vb Balancer Series Portable Instruments
Datasheet

Bently Nevada Machinery Condition Monitoring

Description

Unbalanced rotating machinery can cause high levels of vibration which can degrade bearing life and cause major mechanical complications. Reduce the possibility of outages and downtime with our vbBalancer and vbBalancer+ portable instruments. Used on-site, they detect unbalanced machinery and help you diagnose and immediately fix issues before they become serious, expensive problems.

After you input a few basic parameters describing a machine, use vbBalancer to identify current unbalance levels and determine if the machine is operating within ISO 1940 standards.

If a machine needs balancing, use vbBalancer to identify the mass and position of permanent balance weights.

To verify that balancing is working, the vbBalancer Series record basic vibration spectra. Use vbBalancer to view spectra before and after balancing to validate broad-band improvement.

The two-channel vbBalancer instrument has two accelerometer inputs for simultaneous recordings. The four-channel vbBalancer+ instrument uses vibration readings from four accelerometer inputs to calculate the optimum balance weights to apply to two correction planes, minimizing total machine vibration. This enables you, for example, to monitor both horizontal and vertical axes on a two-bearing machine, giving you confidence that the balance you applied to one axis has not worsened vibration on the other.

The vbBalancer Series provides recordings with up to 800 lines of resolution and up to 5 kHz Fmax. The vbBalancer Series has plenty of storage capacity and features all-day battery life. We back these instruments with a five year warranty.

The vbBalancer Series offers:

- Two or four-channel simultaneous recordings
- Dual-plane balancing
- Laser speed sensor for machine speed and vibration phase angle detection
- Keyphasor tach mode (vbBalancer+ only)
- 800 line vibration spectra with Fmax up to 5 kHz
- 1 GB memory
- ≥ 95 dB dynamic range
- Both instruments support IEPE Accelerometer sensors, and the vbBalancer+ additionally supports velocity and displacement sensors
- The vbBalancer+ additionally supports these balancing-related analysis features: coast-down and run-up, bump test, orbit plot
- Sensor cable self-test feature
- USB host port for data transfer to external USB drive
- Upgradable Proflash system and free firmware updates for five years

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Specifications

Sensors

Parameter	vbBalancer	vbBalancer+	Notes
Channels (simultaneous)	Two	Four	Simultaneous sampling
Compatible sensor types	Accelerometer	Accelerometer, velocity and displacement	
AC coupled range	16 V peak-peak		Allows for ± 8 V sensor output swing (± 80 g)
Connectors	2 x BNC (CH1/CH2)	1 x BNC (CH1) 1 x LEMO (CH2, CH3, CH4)	Safety feature: break-free inline connector
Analog to digital conversion	24-Bit ADC		
Sensor excitation current	0 mA or 2.2 mA (configurable), 24 V maximum		2.2 mA required for IEPE/ICP®-type accelerometer
Sensor detection	Warns if short circuit or not connected		

Tachometer

Parameter	vbBalancer	vbBalancer+	Notes
Sensor	Laser sensor with reflective tape	Laser sensor with reflective tape	Sensor triggers on beam reflection
Laser sensor range	10 cm to 2 m nominal		Dependent on size of reflective tape
Other sensor types supported	Contact, TTL, pulse	Contact, TTL, pulse, Keyphasor	Optically isolated output
Power supply to sensor	5 V, 50 mA		
TTL pulse rating	3.5 V (4 mA) min, 28 V (5 mA) max, off-state 0.8 V		
Keyphasor* thresholds	N/A	7.7 ± 0.5 V 13.2 ± 0.8 V 18.5 ± 1 V	Nominally 8 V, 13 V, 18 V

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| Speed range | 10 RPM to 300 000 RPM (0.2 Hz to 5 kHz) | Pulse width at least 0.1 ms |
| Accuracy | +/- 0.1% | |

