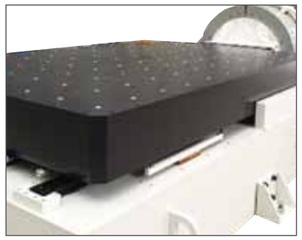
Horizontal Table

Full lineup of IMV slip tables



IMV CORPORATION

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

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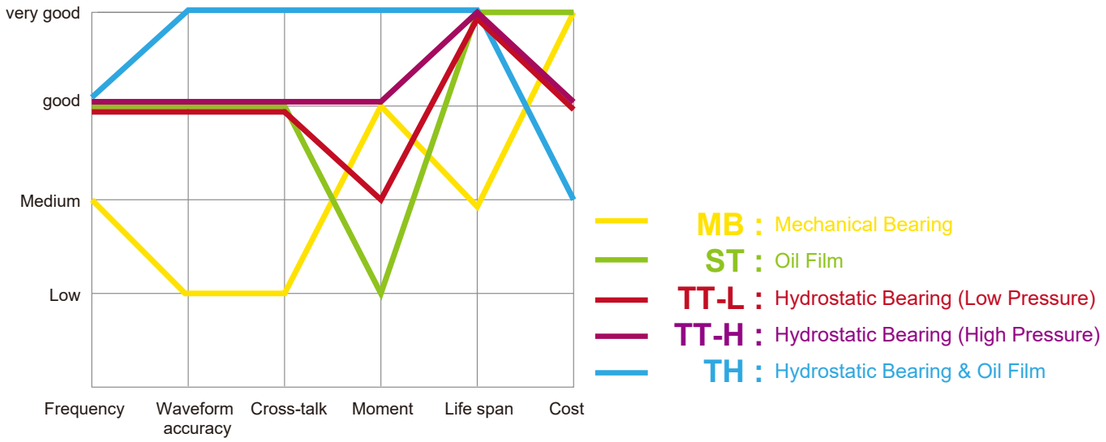
IMV CORPORATION

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]

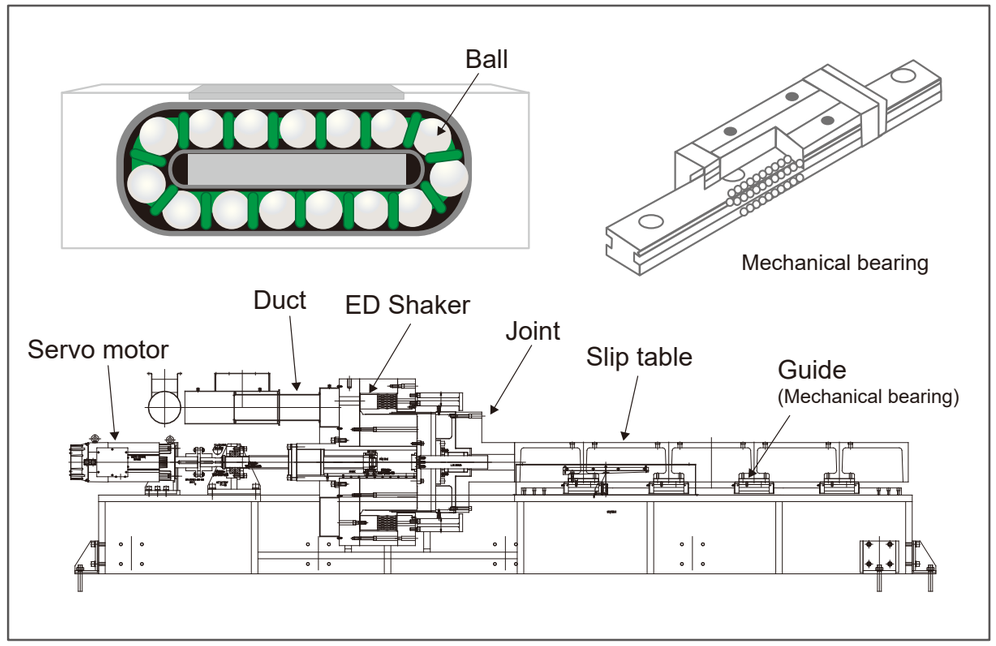
	MB	ST	TT-L	TT-H	TH
200 x 200	50	-	-	-	-
300 x 300	200	-	-	-	-
400 x 400	300	-	-	-	-
500 x 500	-	200	1,100	4,000	-
550 x 550	-	-	1,100	4,000	3,000
630 x 630	-	400	1,100	4,000	-
750 x 750	-	-	2,200	7,700	33,000
800 x 800	-	800	2,200	7,700	-
950 x 950	-	-	2,200	7,700	42,500
1000 x 1000	-	1,300	2,200	7,700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

