PRODUCT DATA

Charge Accelerometer and Charge-to-CCLD Converter Combination Types 8324-G, 8324-G-001, 8324-G-002, 8324-G-003, 8324-G-004 and 8324-G-005

The Type 8324-G family is intended for vibration measurements in harsh industrial environments. Each type consists of an industrial accelerometer paired with a cable-integrated converter.

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Uses and Features

Uses

- Flight test applications
- Measurement in high-temperature environments
- Health usage monitoring systems (HUMS)
- Gas turbines

Features

- Hermetically sealed accelerometer (IP 67) with insulated case
- Charge-to-CCLD, cable-integrated converter*
- Maximum operating temperature:
  - Accelerometer: 482 °C (900 °F)
  - Cable: 250 °C (482 °F)
- Built-in high-pass filter (Type 8324-G-001, -002, -003 and -005)
- Single-ended output
- Built-in TEDS (transducer electronic data sheet)

Description

Type 8324-G, 8324-G-001, 8324-G-002, 8324-G-003, 8324-G-004 and 8324-G-005 consist of an industrial charge accelerometer, Type 8324 or 8347-C, combined with a charge-to-CCLD converter, Type 2647-D-001, 2647-D-003 or 2647-D-004. The converters are integrated in a 10 m cable with a BNC or LEMO connector and are available with or without filters.

Table 1
Accelerometer/ converter combinations

	Accelerometer	Converter	Connector (cable)	Filter
Type 8324-G	Type 8324	Type 2647-D-001	BNC	No
Type 8324-G-001		Type 2647-D-003	BNC	80 to 10,000 Hz
Type 8324-G-002		Type 2647-D-004	LEMO	80 to 10,000 Hz
Type 8324-G-003	Type 8347-C	Type 2647-D-004	LEMO	80 to 10,000 Hz
Type 8324-G-004		Type 2647-D-001	BNC	No
Type 8324-G-005		Type 2647-D-003	BNC	80 to 10,000 Hz

Type 8324-G-001

Type 8324-G-001 has been developed and approved for Brüel & Kjær's Vibration Check Systems for Aircraft Engines Types 3641-A/B, 3647, 3648, 3649 and their variants. The 80 Hz high-pass filter in the CCLD converter eliminates the influence of low-frequency noise on the measured signal, for example due to the pyroelectric effect of the transducer in fluctuating temperature conditions.

* CCLD: Constant current line drive, also known as DeltaTron® (IEPE compatible)

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Characteristics

Type 8324 uses a compression type element to provide excellent temperature stability and a wide operational bandwidth.

Type 8347-C is the upgraded version of Type 8324. It has a shear design for a wider operating bandwidth and excellent temperature stability. Its higher transverse resonance frequency makes it possible to avoid blade pass frequency. Its better linearity makes it possible to avoid linearity caused by high level vibration.

Calibration

Each accelerometer is calibrated using random excitation and 1600-line FFT transformation to provide a high-resolution (amplitude and phase) frequency response. This yields a unique characterization and secures the integrity of your vibration measurements.

The sensitivity given on the calibration chart is measured at 159.2 Hz with 95% confidence level using coverage factor *k* = 2.

The upper frequency limits given on the calibration chart are frequencies where the deviation from the reference sensitivity at 159.2 Hz is within ±10%. The upper frequency limit is approximately 30% of the mounted resonance frequency. This assumes that the accelerometer is correctly mounted on the test structure − poor mounting can have a marked effect on the mounted resonance frequency.

The lower frequency limits and phase response are determined by the amplifier used.

