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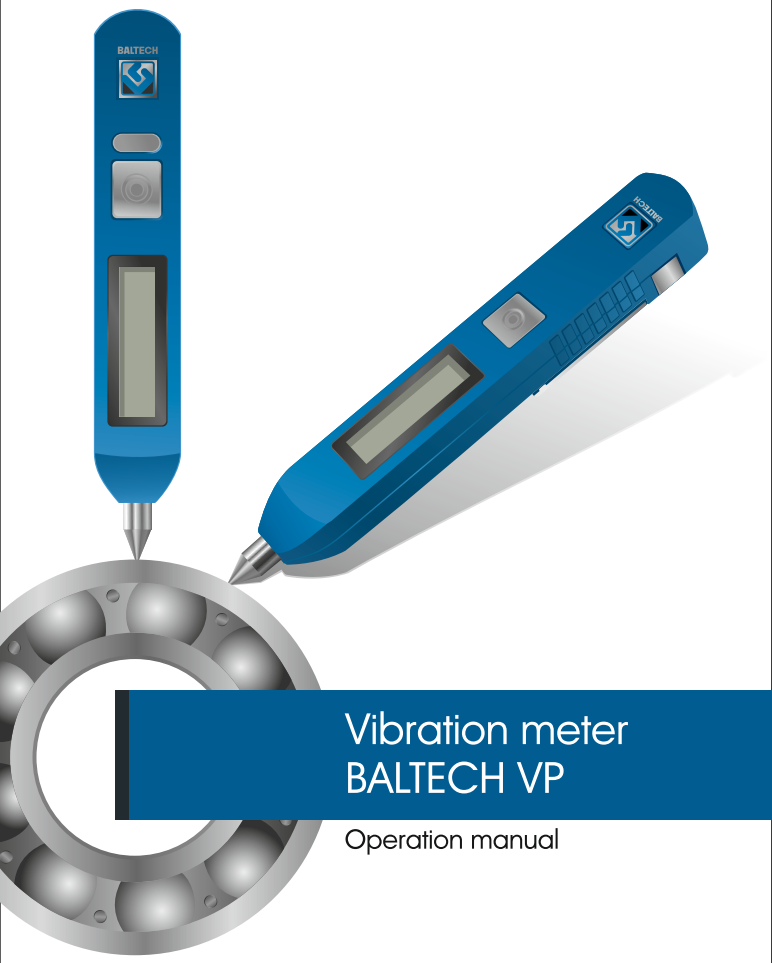

Vibration meter BALTECH VP

Operation manual

Saint-Petersburg

BALTECH

CONTENT

1. APPEARANCE

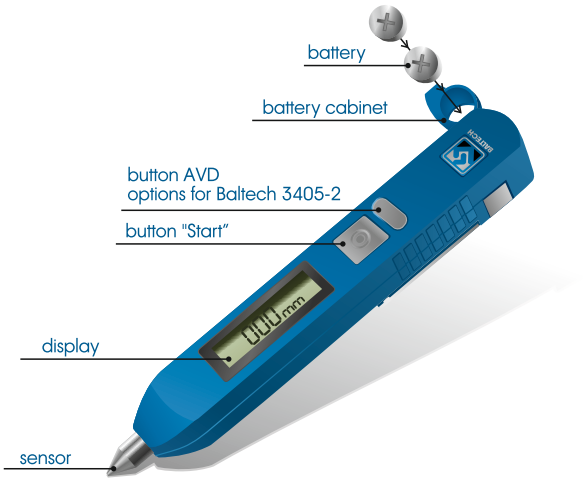

Figure 1

Note:

When charging the battery the anode should be in the direction of "+" sign.

The vibration meters BALTECH VP don't have memory. Please, write down the results to register them.

2. APPLICATION

The vibration meter BALTECH VP-3405 and BALTECH VP-3405-2 are designed for vibration monitoring of a wide range of machines for the purpose of checking their technical condition. The vibration meter is a simple, portable measurement device, which allows to perform the following tasks:

- Measurement of overall vibration by the following parameters:
  -BALTECH VP-3405 (vibration velocity)
  -BALTECH VP-3405-2 (vibration velocity, vibration displacement, vibration acceleration)
- Measurement of RMS vibration velocity and vibration displacement amplitude within the range from 10 to 1000 Hz;
- Measurement of vibration acceleration amplitude in two frequency bands.

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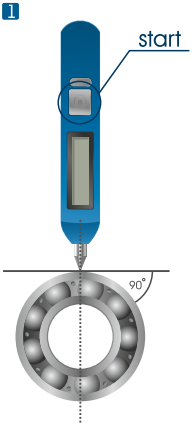
3. OPERATION

1

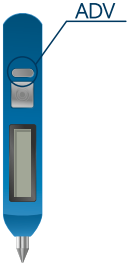


Apply the sensor perpendicular to a measured surface.
Press the "Start" button to start measuring.

2

Release the "Start" button to register the results.
At that moment the LCD will show "HOLD" and a vibration value.
This value will display during 40 seconds, after which the device will switch off automatically.

3



To select a regime (vibration displacement, vibration acceleration, vibration velocity)*, use the button AVD.
If the measured parameter falls outside the range limits, the display will show "Over".

*for BALTECH VP-3405-2

4

Sign "BATT "indicates, that the battery is low. Two batteries should be changed simultaneously.

