



Commercial Installation Guide

- + Warranty
- + Registration



tune®

Simple Energy Savings.

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Registration	Inside Back Cover



WARNING: THIS PRODUCT MUST BE INSTALLED BY A LICENSED ELECTRICIAN. INSTALLATION SHALL BE PERFORMED IN COMPLIANCE WITH NFPA 70 (NEC) AS ALTERED BY ANY STATE, COUNTY OR CITY CODES (IF APPLICABLE).

WARNING: DO NOT INSTALL THIS PRODUCT IN SERIES. THIS PRODUCT IS DESIGNED TO BE INSTALLED IN PARALLEL WITH NEUTRAL BUS BAR.

General Installation Instructions

INSTALLING THE TUNE® DEVICE (EMI FACILITY FILTER) TO UL STANDARDS – APPROVED UNDER UL STANDARD 1283

- **A licensed Electrician should always install this unit**
- **Be sure to follow local electric codes and safety procedures**
- An installation of the Tune® device should allow the device to form a parallel current divider on the neutral bus assembly located in an electrical box/load panel. The objective is to install the Tune® device in such a way as to expose the non-linear noise present on the neutral side of the circuit to the filter/transformer located in the Tune® device. The Tune® device's design does not cause the fundamental frequency to flow through it when installed in a parallel circuit. **The Tune® device should never be installed in series!**
- Generally, as long as the following condition is satisfied: $(\text{Amps on Tune}^\circ \text{ Leads} > \text{Amps on Neutral Main} \times .005)$ the installation will be successful. In the event that there is insufficient current present on the neutral circuit when attempting an installation, it may be necessary to "turn on" or add loads to the circuit to determine if the device is acting as a current divider after installation. Typically, if Amps on the neutral main is < 4 Amps, the installer may need to increase the neutral current. It is best, however, if these measurements are taken during the normal operating conditions of the panel as this is the environment the Tune® device will operate in most of the time.

MOUNTING THE TUNE® DEVICE

- **The TUNE® DEVICE** is mounted on the outside of the load panel. (Ensure all power to the electrical box/load panel has been turned off prior to any installation.)
- Remove or open the electrical box/load panel door.
- Remove the panel cover from the electrical box/load panel.
- Identify a location where a "punch out" may be placed that will allow the Tune® device to be positioned on the outside of the panel so that the leads will be as short as possible when connected to the panel.
- Ensure the "punch out" diameter will allow the nipple on the Tune® device case to pass through the electrical box/load panel wall so the two wire leads and the nipple can be inserted into the electrical box/load panel.
- Attach the Tune® device to the outside of the electrical box/load panel using the nipple. Feed the two Tune® device leads and the nipple through the "punch out".
- Using the locknut provided attach the Tune® device to the panel by sliding the locknut over the two wire leads that are now protruding through the "punch out". Secure the Tune® device to the electrical box/load panel by tightening the locknut onto the nipple against the inside wall of the electrical box/load panel.
- The unit has two white leads.

WIRING INSTRUCTIONS

- Install the end of the coiled lead into the neutral main lug (or the open slot closest to this lug on the neutral bus bar) by loosening the screw of the neutral main lug, inserting the stripped end of the coiled lead into the neutral main lug, and properly re-tightening the neutral main lug screw. Ensure proper contact. (If unable to use the neutral main lug, use a wire position on the neutral bus bar next to where the neutral main lug is located.)
- Install the straight lead into the Neutral bus bar by loosening a lug screw in an open position (surrounding the neutral leads on the bus bar between the 2 Tune® device leads) on the neutral bus bar, inserting the stripped end of the straight lead into the open position on the neutral bus bar, and appropriately tightening the screw. Ensure proper contact.
- It is extremely important to minimize the resistance of the device as it acts as a current divider. Please **trim the leads** as short as possible. **PLEASE NOTE:** for better performance, have the electrician **move the neutral wires as closely together as possible on the neutral bus bar(s) and surround them with the Tune® device leads**. Use a measuring device to read AMPS on the neutral main going to the panel from the street. Take a reading of the AMPS flowing through the Tune® device. If an increase in the current reading is needed, additional loads can be turned on to increase the readings. The objective is to see at least 4.0 milliamps of current flowing through the Tune® device per amp of current flowing through the neutral main. For example, if the meter being used measures out to 2 decimal points, a reading of 10 amps on the neutral main wire near the lug should result in a reading at or above .05 on the meter ie: 10 amps on meter at the neutral main = $10 \times .005 = .05$ on the Tune® device leads **MINIMUM *more current flowing through the Tune® device is better***.
- Complete the installation by replacing the electrical box/load panel cover and door.
- Restore power to the electrical box/load panel.

