

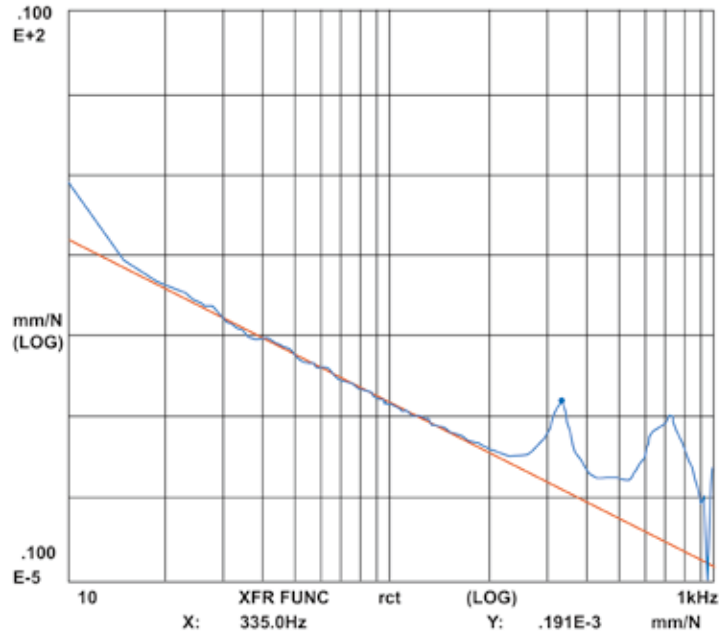
CHAPTER 7

VIBRATION CONTROL

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HONEYCOMB SURFACE TABLE

Improvement of the damping materials and the steel honeycomb cores steel honeycomb offers extreme stiffness and damping a bonding agent having no organic solvents is used between the honeycomb cores and the top and bottom steel plates. Machine polishing of a honeycomb table surface, which has been regarded as difficult to perform, has become possible thanks to our unique technology. As an optional feature, tables with maximum flatness can be manufactured to order the tabletop length, width and thickness can be modified upon request work surface options and configurations, such as through holes, cut-outs, and notches. Custom tapped holes are also available. Two or more tables can also be joined together to create longer or wider tables, or T-shaped tables, L-shaped tables.

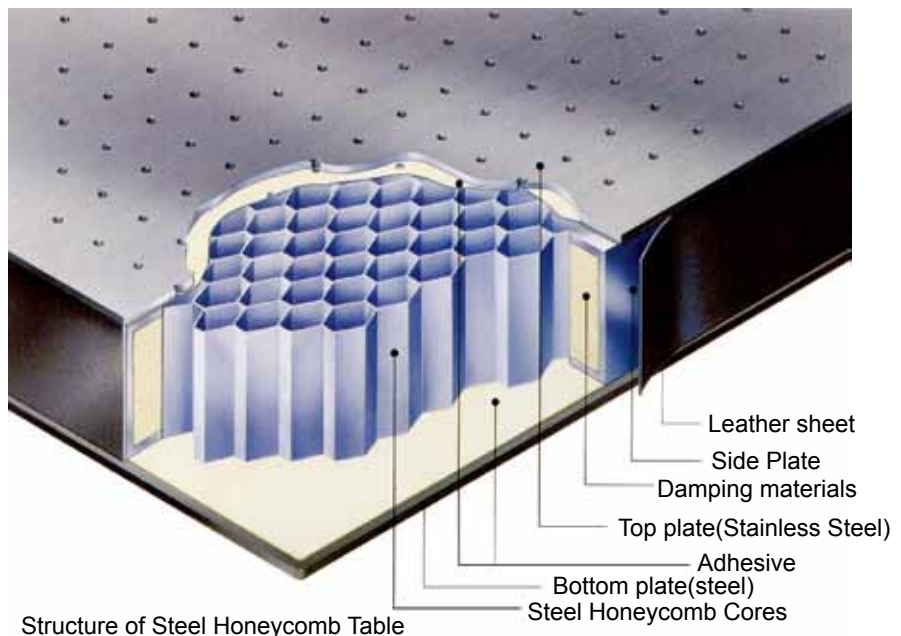


Type K4

The top plate is made of SUS430 stainless steel, enabling the use of a magnetic stand.

Type K5

Each M6 tapped hole, either on 50mm grid or 25mm grid is sealed with a cap attached on the back side, to prevent inflow of water or chemicals, and the circulation of air by convection into the honeycomb table. The air spring vibration isolator of Type K5 (AYA and AY series) comes standard with an automatic leveler with exhaust air drain line, for use in clean rooms. Type K5 is an ideal vibration free system for use in Class 100 clean rooms.



Structure of Steel Honeycomb Table

CHAPTER 7 VIBRATION CONTROL

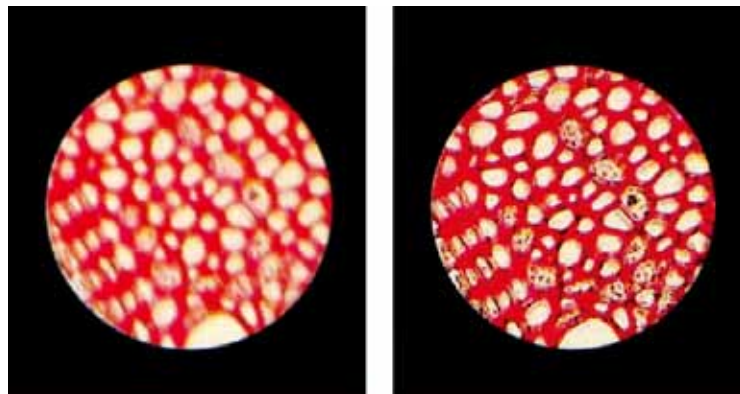
VIBRATION ISOLATION

To interrupt the vibrations immediately prior to the precision instrument itself. VISOLATOR is a vibration isolator that is the embodiment of this principle of vibration.

