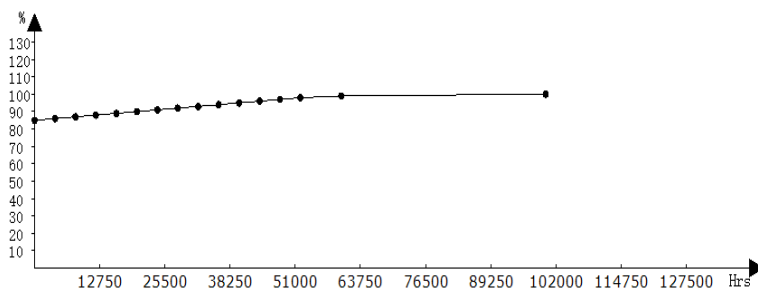
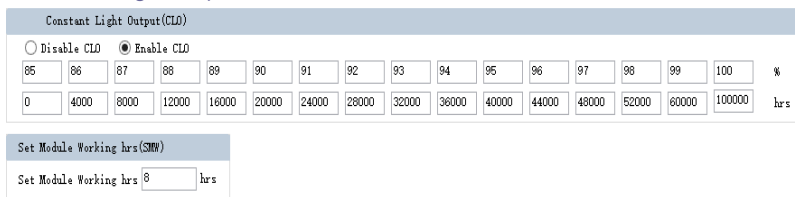
■ Instruction

■ Smart Midnight ClockDIM

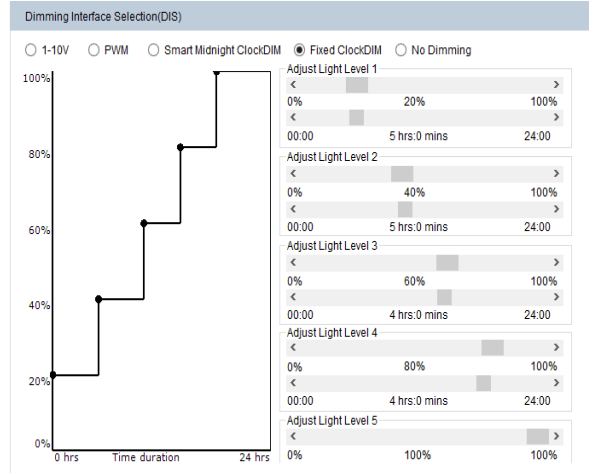


Smart Midnight ClockDIM allows dimming to predefined light levels based on the nightly operating time. With flexibility in setting time and light levels, the user can configure the driver for specific locations and application needs. Using Smart Midnight ClockDIM, it is possible to set up to 5 dim levels and time intervals. The driver does not have a real time clock. Instead it runs a virtual clock, determined by the length of nightly operating hours. After 3 ON-OFF cycles, the driver will calculate the virtual clock time. A valid ON-time is defined as a period during which the driver operates continuously for ≥ 4 hours to ≤ 24 hours. For example, if the requirement in summer is: 23:00-00:00: 75%, 00:00-04:00: 50%, 04:00-05:00: 75% (other time 100% or Off). The driver should be powered on for 7h, so it can calculate the virtual clock time as 22:00. Then we can set the dimming plan: 22:00-23:00: 100%, 23:00-00:00: 75%, 00:00-04:00: 50%, 04:00-05:00: 75%. From summer to winter, the valid ON-time changes day by day. The driver should be powered on for 17h in winter, and it also can calculate the virtual clock time as 17:00. Then the dimming plan is 17:00-23:00: 100%, 23:00-00:00: 75%, 00:00-04:00: 50%, 04:00-05:00: 75%, 05:00-10:00: 100%. From the above, if we set the dimming plan as shown in the picture, after repeating the driver ON-time for 3 consecutive days, the dimming plan takes effect from the 4th day onwards. Each day the driver powered on, it has a different start time according to the virtual clock time. So the driver can satisfy different requirements for different seasons.

■ Constant Light Output(CLO)

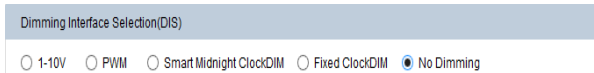


■ Fixed ClockDIM



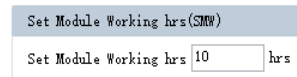
Allow users to separate 24hrs into 5 sections and corresponding output current.

■ No Dimming



The driver will be in constant output mode.