For additional information, contact your sales representative or email us at install@energybytune.com

Installation Considerations

In the best installations, the leads of the Tune® device **bookend all neutral leads** on the neutral bus bar.

This requirement cannot be stressed enough. Surrounding all of the wires on the neutral bus bar means that the Tune® device can address heat and noise (harmonics) coming from each load.

If your panel does not have a **straight neutral bus bar**, take the time to install one.

If your neutral bus is a flat plate or a stacked neutral bus bar, take the time to add a straight neutral bus bar with insulated feet. Once installed, move all neutral leads to the new bus bar. Flat plates and stacked bus bars reduce the device's impact.

Grouping the neutral leads along the neutral bus bar optimizes results.

The neutral bus bar has numerous wire slots for the leads that service the loads. Between the two Tune® leads, there should be no empty bus bar slots.

Keeping the Tune® **leads as short as possible** minimizes resistance, maximizes current flow and delivers the best results.

During installation, consider that keeping the device's leads as short as possible will maximize results.

The Tune® device can be installed in **any panel with a neutral bus**.

The Tune® device is designed to install on the neutral bus of a sub or load panel. By design, the installation panel must have a neutral bus for installation. **Do not attempt to install the Tune® device in any panel that does not house a neutral bus.**



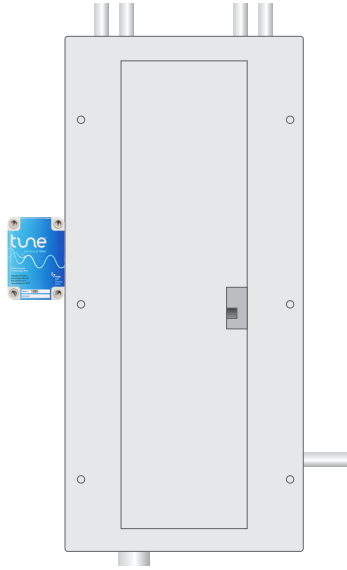
WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT. TAKE PRECAUTIONS. TURN OFF POWER DURING INSTALLATION.

Secondary Transformer

In buildings where a secondary transformer feeds a sub panel with a high impedance rating (above 4%) and the transformer is located within 10 feet of the sub panel, device installation is not recommended. In these sub panels, Tune® will have limited impact. **If the impedance rating is below 4% or the secondary transformer is more than 10 feet from the panel, a successful installation can be made.**

Step One

Mount Device



Option One

Outside Panel

FOR **SURFACE**
MOUNTED PANELS ONLY

YOU WILL NEED

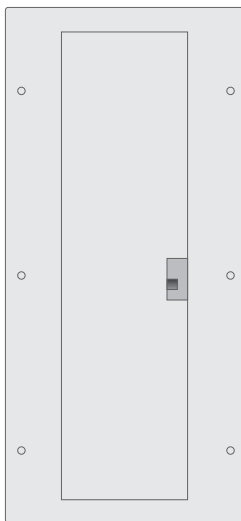
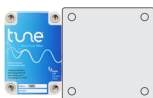
- 1/2" Drill Bit (if no cabinet knockouts)

INSTRUCTIONS

- 1 Record the device's serial number on the registration card located on the inside back cover of this booklet.
- 2 Remove the panel cover
- 3 Take a photo of the open panel
- 4 Use the prefabricated knockout hole or drill a 1/2" hole in the side wall of the panel – as close the neutral bus as possible
- 5 Feed the device's leads through the hole to the inside of the panel and secure the device using the included 1/2" locknut.



WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT. TAKE PRECAUTIONS. **TURN OFF POWER DURING INSTALLATION.**



Best Practice

Always place the Tune[®] device as close as possible to the neutral bus

Keeping the device leads as short as possible minimizes resistance, maximizes current flow and delivers the best results.

Option Two

Adjacent to Panel

FOR **FLUSH**
MOUNTED PANELS

YOU WILL NEED

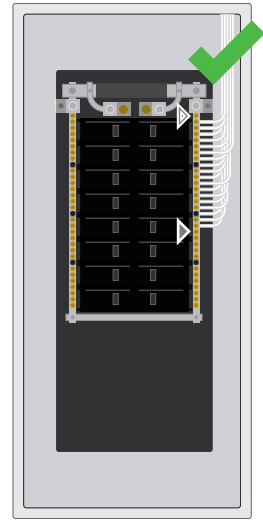
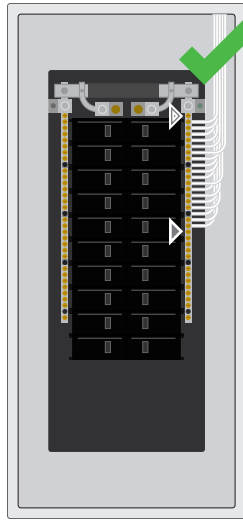
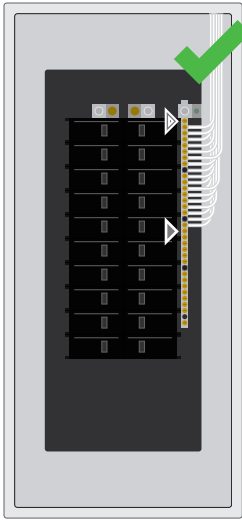
- 4" Square Junction Box
- 1/2" FMC (Flexible Metal Conduit)
- #12 THHN Wire
- 1/2" Drill Bit (if no cabinet knockouts)

INSTRUCTIONS

- 1 Record the device's serial number on the registration card located on the inside back cover of this booklet.
- 2 Remove the panel cover
- 3 Take a photo of the open panel
- 4 Because flush mount panels have studs on both sides, you will place the device above or below the panel
- 5 Use the prefabricated knockout hole or drill a 1/2" hole in the roof (or floor) of the panel – as close to the neutral bus as possible
- 6 Determine position for mounting a 4" square junction box on the wall and drill 1/2" hole
- 7 Using fish-tape, feed 1/2" FMC (flexible metal conduit) and connector – connecting the junction box to the panel
- 8 Secure conduit to panel and junction box
- 9 Use the prefabricated knockout hole or drill a 1/2" hole in the junction box for the Tune[®] device
- 10 Feed the device's leads through the hole to the inside of the junction box and secure the device using the included 1/2" locknut.
- 11 Route the appropriate color #12 THHN conductors (white or gray depending on existing wires) through the flexible conduit. Leave enough wire to reach neutral bus in panel.
- 12 Splice the device leads with the THHN.

Step Two

Neutral Preparation



Straight Neutral Bus

OPTIMAL INSTALLATION

YOU WILL NEED

- Screwdriver

INSTRUCTIONS

- 1 Leave top neutral lead slot open for the first device lead (▶)
- 2 Ensure all neutral leads are inserted into consecutive slots – leaving no empty slots between leads.
- 3 Leave the slot following the neutral leads empty for the second device lead (▶)

Horseshoe Neutral Bus

YOU WILL NEED

- Screwdriver

INSTRUCTIONS

- 1 Leave top neutral lead slot open for the first device lead (▶)
- 2 Move all neutral leads to one bar (left or right)
- 3 Ensure all neutral leads are inserted into consecutive slots – leaving no empty slots between leads.
- 4 Leave the slot following the neutral leads empty for the second device lead (▶)

