Dual Channel Vibration Analyzer

VAST
VibroAcoustical Systems and Technologies

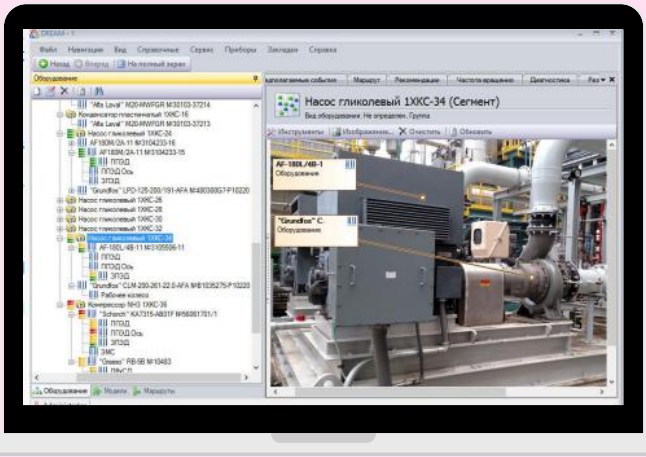
DC-23

Auto-Diagnostic Software

DREAM 5

Vibration Monitoring and Diagnostics System

- Automatic Report
- Auto Suggestion For Corrective Action
- Next Schedule Measurement Prediction



Dual Channel Vibration Analyzer ::: DC – 23 :::

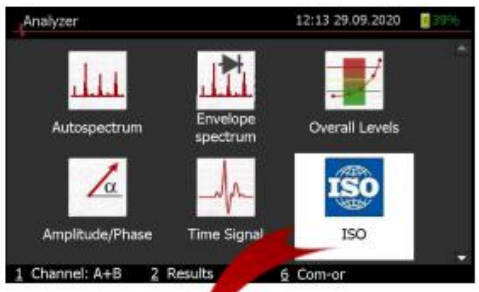
5th Generation of Vibration Analyzers!

DC–23 is a **Dual–Channel Vibration Analyzer** of the new generation. Main device feature: **two–channel simultaneous** and **synchronized data collection**. All measurement results are acquired from the one–time signal. This approach allows to cut down the measurement time by 3– 6 times in comparison with previous generation vibration analyzers.

New features:

- Increase of max frequency up to **51200 Hz**
- Increase of frequency resolution up to **51200 lines**
- New types of measurements added.

1. IN FIELD MACHINE CONDITION ASSESSMENT BY ISO10816 STANDARD

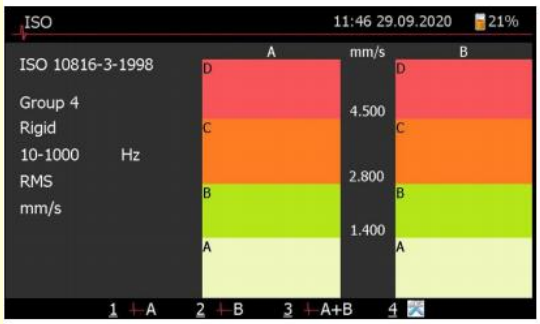


The standard sets vibration levels thresholds for different types of machines depending on:

- machine type;
- power and size;
- support types;
- rotation speed and other parameters.

The configuration is done on board DC-23.

According to ISO Standard, based on machine parameters the DC-23 sets up the masurements and the alarm levels for the machine condition zones.



Zone A: new machines;

Zone B: machines suitable for long-term operation with no limitations;

Zone C: machines not suitable for long-term operation, require maintenance or repair in short time;

Zone D: machines in alarm condition. Should be stopped immediately. Possible damage to machine, personnel and environment.

To make two channel measurement just press «ENTER».

