PKSOUND™

T218

Intelligent Subwoofer

USER MANUAL

v2.0

Table of Contents

1. Important Safety Instructions

1. Read, keep, and follow these instructions and heed all warnings.
2. Do not use this apparatus near water.
3. Clean only with a dry cloth.
4. Do not block any ventilation openings.
5. Install in accordance with the manufacturer's instructions.
6. Do not install near any heat sources, such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
7. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
8. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
9. Only use attachments / accessories specified by the manufacturer.
10. Use only with the Caster Board specified by the manufacturer and / or sold with the apparatus. Use caution when moving the Caster Board / apparatus combination to avoid injury from tip-over.
11. Unplug this apparatus during lightning storms or when unused for long periods of time.
12. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as: the power-supply cord or plug being damaged; liquid has been spilled or objects have fallen into the apparatus; the apparatus has been exposed to rain or moisture; does not operate normally; or has been dropped.
13. The means of disconnection from the mains is the appliance coupler or mains plug. One of these devices must remain accessible when the apparatus is in use.

CAUTION: To reduce the risk of fire or electric shock, do not open or expose this apparatus to rain or moisture.

CAUTION: Failure to follow the instructions in their entirety could result in serious injury or death. Follow all local safety practices and due diligence in ensuring safe working conditions while using T218.

CAUTION: Do not remove the amplifier or actuator assemblies. No user-serviceable parts inside. Refer servicing to qualified service personnel.
Email support@pksound.ca for service.

2. Additional Power Safety Instructions

1. The unit must be powered exclusively by an earth-connected mains socket in an electrical network compliant to IEC 364 or similar local rules. It is vital that the user verifies this fundamental safety requirement. If you are in any doubt, get the installation checked by qualified personnel before use.
2. The means of disconnection from the mains is the mains plug. We strongly recommend that you power the unit from a professionally installed mains supply with an easily accessible on/off switch or circuit breaker.

3. Before powering the unit via the Neutrik® PowerCON TRUE1 connector, make sure that the unit is supplied with the correct mains operating voltage:

- 100-240 VAC, 50-60 Hz, minimum 12.5 A capacity.

4. Only power the unit using an input supply cable rated as follows:

- 110-130 VAC: 15 A or higher rated cable
- 200-240 VAC: 20 A or higher rated cable

5. Only power the unit using a circuit with sufficient load capacity:

- 110-130 VAC: 15 A or higher rated circuit
- 200-240 VAC: 20 A or higher rated circuit

6. Power Consumption for 1 unit, no passthrough devices connected: 660 W

- Do not exceed an additional 660 W on the passthrough connector @ 100-240 VAC.

WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture. Never spray water directly into the front of the module; doing so will expose electronic components to moisture and damage the internal equipment.

WARNING: Do not use this unit if the electrical power cord is frayed or broken.

WARNING: Do not block or restrict air flow from the front of the module, doing so will negatively impact performance of the unit.

3. Approvals

3.1 Safety:

Electrical Safety & Compliance:

- UL62368
- CSA C22.2#62368-1:2014ED.2
- IEC 62368

Mechanical Strength:

- The T218 rigging system complies with structural standards EN 1993, EN 1999, and has been designed following the regulations of DGUV V17 (BGV-C1).

3.2 Environmental:

- IP42 (front), !P43 (rear)
- 0-35° C ambient temperature
- Maximum altitude for operation: 2000 m
- FCC: CFR47 Part 15B-2010 / FCC/ICES-003
- Country of Origin: Canada
- This is a Class A product: In a domestic environment this product may gnerate electromagnetic interference (EMI) in other products, requiring the user to take mitigative efforts.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

3.3 EU Declaration of Conformity & CE Marking:

This declaration applies to the following products manufactured by PK Sound Corp. and includes all types listed below.

Product Name:
• T218 (905-0001)

We herewith declare that said products are in conformity with the provisions of the following EU directives, including all applicable amendments:

2014/35/EU, LVD Directive
- EN 62368-1 2014

2014/30/EU, EMC Directive
- EN 55103-1:2009 +A1:2012
- EN 55103-2:2009

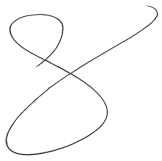
2011/65/EU, RoHS Directive
- EN 63000:2018

2006/42/EC, European Machinery Directive
- T218 Suspension Frame (921-0006)

Manufacturer:
PK Sound Corp.
235075 Ryan Rd.
Rocky View, Alberta, Canada
T1X 0K3

www.pksound.live

All production versions of these types are included, provided they correspond to the original technical version and have not been subject to any later design or electromechanical modifications. PK Sound Corp. accepts responsibility for this declaration.



Jeremy Bridge P.Eng
CEO / Engineering Manager
Signed Oct. 1, 2022, in Rocky View, Canada

4. Power Requirements

4.1 Voltage & Current Requirements

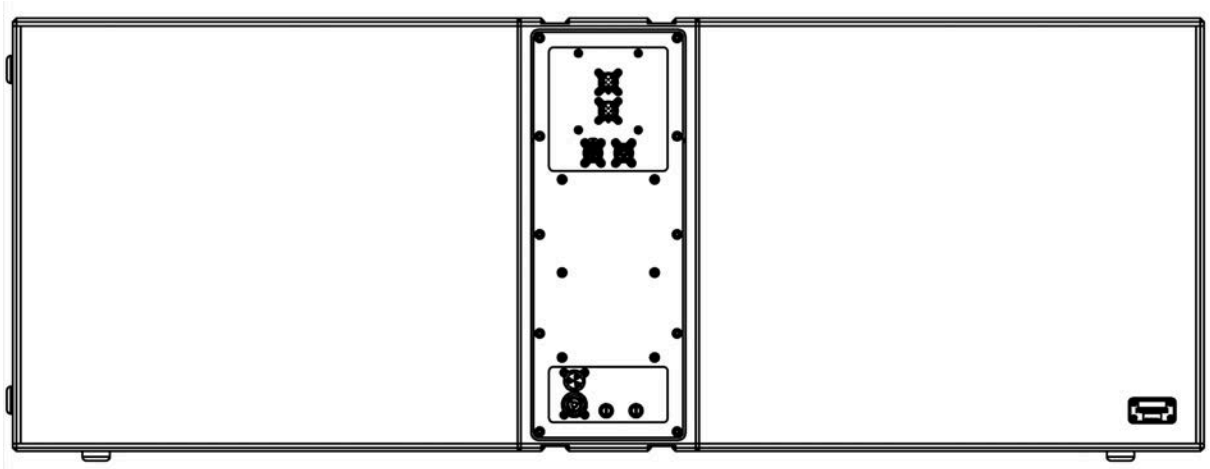
- T218 operates safely and continuously with a supplied mains input between 100–240 VAC at 50 or 60 Hz. The loudspeaker allows any combination of voltage to ground (neutral-line-ground or line-line-ground). If the voltage rises above 275 V, the power supply could become damaged.
- When T218 modules are powered from a three-phase power source, it is very important to keep a good balance on the loads of each phase of the AC power. It is also necessary to include subwoofers, array sources, and other loudspeakers in power distribution calculation.

