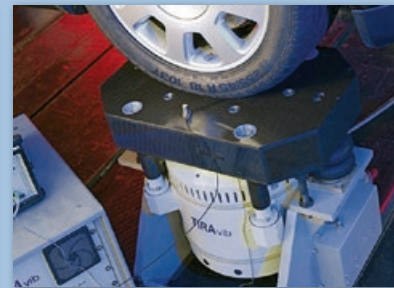


TIRA

Schwingtechnik

Vibration Test Systems



TIRA Vibration Test Systems

Modal-Vibration Test Systems

TIRA Vibration Test Systems

Modal-Vibration Test Systems from 100 N to 2.7 kN

These exciters are specifically designed for **modal and structure analysis**. Modal shakers up to 400 N are excited by permanent magnets, with **lightweight** rare-earth magnets provided for mobile use. These shakers are characterized by **high cross-axial stiffness**. From 1000 N onwards, modal systems permit a max. displacement of 45 mm due to **TMC control**. TMC is an **electronic armature position control system** for precisely coupling the modal shaker to the specimen. The armature datum adjustment allows the operator to offset the nominal position of the armature in relation to the body. The axial stiffness can also be adjusted electronically.

A standard feature on all modal shakers is a trunnion mount. This allows a great variety of coupling options.

The Modal systems TV 51120-MNC and TV 51130-MSK are a special development of TIRA to increase the mobility. The 200 N shaker does not require an additional cooling unit and the 350 N shaker has an integrated cooling blower.



Modal shaker S 51120-M



Modal shaker S 51130-MSK

System	TV 51110-M	TV 51120-M	TV 51120-MNC	TV 51130-MSK
Shaker	S 51110-M	S 51120-M	S 51120-MNC	S 51130-MSK
Amplifier	BAA 120	BAA 500	BAA 500	BAA 500-MSK
Blower	-	TB 0080	-	internal
Rated peak force	Sine _{pk} / Random _{RMS}	100/70 N	200/140 N	200/100 N
Frequency range	DC - 5000 Hz	DC - 5000 Hz	DC - 3000 Hz	DC - 4000 Hz
Max. displacement (pk-pk)	13 mm	13 mm	9 mm	10 mm
Max. velocity	1.5 m/s	1.5 m/s	1.3 m/s	1.3 m/s
Suspension stiffness	8 N/mm	8 N/mm	70 N/mm	70 N/mm
Effective moving mass ±5%	0.23 kg	0.23 kg	0.5 kg	0.55 kg
Main resonance frequency (free-swinging)	>2680 Hz	>2680 Hz	>4000 Hz	>2700 Hz
Total shaker mass	12 kg	12 kg	18 kg	27 kg
Coupling (Thread ø)	M6	M6	M8	M8
Max. power consumption at 230 V Amplifier/Blower	80/- VA	350/460 VA	350/- VA	900 VA (incl. blower)

System	TV 51140-M	TV 5220-M	TV 50350-M
Shaker	S 51140-M	S 5220-M	S 50350-M
Amplifier	BAA 1000	BAA 1000-ET	A 1 02 11 021 T SV
Blower	TB 0140	TB 0140	TB 0310
Rated peak force	Sine _{pk} / Random _{RMS}	400/311 N	1000/650 N
Frequency range	DC - 5000 Hz	1 - 5000 Hz	1 - 3000 Hz
Max. displacement (pk-pk)	20 mm	45 mm	45 mm
Max. velocity	1.5 m/s	1.5 m/s	1.5 m/s
Suspension stiffness	5 N/mm	electr. adjustable	electr. adjustable
Effective moving mass ±5%	0.4 kg	1.45 kg	2.3 kg
Main resonance frequency (free-swinging)	>2450 Hz	>4000 Hz	>3000 Hz
Total shaker mass	18 kg	122 kg	280 kg
Coupling (Thread ø)	M6	M8	M8
Max. power consumption at 230/400 V Amplifier/Blower (+FPS)	2.7/1.4 kVA	2.7/2.5 kVA	17 kVA (total)

General data - For detailed technical information see product data sheets
(Download at <https://www.tira-gmbh.de/en/datasheets>)



Modal-Vibration Test Systems from 4 kN to 15 kN

Especially for modal excitation of big structures or structures with high mass TIRA offers a range of modal systems from 4 kN up to 15 kN.

