LF-D

Large Format Digital Platform

Get More From Your Microscope

PEAK™ METROLOGY

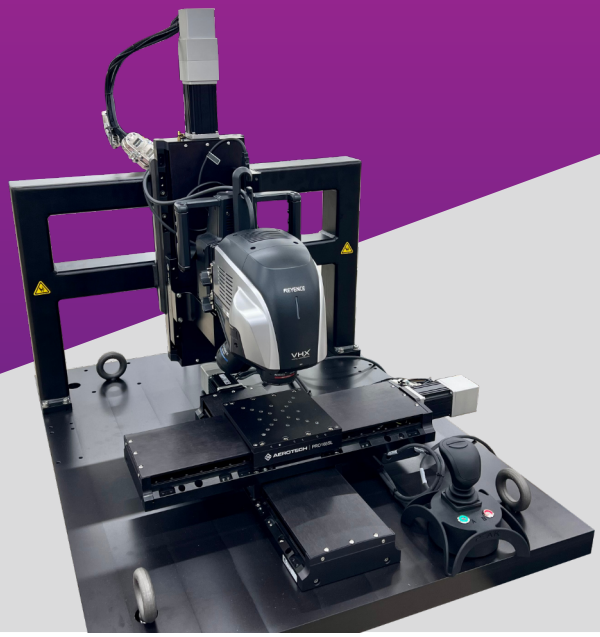
An AEROTECH Company

Contents

PEAK™ METROLOGY
An AEROTECH Company

LF-D

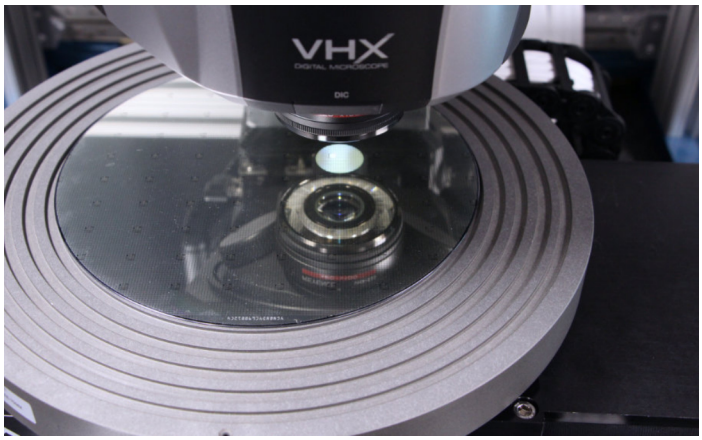
Large Format Digital Platform



600 x 600 mm Inspection Area System

High Resolution. Large Travel.

Larger stages increase the working area and sample payload capacity while ScanX software enables advanced features, such as: increased vertical travel, motorized tilt control, extra large stitching capabilities, and more! Bring your VHX microscope to the next level with Peak's LF-D Platform.



Wafer imaging with the VHX-7100 microscope

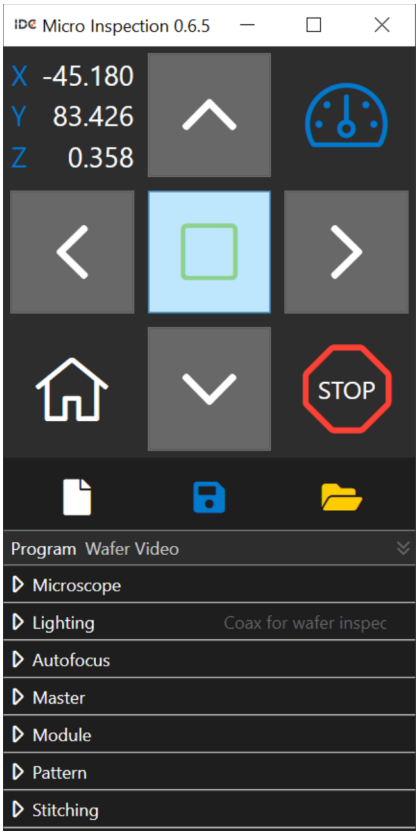
Many Standard Options to Choose From

A variety of accessories are available to meet the needs of customers in environments spanning from R&D to production. Configure a system that works best for your application.

PEAK™ METROLOGY

An AEROTECH Company

ScanX



Better Together

Peak Metrology is proud to partner with IDC MicroInspection to offer the ScanX Automated VHX Software with LF-D systems. This powerful combination allows you to leverage advanced automation techniques via ScanX on large and heavy parts on the LF-D motion platform.

Make quick work of those large parts via Teaching, Stitching, and Patterning. Take control of your inspection workflow with custom image and folder name outputs and an optional manual classifier.

Click here for a full list of features.

IDC+PEAK™

CellType	CellID	X	Y	Size-X	Size-Y	Row	Column
Reference	Ref-1	85257	36246	0	0		
Reference	Ref-2	-108450	48128	0	0		
Block 1	R001_C001	-63322	115993	500	500	1	1
Block 1	R001_C002	-35327	115901	500	500	1	2
Block 1	R001_C003	-17332	115816	500	500	1	3
Block 1	R001_C004	660	115717	500	500	1	4
Block 1	R001_C005	18652	115624	500	500	1	5
Block 1	R002_C001	18501	94028	500	500	2	5
Block 1	R002_C002	510	94120	500	500	2	4
Block 1	R002_C003	-17486	94213	500	500	2	3
Block 1	R002_C004	-35482	94308	500	500	2	2
Block 1	R002_C005	-53474	94395	500	500	2	1

Key Features

- Unlimited image stitching
- Arbitrarily programmable scan positions
- Programmable Autofocus for reduced cycle times
- Customizable file/image naming and folder structure
- Import position lists including reference points for pattern shifting
- Pattern positions for quick processing of batch parts

Your Routines, Your Way

With ScanX, you can easily program thousands of positions (X,Y,V,T axes). For features larger than your field of view, simply specify any image size and have the stitching requirements computed automatically!

Stay organized by choosing image names that make sense for your team.

Use reference locations to align batch parts or a single part measured over long time periods - ScanX will automatically adjust the spatial coordinates.

PEAK™ METROLOGY
An AEROTECH Company

ScanX

Feature/Application	ScanX	VHX
Large Area Stitching Ability to stitch final images > 55,000 pixels	X	
Depth Stacking Combine images from multiple depths to generate a focused image over tall features		X
Advanced Servomotor Motion Use more accurate stages and more stage selection options (flexibility for purpose-built designs)	X	
Work in a Single Application Control stage motion and imaging from within a single program		X
Advanced Teaching/Recipe Capabilities Ability to use a programmable autofocus and include many stitched areas inside a teaching routine	X	
Pre-mapping Navigation Create a macro-scale map of your surface and use it to quickly move the microscope to areas of interest		X
Index-list Navigation Load a position list of coordinates and quickly move between positions with a single click	X	
Teaching Auto Measurement Program a measurement to be made on an image automatically		X
3D Image Stitching Stitch multiple, adjacent 3D images into a single 3D image larger than the field of view		X
Peak Product	LF-D	LF-DN

Is ScanX right for you?

The table above provides a general overview of the type of applications that are best suited for ScanX or the standard VHX software. A complete list of all features and their availability in both pieces of software can be found here (https://www.peakmetrology.com/vhx-feature-comparison/).

Still not sure which is right for you? Contact us today! We'll work with you to review your application in detail to determine which solution best meets your needs. No matter which solution you choose, Peak has you covered. This catalog details the features of the ScanX software package paired with the LF-D motion platform. For more information about systems with large measurement volumes while still working within the standard VHX software: please see our LF-DN product catalog.

