

subject to change without notice

■ Features

- ◆ Input voltage: 90-305VAC.
- ◆ Built-in active PFC function.
- ◆ High efficiency: 95.0% Typ.
- ◆ Constant current/ 1-10V dimming/ PWM dimming/CLK dimming/ 0-1V turn off.
- ◆ Full power at 65%I_{omax}~100%I_{omax} (constant power).
- ◆ IP67 design for indoor or outdoor installation.
- ◆ Lightning protection.
- ◆ Compliance to worldwide safety regulations for lighting.
- ◆ Suitable for dry/damp/wet location.

■ Specification

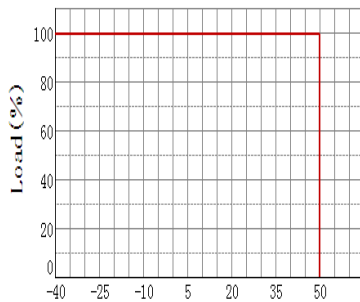
Model MU600H420AQ_CP/AUX		420
Input	Efficiency (120Vac)(Typ.) _{Note.1}	92.0%
	Efficiency (230Vac)(Typ.) _{Note.1}	95.0%
	Voltage Range _{Note.2}	90 ~ 305Vac or 127~431Vdc
	Frequency Range (Hz)	47~63
	Power Factor	PF>0.98/120VAC, PF>0.95/230VAC, PF>0.93/277VAC at full load
	THD	THD< 20% when output loading ≥ 60% at 120VAC/230VAC input and output loading ≥ 80% at 277VAC input
	AC Current	6.0A MAX at 120Vac, 2.9A MAX at 230Vac
	Inrush Current	COLD START 65A(twidth=680μs measured at 50% I _{peak}) at 230VAC
	Leakage Current	0.75mA MAX at 277Vac 60Hz input
Output	Rated Output Voltage (V)	143~214
	Output Voltage Range(V)	86-214
	Rated Current (mA)	2800-4200
	Rated Power (W)	600 (Max.)
	Current Tolerance _{Note.3}	±5%
	Line Regulation	±1%
	Load Regulation	±3%
	Turn-on Delay Time	1.0s, measured at 120Vac input;
Dimming Control	12Vdc Output Voltage (Vdc)	10.8Vmin.~12Vtyp.~13.2Vmax.
	12Vdc Output Current(mAdc)	0mA~50mA max.
	0~10V/DIM+ Voltage	Absolute maximum voltage -10Vmin~20Vmax
	0~10V/DIM+ Short Current	280uA~450uA (DIM(+)=0)
	DIMMING FUNCTION	Default 0-10V dimming mode. Other dimming modes sets to PWM/Clock Dimming(CLK) by software configuration
Protection	Over Voltage (V)(Typ.)	>240V
	Short Circuit	Protection type: Voltage limiting. Recovers automatically after fault condition is removed.
	Over Temperature	Constant current limiting, recovers automatically after fault condition is removed.
Environment	Operating Temp.	Hiccup mode,returning to normal after over temperature is removed.
	Operating Humidity	-40~+50°C, refer to the derating curve for detail
	Storage Temp., Humidity	5~95%RH, non-condensing
	Temp. Coefficient	-40~+85°C, 5%-95%RH
	Vibration	0.03%/°C (0~50°C)
Safety & EMC	Safety Standard	5-55Hz, 2G 5min/cycle, period for 30min each along X、Y、Z axes
	Withstand Voltage	UL8750, UL1012, CAN/CSA-C22.2 No.107.1, EN61347-1, EN61347-2-13,EN62384
	Isolation Resistance	I/P-O/P:3.75KVAC I/P-FG:1.875KVAC O/P-FG:0.5KVAC
	EMC Emission	I/P-O/P, I/P-FG, O/P-FG:100M Ohms/500VDC/25°C/70%RH
	EMC Immunity	EN55015/FCC Part 15 Class A, EN61000-3-2 Class C, EN61000-3-3
Others	MTBF	Compliance to EN61000-4-2,3,4,5,6,8,11, EN61547, light industry level (surge:L~N:±4KV,L,N~FG: ±6KV)
	Dimension	250,000 hours, measured at full load, 25°C ambient temperature MIL-HDBK-217F(25°C)
	Weight	276*102*58
		2.9Kg

Note.1: Measured at full load and steady state, in 25°C ambient temperature. Efficiency will be about 2% lower if measured immediately after startup.

