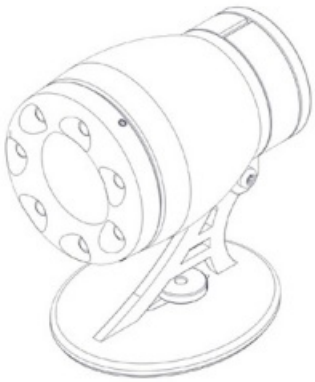
K-ARRAY KT2 – KT2-HV Tornado Multi-Purpose 2 Inch Point Source Loudspeaker User Guide

KT2 – KT2-HV
Tornado Multi-Purpose 2 Inch Point Source Loudspeaker
User Guide

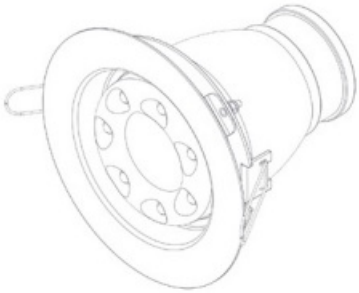
Ver. 2.8
Tornado
KT2 – KT2-HV
KT2C – KT2C-HV
KTL2 – KTL2-HV
KTL2C – KTL2C-HV
USER GUIDE

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.
Tornado

Contents

SYMBOLS

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!

WEEK

Please dispose of this product at the end of its operational lifetime by bringing it to your local collection point or recycling center for 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 the product's use and maintenance.

RoHS 2002/95/EC This device complies with the Restriction of Hazardous Substances Directive.

INTRODUCTION

The Tornado series is a miniature sound source designed for high-quality distributed systems. Housed in a compact aluminum 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 to 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.

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 8-32
- 70V version available
- Compact aluminum ultra-strong chassis
- Weather-resistant IP54 (only KT2 and KT2C)

OPTIONAL FEATURE

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

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

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 a 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.

