The new explosion-proof set for the vibration measurement and dynamic balancing BALTECH VP-3470-Ex is a portable and simple measuring instrument. This diagnostics set VibroPoint Series has been developed by BALTECH GmbH for use at hazardous production facilities.

The new explosion-proof set BALTECH VP-3470-Ex is a modification of the previous portable vibration measurement and balancing instruments. The vibrometer-balancer BALTECH VP-3470-Ex with the BALTECH-Expert software is intended to monitor vibration levels and check technical condition of industrial equipment, as well as to perform the dynamic balancing of rotating units on site (in their own bearings). The application according to the EX marking (2Ex nA ic IIB T4 Gc X), IEC 60079-14-2011 is the electric equipment, used in explosion hazard zones on the basis of the Customs Union Conformity Certificate No. 0328050.

The main reason of the increased vibration of the rotating machinery is the unbalance, which results in increased vibration and wear of bearing assemblies. The unbalance leads to rapid wear of bearings, lubricant degradation, increased noise level, shaft damage, loss of the efficiency of the entire machinery. The new explosion-proof set BALTECH VP-3470-Ex allows performing the balancing of rotating units on site (in their own bearings).

The set has been developed by BALTECH for service and repair organizations. Today it is the best assistant for mechanics and power engineers on the market according to the price/performance ratio. The explosion-proof set BALTECH VP-3470-Ex has all the functions required to perform fast and effective on-site balancing.

2 CHANNEL EXPLOSION-PROOF PORTABLE SYSTEM
for the vibration measurement and analysis with the software for 4 plane on-site balancing

Diagnostics of machines and units
- Pumps
- Fans
- Compressors
- Turbines
- Gas blowers
- Electric motors
- Gearboxes
- Refrigerating machines
- Rolling element bearings
- Sleeve bearings

BALTECH VP-3470-Ex Features:
- Two channel vibration measurement and analysis (2 vibration channels, 1 tach channel)
- Vibrometer mode: overall vibration measurement (vibration velocity, vibration acceleration, vibration displacement, RMS, amplitude, excess)
- Waveform measurement (oscillograph mode)
- Spectrum analysis (vibration velocity, vibration acceleration, vibration displacement)
- Waveform and spectrum analysis of the envelope of high-frequency vibration component
- Phasemeter and tach modes
- Multi-plane balancing (4 planes -16 points, trial run, dynamic influence coefficient)
- Trial weight calculation
- Vector calculator
- Calculation of weight and angle of installation of the balancing mass
- Connection of the stroboscope
- Transfer of the measurement data to the BALTECH-Expert software for the database management (machinery condition monitoring, vibration analysis, machinery life prediction based on trends, report saving)

Balancing stages:
1) Vibration level measurement
2) Trial weight installation
3) Vibration level measurement with the trial weight
4) Calculation of the weight and installation angle of the balancing mass
5) Installation (adding) and removal (milling, drilling) of the calculated balancing mass
6) Control measurement
7) Documentation

Simple procedure of measurement and calculation
1) Unbalance detection
2) Vibration amplitude and phase measurement
3) Calculation and installation of the trial weight
4) Calculation of the balancing mass location
The BALTECH-Balance software is intended to calculate the balancing masses. This is an independent balancing calculator, which can be used with any instruments. The software makes it possible to perform the rotor balancing with any instrument for the phase and vibration amplitude measurement. The integrated calculator allows you to calculate the trial weights and to perform balancing. The initial data for the calculation (amount of the vibration and phase) can be taken by your instrument and entered into the software manually. The number of the balancing planes is not limited!

**BALTECH-Balance Features:**
- The number of the balancing planes and measurement points is not limited
- Additional balancing based on the results of the installation of the correction masses without necessity to install the trial weights. Calculation of the balancing mass without installation of the trial weights based on the results of the previous balancing using the available dynamic influence coefficients (for the machines that have been balanced before)
- Calculation for different balancing conditions (trial weight is removed/not removed, the angles are calculated towards/against the rotor rotation direction)
- Additional tools for automatization of standard balancing actions: 1. estimation of the trial weight amount; 2. unbalance vector dividing; 3. unbalance vector summing up

**BALTECH-Expert Features:**
- Multilevel configuration of the database
- Route creation
- Manual data input
- Vibration monitoring as per ISO 10816, 25364, 30576
- Setup of threshold levels
- Spectrum and waveform analysis
- Creation of trends based on the vibration levels, temperature and any scalar values
- Analysis and diagnostics on all the hierarchy levels
- Thermal image processing
- Creation of the reports on the vibration measurement, thermal imaging, alignment, balancing

