

# PRODUCT DATA

## Modal Exciter — Type 4824

*Designed for demanding modal testing applications, electrodynamic Modal Exciter Type 4824 provides precise, reliable, stable and long-lasting operation. Highest quality materials, stringent quality control and rugged construction assure a versatile means of modal excitation for any experimental modal test using the attached excitation method.*

*Modal Exciter Type 4824 is available as a stand-alone unit – supplied only with the appropriate trunnion and connecting cable – or as a complete system, with matching power amplifier and standard set of cables. Optional accessories include traditional push/pull stingers, tension wire stingers, robust lateral modal exciter stands, turnbuckles, cable extension kits, chuck nut assemblies and various adaptors.*



### USES AND FEATURES

#### USES

- General mechanical mobility measurements
- Experimental modal analysis on most mechanical structures
- SISO, MISO, SIMO and MIMO modal test applications
- Advanced structural dynamics investigations
- Structural damage detection
- Finite element model correlation

#### FEATURES

- Force rating 100 N sine
- Through-hole design for choice of tension wire stingers or traditional stingers
- Rugged, industrial design
- Extremely high force-to-weight ratio due to rare-earth magnet technology
- One inch peak-to-peak displacement for best low-frequency excitation

- High-rigidity, low-mass magnesium armature for minimised force drop-off at resonance frequencies
- Low-weight construction providing easy positioning/orientation relative to test object
- Wide frequency range
- Ideal for any excitation signal (sine, impulse and random based signals)
- Built-in optical sensor for accurate determination of armature position
- Low stray magnetic field
- Full range of stingers – tension wire technology or traditional push/pull stinger technology (optional)
- Robust lateral exciter stands for easy positioning and orientation (optional)
- Electronic DC control of tension wire pre-tensioning (optional)
- Can be delivered as a complete turnkey excitation system with trunnion, auxiliary hardware and all necessary cables

## Description

Based on rare-earth neodymium magnet technology, this modal exciter features extremely small physical dimensions relative to the force rating along with low total weight and a low-mass, high-rigidity, spring-suspended armature. The low armature weight helps to ensure high-quality force measurements by minimising force drop-offs at the test specimen's resonance frequencies. Four upper radial flexures and four lower radial flexures, the latter providing an additional guide for best stabilisation, form a strong rectilinear guidance system which keeps the driver coil perfectly centered in the magnetic assembly's air gap. In the transverse directions and in torsion, the flexure system provides very high stiffness to counteract rotational movement of the test specimen. Also, through this configuration, the modal exciter can absorb high lateral forces without damage to the exciter's internal construction.

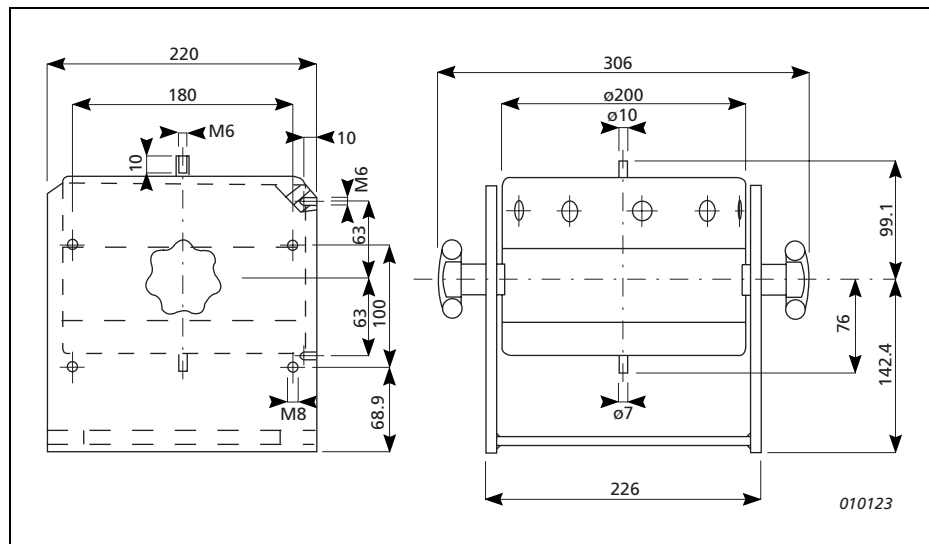
The "hole-through" design makes it possible to use tension wire stingers or traditional push/pull stingers with the exciter. Easy and fast attachment of both types of stingers is achieved with the chuck nut assembly (for use with tension wire stingers) or with an M6 to 10–32 UNF threaded insert (for use with push/pull stingers).