■ Set Module Working hrs(SMW)

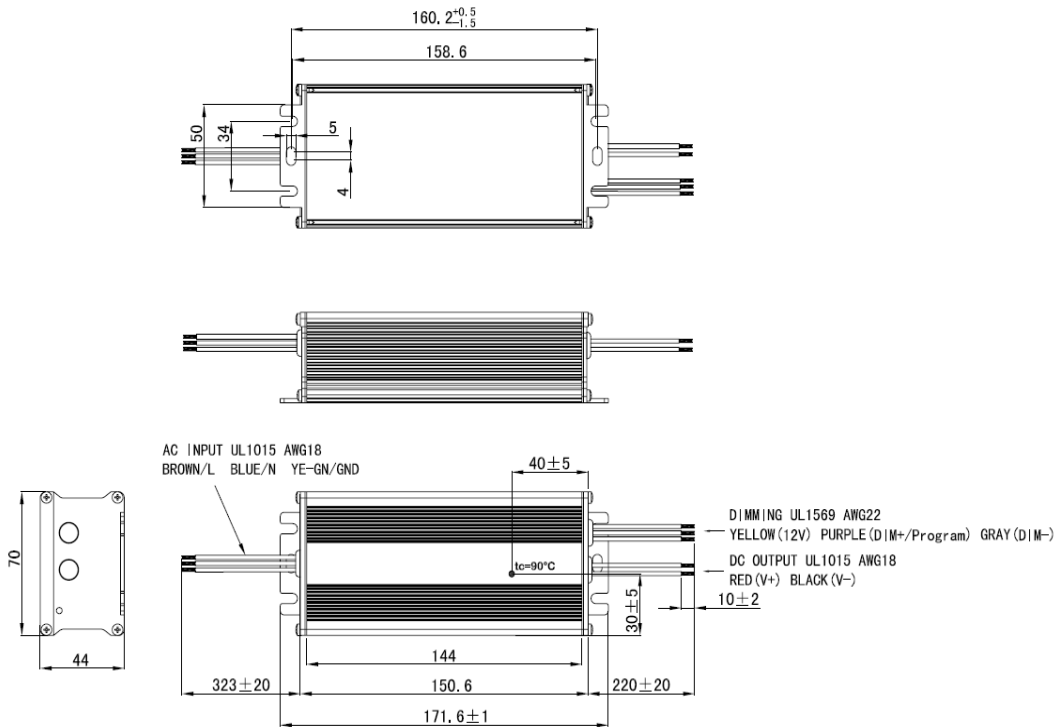


User can check how much time the driver works through this function.

Traditional light sources suffer from depreciation in light output over time. This applies to LED light sources as well. The CLO feature enables LED solutions to deliver constant lumen output through the life of the light engine. Based on the type of LEDs used, heat sinking and driver current, it is possible to estimate the depreciation of light output for specific LEDs and this information can be entered into the driver. The driver counts the number of light source working hours and will increase output current based on this input to enable CLO. When the CLO feature is enabled, the driver nominal output current will be defined by the CLO percentage as shown by the equation below: Driver target nominal output current = CLO percentage * AOC. For example, in the CLO profile shown in Figure, between 52,000-60,000 working hours, the CLO percentage is set at 98%. Assuming the nominal AOC is set to 500mA, the driver output current with CLO enabled will be $0.98 \times 500 = 490$ mA. The CLO percentage can be set to a value between 85%-100%, in increments of 1%. The LED module working hours can be set at any value between (0-100,000 hours).

■ **Mechanical Specification**

Dimensions(Unit:mm)



Nameplate:

INPUT AC/L BROWN AC/N BLUE YE-GN	MOONS' LED Driver Energy Saving Solutions SHANGHAI MOONS' AUTOMATION CONTROL CO.,LTD. Address: No. 168, Mingjia Road, Minhang District, Shanghai, P.R. China 201107 MADE IN CHINA	MU060H105AQ_MB PN: Input Voltage: 100-277Vac 50/60Hz 125-300Vdc Input Current: 0.8A Output Voltage: 24-86Vdc Adjustable Output Current: 70-105mA Settable Output Power: 60W U-OUT: 110V	0539 Ex II 2 G Ex mb IIC Gb Cert Numbers: DEMKO19 ATEX 2269U IECEX UL 19.0089U Permitted supply short-circuit current: 1500A Complies with FCC rules Service Temperature: -50°C to +90°C Dimming Range: 10% to 100% AUX Supply: 12V/300mA max TYPE HL	CUL US E348796 CE SELV RoHS V10	DIM Vaux 12V YE Dim+ PU Program GR Dim- GR
					OUTPUT V- BLACK V+ RED

RoHS Compliance:

Our products comply with the European Directive 2011/65/EC, calling for the elimination of lead and other hazardous substances from electronic products.