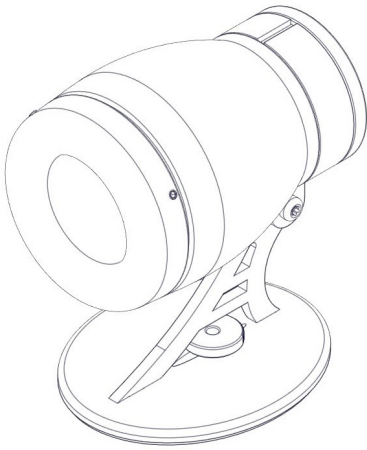


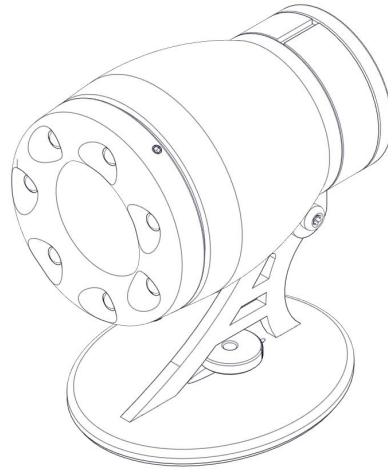


**Tornado**  
**KT2 - KT2-HV**  
**KT2C - KT2C-HV**  
**KTL2 - KTL2-HV**  
**KTL2C - KTL2C-HV**

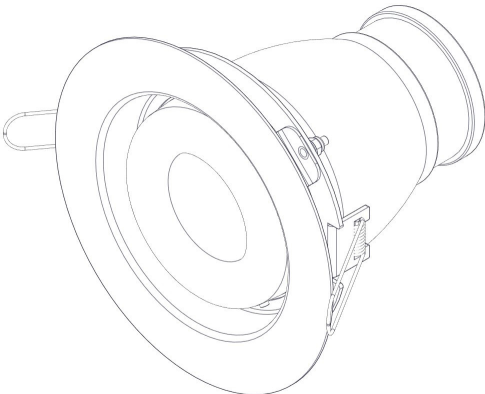
USER GUIDE  
English



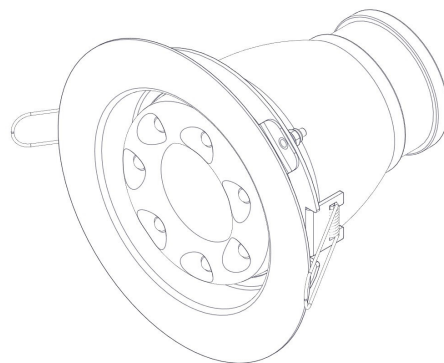
KT2 - KT2-HV



KTL2 - KTL2-HV



KT2C - KT2C-HV



KTL2C - KTL2C-HV

**NEW**

All Tornado models are also available in a 70V version!  
See Paragraph 9.1 for details.

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## SYMBOLS

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K-array declares that this device is in compliance with applicable CE standards and regulations. Before putting the device into operation, please observe the respective country-specific regulations!

---



WEEE

Please dispose of this product at the end of its operational lifetime by bringing it to your local collection point or recycling center for such equipment.

---



This symbol alerts the user to the presence of recommendations about the product's use and maintenance.

---



Warning! Dangerous voltages: RISK of electric shock.

Terminals marked with this symbol are HAZARDOUS LIVE and the external wiring connected to these terminals requires installation by a qualified professional or the use of ready-made leads or cords.

---



This symbol alerts the user to the presence of recommendations about product's use and maintenance.

---



This device complies with Restriction of Hazardous Substances Directive.

---

## 1. INTRODUCTION

The Tornado series is a miniature sound source designed for high-quality distributed systems. Housed in a compact aluminium enclosure, the Tornado is suitable for space sensitive and architectural design installations.

The Tornados are a turn-key loudspeaker solution; designed as passive speakers, they can be easily converted into self-powered devices by inserting the KA1-T2H, 12V/24V amplifier module.

All Tornado models are also available in a 70V version that can be powered with up to 100 units by a single KA84 amplifier channel and up to 50 units by two bridged KA24 amplifier channels.

Tornados have a proprietary 2" high efficiency drive unit with a neodymium magnet structure and a suspension engineered for maximum linear excursion and minimum residual transducer interference. The cone transducer delivers an impressive maximum peak SPL of 107dB, and has a wide operating frequency range from 150 Hz to 18 kHz with very low distortion.

In addition to the standard features of the Tornado loudspeakers, the KTL2 and KTL2C have 7 integrated RGB LEDs that can be controlled thanks the wide range of K-array accessories via DMX or by remote. With its ability to effortlessly reproduce speech, music and lighting, it is an excellent choice for fixed applications such as theatres, museum displays, restaurants, portable systems for corporate AV presentations, department stores, and in hidden locations such as chancel steps in houses of worship.

