1200W, 200-480Vac Input, Triple Output Non-isolated LED Driver

Product Datasheet

The global certified TYKT1K2-C is a non-isolated extremely wide input smart LED driver with multiple output. 20kV surge protection level, 100khour long life and 7-year warranty provide high confidence to luminaire users. It supports not only traditional 4-in-1 control, but also D4i and DMX/RDM protocols. NFC and cable programming are both available. All around protections including digital OTP (internal and external by NTC) with auto-recovery secure 24hour non-stop operation for luminaires.

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Features

- Absolute Supply Voltage: 180~528Vac
- 20kV Built-in Surge Protector
- 97% Efficiency Max.
- Low Frequency Ripple (Broadcasting Level)
- 0.1% Minimum Analog Output Dimming
- Fast Dimming and Quick Flashing
- Low Inrush Current
- 100,000Hour Life @ Tc=75℃
- 7 Year Warranty @ Tc<=75℃
- Lumen Compensation
- +/-2% Output Current Accuracy
- 0-10V/PWM/D4i/DALI2/DMX/RDM Support
- Daisy Chain Control Connection
- All-Channel Sync Mode
- 1% Energy Report Accuracy
- NFC Programmability
- Glow-free Dim Off
- 24V 3W Auxiliary Power
- IP66 and IK08 Enclosure
- Safety according to UL8750, EN 61347-1, 61347-2-13, 62384

Model List

Model Number	Input Voltage Range	Output Power/Channel	Output Voltage	Full Power Settable Current Min	Full Power Settable Current Max	Certification
TYKT1K2-C105-**XY**C	180~528Vac	400 W x 3	229-500Vdc	0.8A	1.05A	UL/ENEC/CB/RCM/ ONGOING
TYKT1K2-C140-**XY**C			171-381Vdc	1.05A	1.4A	UL/ENEC/CB/RCM/ ONGOING

XY=	Dimming Method	Programmable	Vaux	Dim-off
ER	0-10V + PWM	NFC	24V 120mA	√
GR	RDM + DMX + D4i + DALI2 Auto Detective	NFC	24V 120mA	√

Technical Data

Input Voltage	180~528Vac
Input Frequency	47~63Hz
Power Factor	>0.9@60-100%load, refer to PF vs. Load curve
THD	<15%@60-100%load, refer to THD vs. Load curve
Input Current	6.1Amax@208Vac & Full-Load, 5.7Amax@220Vac & Full-Load 4.6Amax@277Vac & Full-Load, 2.8Amax@480Vac & Full-Load
Inrush Current	See Inrush Current Section in the datasheet
Leakage Current	0.75MIU max @480Vac 60Hz, UL8750 0.7mA max @400Vac 50/60Hz, IEC60598-1
Input Under Voltage	Shut down and auto-restart
Surge Protection	Line to line 20kV, line to ground 20kV, IEC 61000-4-5
Current Accuracy	±2%Io
Ripple Current	Ipk-pk: low frequency (<=3kHz) 2%Io max, high frequency (>3kHz) 15%Io max
TLA (Temporal Light Artifacts)	PstLM<0.02, SVM<0.05, @100% dimming condition
Setup Time	2s max
Overshoot	10% Io max & LED Load
Output Over Voltage	110% Vomax, typ.
Short Circuit	Auto recovery. The output recovers when short is removed.
Over Temperature	Lower the output current when Tc≧105±10℃; Auto Recovery When Tc≦70±10℃
Operating Temperature	Case Temperature Tc=-40℃~+90℃ ; 10%RH～100%RH
Storage Temperature	-40℃～+85℃; 5%RH～100%RH
MTBF	≥320,000 hours, 75℃ case temperature (MIL-HDBK-217F)
Lifetime	≥100,000 hours, 75℃ case temperature, refer to life vs. Tc curve
Case Temperature	90℃ max, marked in the Tc point of label
Dimension	380x152x90 mm
Net Weight	<5kg
Packing	See Package Information Section in the datasheet

Notes: Unless specified, all the test results are measured in 25℃ room temperature.

