bepat GmbH & Co. KG

rotabench® NV

NVH Measurement System

For

Automotive Electric Motors

rotabench® NV HARDWARE

TECHNICAL DATA

Housing:	19‘‘ Desktop Housing, Half Width
Product Designation:	rotabench® NV
Type Designation:	rotabench® NVi 4-4
Weight:	ca. 5 kg (Desktop Version)
Dimensions:	ca. 37 x 24 x 15 cm (L x W x H) (Model NVi 4-4, Desktop)
Power Supply:	90 to 260 VAC, 47 to 63 Hz
Electric Power:	max. 50 Watt, typ. 25 Watt
Operating Temperature:	0°C to 60°C
Humidity:	10% to 80% Relative Humidity, Non-Condensing
Input:	4 x IEPE, 1 x Speed (Encoder), 4 x Analog ±10 Volt
Connectors (back):	Remote, RJ-45 Ethernet Connector, Power Inlet
IEPE Channels:	51.2 KS/s maximum sample rate per channel, synchronous sampling, input range: +5 Volt, 24-bit resolution Sigma Delta ADC, 102 dB dynamic range, with TEDS support, built-in hardware anti-aliasing filter with a frequency of 25.6 kHz. IEPE power supply (2 mA) can be software activated, Plug: BNC Connector
Analog Channels:	51.2 KS/s maximum sample rate per channel, synchronous sampling, input range: ±10 Volt, 16-bit resolution SAR-ADC, Plug: BNC Connector
Speed:	Plug: 3 x BNC (Speed A, B and Z), optional (adjustable via software): speed pulse or encoder analysis, input range: 5 Volt TTL (0 to 5 Volt), Bandwidth: 200 kHz
Calculation:	Frequency and order spectrum, resolution 0.1 Hz/0,05s or 0.5 orders, max. frequency: 25.6 kHz (anti-aliasing frequency at max sample rate), max. order: 500, overlapping 0% to 99% adjustable. Calculation of the order spectrum using VBS algorithm
Analysis:	Frequency spectrum, order spectrum, frequency and order - profile, frequency and order average. Customized analysis (post processing) can be integrated directly into the software

OVERVIEW

rotabench® NV is a measurement system for structure-borne noise measurements, consisting of the rotabench® NVi Hardware (Data Acquisition Device) and the rotabench® Client Software, which is operated on a standard Windows PC.

The connection between the Client Software and the DAQ device is established via TCP/IP (Gigabit Ethernet). This allows a distributed setup of the DAQ device and the HMI (Human Machine Interface) computer.

HARDWARE FEATURES

- Developed for NVH measurement on electric motors, which are powered by a frequency converter
- Internal power supply (battery). During all data acquisition the device switches to the internal power supply (suppression of parasitic coupling)
- An isolated high-resolution digital speed input with encoder analysis (A, B and Z - lead) and speed pulse, 200 kHz bandwidth, input range 5 Volts TTL

rotabench® NV HARDWARE

HARDWARE FEATURES

- Type and number of channels can be configured to a maximum of 28 channels:
  - Up to 28 synchronous sampling and isolated IEPE channels for standard accelerometer sensors (e.g., B&K Type 4535) with TEDS support in one device, max sample rate: 51.2 kHz per channel
  - Up to 28 isolated synchronous scanning analog inputs with a range of ±10 Volts with a separately adjustable scaling, max sample rate: 51.2 kHz per channel
- Housing (optional): 19" desktop unit (half width, up to 12 channels) or 19" rack-mounted housing as a desktop unit, alternatively for installation in a 19" rack
- Remote connection (digital IO) for integrating the measuring device in an automated testing system