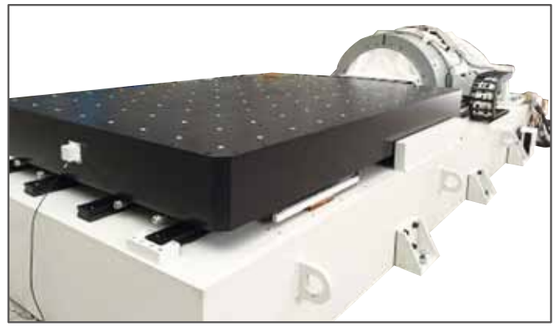
Maximum Load [kg]

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





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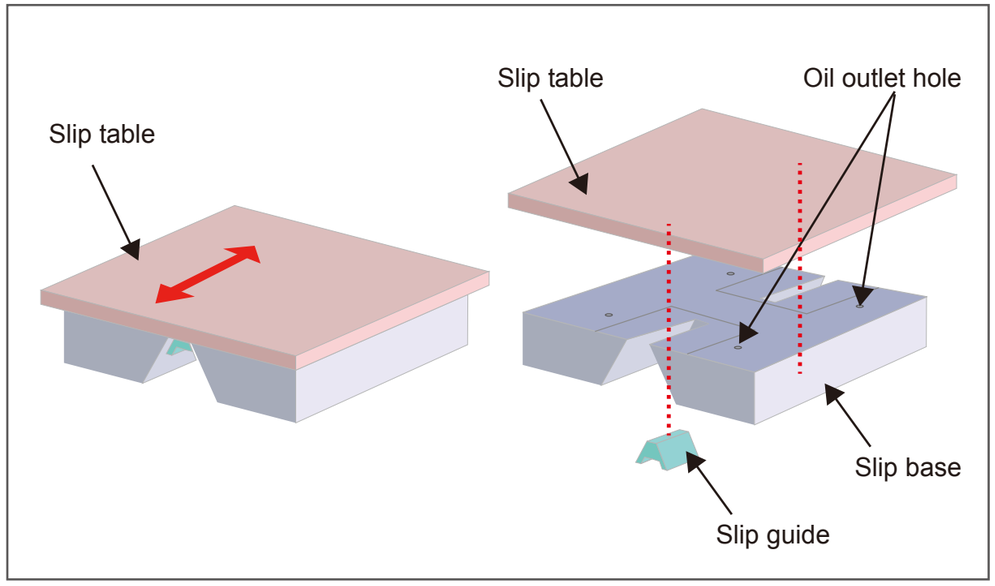
ST : Oil Film Type

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.



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Specification ST : “V”-guided range (Oil Film)

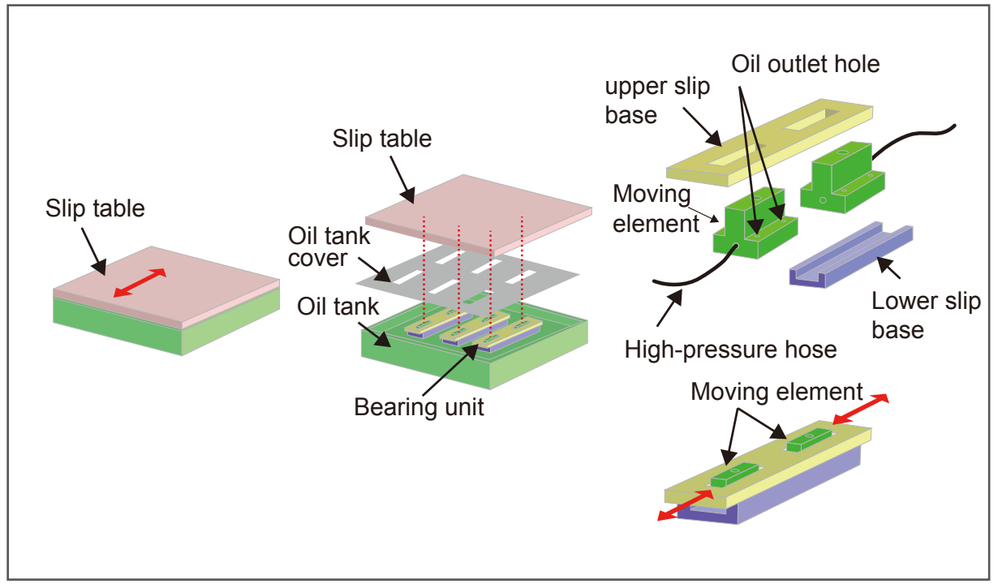
Table size (mm)	Table thickness (mm)	Shaker	Moving mass* (kg)	Frequency (Hz)	Moment (N･m)	Maximum load (kg)
500 x 500	30	i210	33	2,500	200	200
		i220				
		i230				
		i240				
	40	i250	53	2,000		
		i260				
	30	K030	33			
	50	K060	60			
	-	K080	-	-	-	-
630 x 630	30	i210	45	2,000	400	300
		i220				
		i230				
		i240				
	40	i250	70			
		i260				
	30	K030	45			
	50	K060	80			
		K080				
800 x 800	30	i210	-	-	-	-
		i220	65	2,000	800	400
		i230				
		i240				
	40	i250	98			
		i260				
	30	K030	65			
	50	K060	115			
		K080				
1000 x 1000	30	i210	-	-	-	-
		i220	100	1,250	1,300	500
		i230				
		i240				
	40	i250	143			
		i260				
	30	K030	100			
	50	K060	170			
		K080				

