



# Everstill™ K-400

*Benchtop Active Vibration Cancellation Platform*

## Setup & Operation Guide



CE

Doc # 96-42418-01 Rev D  
12/28/16



# Warnings



## Power Supply (included)

The Everstill™ K-400 System uses an external universal power supply.  
The AC voltage requirement is 90-260 VAC, 50-60 Hz.



## Power Cord (applicable cable included)

The main power cord has 0.75mm (18 AWG) wire, and includes a PE ground.



US AC power cord is UL / CSA certified



Euro AC power cord is VDE certified



UK AC power cord is VDE certified



## Ventilation

TMC recommends that system be installed in an unrestricted air circulation environment.

## Operating Temperature

Operating the system at less than 50°F (10°C) may cause malfunction. If system is moved from a cold environment into a relatively warmer one, wait approximately 2-3 hours before applying power to the system.

## System Usage

The system internal controller and its components are only to be used for its intended purposes as described in this manual. Any other usage could jeopardize operator safety and possibly void the warranty.

# Certifications



Complies with European Union requirements



Compliant with Restriction of Hazardous Substances

# TABLE OF CONTENTS

<b>1</b>	<b>Introduction .....</b>	<b>1</b>
<b>2</b>	<b>Unpacking &amp; Moving System .....</b>	<b>2</b>
	Package Content .....	2
<b>3</b>	<b>Setup and Operation .....</b>	<b>3</b>
	Controls and Connections .....	3
	Setup & Operation .....	4
	Shut down .....	6
<b>4</b>	<b>Specifications .....</b>	<b>8</b>
<b>5</b>	<b>Dimensional Drawing .....</b>	<b>9</b>

## FIGURES

Figure 2-1	Unpacking system .....	2
Figure 2-2	Shipping Package Content .....	2
Figure 3-1	Control and Indicators .....	3
Figure 3-2	Connector Panel.....	3
Figure 3-3	Place system on rigid flat surface .....	4
Figure 3-4	System level adjust .....	4
Figure 3-5	Connect external power supply .....	5
Figure 3-6	Center and level equipment on top plate .....	5
Figure 3-7	System automatically levels top plate.....	6
Figure 5-1	Dimensional Drawing.....	9

Page is intentionally blank

# 1 Introduction

Everstill™ K-400 is a hard mount benchtop active vibration cancellation platform incorporating TMC's proven and well known serial architecture originally developed for STACIS. The system isolates highly sensitive instrumentation from low frequency vibration.

The combination of low frequency active vibration cancellation and stability from the hard mount design will enable higher resolution for longer acquisition periods.

Everstill™ K-400 is designed to support benchtop sized optical and scanning probe microscopes as well as AFMs, optical profilers and other sensitive instruments.

The compact design is ideally suited for installing on small work benches and tables. The highly advanced patented Everstill™ technology delivers best-in-class vibration cancellation starting at 0.7 Hz.

Everstill™ K-400 is compact, easy to install and incorporates self-leveling for asymmetric payloads. The only input requirement is from a standard AC power outlet.

## Key Feature Highlights

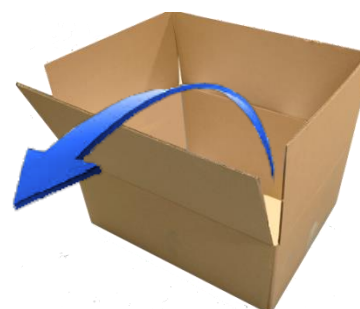
- **Superior low frequency performance**  
Starts to isolate at 0.7 Hz. Significant vibration cancellations in the critical 1-10 Hz range
- **Automatic self-leveling**  
For asymmetric payloads (automatic adjustment) repeatable to  $\pm 0.5$  mm
- **Gainmatch™**  
K-400 automatically selects one of three active gain settings at start-up to match your environment. This feature is also user selectable.
- **Patented active vibration cancellation technology**  
Internal active cancellation for small lightweight ultra-precision instruments
- **Advanced Vibration sensor technology**  
Incorporates geophone type velocity sensors for sub-1 Hz performance  
Better low frequency sensitivity than accelerometers
- **Active hard mount**  
Stable support enables precision long hold imaging, no amplification at low frequencies  
No air, no adjustments, robust plug and play design
- **Evolved from STACIS serial architecture**  
TMC's proven piezoelectric vibration control technology
- **Easy to install**  
Has manually adjustable leveling foot to accommodate uneven tables and benches
- Black anodized aluminum top plate available with or without tapped holes