Shape and material of the air springs, the volume of the air spring chamber and the surge tank, the diameter and length of the orifice and the type of automatic leveler are all mutually inter-related.

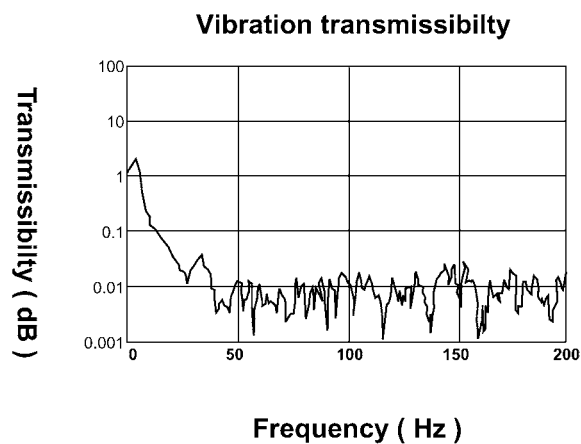
All of the VISOLATOR™ models house the finest in air spring systems that can only be made possible through the expertise of Meiritsu. Allow it to respond with a high degree of sensitivity to even extremely light objects, minimizing vibration spiraling as much as possible.

This series of vibration isolators are equipped with our patented automatic leveling mechanism which constantly keeps the surface table level even when removing and placing instruments as well as when changing their position.



■ On floor

■ On VISOLATOR™



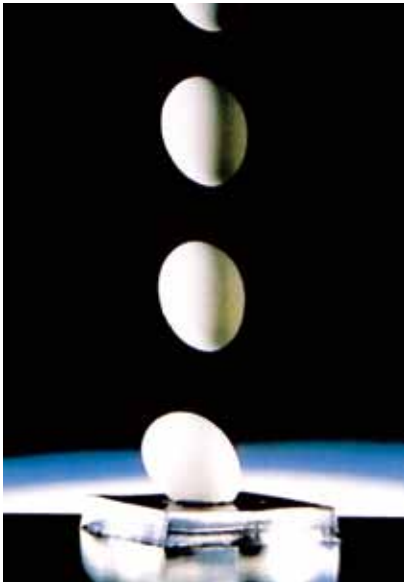
Automatic leveler

Air spring
variable orifice



AYA SERIES OPTICAL TABLES

The AYA series is the highest performance table top of the line series which feature improved isolation performance and various useful functions. Through improvement of horizontal direction vibration isolation performance, the AYA series is able to respond to the optical experimentation needs including interferometers and holography equipment which are sensitive to minute vibrations in all directions.



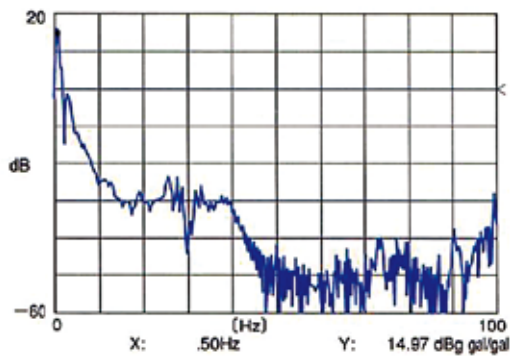
Impact absorption with αGEL

Parallel Swing Mechanism

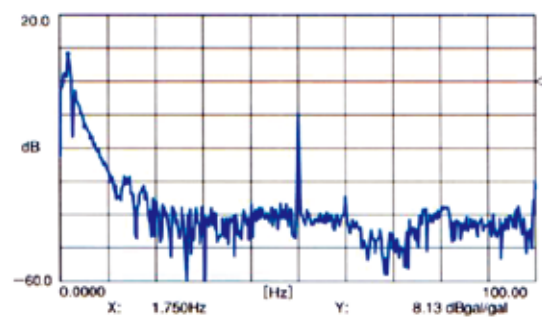
The AYA Series is equipped with Mei-ritsu's original parallel swing mechanism which can be likened to a swing which can swing forward and backward as well to the right and left, and moreover, can do so simultaneously. The result is the horizontal direction being reduced to 0.5Hz.

New Mechanisms for Emphasis on Ease of Use

The AYA Series is equipped with a newtype of damper which utilizes the new material α GEL damping performance, which is able to promptly absorb any vibrations which cause the surface table to fluctuate, has been improved even more without any loss of vibration isolation performance there by leading to increased ease of use α GEL is the registered trademark of GELTEC CO.,LTD



Transmissibility (AYA-2415K4. Vertical, Loading:300Kg)



Transmissibility (AYA-2415K4. Horizontal, Loading: 300Kg)

AYA - K5, k4 Type

AYA-Type K5

- M6 tapped holes, either on 50mm grid or 25mm grid (to be specified by the user).
- Suitable for class 100 clean room uses (each tapped hole is airtight and an automatic leveler is equipped with exhaust air drain line).

