

## PRODUCT DATA

### The NEXUS Range of Conditioning Amplifiers Types 2690, 2691, 2692 and 2693

The NEXUS™ concept is based on flexibility. A single mainframe, a variety of input and output channels, and different filter options make the system highly customizable, as you can configure your conditioning amplifier to suit your needs. You can have acoustic and vibration inputs in the same mainframe with one, two, three or four independent input channels.

The NEXUS units you already own can also be reconfigured if your requirements change. For example, if you have a 1-channel charge conditioning amplifier, it can be upgraded to a 2-channel charge/2-channel microphone conditioning amplifier. In addition, a selection of optional filters can be installed in each channel module upon request.

Microprocessors are used for control, display and interfacing purposes, but the signal is analogue to obtain optimum signal/noise ratio and the lowest possible distortion. NEXUS supports transducers with transducer electronic data sheets (TEDS) according to IEEE 1451.4.



#### Uses And Features

##### Uses

- Specially suited for automotive use. Developed in association with major car manufacturers, for high-quality field and laboratory measurement systems
- For use with charge accelerometers, hydrophones, force transducers, condenser microphones, CCLD\* accelerometers, CCLD preamplifiers, voltage input and sound intensity probes
- Field recording of vibration and acoustic signals
- Specially suitable for applications where shocks and impulses occur such as gas turbine testing and munitions testing (Types 2692-C and -D only)

##### Features

- Highly flexible construction: 1-, 2-, 3- or 4-channel configurations that can be a combination of acoustic and/or vibration transducer inputs with different filter options
- High input signal range, low noise and extensive overload facilities
- Supports transducers with TEDS according to IEEE 1451.4
- Available for: charge, microphone, sound intensity, CCLD and very high input
- Compact robust design and battery operation makes it also suitable for use in the field
- Serial control interface (RS-232) allows for computer control of set-up and test functions. A large number of amplifiers can be controlled from a single PC
- High accuracy due to reliable construction and a wide range of calibration options. Patented Charge Injection Calibration (CIC) and the patented Mounted Resonance Test (MRT) are built-in
- Wide range of filters that can be set up for specific tasks
- Rack-mounting frames available

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

To survive the harsh electrical environment in cars, NEXUS conditioning amplifiers have specifications that far exceed the strict European EMC immunity requirements. ISO 7637-1 "Road Vehicles – Electrical disturbance by conduction and coupling" requirements are met. Mechanical robustness is equally high and meets MIL-STD-810C and IEC 60068-2-6 standards.

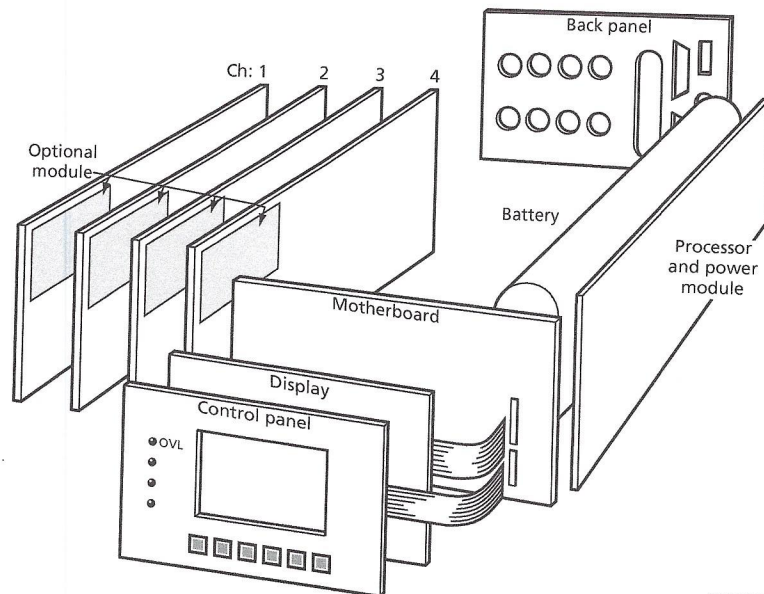
### Environmental

Since all NEXUS amplifiers are built for portable outdoor use, they meet strict requirements for temperature and humidity. The operating temperature range extends from  $-10$  to  $+55$  °C (14 to 131 °F). The instrument will withstand rain if kept with the front panel facing upwards. However, because of the sockets on the back panel it is not watertight.

## Modular Flexibility

All NEXUS conditioning amplifiers use the same mainframe and power supply hardware, while the channel configuration is based on interchangeable modules. This modular design gives the amplifiers a high degree of flexibility with regards to design. To reduce the cost of the instrument and to ensure accuracy and reliability, modules must be replaced at Brüel & Kjær.

**Fig. 1**  
Modular design of NEXUS  
conditioning amplifiers



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### Standard Versions

A number of standard versions are available that cover the most commonly used configurations. However, if you require a combination not found below, we can provide a custom-made version.

