



Vibration Monitoring System Catalogue

Every object having any movable element will generate some vibration or be exposed to some externally transmitted vibration. Such vibration will give the machinery or structures some damage fatal ones at the worst. Therefore, vibrations on the plant equipments should be observed by vibration monitoring systems always to prevent such damages or disasters.

- Contact Sensor Type Vibration Monitoring System (VM-9301) >> P03
- Signal Converter (VM-5011A) >> P05
- DC4-20 mA Output Accelerometer >> P07
- Vibration Switch (VM-90A) >> P08
- Vibration Signal Converter (VM-90D series) >> P09
- Vibration Switch (VM-90M series) >> P10
- Λ-Vibro (VM-8018-LN) >> P11
- Vibration Sensors >> P13

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*The specifications and design are subject to change without notice.

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VMM_E.

IMV CORPORATION

Selection Guide for Vibration Monitoring System

System	Contact Sensor Type Vibration Monitoring System P3	Signal Converter P5	DC4-20 mA Output Accelerometer P7	Vibration Switch P8	Vibration Signal Converter P9	Vibration Switch P10
Model	VM-9301 series 	VM-5011 series 	VP-420/VP-421/VP-422 	VM-90A 	VM-90D series 	VM-90M series 
Indicator	○	—	—	—	○	○
Alarm relay contact	1 - 2	—	—	2	1	2
Level output (DC4-20 mA)	○	○	○	○	○	○
Function changeover*	—	—	—	○	○	—
Simultaneous monitoring for plural functions	○	○	—	—	—	—

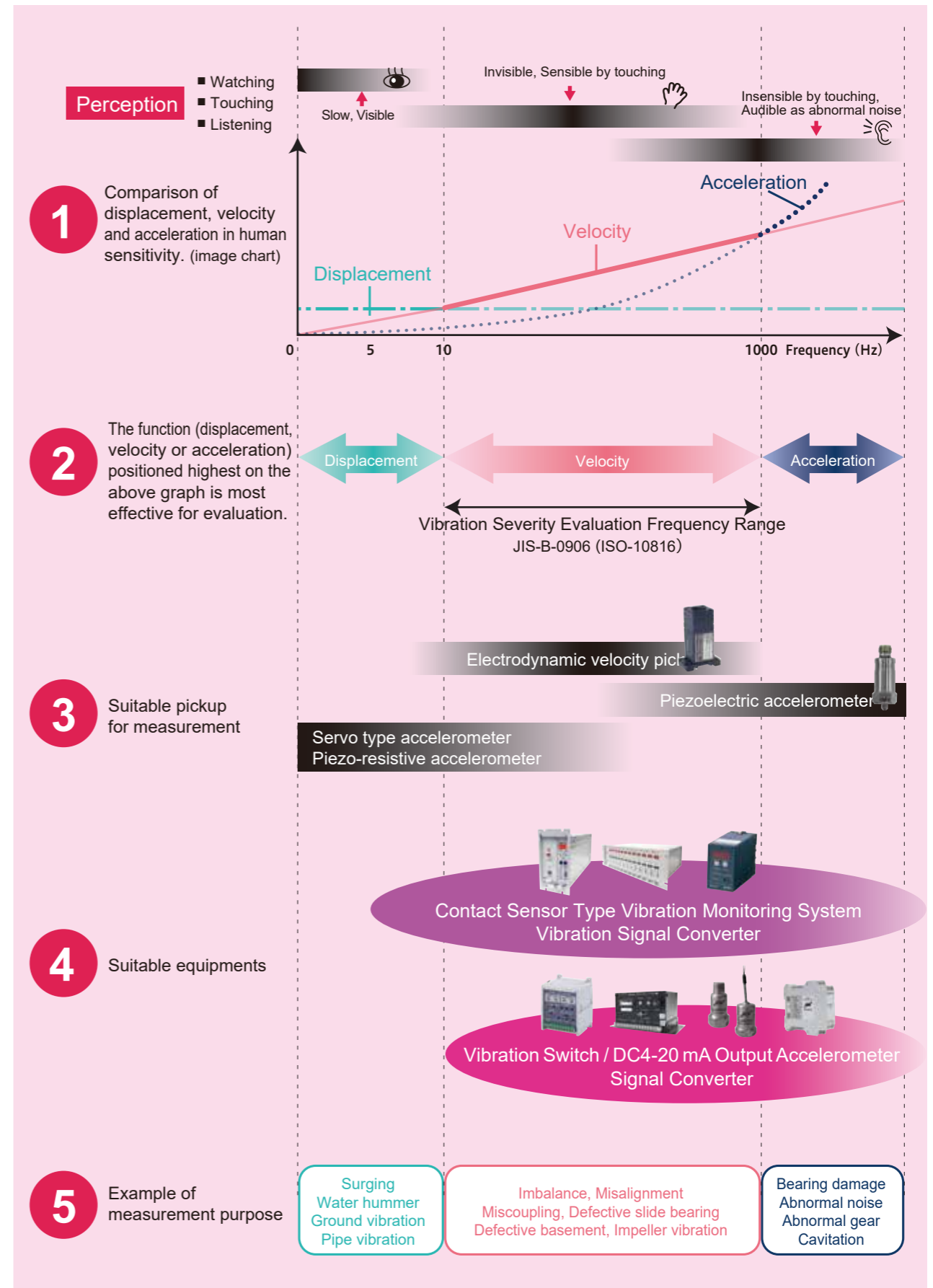
*Changeover of displacement/velocity/acceleration

Application examples



How to select vibration monitoring system

Selection of vibration monitoring systems depends on what kind of vibration you monitor. The following is classification of vibration according to human perception.



Contact Sensor Type Vibration Monitoring System

VM-9301 series

Permanent vibration monitoring for systems such as motor, pump and blower.

Monitoring system suitable for multi-channel measurement. Frequency range, measurement range or output signal can be customized.