The optional Lateral Modal Exciter Stands UA-1607 and UA-1608 can be used with Modal Exciter Type 4824.

In lateral setups of Modal Exciter Type 4824, tension wire stingers can easily be mechanically pre-tensioned when Lateral Modal Exciter Stands UA-1607 and UA-1608 are used. For electrical pre-tensioning, especially useful in vertical, skewed excitation setups and for excitation in confined spaces, the optional DC Static Centering Unit Type 1056 can be used. Modal Exciter Type 4824 has a Video HR-10 socket that outputs the signal from the built-in optical sensor, providing necessary feedback to the optional DC Static Centering Unit Type 1056. Traditional push/pull stingers require no pre-tensioning.

Fig. 1 shows the dimensions of Modal Exciter Type 4824 mounted in its trunnion.


**Fig. 1**  
Dimensions of  
Type 4824 (mm)



Type 3624 is a complete turnkey excitation system comprising Modal Exciter Type 4824, trunnion, auxiliary hardware and all necessary cables.

Forced cooling is not required for Type 4824.

## Compliance with Standards

	<p>CE-mark indicates compliance with: EMC Directive and Low Voltage Directive. C-Tick mark indicates compliance with the EMC requirements of Australia and New Zealand.</p>
<b>Safety</b>	<p>EN/IEC 61010-1: Safety requirements for electrical equipment for measurement, control and laboratory use. ANSI/UL 61010-1: Safety requirements for electrical equipment for measurement, control and laboratory use.</p>
<b>EMC Emission</b>	<p>EN/IEC 61000-6-3: Generic emission standard for residential, commercial and light industrial environments. EN/IEC 61000-6-4: Generic emission standard for industrial environments. CISPR 22: Radio disturbance characteristics of information technology equipment. Class B Limits. FCC Rules, Part 15: Complies with the limits for a Class B digital device.</p>
<b>EMC Immunity</b>	<p>EN/IEC 61000-6-1: Generic standards – Immunity for residential, commercial and light industrial environments. EN/IEC 61000-6-2: Generic standards – Immunity for industrial environments. EN/IEC 61326: Electrical equipment for measurement, control and laboratory use – EMC requirements. <b>Note:</b> The above is only guaranteed using accessories listed in this Product Data sheet.</p>
<b>Temperature</b>	<p>IEC 60068-2-1 &amp; IEC 60068-2-2: Environmental Testing. Cold and Dry Heat. Operating Temperature: +5 to +40°C (+41 to +104°F) Storage Temperature: -25 to +70°C (-13 to +158°F)</p>
<b>Humidity</b>	<p>IEC 60068-2-78: Damp Heat: 90% RH (non-condensing at 40°C (104°F))</p>
<b>Mechanical</b>	<p>Non-operating: IEC 60068-2-6: Vibration: 0.3 mm, 20 m/s<sup>2</sup>, 10–500 Hz IEC 60068-2-27: Shock: 1000 m/s<sup>2</sup> IEC 60068-2-29: Bump: 1000 bumps at 250 m/s<sup>2</sup></p>
<b>Enclosure</b>	<p>IEC 60529: Protection provided by enclosures: IP 20</p>

## Specifications – Modal Exciter Type 4824

**Matching Power Amplifier:** Type 2732 (120 VA)

**Rated Force [sine (peak)/random (RMS)]:** 100/70 N (22/15 lbf)

**Useful Frequency Range:** 2 – 5000 Hz

**Operating Frequency Range:** DC – 5000 Hz

**Max. Rated Travel:** 25.4 mm (1 in)

**Max. Velocity [sine (peak)/random (RMS)]:** 1.5/1.5 m/s (59 in/s)

**Max. Acceleration [sine (peak)/random (RMS)]:** 432/304 m/s<sup>2</sup>  
(44/31 g)

**Rated Current:** 5.5 A

**Suspension Stiffness:** 4 N/mm (23 lbf/in)

**Effective Moving Mass:** 0.23 kg (8.1 oz)

**Main Resonance Frequency:** > 6000 Hz

**Weight with Trunnion:** 21 kg (46.3 lb.)

**Dimensions:** See Fig. 1

## Ordering Information

### MODAL EXCITER TYPE 4824

Includes the following accessories:

AQ-0649-D-050	Cable with two 4-pin Neutrik® Speakon® plugs, length 5 m (16.4 ft)
KC-1007	Trunnion
UA-1612	Three adaptors M6 to 10–32 UNF