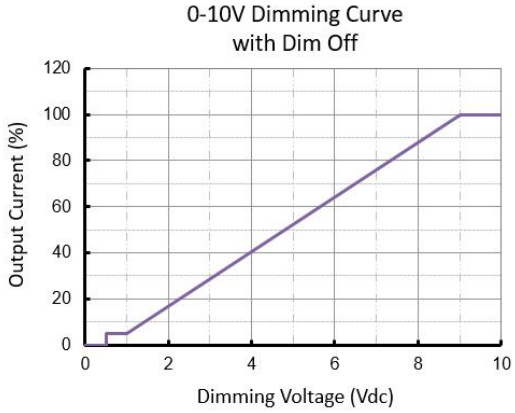
Safety/EMC Compliance

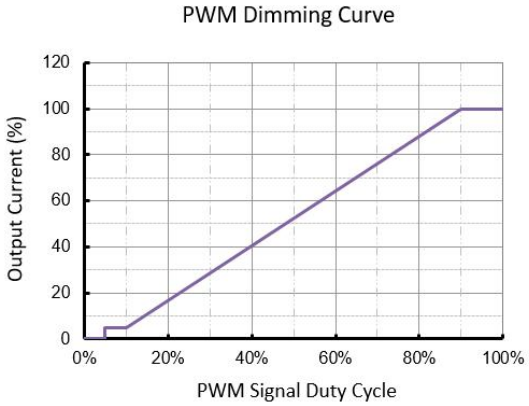
Safety Standards	Description
UL8750	Light emitting diode(LED) equipment for use in lighting products
UL1012	Power units other than class 2
IEC 61347-1	Lamp control gear Part 1: general and safety requirements
IEC 61347-2-13	Lamp control gear Part 2-13: particular requirement for d.c. or a.c. supplied electronic control gear for LED modules
IEC 62384	DC or AC supplied electronic control gear for LED modules - Performance requirements
EMC Standards	Description
IEC 55015	Conducted emission test & radiated emission test
IEC 61000-3-2	Harmonic current emissions; Class C
IEC 61000-3-3	Voltage fluctuations & flicker
FCC Part 15	ANSI C63.4:2009 Class B
IEC 61000-4-2	Electrostatic discharge (ESD): 8 kV air discharge, 4 kV contact discharge
IEC 61000-4-3	Radio frequency electromagnetic field susceptibility test (RS)
IEC 61000-4-4	Electrical fast transient (EFT)
IEC 61000-4-5	Surge immunity test
IEC 61000-4-6	Conducted radio frequency disturbances test (CS)
IEC 61000-4-8	Power frequency magnetic field test
IEC 61000-4-11	Voltage dips
IEC 61547	Electromagnetic immunity requirements applies to lighting equipment

Dimming

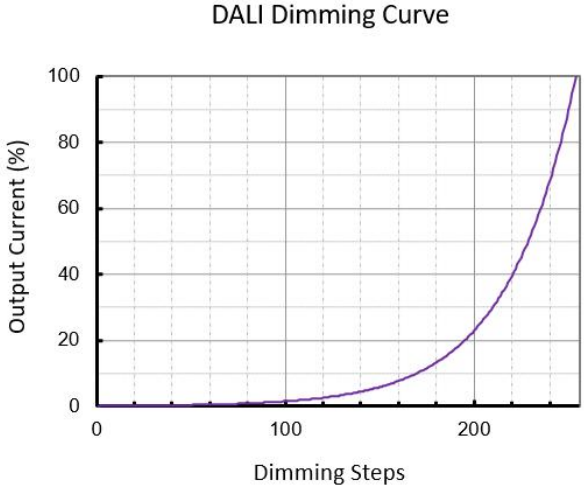
Parameter	Min.	Typ.	Max.
0-10V Vdim Sourcing Current	100uA	150uA	200uA
0-10V Vdim Allowed Input Voltage	-20 V		20 V
0-10V Dimming Range	0.1% (Vdim=1V)	Linear	100% (Vdim=9 or 10V)
PWM Dimming Range	0.1% (Duty=10%)	Linear	100% (Duty=90 or 100%)
Dim off threshold	0.4V or 4%	0.5V or 5%	0.6V or 6%
Dim on threshold	0.6V or 6%	0.7V or 7%	0.8V or 8%
PWM High	3.8V		10V
PWM Low	0V		0.6V
PWM Frequency	300Hz		2kHz
External PWM Controller Current Sinking Capability	300uA		
DALI Interface Standard	IEC62386-101,102,150,207,250,251,252,253		
Dimming Range	0.1%	-	100%
DA1,DA2 High Level	9.5V	16V	22.5V
DA1,DA2 Low Level	-6.5V	0	6.5V
DA1,DA2 Current	0		2mA
Bus Power Supply Voltage	12Vdc	16Vdc	20Vdc
Bus Power Supply Current	52mA	-	60mA
Auxiliary Power Voltage	21.6V	24V	26.4V
Auxiliary Power	3W	-	4W
Auxiliary Power Endurance @6W	3.8ms/6ms	-	4.5ms/6ms
Auxiliary Power Endurance @10W	1.8ms/6ms	-	2.2ms/6ms
DALI Bus Power Supply Current	52mA	-	60mA
DMX+ & DMX- Voltage	-6V		6V
DMX to Ground Resistance	25Mohm		
Logic 0/1 (DMX+ to DMX-) Threshold		0.2V	
Communication Baud Rate		250kbps	
On/Off Flashing Rate with DMX		25fps	