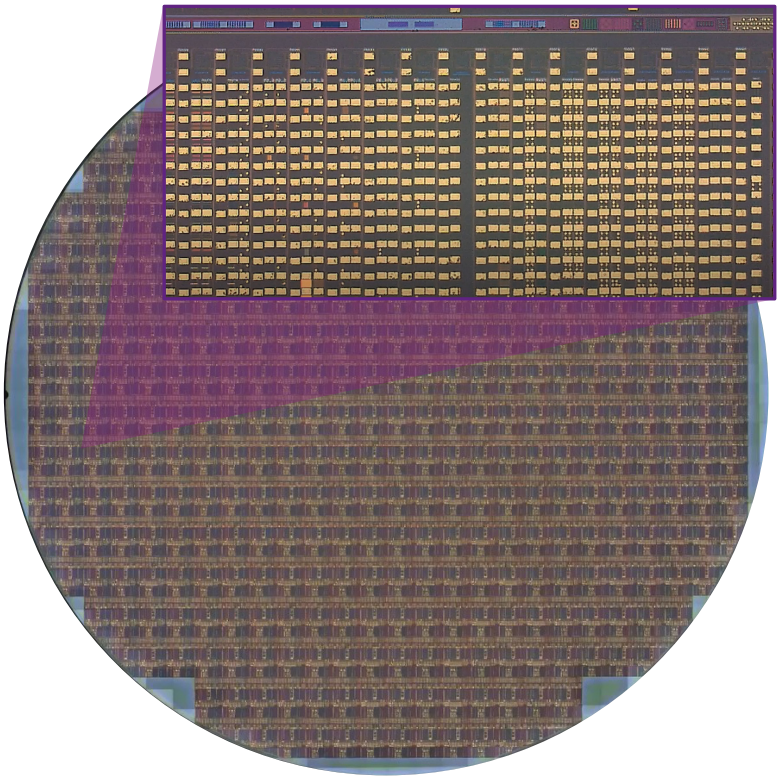
PEAK™ METROLOGY
An AEROTECH Company

ScanX

Larger Stitching Capabilities

The LF-D motion platform provides the larger travel distances required, while ScanX software enables image stitching beyond standard Keyence limitations. Stitch a full wafer at your choice of magnification level and create a single output image with the ability to zoom in as needed.

Excessive numbers of images can, however, bog down the VHX PC and reduce overall throughput. For these applications, Peak recommends the use of a dedicated ScanX PC to divide the image capture and image processing tasks. Doing so also adds a second monitor, making it easy to capture images on one and analyze on the other.



Full 300 mm as a single stitched image

Increased Throughput

Leverage the power of a dedicated ScanX PC to drastically reduce stitching time - up to 50% faster than with the standard Keyence VHX stitching tool.

Additionally, this dedicated PC allows for offline stitching - meaning the VHX microscope can be utilized with 100% image acquisition time.

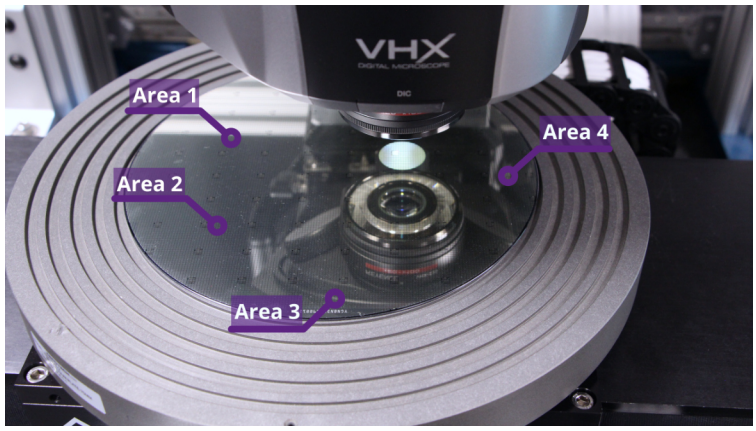
Particularly for large parts, this dual-processing approach can yield marked throughput enhancements.

PEAK™ METROLOGY
An AEROTECH Company

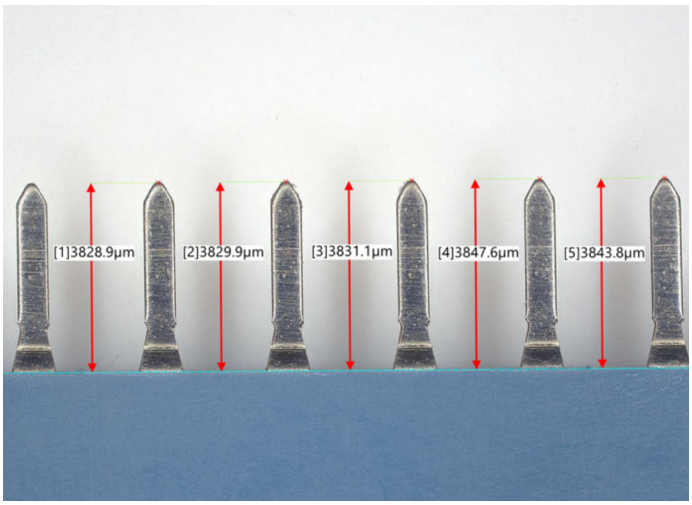
Position Lists

Save entire inspection routines for future use with Position Lists. A series of image acquisition locations are recorded as XYZT positions and saved to Excel or CSV file formats. This feature is great for running identical inspection routines on like-for-like parts.

Utilize reference locations to account for part-to-part misalignments. This feature is even smart enough to auto-calculate stitching requirements - simply specify the areas of interest and ScanX will handle any stitching that's needed.



Position List represented on wafer



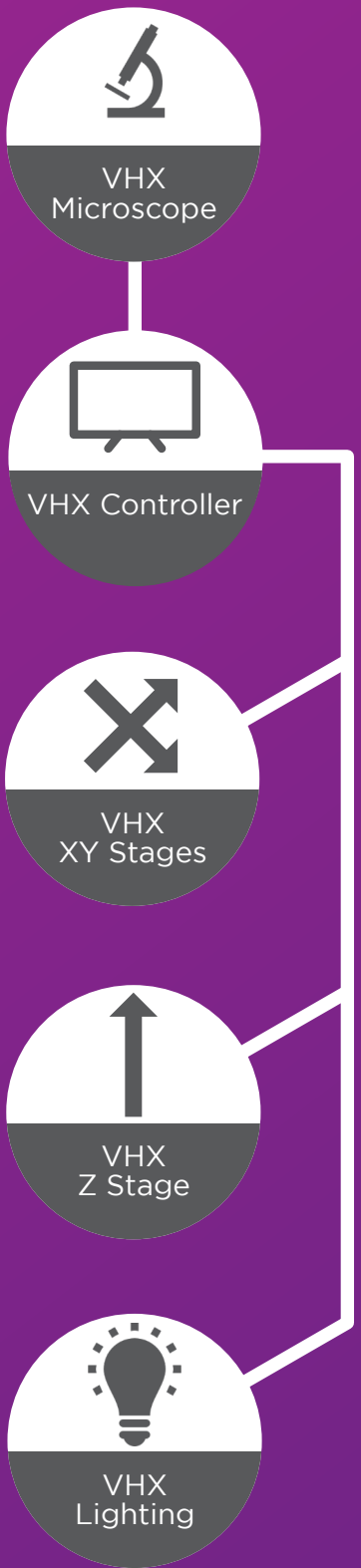
VHX Software: distances from reference line

Analysis

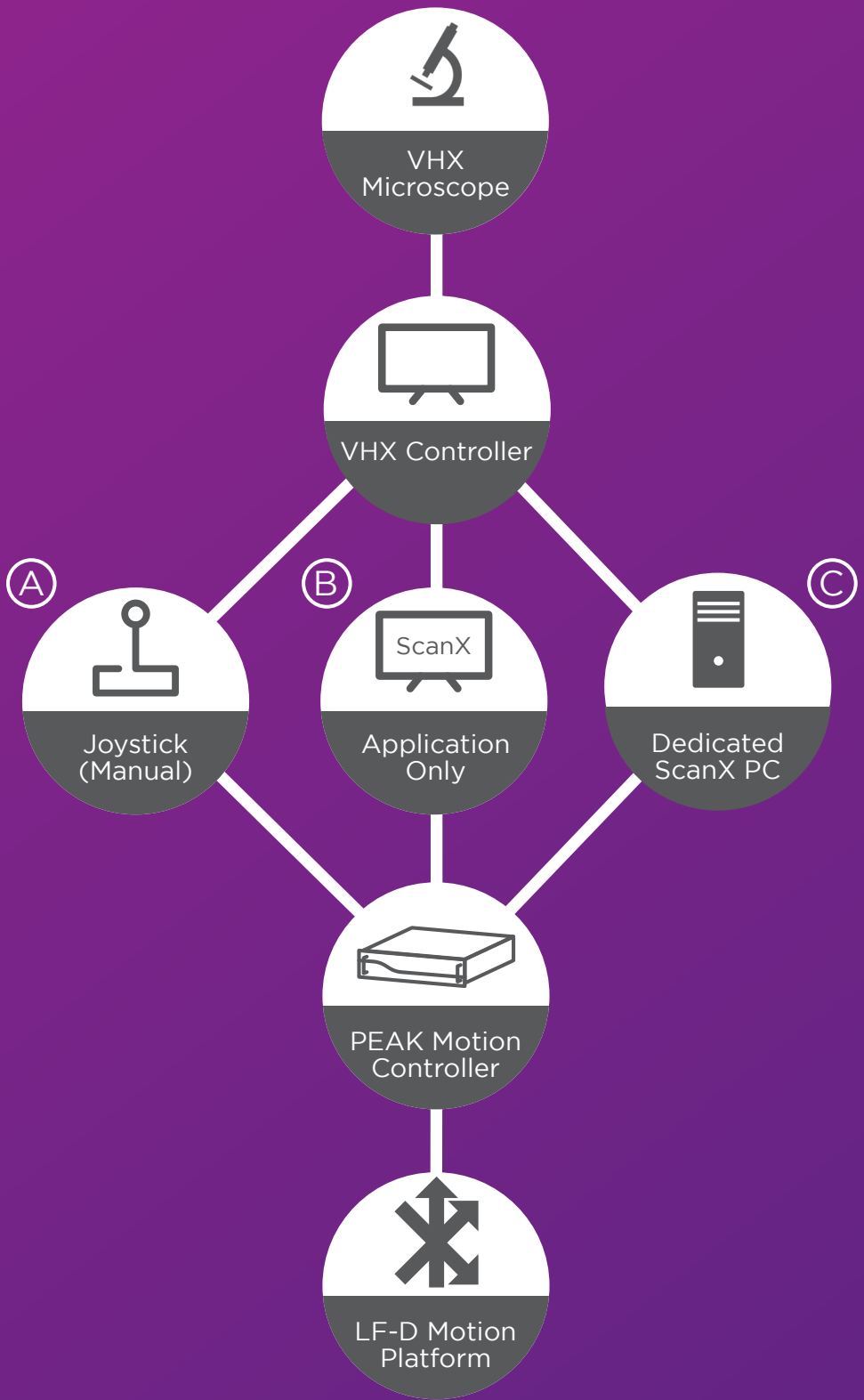
Inspect your parts with the analysis tool of your choice. ScanX works with the standard, built-in VHX analysis tool, which comes with many easy-to-use measurement tools. Tools include: point-to-point, diameters, angles, areas, and many more (including tools to create reference geometry). See VHX manual for full details.