Note.2: Derating may be needed under low input voltage. Please check the static characteristics for more detail.

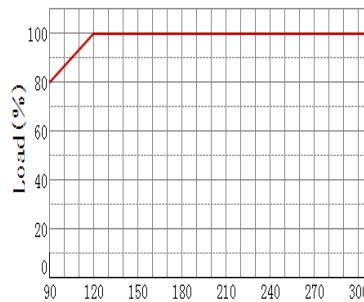
Note.3: Include set up tolerance, line regulation and load regulation.

Derating Curve

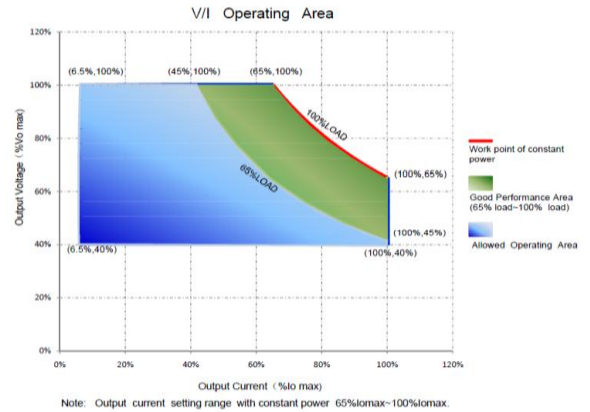


Ambient Temperature (°C)

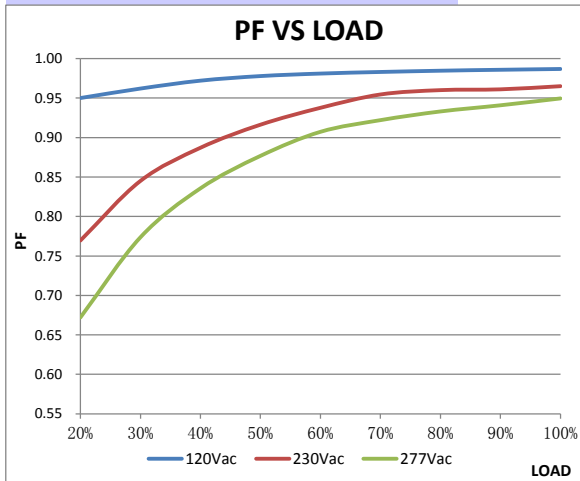
V/I Curve



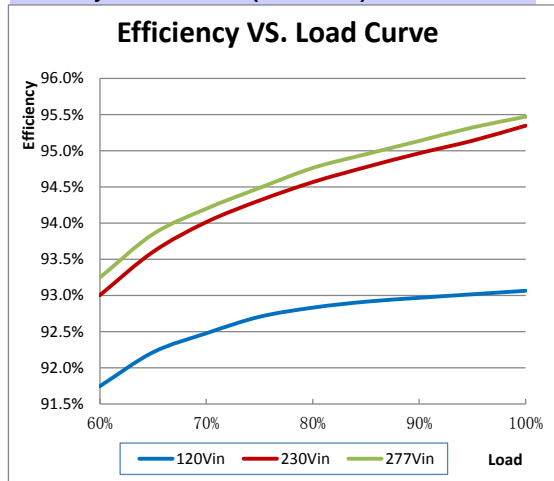
Input Voltage (V)



