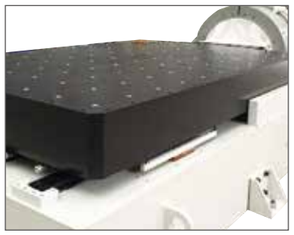
Horizontal Table

Full lineup of IMV slip tables



IMV CORPORATION

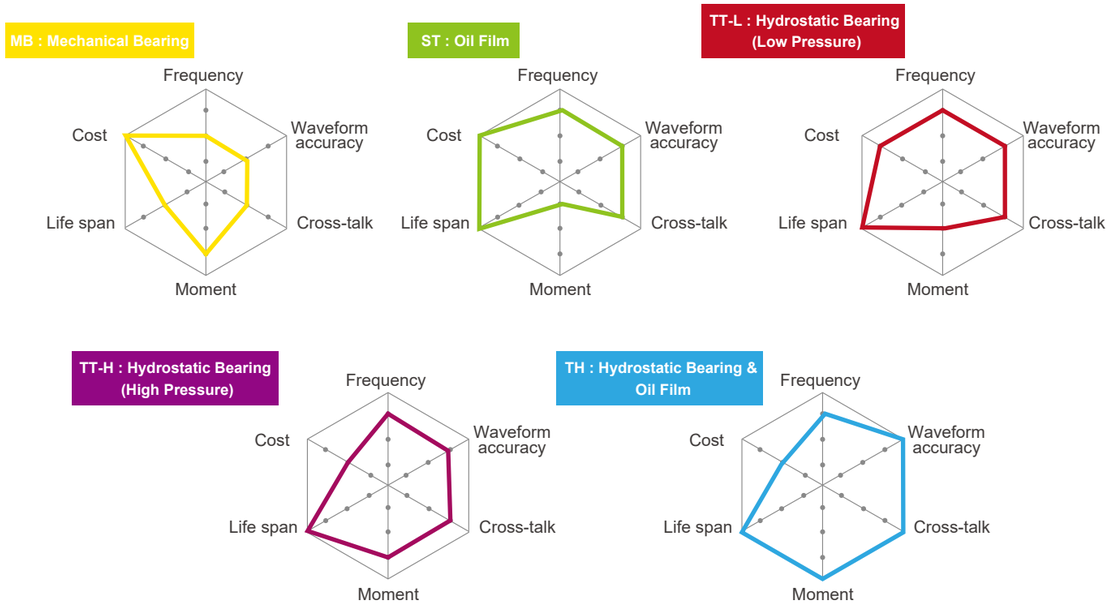
https://www.imv-global.com/

August. 2021
Cat No. 2108②TBV-Eng.

IMV CORPORATION

Introduction

A slip table is required for testing a specimen in its horizontal axis, or when a heavy specimen is to be tested. Slip tables are designed to achieve low friction in the driven axis, while supporting heavy loads and introducing minimum waveform distortion. All products from mechanical bearing to hydrostatic and hydraulic bearing slip table are all designed and built in-house, giving IMV full design control of this important part of a vibration test system.



Pitch Moment [N・m]

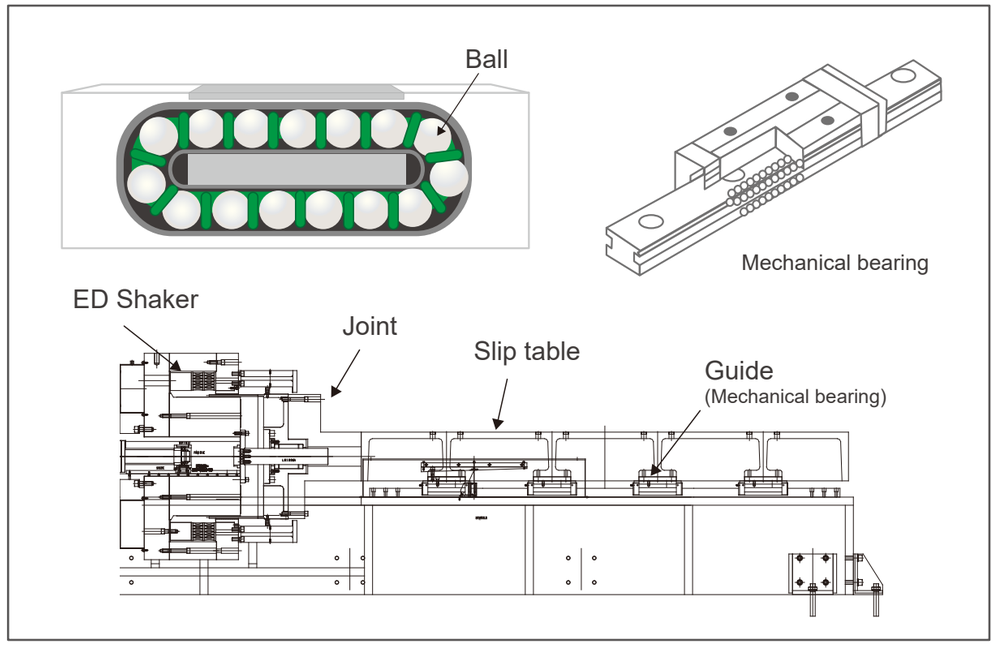
	MB	ST	TT-L	TT-H	TH
200 × 200	50	-	-	-	-
300 × 300	200	-	-	-	-
400 × 400	300	-	-	-	-
500 × 500	-	200	1,100	4,000	-
550 × 550	-	-	1,100	4,000	3,000
630 × 630	-	400	1,100	4,000	-
750 × 750	-	-	2,200	7,700	33,000
800 × 800	-	800	2,200	7,700	-
950 × 950	-	-	2,200	7,700	42,500
1000 × 1000	-	1,300	2,200	7,700	-
1150 × 1150	-	-	4,600	16,000	42,500
1200 × 1200	-	-	4,600	16,000	-
1450 × 1450	-	-	6,500	22,000	99,000
1500 × 1500	-	-	6,500	22,000	-
1800 × 1800	-	-	10,000	48,000	-
2000 × 2000	-	-	10,000	48,000	-