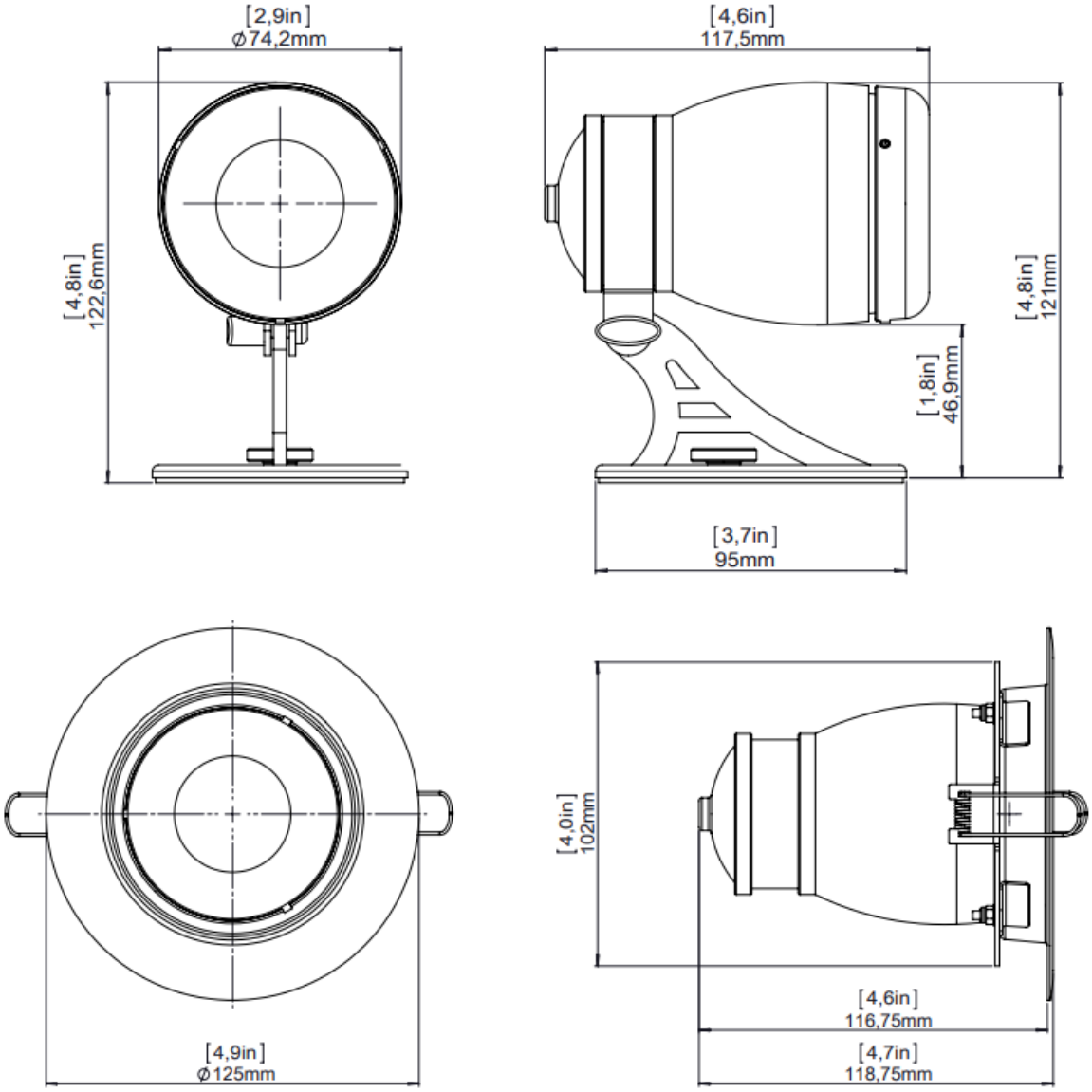
UNPACKING

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.

INCLUDED ACCESSORIES

KT2	KT2C	KTL2	KTL
1 x M5 turned steel thumb nut 1 x 4-pin Phoenix connector 1 x Double threaded screw 1 x Nylon anchor 6x30mm 1 x Jumper cable	1 x 4-pin Phoenix connector 1 x Double threaded screw	1 x M5 turned steel thumb nut 2 x 4-pin Phoenix connector 1 x Double threaded screw 1 x Nylon anchor 6x30mm 1 x Jumper cable	2 x 4 1 x J