Temperature Sensitivity and Frequency Response

Fig. 1 *Sensitivity deviation versus temperature for Type 8324 (**left**) and Type 8347-C (**right**)*

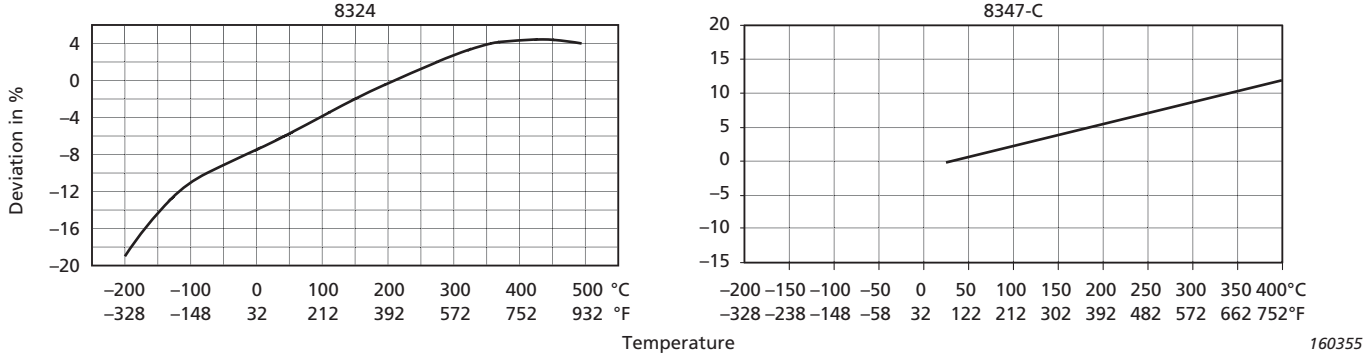
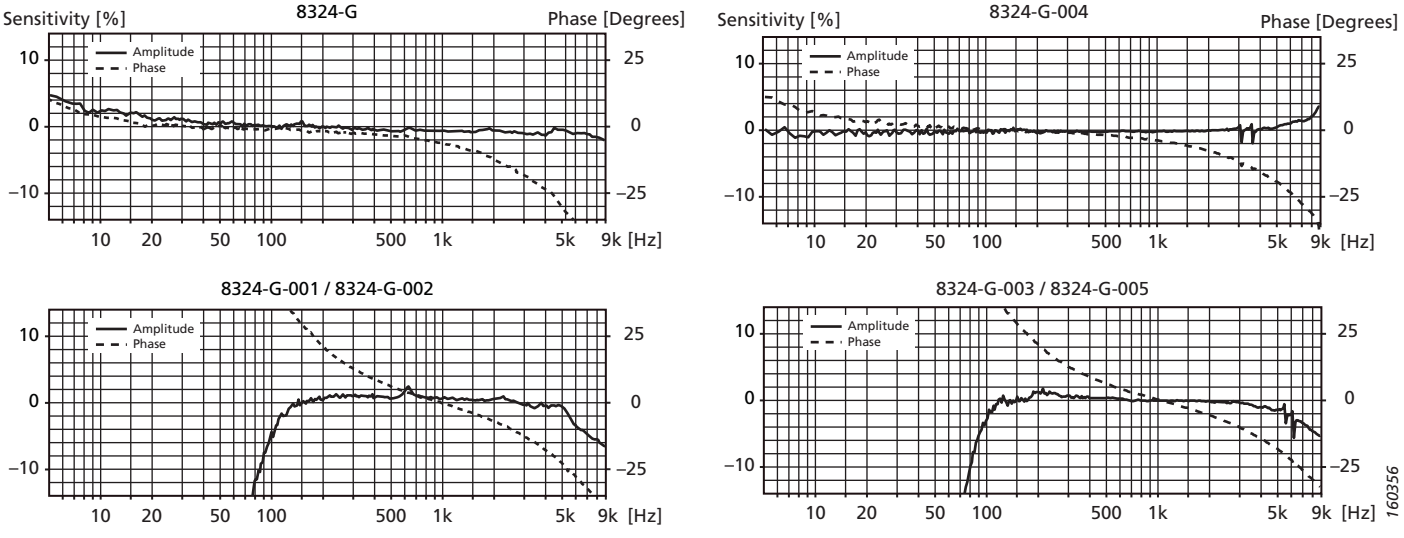


Fig. 2 *Individual frequency response of Types 8324-G, 8324-G-001, 8324-G-002, 8324-G-003, 8324-G-004 and 8324-G-005*