Or choose a 3rd party software suit your needs. Consult with Peak for more details.

KEYENCE



PEAK™



When to select:

- (A) Automation not required
- (B) Automation required, moderate stitching requirements
- (C) Automation, large stitching areas / high throughput required

Specs

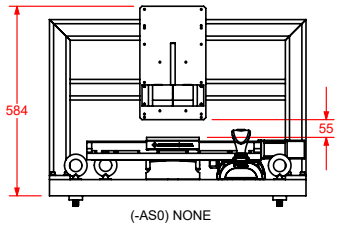
LF-D Specifications		
Travel	300 x 300 mm	600 x 600 mm
XY Performance		
Accuracy	± 10 µm	± 16 µm
Repeatability	± 1 µm	
Max Jog Speed	100 mm/sec	
Z-Axis (Optional) Performance		
Travel	200 mm	
Accuracy	± 8 µm	
Repeatability	± 1 µm	
Minimum Incremental Motion	1.0 µm	
Max Jog Speed	25 mm/sec	
Tilt-Axis (Optional) Performance		
Travel	+/- 90°	N/A
Accuracy	120 arcsec	N/A
Repeatability	45 arcsec	N/A
Mechanical Specifications		
Payload Capacity	35 kg	45 kg
MTBF (Mean Time Before Failure)	20,000 Hours	

PEAK™ METROLOGY
An AEROTECH Company

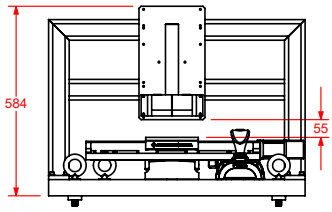
Dimensions

AXIS	NOMINAL TRAVEL
X	300
Y	300
KEYENCE Z	49
V	200

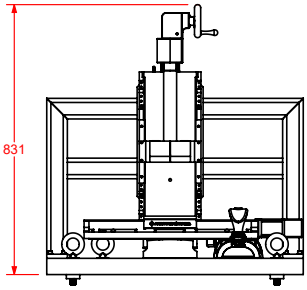
ADDITIONAL STAGES	IMAGE PLANE ADJUSTABILITY	B
(-AS0) NONE	±29.5 (USING POST)	25
(-AS1) KEYENCE Z	±24.5	25
(-AS2) MANUAL V & KEYENCE Z	±124.5	125
(-AS3) POWERED V & KEYENCE Z	±124.5	125



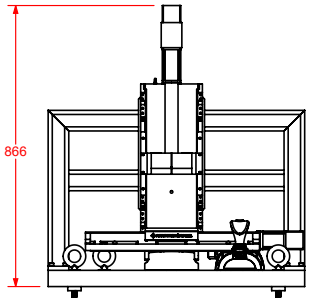
(-AS0) NONE



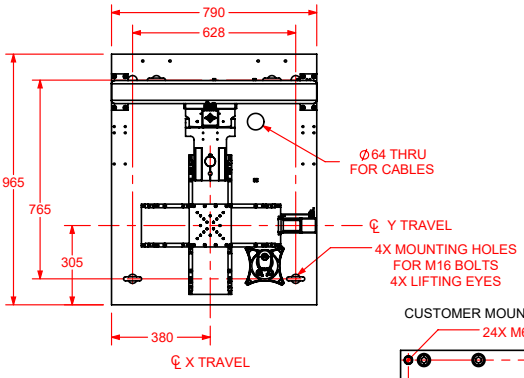
(-AS1) KEYENCE Z

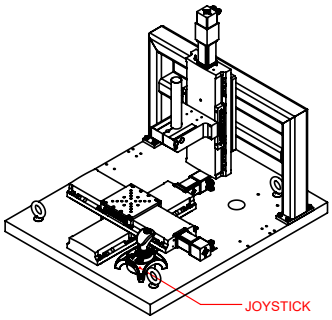


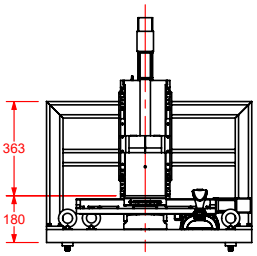
(-AS2) MANUAL V & KEYENCE Z

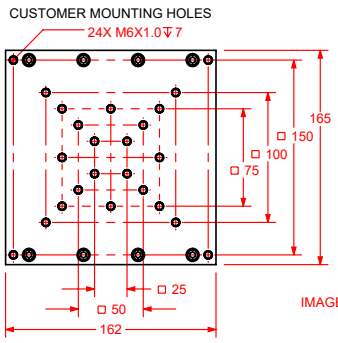


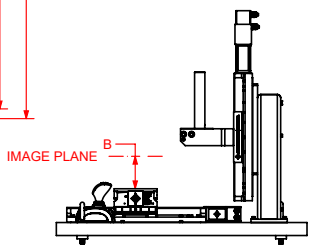
(-AS3) POWERED V & KEYENCE Z









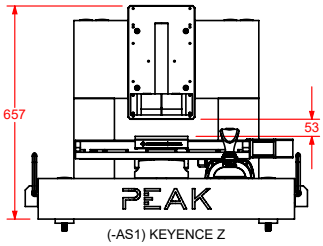


DIMENSIONS: MILLIMETERS

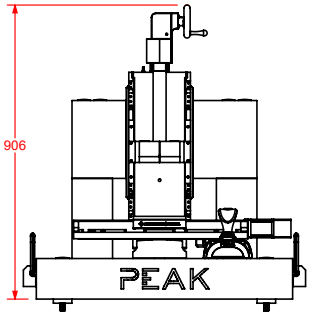
Dimensions

AXIS	NOMINAL TRAVEL
X	300
Y	300
KEYENCE Z	49
V	200

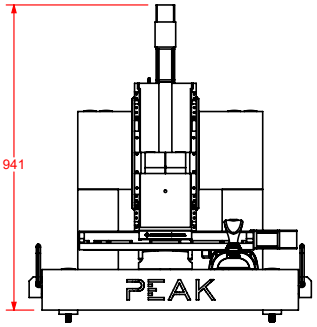
ADDITIONAL STAGES	IMAGE PLANE ADJUSTABILITY	B	C
(-AS1) KEYENCE Z	±24.5	25	468
(-AS2) MANUAL V & KEYENCE Z	±124.5	125	395
(-AS3) POWERED V & KEYENCE Z	±124.5	125	395