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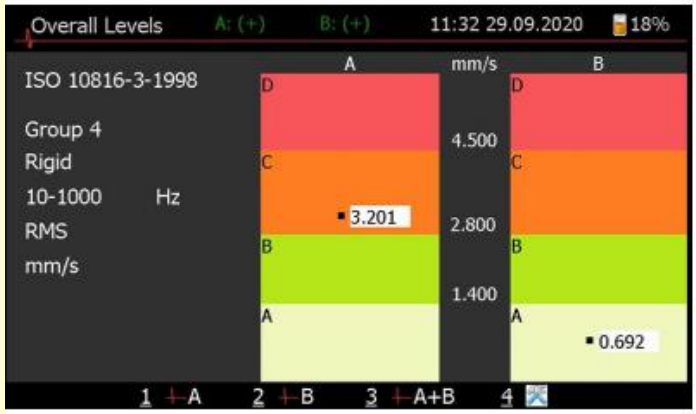


- Current vibration level for two channels.
- Machine condition assessment according to the selected Standard and displaying machine condition to the specific zone.

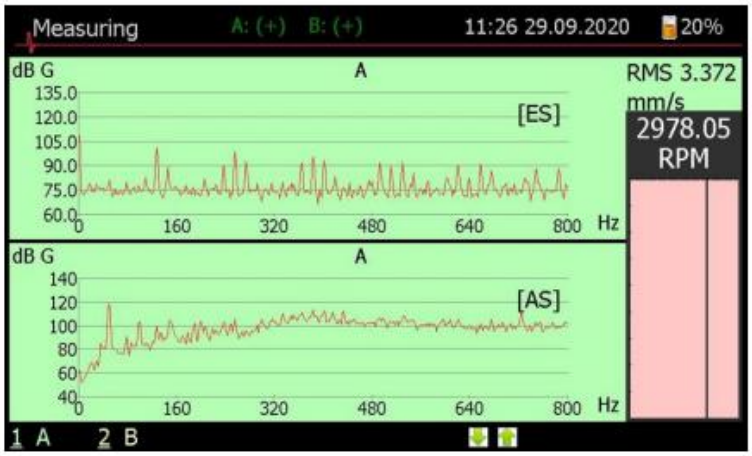
Time required for the machine condition assessment is a few seconds.

The measured data and alarm thresholds could be stored and downloaded to a computer for future processing, trending and reporting.

For the next machine condition assessment just relocate the sensors and press «ENTER».

2. IN FIELD CONDITION DIAGNOSTICS BY ENVELOPE- AND AUTOSPECTRA

Most often we analyze vibration spectra for the condition diagnostics. For this purpose we need to attribute all the lines in the spectra to some defect frequencies.

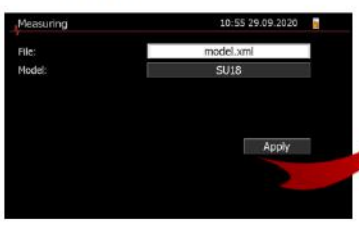


We present the technology for on-board condition diagnostics without computer.

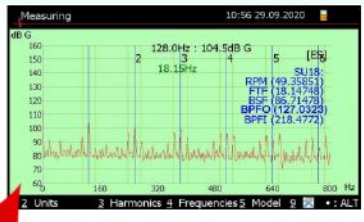
You just need to download from the computer the models of:

- bearings,
- gearboxe,
- pumps,
- drives etc.

After measurement we select the machine part model, e.g. bearing.



The rotation speed is measured by tacho, entered manually or selected in the spectrum.



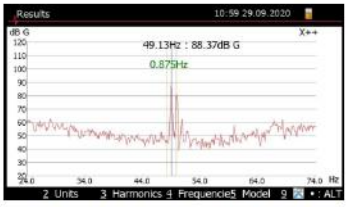
All the defect frequencies are calculated and displayed on the spectrum.

Here we can see the BPFO harmonics modulated by FTF frequency due to crack on the outer race and different size of the rollers in the rolling bearing of the model 18.

Additional features include configuration of the harmonic and side band cursors.

Easy operation with:

- **Cursor.**
- **Harmonic Cursor.**
- **Side bands.**



Setup of the display mode – units of acceleration, velocity, displacement or dB of the corresponding units.