- **0-10V/PWM Dimming Curve (Minimum dimming level can be customized by PC software)**

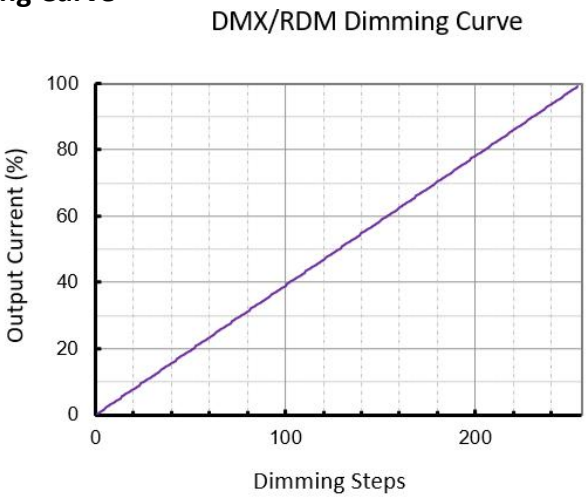




- **DALI/D4i Dimming Curve**



- **DMX512/RDM Dimming Curve**



Note: Both DALI and DMX dimming curves can be customized to be linear or logarithmic as default.

Programming

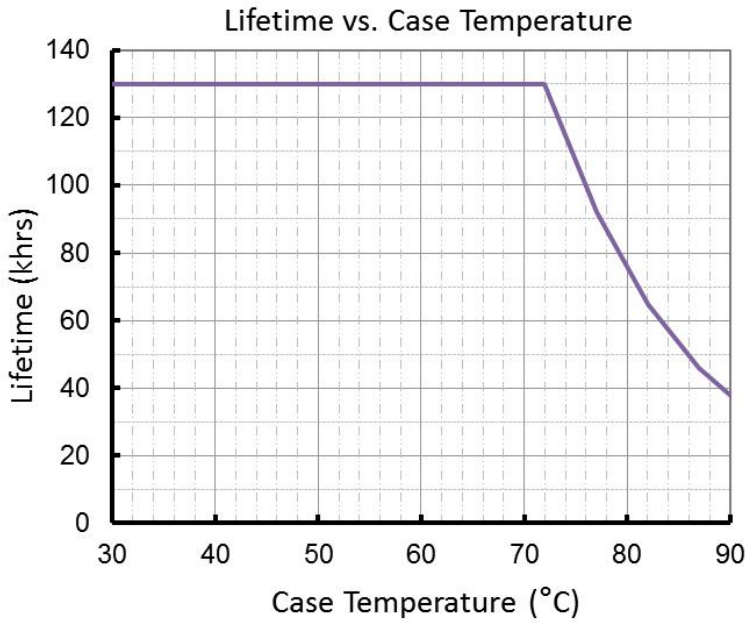
- **NFC Programming by PC/Laptop**

a. Download PC Software at https://www.upowertek.com/download-2/
b. Click “Programming Software for Multi-Channel Drivers”
c. Click uPowerTek_Programming_Utility_For_Multi_Channel_Drivers_Vx_Setup.exe to install the software.
d. Open the software by windows Start Menu.