CAUTION: To ensure that T218 performs as specified, without interruption, and without damage to its power supply, its power source must operate within the required voltage window (100–240 VAC). Its AC cable length and gauge must be such that voltage drop does not exceed 5% of nominal levels.

4.2 AC Input Connector

- Each T218 module is provided with a Neutrik powerCON TRUE1 NAC3PX inlet-outlet to supply power and daisychain over to other modules. The NAC3PX is rated for 16A.
- Due to the high power draw of this loudspeaker, the maximum recommended number of cabinets per circuit are as follows. Exceeding this limit may engage circuit breakers in high-output use cases:
    - 230-240 V, 20 A circuit: 2 Modules
    - 208 V, 20 A circuit: 2 Modules
    - 120 V, 20 A circuit: 1 Module

The Neutrik powerCON TRUE1 connector is rated at IP65 when mated. Unmated connections should be considered not rated. Measures should be taken in wet environments to cover open connections of any type.



5. Electrical Safety

Pay close attention to these important electrical and safety guidelines.

1. T218 requires a grounded outlet. Ensure the presence and functionality of the ground in connected circuits, as well as in all outlets and cables used.
2. Do not use a ground-lifting adapter or cut the AC cable ground pin.
3. Make sure the AC power cable for the loudspeaker has the appropriate power plug (on the other end) for the area in which you will operate the loudspeaker.
4. Do not operate the module if the power cable is frayed or broken.
5. Keep all liquids away from T218 modules to avoid hazards from electrical shock.
6. If potential exists for inclement weather, avoid direct contact between the ground and any T218 modules to avoid water ingress.

6. Environmental Constraints

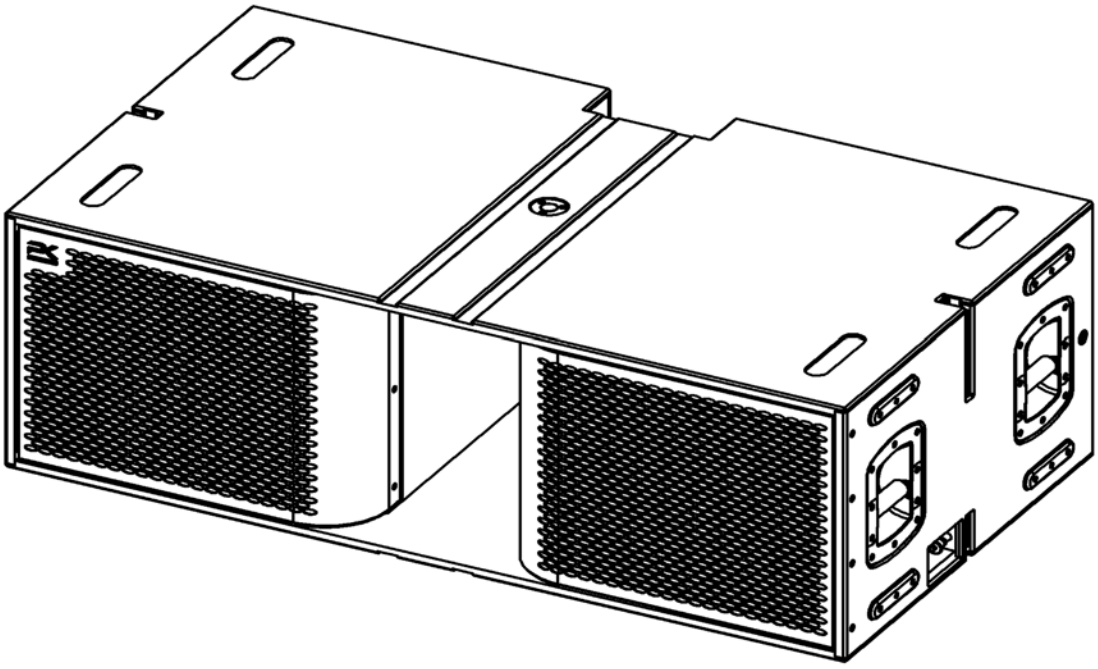
1. Never spray water directly into the front of the module; doing so will expose electronic components to moisture and damage the internal equipment.
2. Never connect, disconnect, or interconnect cables when the cable or T218 module is wet. In the event that the module becomes wet, the user must ensure all power has been remotely disabled prior to disconnecting or reconnecting.
3. Continuous, extended exposure to sunlight may degrade T218's polyurea coating.