The KT2 and KTL2 come with a wall bracket for fixed installations or surface applications. The KT2C and KTL2C come with ceiling brackets for ceiling mounts.

All Tornado components are designed by the K-array R&D department and custom made under the K-array quality control system.

## 2. KEY FEATURES

- High performance-to-size ratio
- Single 2" long excursion full range driver
- Integrated RGB LEDs (only KTL2 and KTL2C)
- Wide-range frequency response
- Integrated 4-pin Phoenix connector
- Double voice-coil driver for variable impedance 8-32Ω
- 70V version available
- Compact aluminium ultra strong chassis
- Weather resistant IP54 (only KT2 and KT2C)

## 4. APPLICATIONS

- Audio for museum and exhibit displays
- Space-sensitive fills and distributed systems for speech and music
- Restaurants, clubs, pubs
- Department stores
- Installed audio-visual systems

## 3. OPTIONAL FEATURE

- Self powered device using the KA1-T2H amplifier module (see Chapter 11)



## 5. SAFETY INFORMATION

Read these instructions - Keep these instructions - Heed all warnings



**WARNING**



- Install the speaker only in a location that can structurally support the weight of the unit. Doing otherwise may result in the unit falling down and causing personal injury and property damage.
- Professional loudspeakers are capable of producing extremely high sound levels and should be used with care. Hearing loss is cumulative and can result from levels above 90dB if people are exposed for an extended period.
- Do not operate the speaker for an extended period of time with the sound distorting. This is an indication of malfunction, which in turn can cause heat to generate and result in a fire.
- Never stand close to loudspeakers driven at high level.
- Suspending the system should only be done by qualified personnel following safe rigging practices. Secure fixings to the building structure are vital. If in any doubt, seek help from architects, structural engineers or other specialists.
- No naked flame sources such as lighted candles should be placed near the device.
- Do not attempt to disassemble the unit. The unit contains no user serviceable parts. Repairs should be performed only by factory trained service personnel.



**CAUTION**



- Choking Hazards. This device contains small parts, which may present a choking hazard to small children. Keep the device and its accessories away from small children.
- It is important that loudspeaker systems are used in a safe manner.
- Do not make repairs yourself. Do not open the device, it contains potentially hazardous voltage. Never attempt to disassemble, repair or modify the system yourself. Disassembling the unit may cause damage that is not covered under the warranty. The device contains no user-serviceable parts. Repairs should only be performed by factory trained service personnel.