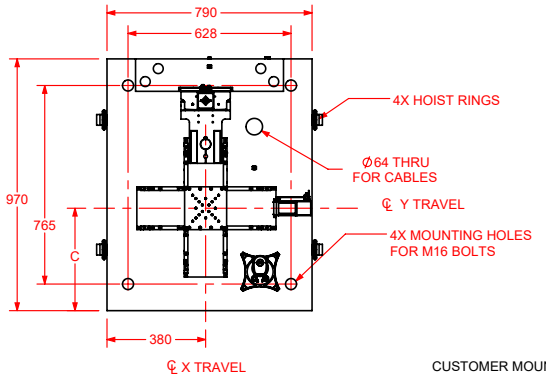
(-AS1) KEYENCE Z



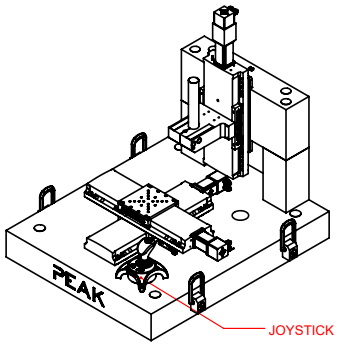
(-AS2) MANUAL V & KEYENCE Z



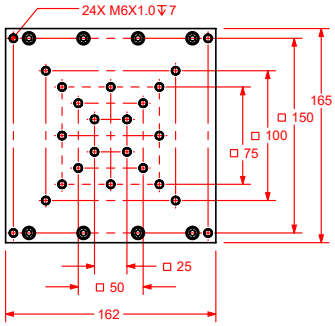
(-AS3) POWERED V & KEYENCE Z

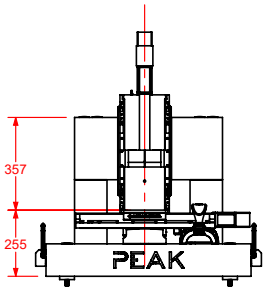


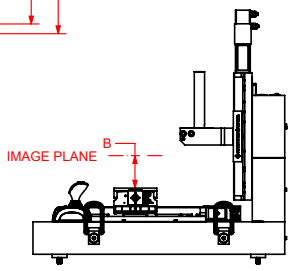
℄ X TRAVEL



CUSTOMER MOUNTING HOLES





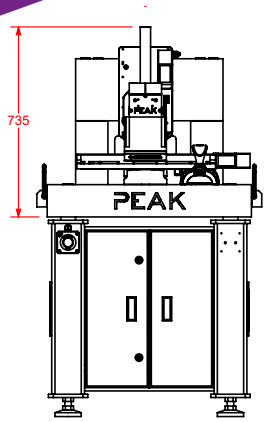


DIMENSIONS: MILLIMETERS

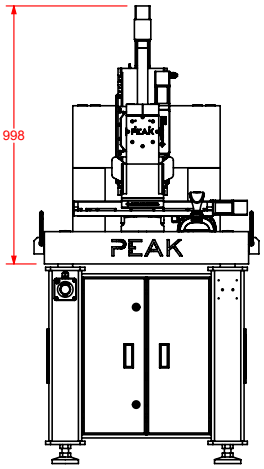
Dimensions

AXIS	NOMINAL TRAVEL
X	300
Y	300
KEYENCE Z	49
V	200
TH	±90°

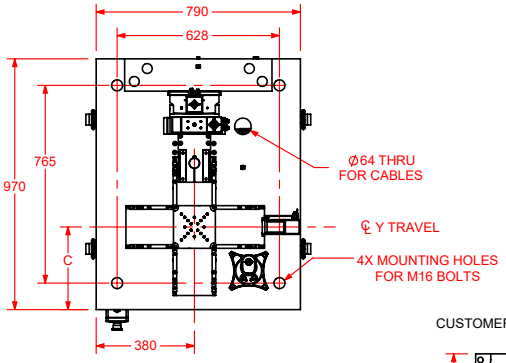
ADDITIONAL STAGES	IMAGE PLANE ADJUSTABILITY	B	C
(-AS4) KEYENCE Z & TH	±24.5	25	405
(-AS5) V & KEYENCE Z & TH	±124.5	125	320

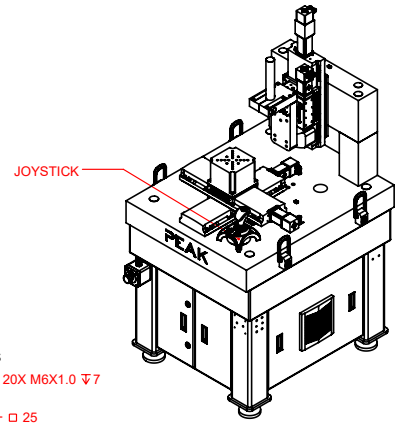


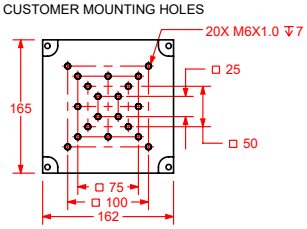
(-AS4) KEYENCE Z & TH

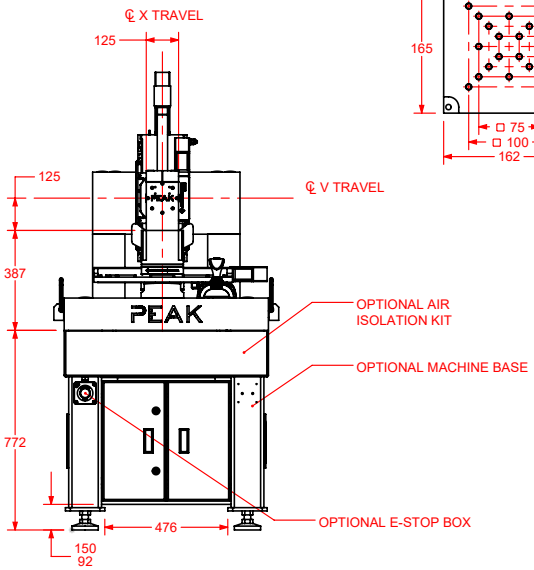


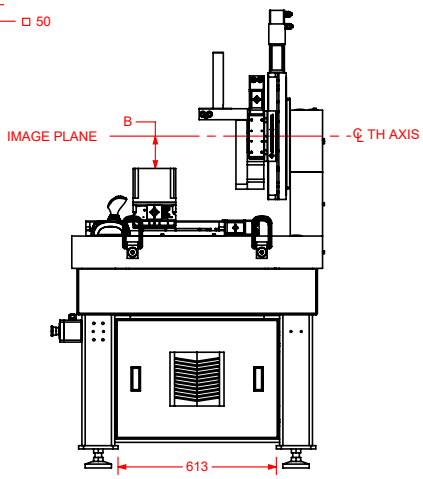
(-AS5) V & KEYENCE Z & TH









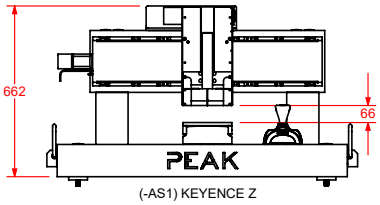


DIMENSIONS: MILLIMETERS

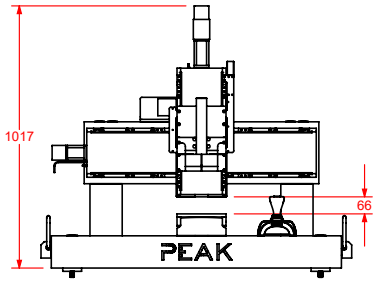
Dimensions

AXIS	NOMINAL TRAVEL
X	600
Y	600
KEYENCE Z	49
V	200

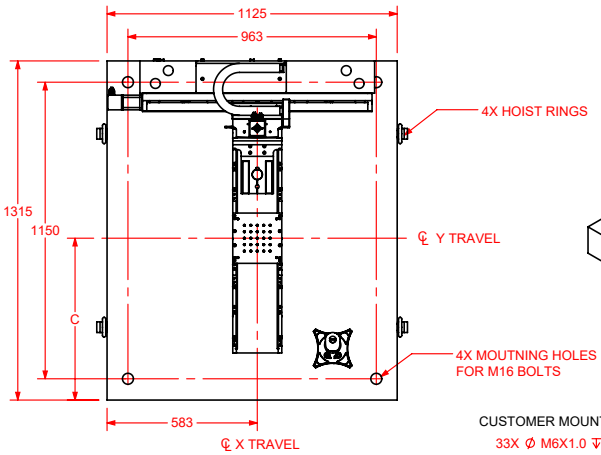
ADDITIONAL STAGES	IMAGE PLANE ADJUSTABILITY	B	C
(-AS1) KEYENCE Z	±24.5	25	713
(-AS3) POWERED V & KEYENCE Z	±124.5	125	628