AYA-Type K4

- M6 tapped holes, either on 50mm grid or 25mm grid (to be specified by the user).
- Through hole and specified tapped hole working available. Can join Honeycomb tables. (optional)

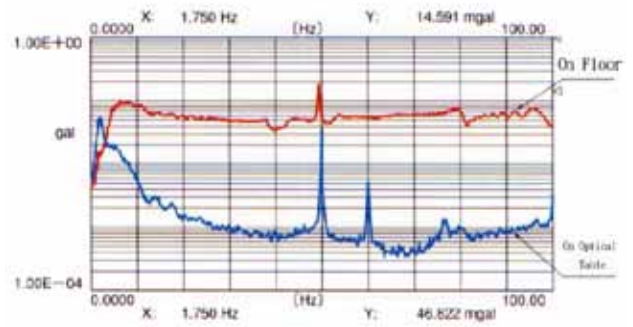
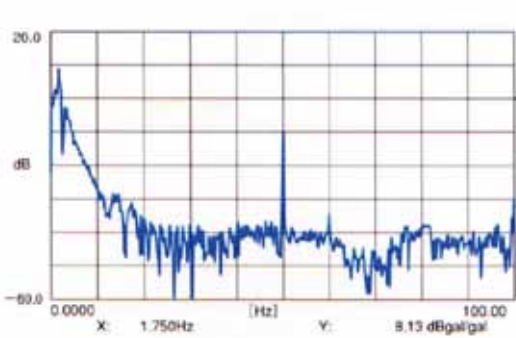
Model	AYA-1007K5	AYA-1209K5	AYA-1510K5	AYA-1809K5	AYA-1812K5	AYA-2010K5	AYA-2012K5	AYA-2015K5	AYA-2015K5	AYA-2210K5
Item	AYA-1007K4	AYA-1209K4	AYA-1510K4	AYA-1809K4	AYA-1812K4	AYA-2010K4	AYA-2012K4	AYA-2015K4	AYA-2015K4	AYA-2210K4
Natural frequency	Vertical: 1.1Hz					Horizontal: 0.5Hz				
Vibration isolation method	Vertical: Diaphragm air spring					Horizontal: Parallel swing mechanism				
Damping method	Vertical: Air damping using variable orifices					Horizontal: Special damping using the α-GEL				
Leveling method	Automatic levelers keep the surface table level automatically									
Low weight(Kg)	300									
Table dimensions(mm)	1030x730	1200x900	1500x1000	1500x1200	1800x900	1800x1200	2000x1000	2000x1200	2000x1500	2200x1000
Table thickness(mm)	100				200	100				200
Table materials	Steel Honeycomb : Top plate SUS430 5t(6t) . Bottom plate SS400 4.5t									
Machine height(mm)	800									
Machine weight(Kg)	185	280	365	410	390	465	440	505	615	470
	175	250	325	365	350	410	385	440	535	410
Air supply	0.35~0.70Mpa									

Model	AYA-2212k5	AYA-2215K5	AYA-2412K5	AYA-2415K5	AYA-3012K5	AYA-3015K5	AYA-3612K5	AYA-3615K5	AYA-4012K5	AYA-4015K5
Item	AYA-2212k4	AYA-2215K4	AYA-2412K4	AYA-2415K4	AYA-3012K4	AYA-3015K4	AYA-3612K5	AYA-3615K4	AYA-4012K4	AYA-4015K4
Natural frequency	Vertical: 1.1Hz		Horizontal: 0.5Hz		Vertical: 1.2Hz		Horizontal: 0.8Hz			
Vibration isolation method	Vertical: Diaphragm air spring					Horizontal: Parallel swing mechanism				
Damping method	Vertical: Air damping using variable orifices					Horizontal: Special damping using the α-GEL				
Leveling method	Automatic levelers keep the surface table level automatically									
Low weight(Kg)	300									
Table dimensions(mm)	2200x1200	2200x1500	2400x1200	2400x1500	3000x1200	3000x1500	3600x1200	3600x1500	4000x1200	4000x1500
Table thickness(mm)	200			300						
Table materials	Steel Honeycomb: Top plate SUS430 5t(6t). Bottom plate SS400 4.5t									
Machine height(mm)	800									
Machine weight(Kg)	535	655	580	710	800	995	945	1170	1060	1275
	465	570	505	610	655	810	765	945	830	1025
Air supply	0.35~0.70Mpa									

AY/AYN SERIES OPTICAL TABLES



Transmissibility (AY-1510K4. Vertical ,Loading:300Kg)



AY/Ayn -Series



AY



AYN

AY Series

The AY Series are equipped with automatic levelers, keeping the surface table level automatically, whereas AYN series are manual leveling types.

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AY/AYN SERIES OPTICAL TABLES

AY/AYN-Type K5

- M6 tapped holes, either on 50mm grid or 25mm grid (to be specified by the user).
- Suitable for class 100 clean room uses. (each tapped hole is airtight and an automatic leveler is equipped with exhaust air drain line).

