

PRODUCT DATA

Preamplifier — Types 2663 and 2663B

USES

- Vibration measurement on aircraft
- Measurement of vibration in severe environments
- Vibration monitoring on industrial machinery
- General vibration measurement

FEATURES

- Complies with MIL-STD 810 D
- Sensitivity adjustable from 1 to 100 mV/pC
- Differential and single-ended inputs
- Adjustable high- and low-pass filters
- Adjustable output bias
- Overload detection
- Rugged construction
- Power supply: single or dual polarity



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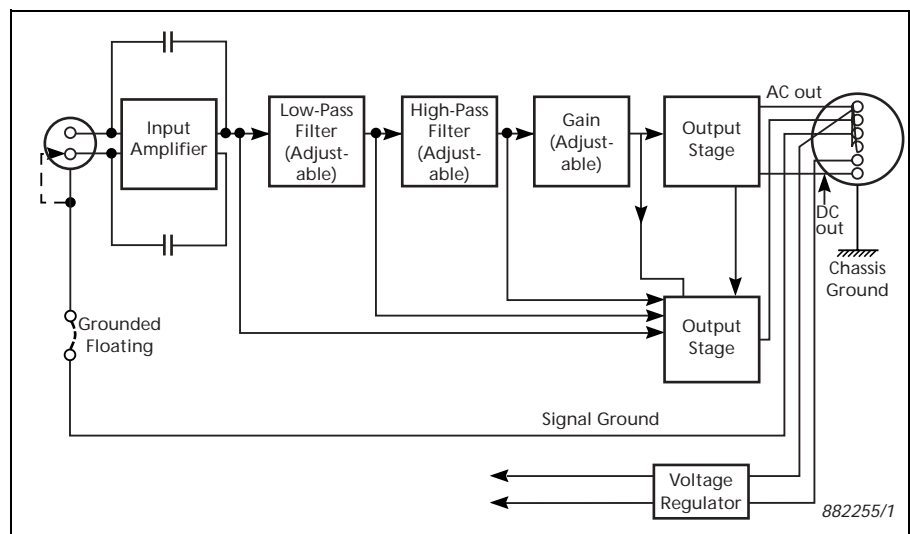
Preamplifiers Types 2663 and 2663 B are charge amplifiers designed for use with piezoelectric transducers in airborne applications. Type 2663 has a preadjusted frequency range of 0.5 Hz (–3 dB) to 33 kHz (–3 dB) whereas Type 2663 B has a frequency range of 0.5 Hz (–3 dB) to 100 Hz (–3 dB).

Gain and frequency range can be adjusted by exchanging appropriate resistors in the preamplifier circuit to meet user requirements. For operation with different types of transducers, the preamplifiers have three built-in choices of input configuration. It can be used with both single-ended grounded and single-ended floating transducers as well as differential types. The rugged case of the preamplifier is constructed from milled aluminium. The removable

side cover is fitted with a rubber seal which protects the electronics from dirt, oil, humidity and other environmental contamination.

The preamplifier can be powered from either a single-ended or dual-polarity supply. The input connector is a 2-pin TNC socket. The output connector is a 6-pin bayonet socket containing both AC and DC signal output pins and two pins for the power supply. It also contains the overload detector pin, which is pulled high during overload, and the signal ground pin. The input amplifier is a differential charge amplifier and the frequency range of the preamplifiers is determined by the low-pass and high-pass filter pair.

Fig. 1
Simplified circuit diagram for Preamplifier Type 2663. For Type 2663 B the high-pass filter is replaced with a low-pass filter giving overall a 4th-order low-pass filter –3 dB at 100 Hz



2663, 2663 B

The high-frequency cut-off is determined by a 2-pole Butterworth low-pass filter preadjusted to 33 kHz (-3 dB) for Type 2663; 100 Hz (-3 dB) for Type 2663 B. The cut-off frequency may be adjusted between 250 Hz and 33 kHz, and with reduced specifications to 200 kHz. The low-frequency cut-off is determined by a 4-pole Butterworth high-pass filter and is pre-adjusted to 0.5 Hz (-3 dB). Two poles of the filter are adjustable to give a cut-off frequency from 0.5 Hz to 1 kHz. For frequencies greater than 3 Hz, the sensitivity is adjustable between 1 mV/pC and 100 mV/pC.

All the adjustments discussed above are made by replacing the appropriate resistors with ones of the desired value and resoldering. Standard metal film resistors are used and, to provide ease of access, these resistors and the Grounded/Floating connection are mounted on standoffs. The remainder of the preamplifier circuit is protected by a shield. The basic formulae necessary to calculate the required values are printed on this shield and the instruction manual supplied gives a comprehensive guide to the use of the resistors in specific circuits.