Features

- Mixed implementation with the conventional system "VM-9201" is possible
- Wide variety of compatible sensors
- Available for multi-channel system



Type 1 channel

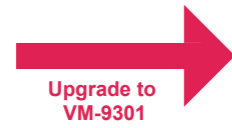


Type 12 channel

Compatible with conventional systems



Conventional system VM-9101



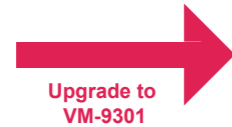
Upgrade to VM-9301

VM-9101→VM-9301

- 1 Can be replaced with half size (indicator).
- 2 Can be redesigned for use in a power station. (adding insulated analog output/arrester/cable disconnection detection function)
- 3 Sensors used with VM-9101 can be diverted.*
- 4 Cables used with VM-9101 can be diverted.*



Conventional system VM-9201



Upgrade to VM-9301

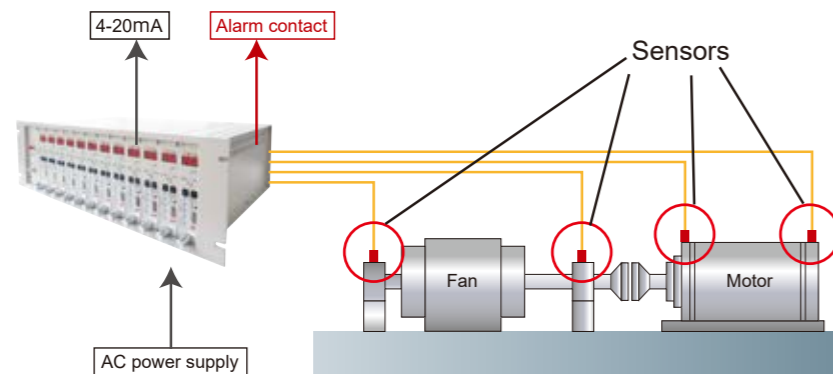
VM-9201→VM-9301

- 1 Size is exactly same, so any shape modification is unnecessary.
- 2 Renewal of internal circuit parts enables stable supply.
- 3 Sensor used with VM-9201 can be diverted.*
- 4 Cables used with VM-9201 can be diverted.*

*Please contact us if you have aged sensors or cables.

Application examples

Cables are laid out between sensors located on a large sized motor of home power generator and a monitoring system housed in a control panel. Monitoring systems can monitor vibration values and output the alarm in an emergency.



Suitable sensors

Selectable from electrodynamic velocity sensor or piezoelectric sensor.

Electrodynamic velocity sensor Specialized in medium frequency (up to 1,000 Hz) vibration detection. Suitable to velocity monitoring.

Feature	General-purpose type	2-axis	3-axis	Flame-proof	For low rotation	For low rotation/Flame-proof
Type	VP-3144 C/D	VP-3354 A	VP-3364 A	VP-3134 AEX	VP-3213 AC/AD	VP-3133 HEX/VEX
Sensitivity	10 mV/ (mm/s)	10 mV/ (mm/s)	10 mV/ (mm/s)	10 mV/ (mm/s)	17.5 mV/ (mm/s)	17.5 mV/ (mm/s)
Frequency Range	10 to 1,000 Hz	10 to 500 Hz	10 to 500 Hz	10 to 500 Hz	5 to 500 Hz	5 to 500 Hz
Natural frequency	14 Hz	14 Hz	14 Hz	14 Hz	4.5 Hz	4.5 Hz
Operating temperature range	-20 to +80°C	-20 to +80°C	-20 to +80°C	-20 to +70°C	-20 to +70°C	-20 to +70°C
Structure	Drip-proof (Equivalent to IP32)	Water-proof (Equivalent to IP66)	Water-proof (Equivalent to IP66)	Flame-proof (EX d II BT4Gb)	Drip-proof (Equivalent to IP32)	Flame-proof (EX d II BT4Gb)
Outward appearance						
Notes	—	—	—	—	Horizontal only	H (horizontal only), V (vertical only)

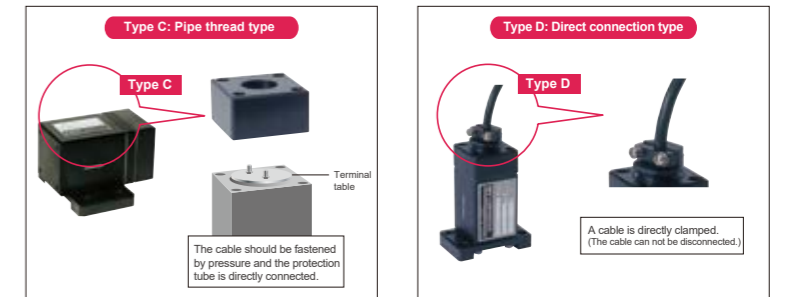
*Other sensors for high temperature or waterproof are also available. Please contact us for details.

Piezoelectric sensor Specialized in high frequency (over 1,000 Hz) vibration detection. Suitable to acceleration monitoring.

Feature	General-purpose type	Flame-proof
Type	VP-A52IW	HS-100I
Sensitivity	5 mV/ (m/s ²)	50mV/G
Frequency Range	3 to 10,000 Hz	2 to 10,000 Hz
Natural frequency	35,000 Hz	24,000 Hz
Operating temperature range	-30 to +110°C	-20 to +80°C
Structure	Isolated/Water-proof	Safe and explosion proof (Ex ia IIC T4 Gb)
Outward appearance		
Notes		Use as a set with MTL7728

*Other sensors for high temperature or waterproof are also available. Please contact us.

The difference between C and D is the shape of cable connection.



