



Charge Amplifier Type 2688 Instruction

Application

Equipment for nuclear power generating stations

Tested to a total integrated dose of up to 12.5 MRad (125 kGy) gamma radiation with no noticeable effect.

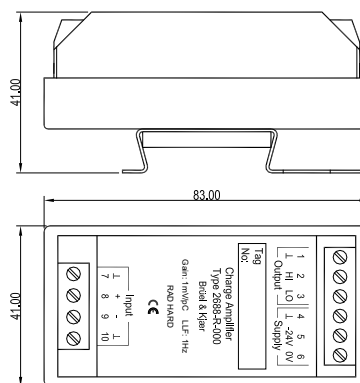


Figure 1 Charge amplifier Type 2688

Usage

Type 2688 converts the high impedance output of piezoelectric transducers into the low impedance signal required for nuclear vibration monitoring applications. The 2688 is designed for use in radiation areas.

The Type 2688 has a differential input which improves the signal/noise ratio in strong electromagnetic fields when used together with balanced accelerometers, such as B&K Vibro Type 8315 and Type 8324.

If single-ended accelerometers are used the “-” input terminal of the charge amplifier must be connected to the ground terminal.

To protect the Type 2688 from harsh environmental conditions, such as EMC, humidity and vibration, it must be mounted in an electrically shielded junction box in conformity with IP 65, as available from Brüel & Kjær Vibro. Type 2688 may be supplied in a number of versions when other amplification factors or filtering ranges are required.



Charge Amplifier Type 2688 Instruction

Technical Data

Balanced Charge Input

Sensitivity	1 mV/pC, $\pm 2\%$ at 80 Hz
Frequency range	1 Hz to 100 kHz ± 1 dB
Max. input signal	8 nC
High-Pass filter	2 nd order, -3 dB @ 0.48 Hz
Common mode rejection	> 30 dB (1 Hz to 50 kHz)
Noise	< 40×10^{-3} pC referred to input terminated with 1 - 4 nF, 2 Hz to 50 kHz
Source impedance	>50 M Ω
Effects of source impedance on Low frequency response	10 M Ω ---> 2 dB peak @ 0.8 Hz 4 M Ω ---> 5 dB peak @ 0.8 Hz 2 M Ω ---> 8 dB peak @ 0.9 Hz
Connections	Screw terminals



Charge Amplifier Type 2688 Instruction

Output

Min. voltage deviation	-2.5 V to -17.5 V unloaded
Output impedance	2 x 5 Ω
DC offset	-10 V, ± 2%
Short circuit time	Infinite
Drive capacity	Min. 13 mA peak
Connections	Screw terminals

Environmental

Temperature /	
Operating temperature	-40 °C to +85 °C (-40 °F to +185 °F)
Non-Operating temperature	-55 °C to +100°C (-67 °F to +212 °F)
Humidity	+30 °C, 95% RH
Electromagnetic sensitivity	< 0.15 μV/A/m
Enclosure	Protection class IP20

Power Supply

Voltage supply	- 24 VDC ±4 V
Quiescent current consumption	< 8 mA (typically 5 mA)
Incorrect installation	Connections to the output and supply terminals can be arbitrarily switched around without overloading the charge amplifier.



NOTE

All values are typical at 25 °C (77 ° F), unless measurement uncertainty is specified.
All uncertainty values are specified at 2σ (i.e. expanded uncertainty using a coverage of 95%).

Physical

Height	41 mm (1.614 in)
Width	41 mm (1.614 in)
Length	83 mm (3.268 in)
Weight	185 g (0.716 lb)
Housing:	Stainless Steel



Charge Amplifier Type 2688 Instruction

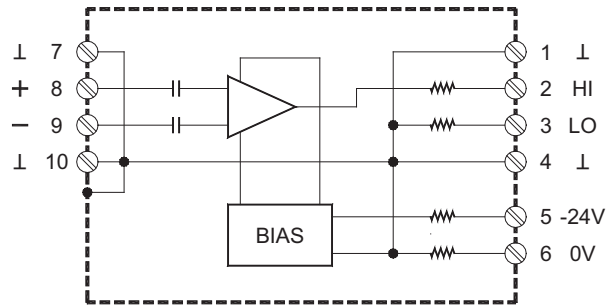


Figure 2 Electrical layout

Connection

The preamplifier must be mounted in a shielded junction box on a DIN-rail.