Specifications – Preamplifier Type 2663 and Type 2663 B

INPUT

Input Configurations: Differential, single-ended grounded, single-ended floating

Nominal Source Capacitance: 2000 pF (transducer + cable)

High-pass Filter:

Type 2663:

4-pole Butterworth preadjusted to 0.5 Hz (-3 dB) (3 Hz \pm 5%, re 160 Hz), 2 poles adjustable to give cut-off frequency between 0.5 Hz and 1 kHz

Type 2663 B:

2-pole Butterworth preadjusted to 0.5 Hz (-3 dB)

Low-pass Filter:

Type 2663:

2-pole Butterworth, preadjusted to 33 kHz (-3 dB) (20 kHz \pm 5%, re 160 Hz). Adjustable between 250 Hz and 33 kHz (200 kHz with reduced specifications)

Type 2663 B:

4-pole Butterworth, preadjusted to 100 Hz (-3 dB)

Inherent Noise (3 Hz – 20 kHz): $< 30 \times 10^{-3}$ pC (2000 pF source capacitance)

Ground Loop Voltage Rejection:

> 50 dB at 50 Hz for single-ended accelerometer – floating input
> 55 dB at 50 Hz ($< 1.6 \times 10^{-3}$ mV/pC) for differential accelerometer at sensitivity 1 mV/pC

Overload Detection: Overload Detection pin on output connector, signal on pin is set high during overload

Max. Input Signal: 5000 pC peak

CONNECTORS

Output Connector: 6-pole, Cannon type KPT 1 A 10-6 P – F 42-Ex-SPL; MIL specified

Input Connector: 2-pole TNC socket

Case Earth Connection: Metric Insert M3

POWER

Supply Voltage:

Single Supply: +20 V to +32 V,
or Dual Supply: \pm 20 V to \pm 32 V

Supply Current: < 30 mA

Isolation: Signal ground isolated from chassis

GAIN

Charge conversion factor:

> 3 Hz: Adjustable between 1 – 100 mV/pC

< 3 Hz: Adjustable between 1 – 25 mV/pC

Preadjusted to 1 mV/pC

OUTPUT

Max. Output Signal: 7.0 V peak-to-peak, symmetric

Max. Output Current: 5 mA peak

Distortion:

Type 2663: < 0.1%, 3 Hz – 3 kHz; < 0.3%, 0.5 Hz – 33 kHz

Type 2663 B: < 0.4%, at 80 Hz

Output Impedance:

Direct coupled: 50 Ω

AC coupled: 50 Ω in series with 5 μ F

Output Bias:

Adjustable from 0 to +5.5 V referred to supply ground (+0.5 to 5.5 V for single supply)

Preadjusted to +2.5 V \pm 3%

Min. Load Impedance: 1 k Ω

Max. Capacitive Load: 100 nF

Output Coupling: Direct and AC

ENVIRONMENT

Temperature:

Operating: -55 to +100°C (-67°F to +212°F),

Non-Operating: -65 to +125°C (-85° to +257°F)

Humidity: Meets MIL-STD 810 D, method 507.2, procedure III up to 100% humidity

Electromagnetic Fields: 100 A/m, 50 – 400 Hz, sensitivity < 0.1 mV/A/m

Vibration: Meets MIL-STD 810 D, method 514.3, category 6

Shock: Max. 100 g, meets IEC 58.2.27

PHYSICAL DIMENSIONS

Height: 31 mm (1.22 in)

Width: 54 mm (2.13 in)

Length: 86 mm (3.46 in)

Weight: 167 grams



Compliance with EMC Directive



Compliance with the EMC requirements of Australia and New Zealand

Ordering Information

Types 2663 and 2663 B Preamplifiers

ACCESSORIES INCLUDED 2663

JJ0615 1 6-pin Cannon-plug, solder terminals, MIL-C-26482 series 1, operating temp. -55° to +125°C

ACCESSORIES INCLUDED 2663 B

JJ0624 1 6-pin Cannon-plug, crimp terminals, MIL-C-26482 series 2, operating temp. -55° to +200°C

OPTIONAL ACCESSORIES

WL0309 Power and signal cable for use with measuring amplifier

JJ0207 I Microdot TNC Adaptor

WH3100 Low-pass filter 50 Hz (-6 dB)

WH3108 Low-pass filter 200 Hz (-6 dB)

AO0250 X TNC Accelerometer Cable (various lengths)

(X = F: 3 m; G: 5 m; H: 10 m; I: 15 m)

Brüel & Kjær reserves the right to change specifications and accessories without notice