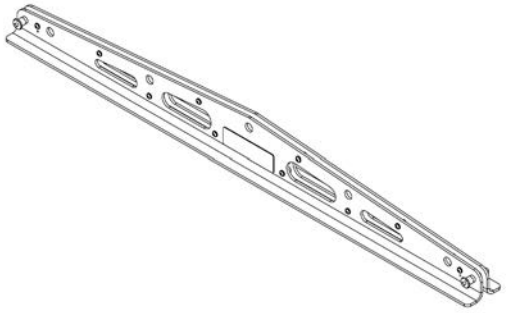
NOTE: For any permanent installation, the user must consult the manufacturer at: **support@pksound.ca**

7. Rigging

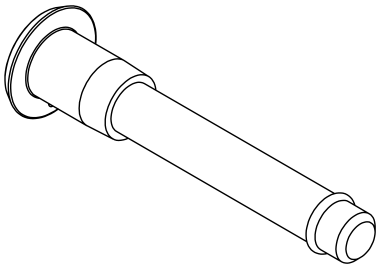
7.1 Rigging Overview

T218's rigging system is included in both the Standard (touring) and Install variants and operates with the T21 Suspension Frame and 12.7mm Quick Release Pins (QRPs).





T218 Suspension Frame



12.7mm Quick Release Pins [QRP]

CAUTION: Use only the Quick Release Pins supplied with T218 or the exact replacement part from PK Sound. Failure to do so will compromise the integrity of the system.
CAUTION: Use only mounting and rigging hardware that has been rated to meet or exceed the total weight of the system being hung, and that meets or exceeds local laws / regulations.

7.2 Assessing Mechanical Safety

Compliance with mechanical design standards is dependent on the user not exceeding the following limits on arrays:

	Max. Ground Stacked	Max. Flown
T218 Modules	4	16

Rated Working Load Limit (WLL) Alone Is Insufficient

The rated WLL is an indication of the module resistance to tensile stress. For complex mechanical systems such as loudspeaker arrays, WLLs cannot necessarily be used to determine the maximum number of enclosures within an array or to assess the safety of a specific array configuration.

Assessing Safety with .dynamics

The overall safety factor of a specific mechanical configuration always corresponds to the lowest safety factor among all linking points. Always model the system configuration with the **.dynamics** software and check the Mechanical Data section to identify the weakest link and its corresponding working load. By default, a safety Alarm will appear when the mechanical parameters go beyond the recommended safety level.

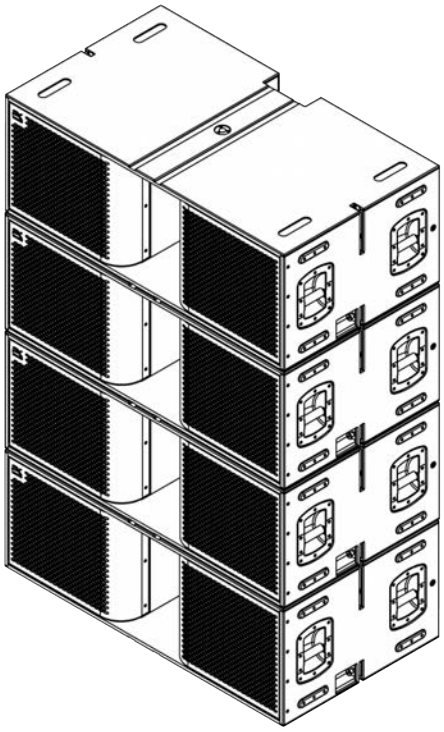
Consideration of Unusual Deployment Conditions

.dynamics calculations are based on typical environmental conditions. A higher safety factor is recommended with conditions such as extreme high or low temperatures, strong wind, prolonged exposure to salt water, etc. Always consult a rigging specialist or local authority having jurisdiction to implement safety practices adapted to such situations. Deployments in unusual conditions should always be approved by a PK Sound representative in each specific instance.

7.3 Ground Stacking Modules

Up to 4 x T218 Modules can be ground stacked directly on the ground or atop the T218 Caster Board.

Do not attempt to stack more than 4 modules in any situation. PK Sound is not responsible for any damages resulting from unsafe storage or movement of products.

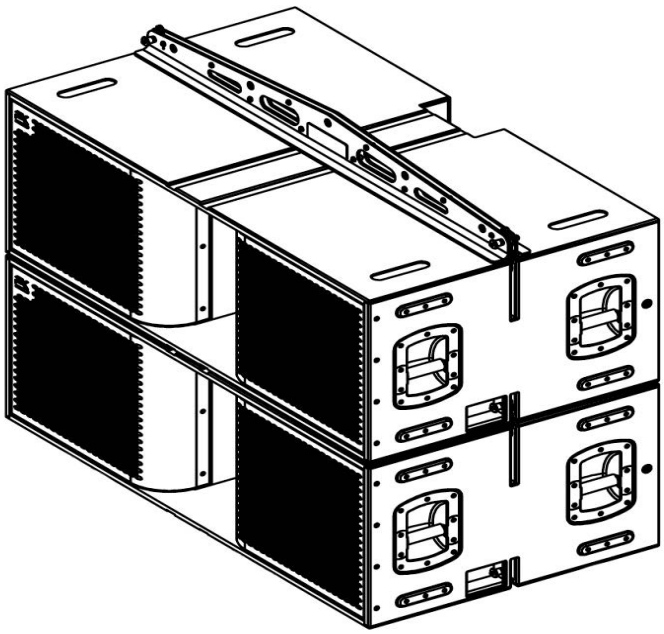


7.4 Storing & Mounting the T218 Suspension Frame

The T218 Suspension Frame can be stored and transported on a covered or uncovered T218 module.

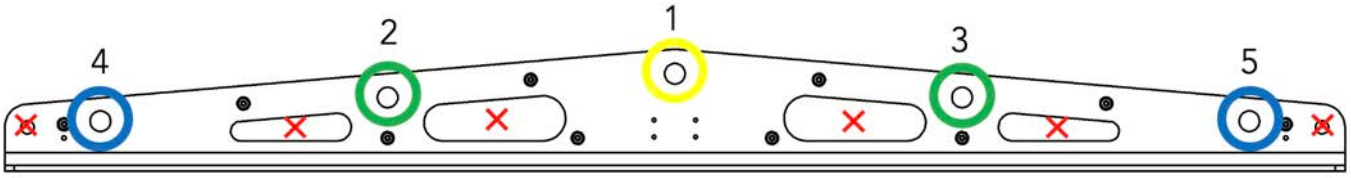
1. To mount the T218 Suspension Frame, place it on the top T218 module in the stack.
2. Depress the push pins at the end of the 2 x Quick-Release Pins (QRPs) and remove them from the Suspension Frame.
3. Flip up the 2 x T218 rigging links to vertical positions.
4. Insert the 2 x QRPs through the Suspension Frame and oval hole in the link.
5. Check that the ball locks on the QRPs are completely through all rigging links, pulling on the QRP to check that it cannot unintentionally slide out.
6. ALWAYS double check the QRPs for a positive lock.