- **Please contact with us for programming user manual and more information such as:**

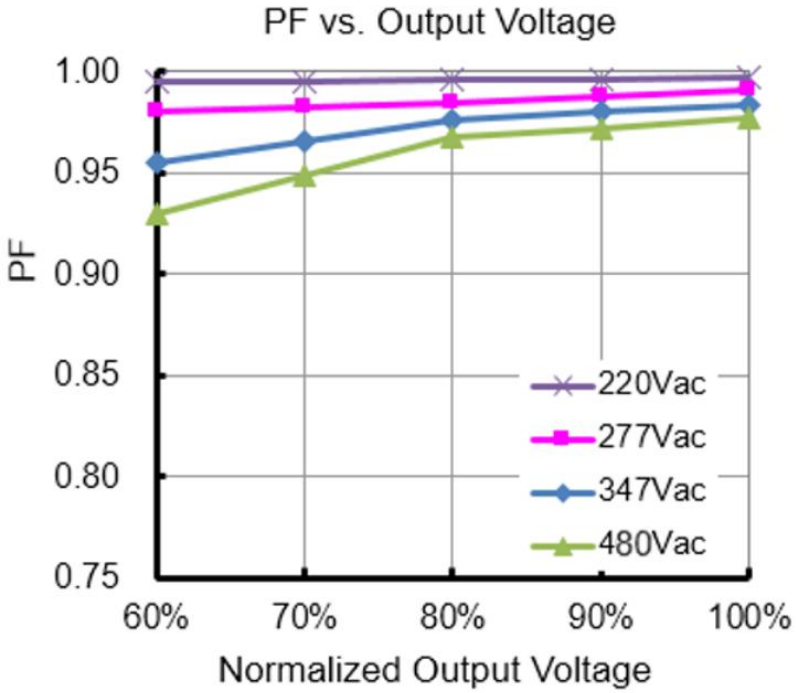
a. Sync Mode to Single Output or Dual Output
b. Output Lumen Compensation
c. Luminaire Thermal Protection by External NTC (with extra cable)
d. Dimming Curve Customization (dim off threshold, minimum dimming level, maximum dimming voltage etc.)
e. Adjustable Startup Time
f. Time Dimming (adaptive mid-night, percentage, etc.)
g. Customized Control Protocol

Lifetime vs. Case Temperature

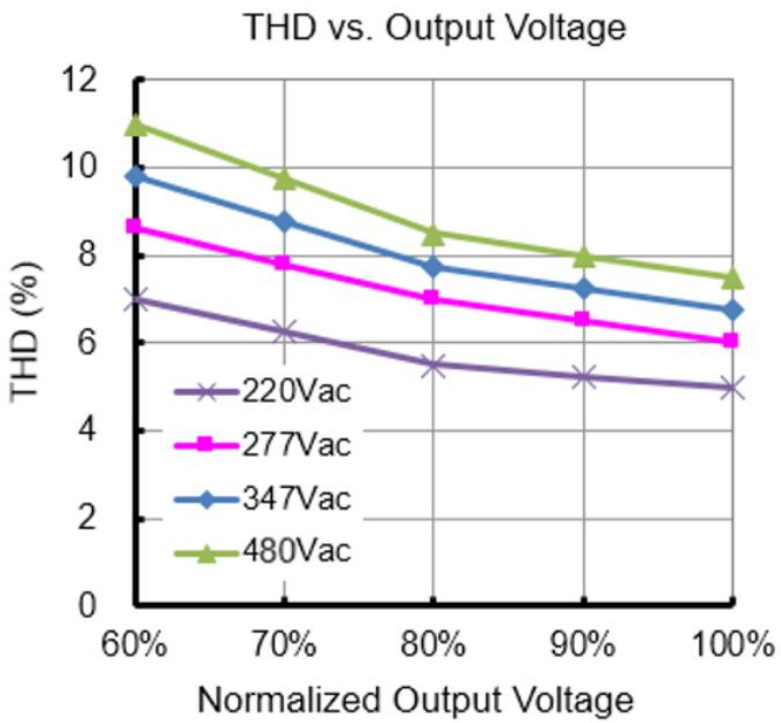


(End of Life: Maximum Failure Rate=10%)