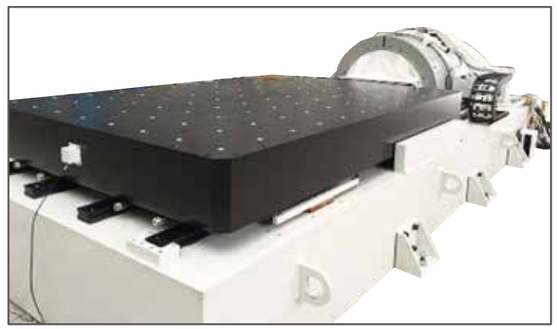
Maximum Load [kg]

	MB	ST	TT-L	TT-H	TH
200 × 200	30	-	-	-	-
300 × 300	30	-	-	-	-
400 × 400	50	-	-	-	-
500 × 500	-	200	200	800	-
550 × 550	-	-	200	800	1,500
630 × 630	-	300	300	1,200	-
750 × 750	-	-	400	1,600	9,000
800 × 800	-	400	400	1,600	-
950 × 950	-	-	500	2,000	9,000
1000 × 1000	-	500	500	2,000	-
1150 × 1150	-	-	-	2,000	9,000
1200 × 1200	-	-	500	2,000	-
1450 × 1450	-	-	-	2,000	9,000
1500 × 1500	-	-	500	2,000	-
1800 × 1800	-	-	800	3,000	-
2000 × 2000	-	-	800	3,000	-

MB: Mechanical Bearing

Mechanical bearing employs the linear motion guide which incorporates a component with a linear rolling motion into practical use. It significantly contributes to high performance of table which are high-rigidity, high load and long stroke motion. Another strong feature of the mechanical bearing is easy to operate. Since it is light weighted and no need for a hydraulic unit.



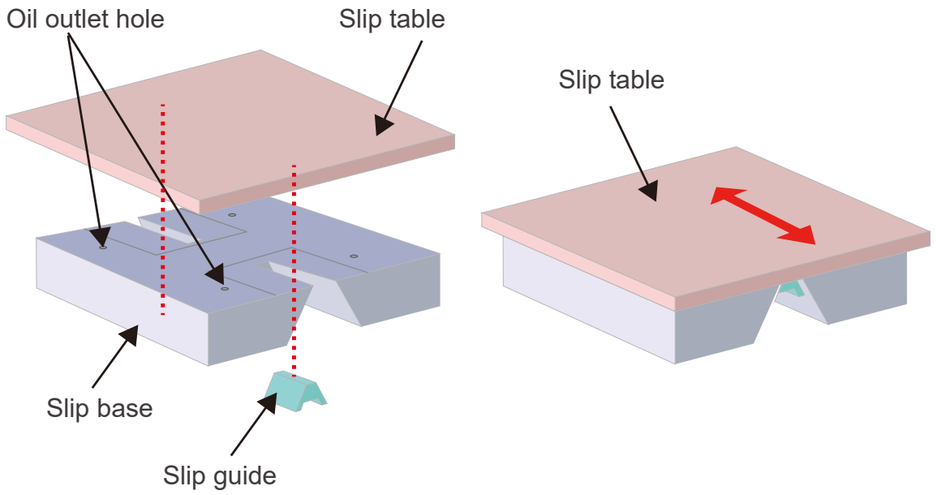


Watch the You Tube video

Watch the You Tube video

ST: Oil Film Type

It is supported on oil film. Constantly create oil film at reverse side of the table letting the table slide with low friction. Pump oil unit is located in the slip table base. Since moving mass is small, it becomes one of most standard slip table with substantial sales record.