Rectangle Neutral Bus

YOU WILL NEED

- Screwdriver

INSTRUCTIONS

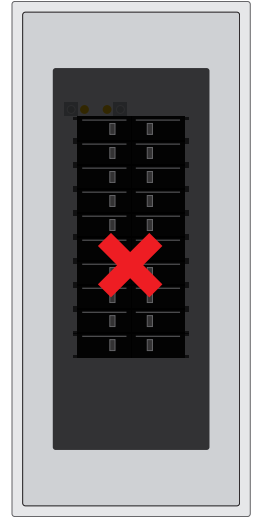
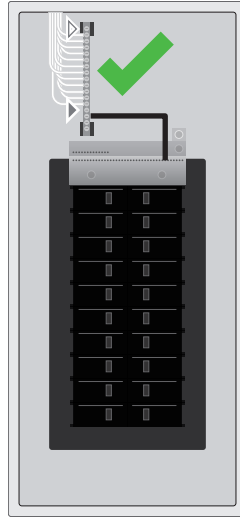
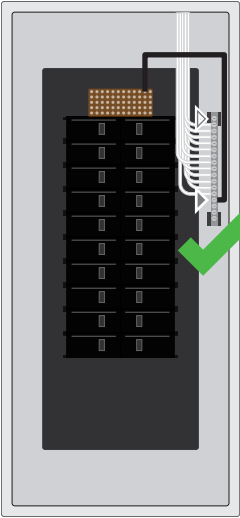
- 1 Leave top neutral lead slot open for the first device lead (▶)
- 2 Move all neutral leads to one bar (left or right)
- 3 Ensure all neutral leads are inserted into consecutive slots – leaving no empty slots between leads.
- 4 Leave the slot following the neutral leads empty for the second device lead (▶)



WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT. TAKE PRECAUTIONS. **TURN OFF POWER DURING INSTALLATION.**

Best Practice

Connect the device to a straight neutral bus bar for best results



Flat Plate Neutral Bus

YOU WILL NEED

- Screwdriver
- Insulated straight bus bar
- Wire equivalent in gauge to the neutral main

INSTRUCTIONS

- 1 Secure a new **insulated** straight neutral bus bar to the panel
- 2 Connect the new neutral bus bar to the flat plate bus bar using a wire with a gauge equivalent to that of the neutral main.
- 3 Leave the first neutral lead slot open for the first device lead (▶)
- 4 Move all neutral leads to the new bus bar using consecutive slots
- 5 Leave the slot following the neutral leads empty for the second device lead (▶)

Stacked Neutral Bus

YOU WILL NEED

- Screwdriver
- Insulated straight bus bar
- Wire equivalent in gauge to the neutral main

INSTRUCTIONS

- 1 Secure a new **insulated** straight neutral bus bar to the panel
- 2 Connect the new neutral bus bar to the stacked neutral bus bar using a wire with a gauge equivalent to that of the neutral main.
- 3 Leave the first neutral lead slot open for the first device lead (▶)
- 4 Move all neutral leads to the new bus bar using consecutive slots
- 5 Leave the slot following the neutral leads empty for the second device lead (▶)