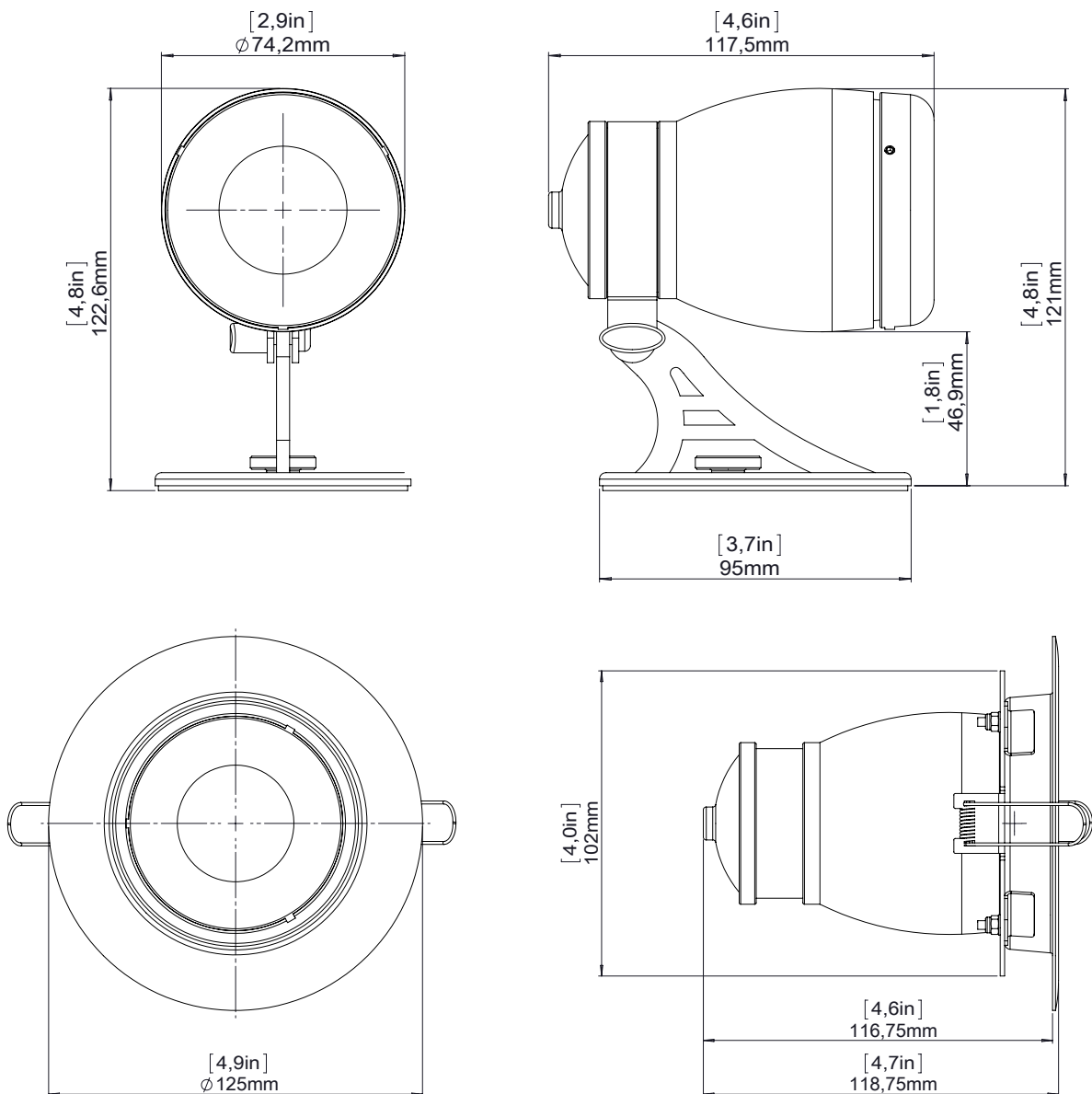
## 6. UNPACKING

Each K-array amplifier is built to the highest standard and thoroughly inspected before leaving the factory. Upon arrival, carefully inspect the shipping carton, then examine and test your new amplifier. If you find any damage, immediately notify the shipping company. Only the consignee may institute a claim procedure regarding the system's electronic equipment.

## 7. INCLUDED ACCESSORIES

KT2	KT2C	KTL2	KTL2C
<ul style="list-style-type: none"> <li>• 1 x M5 turned steel thumb nut</li> <li>• 1 x 4-pin Phoenix connector</li> <li>• 1 x Double threaded screw</li> <li>• 1 x Nylon anchor 6x30mm</li> <li>• 1 x Jumper cable</li> </ul>	<ul style="list-style-type: none"> <li>• 1 x 4-pin Phoenix connector</li> <li>• 1 x Jumper cable</li> </ul>	<ul style="list-style-type: none"> <li>• 1 x M5 turned steel thumb nut</li> <li>• 2 x 4-pin Phoenix connector</li> <li>• 1 x Double threaded screw</li> <li>• 1 x Nylon anchor 6x30mm</li> <li>• 1 x Jumper cable</li> </ul>	<ul style="list-style-type: none"> <li>• 2 x 4-pin Phoenix connector</li> <li>• 1 x Jumper cable</li> </ul>