Model	TBH-500			TBH-630			TBH-800			TBH-1000		
Table Size (mm)	500 × 500			630 × 630			800 × 800			1000 × 1000		
Pitch Moment (kN-m)	0.2			0.4			0.8			1.3		
Maximum Load (kg)	200			300			400			500		
Vibration Generator	Moving Mass* (kg)	Frequency (Hz)	Thickness (mm)	Moving Mass* (kg)	Frequency (Hz)	Thickness (mm)	Moving Mass* (kg)	Frequency (Hz)	Thickness (mm)	Moving Mass* (kg)	Frequency (Hz)	Thickness (mm)
i210	33	2500	30	45	2000	30	—	—	—	—	—	—
i220							65	2000	30	100	1250	30
K030		2000										
K060	60		50	80		50	115		50	170		50
K080	—	—	—									

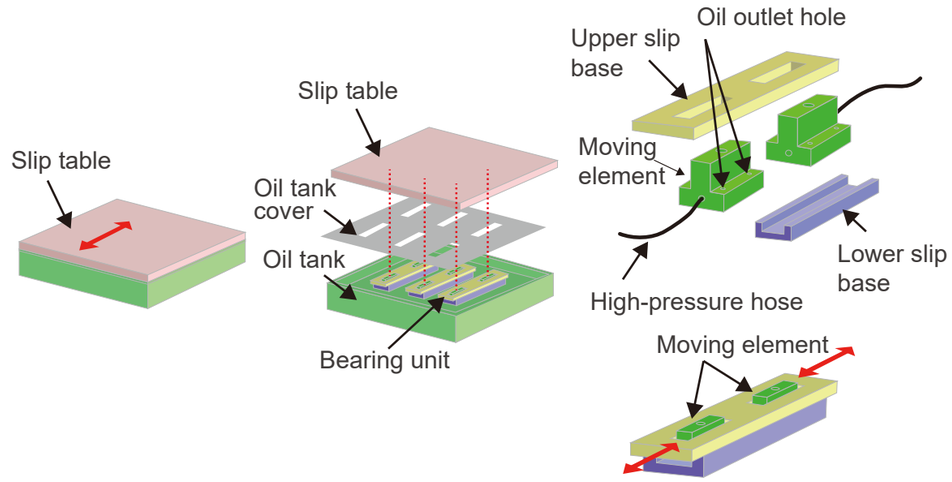
*The material of slip plate is aluminum alloy. It is possible to change to magnesium. Please contact us for more information.

Watch the
You Tube video

TT-L: Hydrostatic Bearing (Low Pressure)

Locating multiple hydrostatic bearing on high rigid base to support slip table. Special purpose designed hydrostatic bearing realizes high load and allowable eccentric moment. Bearings are built in heat insulated oil tanks and a whole table unit fits inside a chamber. Therefore there is no need to attach a thermal barrier. And it is the structure which doesn' t require an elastic rubber connecting a table plate and chamber bottom.

TT-L : Small oil pump unit in the slip table base (standard)



TT-L: Hydrostatic Bearing (Low Pressure)

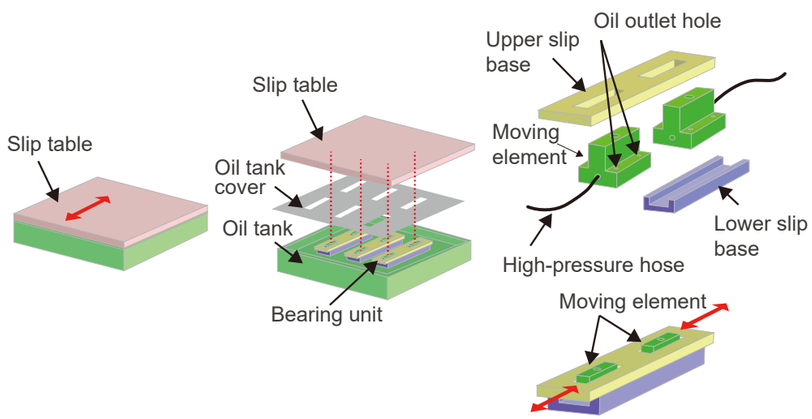
Model	TBH-500-A-TT			TBH-630-A-TT			TBH-800-A-TT			TBH-1000-A-TT			TBH-1200-A-TT			TBH-1500-A-TT			TBH-1800-A-TT			TBH-2000-A-TT		
Table Size (mm)	500 × 500			630 × 630			800 × 800			1000 × 1000			1200 × 1200			1500 × 1500			1800 × 1800			2000 × 2000		
Pitch Moment (kN-m)	1.1			1.1			2.2			2.2			4.6			6.5			10			10		
Maximum Load (kg)	700			1000			1000			1500			2000			2000			2500			2500		
Vibration Generator	Moving Mass* (kg)	Frequency (Hz)	Thickness (mm)	Moving Mass* (kg)	Frequency (Hz)	Thickness (mm)	Moving Mass* (kg)	Frequency (Hz)	Thickness (mm)	Moving Mass* (kg)	Frequency (Hz)	Thickness (mm)	Moving Mass* (kg)	Frequency (Hz)	Thickness (mm)	Moving Mass* (kg)	Frequency (Hz)	Thickness (mm)	Moving Mass* (kg)	Frequency (Hz)	Thickness (mm)	Moving Mass* (kg)	Frequency (Hz)	Thickness (mm)
i210	40	2000	30	53	2000	30	75	1600	30	105	1000	30	280	900	50	450	800	50	650	600	50	800	500	50
i220	43			55			78			108														
J230	50	1600		63	1600		85	1250		118														
J240																								
J250	70		40	85		40	115		40	155		40												
J260																								

*The material of slip plate is aluminum alloy. It is possible to change to magnesium. Please contact us for more information.