Note: The T218 Suspension Frame is symmetrical and can be installed forwards or backwards with identical functionality.



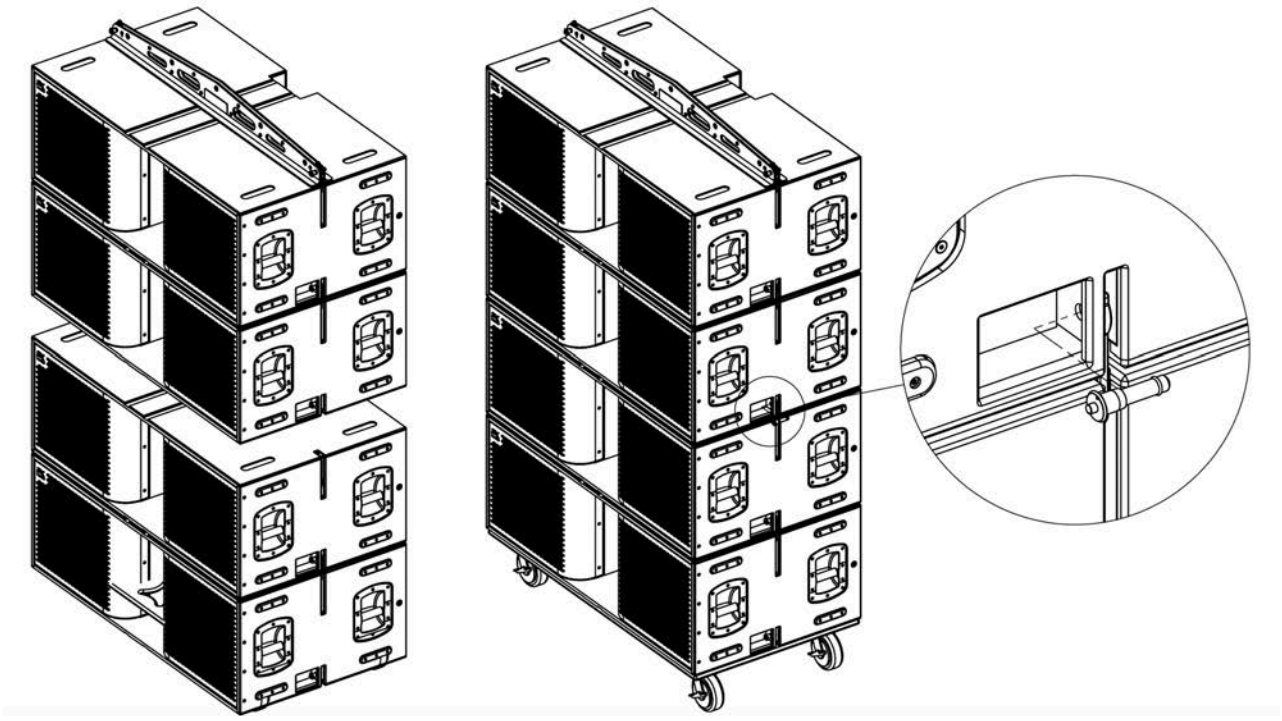
7.5 Flying Multiple T218 Modules

1. Mount the T218-Suspension Frame to a single T218 module or the top module in a stack per the instructions above.
2. Connect the hoist(s) and shackle(s) to the appropriate points on the T218 Suspension Frame. Do not attach shackles to any part of the Suspension Frame except as indicated:
   - For single point hangs, use only Hangpoint 1 as shown below (YELLOW)
     - Max. 16 modules using Hangpoint 1
   - For dual point hangs, use either:
     - Hangpoints 2 and 3 as shown below (GREEN)
       - Max. 16 units on Hangpoints 2 and 3
     - Hangpoints 4 and 5 as shown below (BLUE)
       - Max. 16 units on Hangpoints 4 and 5



CAUTION: When using a chain climbing hoist, ensure that the slack chain and/or chain bag does not come into contact with any part of the T218 Suspension Frame, or any T218 module.