*The weight is referring the plate made of aluminum.

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)



Specification TT-L : Hydrostatic Bearing (Low pressure)

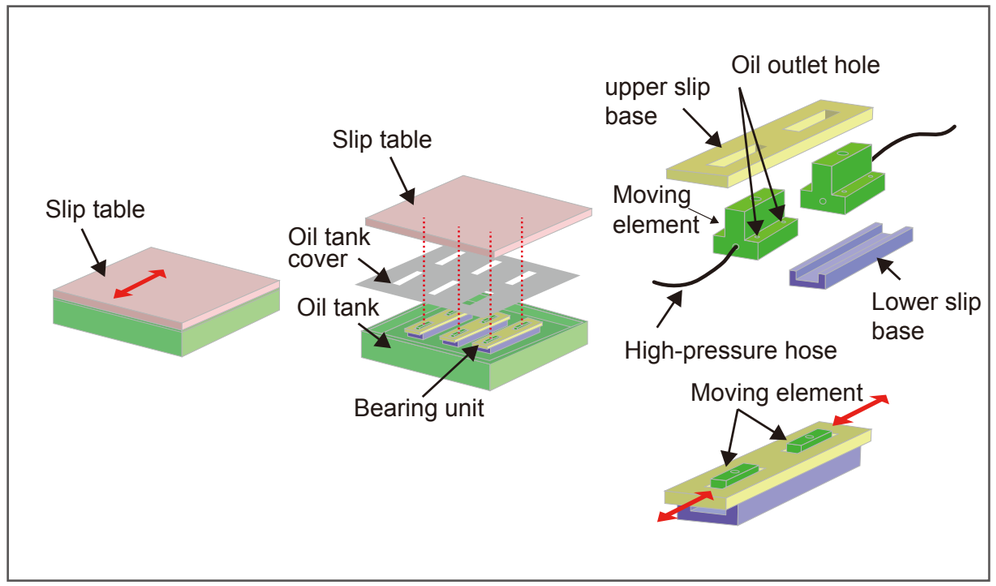
Table size (mm)	Table thickness (mm)	Shaker	Moving mass* (kg)	Frequency (Hz)	Moment (N·m)	Maximum load (kg)
500 x 500	30	J230	50	1,600	1,100	200
		J240				
	40	J250	70			
		J260				
	50	K, A-series	90			
630 x 630	30	J230	63	1,600	1,100	300
		J240				
	40	J250	85			
		J260				
	50	K, A-series	110			
800 x 800	30	J230	85	1,250	2,200	400
		J240				
	40	J250	115			
		J260				
	50	K, A-series	150			
1000 x 1000	30	J230	118	1,000	2,200	500
		J240				
	40	J250	155			
		J260				
	50	K, A-series	200			
1200 x 1200	50	All	280	900	4,600	500
1500 x 1500	50	All	450	800	6,500	500
1800 x 1800	50	All	650	600	10,000	800
2000 x 2000	50	All	800	500	10,000	800

*The weight is referring the plate made of aluminum.

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.