TT-H: Hydrostatic Bearing (High Pressure)

Locating multiple hydrostatic bearing on high rigid base to support slip table. Special purpose designed hydrostatic bearing realizes high load and allowable eccentric moment. Bearings are built in heat insulated oil tanks and a whole table unit fits inside a chamber. Therefore there is no need to attach a thermal barrier. And it is the structure which doesn' t require an elastic rubber connecting a table plate and chamber bottom.

TT-H : High pressure oil pump unit tank (maximum 14 MPa) is located outside of slip table.
Improved table performance of load and allowable eccentric moment.



TT-H: Hydrostatic Bearing (High Pressure)

Model	HB-500-A-TT			HB-630-A-TT			HB-800-A-TT			HB-1000-A-TT			HB-1200-A-TT			HB-1500-A-TT			HB-1800-A-TT			HB-2000-A-TT		
Table Size (mm)	500 × 500			630 × 630			800 × 800			1000 × 1000			1200 × 1200			1500 × 1500			1800 × 1800			2000 × 2000		
Pitch Moment (kN·m)	4			4			7.7			7.7			16			22			48			48		
Maximum Load (kg)	800			1200			1600			2000			2000			2000			3000			3000		
Vibration Generator	Moving Mass* (kg)	Frequency (Hz)	Thickness (mm)	Moving Mass* (kg)	Frequency (Hz)	Thickness (mm)	Moving Mass* (kg)	Frequency (Hz)	Thickness (mm)	Moving Mass* (kg)	Frequency (Hz)	Thickness (mm)	Moving Mass* (kg)	Frequency (Hz)	Thickness (mm)	Moving Mass* (kg)	Frequency (Hz)	Thickness (mm)	Moving Mass* (kg)	Frequency (Hz)	Thickness (mm)	Moving Mass* (kg)	Frequency (Hz)	Thickness (mm)
i210	60	2000	50	70	2000	50	115	2000	50	165	1250	50	280	900	50	450	800	50	650	600	50	800	500	50
i220	63			83			118			168														
J230	68	1600		88	1600		125	1250		175	1000													
J240	70			90			130			178														
J250	83			100			143			188														
J260																								
K030	68	2000		88	2000		123	2000		173	1250													
K060	93			108			145			193														
K080	78			95			133			180														
K125	103			118			155			205														
K125LS	113	1600		128	1600		170	1250		220	1000													

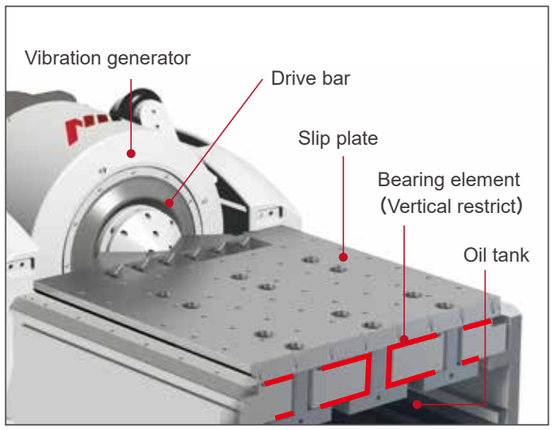
*The material of slip plate is aluminum alloy. It is possible to change to magnesium. Please contact us for more information.

TH: Hydrostatic Bearing & Oil Film

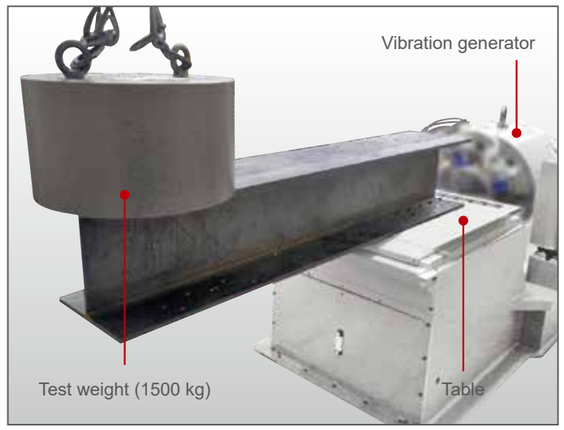
Newly developed hydrostatic and hydraulic bearing realizes the following features.

- High moment resistance
- Low cross-axis acceleration
- Low distortion
- No requirement for a separate hydraulic unit
- Smaller system installation space

■ **Bearing structure**



■ **Allowable eccentric moment verification test**



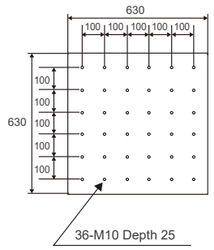
Model	TBH-550TH		TBH-750TH		TBH-950TH		TBH-1150TH		TBH-1450TH	
Table Size (mm)	550 × 550		750 × 750		950 × 950		1150 × 1150		1450 × 1450	
Table Thickness (mm)	50		50		50		50		50	
Pitch Moment (kN·m)	6		66		85		85		198	
Maximum Load (kg)	1500		9000		9000		9000		9000	
Vibration Generator	Moving Mass* (kg)	Frequency (Hz)	Moving Mass* (kg)	Frequency (Hz)	Moving Mass* (kg)	Frequency (Hz)	Moving Mass* (kg)	Frequency (Hz)	Moving Mass* (kg)	Frequency (Hz)
A11	85	2000	159	2000	215	1250	298	800	452	500
A22										
A30										
A45	—	—	180		236		318		473	
A65										
A74										

*The material of slip plate is aluminum alloy. It is possible to change to magnesium. Please contact us for more information.