AY/AYN-Type K4

- M6 tapped holes, either on 50mm grid or 25mm grid (to be specified by the user).
- Through hole and specified tapped hole working available. Can join Honeycomb tables.(optional)

Model	AY/AYN-1007K5	AY/AYN-1209K5	AY/AYN-1510K5	AY/AYN-1512K5	AY/AYN-1809K5	AY/AYN-1812K5	AY/AYN-2010K5	AY/AYN-2012K5	AY/AYN-2015K5	AY/AYN-2210K5
Item	AY/AYN-1007K4	AY/AYN-1209K4	AY/AYN-1510K4	AY/AYN-1512K4	AY/AYN-1809K4	AY/AYN-1812K4	AY/AYN-2010K4	AY/AYN-2012K4	AY/AYN-2015K4	AY/AYN-2210K4
Natural frequency					Vertical:1.5Hz	Horizontal:1.8Hz				
Vibration isolation method	Diaphragm air spring									
Damping method	Air damping using variable orifices									
Leveling method	AY: Automatic levelers keep the surface table level automatically					AYN: Manual operated with an attached hand pump				
Low weight(Kg)	300									
Table dimensions(mm)	1030x730	1200x900	1500x1000	1500x1200	1800x900	1800x1200	2000x1000	2000x1200	2000x1500	2200x1000
Table thickness(mm)	100					200				
Table materials	Steel Honeycomb : Top plate SUS430 5t(6t) . Bottom plate SS400 4.5t									
Machine height(mm)	800									
Machine weight(Kg)	175	265	350	395	375	450	425	485	600	455
	165	235	310	350	335	395	370	420	520	395
Air supply	0.35~0.70Mpa									

Model	AY/AYN-2212K5	AY/AYN-2215K5	AY/AYN-2412K5	AY/AYN-2415K6	AY/AYN-3012K5	AY/AYN-3612K5	AY/AYN-3615K5	AY/AYN-4012K5	AY/AYN-4012K5	AY/AYN-4015K5
Item	AY/AYN-2212K4	AY/AYN-2215K4	AY/AYN-2412K4	AY/AYN-2415K4	AY/AYN-3012K4	AY/AYN-3612K4	AY/AYN-3615K4	AY/AYN-4012K4	AY/AYN-4012K4	AY/AYN-4015K4
Natural frequency					Vertical:1.5Hz	Horizontal:1.8Hz				
Vibration isolation method	Diaphragm air spring									
Damping method	Air damping using variable orifices									
Leveling method	AY: Automatic levelers keep the surface table level automatically					AYN: Manual operated with an attached hand pump				
Low weight(Kg)	300									
Table dimensions(mm)	2200x1200	2200x1500	2400x1200	2400x1500	3000x1200	3600x1200	3600x1500	4000x1200	4000x1200	4000x1500
Table thickness(mm)	200					300				
Table materials	Steel Honeycomb : Top plate SUS430 5t(6t) . Bottom plate SS400 4.5t									
Machine height(mm)	800									
Machine weight(Kg)	520	639	565	695	785	975	930	1155	1045	1260
	450	554	490	595	640	790	750	930	815	1010
Air supply	0.35~0.70Mpa									

Note: Load weight up to 500kg can be customized

RHS/HS SERIES OPTICAL TABLES



RHS Series

These surface tables specially designed for optical experimentation applications have inherited all of the characteristics of the surface tables used in our steel honeycomb surface table air spring vibration isolators.

RHS Series-Optical Surface Tables with Stand

The RHS Series uses a rubber cushion to suppress vibrations. It features all optimal design that brings out the features of optical surface tables. Since the stand is equipped with foot-adjusted and casters the installation site can be changed easily.

Rigid tables without rubber cushions, called the LHS Series, are also available.

HS Series-Optical Surface Tables without Stand

This is a simple type of surface table which can be installed by simply placing on existing lab desks or racks for meeting the specifications of optical experiments.



HS Series



RHS Series

RHS/Hs - K5, k4 Type

RHS/HS-Type K5

- M6 tapped holes, either on 50mm grid or 25mm grid (to be specified by the user).
- Suitable for class 100 clean room uses. (each tapped hole is airtight)

RHS/HS-Type K4

- M6 tapped holes, either on 50mm grid or 25mm grid (to be specified by the user).
- Through hole and specified tapped hole working available. Can join Honeycomb tables.(optional)

Item	Model	RHS/HS-0806k5	RHS/HS-1007K5	RHS/HS-1209K5	RHS/HS-1510K5	RHS/HS-1512K5
		RHS/HS-0806k4	RHS/HS-1007K4	RHS/HS-1209K4	RHS/HS-1510K4	RHS/HS-1512K4
Table dimensions(mm)		830x630	1030x730	1200x900	1500x1000	1500x1200
Table thickness(mm)		100			200	
Table weight (Kg)		60 / 55	85 / 75	165 / 135	225 / 185	265 / 220
Table materials		Steel Honeycomb : Top plate SUS430 5t(6t). Bottom plate SS400 4.5t				
Load weight (Kg)		300				
Machine height (Kg)		800				
Machine weight (Kg)		95	140	225	285	330
		90	130	195	245	285