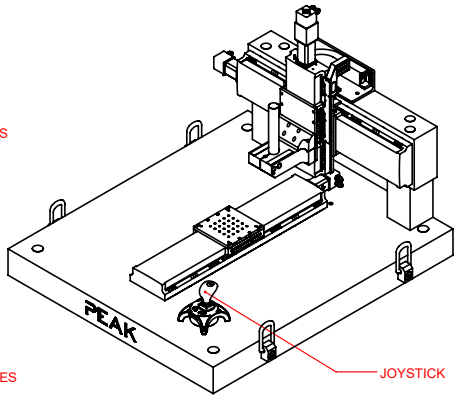


(-AS1) KEYENCE Z

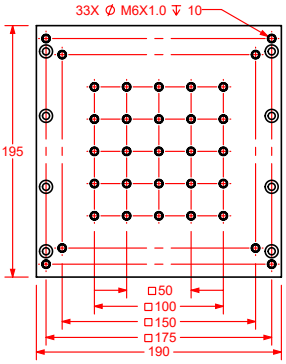


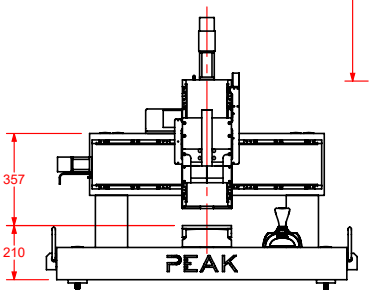
(-AS3) POWERED V & KEYENCE Z

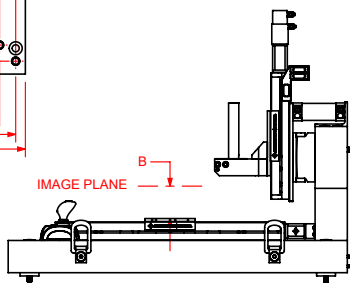




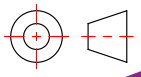
CUSTOMER MOUNTING HOLES







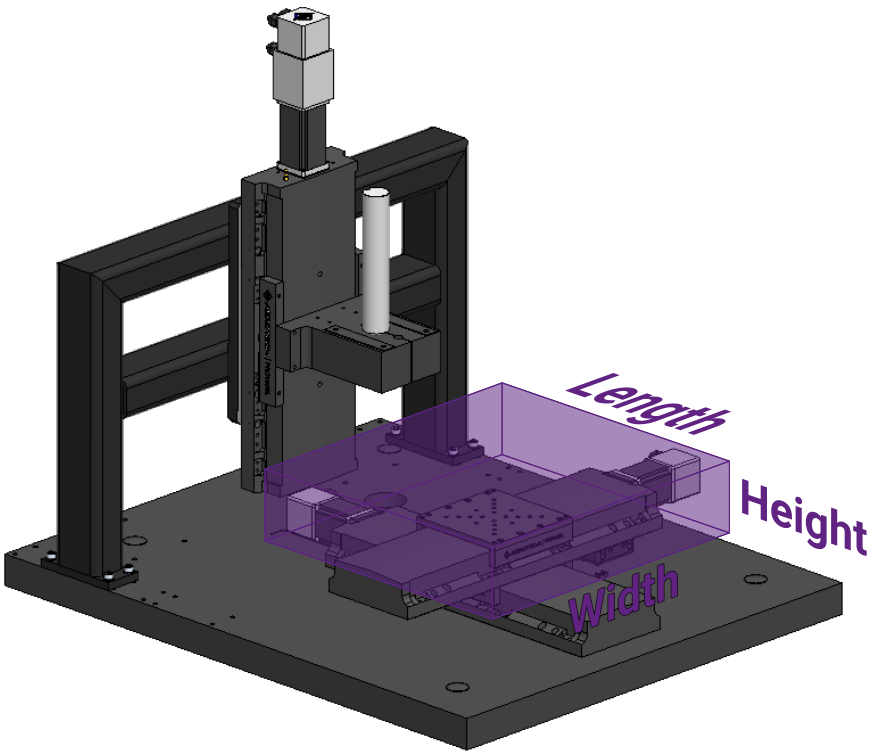
DIMENSIONS: MILLIMETERS

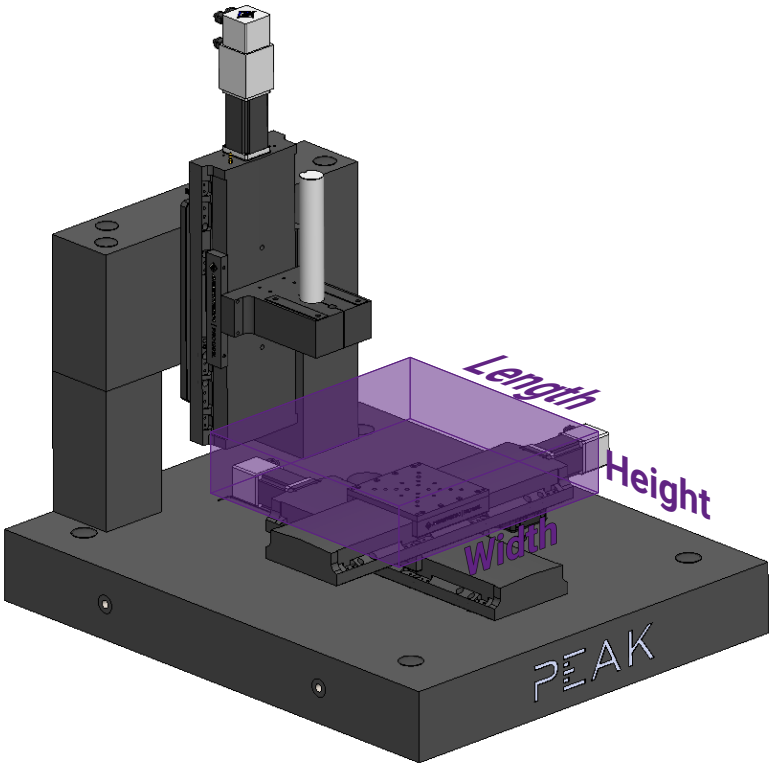


PEAK™ METROLOGY
An AEROTECH Company

Part Sizes

LF-D-300-MT			
Option	Height (mm)	Max Width (mm)	Max Length (mm)
-AS0	0 to 52	307	310[1] (500)
-AS1	0 to 49	434	310[1] (467)
-AS2	0 to 250	434	310[1] (425)
-AS3	0 to 250	434	310[1] (425)
-AS4	0 to 49	434	360
-AS5	0 to 250	434	360





LF-D-300-GR			
Option	Height (mm)	Max Width (mm)	Max Length (mm)
-AS1	0 to 49	434	429
-AS2	0 to 250	434	429
-AS3	0 to 250	434	429
-AS4	0 to 49	434	360
-AS5	0 to 250	434	360

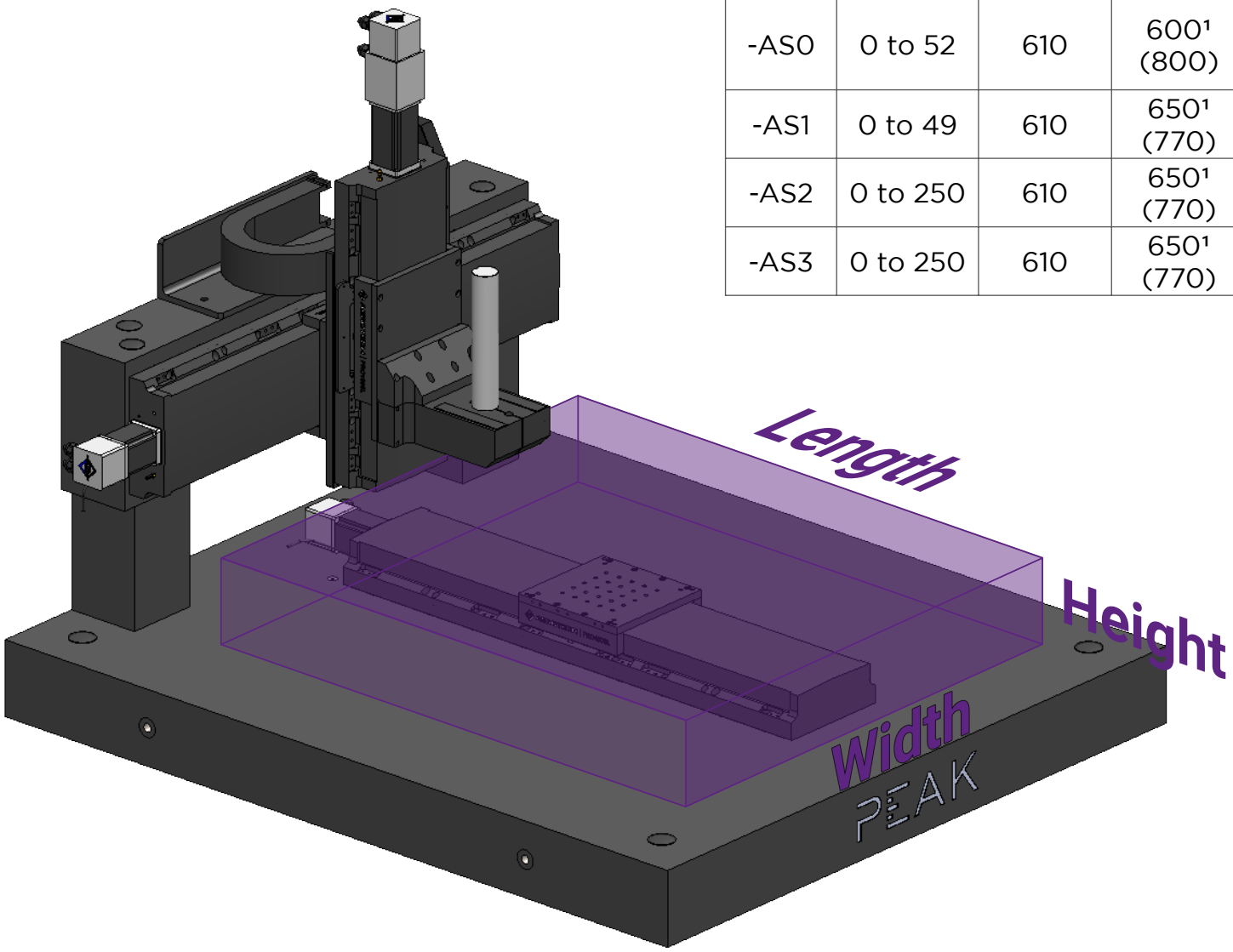
* All dimensions assume part is centered on travel. Consult Peak about non-symmetric parts.