Specifications

Type	VM-9301 series	VM-9301A series
Sensor	Electrodynamic velocity sensor	Piezoelectric sensor
Amplifier unit type	Type 1 line: VA-9301(1-1) Select velocity or displacement Type 2 line: VA-9301(2-1) Simultaneous measurement of velocity and displacement	Type 1 line: VA-9301A (1-1) Select acceleration, velocity or displacement Type 2 line: VA-9301A (2-1) Simultaneous measurement of any two of acceleration, velocity or displacement
Frequency range	Low: 5 to 500 Hz (-11 to +6%) Medium: 10 to 500 Hz (-11 to +6%) Filter selectable (pass band) High-pass filter: 5, 10, 15, 20, 50, 100 Hz Low-pass filter: 20, 50, 100, 200, 500 Hz	5 to 10 kHz (-30 to +6%) Filter selectable (pass band) High-pass filter: 5, 10, 20, 50, 100 Hz Low-pass filter: 100, 200, 500, 1k, 5k, 10 kHz (High-pass filter: 20 Hz in case of displacement or velocity Low-pass filter: 500 Hz in case of displacement, -1 kHz in case of velocity)
Measurement range	Displacement: 50, 100, 150, 200, 300, 500, 999 (1000) μmP-P Velocity: 10, 15, 20, 30, 50 mm/s Acceleration: —	100, 150, 200, 300, 500, 999 (1000) μmP-P 10, 15, 20, 30, 50 mm/s 10, 15, 20, 30, 50, 100, 150, 200, 300, 500 m/s ²
Equipment failure	Indication lamp: Orange LED located on the upper part of amplifier front panel (FAT) Alarm contact: 1a contact (open at normal condition) operate under fuse melting, power switch shut off and primary / secondary power failure Alarm reset: Select from automatic or manual recovery	Indication lamp: Green LED located on the upper part of amplifier front panel (PU) Lights-out when wire is broken (lights-on at normal condition) (When pickup connected with charge amplifier is used, this function is not valid.) Alarm contact: Standard: 1a contact *available 1b or 1c (open at normal condition, closed when wire is broken) operate when pickup cable is broken. Alarm reset: Select from automatic or manual reset
Pickup cable break alarm	Alarm step: Type 1 line: upper limit 2 steps Alarm (ALM) / Trip (TRP) Type 2 line: upper limit 1 step Alarm1 (ALM1, 1line), Alarm2 (ALM2, 2line)	Delay timer: Select from 0 to 15 sec. by the slide switch inside of the amplifier unit (0 sec. if not specified.) Setting range: 5.0 to 99.9% (can be set at 0.1% step) (When alarm function is not used 99.9% is set. Indication lamp and contact is on at over fullscale value)
Alarm	Indication lamp: Type 1 line: Orange LED [ALM], red LED [TRP] Type 2 line: Orange LED [ALM1], red LED [ALM2] Alarm contact: Select from "ALM/ALM1 circuit: 2a contact TRP/ALM2 circuit 2a contact" or "ALM/ALM1 circuit: 1b1a contact TRP/ALM2 circuit 1a1b contact" Contact capacity: AC110 V 2 A (DSP Relay made by Panasonic) DC30 V 0.2 A Alarm reset: Select from automatic (Hysteresis 3%) or manual reset	Indication lamp: — Alarm contact: — Contact capacity: — Alarm reset: —

Type	VM-9301 series	VM-9301A series
Rectified level output	DC output 1: Select from DC4-20 mA (insulation output), Loading 500 Ω or less or DC1-5 V (insulation output), Loading 100 kΩ or more DC output 2: Select from DC4-20 mA (insulation output), Loading 500 Ω or less or DC1-5 V (insulation output), Loading 100 kΩ or more	DC output 1: Select from DC4-20 mA (insulation output), Loading 500 Ω or less or DC1-5 V (insulation output), Loading 100 kΩ or more DC output 2: Select from DC4-20 mA (insulation output), Loading 500 Ω or less or DC1-5 V (insulation output), Loading 100 kΩ or more
Waveform output	Pickup waveform output: AC±10 mV/(mm/s) or AC±17.5 mV/(mm/s), Loading 100 kΩ or more Waveform output: AC±5 mV/(m/s ²), Loading 100 kΩ or more AC±5 V (at the full-scale), Loading 100 kΩ or more	AC±10 mV/(mm/s) or AC±17.5 mV/(mm/s), Loading 100 kΩ or more AC±5 mV/(m/s ²), Loading 100 kΩ or more AC±5 V (at the full-scale), Loading 100 kΩ or more
Panel meter	Red LED three-digit indication, [9.9.9] is displayed at over 120% of full-scale	Red LED three-digit indication, [9.9.9] is displayed at over 120% of full-scale
Operating temperature range	0 to 50°C, 20 to 95% RH, wet bulb temperature is 35°C (non-condensing)	0 to 50°C, 20 to 95% RH, wet bulb temperature is 35°C (non-condensing)
Power supply	Available range AC 85 to 264 V, 47 to 66 Hz	Available range AC 85 to 264 V, 47 to 66 Hz
Power consumption	20 VA or less (1 ch), 30 VA or less (3 ch), 45 VA or less (6 ch), 60 VA or less (9 ch), 75 VA or less (12 ch) At AC100V (Depends on the number of amplifier or power supply)	20 VA or less (1 ch), 30 VA or less (3 ch), 45 VA or less (6 ch), 60 VA or less (9 ch), 75 VA or less (12 ch) At AC100V (Depends on the number of amplifier or power supply)
Painting color	Munsell 5Y7/1, half matted	Munsell 5Y7/1, half matted
Mass	Approx. 2.0 kg (1 ch), approx. 3.9 kg (3 ch), approx. 5.9 kg (6 ch), approx. 8.2 kg (9 ch), approx. 10.2kg (12 ch)	Approx. 2.0 kg (1 ch), approx. 3.9 kg (3 ch), approx. 5.9 kg (6 ch), approx. 8.2 kg (9 ch), approx. 10.2kg (12 ch)

Dimension	A	B	C	D	E	F	G	H	I
Channel									
Type 1 channel	90	170	300	88	132	90	148	162	50
Type 3 channel	210	149	300	160	132	180	143	100	195
Type 6 channel	300	149	300	250	132	270	143	100	285
Type 9 channel	390	149	300	340	132	360	143	100	375
Type 12 channel	480	149	300	430	132	450	143	100	465

Unit: mm

Signal Converter

VM-5011 series

Slim type vibration transducer

It can output 4-20 mA DC current and 0-10 V DC voltage. This converter is suitable for measuring vibration of thousands of equipment.

Features

- Low cost and compact size
- Changeover type for measurement mode and range
- Simultaneous output of envelope acceleration and velocity
- Vibration waveform output can be used for frequency analysis
- Vibration level output (DC4-20 mA)

VM-5011A (Envelope acceleration/velocity Output type)
VM-5011B (Acceleration/Velocity Output type)



VP-100

Function

Converter for connecting to PLC

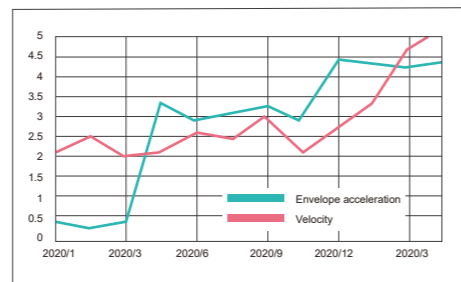
The signal converter (VM-5011A) is a converter that converts the output signal of the vibration sensor. It is also possible to connect to a PLC that cannot be directly connected to the vibration sensor. In addition to PLC, any device that can take in current (4-20 mA) or voltage (0-10 V) can be connected.