None No Neutral Bus

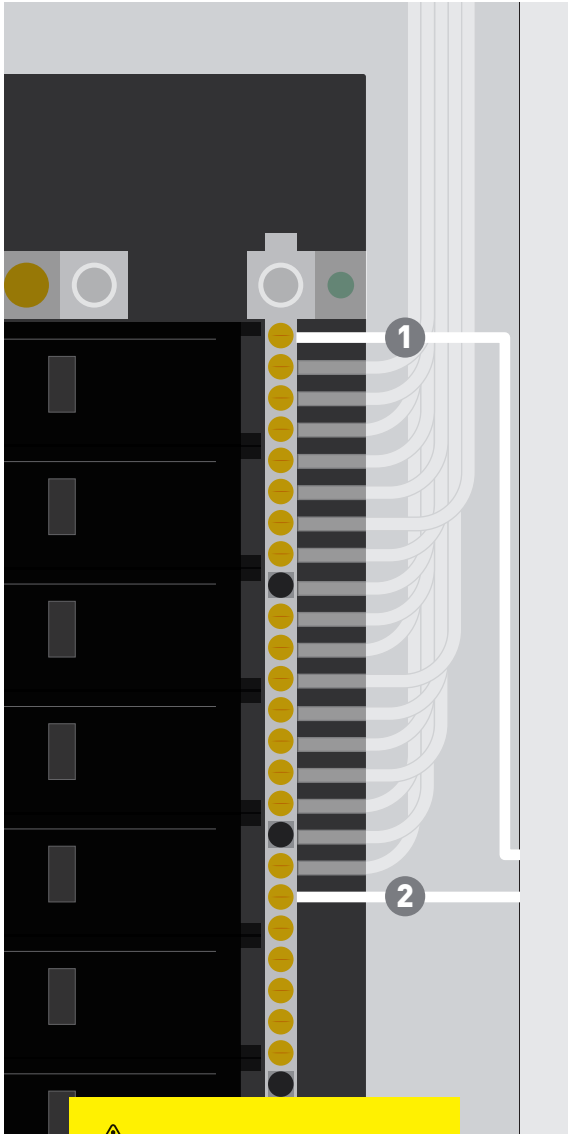
DO NOT INSTALL THE TUNE® DEVICE IN ANY PANEL WITHOUT A NEUTRAL BUS

In 3 phase 3 wire panels you will not find a neutral bus and will not be able to install a Tune® device. However, **Tune® can be installed in 3 phase 4 wire panels** that house a neutral bus.

Step Three

Connect Tune® Lead Wires

A successful installation requires the leads of the Tune® device to bookend the neutral wires on the bus bar. The best installations leave no empty slots between the two device leads. For **Split Neutral** installations see special instructions on page 11.



- 1 Connect the coiled lead wire at the first open slot on the neutral bus bar – generally at the top. **Trim lead as short as possible.**
- 2 Connect the straight lead wire to the slot immediately following the last neutral lead. **Trim lead as short as possible.**
- 3 Ensure lead wires are not touching other wires or touching the panel.
- 4 Turn power on

Device can be rotated to mount on the right side of panel.

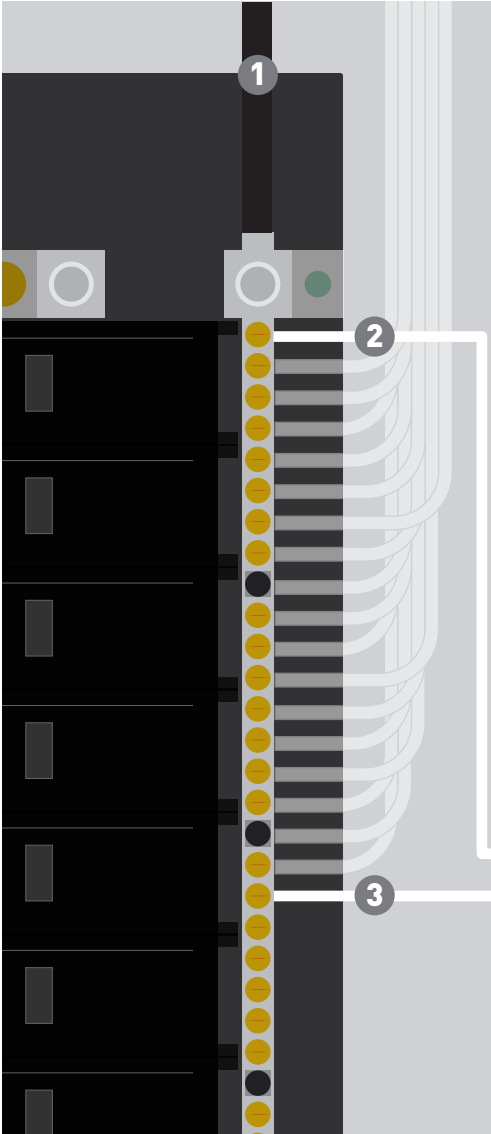


WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT. TAKE PRECAUTIONS. **TURN OFF POWER DURING INSTALLATION.**

Step Four

Capture Amp Readings

Successful installation is confirmed when the amp readings on the Tune® device leads are at least .005 that of the amp reading of the neutral main.



Using a hand held volt/amp meter:

- 1 Measure the amps on the neutral main and multiply by .005. The amps on the two device leads must be greater than or equal to this number.