Item	Model	RHS/HS-1809K5	RHS/HS-1812K5	RHS/HS-2010K5	RHS/HS-2012K5	RHS/HS-2015K5	RHS/HS-2210K5
		RHS/HS-1809K4	RHS/HS-1812K4	RHS/HS-2010K4	RHS/HS-2012K4	RHS/HS-2015K4	RHS/HS-2210K4
Table dimensions(mm)		1800*900	1800x1200	2000x1000	2000*1200	2000x1500	2200x1000
Table thickness(mm)		200					
Table weight (Kg)		240 / 200	315 / 260	295 / 240	350 / 285	460 / 380	325 / 265
Table materials		Steel Honeycomb : Top plate SUS430 5t(6t). Bottom plate SS400 4.5t					
Load weight (Kg)		300					
Machine weight (mm)		800					
Machine weight (Kg)		305	385	360	420	530	390
		265	330	305	355	450	330

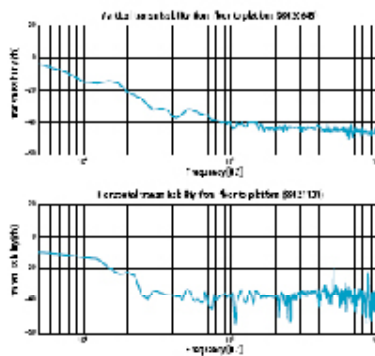
Item	Model	RHS/HS-2212k5	RHS/HS-2215K5	RHS/HS-2412K5	RHS/HS-2415K5	RHS/HS-3012K5	RHS/HS-3015K5	RHS/HS-3612K5	RHS/HS-3615K5	RHS/HS-4012K5	RHS/HS-4015K5	
		RHS/HS-2212k4	RHS/HS-2215K4	RHS/HS-2412K4	RHS/HS-2415K4	RHS/HS-3012K4	RHS/HS-3015K4	RHS/HS-3612K4	RHS/HS-3615K4	RHS/HS-4012K4	RHS/HS-4015K4	
Table dimensions(mm)		2200x1200	2200x1500	2400x1200	2400x1500	3000x1200	3000x1500	3600x1200	3600x1500	4000x1200	4000x1500	
Table thickness(mm)		200										
Table weight (Kg)		385 / 315	500 / 415	420 / 345	550 / 450	520 / 425	680 / 560	625 / 510	815 / 670	695 / 565	905 / 740	
Table materials		Steel Honeycomb : Top plate SUS430 5t(6t). Bottom plate SS400 4.5t										
Load weight (Kg)		300										
Machine height (mm)		800										
Machine weight (Kg)		455	575	490	625	610	775	730	930	810	1030	
		385	490	415	525	515	655	615	785	680	865	

ACTIVE PNEUMATIC SUSPENSION



A device of ten tons or more can be isolated from vibrations by a standard type of MAPS

The recent precise machine shows a tendency of becoming large caused by the functional fulfillment. Some devices already have 10 tons or more in the total weight. It has become difficult to keep the structural natural frequency of the device high because of the enlargement of the device. This is one of the reasons why active vibration isolation system which has excellent performance in the low frequency is necessary.



It is steady even if a device on which stage works is carried.

If a device has some movements made by XYstages for example, the device swings in the big amplitude, and the vibration is enlarged on passive isolation system such as air mounts or rubber mounts. The swings can be made small on active vibration isolator because it is feedback-controlled to keep the position stable. And, if the movement of the stage can be outputted as an electric signal in advance, it is possible to get an environment which hardly

swings because MAPS can be feed-forward controlled so that the swings may become the smallest

MAPS is excellent in accurate positioning and precise leveling.

When the size of a device becomes large, inclination causes a trouble, too. It leans and sags when it inclines because of its heaviness, and the precision is affected remarkably. MAPS makes inclination small, and can keep the precision in good condition. For example, MAPS makes the smooth delivery of wafer or LCD panel possible.

All types of MAPS are easy to install.

We listen to the customer's request, and make all the functions which should be necessary crowded in MAPS series. It only needs small space to install MAPS, and you can get an environment which isn't influenced by vibration. Because the control system of the MAPS series is very stable, we can handle you MAPS series confidently not only as an equipment of your factory but also as attachments to the products for sale.

MAPS is one of the important parts which compose your precise devices.

It seems that there are a lot of customers who use vibration isolation devices only from anxiety to the vibration. When high precisionization, high function, and enlargement are proceeding today, an environment with no influence of vibration is necessary to show the full performance of the device

Though MAPS has compact size, it can isolate the vibration of six degrees of freedom

Each unit of MAPS series provided by Meiritsu has two air pressure actuators: one for the vertical, another for the horizontal. Using MAPS, you can experience excellent performance of vibration-isolation, vibration suppression and precise positioning.

MAPS makes it possible to eliminate the vibration of frequency band width which passive system cannot.

It often occurs that resonance due to the natural frequency causes a trouble in passive isolation system. The resonance increases magnitude of vibrations three times or more. But the resonance can be removed by using MAPS. And it is possible to get excellent isolation performance in this frequency area. For example, vibration of 2Hz near the resonance of typical passive isolation system can be eliminated to less than 1/30-1/100 in comparison with most of passive isolation systems.

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described in the specification sheet. Vibration isolation device is one of the indispensable parts to construct a system of the precise machine rather than the assist-tant device.

Make contact with us when you start development.