Specification TT-H : Hydrostatic Bearing (High pressure)

Table size (mm)	Table thickness (mm)	Shaker	Moving mass* (kg)	Frequency (Hz)	Moment (N·m)	Maximum load (kg)
500 x 500	50	i210	60	2,000	4,000	800
		i220	63			
		i230	65			
		i240	68			
		i250	78			
		i260	78			
		J230	68	1,600		
		J240	70			
		J250	83			
		J260	83			
		K030	68	2,000		
		K060	93			
		K080	78			
		K125	103			
		K125LS	113	1,600		
630 x 630	50	i210	70	2,000	4,000	1,200
		i220	83			
		i230	83			
		i240	88			
		i250	95			
		i260	95			
		J230	88	1,600		
		J240	90			
		J250	100			
		J260	100			
		K030	88	2,000		
		K060	108			
		K080	95			
		K125	118			
		K125LS	128	1,600		
800 x 800	50	i210	115	2,000	7,700	1,600
		i220	118			
		i230	120			
		i240	123			
		i250	133			
		i260	133			
		J230	125	1,250		
		J240	130			
		J250	143			
		J260	143			
		K030	123	2,000		
		K060	145			
		K080	133			
		K125	155			
		K125LS	170	1,250		
1000 x 1000	50	i210	165	1,250	7,700	2,000
		i220	168			
		i230	170			
		i240	173			
		i250	180			
		i260	180			
		J230	175	1,000		
		J240	178			
		J250	188			
		J260	188			
		K030	173	1,250		
		K060	193			
		K080	180			
		K125	205			
		K125LS	220	1,000		
1200 x 1200	50	All	280	900	16,000	2,000
1500 x 1500		All	450	800	22,000	2,000
1800 x 1800		All	650	600	48,000	3,000
2000 x 2000		All	800	500	48,000	3,000

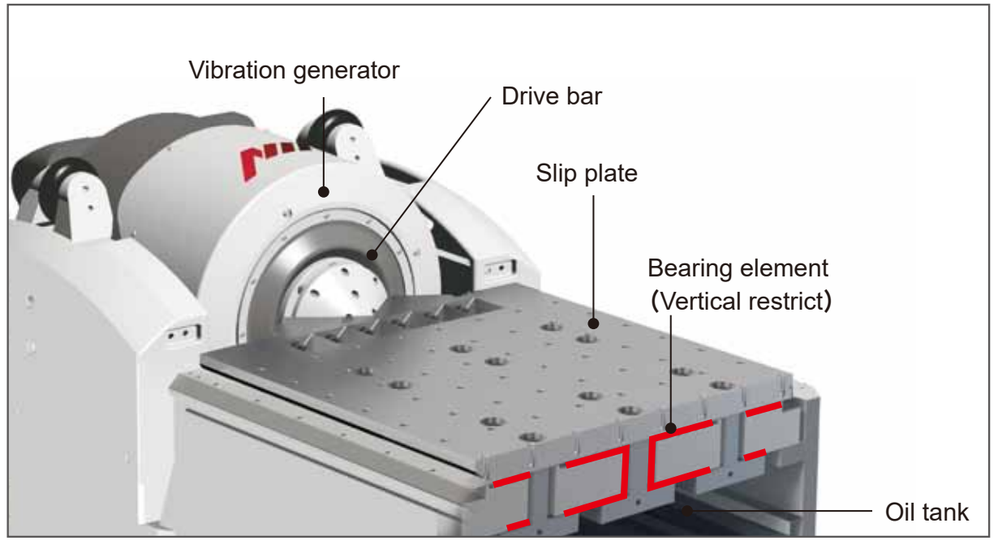
*The weight is referring the plate made of aluminum.

TH : Hydrostatic Bearing & Oil Film

Newly developed hydrostatic and hydraulic bearing realizes the following features.

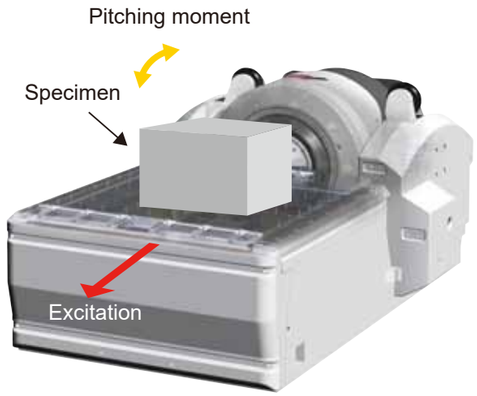
- High moment resistance
- Low cross-axis acceleration
- Low distortion
- No requirement for a separate hydraulic unit
- Smaller system installation space

■ Bearing structure



■ Moment resistance performance

New type slip table can achieve high moment resistance only by built-in hydraulic unit.
As compared to our conventional systems, high quality system of reasonable and high rigidity can be provided.