These shakers are characterized by **high cross axial stiffness** and permit a max. displacement of up to 100 mm (pk-pk) due to **TMC control**.

TMC is an electronic armature position control system for precisely coupling the modal shaker to the specimen. The armature datum level adjustment allows the operator to offset the nominal position of the armature in relation to the body. The axial stiffness can also be adjusted electronically.

A standard feature on all modal shakers is a trunnion mount. This allows a great variety of coupling options.



Modal shaker S 55240-M/LSS

System	TV 55240-M/LSS	TV 56280-M/LSS	TV 57315-M/LSS	
Shaker	S 55240-M/LSS	S 56280-M/LSS	S 57315-M/LSS	
Amplifier	A 1 02 11 021 T SV	A 1 02 11 021 T SV	A 3 01 11 063 T	
Blower	TB 0310	TB 9 FUK	TB 120 FUK	
Rated peak force	Sine _{pk} / Random _{RMS}	4000/3400 N	8000/6000 N	15000/11000 N
Frequency range	1 - 2000 Hz	1 - 2000 Hz	1 - 2000 Hz	1 - 2000 Hz
Max. displacement (pk-pk)	100 mm	100 mm	100 mm	100 mm
Max. velocity	2.0 m/s	2.0 m/s	2.0 m/s	2.0 m/s
Effective moving mass ±5%	11.0 kg	12.0 kg	18.0 kg	18.0 kg
Main resonance frequency (free-swinging)	>2500 Hz	>2500 Hz	>2500 Hz	>2500 Hz
Total shaker mass	800 kg	850 kg	1200 kg	1200 kg
Coupling (Thread ø)	M10	M10	M10	M10
Max. power consumption at 400 V incl. blower	17 kVA	17 kVA	31 kVA	31 kVA

General data - For detailed technical information see product data sheets (Download at <https://www.tira-gmbh.de/en/datasheets>)



TIRA Vibration Test Systems

Special Modal-Vibration Test Systems 100 N to 400 N

TIRA offers a new series of special modal systems for **mobile use**. The MOSP models distinguish themselves by an **extended displacement** of 25.4 mm. The low mass by using rare-earth magnets, the through-hole in the center of the armature for attaching **tension-wire stingers** besides push/pull stingers and for accomplishing a variable adjustment of the distance to the test structure, are additional features of this series.

These shakers are characterized by a **high cross axial stiffness**.

A standard feature on all modal shakers is a trunnion mount. This allows a great variety of coupling options.



Modal shaker S 51110-MOSP

System	TV 51110-MOSP	TV 51120-MOSP	TV 51140-MOSP
Shaker	S 51110-MOSP	S 51120-MOSP	S 51140-MOSP
Amplifier	BAA 120	BAA 500	BAA 1000
Blower	–	TB 0080	TB 0140
Rated peak force	Sine _{pk} / Random _{RMS}	100/70 N	200/140 N
Frequency range	DC - 5000 Hz	DC - 5000 Hz	DC - 5000 Hz
Max. displacement (pk-pk)	25.4 mm	25.4 mm	25.4 mm
Max. velocity	1.5 m/s	1.5 m/s	1.5 m/s
Suspension stiffness	4 N/mm	4 N/mm	4 N/mm
Effective moving mass ±5%	0.23 kg	0.23 kg	0.4 kg
Main resonance frequency (free-swinging)	>6000 Hz	>6000 Hz	4000 Hz
Total shaker mass	21 kg	21 kg	21 kg
Coupling (Thread ø)	M6	M6	M6
Max. power consumption at 230 V Amplifier/Blower	80/- VA	350/460 VA	2.7/1.4 kVA