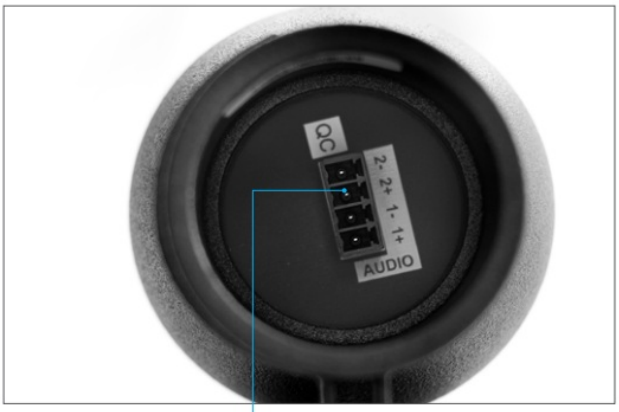
PHYSICAL



Weight Table	KT2	KT2C	KTL2
Kg	0.56	0.67	
lb	1.23	1.48	

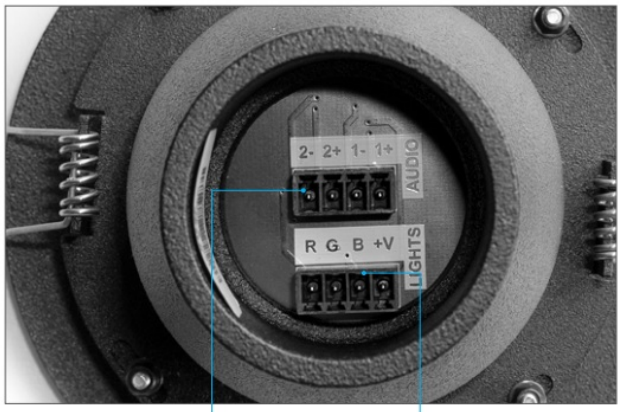
REAR PANEL AND WIRING

KT2 - KT2C



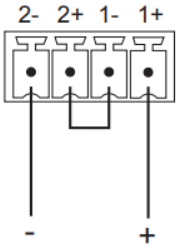
1

KTL2 - KTL2C



1 2

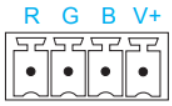
32Ω Wiring



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

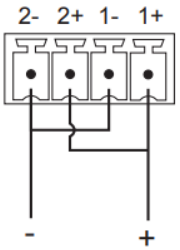
Light Controller Wiring



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

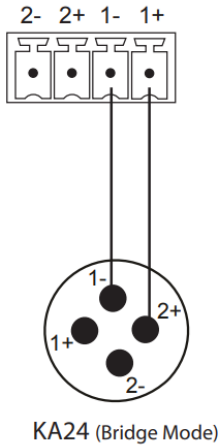
Take care, respect the polarity and the maximum DC voltage. An inverted polarity or a different voltage could damage the device or part of its component parts.

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



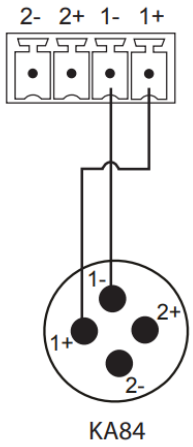
KA24 (Bridge Mode)