### MODAL EXCITATION SYSTEM TYPE 3624

Type 4824	Modal Exciter
Type 2732	Power Amplifier
UA-1598	Three push/pull steel stingers, including: three fastening screws; three adaptors, diameter 2.5 mm to 10–32 UNF; three steel rods, length 500 mm, diameter 2.5 mm; one 2.5 mm collet chuck (chuck nut with collet insert)

## Optional Accessories

### ELECTRICAL TENSION WIRE PRE-TENSIONING

Type 1056	DC Static Centering Unit
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### STINGERS, COLLET CHUCKS AND ADAPTORS

UA-1596	Five push/pull steel stingers, including: ten adaptors, 2.5 mm to 10–32 UNF diameter; five steel rods, 200 mm length, 2.5 mm diameter; ten fastening screws
UA-1597	Five push/pull steel stingers, including: ten adaptors, 3.5 mm to 10–32 UNF diameter; five steel rods, 200 mm length, 3.5 mm diameter; ten fastening screws
UA-1598	Three push/pull steel stingers, including: three fastening screws; three adaptors 2.5 mm to 10–32 UNF diameter; three steel rods, 500 mm length, 2.5 mm diameter; one 2.5 mm collet chuck (chuck nut with collet insert)
UA-1599	Three push/pull steel stingers, including: three fastening screws; three adaptors, 3 mm to 10–32 UNF diameter; three steel rods, 500 mm length, 3 mm diameter; one 3 mm collet chuck (chuck nut with collet insert)
UA-1600	One tension wire, 5000 mm length, with collet chuck, including: one fastening screw; one adaptor, 0.75 mm to 10–32 UNF diameter; one tension wire, 5000 mm length, 0.75 mm diameter, on a spool; one 0.75 mm collet chuck (chuck nut with collet insert)
UA-1601	Three tension wires, including: three fastening screws; three adaptors, 1.5 mm to 10–32 UNF diameter; three tension wires, 500 mm length, 1.5 mm diameter; three 2.0 mm collet chucks (chuck nut with collet insert)

UA-1602	Collet chuck and adaptor, for tension wire with 0.75 mm diameter, including: three chuck nuts; three collet inserts for 0.75 mm diameter wire; three fastening screws; three adaptors, 0.75 mm to 10–32 UNF diameter
UA-1603	Collet chuck and adaptor for tension wire with 1.5 mm diameter, including: three chuck nuts; three collet inserts for 1.5 mm diameter wire, three fastening screws; three adaptors, 1.5 mm to 10–32 UNF diameter
UA-1604	Collet chuck and adaptor for push/pull rod, 2.5 mm diameter, including: three chuck nuts; three collet inserts for push/pull rod 2.5 mm diameter; three fastening screws; three adaptors, 2.5 mm to 10–32 UNF diameter
UA-1605	Collet chuck and adaptor for push/pull rod, 3.5 mm diameter, including: three chuck nuts; three collet inserts for push/pull rod 3.5 mm diameter; three fastening screws; three adaptors, 3.5 mm to 10–32 UNF diameter
UA-1606	Five nylon stingers, including: five nylon rods, 200 mm, 3.5 mm diameter; ten fastening screws; ten adaptors, 3.5 mm to 10–32 UNF diameter

### FORCE TRANSDUCERS AND IMPEDANCE HEADS

Type 8230-C-003	Force Transducer, Charge (+22200/–2200 N range)
Type 8231-C	Force Transducer, Charge (+110000/–2200 N range)
Type 8230-003	Force Transducer, DeltaTron® (+22000/–2200 N range)
Type 8230-002	Force Transducer, DeltaTron (+2200/–2200 N range)
Type 8230-001	Force Transducer, DeltaTron (+220/–220 N range)
Type 8203	Force Transducer/Impact Hammer
Type 8001	Impedance Head

### THREAD AND BUSHING ADAPTORS

UA-2054	Bushing Adaptor, 10–32 UNF to ¼–28 UNF
UA-2052	Adaptor, Male 10–32 UNF to Male ¼–28 UNF

### CABLE AND HOSE EXTENSIONS

AQ-0648	Extension cable with Neutrik Speakon 4-pin connector at both ends, 10 m
AQ-0658	Extension cable with 9-pin D-sub connector to video HR-10 connector

### LATERAL MODAL EXCITER STANDS

UA-1607	Modal Exciter Stand, 1.4 m high. Mechanical pre-tensioning of tension wire is possible via an adjustable spring
UA-1608	Modal Exciter Stand, 2.0 m high. Mechanical pre-tensioning of tension wire is possible via an adjustable spring

### TRADEMARKS

Neutrik and Speakon are registered trademarks of Neutrik AG

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