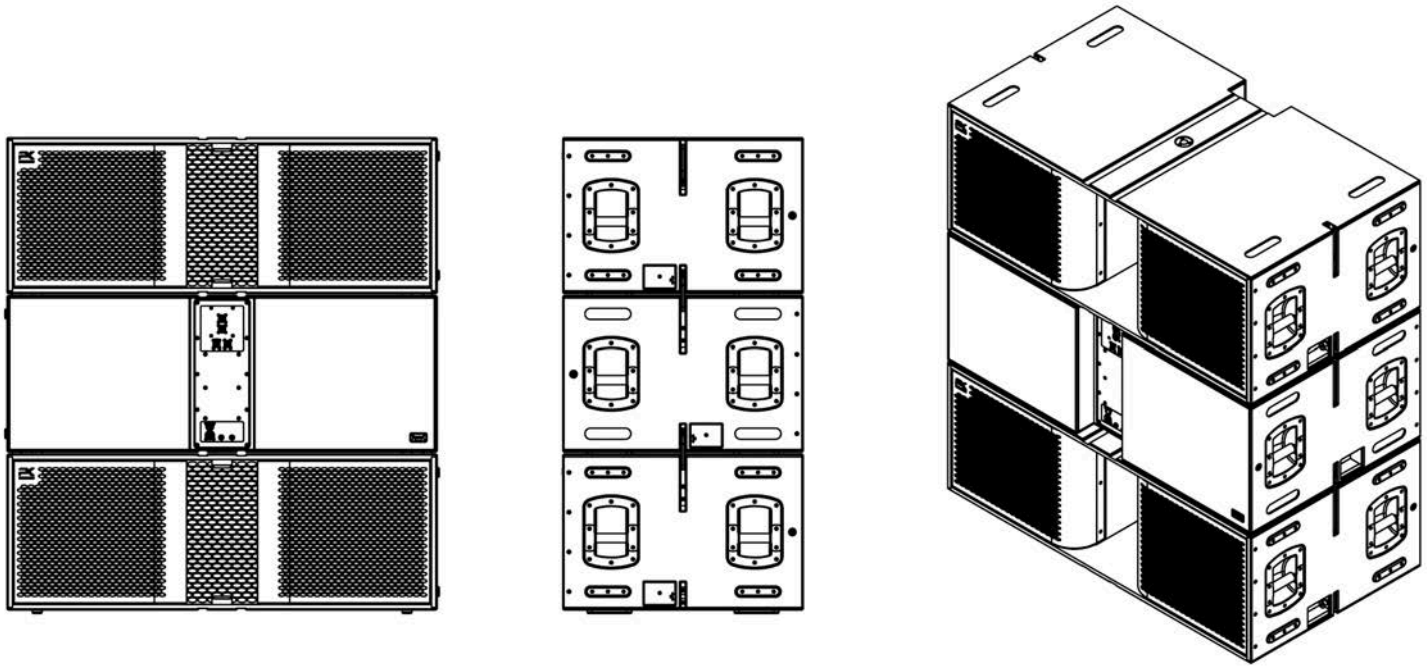
3. When using a chain climbing hoist, ensure that the slack chain and/or chain bag does not contact any part of the T218 Suspension Frame assembly or any T218 module.
4. Raise the modules until they are just high enough to allow another Caster Board loaded with T218 modules to be placed directly underneath.
5. Lower the suspended array slowly onto the stacked loudspeakers. Do not allow the full weight of the array to rest on the Caster Board to avoid tipping.
6. Remove the 2 x QRPs from the bottom module in the suspended array.
7. Align the front / rear and left / right faces of the suspended T218 modules with the next stack of carted T218 modules.
8. Flip up the 2 x T218 rigging links from the top T218 module on the carted stack into the rigging slots of the bottom suspended T218 module.
9. Reinsert the 2 x QRPs on the bottom suspended module through its rigging slots and the rigging linkage of the top T218 module on the Caster Board.
10. ALWAYS double check the QRPs for a positive lock.
11. Repeat steps 4-10 until all modules to be flown are connected.
12. Raise the hoist(s) to trim height.
    - If using "Dual Point" hang points, adjust the lengths of each hoist to level the array from side to side.
13. Appropriate rigging hardware should be used to provide strain relief for flown array cables.



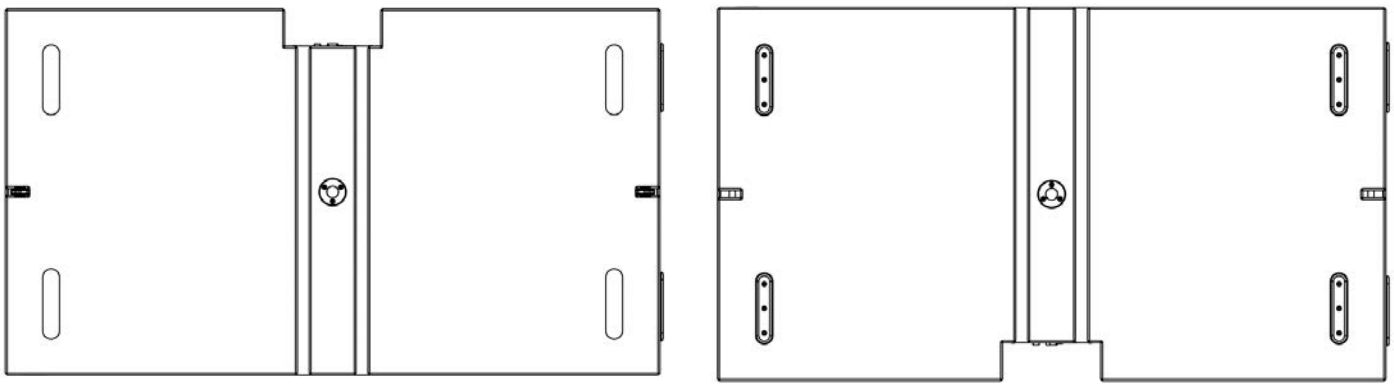
WARNING: Never bridle multiple shackle points on the T218 Suspension Frame together.
WARNING: Keep fingers and hands clear of all possible pinch hazards wheen stacking and unstacking clusters of T218 loudspeakers.

7.6 Cardioid Configuration

T218 may be installed in a cardioid configuration. Rigging installs as normal, but with 1 cabinet facing in reverse for every 2 oriented forwards.



In cardioid configurations, the cable tracks at the top and bottom of the cabinets may be used to neatly route cables between modules.



8. .dynamics Software

8.1 Prerequisites

.dynamics software is used to remotely manage your T218 modules and access the full range of their functionality.

8.2 Installation Procedure

The latest **.dynamics** release can be downloaded at: http://software.pksound.live.

8.3 Updates

.dynamics will automatically prompt the user to update to the latest released version, if there is an internet connection available. Follow the in-app prompts to complete the update. The new version will be available upon relaunching the software.

8.4 User Guide

The **.dynamics** User Guide is included in every release of the software. To access it, download and install **.dynamics**, then select File > User Guide.

9. Amplification & Audio

9.1 Overview

The T218 loudspeaker is powered by an integrated Class-D amplifier capable of delivering up to 4000 W short-term power to the two 18" drivers. This amplifier features dual-mode active cooling via fans and routed port flow to maximize thermal dissipation.

Patented built-in PFC (Power Factor Correction) allows the amplifier to achieve optimal, consistent performance in all operating conditions worldwide. Intelligent rail management technology maximizes the efficiency of the system and drastically reduces power consumption at any load condition. The amplifier is also equipped with extensive protection circuitry and controls to ensure fluid operation.