NEXUS Standard Version	Type/Order Number
2-channel Microphone Conditioning Amplifier with A, B, C and D Filters	2690-A-0F2
4-channel Microphone Conditioning Amplifier with A, B, C and D Filters	2690-A-0F4
1-channel Microphone Conditioning Amplifier	2690-A-0S1
2-channel Microphone Conditioning Amplifier	2690-A-0S2
4-channel Microphone Conditioning Amplifier	2690-A-0S4
2-channel (Single Probe) Intensity Conditioning Amplifier	2691-A-0S2
1-channel Charge Conditioning Amplifier with Single and Double Integration	2692-A-0I1
2-channel Charge Conditioning Amplifier with Single and Double Integration	2692-A-0I2
4-channel Charge Conditioning Amplifier with Single and Double Integration	2692-A-0I4
1-channel Charge Conditioning Amplifier with Constant Power On	2692-A-0P1
1-channel Charge Conditioning Amplifier	2692-A-0S1
2-channel Charge Conditioning Amplifier	2692-A-0S2
3-channel Charge Conditioning Amplifier	2692-A-0S3
4-channel Charge Conditioning Amplifier	2692-A-0S4
4-channel NEXUS Conditioning Amplifier for Very High Levels (100 nC)	2692-C*
4-channel NEXUS Conditioning Amplifier for Very High Levels (100 nC) with Integration Filters	2692-D*
1-channel CCLD Conditioning Amplifier with Integration Filter	2693-A-0I1
4-channel CCLD Conditioning Amplifier with A, B, C and D Filters	2693-A-0F4
4-channel CCLD Conditioning Amplifier with Single and Double Integration	2693-A-0I4
4-channel, 2-channel Charge and 2-channel CCLD Conditioning Amplifier	2693-A-0M4
4-channel CCLD Conditioning Amplifier with Constant Power On	2693-A-0P4
1-channel CCLD Conditioning Amplifier	2693-A-0S1
2-channel CCLD Conditioning Amplifier	2693-A-0S2
4-channel CCLD Conditioning Amplifiers	2693-A-0S4
NEXUS Accessories	Type/Order Number
Upper Limiting Frequency 140 kHz	WH-3219
Constant Power On	WH-3345
Single and Double Integration Filter	ZE-0788
A, B, C and D Weighting Filters	ZE-0794
Individual filters available on request	

\* See separate Product Data (BP 1976)

### Custom-made Versions

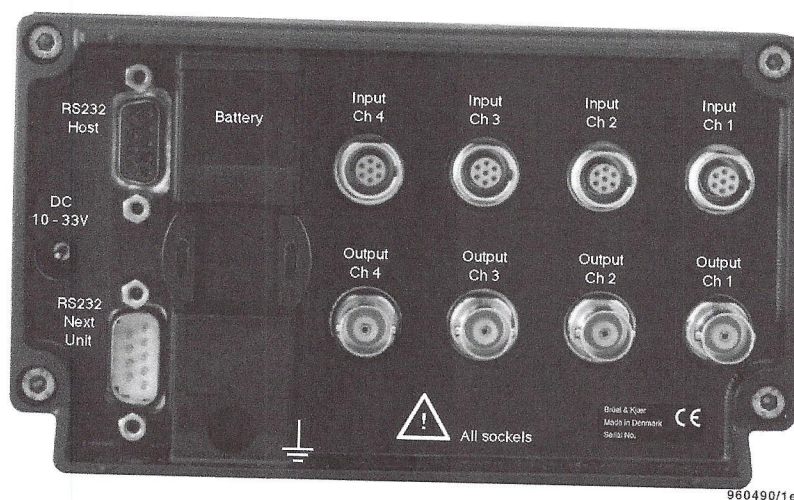
If you need a number and/or combination of channels not found in a standard version, each conditioning amplifier has up to four separate channels for charge, microphone and CCLD inputs or up to two separate channels for intensity inputs since sound intensity probes require two channels. Furthermore, any combination of the different channel types is possible. If you want to change the configuration of your NEXUS amplifier, it must be returned to Brüel & Kjær for updating and calibration.

## Channel Description

A conditioning amplifier can contain up to four modular channels. Each channel consists of a common module, an input module, an optional module and an output module. The common module contains filters, gain settings and calibration functions. The input and output modules have additional gain settings and include high-pass filters.

**Fig. 2**

Back panel of a 4-channel NEXUS Conditioning Amplifier Type 2690-A-OS4. Each input module has a 7-pin LEMO connector for connecting Brüel & Kjær's Falcon™ range microphones and a BNC output channel



### Charge Channel

A conditioning amplifier can contain up to four separate charge input channels. Each channel has comprehensive high- and low-pass filtering facilities. TNC input connectors are used and TNC to 10–32 UNF adaptors are provided. Input can be single ended or floating.

Single and double integration modes are available in some standard versions and also as an option for all input modules.

Use the built-in MRT to get information about the mounting of the associated charge accelerometer and general errors in the measurement setup.

**Note:** NEXUS Conditioning Amplifier Types 2692-C and 2692-D are designed for applications where very high charge inputs (up to 100 nC) can occur, see Product Data [BP 1976](#) for more information

### Microphone Channel

You can have up to four microphone channels in a single conditioning amplifier.

7-pin LEMO sockets are used to connect Falcon range microphone preamplifiers. Floating inputs are used for maximum electromagnetic interference protection. The microphone polarization voltage can be set to 0 or 200 V, and the short-circuit protected microphone preamplifier supply voltage can be set to  $\pm 40$  or  $\pm 14$  V. In addition to the extensive low-pass filters, there is a 20 Hz high-pass filter that is useful for suppressing wind noise. An A-weighting type 0 filter is standard.

One of the comprehensive overload facilities is current overload detection. It is used to determine excessive drive current for the microphone preamplifier, thereby indicating an overload that may be very difficult to detect, especially in a setup with long cables and high-frequency signal content.

The patented CIC technique is also implemented, and will reveal setup errors such as incorrect/missing polarization voltage and leakage in the microphone.