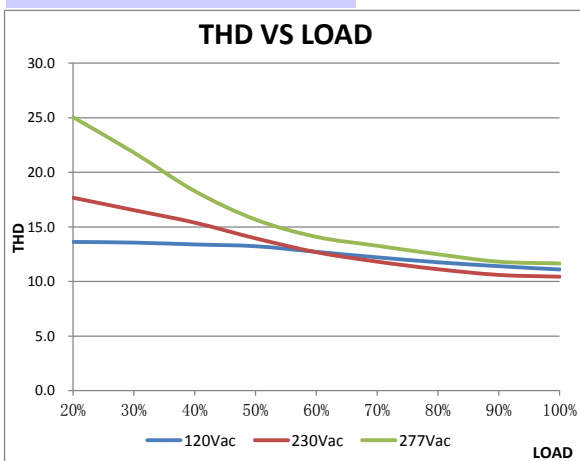
Power Factor VS. Load Curve



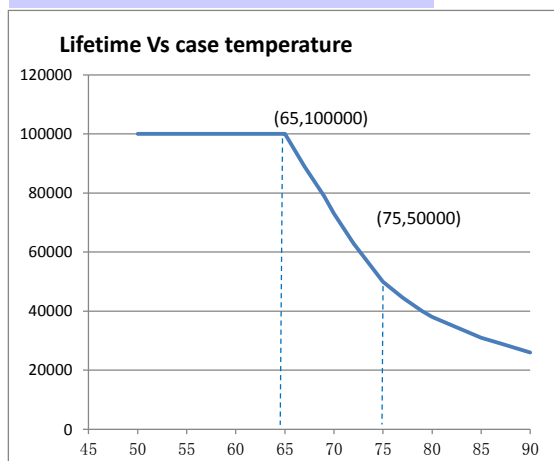
Efficiency VS. Load Curve(Model:3.5A)



THD VS. Load Curve

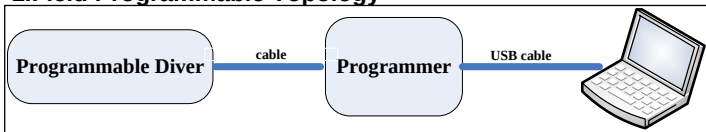


Life Time VS. Tcase



■ 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

CLKS DIMMING PROGRAMMING INTERFACE

- 1 Vaux 12V / YE(黄色)
- 2 Dim+ / Program / 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 10%*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)

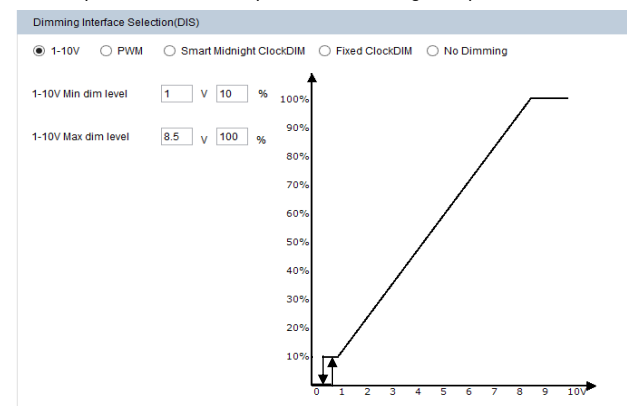
Fade Time(FT)

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

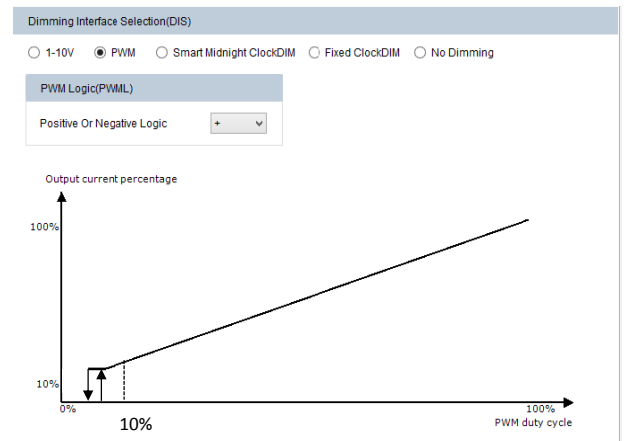
Allow users to set the max and min output current and corresponding output voltage to clarify the 1-10V dimming curve. Input a 0~10V signal from 2nd pin of the dimming interface. Default: input $\leq 1V$, output current 10%; input $\geq 8.5V$, output current 100%; input $\leq 0.5V$, Dimming off; input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