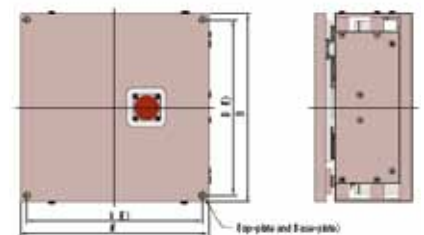
MAPS series has all the functions which are necessary for vibration isolation, positioning, and leveling. And it doesn't need a large space to install. Even after development of a device is completed, MAPS can be assembled into the device. But, in that case, various restrictions often come out. And this is not a good method from neither vibration isolation performance nor cost. When development of a new device is begun, we would like to hear your ideas about the device, and would like to start arrangements about the installation space of MAPS, vibration isolation performance, and the positioning precision which should be necessary. Your vibration environment can be drawn to the ideal by adopting this way that we recommend.



Model	MAPS-008	MAPS-016	MAPS-033	MAPS-065	MAPS-130	MAPS-240
Payload Range [kN] ([kgf])	4 - 8 (400 - 800)	8 - 16 (800 - 1600)	16 - 33 (1600 - 3400)	33 - 65 (3400 - 6600)	65 - 130 (6600 - 13300)	130 - 240 (13300 - 24500)
Dimensions WxDxH [mm]	235x235x130	295x295x140	350x350x150	450x450x190	600x480x190	700x600x267
Mass of a Unit [kg]	13	42	63	110	180	230
Supplied Air Pressure [MPa]	0.6 - 0.8 (Dry Clean Air)					
Typical Air Consumption [l/min]	45 - 65		120 - 170			
Maximam Air Consumption [l/min]	120		300			
Power Supply Voltage [V]	100 - 240 (AC, 50/60Hz)					
Rated Power Consumption [W]	130					
Positioning Tolerance [mm]	0.001 - 0.050					
Active Degrees of Freedom	<=6					

*Notice: The vibration transmissibility curves and the positioning tolerance sometimes vary according to not only the environmental conditions of the place where MAPS will be installed but also the structure or behavior of the precision machine mounted on MAPS. All specifications are subject to change without notice.
MAPS which is not in this specifications table can be available, too. Contact the following

- Third angle projection.
- All dimensions are in millimeters.
- MAPS' appearance varies according to the type.



AET DESKTOP & ADZ-A DESK TYPE SERIES AIR SUSPENSION VIBRATION ISOLATOR

The AET is a series of desktop vibration isolators that bring a high-performance vibration isolation system. The AET Series, which combines vibration isolators with steel honeycomb surfaces tables, consists of desktop air suspension vibration isolators optimal for optical experiments using a small surface area.

• **S Type with Automatic Leveler**

The S type is equipped with an automatic leveler. This keeps the surface table level even when the load distribution on the spring system is changed.

• **Manual Leveling N Type**

The N type is provided with a hand pump used for supplying air to the system in order to maintain the surface table level.

• **Clamp-Equipped NC and SC Type**

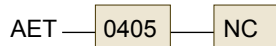
The SC and NC type are equipped with clamps that allow you to fix the surface table in position both quickly and easily



S	Automatic Leveling, No Clamp
SC	Automatic Leveling, Clamp
N	Manual Leveling, No Clamp
NC	Manual Leveling, Clamp

Item	Model	AET-0405	AET-0506	AET-0605	AET-0806	AET-1007
Natural frequency		2.5 ~ 2.7 Hz				
Vibration isolation method		Special diaphragm air spring				
Damping method		Air damping using orifices				
Load weight (kg)		60	60	60	60	80
Table dimensions (mm)		430x530x50	530x630x50	630x530x50	800x600x50	1000x750x50
Machine height (mm)		430x530x115.5	530x630x115.5	630x530x115.5	800x600x115.5	1000x750x115.5
Machine weight (kg)		30	39	39	50	72
Standard accessories		S-type: Urethane tube φ6x3, piping (PT 1/4 male threads)x1 N-type: Hand pump, Screw driver for adjustment of air supply and exhaust valve				

Ordering Information



Note: Load weight up to 200kg can be customized

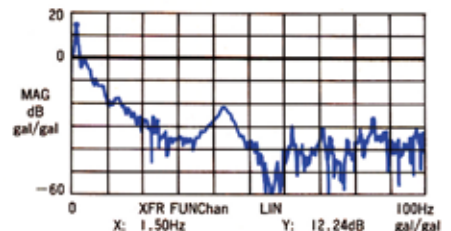
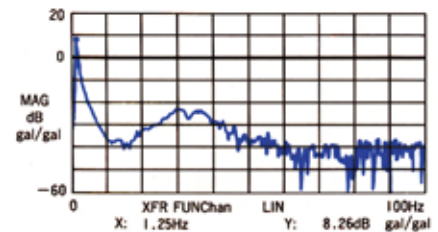


FEATURES:

- Improved performance on both Vertical and Horizontal vibration isolation
- Application of Light Steel Honeycomb platform
- Selection of automatic level maintenance system to suit purpose of use
- Instant stop to vibration of platform
- Bunch of options for various requirements

SPECIFICATIONS

Model	ADZ-A0806	ADZ-A1007	ADZ-A1207
Natural frequency	Vertical:1.2-1.5Hz Horizontal:1.2-1.5Hz		Vertical:1.5-1.8Hz Horizontal:1.5-1.8Hz
Vibration isolation method	Vertical:Diaphragm air spring(Air damping by orifices)		Horizontal:antivibration rubber
Leveling method	Height control valves keeps the surface table level automatically		
Table dimensions (mm)	800x600x50	1000x750x50	1200x750x50
Table materials	Steel Honeycomb core, Top plate SUS430 5t(6t), Bottom plate SS400 (3.2t)		
Height (mm)		750	
Dimensions (mm)	900x700	1100x850	1300x850
Weight (kg)	110	145	165
Load weight (kg)	200	250	300
Air Supply (MPa)	0.35-0.70 (Air regulator with filter attached)		



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AVT SERIES BOARDS

Desktop vibration absorption boards featuring advanced air suspension type vibration isolators. All vibration isolations functions are incorporated in a compactly designed body. This designs are sophisticated considering operation conditions sufficiently. Precision machines and those for machining minute parts.