Guidelines for connecting transducers to Charge Amplifier type 2688:

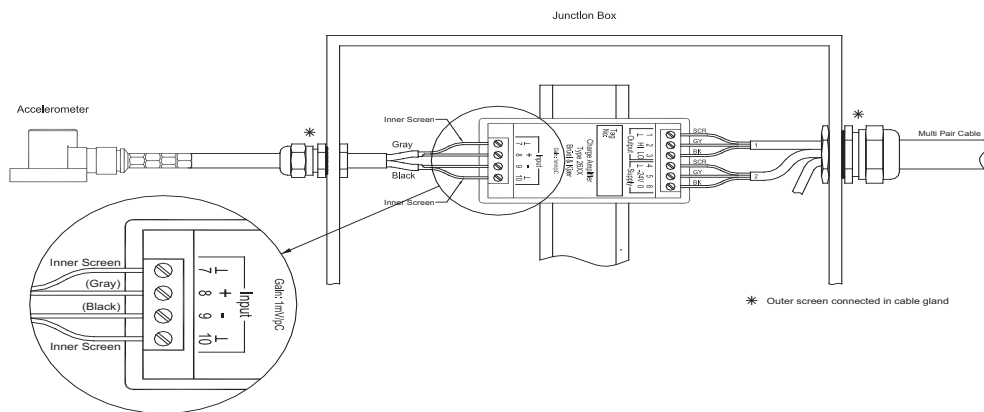


Figure 3 Connection to a differential accelerometer



Charge Amplifier Type 2688 Instruction

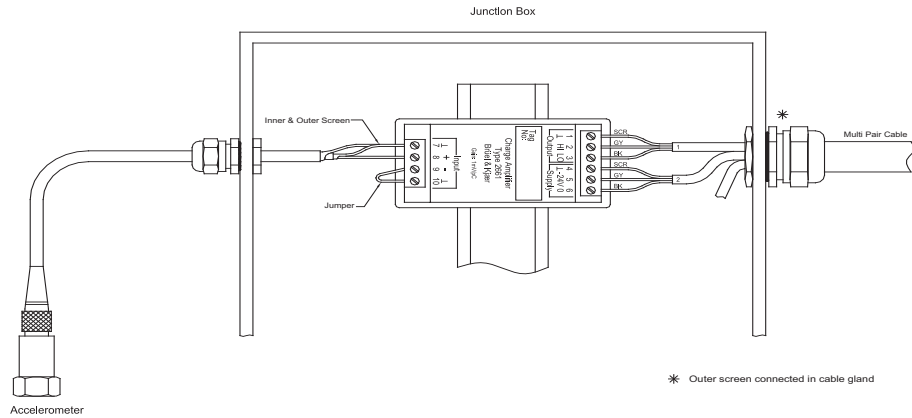


Figure 4 Connection to a single-end accelerometer

Figures 3 and 4 show Type 2688 with connected cable(s).



NOTE

It may be advantageous to use Microdot Input Adaptor type EQ2353 for connection of single-end accelerometers.

EMC

EN61326-1: 2006

To avoid possible negative influences caused by a surge impulse (according to EN61000-4-5), double screened cables must be used.

The amplifier must be installed in an electrically shielded junction box. The required isolation between amplifier housing and PA is given over isolated bottom of housing to the DIN rail holder.

Contact from amplifier housing to other PA/PE must be avoided.



Charge Amplifier Type 2688 Instruction

Ordering

The 2688 may be delivered in several versions, with slightly different specifications.
Standard version in bold.

Type number	Sensitivity	Inherent Noise * (2 Hz - 50 kHz)	DC offset
2688-R-000	1mV / pC	<0.04 pC RMS	-10 V
2688-R-003	5mV / pC	<0.02 pC RMS	0 V
2688-R-004	10 mV / pC	<0.014 pC RMS	-10 V

**terminated with accelerometer capacity 1 - 4 nF at input terminals*

Brüel & Kjaer Vibro GmbH
Leydheckerstraße 10
64293 Darmstadt
Deutschland
Tel. : +49 (0) 6151 428-0
Fax : +49 (0) 6151 428-1000
info@bkvibro.com

Copyright

All rights to this technical documentation are reserved.
Any corporeal or incorporeal reproduction of this technical documentation, its distribution or making copies of the documentation available to the public without prior written permission from Brüel & Kjaer Vibro GmbH is prohibited. This also applies to parts of this technical documentation.

Copyright 2013 by Brüel & Kjar Vibro GmbH

Subject to technical changes without prior notice.