9.2 DSP Functionality

T218 features a complete suite of onboard DSP functionality, configurable through **.dynamics** software. This includes loudspeaker presets, gain, delay, crossover, and filters. T218 ships loaded with a standard 70 Hz cutoff preset and retains the last loaded preset when disconnected. Please refer to the **.dynamics** User Guide for further detail.

9.3 Status Monitoring

Status monitoring is similarly performed using **.dynamics**. Module input levels, output levels, gain reduction, limiting, and protections are all provided per-speaker. Additionally, the colour of the LED logo may be changed (or turned off entirely) to aid in cabinet identification.

Loudspeaker service notes and "Service Required" flags may also be saved to the amplifier to indicate service history or a need for immediate service.

9.4 Thermal & Electrical Protections

Temperature Warning – When the T218 module heats up to 65°C, a YELLOW warning light will flash on that module's visual representation in **.dynamics** to indicate that the module is 5°C away from a thermal protect scenario.

Thermal Protection – When the T218 amplifier's internal temperature exceeds 60°C, a temperature-controlled fan is engaged. When the amplifier reaches 70°C, the amplifier engages a progressive thermal limiter that increases gain reduction with higher temperatures. At 85°C the system shuts off completely to prevent damage.

Output Loading Error – The amplifier will automatically detect problematic loading scenarios, such as damaged voicecoils or a missing driver. Upon detection of such a load, the output amplification is immediately disabled. **.dynamics** functionality is unaffected by this shutdown, and the amplifier will restart if the condition clears.

Output Protection – The amplifier outputs are monitored, and limiters will engage to prevent overloading of mains voltage inputs and damage to the loudspeaker.

Clipping – Limiters are used to prevent signals from exceeding rated limits.

Input Overvoltage & Overcurrent Protection – If AC mains inputs exceed 280 V RMS, the loudspeaker will automatically shut down and periodically attempt to restart. User-serviceable fuses automatically break the input circuit if current exceeds 10 A RMS.

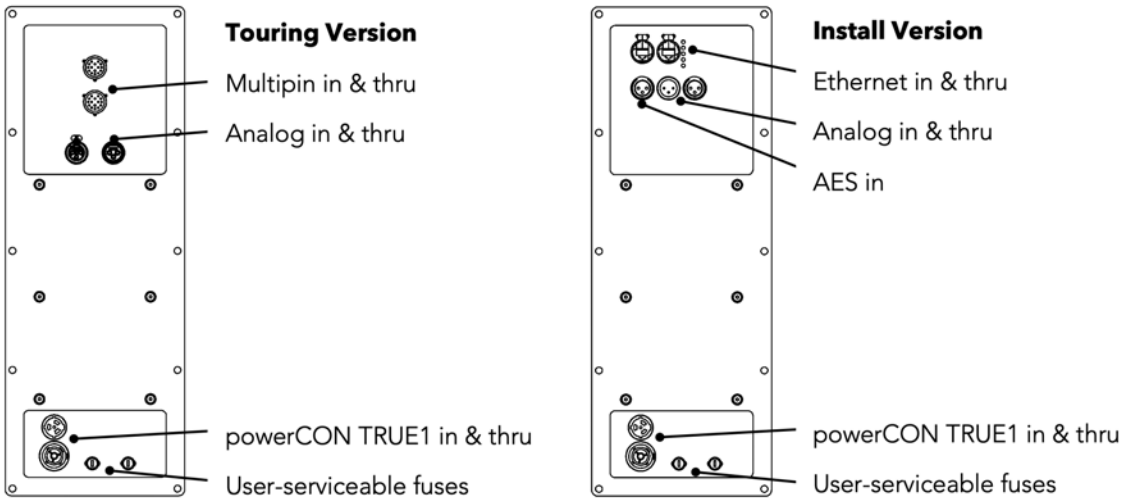
10. Connectivity

10.1 Back Panel

The T218 rear panel includes an input and loop output multi-pin connector (Touring models only) or a single AES3 input connector (Install models only) and 2x Ethernet connectors and for transmitting digital audio and configuration of the subwoofer via PK's Kontrol software.

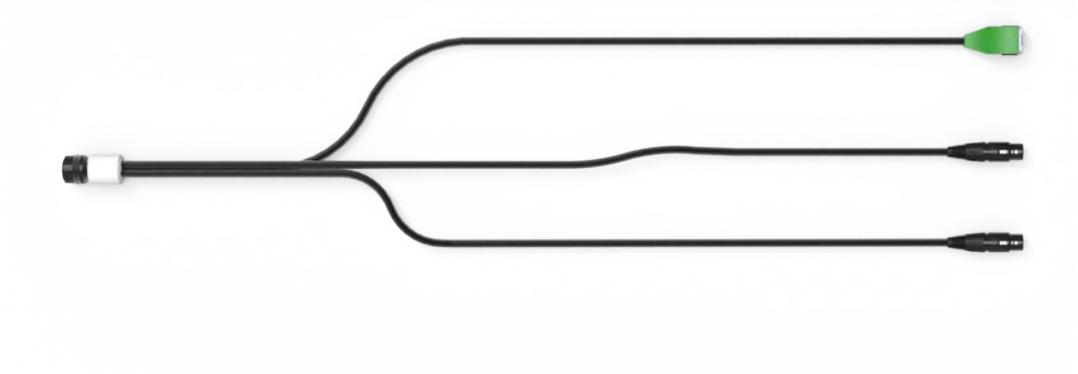
XLR input and loop output connectors (all models) can receive and passthrough balanced audio signals.

Power is introduced to the amplifier through a Neutrik® PowerCON TRUE1 input, and cabinets may be daisy-chained using a standard Neutrik powerCON extension cable.



10.2 Connectors

MG.9-BI (36 IN) - This PK Sound proprietary break-in cable accommodates analog and digital inputs into a T10 element via standard AES and XLR cables. It also allows for a standard Cat-5 ethernet cable to connect to the **.dynamics** network. All Multipin cables share the same technical wiring pin-out. A screw-on cap protects the Multipin ends from damage when not in use.