[1] Parts exceeding this size will extend beyond front edge of base when Y-axis reaches extent of travel. See parentheses for max size with overhang.

PEAK™ METROLOGY
An AEROTECH Company

Part Sizes

LF-D-600			
Option	Height (mm)	Max Width (mm)	Max Length (mm)
-AS0	0 to 52	610	600[1] (800)
-AS1	0 to 49	610	650[1] (770)
-AS2	0 to 250	610	650[1] (770)
-AS3	0 to 250	610	650[1] (770)



* All dimensions assume part is centered on travel. Consult Peak about non-symmetric parts.

[1] Parts exceeding this size will extend beyond front/rear edge of base when Y-axis reaches extent of travel. See parentheses for max size with overhang.

PEAK™ METROLOGY
An AEROTECH Company

Ordering

Step 1 - Select your travel	
-300 (300 x 300 mm)	Stacked XY axes, with 300 mm of square travel
-600 (600 x 600 mm)	Lower axis mounted to base, upper axis mounted to the bridge
Step 2 - Select your base material	
-MT (Aluminum/Steel)[3]	Lightweight, aluminum base with welded steel bridge
-GR (Granite)	Granite used for vibration isolation concerns
Step 3 - Choose your options	
VHX Camera[2] (Required)	
-V1 (VHX-7100)	Keyence VHX-7100 Fully Integrated Camera Head
-V2 (VHX-7020)	Camera unit with manual lens changes for the VHX-7000 series
-V3 (VHX-6020)	Camera unit with manual lens changes for the VHX-6000 series
Additional Stages (Required)	
-AS0 (None)	No additional stages provided
-AS1 (Small Z)	49 mm of motorized vertical travel range with Keyence VHX-S700F[3]
-AS2 (Large Manual Z)	200 mm vertical travel via handwheel; 49 mm of fine adjustment with Keyence VHX-S700F[3]
-AS3 (Large Motorized Z)	200 mm of motorized vertical travel; 49 mm of fine adjustment with Keyence VHX-S700F[3]
-AS4 (Small Z with Tilt)[3]	Same as -AS1 with +/- 90° motorized tilt adjustment
-AS5 (Large Motorized Z with Tilt)[3]	Same as -AS3 with +/- 90° motorized tilt adjustment
Machine Base (Optional)	
-MB (Machine Base)	Steel weldment with leveling feet, doors, and mounting features for electronics
Isolation (Required)	
-ISO1 (Elastomer)	Vibration reduction via elastomer pads designed to provide high damping
-ISO2 (Passive Air)[1]	Increased isolation of environmental vibrations with self-leveling air isolators
Emergency Stop (Optional)	
-ESTOP (Emergency Stop)	Mushroom button to cut power to stage motors
Line Cord (Required)	
-LC0 (None)	No line cord
-LC1 (US115VAC)	US (115VAC) compatible line cord
-LC2 (US230VAC)	US (230VAC) compatible line cord
-LC3 (German)	Germany compatible line cord
-LC4 (UK)	UK compatible line cord
Vacuum Line (Optional)	
-VAC (Vacuum Line)[4]	Vacuum line cable routing

[1] Requires “Machine Base” option

[2] Provided by Keyence

[3] Only available with -300 Travel Option

[4] For use with accessory vacuum chucks

PEAK™ METROLOGY
An AEROTECH Company

Ordering

Required

LF-D -300 -GR -V1 -AS3 -MB -ISO1 -ESTOP -LC1 -VAC

Product

Travel
- **-300:** 300 x 300 mm
- **-600:** 600 x 600 mm

Base Material
- **-MT:** Aluminum/Steel[3]
- **-GR:** Granite

VHX Camera[2]
- **-V1:** VHX-7100
- **-V2:** VHX-7020
- **-V3:** VHX-6020

Additional Stages
- **-AS0:** None
- **-AS1:** Small Z[2]
- **-AS2:** Large Manual Z
- **-AS3:** Large Z
- **-AS4:** Small Z[2] with Tilt[3]
- **-AS5:** Large Z with Tilt[3]

Machine Base*
- **-MB:** Machine Base

Isolation
- **-ISO1:** Elastomer
- **-ISO2:** Passive Air[1]

Emergency Stop*
- **-ESTOP:** Emergency Stop

Line Cord
- **-LC0:** None
- **-LC1:** US115VAC
- **-LC2:** US230VAC
- **-LC3:** German
- **-LC4:** UK

Vacuum Line[4]
- **-VAC:** Vacuum Line

* Optional - omit if not desired

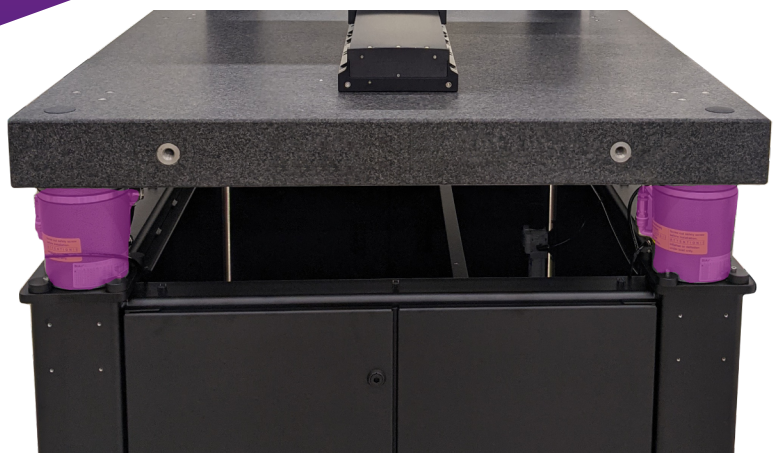
[1] Requires “Machine Base” option

[2] Provided by Keyence

[3] Only available with -300 Travel Option

[4] For use with accessory vacuum chucks

Ordering



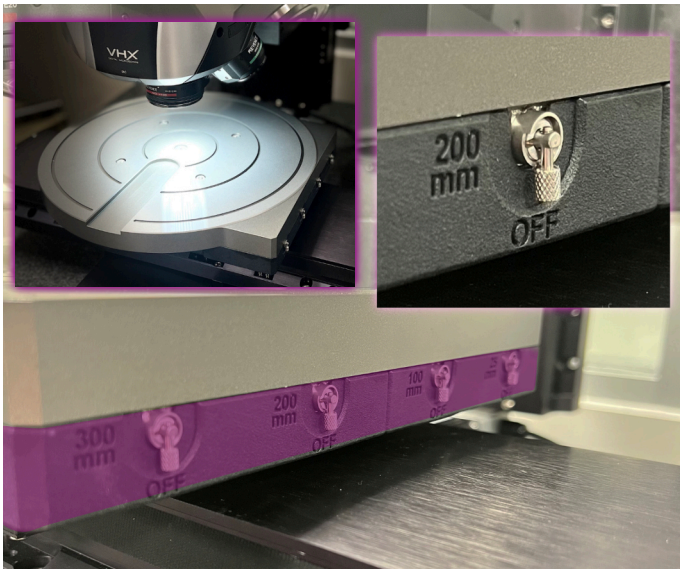
Showing -ISO2 (Passive Air) Option

Finishing touches

Choose from available ordering options to get exactly what you need.