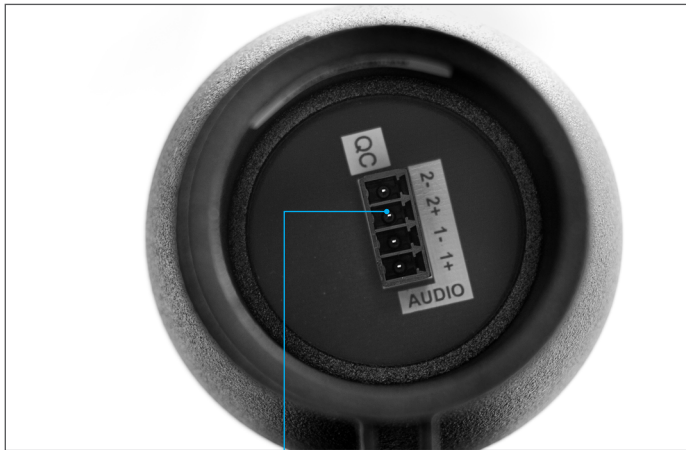
## 8. PHYSICAL



Weight Table	KT2	KT2C	KTL2	KTL2C
Kg	0.56	0.67	0.54	0.65
lb	1.23	1.48	1.19	1.43

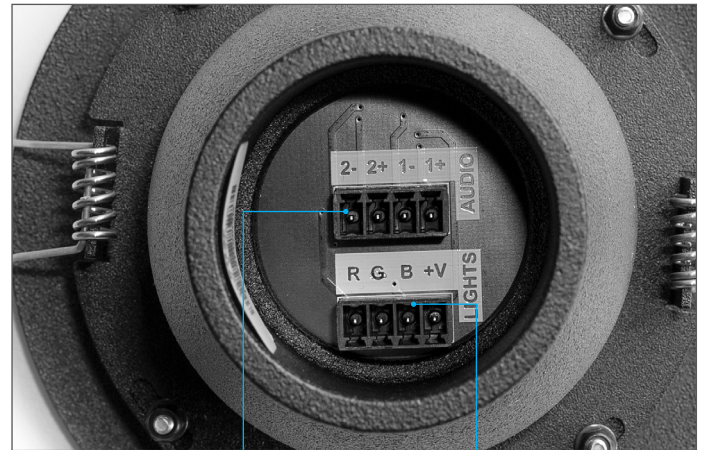
## 9. REAR PANEL AND WIRING

KT2 - KT2C



1

KTL2 - KTL2C

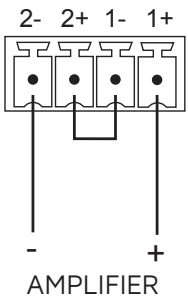


1

2

1. 4-pin audio input connector
2. 4-pin light controller connector

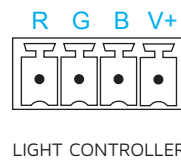
### 32Ω Wiring



- 2- to (-)pin of the Amp
- 2+ bridged to 1(-)
- 1- bridged to 2(+)
- 1+ to (+)pin of the Amp

the 32Ω configuration must be used with a KA14, KA24, KA84, KA7, KA7-7, KA10 or a KA10-10 amplifier

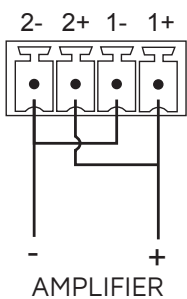
### Light Controller Wiring



LIGHT CONTROLLER

- R to negative DC power for Red LED
- G to negative DC power for Green LED
- B to negative DC power for Blue LED
- V+ Common positive DC power (24V) for RGB LEDs

### 8Ω Wiring



- 2- / 1- parallel to (-)pin of the Amp
- 2+ / 1+ parallel to (+)pin of the Amp

the 8Ω configuration must be used with a KA1-1 amplifier



### Warning

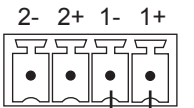
Take care, respect the polarity and the maximum DC voltage. An inverted polarity or a different voltage could damage the device or part of its component parts.

### 9.1 70V VERSION

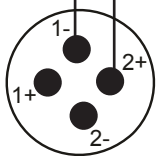
All Tornados are available also in the 70V version: KT2-HV, KT2C-HV, KTL2-HV, KTL2C-HV. The very high impedance of the speakers allows to drive up to 100 units by a single KA84 amplifier channel and up to 50 units by two bridged KA24 amplifier channels.

#### KA24

70V Version Wiring with KA24



- 2- not connected
- 2+ not connected
- 1- to 1- pin of the Amp
- 1+ to 2+ pin of the Amp

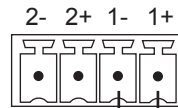


KA24 (Bridge Mode)

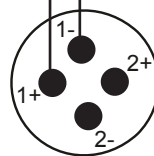
Up to 50 units per KA24 in bridge mode (so a total of max 100 units per KA24)

#### KA84

70V Version Wiring with KA84



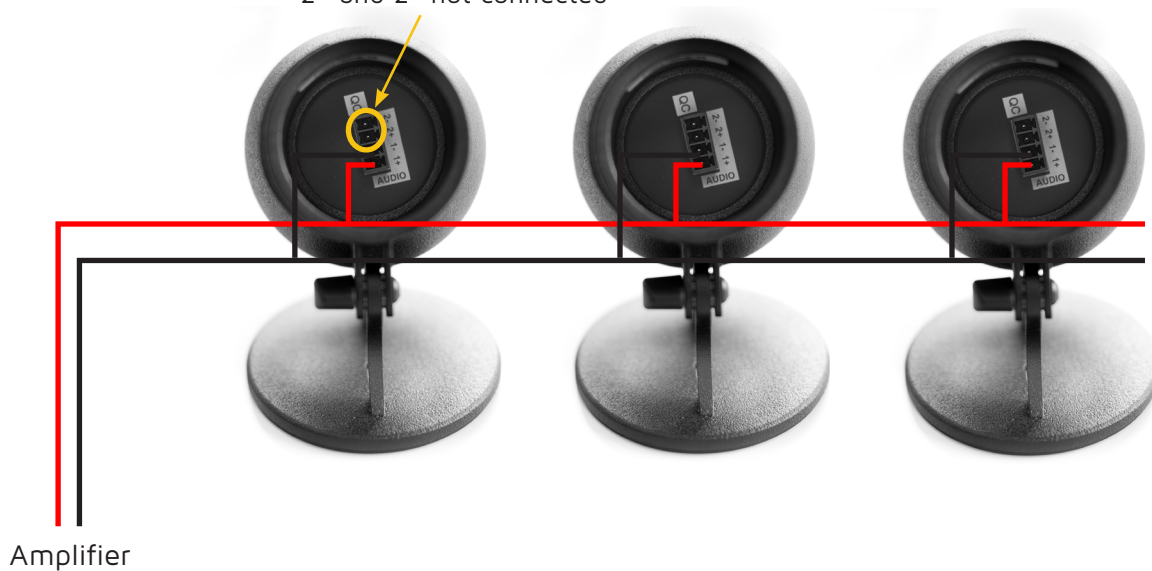
- 2- not connected
- 2+ not connected
- 1- to 1- pin of the Amp
- 1+ to 1+ pin of the Amp