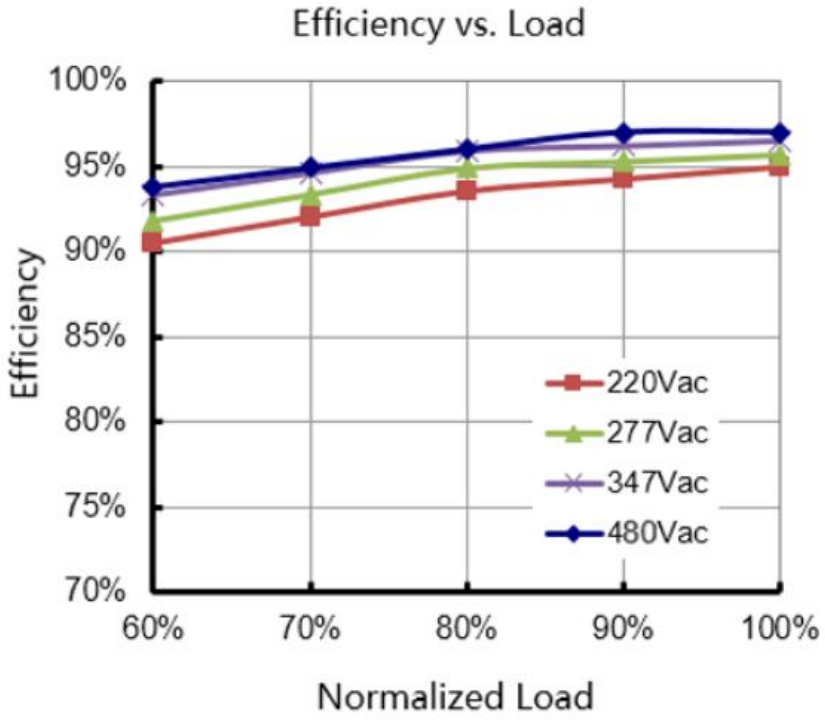
Power Factor vs. Load



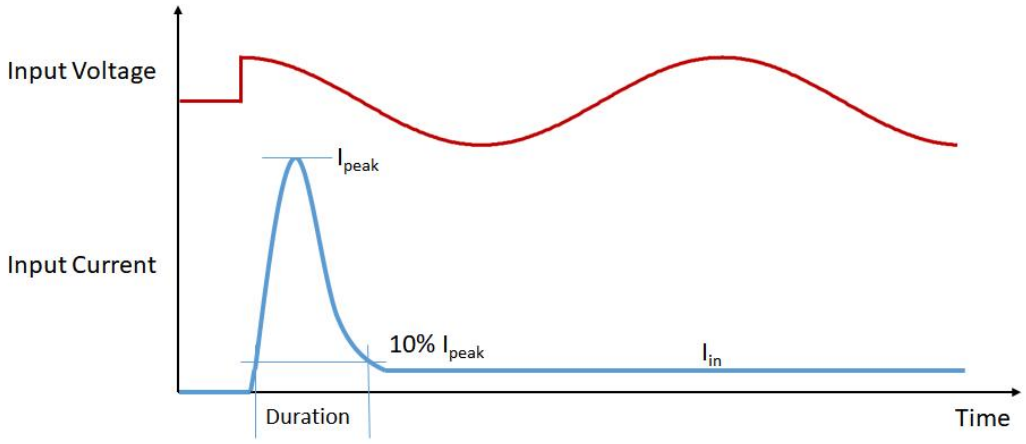
THD vs. Load



Efficiency vs. Load



Inrush Current



Input Voltage	I_{peak}	Duration
277Vac	8A	20mS
347Vac	12A	25mS
400Vac	15A	25mS

Please contact with us for MCB calculation and waveforms.

Dielectric Strength

Unit: Vac	Input	Output	Dimming	Case
Input	-	-	3920	1960
Output	-	-	1960	1960
Dimming	3920	1960	-	1960
Case	1960	1960	1960	-

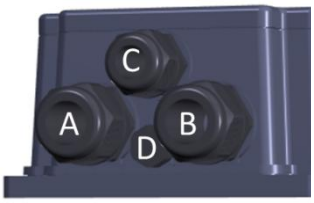
Tc Point

Packaging Information

Typical Carton Dimension(L×W×H)	TBD
Positioning plate	
Shield Board	
LED Drivers	
Net Weight	
Gross Weight	