Parameter Indication

Parameter	vbBalancer	vbBalancer+	Notes
Dynamic signal range	> 95 dB		Typical at 400 line resolution
Harmonic distortion	Less than -70 dB typical		Other distortions and noise are lower
Units	g or m/s2 or adB in/s or mm/s or vdB mil or mm or µm		0-peak, peak-peak or RMS Auto-scale by 1000x when required. US & SI options for adB & vdB
Magnitude & cursors	Overall value: RMS, waveform true pk-pk, dual cursors, harmonics		Digital readouts on chart
Base accuracy	± 1% (approximately 0.1dB)		% of reading
High frequency attenuation	≤ 0.1 dB 100 Hz to 5 kHz		Attenuation tolerances are in addition to base accuracy
AC coupling attenuation	≤ 0.1 dB 10 Hz to <100 Hz ≤ 3 dB 1 Hz to <10Hz		
Attenuation due to Integration	≤ 0.1 dB 10 Hz to <100 Hz ≤ 1.5 dB 1 Hz to <10 Hz		Values apply to single integration (acceleration to velocity). Double the values for double integration (acceleration to displacement).

Spectrum Display

Parameter	vbBalancer	vbBalancer+	Notes
Fmax ranges	25, 50, 100, 125, 150, 200, 300, 400, 500, 600, 800,1000, 1200, 1600, 2000, 2500, 3000, 4000, 5000 Hz		Or equivalent CPM values or orders-based from 1X to 999X
Fmin possible range	0 to Fmax		Instrument zeroes all spectral lines below Fmin
Resolution	800 lines		
Frequency scale	Hz, CPM, Orders		Linear scale with zooming
Amplitude scale	Acceleration, velocity or displacement		Linear or log scales, auto or manual scaling
Window,	Hanning, 50%, 4 x Linear		

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overlap, averaging			

Waveform Display

Parameter	vbBalancer	vbBalancer+	Notes
Number of samples	2048		
Time scale	160 ms to 32 seconds		Or orders based from 1 to 999 revs

Data Logging

Parameter	vbBalancer	vbBalancer+	Notes
Data storage	1 GB		
Data storage structure	Folders/ machines		No limits are applied, 50 character names
Max. folder size	10 000 measurement locations		

Balancing

Parameter	vbBalancer	vbBalancer+	Notes
Planes and Sensors	Two planes Two sensors	Two planes Four sensors	
Speed range	30 to 60 000 RPM		
Measurement type	Acceleration, velocity, displacement		
Weight modes	Angle 0º to 360º Fixed position Circumference arc		Examples: weights on fan blades, linear distance around circumference
Remove trial weights	User choice		Removed weight automatic recalculation
Manual data entry	Yes		Allows re-entry of previous balance jobs
Storage	Against machines in data structure		No limits applied
Channel selection	Single or dual channel	Up to four channels simultaneous	

Display and Communication

Parameter	vbBalancer	vbBalancer+	Notes

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Display	Graphic Grayscale LCD	White LED back light
Resolution and size	480 x 320 (HVGA), 5.5" (140 mm)	Readable in direct sunlight
Supported languages	EN, ZH, FR, DE, JA, PT, RU, ES	
Communication with PC	USB and ethernet	PROFLASH to upgrade instrument firmware
USB host port	USB 2.0, supplying 5 V, 250 mA	Save folders to USB flash drive

Battery and Charger

Parameter	vbBalancer	vbBalancer+	Notes
Battery type	Custom Lithium Ion pack 7.4 V, 4500 mAh		
Operating time	10 hours		Back light on (60 second time-out)
Charger type	Internal charging, automatic control		External power pack 12 V DC, 3 A output
Charge rate	3 A nominal		Three hours for complete charge

Mechanical

Parameter	vbBalancer	vbBalancer+	Notes
Size	9.9" W x 5.8" L x 2.4" H (252 x 148x 60) mm		
Weight	2.7 lb (1.2 kg)		Includes battery and strap