VM5011A connection example

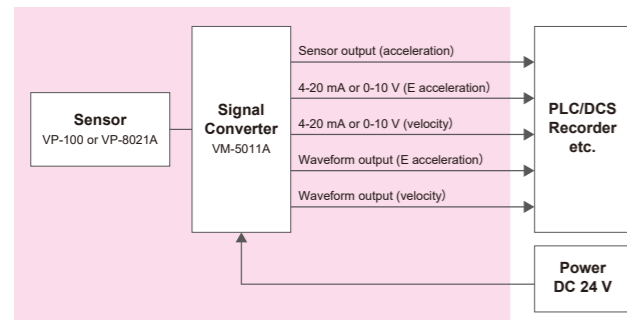
Conversion to envelope acceleration and velocity

The VM-5011 can calculate and output the signal of the vibration sensor to the acceleration and velocity.
Envelope Acceleration: Effective for bearing diagnosis
Velocity: Effective for detecting imbalance and misalignment

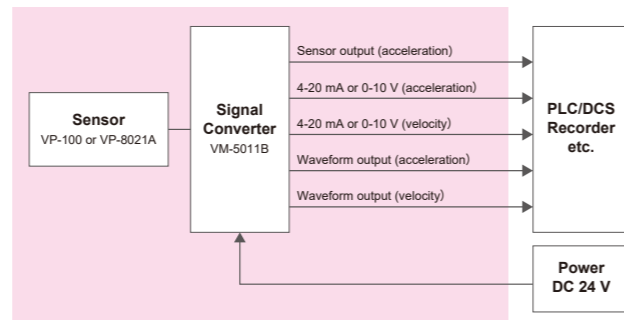


System composition

VM-5011A (Envelope acceleration/velocity Output type)



VM-5011B (Acceleration/Velocity Output type)



Suitable sensors

Model	VP-100 (standard)	VP-100R (Oil and water resistant type)
Sensor type	Piezoelectric Compression type (Built-in pre-amplifier)	
Resonance frequency	22 kHz or more	
Frequency range	2 Hz to 10 kHz	
Acceleration sensitivity	100 mV/g	
Shock resistant	5000 g	
Maximum measurement acceleration	±80 g	
Sensor drive current	0.5 to 8 mA (DC18 to 30 V)	
Output impedance	Maximum 200 Ω	
Operating temperature range	-55 to 140°C	-30 to 90°C
Protection grade	IP65	IP68
Mass	Approx. 125 g (Cable not included)	
Material	SUS303	
Mounting method	M6Screw fixing	
Cable material	SUS Braided cable	PUR
Standard cable length	5 m	
Maximum cable length	200 m	

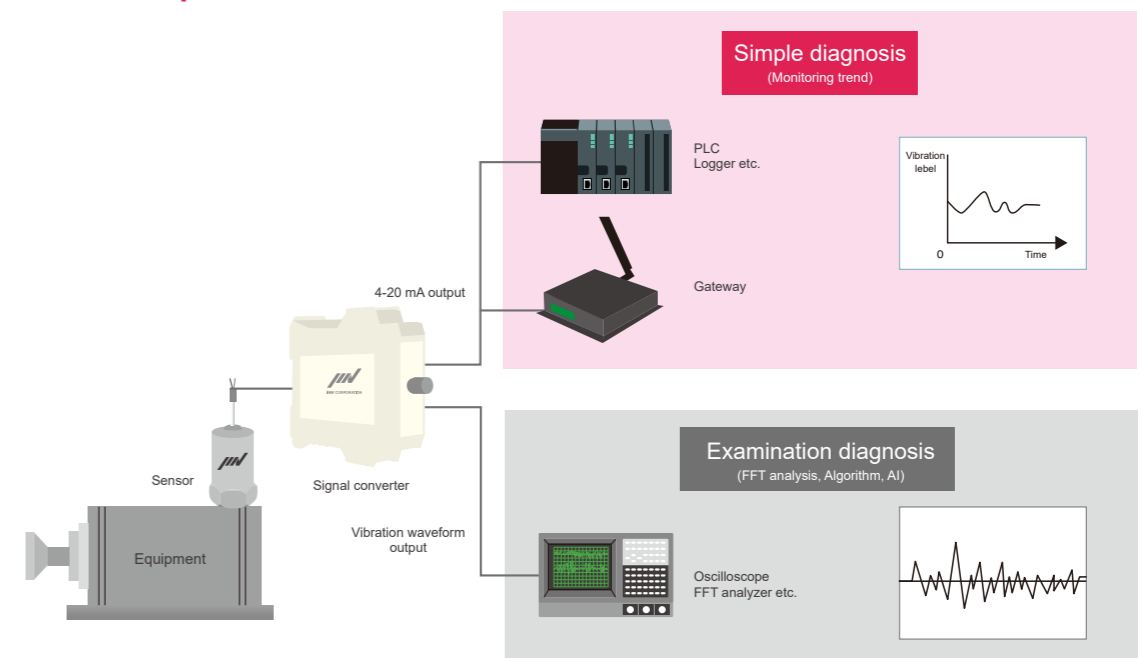
Model	VP-8021A
Sensor type	Base insulated voltage drive type
Acceleration sensitivity	3.9 mV/(m/s ²) ±5%
Vibration frequency response	20 Hz to 3 kHz ±1 dB 10 Hz to 8 kHz ±3 dB 10 Hz to 10 kHz ±4 dB
Operating temperature range	-30°C to +120°C
Sensitivity change due to temperature	±3% 25°C standard
IEPE power supply	3.5 mA Maximum 24 V
Note	Standard type