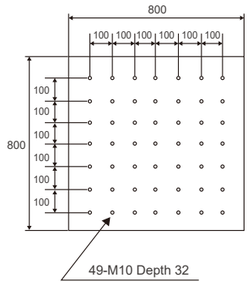
Watch the
You Tube video

Features

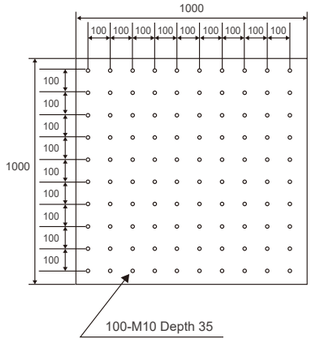
■ Table insert pattern



TBH-6



TBH-8



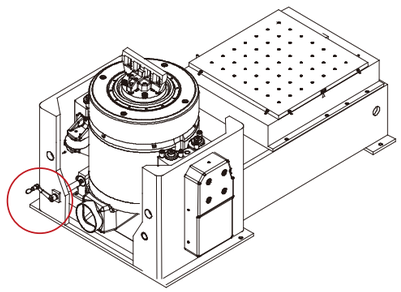
TBH-10

* Please contact us with another table insert pattern.

■ Option for slip table

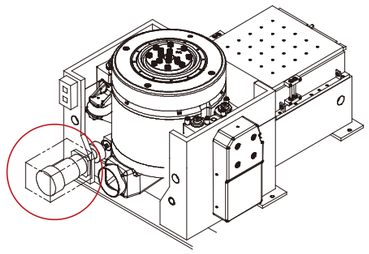
Rotation reduction gearing

A reduction gearing unit enabling easier reconfiguration of the vibration generator.



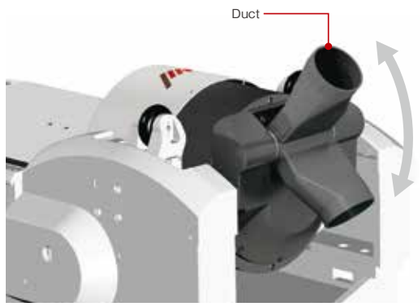
Motor drive rotation

Powered rotation of the vibration generator.
The motor-driven rotation can be optionally installed on systems equipped with reduction gearing.

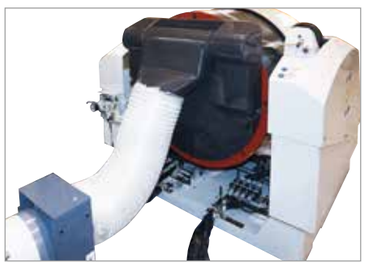


Duct

A newly developed duct is provided as standard. No operation needed for direction change between vertical and horizontal. Space behind the shaker is minimised.