[Return to TOC](#)

## 2 Unpacking & Moving System



**IMPORTANT!** Ensure to always lift system by two side handle inserts when unpacking or moving system.



**CAUTION!** System weighs approximately 55 lbs. (25 kg)

Figure 2-1 Unpacking system

### Package Content

Everstill™ K-400



Power supply and applicable power cord



Setup & Operations Guide and Quick Setup Guide



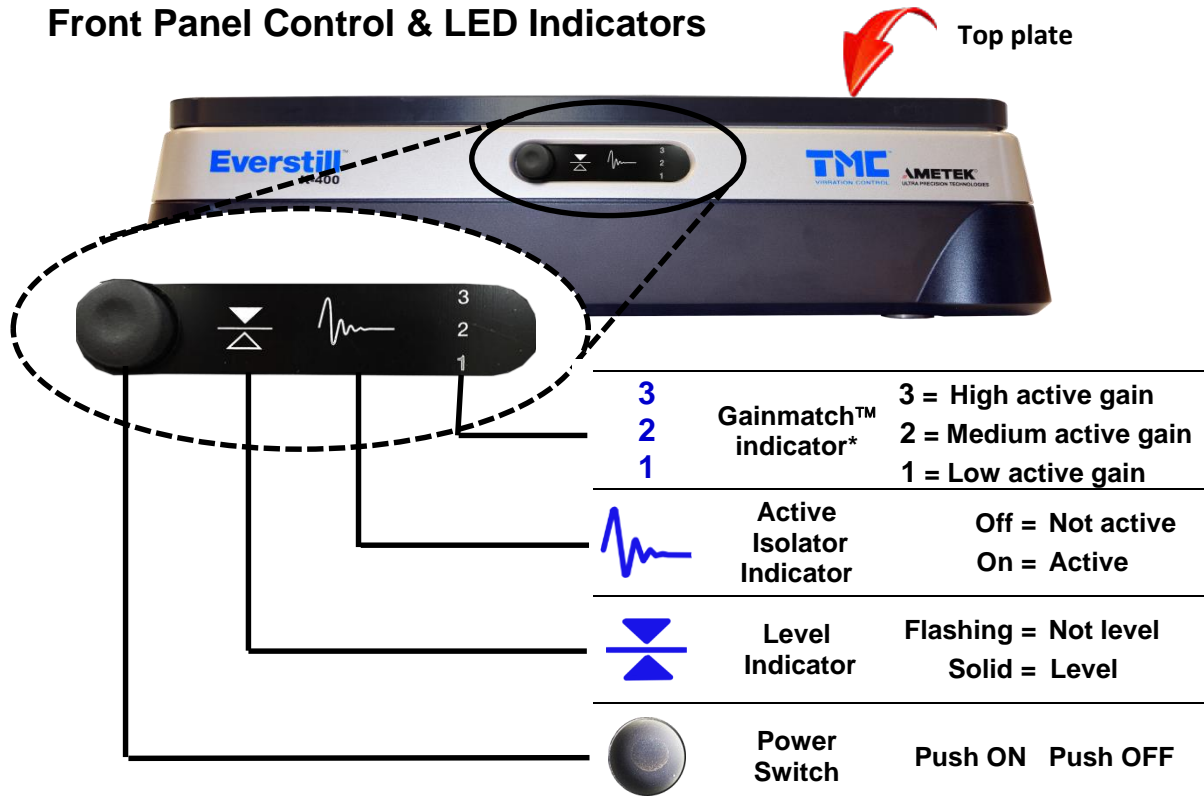
Figure 2-2 Shipping Package Content

[Return to TOC](#)