C1 - Ethernet Input
C2 - AES Digital Audio Input
C3 - Analog Audio Input
Amphenol 15-pin male Input

Ethernet Input - Requires a standardized Cat 5 twisted pair cable for carrying signals.

Digital Input (AES 3-Pin Female) – The digital audio input is a 3-pin XLR female which accepts digital AES data. AES uses 110 Ohm shielded twisted pair (STP) cable with XLR connectors up to a distance of 100 m. It uses the following wiring:

- Pin 1 – Chassis and earth ground
- Pin 2 – Positive polarity signal (+)
- Pin 3 – Negative polarity signal (-)

Analog Input (XLR 3-Pin Female) – The analog audio input is a 3-pin XLR female connector which accepts balanced audio signals with an input impedance of 10k Ohm. It uses the following wiring:

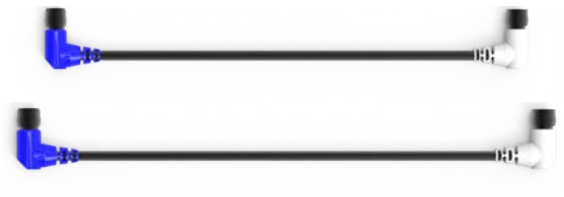
- Pin 1 – Chassis and earth ground
- Pin 2 – Positive polarity signal (+)
- Pin 3 – Negative polarity signal (-)
- Case – Earth (AC) ground and chassis

Multipin Drive Cable / Home Runs (Assorted lengths) – T218 Multipin cable is available in 15, 30, and 45 m (50, 100, and 150 ft.) lengths to run from a stage box or snakehead to the first T218 module or stack in an array.

M-Barrel – The M-Barrel male-to-female connector piece is used to join a breakout to a cable length as the twist collar of the Multipin connector is not compatible to join with another collar.

NOTE: For easy identification, the male connector of every Multipin cable is WHITE.

MBLRA.49 (19 IN) / MBLRA.55 (23 IN) – The 0.49 m / 20 in. or 0.55 m / 23 in. Multipin jumpers are used to daisychain T218 modules in a standard stack / array configuration and can travel on pre-cabled stacks. The short length of these jumpers greatly reduces the possibility of a worker or moving object snagging and pulling on the cable, which can cause damage to circuitry or the connectors themselves.



MBLRA1.2 (48 IN) – The 1.2 m / 48 in. cardioid jumpers are used to interconnect front- and rear-facing T218 modules in a cardioid configuration, running through the tracks on the top and bottom of the enclosures.

MB5.4 (18 FT) – The 5.4 m / 18 ft. extended Multipin jumpers are used to connect separate clusters of 2 to 4 T218 modules, or to connect front-to-back modules in a cardioid configuration.

PTRA.55 (23 IN) – The 0.55 m / 23 in. powerCON TRUE1 jumper is used to daisychain T218 modules via the TRUE1 AC inputs. Two modules can be daisy-chained on a single 20-amp circuit at 208V or 240V.

PTRA1.2 (48 IN) – The 1.2 m / 48 in. cardioid TRUE1 jumpers are used to interconnect front- and rear-facing T218 modules in a cardioid configuration, running through the tracks on the top and bottom of the enclosures.

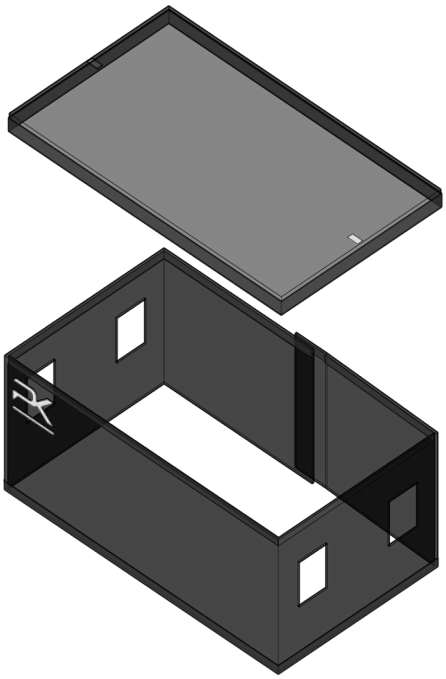
PT5.4 (18 FT) – The 5.4 m / 18 ft. extended TRUE1 jumpers are used to connect separate clusters of 2 to 4 T218 modules, or to connect front-to-back modules in a cardioid configuration.

powerCON TRUE1 Drive Cable / Home Runs (Assorted lengths) – T218s are powered via the ubiquitous Neutrik powerCON TRUE1, available in 15, 30, and 45 m (50, 100, and 150 ft.) lengths.

11. Transportation

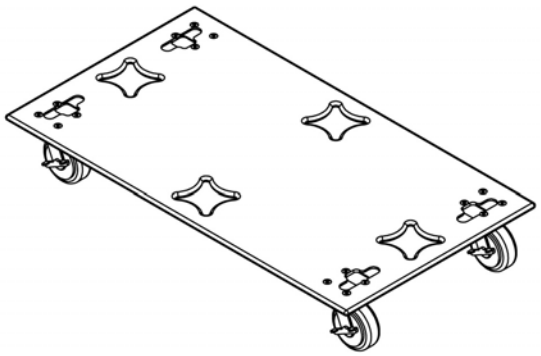
11.1 Covers

Covers are supplied as 2 separate products, referred to as the T218 Cover Top and T218 Wrap. Covers are designed to work with the various stacking configurations available. The Cover Top is placed atop the upper module on a stack of T218s and equipped with strips of Velcro loop for attaching the Wrap. The Wrap covers a single T218 module and also equipped with a lower strip of Velcro to attach Wraps for subsequent T218 modules.



11.2 Caster Board

The T218 Caster Board is designed to transport a maximum of 4 modules with or without a Suspension Frame on top. When transporting with a Suspension Frame, the Frame must be secured to the cabinet below using the supplied QRPs. It is recommended, but not necessary, that stacked modules be secured together using the QRPs. Jumper cables may remain connected to the T218 units during transportation.