4. WORK WITH THE VIBRATION METER

- As a measurement point, use a bearing,bearing support or some other structure component, which indicates clearly the vibration characteristics.
- For the most comprehensive analysis of the vibration characteristics of the object, it is necessary, as far as possible, to perform a test in three perpendicular directions (figure 2).
- For execution of measurements hold the sensor in contact with a surface under pressure from 5 N to 20 N. The vibration meter should be also perpendicular to a surface.

Figure 2

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5. CHARACTERISTICS

Name	Technical characteristics	
	BALTECH VP-3405	BALTECH VP -3405-2
measured parameters		
Acceleration	————	0,01 mm/s~199,9 mm/s (peak value)
Velocity	0,01 mm/s~199,9 mm/s (rms value)	0,01 mm/s~199,9 mm/s (rms value)
Displacement	————	0,01 mm/s~199,9 mm/s (peak-peak)
frequency range		
Acceleration	————	10 Hz-1 kHz
Velocity	10 Hz-1 kHz	10 Hz-1 kHz
Displacement	————	10 Hz-500 kHz

RELATIVE ERROR

Sensitivity uncertainty	±3%
Fundamental relative error of measurement of vibration acceleration at a base frequency 160 Hz of vibration velocity at a base frequency 80 Hz doesn't exceed, % of vibration displacement at a base frequency 45 Hz, %	±5,0±2 dgt; ±10,0 ±2 dgt;
Variations in frequency response: of vibration acceleration and vibration velocity, relative to base frequencies, is: in the frequency range 25-1000 Hz,% in the frequency range 10-1000 Hz,% of displacement in the frequency range 10-500 Hz,%	±5 +10-25 +10-25

DISPLAY:

Three-digit LCD, update time is roughly 1 second.

Power supply	2 button batteries (LR44 or SR44)
Battery operation time	4,5 hours of continuous operation, in holding mode

ENVIRONMENT:

Temperature	0°C~40°C
Humidity	<85%
Dimensions	150 mm x 22 mm x 18 mm
Weight	Roughly 55 g (including 2 batteries)

6. TECHNICAL CHARACTERISTICS

The vibration meters Baltech VP are precise devices. For correct work of this device it is necessary to ensure protection against mechanical damage, humidity, electromagnetic field, dirt and dust. When changing the battery, insert it with a positive pole up. Remove the battery, if you don't use the device for a long period.

Clean the screen only with clear water. Alcohols and solvent erode metal.

7. REPAIR

When failures arise, user should not try to dismantle or repair the device. It is necessary to return the device with a warranty certificate, description and declaration of failure to the manufacturer for its checking and repair. If necessary, address yourself to sales department or to trade representative of our company.

8. TRAINING

For efficient and qualitative operation of the device BALTECH VP, we recommend you to pay attention to:

- Specialists, who work with the device, must be certified on the course TOP -103 "Basis of the vibration diagnostics" in the training centre of the company "Baltech" (Saint-Petersburg, phone number/fax +7 (812) 335-00-85, e-mail: info@baltech.ru, you can find the schedule of the training courses on the website www.baltech.ru)
- Or organize a group of at least 5 persons for conducting the training course at your premises.

9. APPENDIX

a) ISO 2372 Machine Vibration grades (NEMAMG1_12)

I class - small-power motors (less than 15 kW),
II class- (up to 875 kW),
III class- heavy-duty motors
(rigid base up to 10000 kW),
VI class- heavy-duty motors (soft base)
over 10000 kW.

The result should be received on three orthogonally related directions of a bearing case.

velocity (RMS) mm/s	I	II	III	IV
0.28	perfect	perfect	perfect	perfect
0.45				
0.71				
1,12	good			
1,8		good		
2,8	bad		good	
4,5		bad		good
7,1	forbidden		bad	
11,2		forbidden		bad
18			forbidden	
28				forbidden
45				

b) Maximum permissible vibration of engine with capacity of up to 1 hp. (NEMA MGI_12.05)

Rotation speed (Rpm)	Peak- Peak (μm)
3000-4000	25,4
1500-2999	38,1
1000-1499	50,8
999 or less	63,6

Note: For alternating-current motors these values are specified for the peak synchronous rotation. For constant-current motors- for peak speed. For series-wound motors and multifunction motors- for operation speed.

c) Maximum permissible vibration of large asynchronous motor (NEMA MGI_20.52)

Rotation speed (Rpm)	Peak- Peak (μm)
3000 или больше	25,4
1500-2999	50,8
1000-1499	63,6
999 or less	76,2

Two above mentioned standards are set by National Electrical Manufacturers Association (NEMA).

d) Maximum permissible vibration of squirrel-cage induction motor (API STD541)

Rotation speed (Rpm)	Peak- Peak (μm)	
	Elastic support	Rigid support
720-1499	50,8	63,6
1500-2999	38,1	50,8
3000 and over	25,4	25,4

The above mentioned standard is set by the American Petroleum Institute.

e) ISO/IS2373 motor quality standard according to vibration velocity

Quality level	Rotation speed	Height of H (mm) Max. speed fluctuation rms (mm/s)		
		80<H<132	132<H<225	225<H<400
N (standard)	600-3600	1,8	2,8	4,5
R (perfect)	600-1800 1800-3600	0,17 1012	11,12 1,8	1,8 2,8
S (special)	600-1800 1800-3600	0,45 10,71	0,71 1,12	0,12 1,8

Note: The quality level N, specified in the above table, is suited to standard motors. If you need to work with machines of higher levels, than listed in the table, you can get a limit value by dividing the limit value of level S by 1.6 or by its multiple.

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