

BRÜEL & KJÆR® Modal and Measurement Exciters

Modal Exciter Types 4827 and 4828 Modal Excitation Systems Types 3627 and 3628

Designed for demanding large structure modal test applications, electrodynamic Modal Exciter Types 4827 and 4828 provide precise, reliable, stable and long-lasting operation. High quality materials, rugged construction and stringent quality control assure versatile means of modal excitation for any experimental modal test.

The two modal exciters are available as stand-alone units – supplied with the appropriate trunnion, blower and connecting cable – or as complete systems (Types 3627 and 3628), with centering unit, matching power amplifier and field power supply.

Optional accessories include traditional push/pull stingers, tension wire stingers, turnbuckles, hose and cables, chuck nut assemblies and various adaptors.



Uses and Features

Uses

- Experimental modal analysis using SIMO (single input multiple output) and MIMO (multiple input multiple output) testing techniques
- Normal mode testing (NMT)
- Linearity studies
- Mechanical impedance and mobility measurements
- Advanced structural dynamics investigations
- Test results for finite element model (FEM) correlation and updating
- Structural damage detection

Features

- Force rating with forced air cooling:
 - Type 4827: 650 N (146 lbf) sine peak; 420 N (94 lbf) random RMS
 - Type 4828: 1000 N (225 lbf) sine peak; 650 N (146 lbf) random RMS
- 2-inch peak-to-peak displacement for best low-frequency excitation
- Wide frequency range: 2 to 5000 Hz

- Rugged, industrial design
- High force-to-weight ratio due to rare earth magnet technology
- High-rigidity, low-mass magnesium armature for minimised force drop-offs at resonance frequencies
- Low stray magnetic field
- Ideal for any excitation signal (sine, impulse or random)
- Built-in air switch for protection against damage related to excessive current
- Built-in optical sensor for accurate determination of armature position
- Blocked forced air cooling with installation of Squeak and Rattle Option WQ-2553 (maximum operating time is 2 hours)
- Electronic DC control of tension wire pre-tensioning
- Stingers:
 - Choice of tension wire or traditional push/pull stingers
 - Tension wire technology (only electrical pre-tensioning) minimizes lateral loading of the structure and reduces potential rattling (slack) of the structure
- Included in complete modal excitation systems: Types 3627 and 3628

Setup

In order to function properly, Modal Exciter Types 4827 and 4828 require Power Amplifier Type 2721, Field Power Supply Type 2830 and DC Static Centering Unit Type 1056.

Field Power Supply Type 2830 provides the necessary current to the electromagnet, while DC Static Centering Unit Type 1056 provides armature “suspension” and correct centering of the armature relative to the exciter’s housing and the test specimen.

Precise centering of the armature requires that Type 1056 and the modal exciter are calibrated together. If the exciter and static centering unit are not purchased together, they must be calibrated before use.

Modal Excitation Systems

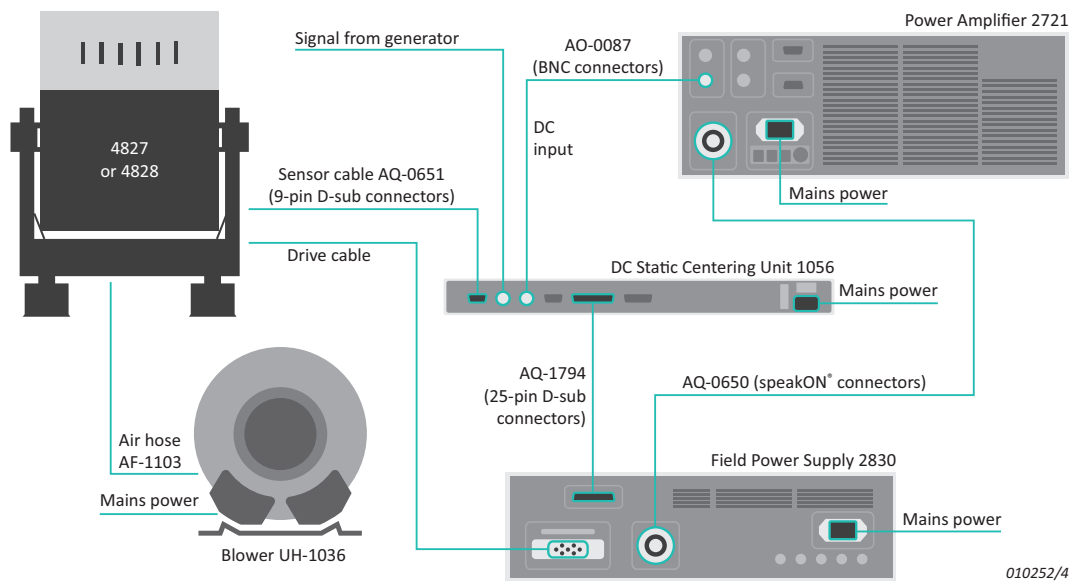
Modal Excitation System Types 3627 and 3628 come with a modal exciter (Type 4827 and 4828, respectively) and its accessories, DC Static Centering Unit Type 1056, Power Amplifier Type 2721, Field Power Supply Type 2830 and three push/pull steel stingers.