Environmental Limits

Parameter	vbBalancer	vbBalancer+	Notes
Operating temperature	14 ºF to 122 ºF (-10 to 50) ºC		
Storage temperature and humidity	-4 ºF to 140 ºF (-20 to 60) ºC 95% relative humidity		If storage exceeds one month: up to 95 F (35 C), 85% RH
Ruggedness	4' (1.2 m) drop onto concrete, IP65		Procedure: 26 drops following MIL-STD-810F-516.5-IV

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Compliance and Certifications

FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

EMC

EN 61326-1: 2012

EN 61326-2-3: 2012

EMC Directive 2014/30/EU

Electrical Safety

EN 62133: 2002

LV Directive 2014/35/EU

RoHS

RoHS Directive 2011/65/EU

Hazardous Area Approvals

For the detailed listing of country and product specific approvals, refer to the *Approvals Quick Reference_ Guide* (108M1756) available from BNTechSupport.com.

CSA	CSA Class I, Division 2 (Groups A, B, C, D)

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Ordering Information

> ✏️ For the detailed listing of country and product specific approvals, refer to the *Approvals Quick Reference_ Guide* (108M1756) available from BNTechSupport.com.

You can order all accessories included in the Basic Kit, Balancing Kit, and Zone 2 Laser Tach kit separately.

VBBALANCER-AA

VBBALANCERPLUS-AA

A: Agency Approval	
01	CSA / NRTL / C (Class 1, Division 2)

Basic Kit

We offer the vb Balancer Series Portable Instruments instrument in a basic kit with the option to purchase System 1 or Ascent software and license separately.

> ✏️ * Kit items with multiple part numbers listed have limited regional availability due to certification requirements.

Part Number	Description	Qty
	vbBalancer is a two-channel vbBalancer+ is a four-channel portable data collector	1
108M4049-01	USB flash drive contains vbX Manager and installation guide together with reference guides and brochures for vbSeries and other products.	1

ACCL0547 **or** 200350 *	Straight accelerometer	2 for vbBalancer 4 for vbBalancer+
138M7748	Transducer cable, 4 ft straight	2 for vbBalancer 4 for vbBalancer+
113M5585 MAGF0104 ???	Accelerometer magnetic base	2 for vbBalancer 4 for vbBalancer+
CBTB0278	Triple BNC adapter	1 for vbBalancer+
CABU0213	USB data transfer cable	1
110M8172	LEMO-BNC TTL Tach/Keyphasor cable	1
PLUS0230	Category A power plug USA / Canada	1
PLSA0241	Category D power plug South Africa / India	1
PLAU0228	Category M power plug Australia / New Zealand / China	1
PLHK0245	Category G power plug Hong Kong / UK	1
PLEU0229	Category C power plug Europe	1
CBVB0032	vbx instrument carry bag	1
109M2384-	Neck strap with	1

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02	Sensor Keeper	
108M4044	AC power adapter	1
DCCA0041	DC car adapter	1
108M3536	*SCOUT100_ Series and vbSeries Quick_ Start_ Guide*	1
108M4048	*vbBalancer & vbBalancer+ Instrument Reference_ Guide*	1

108M4066	Circlips - 20Mm Stainless	1
108M4067	Arp115 O-ring	2
108M4069	Laser Tach Zone 2 rated	1

Accessory Kits

Balancing Kit - 108M4050-04

Part Number	Description	Qty
113M5529-01	Reflective tape, one roll, 60 cm	1
LASA0315	Laser Tach Kit Zone 2 rated	1
CBL50216	Laser cable, five meters	1
MAGA0063	Laser magnetic stand	1
CB5G0024	Sensor cable, five meters, green	2
CB5R0025	Sensor cable, five meters, red	2
CBBL0026	Carrying case for the kit	1

Miscellaneous Parts

Part Number	Description
MAGM0064	Accelerometer magnetic base Male connection
VBMR0222	Stainless safety rings (one pair)
100M5828	vbSeries hard case
DTC70262	vbSeries dust cover
BATT0575	Replacement battery pack, Li-Ion 7.4 V 5 Ah

Zone 2 Laser Tach Kit - LASA0315

Part Number	Description	Qty
108M4064	Laser Tacho Holder	1

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