• Automatic leveler incorporated S-type

automatically keep the surface table level, even when the load distribution on the spring system is changed due to a replaced or repositioned loading device. The automatic levelers is indispensable for automatic measuring and machining devices which are continuously accompanied by changes in load distribution.

• Manual leveling N-type

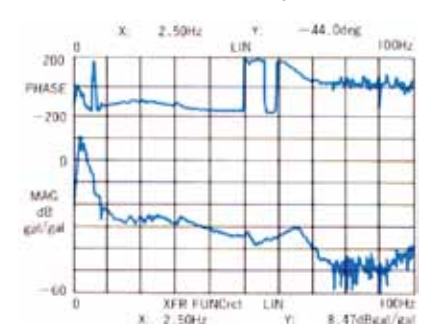
The N-type uses an attached hand pump to supply air for leveling. The well designed adjusting inlet requires no experience for initial leveling. Once it is set, you need not supply air for 1 or 2 weeks. This type is recommended if no air source is available in your installation room or the setting location is likely to be changed frequently.

• One-touch clamber provided C-type

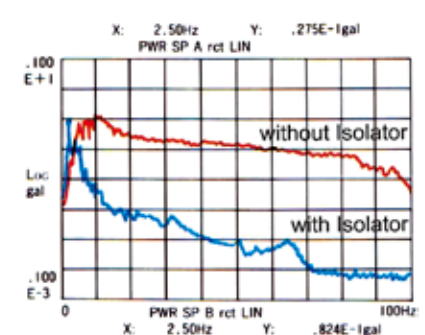
A clamp mechanism can be added to the S-and N-mechanism types. Using a lever you can fix the surface table when you replace a specimen, a lens, and so for the with another.

The compact special air spring can effectively suppress a wide range of vibrations from low frequencies to high frequencies. An orifice used in the air damper is incorporated to immediately suppress surface table fluctuations that may occur during operation. This ensures smooth measurement and machining, free from troublesome fluctuations.

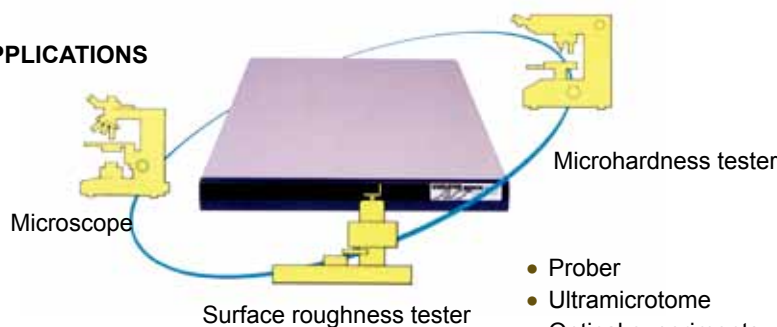
Vibration transmissibility



Power spectrum



APPLICATIONS



- Prober
- Ultramicrotome
- Optical experiments
- Other precision equipment

Ordering Information

AVT — 0405 — SC

N	Manual Leveling, No Clamp
NC	Manual Leveling, Clamp
S	Automatic Leveling, No Clamp
SC	Automatic Leveling, Clamp

Item	Model	AVT-0405	AVT-0506	AVT-0605	AVT-0806
Natural frequency		2.5~2.7Hz			
Vibration isolation method		Special - diaphragm air spring			
Damping method		Air damping using an orifice			
Leveling method		S-type: an automatic lever keeps the surface table level automatically N-type: hand operated with an attached hand pump			
Load weight(kg)		55	60	60	70
Table dimensions(mm)		430x530	530x600	600x300	800x600
Machine dimensions(mm)		430x548x60±3	530x610x60±3	600x548x60±3	800x618x60±3
Machine weight(kg)		18	23	23	32

Standard accessories
 S type : urethane tube φ6x3m , piping joint (PT 1/4 male threads)x1
 N type: hand pump, screw driver for adjustment of air supply and exhaust valve, high gage.