	Bearing method	Slip table model	Allowable eccentric moment (kN・m)
New	TH bearing (new hydrostatic hydraulic bearing)	TBH-10TH (size 1m x 1m)	42.5
Conventional	TT bearing (high pressure : exterernal hydraulic unit)	TBH-10 (size 1m x 1m)	7.7
	TT bearing (low pressure : interernal hydraulic unit)	TBH-10 (size 1m x 1m)	2.2
	Slip table (low pressure : interernal hydraulic unit)	TBH-10 (size 1m x 1m)	1.3

Specification TH : Hydrostatic Bearing & Oil Film

Table size (mm)	Table thickness (mm)	Shaker	Moving mass* (kg)	Frequency (Hz)	Static Pitch Moment (N・m)	Dynamic Pitch Moment (N・m)	Maximum load (kg)
550 x 550	50	A10	85	2,000	3,000	6,000	1,500
		A20					
		A30					
		A45	-	-	-	-	-
		A65					
750 x 750	50	A10	159	2,000	33,000	66,000	9,000
		A20					
		A30					
		A45	180				
		A65					
950 x 950	50	A10	215	1,250	42,500	85,000	9,000
		A20					
		A30					
		A45	236				
		A65					
1150 x 1150	50	A10	298	800	42,500	85,000	9,000
		A20					
		A30					
		A45	318				
		A65					
1450 x 1450	50	A10	452	500	99,000	198,000	9,000
		A20					
		A30					
		A45	473				
		A65					

*The weight is referring the plate made of aluminum.

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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 aluminium 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.

■ 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.

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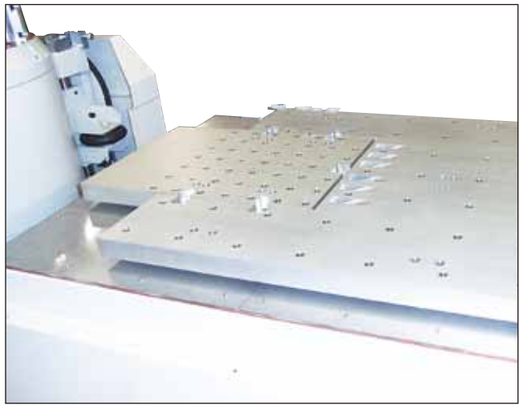
■ High sealing performance oil tank * For TT-L / TT-H model only

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.



Optional Units

VST(Vacuum Slip Table)

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

Features

- Long stroke of up to 160 mm
- Interchangeable table fits customer needs (option)
- High Damping Ratio
- High Moments
- Minimum alignment operation
- Low maintenance

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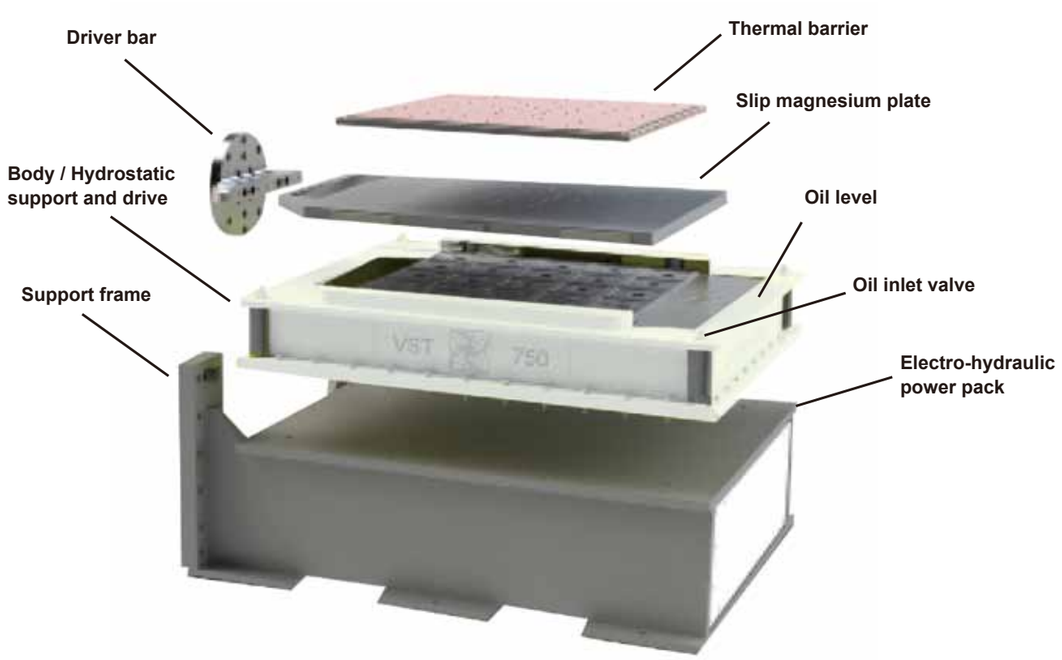
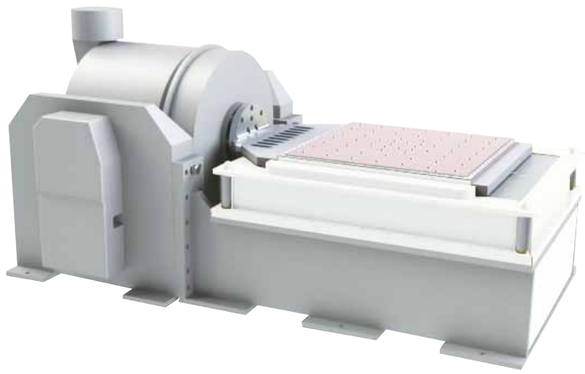
Specification : VST (Vacuum Slip Table)