General data - For detailed technical information see product data sheets
(Download at <https://www.tira-gmbh.de/en/datasheets>)



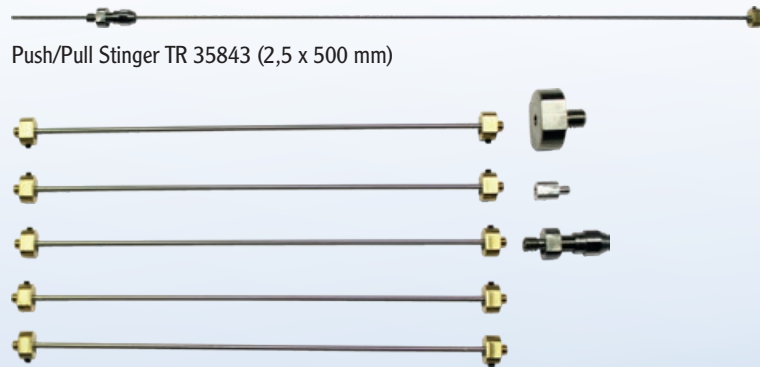
Stinger - Push/Pull

A stinger consists of a thin and flexible steel rod with fixation device on each end. The stinger transfers forces in axial direction and is flexible in lateral direction to minimize lateral forces to the structure. Lateral forces are not measured by uniaxial force pickups and add unwanted random signals to the measuring process, therefore the reduction of these forces is important. Avoiding these lateral forces increases the accuracy of measurement.

The stinger is also useful for isolating the moving armature from the test structure, reducing unwanted shock forces. Additionally it helps to avoid damages to the armature and the structure by unwanted excitations.

TIRA offers a variety of stinger models, collet chucks and adapters for different types of application.

Modal adapters enable the utilization of normal vibration exciters for modal applications.



Push/Pull Stinger TR 35843 (2,5 x 500 mm)

Push/Pull Stinger TR 36154 (3,0 x 200 mm),
Adapter TR 36235 (10-32 UNF - M8), Adapter TR 36237 (10-32 UNF - M4),
Collet chuck TR 36232

Push/Pull Stinger	
Designation	Description
TR 35833	Push/Pull Stinger 2,5 x 200 mm (Adapter thread 10-32 UNF)
TR 36154	Push/Pull Stinger 3,0 x 200 mm (Adapter thread 10-32 UNF)
TR 36156	Push/Pull Stinger 2,0 x 500 mm with collet chuck M6 (Adapter thread 10-32 UNF)
TR 35843	Push/Pull Stinger 2,5 x 500 mm with collet chuck M6 (Adapter thread 10-32 UNF)
TR 36155	Push/Pull Stinger 3,0 x 500 mm with collet chuck M6 (Adapter thread 10-32 UNF)

Collet chucks (separate)	
Designation	Description
TR 36231	Collet chuck M6 for TR 36156 2,0 mm (Adapter thread 10-32 UNF)
TR 36232	Collet chuck M6 for TR 35843 2,5 mm (Adapter thread 10-32 UNF)
TR 36233	Collet chuck M6 for TR 36155 3,0 mm (Adapter thread 10-32 UNF)

Adapter	
Designation	Description
TR 36235	Adapter 10-32 UNF - M8
TR 36234	Adapter 10-32 UNF - M6
TR 36237	Adapter 10-32 UNF - M4
TR 36238	Adapter M5 - M4
TR 36239	Adapter M6 - M4
Modal adapter 60-M6	Modal adapter - Internal thread M6 for mounting on armature ø60 mm
Modal adapter 80-M8	Modal adapter - Internal thread M8 for mounting on armature ø80 mm
Modal adapter 120-M8	Modal adapter - Internal thread M8 for mounting on armature ø120 mm

TIRA company view and location