_____ neutral main
amps

x .005

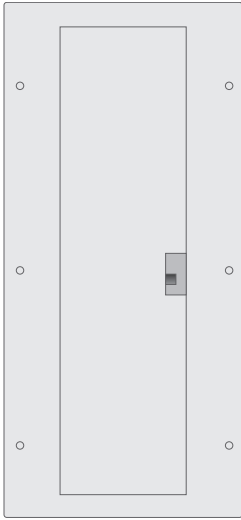
_____ min. device leads
amps

- 2 Measure the amps on Tune®'s coiled lead wire. Amps must be greater than or equal to minimum device lead amps calculated above.*
- 3 Measure the amps on Tune®'s straight lead wire. Amps must be greater than or equal to minimum device lead amps calculated above.*
- 4 Record amp readings on the registration card located on the inside back cover of this booklet.

*if amp readings on either of the device leads was less than the neutral main amps x .005, return to step 2 and ensure all steps were performed correctly.

Step Five

Finalize Installation

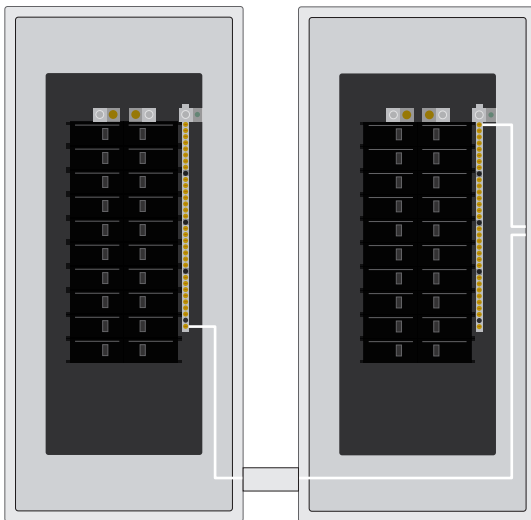


You're almost done. Just a few final tasks to complete your installation.

INSTRUCTIONS

- 1 Ensure all connections inside the panel are tight
- 2 Before replacing the panel cover – make sure you have recorded:
 - The device's serial number
 - The amp readings for the:
 - Neutral main
 - Tune®'s coiled lead wire
 - Tune®'s straight lead wire
 - Photo of the final installation
- 3 Replace and secure the panel cover
- 4 Complete the registration card on the inside back cover of this booklet

Special Situations



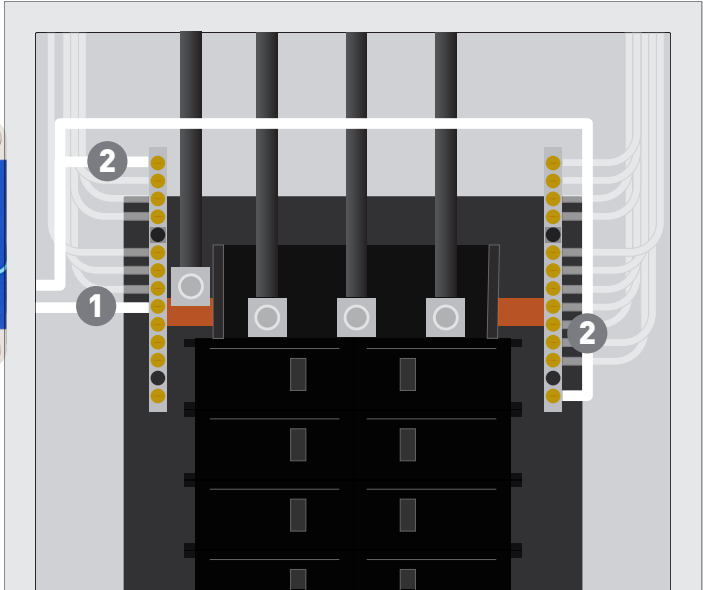
Daisy Chain Cabinets

While not ideal due to the length of the device leads, it is possible to use one Tune® device for a daisy chain pair of cabinets. As with all installations, the device leads must bookend all neutral wires. Amp measurements should be made as outlined on page 9 of this booklet.