Horizontal operation

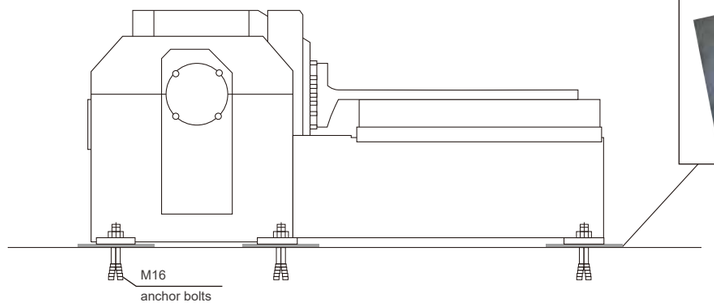


Changing orientation

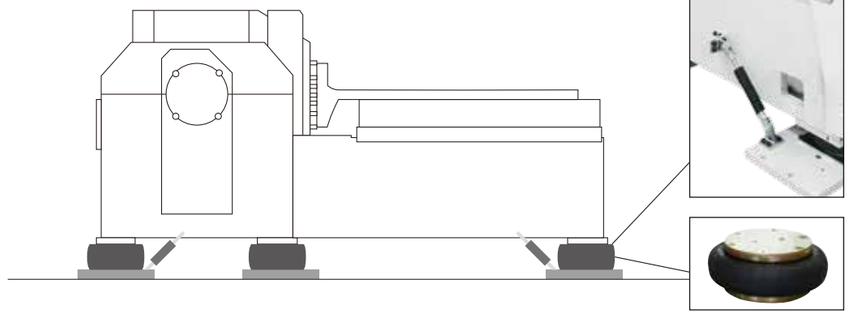
Vertical operation

■ Vibration Isolation

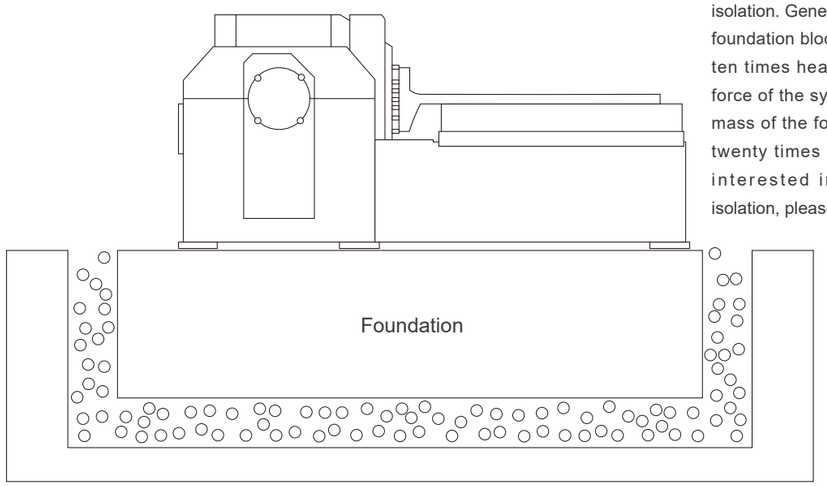
1) Standard: anchor bolts (6 locations) + SIM plate



2) Bottom suspension: air springs (option: dumper)



3) Isolated foundation



This is the best way of vibration isolation. Generally, the mass of the foundation block should be at least ten times heavier than the rated force of the system. Typically, the mass of the foundation should be twenty times heavier. If you are interested in this method of isolation, please contact IMV.

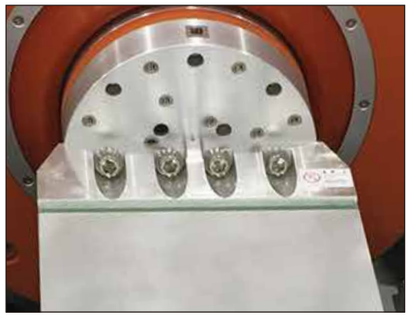
Features

■ Permanent alignment

Critical parts such as a vibration generator, a bearing and large and small slip tables are all assembled on a one base. All alignment adjustments are performed at IMV factory, so there is no need for alignment adjustment by user when combining a vibration generator and a slip table. Any connecting work, there is no need to measure by a gage or adjustment with shim plates. Dowel pins are used in driver bars which connects a vibration generator and a slip table, there is no need for positioning of driver bars to a vibration generator.

■ Highly rigid driver bar

Driver bar is integrally molded with aluminum alloy casting provides a more rigid attachment than welded driver bars. Cast construction has more flexibility, so it can form a rigid and high reliability shape. Welded construction has associated inherent weakness root cracks or blow holes, high quality casting material can eliminate those problem. Bolting line which connects drive bars has the same direction with excitation direction, it is a strong layout for connection.



* Please contact us with another connection method.
(oblique insertion joint method)

■ Vibration isolation

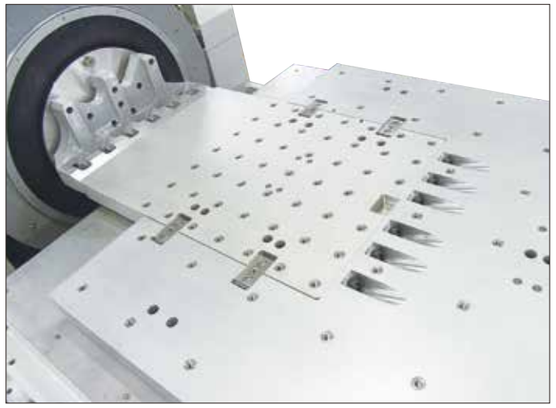
Effective and easy handle way to isolate vibration is possible by vibration isolation guide with linear guide placed between a shaker body and combo base. The moving direction of linear guide and air spring is the same as excitation direction of a shaker, so they can suppress the vibration generated from a shaker body in both vertical and horizontal excitation. Air volume for air spring can be easily adjusted by a valve attached in a combo base. When air volume adjustment is required for changing shaker angle, it is easily handled by this valve. Dedicated lock plate can fix the vibration shaker body, so it can suppress the shaker body stroke during large stroke vibration testing. Air springs are placed under the combo base, so pitching vibration generated from specimen on the slip table is isolated and doesn't transmit to the floor.

Watch the
You Tube video

■ High sealing performance oil tank * For TT-L / TT-H model only

High sealing oil tank located in all hydro-static bearing table. Connecting block between hydraulic bearing and slip table is covered with a movable seal which prevent oil from scattering and foreign particles entering circulating oil. Due to this construction, user ever touch the oil even during changing the size tables.