Specifications – Family of Accelerometer/Converter Combinations Type 8324-G

Type No.			8324-G, 8324-G-001, 8324-G-002			8324-G-003, 8324-G-004, 8324-G-005		
General								
Weight (excluding cable)		gram	66			60		
		oz	2.33			2.1		
Voltage sensitivity (at 159.2 Hz and 4 mA supply current)		mV/ms^{-2}	1 ± 10%			1 ± 10%		
		mV/g	10			10		
Frequency range, amplitude (±10%)			**8324-G:** ± 10%, 1 Hz to 9 kHz **8324-G-001:** ± 10% 100 Hz to 9 kHz **8324-G-002:** ± 10% 100 Hz to 9 kHz			**8324-G-003:** ± 10% 100 Hz to 10 kHz **8324-G-004:** ± 10%, 1 Hz to 10 kHz **8324-G-005:** ± 10% 100 Hz to 10 kHz		
Mounted resonance frequency		kHz	30			39		
Max. transverse sensitivity (at 30 Hz, 100 ms^{-2})		%	<3			<3		
Transverse resonance frequency		kHz	9			17		
Measuring range (± peak)		kms^{-2}	± 20			± 10		
		g	± 2000			± 1000		
Electrical								
Bias voltage, at full temp. and curr. range		V	+13 ± 1			+13 ± 1		
Power supply, constant current		mA	2 to 20			2 to 20		
Output impedance		Ω	<100			–*		
Start-up time (to final bias ±10%)		s	<2			–*		
Residual noise (inherent RMS broadband noise in the specified frequency range)		µV	4			–*		
		µg	0.4			–*		
Grounding			Case insulated			Case insulated		
Insulation resistance (signal ground to case)		MΩ	>100			>100		
Environmental								
Operating temperature range		°C (°F)	–196 to +250 (–321 to +482)			–196 to +250 (–321 to +482)		
Temperature transient sensitivity (3 Hz lower limiting freq. (–3 dB, 6 dB/octave))		ms^{-2}/°C	20			1.5		
		g/°F	1.1			0.083		
Magnetic sensitivity (50 Hz, 0.038 T)		ms^{-2}/T	25			20		
		g/kG	0.25			0.2		
Base strain sensitivity (at 250 µε in base plane)		ms^{-2}/µε	0.2			0.02		
		g/µε	0.02			0.002		
Max. non-destructive shock (± peak)		kms^{-2}	20			50		
		g	2000			5000		
Mechanical								
Case material			Inconel			Inconel		
Piezoelectric sensing element			Piezoelectric type PT			PZ 101		
Construction			Compression			Shear		
Sealing			Hermetic			Hermetic		
Cable	**Length**	m (ft)	10 (32.8)			10 (32.8)		
	Connector		BNC	BNC	LEMO	LEMO	BNC	BNC
Mounting			ARINC footprint, 3 × M4 or 8–32 UNC			ARINC footprint, 3 × M4 or 8–32 UNC		
Mounting torque		Nm (lbf-in)	1.6 (14.16)			1.6 (14.16)		

* Specifications unavailable

All values are typical at 25 °C (77 °F) unless measurement uncertainty is specified

COMPLIANCE WITH STANDARDS

SPECIFICATIONS FOR COMPONENT PRODUCTS

See the related Product Data:

- Charge-to-CCLD Converter Type 2647: BP 1874
- Accelerometer Type 8324: BP 2107
- Accelerometer Type 8347-C: BP 2431