# 3 Setup and Operation

## Controls and Connections

### Front Panel Control & LED Indicators



\*Note: When Gainmatch™ indicator is flashing, re-start or switch to next lowest setting. Please reference Step 5d for details

Figure 3-1 Control and Indicators

### Rear Panel Connectors

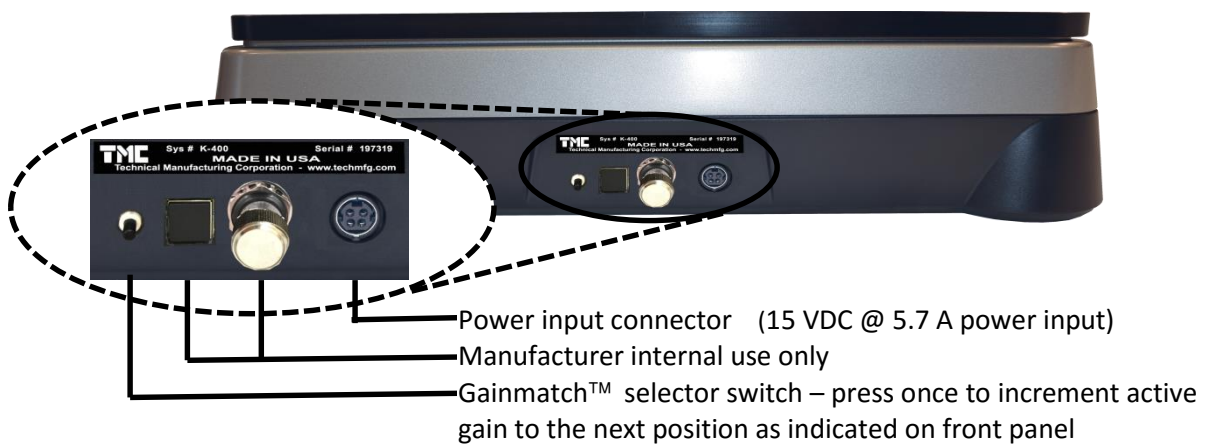


Figure 3-2 Connector Panel

[Return to TOC](#)

## Setup & Operation

- Step 1** Place K-400 system on a rigid flat surface using side handle inserts.
- The surface should be flat to within 1/8 inch (3 mm). Confirm that table surface is nominally level using a bubble level.
  - Confirm table is rigid by bumping the side of the table with the side of your fist. If the table noticeably shakes then it may not be rigid enough to support an inertial active benchtop isolation system, or it may not operate optimally at a high gain setting. .



**Figure 3-3** Place system on rigid flat surface

- Step 2** Rotate rear corner level adjust to ensure all four corners sit flat on rigid surface.



**Figure 3-4** System level adjust



[Return to TOC](#)

- Step 3** Connect external power supply between system input power connector on rear panel and AC power.

Note: Always grasp power cord on the sliding collar when connecting or disconnecting on rear panel.



**Figure 3-5** Connect external power supply

- Step 4** Ensure power is OFF. Place, center and level equipment payload on top plate.

Payload capacity:  
50 – 330 lbs.  
(23 – 150kg)



**Figure 3-6** Center and level equipment on top plate

**Load plate p/n 29-43240-01**, (Optional) 400mm x 500mm x 12mm, 21Kg  
When payload is less than 50 lb. (23Kg) then plate can be used for added weight by placing on system top plate under equipment payload.





**Basepad p/n 29-43245-01**, (Optional) 400mm x 500mm x 0.8mm  
If equipment payload doesn't include integrated kinematic support or leveling feet, for example if it has its own uniform baseplate, then basepad can be used to place on system top plate under equipment payload.

[Return to TOC](#)

- Step 5** Press power switch ON when no external transient events are expected for 3-5 minutes.