VP-100

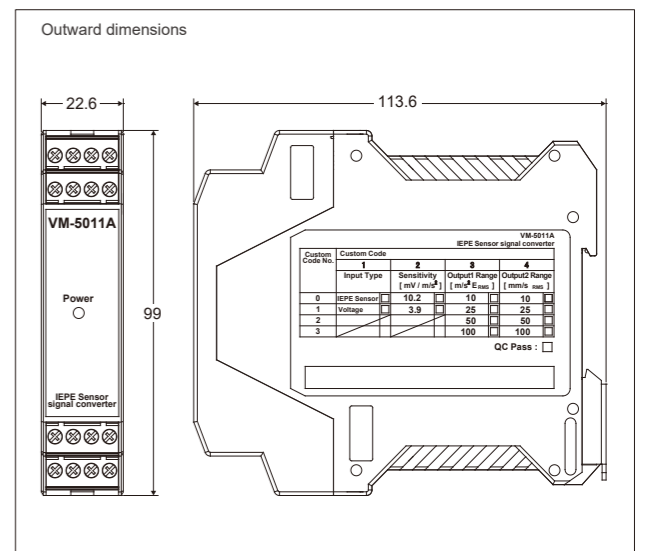
VP-8021A

Connection Example



Specifications

Model	VM-5011A	VM-5011B
type	Envelope acceleration/velocity Output type	Acceleration/Velocity Output type
Input range	0 to 500 m/s ²	
Measuring range of frequency	Acceleration	10 Hz ~ 10 kHz
	Velocity	10 Hz to 1 kHz
Measuring range	Envelope acceleration	10/25/50/100 m/s ² E rms
	Velocity	10/25/50/100 mm/s rms
DC output	Acceleration	4-20 mA or DC0-10 V
	Velocity	4-20 mA or DC0-10 V
AC output	Acceleration	0-1 Vrms
	Velocity	0-1 Vrms
Sensor waveform output	Depends on sensor voltage sensitivity	
Operating temperature/humidity range	0 ~ 50°C, 95% RH or less (without freezing or condensing)	
Power supply of converter	DC24 V ±10%	
Size	22.6 (W) x 99 (H) x 113.6 (D) mm (Excluding protrusions)	
Mass	Approx. 150 g	



DC4 - 20 mA Output Accelerometer

VP-420/VP-421/VP-422

No amplifier unit required

Measurements of acceleration or velocity are provided for easy monitoring of abnormality on bearings or imbalance.

Features

- Small size, light weight
- Eliminate necessity of alarm controllers
- Wide variety of lineup corresponding to various field environment
- Choice of studs for easy setup



Vibration Switch

VM-90A

Compact popular type

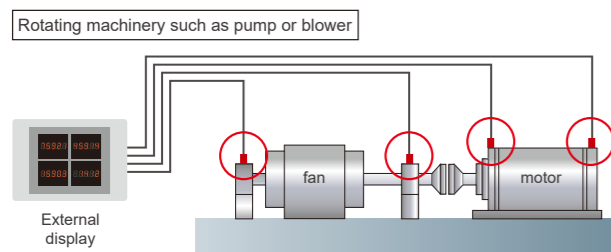
A popular vibration monitor specialized in low cost and control function. It is suitable for automatic control when abnormal vibration occurs.

Features

- Low cost
- Changeover type for measurement mode and range
- Two step alarm setting, level outputs available
- Applicable with intrinsic safety proof pickups

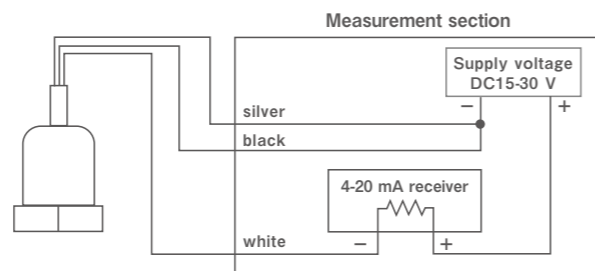


Application example

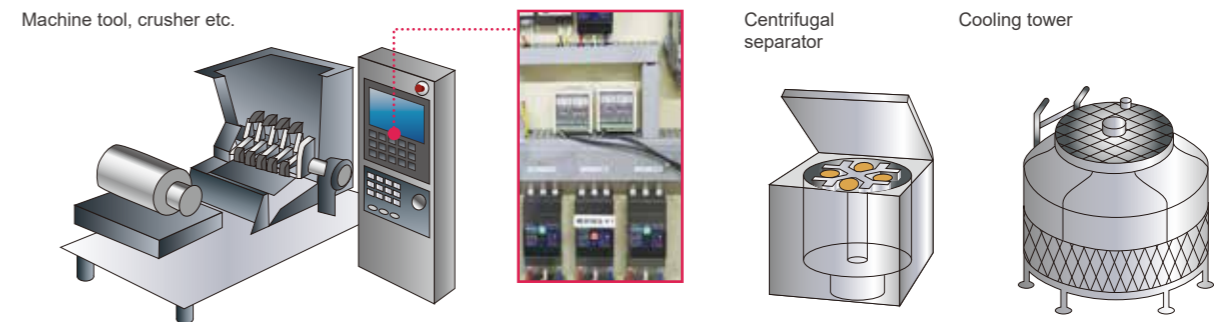


By direct connection of sensor cables to external displays, trend monitoring is available.

Basic connection example (common for all types)



Application example



Stop operation in case of abnormality installed on or inside machine tools or crushers etc.

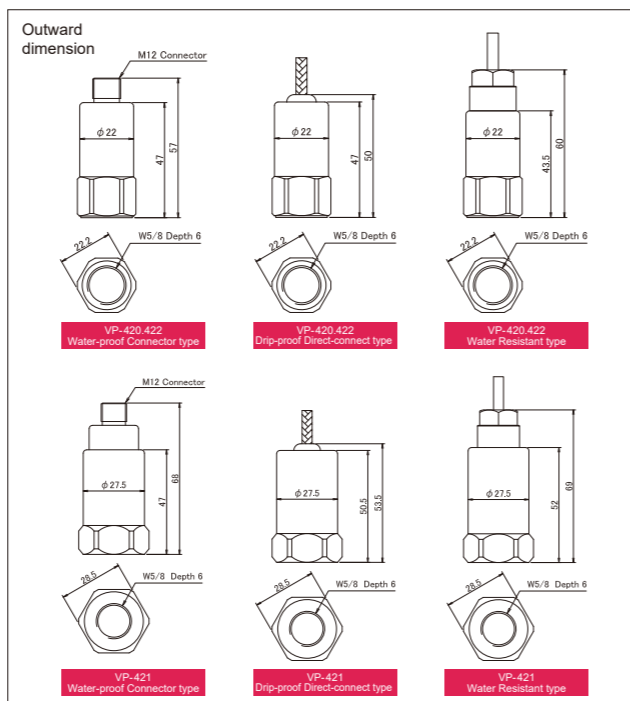
Specifications

Item	Velocity (current output) VP-420	Velocity (current output) + Acceleration waveform (voltage output) VP-421	Acceleration (current output) VP-422
Frequency range	10 Hz to 1 kHz ±5% (ISO10816)	10 Hz to 1 kHz ±5% (ISO10816)	10 Hz to 5 kHz ±3 dB
Measurement range	10, 20, 25, 50, 100 mm/s rms	10, 20, 25 mm/s rms	9.8, 19.6, 49, 98, 980 m/s ² rms
Output sensitivity	4 - 20 mA/0 - full scale	4 - 20 mA/0 - full scale Acceleration waveform: 12 mV / (m/s ²)	4 - 20 mA/0 - full scale
Voltage supply	DC15 to 30 V, 30mA or more		
Warm-up time	Approx. 30 seconds		
Output impedance	DC24 V, maximum 600 Ω		
Insulation resistance	DC500 V, 100 MΩ or less		
Operating temperature range	-25 to 90°C		
Cable length	Standard 5 m (1,000 m)		
Mass	Approx. 140g to 120g (Cable is not included)		
Protection structure	Drop-proof direct connection cable type: IP65 (dust-proof, drop-proof) Waterproof connector type: IP67 (dust-proof, waterproof) Water resistant type: IP68 (dust-proof, perfect waterproof: water depth 100 m, 10 bar)		

Please inform us requested full scale value and cable length. Acceleration output + acceleration waveform output type is also available.