■ PWM

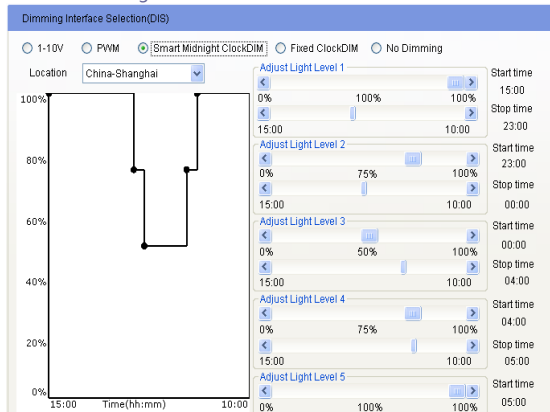
Input a PWM signal from the 2nd pin(Dim+/Program) of the dimming interface to change the output current. User can set "Positive Logic" or "Negative Logic" of the PWM signal. PWM duty circle: 1%~99%(it has both positive and negative logics), frequency: 500Hz~5kHz, 3V~10V is high, -0.3V~0.8V is low.

Default: PWM $\leq 5\%$, Dimming off, PWM $\geq 8\%$, Dimming on



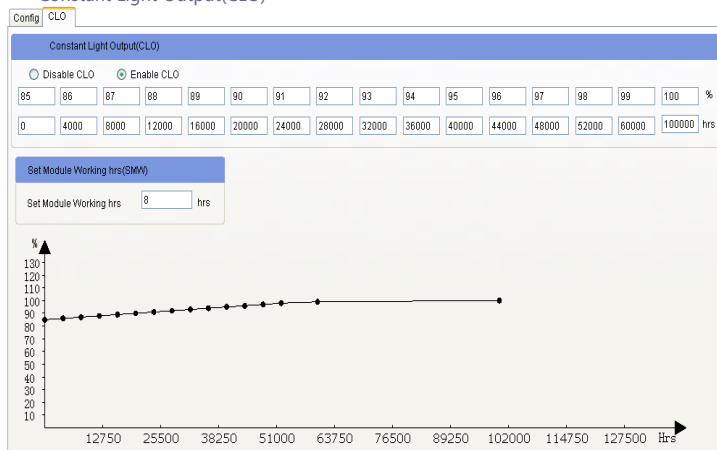
Instruction

Smart Midnight ClockDIM

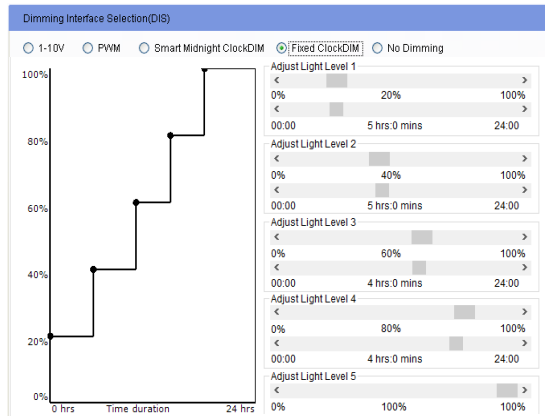


Smart Midnight ClockDIM allows dimming to predefined light levels based on the nightly operating time. With flexibility in setting time and light levels, the user can configure the driver for specific locations and application needs. Using Integrated Dynadimmer, it is possible to set up to 5 dim levels 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



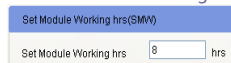
Allow users to separate 24hrs into 5 sections and corresponding output current.

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 $0.98 \times 500 = 600$ 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 to any value between (0-100,000 hours).