■ Selectable discrete type table * For TT-L / TT-H model only

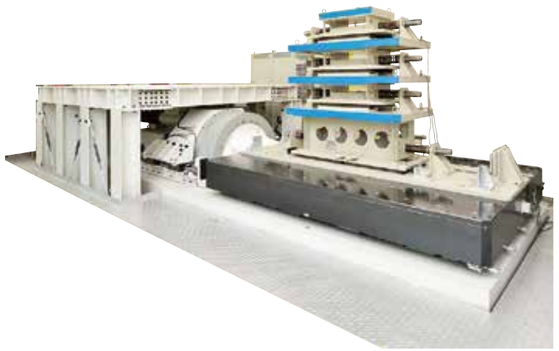


Slip table is selectable for applications from two kinds : Large and Small sized one.
Large slip table is used for testing of large specimen. If high acceleration testing for small specimen is
required, a small slip table is selected. During changing slip tables, there is no need to remove and remount the table. Small slip table is built in a large slip table and tightly connected.

■ Hook bolt

Hook bolts can fix the specimen on the table with ropes. Please contact us about the location of bolts.

Case study



Large scale earthquake resistance vibration test systems

Watch the You Tube video

Industry first hybrid technology low frequency vibration test system which simulates highly accurate waveforms including low frequency and high frequency components simultaneously with a electrodynamic shaker and AC servomotor.

Large scale 200 kN vibration test systems for the aerospace industry

With low displacement requirements for the aerospace industry, this system is fitted with a Team slip table using the T-Film bearing. High over-turning moment and low cross-axis acceleration are features of this system in both vertical and horizontal operation.

Large vibration test system for high frequency testing (up to 5000 Hz)

High frequency test with large specimen. The slip table can be replaced according to the size of specimen and each table can be used for high frequency testing.

Low stroke hydrostatic & hydraulic bearing high performance type

With a newly developed hydrostatic and hydraulic bearing, it achieves large table 1800 mm × 1800 mm and low stroke.

Note

Optional Units

VST(Vacuum Slip Table)

New concept slip table guided by balancing oil pressure and vacuum force.

Features

- Long stroke up to 160 mm
- Interchangeable table fits customer needs (option)
- High damping ratio
- High moments
- Minimum alignment operation
- Low maintenance

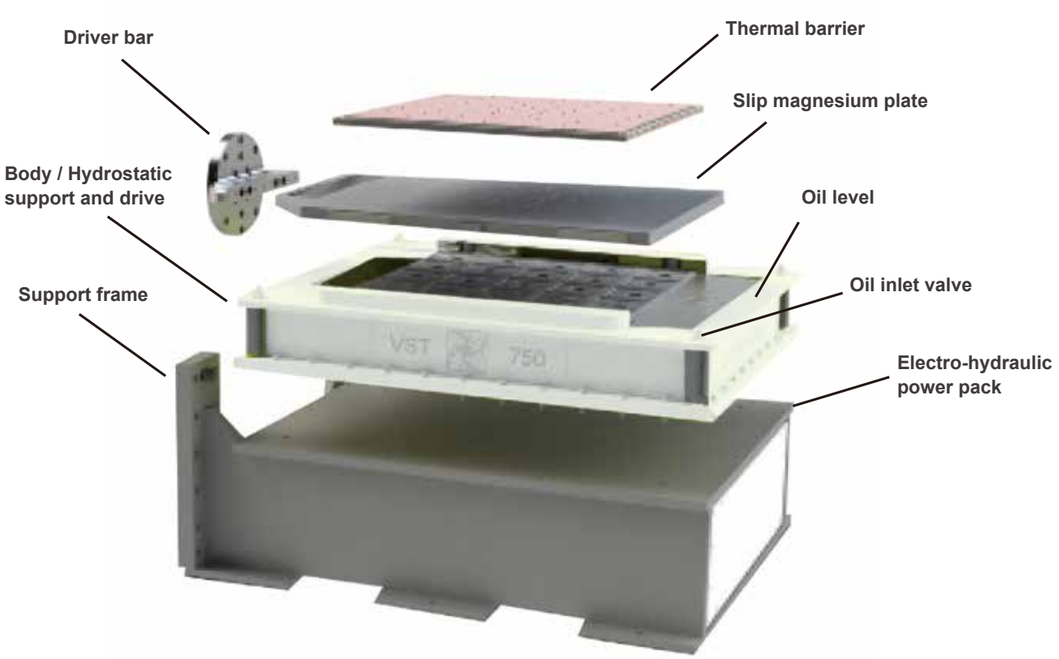
CENTROTECNICA S.r.l.

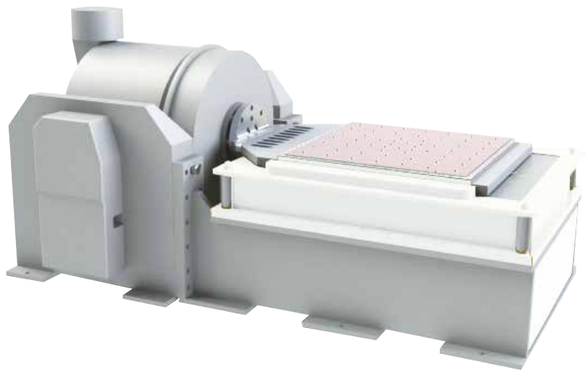
Specification: VST (Vacuum Slip Table)