KA84

Up to 100 units per KA84 channel (so a total of max 400 units per KA84)

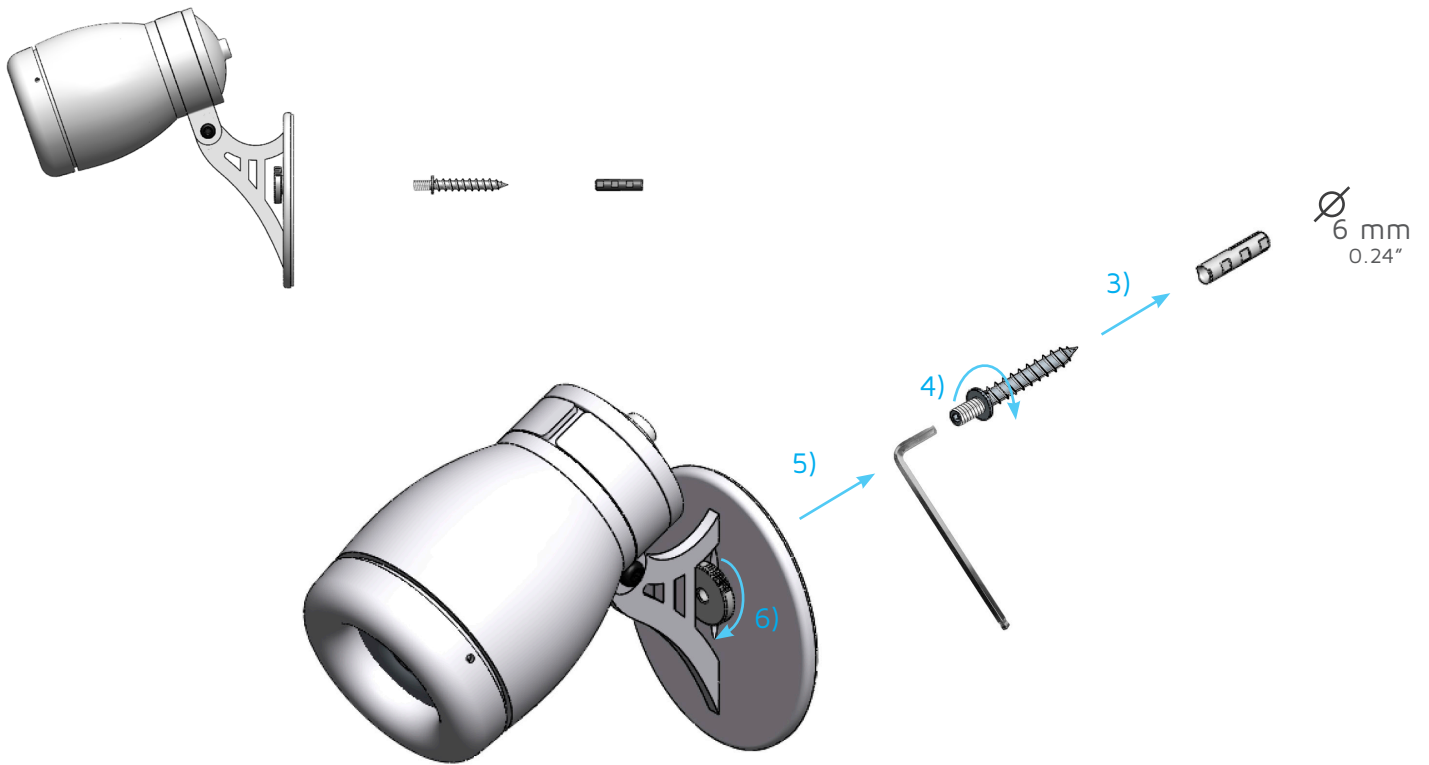
2+ and 2- not connected