When delivered as part of Modal Excitation System Type 3627 or Type 3628, Modal Exciter Types 4827 and 4828 come calibrated (matched) with the DC Static Centering Unit Type 1056.

Modal Exciter Configurations

See Modal Exciter Configuration Guide (BG 1483) for an overview of modal excitation systems, exciter stands, stingers, tension wires, and force and impedance transducers.

Fig. 1 Setup for Modal Excitation System Types 3627 and 3628



Compliance with Standards

	The CE marking is the manufacturer's declaration that the product meets the requirements of the applicable EU directives RCM mark indicates compliance with applicable ACMA technical standards – that is, for telecommunications, radio communications, EMC and EME China RoHS mark indicates compliance with administrative measures on the control of pollution caused by electronic information products according to the Ministry of Information Industries of the People's Republic of China WEEE mark indicates compliance with the EU WEEE Directive
Temperature	IEC 60068 – 2 – 1 & 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)
Humidity	IEC 60068 – 2 – 78: Damp Heat: 93% RH (non-condensing at 40 °C (104 °F)).

Specifications – Modal Exciters Types 4827 and 4828

Table 1 Specifications for Modal Exciter Types 4827 and 4828 in system configurations

			TYPE 4827/3627	TYPE 4828/3628
Matching Power Amplifier			Type 2721	
Matching Blower*			UH-1036	
Rated Force	Without forced air cooling†	Sine peak	100 N (22 lbf)†	
		Random RMS	70 N (15 lbf)†	
	With forced air cooling	Sine peak	650 N (146 lbf)*	1000 N (225 lbf)*
		Random RMS	420 N (94 lbf)*	650 N (146 lbf)*
Useful Frequency Range			2 – 5000 Hz	
Max. Rated Travel			50.8 mm (2 in)	
Max. Velocity	Sine peak		1.5 m/s (59 in/s)	
	Random RMS		1.5 m/s (59 in/s)	
Max. Acceleration	Sine peak		500 m/s ² (51 g)	765 m/s ² (78 g)
	Random RMS		343 m/s ² (35 g)	490 m/s ² (50 g)
Rated Current			18 A	
Suspension Stiffness‡			Adjustable	
Effective Moving Mass			1.3 kg (2.87 lb)	
Main Resonance Frequency			3000 Hz	
Weight of Exciter with Trunnion			127 kg (280 lb)	
Weight of Trunnion			36 kg (79 lb)	

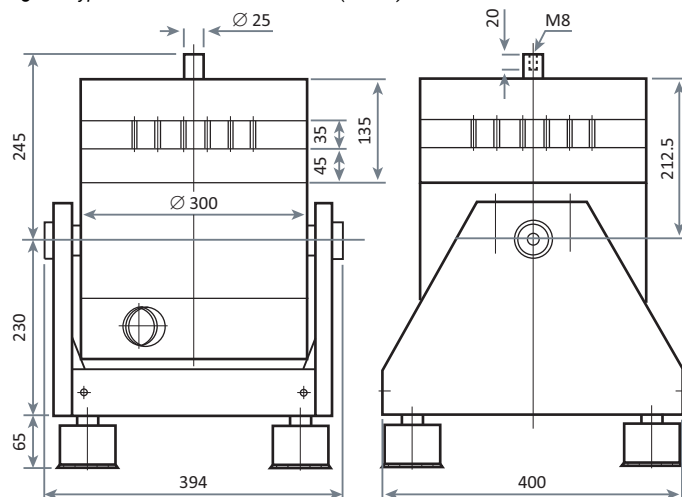
* HBK assumes no responsibility if blowers other than UH-1036 are used for cooling

† Only if option WQ-2553 is installed. Maximum operating time is then two hours

‡ Adjusted with DC Static Centering Unit Type 1056

DIMENSIONS

Fig. 2 Type 4827 or 4828 in its trunnion (in mm)



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SPECIFICATIONS FOR BLOWER UH-1036

Mains Power Frequency	50 Hz
	60 Hz
Max. Air Capacity	140 m ³ /hr
	175 m ³ /hr
Max. Diff. Pressure (Vacuum)	150 hPa
	180 hPa
Electro-motor	1.1 kW
	1.3 kW
Hose Diameter	40 mm (1.6 in)
SPL	63 dB(A)
	64 dB(A)
Weight	16 kg (35.3 lb)
Approx. Dimensions	287 × 241 × 305 mm (11.3 × 9.5 × 12.0 in)
Enclosure	IP class 54

Ordering Information

Modal Exciters

Type 4827 **Modal Exciter, 650 N**
Type 4828 **Modal Exciter, 1000 N**

Each exciter includes the following accessories:

- Integral Cable with Hahn-15 connector
- KC-1008: Trunnion
- UH-1036: 1000 N Blower
- AF-1103: Air Hose for UH-1036, length 5 m (16.4 ft)
- UA-1614: Three Adaptors, M8 to 10 – 32 UNF
- UA-2039: Three M8 to M6 Thread Inserts

Modal Excitation Systems

Type 3627 **Modal Excitation System**

Includes the following accessories:

- Type 4827: Modal Exciter
- Type 2721: Power Amplifier (1250 VA)
- Type 1056: DC Static Centering Unit
- Type 2830: Field Power Supply
- UA-1599: Three 3.0 mm Push/Pull Steel Stingers

Type 3628 **Modal Excitation System**

Includes the following accessories:

- Type 4828: Modal Exciter
- Type 2721: Power Amplifier (1250 VA)
- Type 1056: DC Static Centering Unit
- Type 2830: Field Power Supply
- UA-1599: Three 3.0 mm Push/Pull Steel Stingers

Optional Accessories

Type 1056	DC Static Centering Unit (must be calibrated with the exciter at HBK)
Type 2721	Power Amplifier (1250 VA)
Type 2830	Field Power Supply
WQ-2553	Squeak and Rattle Option (must be installed at HBK)

STINGERS, TENSION WIRES AND ACCESSORIES

All adaptors, screws and inserts required to attach the Modal Exciter and/or DC Static Centering Unit are included in each package.

UA-1596	Five 2.5 mm Push/Pull Steel Stingers, including: • 10 × adaptors, diameter 2.5 mm to 10–32 UNF • 5 × steel rods, length 200 mm, diameter 2.5 mm • 10 × fastening screws
UA-1597	Five 3.0 mm Push/Pull Steel Stingers, including: • 10 × adaptors, diameter 3.0 mm to 10–32 UNF • 5 × steel rods, length 200 mm, diameter 3.0 mm • 10 × fastening screws
UA-1598	Three 2.5 mm Push/Pull Steel Stingers, including: • 3 × fastening screws • 3 × adaptors, diameter 2.5 mm to 10–32 UNF • 3 × steel rods, length 500 mm, diameter 2.5 mm • 1 × 2.5 mm collet chuck (chuck nut with collet insert)
UA-1599	Three 3.0 mm Push/Pull Steel Stingers, including: • 3 × fastening screws • 3 × adaptors, diameter 3.0 mm to 10–32 UNF • 3 × steel rods, length 500 mm, diameter 3.0 mm • 1 × 3.0 mm collet chuck (chuck nut with collet insert)
UA-1600	One 0.75 mm Tension Wire, length 5000 mm, including: • 1 × fastening screw • 1 × adaptor, diameter 0.75 mm to 10–32 UNF • 1 × 0.75 mm collet chuck (chuck nut with collet insert)
UA-1601	Three 1.5 mm Tension Wires, length 500 mm, including: • 3 × fastening screws • 3 × adaptors, diameter 1.5 mm to 10–32 UNF • 3 × 1.5 mm collet chuck (chuck nut with collet insert)
UA-1602	Three 0.75 mm Collet Chucks and Adaptors, for tension wires, including: • 3 × chuck nuts • 3 × collet inserts, diameter 0.75 mm • 3 × fastening screws • 3 × adaptors, diameter 0.75 mm to 10–32 UNF
UA-1603	Three 1.5 mm Collet Chucks and Adaptors, for tension wires, including: • 3 × chuck nuts • 3 × collet inserts, diameter 1.5 mm • 3 × fastening screws • 3 × adaptors, diameter 1.5 mm to 10–32 UNF

UA-1604	Three 2.5 mm Collet Chucks and Adaptors, for push/pull rods, including: • 3 × chuck nuts • 3 × collet inserts, diameter 2.5 mm • 3 × fastening screws • 3 × adaptors, diameter 2.5 mm to 10–32 UNF
UA-1606	Five 3.5 mm Nylon Stingers, including: • 5 × nylon rods, length 200 mm, diameter 3.5 mm • 10 × fastening screws • 10 × adaptors, diameter 3.5 mm to 10–32 UNF

FORCE TRANSDUCERS AND IMPEDANCE HEAD

Type 8230	CCLD Force Transducer (+44/–44 N range)
Type 8230-001	CCLD Force Transducer (+220/–220 N range)
Type 8230-002	CCLD Force Transducer (+2200/–2200 N range)
Type 8230-003	CCLD Force Transducer (+22000/–2200 N range)
Type 8230-C-003	Charge Force Transducer (+22200/–2200 N range)
Type 8231-C	Charge Force Transducer (+110000/–2200 N range)
Type 8001	Impedance Head

THREAD AND BUSHING ADAPTORS

UA-2052	Set of 10 Stud Adaptors, 10–32 UNF to ¼"–28 UNF
UA-2054	Set of 20 Bushing Adaptors, 10–32 UNF to ¼"–28 UNF

CABLES AND AIR HOSE

AF-1102	Extension Air Hose, length 10 m (32.8 ft)
AQ-0655	Cable with Hahn 15-pin connectors at both ends, length 10 m (32.8 ft)
AQ-0659	Cable with two 8-pin Neutrik® speakON® connectors, length 5 m (16.4 ft), for connection between Power Amplifier Type 2721 and Field Power Supply Type 2830
AQ-0665	Cable with two 8-pin Neutrik speakON connectors, length 10 m (32.8 ft), for connection between Power Amplifier Type 2721 and Field Power Supply Type 2830



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