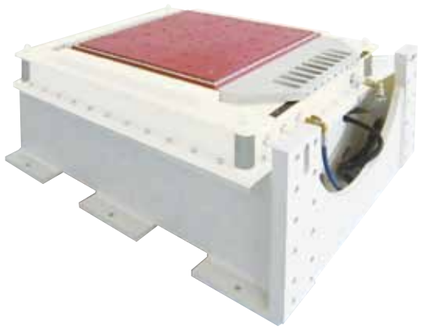
Table Size		600 x 600	750 x 750	900 x 900	1050 x 1050	1200 x 1200	1500 x 1500
Weight (kg)	Magnesium	35	50	67	88	111	167
Moments (kNm)	Pitch	7.7	15	25.9	41.2	61.4	120
	Roll	7.7	15	25.9	41.2	61.4	120
	Yaw Continuous	2.8	3.7	4.7	5.6	6.5	8.4
	Yaw Ultimate	23.4	31.2	39	46.8	54.6	70.2
Maximum Displacement (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)

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.

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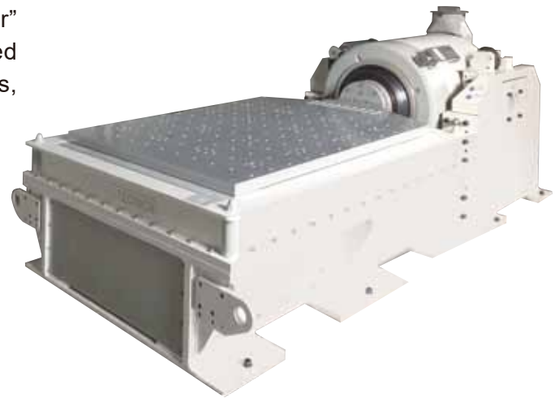
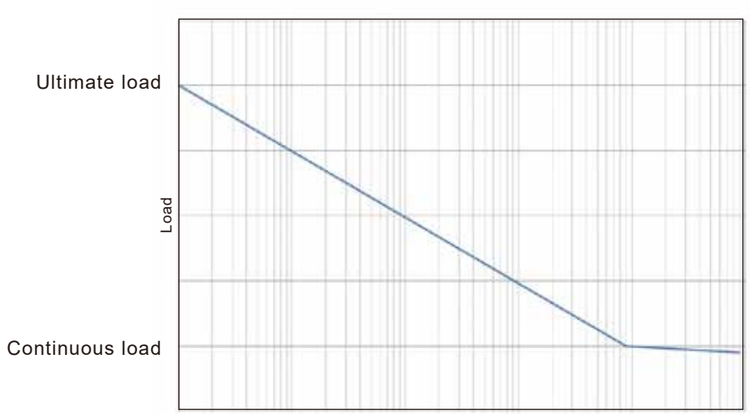


Features

- easily to use
- no oil
- no electrical power
- no compressed air
- long stoke
- robust and longlasting
- easily to repair and mantain
- 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 x 450	600 x 600	750 x 750	900 x 900	1050 x 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