Special Situations

Split Neutral Installations

While straight, horseshoe or rectangular bus bars allow for the ideal Tune® installation, a successful installation can be made on a split neutral bus bar using the following instructions.



- 1 Connect the coiled lead wire to the slot on the neutral bus bar closest to the copper connector at the incoming neutral lug. **Trim lead as short as possible.**
- 2 Split the straight lead wire into two wires. Connect the first of these lead wires to the top slot on the bar closest to the Tune® device. Connect the second lead wire to the bottom of the bar furthest from the Tune® device. **Trim lead as short as possible.**
- 3 Ensure lead wires are not touching other wires or touching the panel.
- 4 Turn power on



WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT. TAKE PRECAUTIONS. **TURN OFF POWER DURING INSTALLATION.**

Tune® Device Limited Warranty

THIS LIMITED WARRANTY CONTAINS IMPORTANT INFORMATION ABOUT YOUR RIGHTS AND OBLIGATIONS, AS WELL AS LIMITATIONS AND EXCLUSIONS THAT MAY APPLY TO YOU.

1. WHAT THIS LIMITED WARRANTY COVERS; PERIOD OF COVERAGE

Tune® LLC, 5211 Village Parkway, Suite 101, Rogers, Arkansas USA ("Tune®"), warrants to the owner of the enclosed Tune®-branded product contained in this box ("Product") will be free from defects in materials and workmanship for a period of three (3) years from the date of delivery following the original retail purchase (the "Warranty Period"). If the Product fails to conform to this Limited Warranty during the Warranty Period, Tune® will, at its sole discretion, either (a) repair or replace any defective Product or component; or (b) accept the return of the Product and refund the money actually paid by the original purchaser for the Product. Repair or replacement may be made with a new or refurbished product or components, at Tune®'s sole discretion. If the Product or a component incorporated within it is no longer available, Tune® may, at Tune®'s sole discretion, replace the Product with a similar product of similar function. This is your sole and exclusive remedy for breach of this Limited Warranty. Any Product that has either been repaired or replaced under this Limited Warranty will be covered by the terms of this Limited Warranty for the longer of (a) ninety (90) days from the date of delivery of the repaired Product or replacement Product, or (b) the remaining Warranty Period. This Limited Warranty is transferable from the original purchaser to subsequent owners, but the Warranty Period will not be extended in duration or expanded in coverage for any such transfer.

2. TOTAL SATISFACTION RETURN POLICY

If you are the original purchaser of the Product and you are not satisfied with this Product for any reason, you may return it in its original condition and packaging within thirty (30) days of the original purchase and receive a full refund.

3. WARRANTY CONDITIONS; HOW TO GET SERVICE IF YOU WANT TO CLAIM UNDER THIS LIMITED WARRANTY

Before making a claim under this Limited Warranty, the owner of the Product must (a) contact Tune® during the Warranty Period to provide notice of your warranty claim and describe the alleged failure, and (b) comply with Tune® (or its authorized dealers) return shipping instructions. Tune® will have no warranty obligations with respect to a returned Product if it determines, in its reasonable discretion after examination of the returned Product, that the Product is an Ineligible Product (defined below). Tune® will bear all costs of return shipping to owner and will reimburse any shipping costs incurred by the owner, except with respect to any Ineligible Product, for which the owner will bear all shipping costs.

4. WHAT THIS LIMITED WARRANTY DOES NOT COVER

This Limited Warranty does not cover the following (collectively "Ineligible Products"): (i) Products marked as "sample" or "Not for Sale", or sold "AS IS"; (ii) Products that have been subject to: (a) modifications, alterations, tampering, or improper maintenance or repairs; (b) handling, storage, installation, testing, or use not in accordance with any User's Guide, Placement Guidelines, or other instructions provided by Tune®; (c) abuse or misuse of the Product; (d) Acts of God, including but not limited to lightning, flood, tornado, earthquake, or hurricane; or (iii) any non-Tune® branded hardware products, even if packaged or sold with Tune® hardware. Tune® recommends that you use only authorized service providers for maintenance or repair. Unauthorized use of the Product can impair the Product's performance and may invalidate this Limited Warranty.