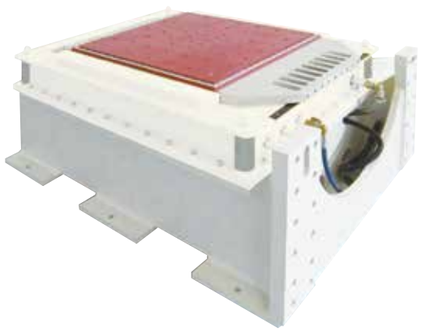
Table Size		600 × 600	750 × 750	900 × 900	1050 × 1050	1200 × 1200	1500 × 1500
Weight (kg)	Magnesium	35	50	67	88	111	167
Moments (kNm)	Pitch	7.7	15	25.9	41.2	61.4	120
	Roll	7.7	15	25.9	41.2	61.4	120
	Yaw Continuous	2.8	3.7	4.7	5.6	6.5	8.4
	Yaw Ultimate	23.4	31.2	39	46.8	54.6	70.2
Maximum Displacement (mm)		160	160	160	160	160	160
Maximum Payload (kg)		640	1000	1450	1950	2550	4000
Maximum Frequency (Hz)		2000	2000	2000	2000	2000	2000
First Resonance (Hz)		1250	1050	950	830	730	600
Standard Insert Pattern	100 mm Grid	36	64	81	121	144	225
Driver Bar Weight (kg) *	Aluminium	15	15	15	15	15	15

*TBC according to the armature

VST in details





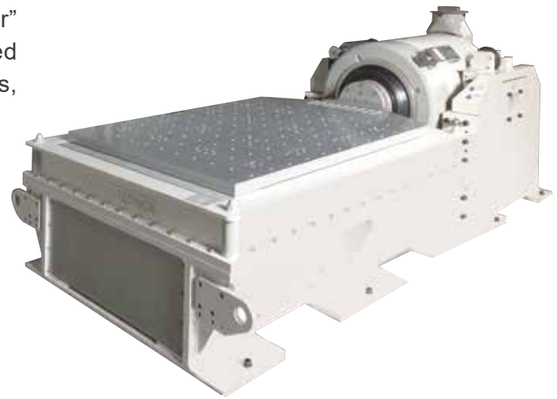


Optional Units

RT(Rail Table)

CENTROTECNICA S.r.l.

The main innovation consists in the use of recirculating balls guideways and a particular damping technology based on the “constrained layer” principle. The innovative system is characterized by high reliability and excellent performances, the result of a long direct field experience.

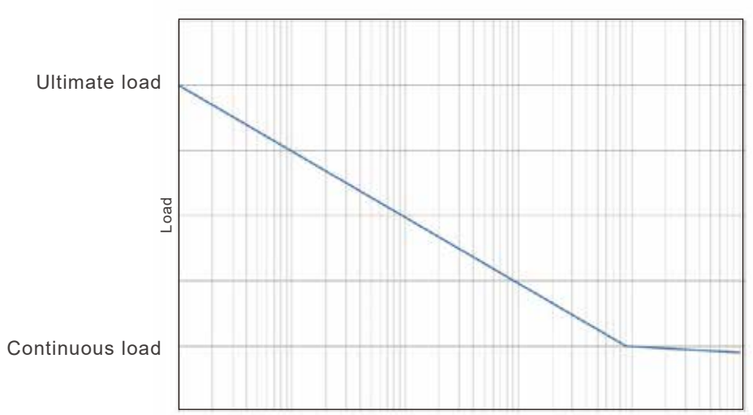


Features

- Easily to use
- No oil
- No electrical power
- No compressed air
- Long stroke
- Robust and longlasting
- Easily to repair and maintain
- Very good dynamic performances
- Oxidation resistance

Bearing lasting time

The high technical level of the Rail Table led to an extension of the working time between each maintenance. Before the test start, the customer could easily calculate the table bearable test load and, by comparing the “continuous” and “ultimate” load values, asses the wear level which the test will cause to the table and consequently the economic impact of the maintenance.
Important : the maintenance is a very simple operation since it consists in the mere substitution of the bearings.



Specification: RT (Rail Table)

Table Size		450 × 450	600 × 600	750 × 750	900 × 900	1050 × 1050
Weight (kg)	Aluminium	30	50	68	96	125
	Magnesium	23	40	53	75	98
Moments (kNm)	Pitch Continuous	1.7	5.7	7.4	16.2	19.3
	Pitch Ultimate	22.3	71.6	93	203.4	241.4
	Roll Continuous	1.3	4.7	6.5	14.6	17.6
	Roll Ultimate	17.1	59.9	81.3	182.5	220.6
	Yaw Continuous	1.7	5.7	7.4	16.2	19.3
	Yaw Ultimate	22.3	71.6	93	203.4	241.4
Maximum Displacement (mm)		160	160	160	160	160
Maximum Payload (kg)		414	620	931	1241	1654
Maximum Frequency (Hz)		2000	2000	2000	2000	2000
First Resonance (Hz)		1400	1250	1050	950	830
Standard Insert Pattern	100 mm Grid	25	36	64	81	121
Driver Bar Weight (kg) *	Aluminium	15	15	15	15	15

* TBC according to the armature