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

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

KA84

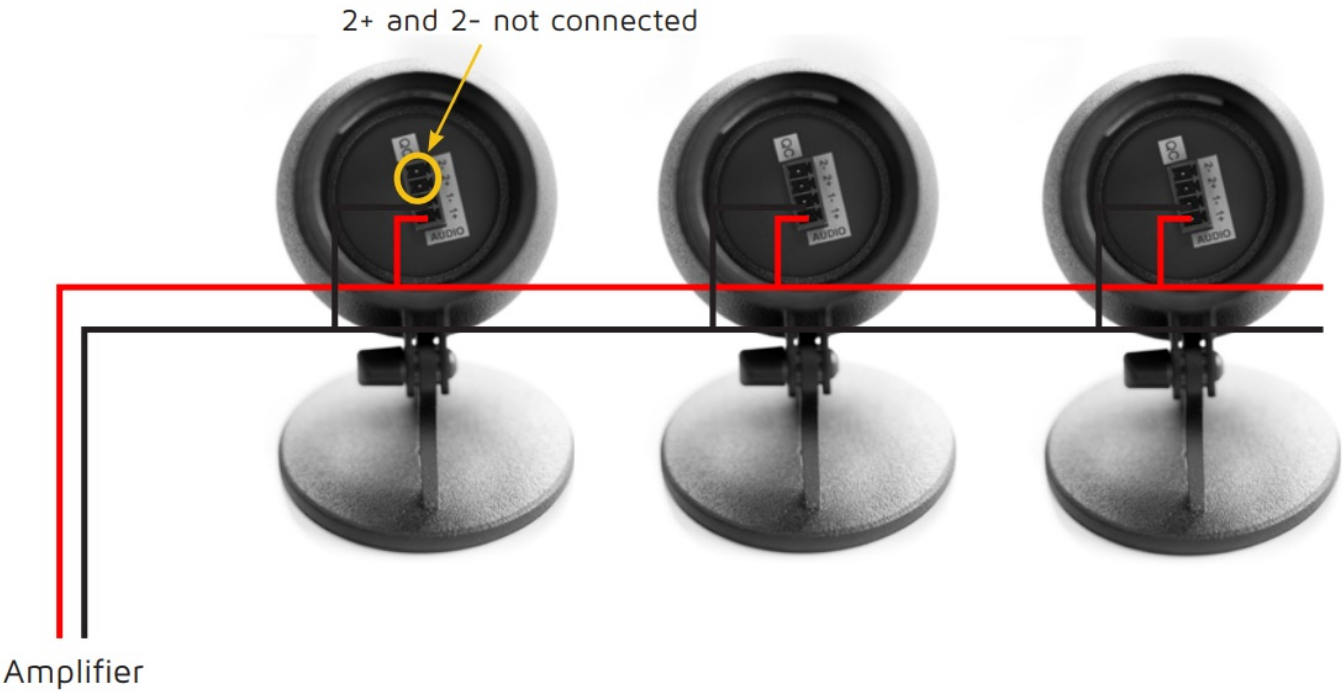
70V Version Wiring with KA84



KA84

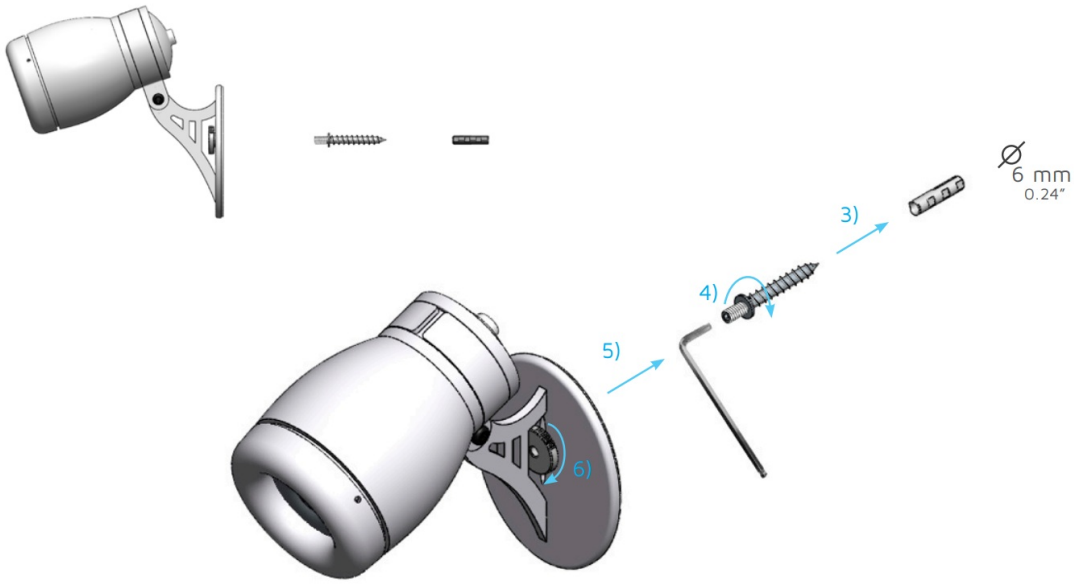
2- not connected
2+ not connected
1- to 1- pin of the Amp
1+ to 1+ pin of the Amp