5. DISCLAIMER OF WARRANTIES

EXCEPT AS STATED ABOVE IN THIS LIMITED WARRANTY, AND TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, TUNE® DISCLAIMS ALL EXPRESS, IMPLIED, AND STATUTORY WARRANTIES AND CONDITIONS WITH RESPECT TO THE PRODUCT, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, TUNE® ALSO LIMITS THE DURATION OF ANY APPLICABLE IMPLIED WARRANTIES OR CONDITIONS TO THE DURATION OF THIS LIMITED WARRANTY.

6. LIMITATION OF DAMAGES

IN ADDITION TO THE ABOVE WARRANTY DISCLAIMERS, IN NO EVENT WILL TUNE® BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, EXEMPLARY, OR SPECIAL DAMAGES, INCLUDING ANY DAMAGES FOR LOST PROFITS, ARISING FROM OR RELATING TO THIS LIMITED WARRANTY OR THE PRODUCT, AND TUNE®'S TOTAL CUMULATIVE LIABILITY ARISING FROM OR RELATED TO THIS LIMITED WARRANTY OR THE PRODUCT WILL NOT EXCEED THE AMOUNT ACTUALLY PAID FOR THE PRODUCT BY THE ORIGINAL PURCHASER.

7. LIMITATION OF LIABILITY

THE TUNE® ONLINE SERVICES ("SERVICES") PROVIDE YOU INFORMATION ("PRODUCT INFORMATION") REGARDING YOUR TUNE® PRODUCTS OR OTHER PERIPHERALS CONNECTED TO YOUR PRODUCTS ("PRODUCT PERIPHERALS"). THE TYPE OF PRODUCT PERIPHERALS THAT MAY BE CONNECTED TO YOUR PRODUCT MAY CHANGE FROM TIME TO TIME. WITHOUT LIMITING THE GENERALITY OF THE DISCLAIMERS ABOVE, ALL PRODUCT INFORMATION IS PROVIDED FOR YOUR CONVENIENCE, "AS IS", AND "AS AVAILABLE". TUNE® DOES NOT REPRESENT, WARRANT, OR GUARANTEE THAT PRODUCT INFORMATION WILL BE AVAILABLE, ACCURATE, OR RELIABLE OR THAT PRODUCT INFORMATION OR USE OF THE SERVICES OR PRODUCT WILL PROVIDE SAFETY. YOU USE ALL PRODUCT INFORMATION, THE SERVICES, AND THE PRODUCT AT YOUR OWN DISCRETION AND RISK. YOU WILL BE SOLELY RESPONSIBLE FOR (AND TUNE® DISCLAIMS) ANY AND ALL LOSS, LIABILITY, OR DAMAGES, INCLUDING TO YOUR WIRING, FIXTURES, ELECTRICITY, STRUCTURE, PRODUCT, PRODUCT PERIPHERALS, AND ALL OTHER ITEMS, RESULTING FROM YOUR USE OF THE PRODUCT INFORMATION, SERVICES, OR PRODUCT. PRODUCT INFORMATION PROVIDED BY THE SERVICES IS NOT INTENDED AS A SUBSTITUTE FOR DIRECT MEANS OF OBTAINING THE INFORMATION. FOR EXAMPLE, A NOTIFICATION PROVIDED THROUGH THE SERVICE IS NOT INTENDED AS A SUBSTITUTE FOR AUDIBLE AND VISIBLE INDICATIONS ON THE PRODUCT, NOR FOR A THIRD PARTY MONITORING SERVICE THAT MONITORS ALARM STATE.

8. YOUR RIGHTS AND THIS LIMITED WARRANTY

This Limited Warranty gives you specific legal rights. You may also have other legal rights that vary by state, province, or jurisdiction. Likewise, some of the limitations in this Limited Warranty may not apply in certain states, provinces or jurisdictions. The terms of this Limited Warranty will apply to the extent permitted by applicable law. For a full description of your legal rights you should refer to the laws applicable in your jurisdiction and you may wish to contact a relevant consumer advisory service.



Simple Energy Savings.

Have questions or comments?
email install@energybytune.com
or visit us online
energybytune.com