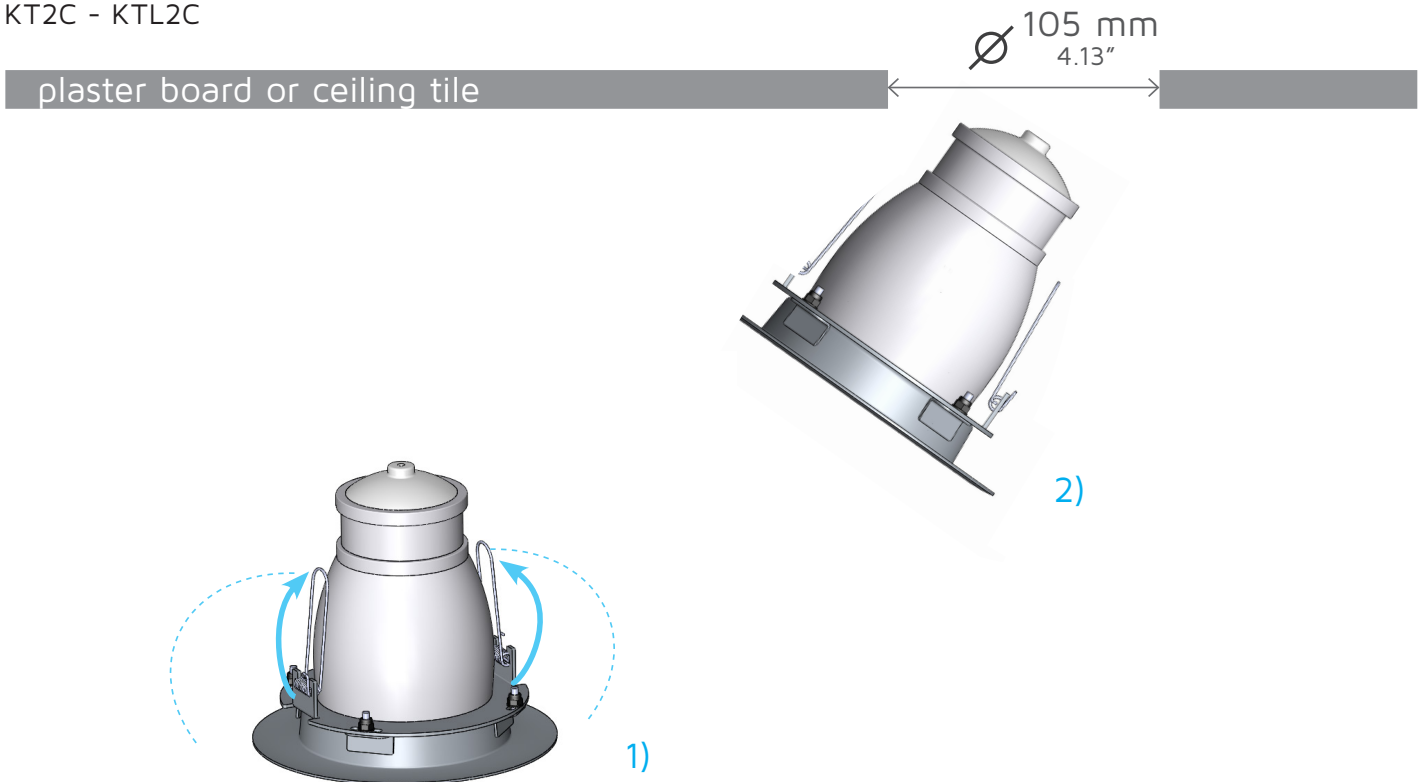


# 10. INSTALLATION

KT2 - KTL2



KT2C - KTL2C













## 11. ACCESSORIES

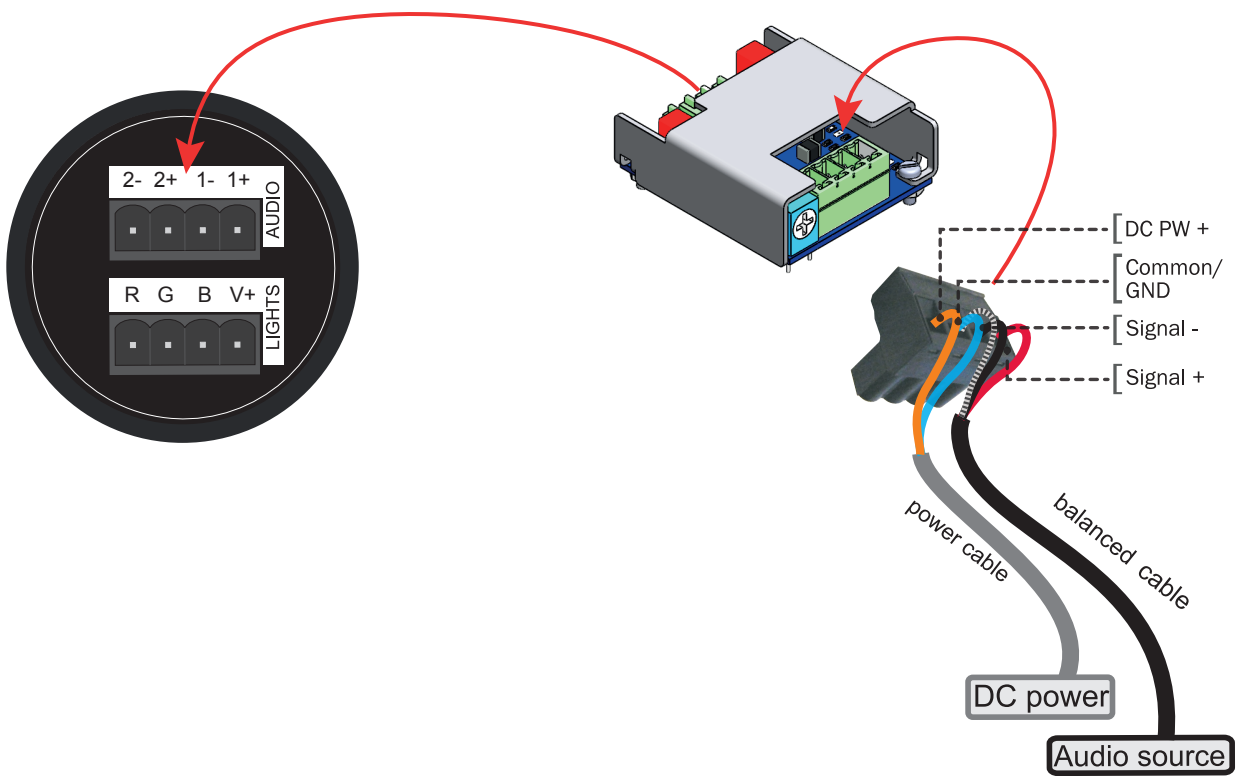
DID YOU KNOW THAT ....