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

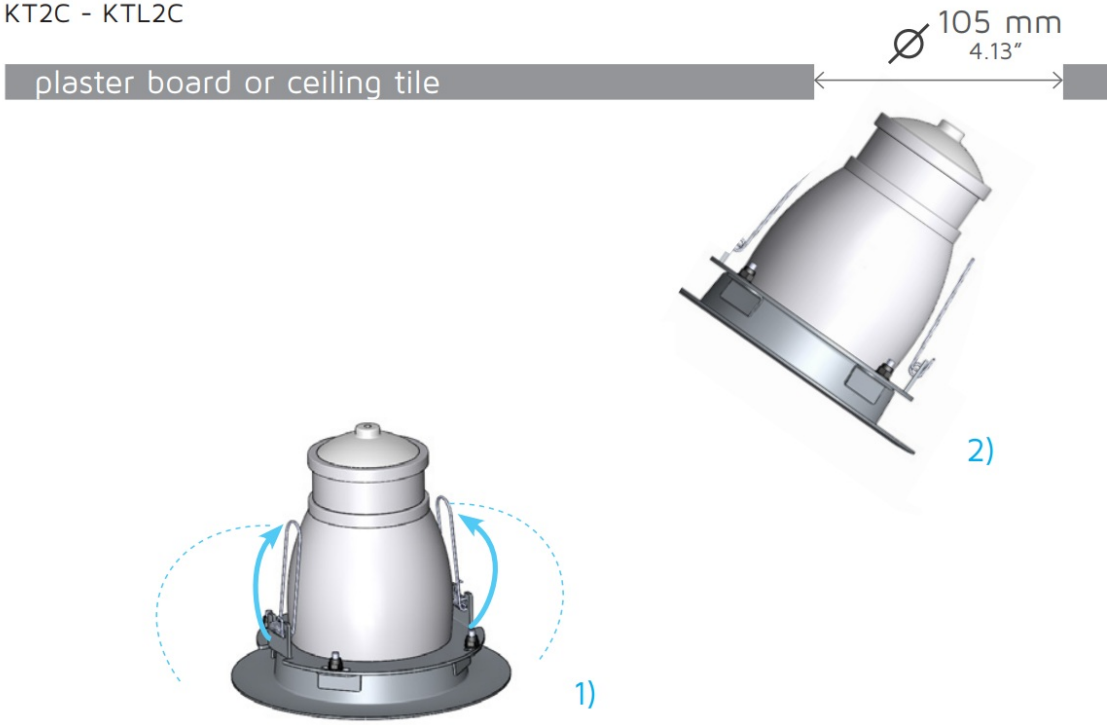


INSTALLATION

KT2 - KTL2



KT2C - KTL2C



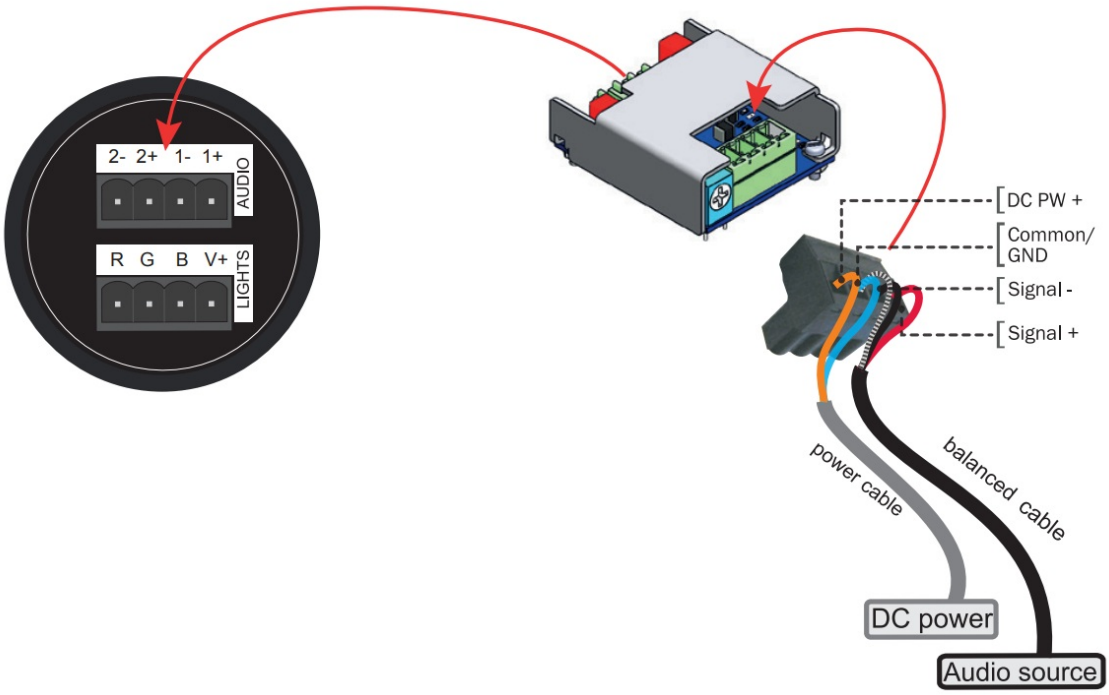
ACCESSORIES

DID YOU KNOW THAT ….