CUSTOMIZATION

The hardware of rotabench® NV measurement system is individually customized to suit your needs and measurement requirements. Up to 28 IEPE or analog input channels are realizable in one device. You determine the combination of channels, and we are happy to advise on the selection of your particular hardware configuration. Thanks to the complete electrical isolation during the data acquisition time (due to the internal battery-based power supply), the hardware is extraordinary resistant to parasitic coupling, which e.g. may occur when the acceleration sensor is installed directly to an electric motor powered by a frequency converter. Multiple test runs have shown a significantly better insensitivity towards parasitic coupling when compared with other measurement systems. This device is designed for being operated both in a production environment, as well as any relevant applications in R&D.

rotabench® NV SOFTWARE

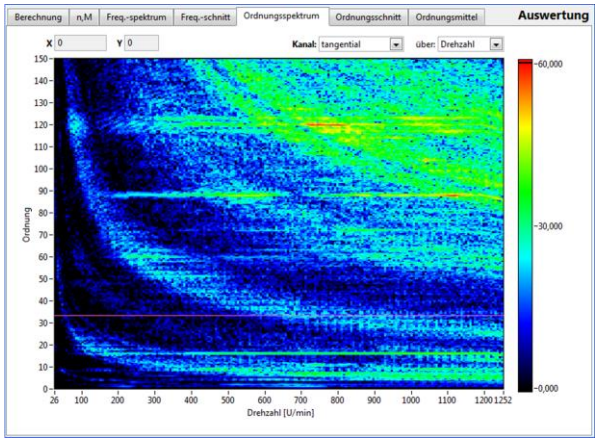
OVERVIEW

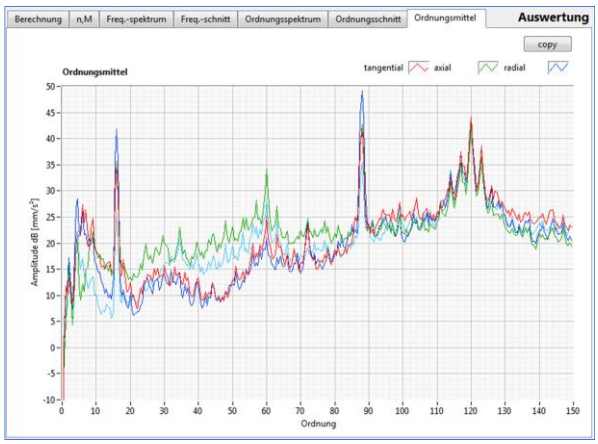
The rotabench® NV software is designed to provide a measurement result with speed and simplicity. Compared to conventional noise measurement systems, it has a considerably reduced functional scope, which facilitates an ease of operation. As an advanced analysis (e.g. frequency and/or order analysis), which is integrated in the operating software to suit your individual needs and specifications, is automatically run after a measurement (configurable), test results are displayed immediately after any measurement. In contrast to conventional noise measurement systems, this drastically shortens the time between the start of the measurement and the output of the test report.

SOFTWARE FEATURES

The following features are available in the software:

- Administrative features for measurements, test series, DUTs
- Local data storage (raw data, binary) on the operating computer, the raw data format can be disclosed upon request
- Sensor calibration with a handheld calibrator (B&K Type 4294), automatic channel detection
- Recorder function to capture and store the measurement data
- Various trigger conditions for the start of the measurement, adjustable (time and speed)
- Easy to use: measurement and analysis parameters can be stored in test configurations, which can be quickly accessed for later use
- Parameterised analyse functions:
    - Frequency spectrum (FFT)
    - Order Spectrum
    - Frequency and order – profile
    - Frequency and order – average
- Operating software available for all standard Windows PC
- No license files or Dongles are required for the operation of the Client Software, the software license is bound to the measurement hardware
- The software can also be operated offline, to evaluate any stored data for example
- The connection between the Client PC and the device via TCP/IP (Gigabit Ethernet) ➔ decentralised test configuration possible
- The Client Software can be integrated in a master test system (via remote connector on the device), to start the measurement remotely (trigger conditions according to test configurations remain valid)





+49 211 416 6441 sales@bepat.de