Option

Model	MS-AS001	MS-AS002	MS-AS003	MS-AM005	MS-AC011-5
Item	Quick fit (glue stud)	Quick fit (M8 male)	Quick fit (M6 male)	Quick fit (magnet)	Connector cable 5 m applied to water proof type
Image					



Specifications

Item	Specification
Frequency range	Acceleration 8 Hz to 8 kHz, -3 dB (10 Hz to 5 kHz, ±1dB)
	Velocity 10 Hz to 1 kHz, ±1.5 dB
	Displacement 10 Hz to 300 Hz, ±1.5 dB
Measurement range	Acceleration 10, 100 m/s ²
	Velocity 10, 100 mm/s rms
	Displacement 100, 1,000 μmp-p
Alarm output	Individual level setting (upper 2 steps): 10 to 100% Individual 1c contact: maximum capacity DC30 V, 1A Delay time setting: 1 to 10 seconds Automatic reset
Level output	DC4 - 20 mA (maximum load resistance 300 Ω)
Monitor output	AC3 VP-P full scale DC2 V full scale
Power supply	AC100 V±10 V, 47 to 63 Hz
Power consumption	4 VA or smaller
Operating temperature / humidity range	0 to +50°C, 35 to 95% RH (non-condensing)
Mass / Size	74 (W) × 72 (D) × 90 (H) mm/approx. 250 g

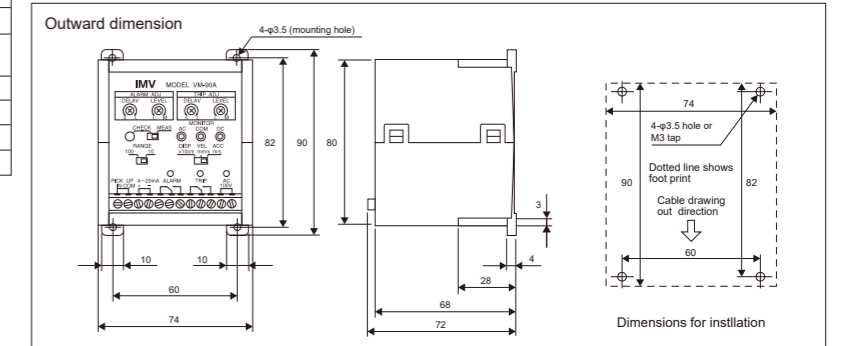
Standard composition

Item	Notes
Sensor (VP-A52IW)	Piezoelectric sensor (see page 22)
Sensor cable	5 m long cable with a pick up connector and waterproof cap
Standard accessories	<ul style="list-style-type: none"> • screw for pickup attachment M6, hexagonal hole • hex key wrench • sems screw for main body installation • instruction manual (with test certification)

Other lengths available on request. (Maximum length is 200m) Please refer to page 25 about the cable length.

Option

Item	Notes
Mechanical filter (MCF-6)	Prevention of incorrect operation on displacement / velocity measurement. Elimination of high frequency component.



Vibration Signal Converter

VM-90D series

Entry level model for vibration monitoring

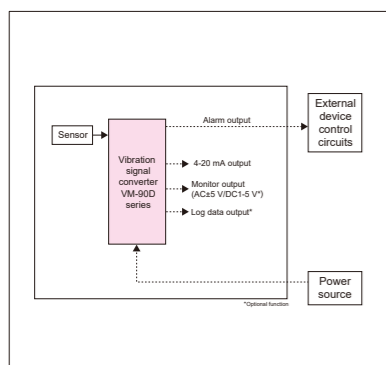
A standard monitoring device which has the standard functions, such as indication of vibration value, signal output and alarm contact output.

Features

- Low price
- Compact size
- Changeover type for measurement mode and range



System composition



Suitable sensors

Type	VP-3144C/D	VP-3213AC/AD (Horizontal only)	VP-3223AC/AD (Vertical only)	VP-A52IW	HS-100I
Sensor type	Electrodynamic velocity type			Piezoelectric accelerometer	
Sensitivity	10 mV/ (mm/s)	17.5 mV/ (mm/s)		5 mV/ (m/s ²)	50mV/G
Natural frequency	14 Hz	4.5 Hz		35,000 Hz	24,000 Hz
Operating temperature range	-20 to +80°C	-20 to +70°C		-30 to +110°C	-20 to +80°C
Structure	Drop-proof (Equivalent to IP32)			Isolated/Water-proof	Safe and explosion proof (Ex ia I C T4 Ga)
Outward appearance					
Notes	Suitable for monitoring of medium frequency displacement or velocity	Suitable for monitoring of low frequency displacement or velocity		Suitable for monitoring of acceleration	Insulated

*Other sensors for high temperature or waterproof are also available. Please contact us for details.