Designed as passive speaker, the new Tornados can be easily converted into self-powered devices by inserting the KA1-T2H amplifier module.

	KA1-T2H	Amplifier module for Tornados (32 W)
	K-AL15	15 W power supply for 1 KA1-T2H (in background music or speech applications)
	K-AL66	66 W power supply for up to 2 KA1-T2H (full power) or up to 4 KA1-T2H (in background music or speech applications)
	K-AL75	75 W DIN rail power supply for up to 3 KA1-T2H (full power) or up to 6 KA1-T2H (in background music or speech applications)
	K-AL120	120 W DIN rail power supply for up to 5 KA1-T2H (full power) or up to 10 KA1-T2H (in background music or speech applications) and for K-RGBDMX / KRGBREM RGB LED controller for KTL2 and KTL2C
	K-AL240	240 W DIN rail power supply for up to 12 KA1-T2H (full power) or up to 24 KA1-T2H (in background music or speech applications) and for K-RGBDMX / KRGBREM RGB LED controller for KTL2 and KTL2C
	K-CTRL	60 W RGB LED DMX Controller for up to 4 KTL2s or KTL2Cs
	K-RGBDMX	RGB LED DMX Controller for up to 10 KTL2s / KTL2Cs (using the K-AL120) or up to 20 (using the K-AL240)
	K-RGBREM	RGB LED Controller with remote control for up to 10 KTL2s / KTL2Cs (using the K-AL120) or up to 20 (using the K-AL240)
	KA-FRAME	2U Rack Adapter for 4 K-CTRLs

### 11.1 KA1-T2H WIRING



## 12. SERVICE

To obtain service:

- 1) Contact the official K-array distributor in your country. Your local distributor will direct you to the appropriate service center.
- 2) If you are calling for service, please have the serial number(s) of the unit(s) available for reference. Ask for Customer Service, and be prepared to describe the problem clearly and completely.
- 3) If the problem cannot be resolved over the phone, you may be required to send the unit in for service. In this instance, you will be provided with an RA (Return Authorization) number which should be included on all shipping documents and correspondence regarding the repair. Shipping charges are the responsibility of the purchaser.

Any attempt to modify or replace components of the device will invalidate your warranty. Service must be performed by an authorized K-array service center.



### Cleaning:

Use only a soft, dry cloth to clean the housing. Do not use any solvents, chemicals, or cleaning solutions containing alcohol, ammonia, or abrasives. Do not use any sprays near the product or allow liquids to spill into any openings.

### 13. SPECIFICATIONS

#### KT2 - KT2C - KT2-HV - KT2C-HV

	ACOUSTICS			TRANSDUCERS	
Power handling	18 W <sup>(AES)</sup>		Full range	2" Neodymium magnet woofer with 2 x 0.8" voice coils	
Frequency range	150 Hz – 18 kHz (-10dB) <sup>(1)</sup>		Connector	4-pin Phoenix	
Impedance	KT2, KT2H: 8 Ω / 32 Ω (selectable) KT2-HV, KT2C-HV: High Impedance for 70V amp		Type	KA1-T2H, KA14, KA24, KA84	
Maximum SPL	101 dB (cont.) – 107 dB (peak) <sup>(2)</sup>		IP	54	
	COVERAGE			PHYSICAL	
Horizontal	90°			KT2	KT2C
Vertical	90°		Dimensions	74 mm x 123 mm x 118 mm (2.9" x 4.8" x 4.6")	125 mm x 125 mm x 119 mm (4.9" x 4.9" x 4.7")
	CROSSOVER		Weight	0.56 kg (1.23 lbs)	0.67 kg (1.48 lbs)
Type	External Crossover required				
Frequency	150 Hz, 24 dB/oct suggested minimum				

Notes for data

- 1. With dedicated preset;
- 2. Measured with musical signal

New materials and design are introduced into existing products without previous notice. Present systems may differ in some respects from those presented in this datasheet.