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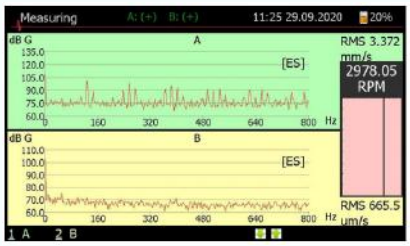
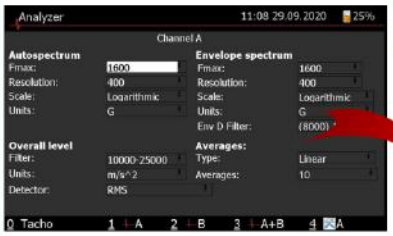
3. COMBINED VIBRATION MEASUREMENT



The DC-23 allows simultaneous measurements by two channels of the following parameters:

- autospectrum;
- envelope (demodulated) spectrum;
- Vibration level;
- Rotation speed.

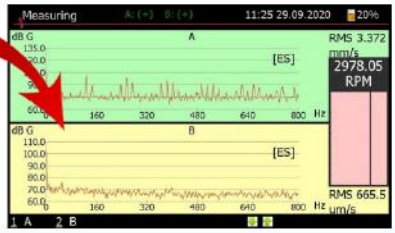
Set up any parameters.



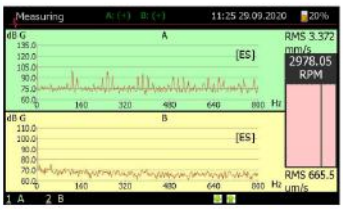
Same or different for two channels.
And make simultaneous measurements.

During measurements you can monitore and compare:

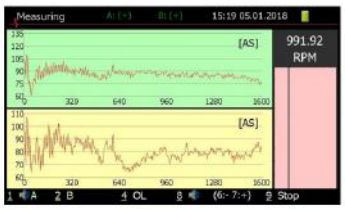
- Two spectra from different channels;
- Two vibration levels, rotation speed and its stability.



A number of options are available for display and analysis:

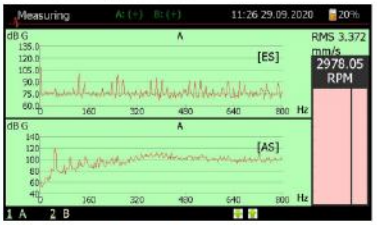


Compare two envelope spectra from two channels.

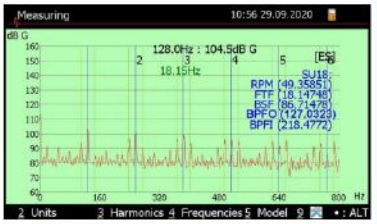


Compare two autospectra from both channels.

Variety of analysis modes:



Analysis of outer spectrum and envelope spectrum from any channel.



Detailed analysis of any spectrum with defect frequencies, harmonics and sidebands for modulation processes.

All the data can be saved and downloaded to PC for future analysis, trending, reporting, etc.

4. WIRELESS TACHO CHANNEL

For the simultaneous measurements of the vibration parameters and rotation speed, e.g. amplitude and phase on the **RPM** of rotors, we recommend to use the wireless tacho channel.

The wireless techo channel kit includes:

- Transmitter with battery. Any type of tacho (Photo, laser, eddy current) by Association VAST is compatible with the transmitter.
- Receiver of the tacho signal. Any of the Association VAST vibration meter or analyzer is compatible with the receiver (DC-21, DC-23, CM-21, etc)

Operating time from battery exceeds the operation time of the vibration analyzer.
Operating distance depends on the environment configuration and can be in the range of 20–200 meters.

Wireless tacho channel replaces the most long cable in the measurement system and allows free walking around the machine for:

- Balancing for large machines.
- Contour characteristics measurements.
- condition diagnostics of locomotives and other machines with unstable rotation speed.
- Any vibration measurements that require rotation speed access.

Main advantages:

- Compatibility with all past, current, and future tacho probes and instruments of the association VAST production
- User friendly and easy to use.