Designed as a 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)
	<-AL66	66 W power supply for up to 2 KA1-T2H (full power) or up to 4 KA1-T2H (in background music or speech a pplications)
	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 a pplications)
	-AL120	120 W DIN rail power supply for up to 5 KA1-T2H (full power) or up to 10 KA1-T21-1 (in background music or speecr 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-RGB D MX	RGB LED DMX Controller for up to 10 KTL2s / KTL2Cs (using the K-AL120) or up to 20 (using the K-AL240)
	K-RGB R AM	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-FRA ME	2U Rack Adapter for 4 K-CTRLs

11.1 KA1-T2H WIRING



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.

SPECIFICATIONS

KT2 – KT2C – KT2-HV – KT2C-HV

Power handling Frequency range Impedance Maximum SPL Horizontal Vertical Type Frequency	**ACOUSTICS18 W(AES)** 150 Hz – 18 kHz (-10dB)(1) KT2, KT2H: 8 Ω / 32 Ω (selectable) KT2-HV, KT2C-HV: High Impedance for 70V amp 101 dB (cont.) – 107 dB (peak)(2) COVERAGE90° 90° CROSSOVER External Crossover required 150 Hz, 24 dB/oct suggested minimum
Full range Connector TypeIP Dimensions Weight	**TRANSDUCERS** 2” Neodymium magnet woofer with 2 x 0.8” voice coils POWER AUDIO INPUT 4-pin Phoenix RECOMMENDED AMPLIFIERS KA1-T2H, KA14, KA24, KA84 CERTIFICATION 54 PHYSICAL KT2 ……. KT2C 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“) 0.56 kg (1.23 lbs) 0.67 kg (1.48 lbs)

Notes for data

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

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

Power handling Frequency range Impedance Maximum SPL Horizontal Vertical Type Frequency Full range Connector	ACOUSTICS 18 W(AES) 150 Hz – 18 kHz (-10dB)(1) KT2, KT2H: 8 Ω / 32 Ω (selectable) KT2-HV, KT2C-HV: High Impedance for 70V amp101 dB (cont.) – 107 d COVERAGE 90° 90° CROSSOVER External Crossover required150 Hz, 24 dB/oct suggested minimum TRANSDUCERS 2” Neodymium magnet woofer with 2 x 0.8” voice coils POWER AUDIO INPUT 4-pin Phoenix
Type Type Connector Light Output Viewing Angle Consumption IP Dimensions Weight	RECOMMENDED AMPLIFIERS KA1-T2H, KA14, KA24, KA84 LED 7 x RGB LED 4-pin Phoenix Black version: 330 lumen White version: 400 lumen 90° 10 W CERTIFICATION 40 PHYSICAL KTL2 KTL2C 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“) 0.54 kg (1.2 lbs) 0.59 kg (1.3 lbs)

Notes for data

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

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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.

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

Notes for data

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

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

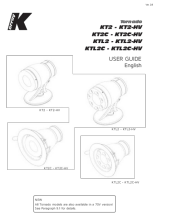
KT2 AND KT2C EN54-24 DATA

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

CE	C
K-array 0068-CPR-082 /2017	K-array 0068-CPR-082 /2017
EN 54-24 : 2008 Loudspeaker for voice alarm systems for fire detection and fire alarms system s for buildings KT2 TYPE B	EN 54-24 : 2008 Loudspeaker for voice alrm systems s for buildings KT2C TYPE B

The contents of this manual are furnished for informational purposes only. K-array s.u.r.l. assumes no responsibility for any errors or inaccuracies that may appear in this manual. K-array s.u.r.l. reserves the right to make modifications without prior notice.

Documents / Resources

	K-ARRAY KT2 - KT2-HV Tornado Multi-Purpose 2 Inch Point Source Loudspeaker [pdf] User Guide KT2 - KT2-HV, KT2C - KT2C-HV, KTL2 - KTL2-HV, Tornado Multi-Purpose 2 Inch Point Source Loudspeaker