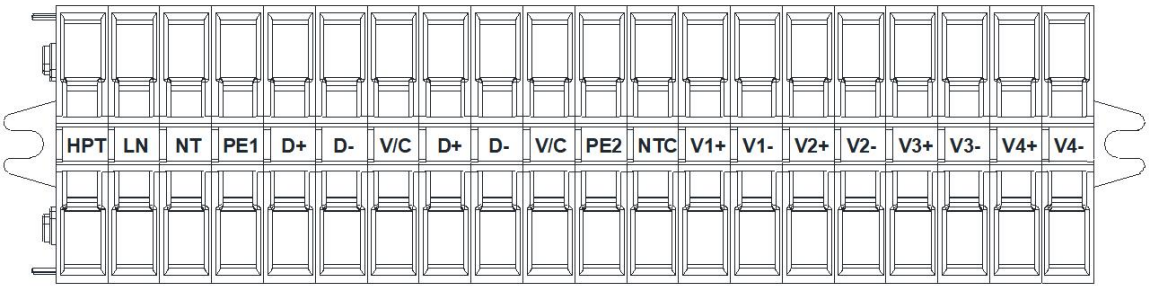
Connection

- **Waterproof Connectors**



Part	Description	Type	Cable Diameter (mm)	AWG	Cross Section (mm2)	Torque (N*m)
A	Input	M25	13~18	#15~#12	1.5~2.5	5.5
B	Output	M25	13~18	#15~#12	1.5~2.5	5.5
C	Daisy Chain Dimming	M20	6~12	#18~#12	0.75~2.5	3.5
D	Ventilation Valve	-	-	-	-	-

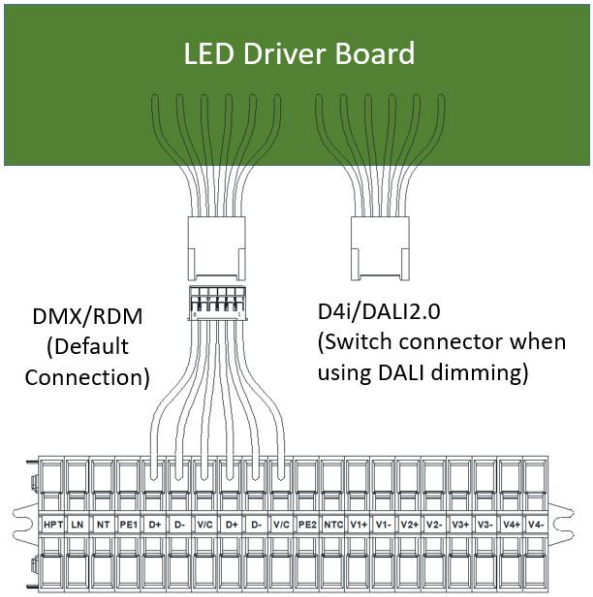
- **Terminal Block Definition**



Note: Wire Stripping Length: 8-9mm

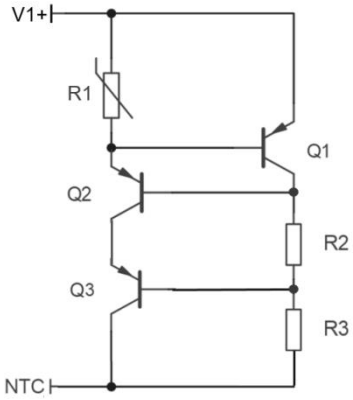
Position	Name	Description
1	HPT	Remove the cable connection when doing the hi-pot test
2	LN	Line Input
3	NT	Neutral Input or Line Input with 3 phase electricity
4	PE1	Ground or Protective Earth from input
5	D+	0-10V + for -ERC models, DALI or DMX Signal + for -GRC models
6	D-	0-10V - for -ERC models, DALI or DMX Signal - for -GRC models
7	V/C	24Vaux Power @ 0-10V or DALI dimming, COM for shielding @DMX dimming
8	D+	Daisy chain connection for D+
9	D-	Daisy chain connection for D-
10	V/C	Daisy chain connection for V/C
11	PE2	Ground or Protective Earth to light fixture
12	NTC	External NTC signal for luminaire over temperature protection
13	V1+	LED Channel 1 +
14	V1-	LED Channel 1 -
15	V2+	LED Channel 2 +
16	V2-	LED Channel 2 -
17	V3+	LED Channel 3 +
18	V3-	LED Channel 3 -
19	V4+	-
20	V4-	-