#### KTL2 - KTL2C - KTL2-HV - KTL2C-HV

	ACOUSTICS			RECOMMENDED AMPLIFIERS	
Power handling	18 W <sup>(AES)</sup>		Type	KA1-T2H, KA14, KA24, KA84	
Frequency range	150 Hz – 18 kHz (-10dB) <sup>(1)</sup>		LED		
Impedance	KT2, KT2H: 8 Ω / 32 Ω (selectable) KT2-HV, KT2C-HV: High Impedance for 70V amp		Type	7 x RGB LED	
Maximum SPL	101 dB (cont.) – 107 dB (peak) <sup>(2)</sup>		Connector	4-pin Phoenix	
	COVERAGE		Light Output	Black version: 330 lumen White version: 400 lumen	
Horizontal	90°		Viewing Angle	90°	
Vertical	90°		Consumption	10 W	
	CROSSOVER			CERTIFICATION	
Type	External Crossover required		IP	40	
Frequency	150 Hz, 24 dB/oct suggested minimum			PHYSICAL	
	TRANSDUCERS			KTL2	KTL2C
Full range	2" Neodymium magnet woofer with 2 x 0.8" voice coils		Dimensions	74 mm x 123 mm x 118 mm (2.9" x 4.8" x 4.6")	125 mm x 125 mm x 119 mm (4.9" x 4.9" x 4.7")
	POWER AUDIO INPUT		Weight	0.54 kg (1.2 lbs)	0.59 kg (1.3 lbs)
Connector	4-pin Phoenix				

Notes for data

- 1. With dedicated preset;
- 2. Measured with musical signal

New materials and design are introduced into existing products without previous notice. Present systems may differ in some respects from those presented in this datasheet.

## KA1-T2H ACCESSORY

---

DESIGNED AS PASSIVE SPEAKERS, THE NEW TORNADOS CAN BE EASILY CONVERTED INTO SELF-POWERED DEVICES BY INSERTING THE **KA1-T2H 12V/24V** AMPLIFIER MODULE.

	<b>AUDIO INPUT</b>		<b>DC POWER</b>
Connectors	Phoenix connector	Nominal voltage	12/24 Vdc
Wiring	IN - (-) IN + (+) GRD (Ground)	Operating range	10 - 26 Vdc
	<b>POWER INPUT</b>	I. Nom.	0.4 A / 24 Vdc
Connectors	Phoenix connector		<b>CONSUMPTION</b>
Wiring	VCC (+) GND (common)	Efficiency	83%
	<b>AMPLIFIER</b>	Nominal power	10 W
Type	1 Module Class D Electronically Processed		<b>PHYSICAL</b>
Nominal Power Output	32 W @ 8 Ω 1% THD + NOISE <sup>(1)</sup>	Dimensions	35 mm x 40 mm x 14 mm (1,37" x 1,57" x 0,55 ")
Protections	Dynamic limiter, over current, over temperature, short circuit power supply polarity inversion	Weight	40 g (0.08 lb)
Frequency response	20Hz - 20kHz (+/- 3 dB) for 1W @ 8 Ω		
THD+N 1kHz,1 W	0,100%		

### Notes for data

1. EIAJ Test Standard, 1 kHz, 1%THD

New materials and design are introduced into existing products without previous notice. Present systems may differ in some respects from those presented in this datasheet.

## 14. KT2 AND KT2C EN54-24 DATA

KT2 and KT2C are EN54-24 compliant. Consider the specifications below when either model is used in a voice alarm system.

### **KT2 - KT2C**

Power handling	15 W
SPL 1W/1m	89 dB
Maximum SPL	100 dB
Connector IN	Voice coil A: 1+ 1- Voice coil B: 2+ 2- Double coil: 1+ 2- (1- 2+ CC)
Vmax In (Pink Noise)	8.20 V @ 8 Ohm 16.40 V @ 32 Ohm
Frequency Range	150 Hz - 18 kHz
Coverage Horizontal	180° @ 500 Hz 180° @ 1000 Hz 180° @ 2000 Hz 120° @ 4000 Hz
Coverage Vertical	180° @ 500 Hz 180° @ 1000 Hz 180° @ 2000 Hz 120° @ 4000 Hz