Figure 3-7 System automatically levels top plate

- a) System automatically levels top plate while level indicator flashes. Once top plate is level, indicator changes from flashing to solid. Leveling process may take up to 3 minutes at initial start-up. When system is restarted with the same payload this process may take only a few seconds. 
- b) System then initiates start-up self-test and automatic Gainmatch selection. This process typically takes roughly 2 minutes, dependent on leveling time. During this process, the isolator indicator will turn on and off while each Gainmatch level is tested as indicated by the flashing number. 
- c) System is ready for use when both indicators and Gainmatch setting are solid.  
- d) If the isolator indicator and a Gainmatch setting do not illuminate at the end of the start-up self test, then this is an indication the K-400 is not resting flat (check rear leveling foot), the supporting table is not adequately rigid, or the environment is introducing an excessive displacement. Restart the K-400 when these conditions are corrected or eliminated.



**Note:** Moving or changing the payload will cause the top plate to tilt and the level indicator will flash indicating that it is no longer level; power OFF unit, wait 10 seconds, and then repeat steps 4 & 5.

- e) **Gainmatch™** The Gainmatch selection procedure is automatic and initiated upon start-up. Occasionally, and more often if the supporting table is not adequately rigid, the procedure may result in an incorrect gain setting. When this occurs, the Gainmatch indicator will start to flash roughly 20 seconds after the procedure is complete, and will continue to flash. This is an indication the K-400 is not resting flat, the supporting table is not adequately rigid, or the environment is introducing an excessive displacement during the

[Return to TOC](#)

procedure. Restart the K-400 when these conditions are corrected or eliminated.

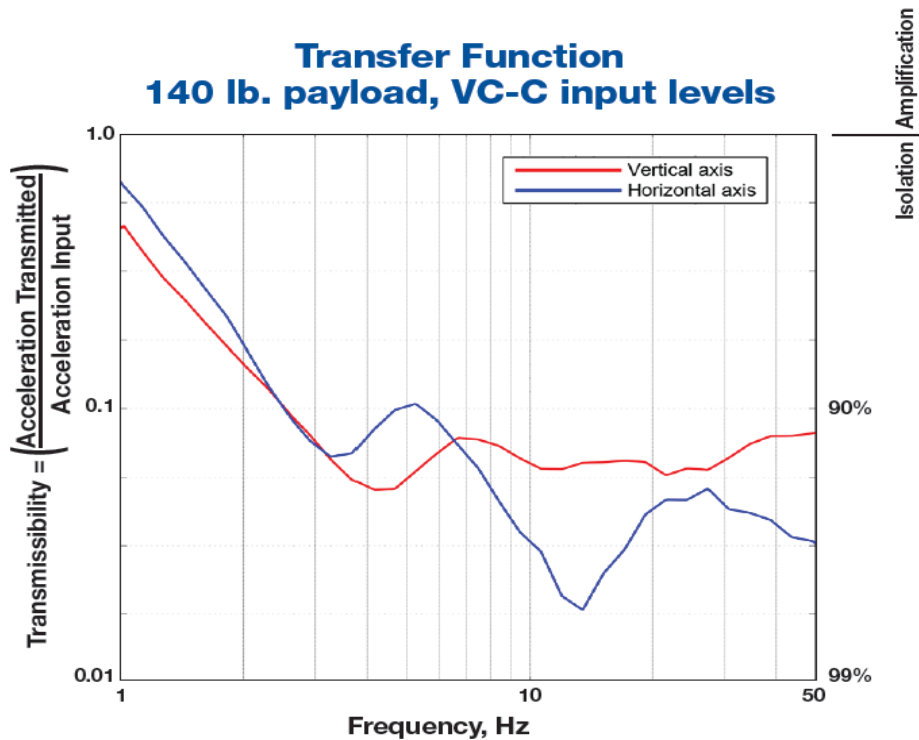
Alternatively, the Gainmatch setting is user selectable. If the Gainmatch indicator continues to flash (after start-up or at a later time) even after restarting several times, then press the button on the back to select the next lowest Gainmatch setting. No active gain, when no setting is illuminated and the isolator indicator is off, is also an option and may be required when using a very weak table. If the Gainmatch indicator flashes continuously on all 3 settings, and the K-400 is resting flat (see step 2), then consider using a more rigid support table.