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MONITORING AND DIAGNOSTICS

- Time signal (oscilloscope mode)
- Vibration levels in bands according to ISO and other standards
- Peak-factor
- Autospectrum
- Cross-spectrum
- Enveloped spectrum
- Orbits
- Rotation speed
- Amplitude and phase of the signal on the rotation frequency

BALANCING

- 1, 2, 3, 4 – planes balancing
- Up to 5 measurement planes
- Influence coefficients calculation
- Trial mass calculation, addition, and division of balancing mass
- Balancing reports

VIBRATION ADJUSTMENT

- Amplitude-phase characteristics during runup/coast-down of the machine
- Resonance analysis, induced by shock. Calculation of natural oscillation damping frequencies and decrements.

SENSORS

- Vibration analyzer is used for measurement of vibration, electric current etc..
- Accelerometers and proximeters are used for measurement of vibration.
- Current clamps are used for electric current measurements.

TACHO SENSORS

DC-23 can operate with a wide range of tacho sensors. for example eddy current tacho sensors.

EARPHONES

For audio monitoring, optional earphones are available.

Supply kit

Vibration analyzer DC-23 supplied with accelerometers, earphones, tachometer, cables, battery charger and transportation bag. Software DREAM-0 is included.

Additional accessories

Wide range of additional accessories are available:
earphones, current clamp, various sensors (rotation, proximity probes, accelerometers), cables, weights for balancing.

Specification – DC –23

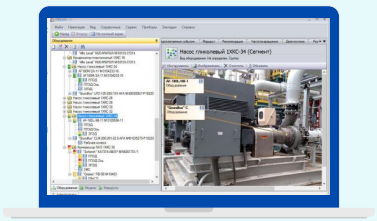
Input	
Channels	2 analog channels 1 synchronization channel
Converter types	Accelerometer, current clamp, tacho, microphone
Frequency range	0.5 - 51200 Hz
Non-linearity of AFR	+/- 5% (0.5 dB)
Channel interference	-100dB
Vibration parameters	
Measured parameters	displacement, velocity, acceleration
Detector	RMS, peak, peak-to-peak, peak-factor
Measurement of vibration broadbands according to GOST:	2..1000, 10..1000, 10..2000 Hz 2..200, 3..300, 5..500, 10..5000, 500..2500, 625..2500, 1200..2500, 2500-5000, 5000..10000
Additional:	10000..25000,17000-25000 Hz
Spectral analysis	
Border frequency	from 25 to 51200 Hz
Frequency resolution	from 400 to 51200 lines
Dynamic range	≥100 dB
Enveloped spectra	
1/3 octave, Hz:	800, 1000, 1250, 1600, 2000, 2500, 3200, 4000, 5000, 6400, 8000, 10000,12800, 16000, 20000
1/1 octave, Hz:	50, 100, 200, 400, 800, 1600, 3200, 6400, 8000, 12800, 16000
General info	
Protection	IP65 (dust- and moisture-proof)
Operating temperature range	-20 / +50C
Device weight without sensors	1 kg
Dimensions	143 x 194 x 39 mm
Operating time	≥8 hrs.
Charging time	≤4.5 hrs.

DREAM

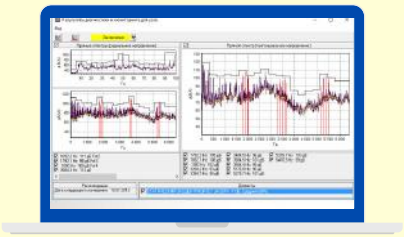
(Optional Software For PC With or Without Automatic Diagnostic)

DREAM® version 5 is used as an individual system, that allows:

- Vibration control
- Condition monitoring
- Automatic Detailed diagnostics of elements of rotating equipment
- Complex diagnostics of the machine as a whole
- Technical condition forecast
- Planning of technical maintenance
- Transition to condition-based maintenance
- Operation in portable and stationary variants



