Brüel & Kjær Vibro

VIBROCONTROL 1100

The 2 x 2 solution for bearing vibration and rolling-element bearing condition monitoring

VIBROCONTROL 1100

The VIBROCONTROL 1100 reliably helps prevent machine damage and production downtime by

- continuously monitoring the actual condition of the machine and its components,
- signalling irregularities in the operating condition at an early stage and
- by immediately shutting down the machine when dangerous operating condition results are reached.

Bearing vibrations

Through the measurement of the mechanical vibrations in the frequency range up to 1000 Hz and the comparison of the measured values with

- standards and guidelines,
- default values from the machine manufacturer, or
- values determined by experience,

decisions can be made about the overall machine condition. In case of excessive bearing vibrations due to rotor unbalance, alignment errors, foundation movements, blade and gear damage the machine can be switched off at an early stage.

Rolling-element bearing condition

Impulses caused by rolling-elements are a measure of the rolling-element bearing condition. Reliable monitoring of the rolling-element bearing condition is possible through

- measurement of the intensity and regularity of the impulses,
- formation of a special characteristic value, namely a Bearing Condition Unit (BCU) and
- normalized BCU values.

Damage and production downtime as a result of “defective” bearings can be prevented with a high degree of accuracy.

The VIBROCONTROL 1100 consists of a combination of vibration sensors and an electronic monitoring instrument.

Vibration sensors

Mechanical vibrations and impulses which occur in the machine are converted by the vibration sensors into electrical signals. Subject to the monitoring task, acceleration or vibration velocity sensors can be used.

Monitoring electronics

The monitoring electronics has two sensor inputs and performs the vibration and bearing condition measurements via two separate signal paths.

Depending on the operating mode and measurement type, cycle times of 0.25 s for single-channel and 6 … 20 s for two-channel operation can be achieved. For each channel, two limit values for vibration and one limit value for bearing condition can be defined. The alarm relay delay time is individually selectable for each limit value annunciation.

The VIBROCONTROL 1100 has two analogue outputs. The assignment of the measurements to the analogue outputs and their operating mode can be freely programmed.
There are three limit value relays with potential-free contacts for signalling limit value violations. The OK-relay signals the condition of the sensors, the cable and the power supply.

The operator can directly access the information about the current measurements, limit value violations, relay conditions and Logbook entries from the instrument.

To store events, e.g. limit value violations, OK-faults, power failures, the Logbook is provided in the form of a ring memory with max. 99 entries for the storage of events.

Reliability

An internal, system-testing firmware, automatic self-calibration and protective circuits such as

- self-monitoring
- limit value blocking
- power-up error protection

provide a guarantee of trouble-free operation of the instrument.

Plug-in connection terminals make it easy to mount the connection cables. Thanks to the rugged industrial housing in IP 65 protection class, the instrument is suitable for use in harsh industrial conditions. Optionally one or two acceleration or vibration velocity sensors in industrial design can be used.

Set up

It is easy to enter parameters or change default settings directly at the instrument in user-friendly dialogues through an LCD display and five operating pushbuttons.

VIBROCONTROL 1100 Technical Data

	2-channel bearing vibration and 2-channel bearing condition
Order code	**Type** C01 Bearing vibration and bearing condition (only with acceleration sensors) 230/115 V AC, 50/60 Hz, approx. 15 VA C02 Bearing vibration and bearing condition (only with acceleration sensors) 24 V DC (16 … 36 V), approx. 15 W VC-1100-Cxx C11 Bearing vibration 230/115 V AC, 50/60 Hz, approx. 15 VA C12 Bearing vibration 24 V DC (16 … 36 V), approx. 15 W
Inputs No. of vibration channels Sensor connections Sensor power Sensor OK monitoring	 2 Acceleration sensor, e.g. AS-022, AS-062 (CCS), ASA-022 etc. Vibration velocity sensor, e.g. VS-068, VS-069, VS-0168, VC-0169 -24 V DC (max. 30 mA) or 4 mA constant-current supply (CCS) [1] Velocity sensor: no supply required Yes
Measurement types [2] Measurement channels (operating modes) Frequency range Vibration displacement [3] Bearing vibration measurement Bearing condition measurement Measurement accuracy	 1-channel operation with continuous monitoring 2-channel operation with cyclic (multiplex) monitoring, cycle time approx. 6 … 20 s Standard setting 10 Hz to 1 kHz Highpass: 1, 3, 10 Hz; Lowpass: 1 kHz, 10 kHz Integrated vibration velocity signal (10 Hz – 1 kHz) in µm RMS value (default) of vibration velocity in mm/s Signal detection selectable: RMS, peak value (p), peak-peak value (p-p) RMS value (default) of acceleration in m/s^2 Signal detection selectable: RMS, peak value (p), peak-peak value (p-p) Bearing Condition Unit (BCU) Bearing vibration +/-2% of measured value Bearing condition +/-6% of measured value and +/-3.5% of measuring range full scale value
Monitoring [2] Alarm signalling Alarm relay delay time Alarm relays	 Alert and Danger alarms for bearing vibration and one alarm for bearing condition 1 ... 99 s 3 relays with free assignment to measurement type, with AND/OR coupling, normally-energized or normally de-energized operation, latching or non-latching
Outputs [2] Analogue signal outputs Measured signal outputs	 The function can be assigned to one of the measurement types: 0/4 …20 mA (Load <= 500 Ω) or 0…10 V (Load >= 1 kΩ) Raw s ignal data (buffered output) of the sensor signal (galvanically separated)
Power supply Mains power	 C01/C11: 230/115 V AC +15% / - 25%, 50/60 Hz, approx. 15 VA C02/C12: 24 V DC (16 … 36 V), approx. 15 W
Environmental conditions Operating temperature range Storage temperature range Humidity	 0 °C ... +50 °C -20 °C ... +70 °C Max. 95%, non-condensing
Mechanical data Housing Dimensions Cable connection gland	 Rugged aluminium housing in IP-65 protection class. Total weight approx. 5 kg 400 x 160 x 91 mm (L x B x H) 3 x M20 x 1.5 and 9 x M16 x 1.5 feed-through fittings