Specifications

Item	Specification
Signal output	Conversion output DC4-20 mA, 1 output (response time 3 seconds)*1 Monitor output AC ±5 V, FS ± 5% (For quick check)*3 DC 1 to 5 V, FS ± 5% (Option)
Alarm output	Alarm contact 1 step 1a contact, AC 125 V to 0.5 A, DC 30 V to 1A (resistive load) Alarm setting range 0 to 100% of full scale arbitrary setting (in 1% step)*2 Alarm action Operation that activates when time passes alarm delay time after vibration level exceeds alarm set level. (automatic reset) Initial alarm delay time setting 5 sec. (3 - 99 sec.: 1 sec. step)
Indication function	Main body Red 7 segment LED (4 digit indication) Indicator Vibration value: 5-step switching indication depends on the setting mode Blink for 120% over range full scale Alarm setting value (%): 0 to 100 for full scale*2 Pickup sensitivity value (%): 80 to 120 for standard sensitivity
Operating temperature range	-5 to +55°C 30 to 90% RH (Non-condensing)
Power supply	AC100 V ± 10% 50/60 Hz ± 2 Hz
Power consumption	Less than 10 VA
Mounting	On the wall or Din rail (Din rail connector is detachable)
Terminal board	M3.5 screw on the back panel
Material	Plastic
Size/Mass	50 (W) × 127 (D) × 80 (H) mm/Approx. 300 g

*1 Can be changed by the customized software *2 Setting at 0% disable a alarm function *3 Only for quick check of waveform

▶ VM-90DA (Applicable to pre-amplifier build-in type sensor) (VP-A52IW, HS-100I)

Measurement mode	Item	Specifications
Acceleration*5	Measurement range	10, 20, 50, 100, 200 (m/s ² rms)
	Frequency range	10 to 4 kHz ± 1 dB, 10 to 10 kHz, +1 dB, -3 dB
Velocity*5	Measurement range	5, 10, 20, 50, 100, (mm/s rms)
	Frequency range	10 to 1 kHz ± 1 dB, -2 dB
H function*5	Measurement range	10, 20, 50, 100, 200 (m/s ² rms)
	Frequency range	DC to 1 kHz (Envelope detection of 2 kHz to 15 kHz)
H function CF*5	Measurement range	5, 10, 20, 50, 100
	Frequency range	DC to 1 kHz (for peak/rms of H function)

▶ VM-90DV (Applicable to medium frequency sensor) (VP-3144C/D)

Measurement mode	Item	Specifications
Velocity*5	Measurement range	5, 10, 20, 50, 100 (mm/s rms)
	Frequency range	10 to 1 kHz ± 1 dB
Displacement*5	Measurement range	50, 100, 200, 500, 1,000 (µm-p)
	Frequency range	10 to 500 Hz ± 1 dB

▶ VM-90DVL (Applicable to low frequency sensor) (VP-3123AC/AD, VP-3223AC/AD)

Measurement mode	Item	Specifications
Velocity*5	Measurement range	5, 10, 20, 50, 100 (mm/s rms)
	Frequency range	5 to 500 Hz ± 1 dB
Displacement*5	Measurement range	50, 100, 200, 500, 1,000 (µm-p)
	Frequency range	5 to 500 Hz ± 1 dB

*5 Measurement mode is switchable by the switch on the front panel. Measurable up to 20% of range over. Error is 1% or less.

Vibration Switch

VM-90M series

Analog type which has lots of achieved hazard prevention

Widely used and long-selling device.

Features

- Corresponds to all kinds of sensor
- Easy installation : stationary, panel housed or wall-mounted
- Customizable power supply, alarm delay time and so on



VM-90MEV

Suitable sensors

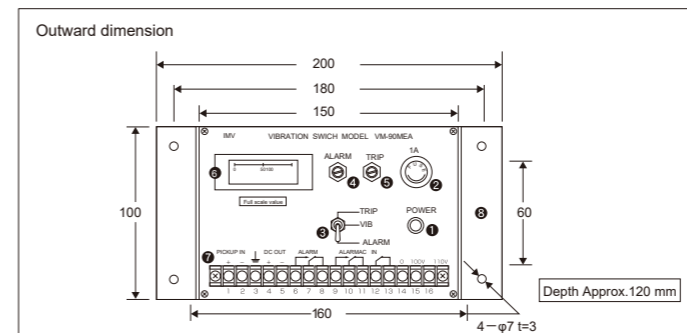
Type	VP-3144C/D	VP-3213AC/AD (Horizontal only)	VP-3223AC/AD (Vertical only)	VP-A52IW	VP-3133 HEX/VEV	VP-3134 AEX
Sensor type	Electrodynamic velocity type			Piezoelectric accelerometer		
Sensitivity	10 mV/ (mm/s)	17.5 mV/ (mm/s)		5 mV/(m/s ²)	Electrodynamic velocity type	
Natural frequency	14 Hz	4.5 Hz		35,000 Hz	4.5 Hz	14 Hz
Operating temperature range	-20 to +80°C	-20 to +70°C		-30 to +110°C	-20 to +70°C	
Structure	Drop-proof (Equivalent to IP32)			Isolated/Water-proof	Flame-proof (EX d II BT4Gb)	
Outward appearance						
Notes	Suitable for monitoring of medium frequency displacement or velocity	Suitable for monitoring of low frequency displacement or velocity		Suitable for monitoring of acceleration	Suitable for monitoring of low frequency displacement or velocity	Suitable for monitoring of medium frequency displacement or velocity

*Another sensor for high temperature or waterproof are also available. Please contact us for details.

Specifications

Type	Monitor for displacement	Monitor for velocity	Monitor for acceleration
	VM-90 MED	VM-90 MEV	VM-90 MEA
Frequency range	15 to 500 Hz -3 dB, +0.5 dB 20 to 500 Hz ± 0.5 dB	15 to 1,000 Hz -3 dB, +1 dB 20 to 850 Hz ± 1 dB	10 to 8,000 Hz ± 3 dB 20 to 5,000 Hz ± 1 dB
Measurement range (full scale)*1	Select from 0 to 20 µm-p, 0 to 50 µm-p, 0 to 100 µm-p, 0 to 200 µm-p, 0 to 500 µm-p	Select from 0 to 1 mm/s, 0 to 2 mm/s, 0 to 5 mm/s, 0 to 10 mm/s, 0 to 20 mm/s, 0 to 50 mm/s	Select from 0 to 1m/s ² , 0 to 2m/s ² , 0 to 5 m/s ² , 0 to 10 m/s ² , 0 to 20m/s ² , 0 to 50m/s ² , 0 to 100 m/s ²
Alarm step	2 steps		
DC output (for recorder)	4 to 20 mA (at the load 0 to 300 Ω) 1 to 5 V (100 kΩ or more, 250 Ω connection to outside)		
Alarm action	Activated over alarm setting value (time constant: approx. 3 seconds)		
Alarm setting range	Possible to set 10 to 100% of full scale		
Alarm contact	1C contact for each alarm		
Alarm contact capacity	AC250 V 3.0A/DC24 V, 3.0 A (at resistive load)		
Alarm reset	Automatic		
Operating temperature / humidity range	0 to 50°C 0 to 85% RH (Non-condensing)		
Power supply	AC100 V or 110 V *2 (+10%/ -15%), 50/60 Hz		
Power consumption	15 VA or less		
Size / Mass	200 (W) × 103 (D) × 105 (H) mm (excluding connectors etc.)/2 kg		

*1 Please inform us the measurement range *2 AC 200/220 V is optional



Λ-Vibro

VM-8018-UT

For recording valuable vibration data!

