Brüel & Kjær Vibro

Product Specifications

VC-6000 Monitoring System
Monitoring Module – SM-610-113
12x Vibration Channels, 12x DC Outputs

The VC-6000 Monitoring System hardware is used for both stand-alone safety monitoring and condition monitoring using the Compass 6000 monitoring software modules and database. The VC-6000 offers various standard monitoring modules, power supply modules and communication modules. These Product Specifications describe the SM-610-113.

Applications

The SM-610 series of VC-6000 Monitoring Modules are designed to provide protective monitoring of various types of industrial machines. The SM-610-113 is specifically designed for monitoring casing vibration of a machine train with up to12 rolling-element bearings.

General Description

The features and functions common to all SM-610 Monitoring Modules are briefly listed below. Please refer to the VC-6000 Product Specifications (BPS 0044) for more information.

- Interfacing with the CI-6xx Communication Modules
- High speed digital signal processor
- Relay outputs (logic controlled)
- OK-relay status indication
- Extensive local LED indication
- Flash memory for storing settings and local logbook
- High speed reaction time - 10ms
- Alarm limits with programmable hysteresis and response delay time
- Global trip multiply and override
- Extensive self-monitoring functions
- System bus interface to other modules
- Buffered vibration outputs

Inputs

- 12x vibration signals – single-point measurement

Outputs

- 12x analogue DC outputs

Measurements

- 12x Bandpass (ISO 7919 or ISO 10816)

Input Channel Configuration Combinations

	Monitoring Module – SM-610-113 12x Vibration Channels, 12x DC Outputs																			
No. of Inputs[1]	**Channel Types**																	**Additional Measurements**		**Relay's**
	Dual- point Vibr.[2] (ISO)	DC-out	**Single-point Vibr[2] (ISO)**	**DC-out**	Axial Pos.	DC-out	Speed	DC-out	Rod Drop	DC-out	Rel. Exp.	DC-out	Eccentricity	DC-out	DC Input (Process, Absolute Exp)	DC-out	Bin. in	Vector[3]	BP	Tracking BP
12			12	12																
	[1] The number of input signals is the sum total of the channels shown in yellow.																			

[1] The number of input signals is the sum total of the channels shown in yellow.

Signal Flow Diagram

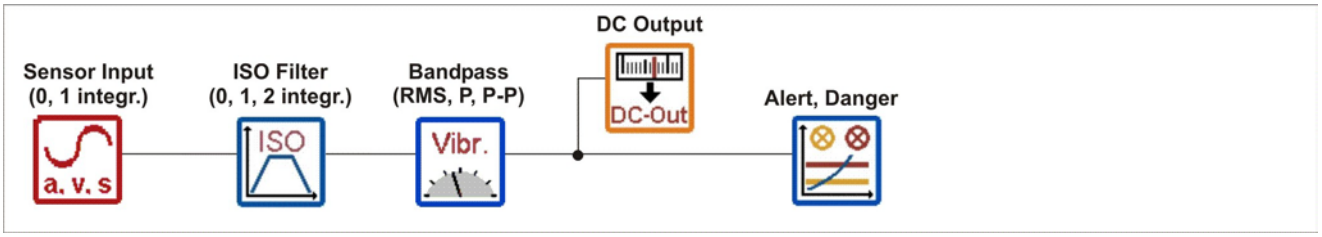

Figure 1. AC/DC vibration input (12 channels).

Technical Specifications

The specifications given below are specific for the SM-610-113 Monitoring Module. See the VC-6000 Product Specifications for features and functions common to all SM-610 Monitoring modules.

AC/DC Vibration Sensor Inputs

Input voltage range ..... –21.5 to –1V

Input frequency range:
- Accelerometer/velocity sensor.....0.6Hz to 20kHz
- Displacement sensor .....DC to 20kHz

Input impedance:
- Accelerometer.....>800kΩ
- Velocity sensor 50kΩ
- Displacement sensor .....>800kΩ

Gain:
- Accelerometer:
  - No integration ..... 1 to 80 (±0.75%)
  - Analogue integration..... 1 to 80 (±2.75%)
- Velocity sensor ..... 1 to 80 (±0.75%)
- Displacement sensor .....1 (±0.75%)

Sensitivity:
- Accelerometer.....adjustable (typ. 100 or 10mV/g)
- Velocity sensor . adjustable (typically 100mV/mm/s)
- Displacement sensor .....adjustable (typ. 8mV/μm)

Common mode rejection:

DC to 30kHz ..... typically 90dB
30kHz to 100kHz ..... typically 85dB

Maximum accelerometer input signal (100mV/g):
No integration ..... 1.25 to 80g peak
Analogue integration..... 12.5 to 150mm/s peak

Sensor power:
Sensor supply ..... −24VDC ±2%
Maximum current 30mA

Buffered Outputs

Minimum output load 100kΩ
Output gain ..... 1 (±2%)
Cross-talk..... typically −90dB (up to 50kHz)
Inherent noise (1Hz to 50kHz)..... typically 10mV RMS
Output impedance ..... <100Ω
Frequency range..... DC to 50kHz (phase shift <5%)

Output offset ..... ≤ ±13mV

Analogue DC Outputs

Current output:
Current range..... 4 to 20mA or 0 to 20mA
Maximum output load 500Ω
Accuracy ..... <2.4% of measured value
Offset ..... <20μA

Voltage output:
Voltage range ..... 0 to 10V or 2 to 10V
Minimum output load 1kΩ
Accuracy ..... <1.3% of measured value
Offset ..... <9.5mV

Measurements

Meas. Name	**Frequency Range**	**Measuring Time**	**Detection**	**Alarm Limits**	**Measuring Range**	**Units**[1]	**Accuracy** (25°C, 80Hz, 0-Peak)
Bandpass (ISO 10816)	HP: 1 to 10Hz (-1dB) LP: 1kHz (-1dB) 18dB/Octave (ISO 2954)	Adjustable 100ms to 100s in steps of 100ms	RMS, Peak, Peak-peak	1x Alert, 1x Danger	80g	g	±(0.08g + 0.75% of measured value)
					150mm/s (1 integration[2])	mm/s	±(0.6mm/s + 2.75% of measured value)
					100mm/s	mm/s	±(0.1mm/s + 0.75% of measured value)
Bandpass (ISO 7919)	HP: 1 to 10Hz (-1dB) LP: 1kHz (-1dB) 18dB/Octave (ISO 2954)	Adjustable 100ms to 100s in steps of 100ms	RMS, Peak, Peak-peak	1x Alert, 1x Danger	2000μm	μm	±(10.0μm + 1.0% of measured value)

[1] Metric and imperial units can be used; Metric units are shown only as an example.

[2] One analogue integration is possible. An additional digital integration can be done but this will result in less accuracy.

Brüel & Kjær Vibro reserves the right to change specifications without notice

Brüel & Kjær Vibro A/S
2850 Nærum – Denmark
Tel.: +45 7741 2500
Fax: +45 4580 2937
E-mail: info@bkvibro.com

Brüel & Kjær Vibro GmbH
64293 Darmstadt – Germany
Tel.: +49 (0) 6151 428 1100
Fax: +49 (0) 6151 428 1200
E-mail: info@bkvibro.de