[1] Acceleration sensors with constant-current supply only
[2] Each channel and connected sensor
[3] Vibration velocity sensors only

Ordering data for VIBROCONTROL 1100 and accessories

VC-1100	Type C01	For vibration and bearing condition [1], power supply 230/115 V AC, 50/60 Hz
Monitoring electronics	Type C01 CCS	For vibration and bearing condition [1], power supply 230/115 V AC, 50/60 Hz [2]
	Type C02	For vibration and bearing condition [1], power supply 24 V DC, 50/60 Hz
	Type C02 CCS	For vibration and bearing condition [1], power supply 24 V DC, 50/60 Hz [2]
	Type C11	For vibration only, power supply 230/115 V AC, 50/60 Hz
	Type C11 CCS	For vibration only, power supply 230/115 V AC, 50/60 Hz [2]
	Type C12	For vibration only, power supply 24 V DC
	Type C12 CCS	For vibration only, power supply 24 V DC [2]
Installation accessories	AC-2104	Terminal protective housing for max. 2 vibration sensors, standard
	AC-2105	Terminal protective housing for max. 2 acceleration sensors, Ex-protection (Exi)
	AC-2103	Terminal protective housing for max. 2 velocity sensors, Ex-protection (Exe)
	AC-112	Signal cable, shielded, 4 x 0.5 mm^2, for acceleration sensor
	AC-114	Signal cable, shielded, 4 x 0.5 mm^2, for acceleration sensor, Ex protection (Exi)
	AC-186	Signal cable, shielded, 2 x 0.75 mm^2, for velocity sensor, Ex protection (Exe)
	AC-2201	PU-sheathed steel protective conduit, minimum order length 5 m
	AC-2202	Protective conduit fittings M12 x 1.5; scope of delivery 2 pieces
	AC-2304/16/12	Reducers for protective conduit fittings from M16 x 1.5 to M12 x 1.5; scope of delivery: 10 pieces
	AC-352	Mounting studs for acceleration sensors
	AC-354	Stepped drill for mounting studs
Acceleration sensors	AS-022	Any measurement direction, 5 m cable with central threaded mounting hole
	ASA-022	Any measurement direction, 5 m cable, Ex-protection
		⟨Ex⟩ II 2G Ex ia IIC T6 ⟨Ex⟩ II 2D Ex iaD 21 T=145 °C [3]
	AS-030	Any measurement direction, without cable, with Fast-On lugs and protective cap
	AS-062 (CCS)	Any measurement direction, 5 m cable with central threaded mounting hole
	ASA-062 (CCS)	Any measurement direction, 5 m cable with central threaded mounting hole, Ex protection
		⟨Ex⟩ II 1 G Ex ia IIC T6 ⟨Ex⟩ II 2 D Ex iaD 21 T=145 °C [3]
Velocity sensors	VS-068	For horizontal measurement, 5 m cable
	VS-069	For vertical measurement, 5 m cable
	VS-0168	For horizontal measurement, 10 m cable, Ex protection
		⟨Ex⟩ II 2G Ex d IIC T6 ⟨Ex⟩ II 2D Ex tD A21 IP66 T=85 °C [3]
	VS-0169	For vertical measurement, 10 m cable, Ex protection
		⟨Ex⟩ II 2G Ex d IIC T6 ⟨Ex⟩ II 2D Ex tD A21 IP66 T=85 °C [3]
Accessories for Ex protection	AC-293	Safety barriers, complete for one acceleration sensor ASA-02x with Ex protection
	AC-297	Safety barriers, complete for one acceleration sensor ASA-06x with Ex protection

Accessories for computer connection and network operation, e.g. interface converters, special cables, over-voltage protection equipment and further installation accessories available on request

[1] With acceleration sensors only [2] With acceleration sensors with constant-current-supply (CCS) only

[3] ATEX certificates and datasheets are available on our homepage www.bkvibro.com for download

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