**Shut down** Press power switch OFF.

[Return to TOC](#)

# 4 Specifications

Vibration cancellation type..... Active hard mount  
 Schematic architecture.....Serial type active (actuator in series with isolator spring)  
 Vibration sensors.....Geophone type velocity sensors (voltage proportional to velocity)  
 Leveling.....Automatic, Repeatability +/- 0.02 in. (+/- 0.5 mm)  
 Payload capacity ..... 50 – 330 lbs. (23 – 150 kg)  
 Isolation performance ..... 4 – 7 dB @ 1.0 Hz, >20 dB above 2.5 Hz  
 Resonant Frequency .....0.6 Hz  
 Active vibration cancellation bandwidth..... 0.7 Hz to 100 Hz  
 Passive vibration cancellation bandwidth ..... up to 1000 Hz  
 System dimensions (W x L x H) ..... 16" x 20" x 4" (400 mm x 500 mm x 100 mm)  
 Weight ..... approx. 55 lbs. (25 kg)  
 Power requirements..... 90–260 VAC, 50/60 Hz  
 Transportation..... Internal lock-out restraint  
 Power wattage..... 20 watts average, 50 watts max  
 Active gain .....3 user selectable settings



**Note:** Above data was taken with low-amplitude, micron level vibration as the excitation. Actual performance may vary and is dependent on the vibration input levels and the payload.

[Return to TOC](#)

## **5** Dimensional Drawing

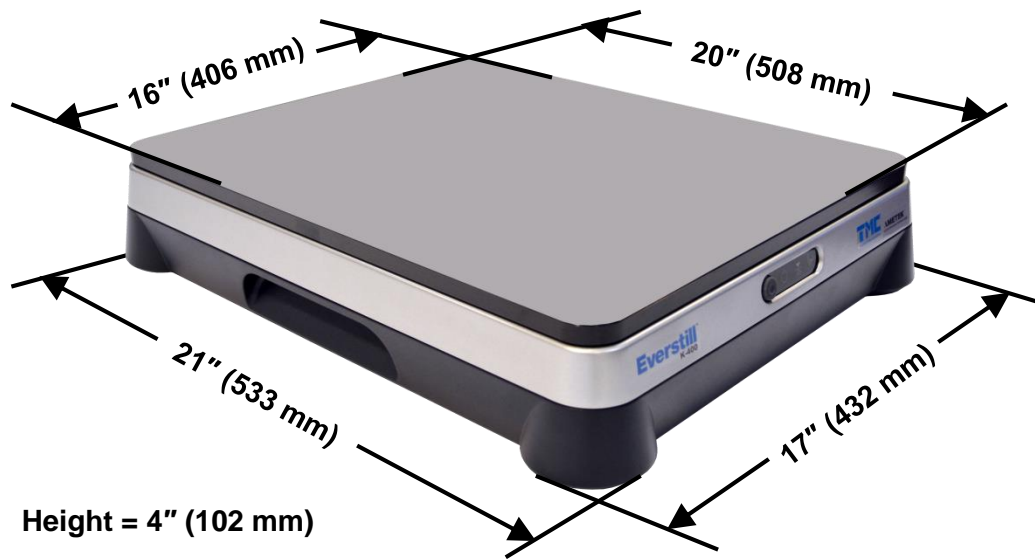


Figure 5-1 Dimensional Drawing

Page is intentionally blank



TMC ▪ 15 Centennial Drive, Peabody MA 01960 USA  
Tel (800) 542-9725, (978) 532-6330 ▪ Fax (978) 531-8682

sales@techmfg.com ▪ service@techmfg.com  
<http://www.techmfg.com>

All data in this document is subject to change in accordance  
with TMC policy of continual product improvement.

Copyright © 2016 TM ▪ All Rights Reserved  
All registered marks and trademarks are property of their respective holders

---