13. Care & Cleaning

T218 loudspeakers are coated with a resilient polyurea coating. It may be cleaned with a mild soapy damp microfiber cloth and wiped dry with a dry cloth. To reduce the risk of electrical shock, ensure the system in unplugged from AC power before cleaning. To clean dust off the speaker cone, use a can of compressed air such as commercial air dusters.

14. Specifications

14.1 General Specifications

T218 is the flagship subwoofer in the Trinity range, the industry's first series of robotically controlled line array elements. This high-output, low-profile enclosure offers outstanding low-frequency performance with an operating range of 25 Hz-100 Hz.

T218 features dual front-loaded, long-excursion 18" transducers in a bass reflex design for clean and punchy output. A large, unrestricted vent produces high SPL performance with minimal port distortion. A single field-replaceable module located on the rear of the cabinet contains the 4,000 W Class D amplifier, control electronics, and power supply. Advanced onboard DSP simplifies set-up and calibration and maximizes performance.

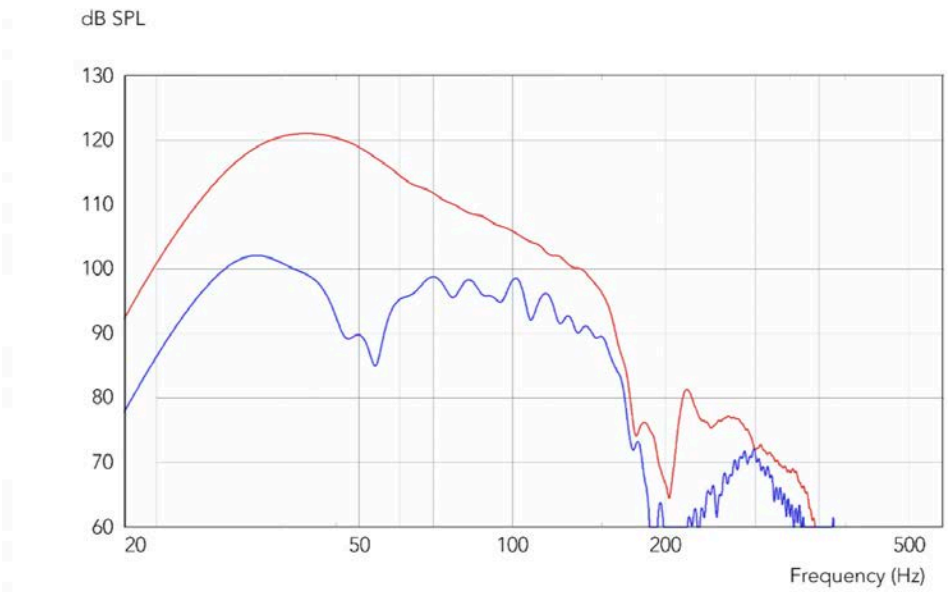
Network-based Auto-ID enhances the efficiency of deployment and control in tandem with the PK **.dynamics** platform. Low-frequency directivity and performance is then further optimized via presets within **.dynamics**.

Integrated rigging hardware allows for up to 16 T218 modules to be flown in a column, or securely ground-stacked. A low-profile design allows T218 to slide under any stage and efficiently pack for global transport, ideal for both mobile and performance installation applications.

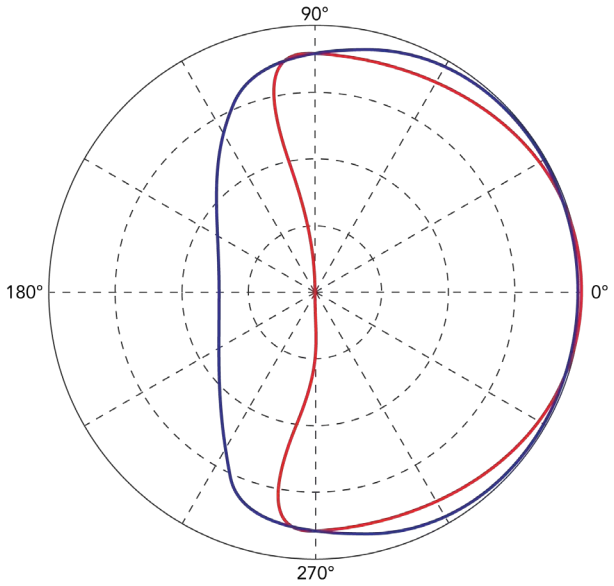
14.2 Technical Specifications

Acoustic Properties	
Frequency Response	25 Hz-100 Hz
Transducers	2 x 18" Bass Reflex
Output Capability	
Peak SPL	145.1 dB
Amplification	
Amplifier	Class D
Amlifier Power	4000 Watts RMS
Operating Voltage	Auto-Switching 100-240V, 50/60 Hz
Power Consumption	660W, 1800W max. power
Input Impedence	10k Ohm Balanced
Nominal Input Sensitivity	OdBu
Crossover	70 & 100 Hz
Network	Proprietary
Input / Output Connections	
Input Selection	Analog/AES (Standard/Touring); Analog/AES/Ethernet (Install)
Audio / Network	Multipin Amphenol – IP65
Power	Neutrik powerCON® TRUE1 – IP65
Module Properties	
Weight	104 kg / 229 lb.
Environmental	IP42 (front) / IP43 (rear)
Dimensions (W x H x D)	1395 x 518 x 780 mm / 54.9 x 20.4 x 30.7 in.
Max. Line Length	16 Modules
Rain Protection	Weather-resistant amplifier plate & IP65 input connectors
Module Construction	High-grade, void-free Baltic birch
Rigging Construction	6061-T6 Aluminum
External Coating	EXL Polyurea
Grill	Powder Coated Aluminum

14.3 Technical Data



T218 Frequency Response - Regular & Cardioid
RED: FBF 70 Hz Front
BLUE: FBF 70 Hz Rear



T218 Cardioid Dispersion Pattern (FBF)
BLUE: 20-100 Hz
RED: 40-60 Hz

14.4 Dimensions