AP SERIES AIR SUSPENSION VIBRATION ISOLATORS



APPLICATIONS:

- Semiconductor fabrication and wafer inspection
- LCD manufacture and inspection
- Electron Microscopy
- Optical Inspection
- SEMs/TEMs
- Other Precision equipments

Item	Model	AP-80	AP-100	AP-120	AP-140	AP-160
Natural frequency		Vertical / Horizontal: 2.5~3.0Hz				
Vibration isolation method		Air spring				
Damping method		Air damping using orifices				
Leveling method		Automatic levelers keep the surface table level automatically (graduation $\pm 200\mu\text{m}$)				
Size(WxDxH mm)		170x170x185	180x180x185	200x200x185	210x210x185	240x240x185
Weight(Kg) /1pc		10.5	14	15	19	21
Max Loading(kg)(4pcs/set)		560	880	1200	1700	2200
Screw hole pitch(mm)		150x150	160x160	176x176	186x186	210x210
Screw hole Diameter(mm)		10	10	10	10	13
Air pressure requirement		0.40~0.70MPa				

Item	Model	AP-180	AP-200	AP-230	AP-270	AP-330	AP-380
Natural frequency		Vertical / Horizontal:2.5~3.0Hz					
Vibration isolation method		Air spring					
Damping method		Air damping using orifices					
Leveling method		Automatic levelers keep the surface table level automatically (graduation $\pm 200\mu\text{m}$)					
Size(WxDxH mm)		250x250x185	260x260x185	300x300x185	380x380x185	410x410x185	430x430x185
Weight(Kg)/1pc		27.5	32	43.5	52	67.5	90
Max Loading(kg)(4pcs/set)		2800	3600	4600	6400	9600	13000
Screw hole pitch(mm)		230x230	230x230	270x270	290x290	340x340	400x400
Screw hole Diameter(mm)		13	13	13	13	13	13
Air pressure requirement		0.40~0.70MPa					

PORTABLE VIBRATION MEASUREMENT SYSTEM



A portable vibration measurement system for simple and efficient measurement/analysis of microvibration.

With built-in servo type accelerometer and sensor amplifier, a small and light-weight all-in-one attache case designed based on the concept of "Simple and Anywhere" is easy for carrying and move between measurement points. With battery/AC power supply, analysis can be performed simply anywhere.

Time domain signal, power spectrum, coherence, phase and vibration transmittivity can be displayed on real time basis using easy-to-use user interface and easy-to-see graphic layout. The system is full of required vibration analysis functionalities, such as online analysis of the required portion by extracting data from long-length of vibration data recorded using data recording function, and graph print-out and measurements of acceleration/velocity/displacement etc.. It can export CSV data file (text file using comma for separation), which can be used for further data analy-

sis using software like Microsoft Excel etc.

HANDYSAM makes the large-scale complicated microvibration measurement to be so simple!

The microvibration measurement and evaluation at nanometer accuracy level of semiconductor related manufacturing inspection equipment and electronic microscope, required setup of large-scale measurement HANDYSAM brings all components (PC, ampli-

fier unit, sensor and carrying case etc.) required for microvibration measurement into an integrated all-in-one system. You do not need to buy any more. Further more, complicated adjustment and setup of sensor, amplifier, FFT analyzer is unnecessary. It is a handy type vibration measurement system which can simply be used anywhere by anyone.

- **Real time multi-channel display of various vibration data**
 - Time domain signal
 - Power spectrum
 - Vibration transmittivity
 - Phase
 - Coherence
- **Real time display for 3 types of vibration mode**
 - Acceleration
 - Velocity
 - Displacement
- **Data record functionality**
 - Long time vibration data recording
 - Offline analysis of saved data
 - Analysis of data extracted from long-time recording
- **Graph print-out functionality**
 - Time domain signal
 - Power spectrum
 - Vibration transmittivity
 - Phase
 - Coherence
- **Data export functionality**
 - It can export CSV data file (text file using comma for data separation), which can be used for further data analysis using software like Microsoft Excel etc..
- **Other functionalities**
 - Various graphic handling --- Cursor search, Scale change, Zoom and pan
 - Software upgrade via internet --- Automatic software version check functionality, Automatic software version upgrade functionality
 - Various measurement conditions for different purpose ---
 - Various Window functions, Peak hold functionality, Overlap

Model NO.	HM4-01	HM4-02	HM4-03	HM4-04	HM4-05	HM4-06
Channel No.	1ch	2ch	3ch	4ch	5ch	6ch
Frequency Range	50, 100, 200, 400Hz					
Measurement Frequency	0.1 - 400Hz (acceleration), 1 - 400Hz (Velocity, Displacement) ⁽¹⁾					
Spectrum Lines	400 lines					
Window Function	Hanning /Rectangular					
Averaging Mode (Frequency domain)	Addition Average/Peak Hold					
Overlap	0, 25, 50, 75, 87.5% (vary with measurement conditions)					
Sensor Type	Servo type accelerometer					
Sensor Sensitivity	5.1x10 ⁻⁷ m/s ²					
A/D Converter	16bit					
Graphic Display and Printing	Time domain signal, Power spectrum, Vibration transmittivity, Phase, Coherence, Tripartite, 1/3 Octave					
Data Recording functionality	standard 12 hours for each measurement ⁽²⁾					
Operating System	Windows XP Home Edition					
Screen Display	XGA (1024x768)					
System Dimensions (W x D x H)	490x390x175			530x470x175		
Weight (Approximately)	10kg	11kg	12kg	13kg	14kg	15kg
External Power Supply	AC100 - 240V					

1. Velocity and Displacement are calculated data
2. Vary with Channel No. and hard disk space
3. Vary with measurement environment and usage condition

System Configuration

Note PC
A/D card
Amplifier unit
Accelerometer
Carrying case
Measurement software



Accelerometer
(44x44x50mm)



Carrying Case



In Storage
(3ch model)