DIMENSIONS

Fig. 3 *Type 8324*

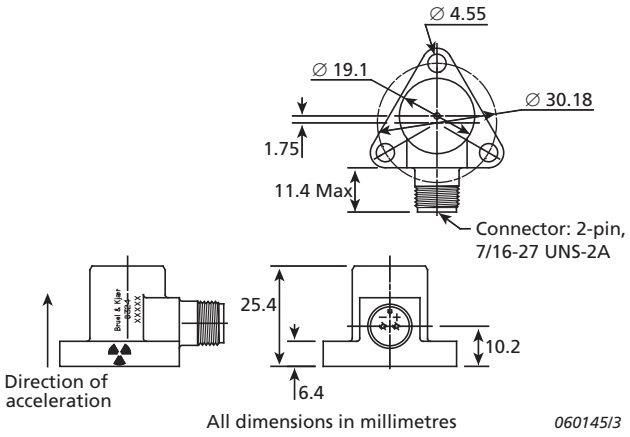


Fig. 4 *Type 8347-C*

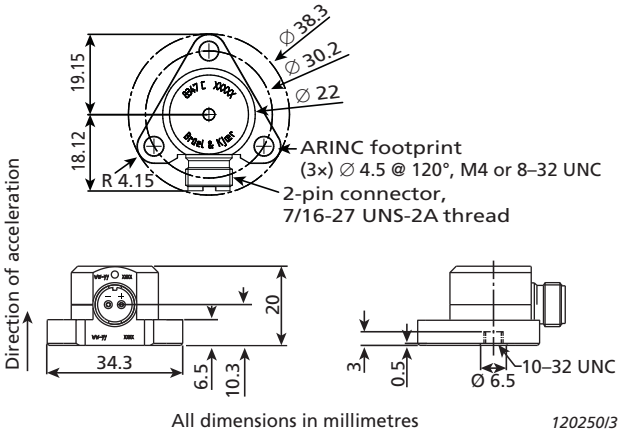
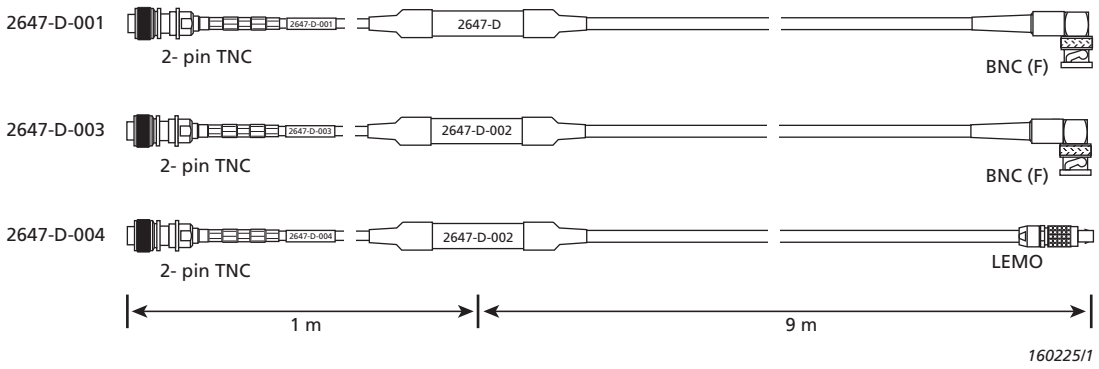


Fig. 5 *Cable-integrated converters*



Ordering Information

Combination	Accelerometer	Converter
Type 8324-G	Type 8324	Type 2647-D-001
Type 8324-G-001		Type 2647-D-003
Type 8324-G-002		Type 2647-D-004
Type 8324-G-003	Type 8347-C	Type 2647-D-004
Type 8324-G-004		Type 2647-D-001
Type 8324-G-005		Type 2647-D-003

All combinations include the following*:

- Accelerometer Type 8324 or Type 8347-C
- Cable-integrated Charge-to-CCLD Converter Type 2647-D-001, -003, or -004,
- Carrying box
- Hex key
- Mounting template
- Screws for mounting × 4
  - Type 8324-G, -001, -002: M4 × 10 mm
  - Type 8324-G-003, -004, -005: M4 × 12 mm

Supported Brüel & Kjær Services

ACC-M-CAF	Accredited calibration of monoaxial accelerometers
ACC-M-CAI	Initial accredited calibration of monoaxial accelerometers
ACC-M-CTF	Traceable calibration of monoaxial accelerometers

* Additional accessories and cables are available (see www.bksv.com)

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