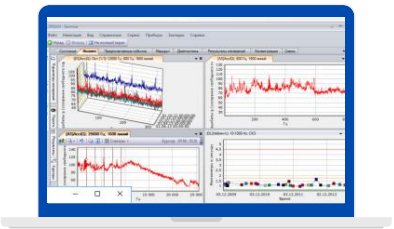
VIBRATION MONITORING



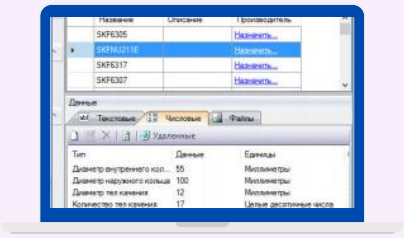
- Vibration monitoring according to ISO 10816, 25364 with automatic measurements configuration.
- Analysis and trends of vibration levels, autospectrum, enveloped spectrum, any scalar parameters.
- Identification of events of vibration rise above preset thresholds. Forecast of possible accident events.
- Set up of any kind of vibration thresholds.

AUTOMATIC DIAGNOSTICS AND CONDITION FORECAST

1. **Automatic configuration of measurements according to the machine type.**
2. **Automatic identification of type and severity of the defect**
3. **Automatic long-term forecast of equipment technical condition, maintenance recommendations**
4. **Automatic scheduling of next measurement and repair operations**



AUTOMATIC REPORTS AND ON-LINE WORK



- Automatic report creation in Microsoft Word format, including graphs, tables etc.
- Customization of reports
- Data transfer between ACS MRO of the enterprise
- Operation in common network of the factory/company.

DREAM

Specification DREAM for Windows

Application

- Vibration monitoring of machines and equipment
- Vibration analysis
- Automatic diagnostics of equipment technical condition
- **Automatic long-term condition forecast**
- Manual vibration analysis and technical diagnostics
- **Maintenance recommendations**
- Transfer to condition-based maintenance and repair
- **Automatic report generation**
- Interaction with ACS MRO

Data base configurations

Hierarchy levels Measurement setup

- Not limited
- Automatically according to ISO standards
- Automatically according to machine specification
- custom

Vibration monitoring

Types of monitoring

- According to ISO 10816 and other standards
- Spectras in various frequency bands
- Levels of vibration and other parameters

Thresholds setup

- Automatic thresholds setup according to ISO
- Automatic thresholds setup according to machine specification
- Custom thresholds setup

Monitoring-based diagnostics

- Identification of any events of vibration rise
- Identification of machine condition according to events

Automatic diagnostics

Types of diagnostics

- Separate machine element
- Machine as a whole, based on results of each
- Machine element diagnostics with Recommendations «Operation allowed», «Operation not allowed»
- Integral evaluation based on monitoring and diagnostics
- It is possible to conduct several diagnostics for one element

Automatic diagnostics module

- Sleeve bearings
- Roller bearings
- Gears, differentials
- Chain and pulley gearing
- Shafts and couplings
- Pumps and fans rotor wheels
- Motor pumps
- Turbines and compressors rotor wheels
- Electromagnetic system (motors and generators)

Diagnostics results

- Period of safe operation
- Type and severity of each defect
- Repair and maintenance recommendations
- * expert resume on each element and machine as a whole

Each diagnostics module detects up to 14 different types of defects

- Assembly and installation defects, which can be dealt with promptly, thus increasing the life of the equipment, such as **bearing misalignment, static eccentricity in electric machine, disbalance, shafts misalignment etc.**
- Exploitation defects, for example, **cavitation** in the pump, caused by improper equipment operating regime. Regime can be changed and thus equipment residual lifetime can be prolonged.
- Deterioration defects, for example, **cavities on the surfaces of the roller bearings, deterioration of gear tooth etc.** This kind of defects cannot be eliminated by adjustment operations (ex. balancing, alignment). In this case main purpose of diagnostics is to keep track on the development of these defects and secure a safe operation of the equipment until it would be possible to do maintenance operations. In this way, purchasing team will have time to acquire needed spare parts and equipment down time will be narrowed down to minimum.

In Association with VAST Vibroacoustical Systems and Technologies **Your trusted OEM**

Authorized Partners

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