The optional machine base provides storage for all PCs and control electronics - all within the envelope of the machine.

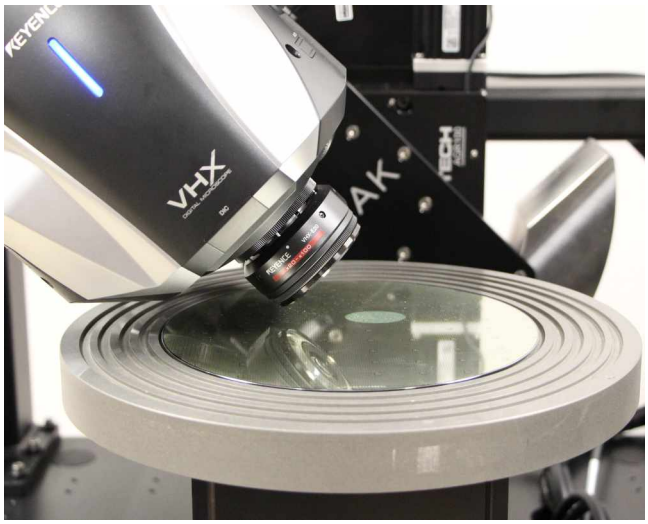
Get only the stages you need by selecting from our combinations of different vertical and tilt stage offerings.



Showing Zone-Selectable Vacuum Chuck PM-FP-VZR

Control for your environment

We'll work with you to characterize your floor vibrations and identify any necessary isolation measures to preserve measurement performance. Our standard air and active isolation systems are available to make sure your measurements are rock solid. Please see this video for more details.



Showing tilt stage as part of the -AS4/5 Option

Accessories

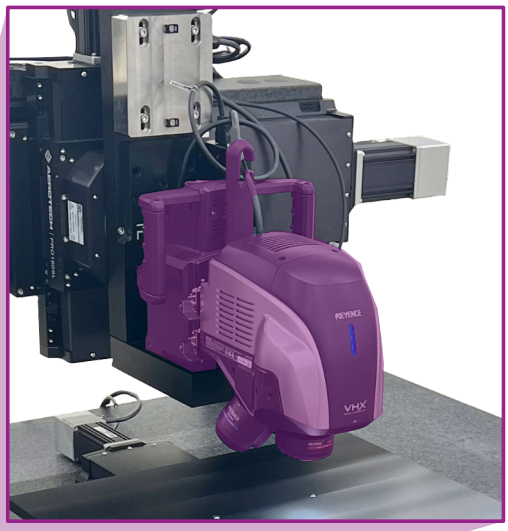
Choose from our standardly available accessories such as: fixture plates, wafer chucks, and more!

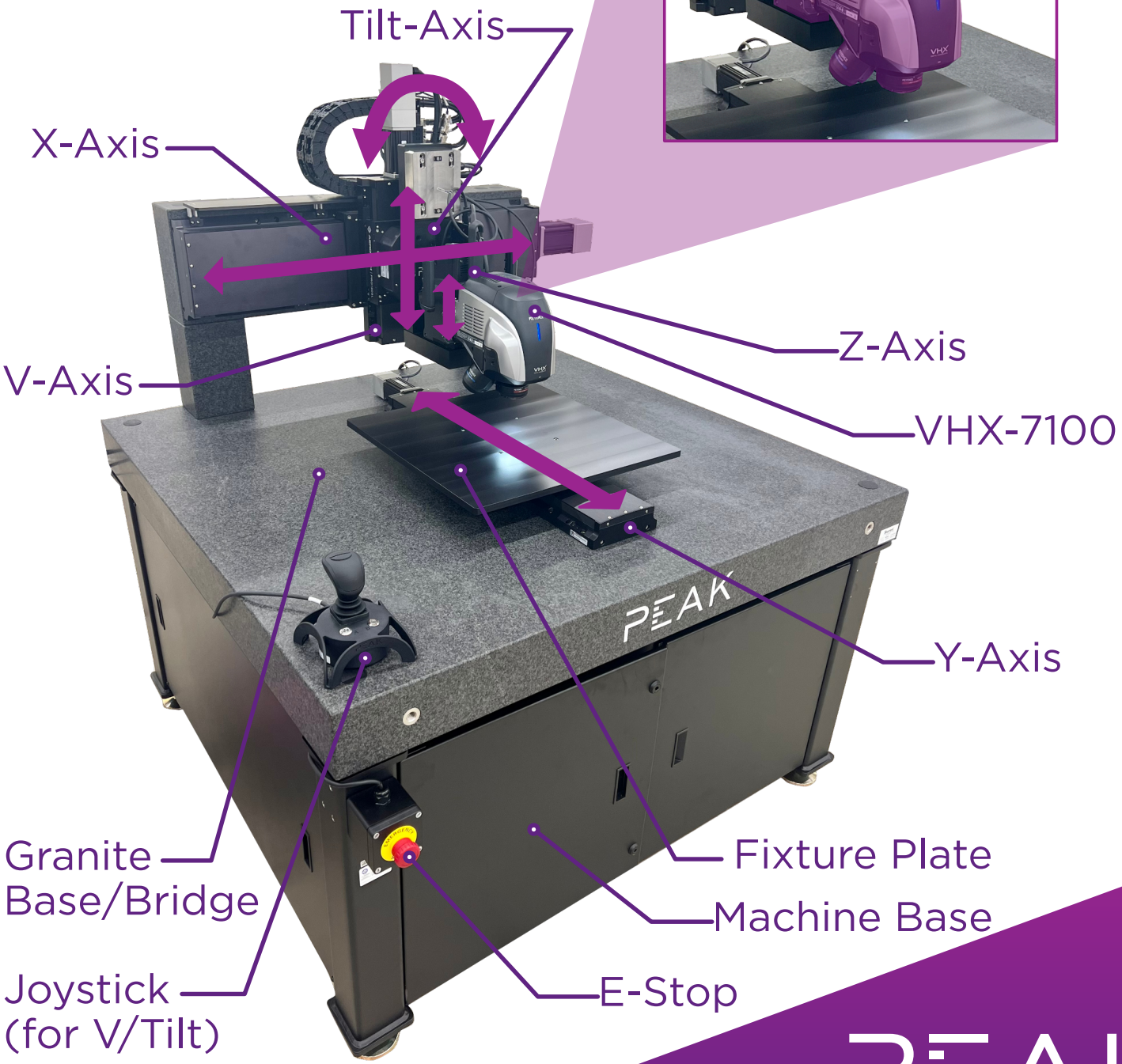
PEAK™ METROLOGY
An AEROTECH Company

Anatomy

Configuration Shown:
LF-D-600-GR-V1-AS3-MB-ISO1-ESTOP
with built-to-order Tilt Axis
and PM-FP-600 accessory fixture plate

Fine Focus Z and Microscope (from Keyence)



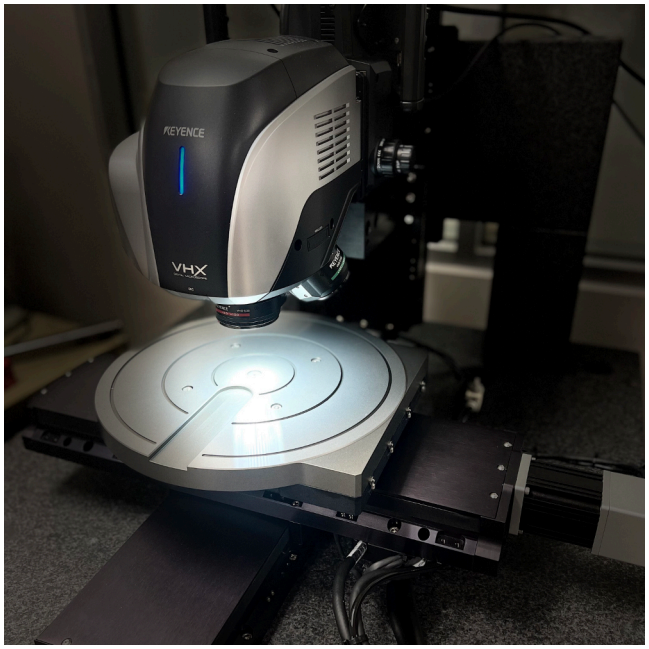


PEAK™ METROLOGY
An AEROTECH Company

Customize

Squeaky clean

We offer various levels of clean room preparation. From material selection and design to component cleaning and assembling/bagging in our own clean room - no matter your room's requirements, we have a solution for you.