- **DMX (RDM) Mode and D4i (DALI) Mode Connection**



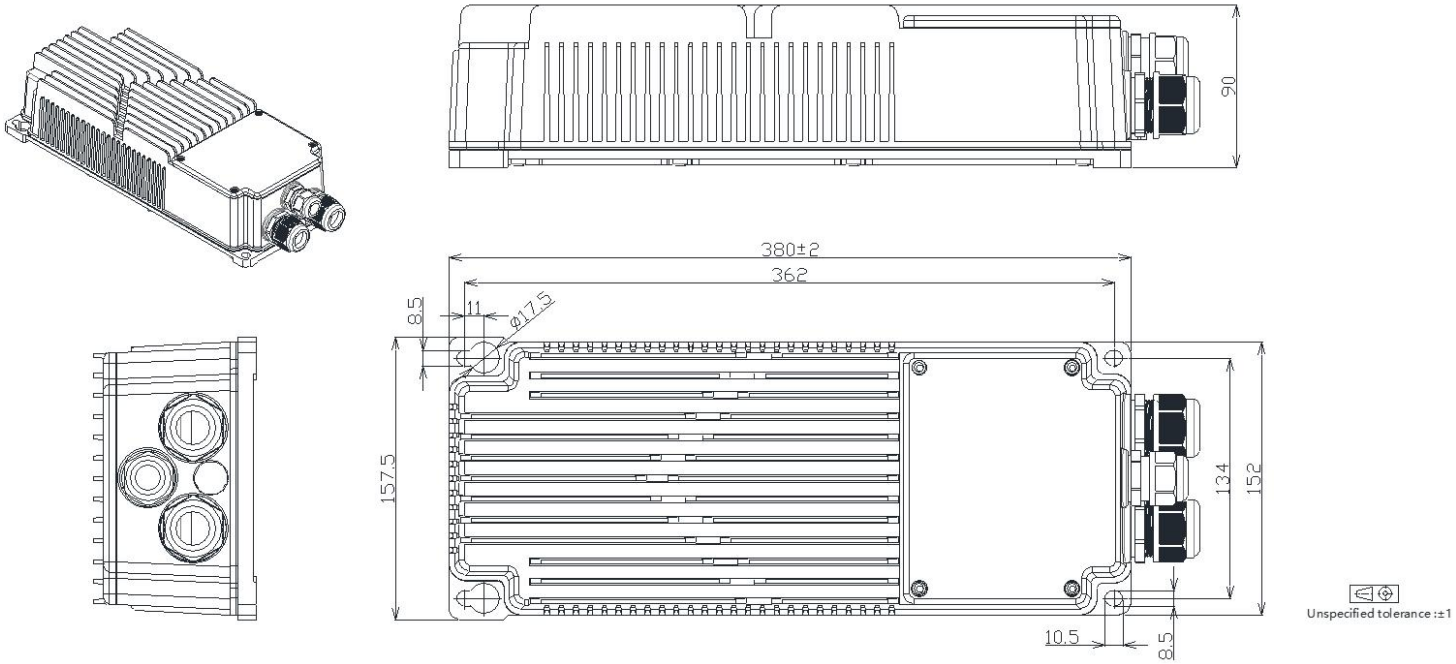
- **Over Temperature Protection by NTC**

Besides the internal thermal protection, external thermal protection is also provided by TYK series. Compared with other uPowerTek drivers, TYK series only offers single connector for NTC rather than 2 connectors like NTC+ and NTC-. The suggested thermal detection circuitry is a constant current regulator and the NTC pin current is dependent on the NTC (R1) resistance thus TYK gets the current information to know the temperature of the luminaire. And the protection parameters can be set by uPowerTek programming software.



Reference	Part	Manufacturer	Description
Q1/Q2/Q3	PBHV9050T	NEXPERIA	500V 150 mA PNP Transistor
R1	-	-	10kOhm Thermistor
R2/R3	-	-	500V 1MOhm Resistor 1% -

Mechanical Design



Output Operation Range

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)
-C105	1050	400	229	381
	1000	400	240	400
	950	400	253	421
	900	400	267	444
	850	400	282	471
	800	400	300	500
	750	375	300	500
	700	350	300	500
	650	325	300	500
	600	300	300	500
	550	275	300	500
	500	250	300	500
	…	…	…	…
	40	20	300	500

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)
-C140	1400	400	171	286
	1300	400	185	308
	1200	400	200	333
	1100	400	218	364
	1050	400	229	381
	900	343	229	381
	800	305	229	381
	700	267	229	381
	600	229	229	381
	500	190	229	381
	400	152	229	381
	300	114	229	381
	…	…	…	…
	53	20	229	381

Revision History

Revision	Date	Contents
A	2023-12-22	1. Product release

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