BALTECH-Expert is a complex expert software for monitoring, diagnostics and analysis of the machinery condition, it is intended to be used with the portable alignment systems KVANT Series, balancing instruments BALTECH VP Series, thermal imaging systems BALTECH TR Series. The software allows creating trends and saving reports on the balancing, laser alignment, vibration analysis and thermal imaging, which helps an expert to determine the machinery reliability level.
**Technical characteristics**

**Input**
- Number of channels: 2 analogue simultaneous channels, 1 synchronizing channel
- Input type: ICP accelerometer (two channels), speed sensor (one channel)
- Transducer type: Accelerometer, speed sensor, strobscope
- Integration: Digital
- Frequency range, Hz: 2 - 10000

**Vibration parameters**
- Measurement parameters: Vibration velocity, vibration acceleration, vibration displacement
- Detector: RMS, Peak, Peak-Peak, Peak-factor, excess
- Number of averagings: 1-100
- Bands for the vibration measurement, Hz:
  - Standard: 2...200, 2...1000, 10...1000, 10...2000, 10...10000
  - Additional: 2...200, 2...1000, 10...1000, 10...2000, 10...10000

**Spectrum analysis**
- Boundary frequencies, Hz: 200, 500, 1000, 2000, 5000, 10000
- Number of lines: 400, 800, 1600
- Windows: Rectangle, Hanning, Blackman-Hamming
- Dynamic range, dB: Not less than 75
- Envelope detector with band-pass filters
  - 2/3 octave, Hz: 4000, 5000, 6300, 8000
  - 1/3 octave, Hz: 4000, 5000, 6300, 8000
  - 1/1 octave, Hz: 4000, 5000, 6300, 8000

**Amplitude and phase measurement for the balancing**
- Rotation frequency range, Hz (rpm): 1-400 (60-24000)
- Frequency error, %: +/- 1
- Phase error, degree: +/- 5
- Amplitude error, dB: +/- 1
- Automatic control: Sensor connection control
- Amplitude measurement units: dB, g, m/s², mm/s, um

---

**Measurement ranges**

<table>
<thead>
<tr>
<th>Machines</th>
<th>Class I Small machines up to 15 kW</th>
<th>Class II Medium machines 15...75 kW</th>
<th>Class III Large rigid foundation</th>
<th>Class IV Large soft foundation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.24</td>
<td>GOOD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.45</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.71</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.80</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.80</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.90</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**General characteristics**
- Display: LCD
- Display size: 3.5"
- Display resolution, pixel: 320x240
- Memory, mB: 8
- Keyboard: Film keyboard
- External device: USB
- Battery led indicator: Red/Green
- Power supply, W: 3.7
- Battery charge time, h: ~ 4
- Battery operation time, h: Not less than 10

**ISO 10816 Evaluation of the machine vibration**

**Technical specifications**

<table>
<thead>
<tr>
<th>BALTECH VP-3470-Ex Delivery set</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Display unit</td>
</tr>
<tr>
<td>2 Shroud</td>
</tr>
<tr>
<td>3 Power supply</td>
</tr>
<tr>
<td>4 Vibration transducer with mounting magnet</td>
</tr>
<tr>
<td>5 Magnetic rack</td>
</tr>
<tr>
<td>6 USB cable</td>
</tr>
<tr>
<td>7 Angle gauge</td>
</tr>
<tr>
<td>8 Led strobscope</td>
</tr>
<tr>
<td>9 Tachometer</td>
</tr>
<tr>
<td>10 Electronic scales</td>
</tr>
<tr>
<td>11 Middle clamp</td>
</tr>
<tr>
<td>12 Small clamp</td>
</tr>
<tr>
<td>13 Scissors</td>
</tr>
<tr>
<td>14 Signal cable</td>
</tr>
<tr>
<td>15 Vibration transducer cable</td>
</tr>
<tr>
<td>16 Reflective film</td>
</tr>
<tr>
<td>17 BALTECH-Expert software</td>
</tr>
<tr>
<td>18 Operation manual</td>
</tr>
<tr>
<td>19 Technical specification</td>
</tr>
<tr>
<td>20 Transportation case</td>
</tr>
<tr>
<td>21 Packing box</td>
</tr>
</tbody>
</table>