300 mm, zone-selectable wafer chuck

Above and beyond

Parts still too big to move? We've still got you covered! With our overhead gantry design, extra-large parts or parts too delicate to move can still be inspected. Load parts onto the flat granite base (available with customer-specified mounting patterns and features) and move the microscope overhead. All the same, great ScanX features are still available with this design.

We're here to make your measurements easy. Leverage our decades of experience building custom motion platforms to make sure you get exactly what you need.

Cleanroom Facility

Have it your way

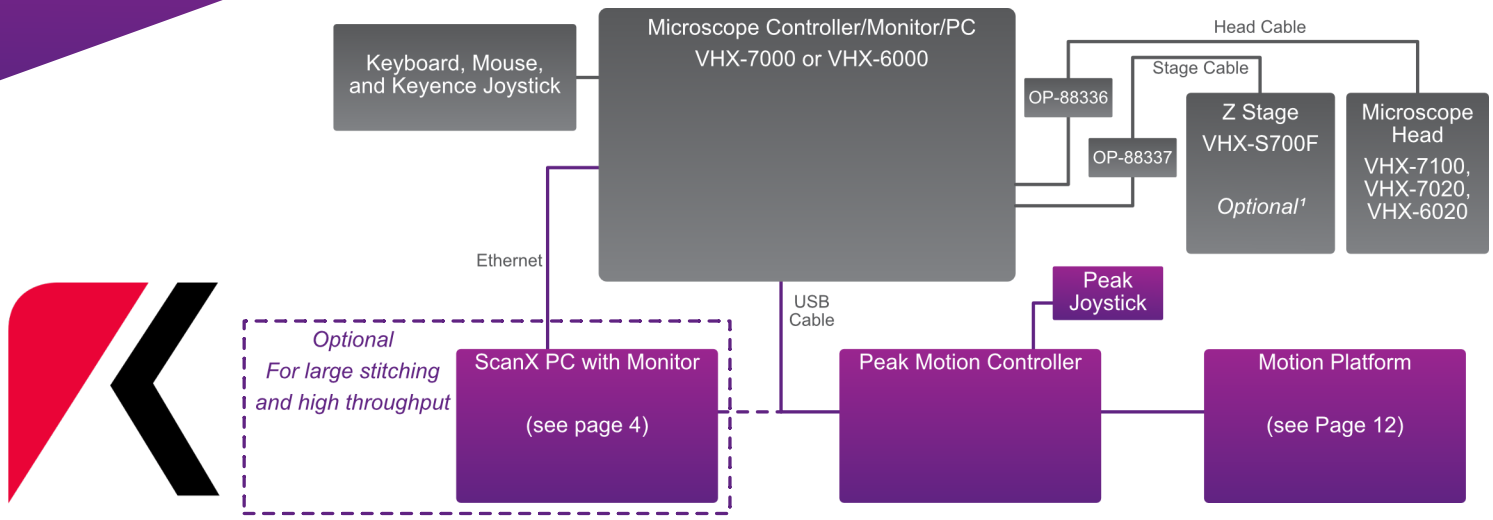
Don't see exactly what you need? Don't compromise, customize. At Peak, nearly half of our machines are customized per our customers' requirements - so don't hesitate to contact us to find out how we can deliver exactly what you need.

Are your parts difficult to hold? We'll work with you to design custom part fixturing to make sure your inspections are reliable and repeatable.

Overhead gantry system

PEAK™ METROLOGY
An AEROTECH Company

Keyence Kit



Complete the system

Peak provides all the motion equipment you need to be up and running in no time. The Keyence equipment listed below is required to complete the system. Have questions? Don't hesitate to contact us for answers on what is required.

Microscope Head

VHX-7100, VHX-7020, or VHX-6020

Microscope Controller

VHX-7000 or VHX-6000

Z Stage

VHX-S700F[1] (as needed)

Software

VHX Software (comes standard)

VHX-H3M3 XY Measurement Module

VHX-H5M 3D Profile Measurement Module (as needed)

Other

OP-88338 Lens Joint[2]

OP-88336 & OP-88337 Cable Repeaters

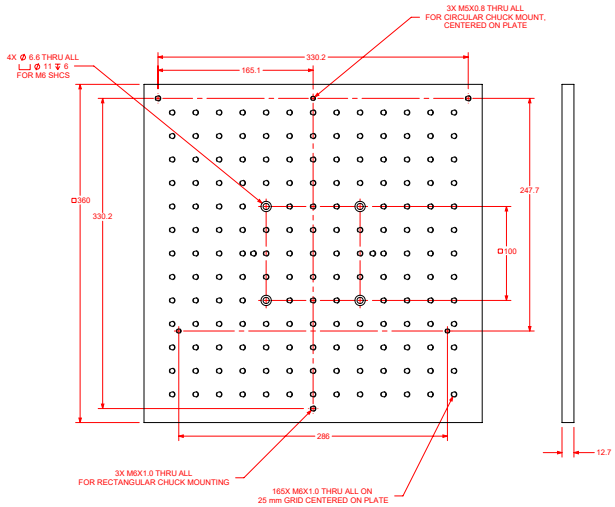
Head and Stage Cables

[1] Required for Additional Stages options -AS1-5
[2] Required for Camera Type -V2/3 options

Fixtures

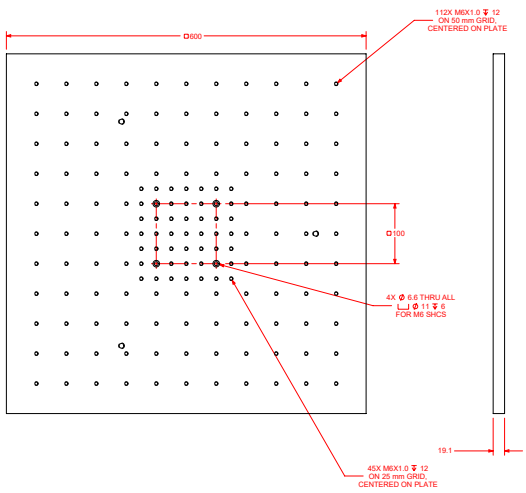
PM-FP-P360

360 mm Square Tooling Plate



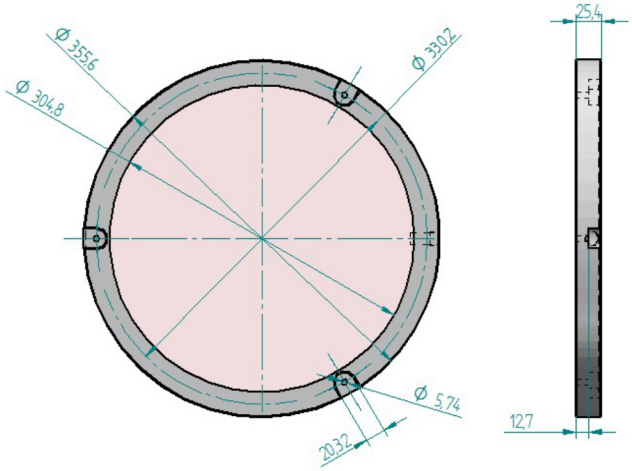
PM-FP-P600

600 mm Square Tooling Plate



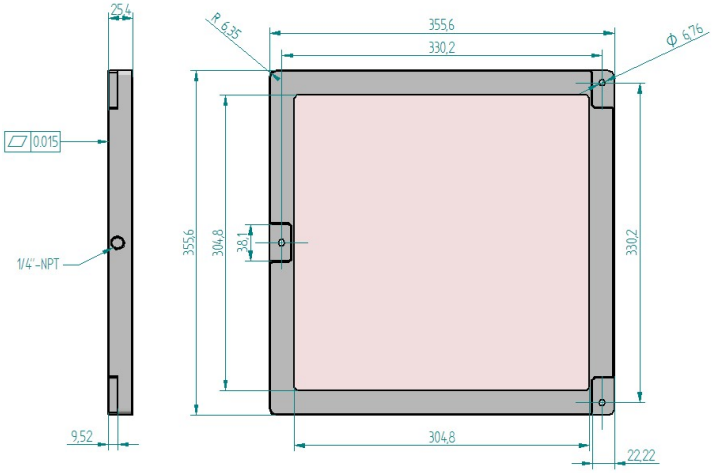
PM-FP-VPR

300 mm Diameter Porous Vacuum Chuck



PM-FP-VPS

300 mm Square Porous Vacuum Chuck



PM-FP-VZR

300 mm Diameter Zone-Selectable Vacuum Chuck

Zones: 25 mm, 100 mm, 200 mm, and 300 mm Diameters