Generate vibration diagnosis and analysis results in CSV format files. We support the construction of a full-fledged condition monitoring system using IoT.

Features

- Vibration analysis by edge computing
- Simultaneous measurement and recording of waveforms, FFT, and OA (trend) at arbitrary intervals
- Supports various sensor inputs
- Vibration measurement by external trigger/time reservation



Λ-Vibro

Features

Supports various sensor

In addition to the general acceleration sensor for rotating machinery (VP-100M), it also supports the sensor for low-speed rotating machinery (VP-8013) and voltage input, and can capture parameters other than vibration.

Data storage suitable for diagnosis

Acceleration, velocity, displacement, and envelope acceleration Peak/rms values are periodically saved to a file. FFT and acceleration waveforms are also sampled at a maximum sampling rate of 51.2 kHz to record detailed data.

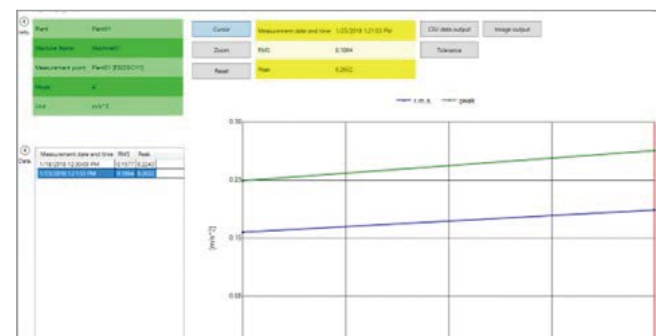
Easy data access

Uses Linux as the OS. Folders and files in Lambda Vibro can be accessed from the same network. The file is in CSV format, so you can check the data directly.

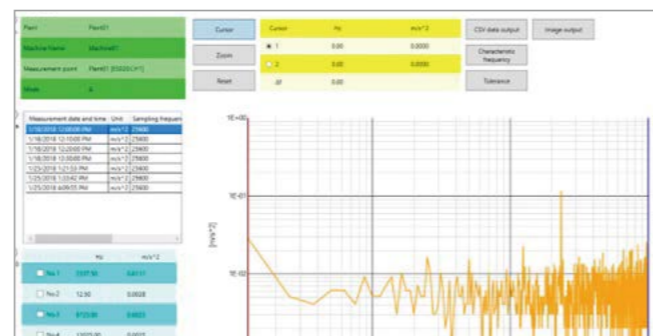
Option Database software DS-8018

Manually captures and organizes data from multiple lambda vibros to support trend management and precise diagnosis.

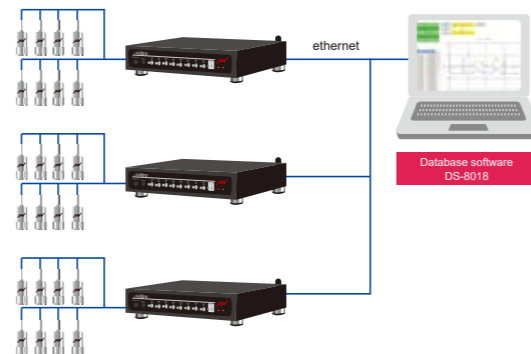
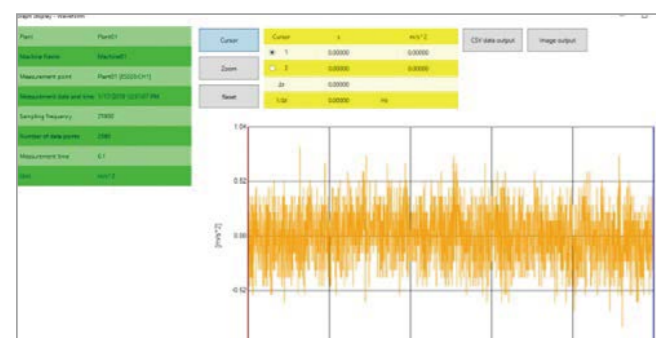
OA



FFT



Waveform

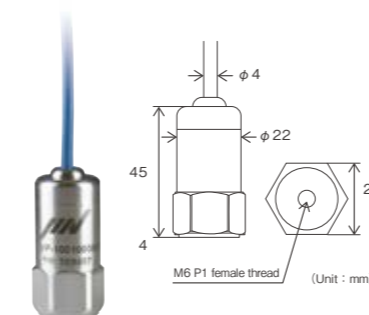


Suitable sensors

For general rotating machinery

Piezoelectric sensor (Built-in pre-amplifier type) VP-100M

High-cost performance and easy adaptation



Specifications

Item	Micro BNC Type
Detection method	Piezoelectric compression type (with built-in preamplifier)
resonant frequency	Above 22 kHz
Frequency Range	2Hz to 10 kHz
Voltage sensitivity	100 mV/g
Impact-resistant	5000 g
Max. measured acceleration	±80 g
Pickup drive current	0.5 to 8 mA(DC18 to 30 V)
Output impedance	200 Ω max.
Operating temperature range	-55 to 140°C
Protection class	IP65
Mass	Approx. 125 g (excluding cable)
Material	SUS303
Mounting method	M6 screw fixing
Standard cable length	5 m
Max. cable length	200 m

- Please contact us for waterproof and oil-resistant versions
- Choose from the following two mounting magnets
 - Mounting magnet (non-insulated) MH-205R
 - Mounting magnet (non-insulated/for curve surface) MH-206R

For low-speed rotating machinery

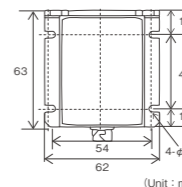
Broad Motion Sensor VP-8013M

Covers ultra-low acceleration up to high-frequency mechanical vibration.



Specifications

Item	VP-8013M
Measurement direction	3 axis
Measurement frequency range	0.1 to 1,000Hz
Maximum acceleration	±58.8m / s ²
Sensitivity	44.9mV/(m/s ²)
Sensitivity error	±10%
Cross-axis sensitivity	Less than ± 2%
Output noise	XY:0.00294(m/s ²)/√Hz level, Z:0.0049(m/s ²)/√Hz level
Shock durability	10,000 m/s ²
Protection rating	IP67
Operational temperature range	-10°C to +60°C (non-condensing)
Mass	Approx. 230g

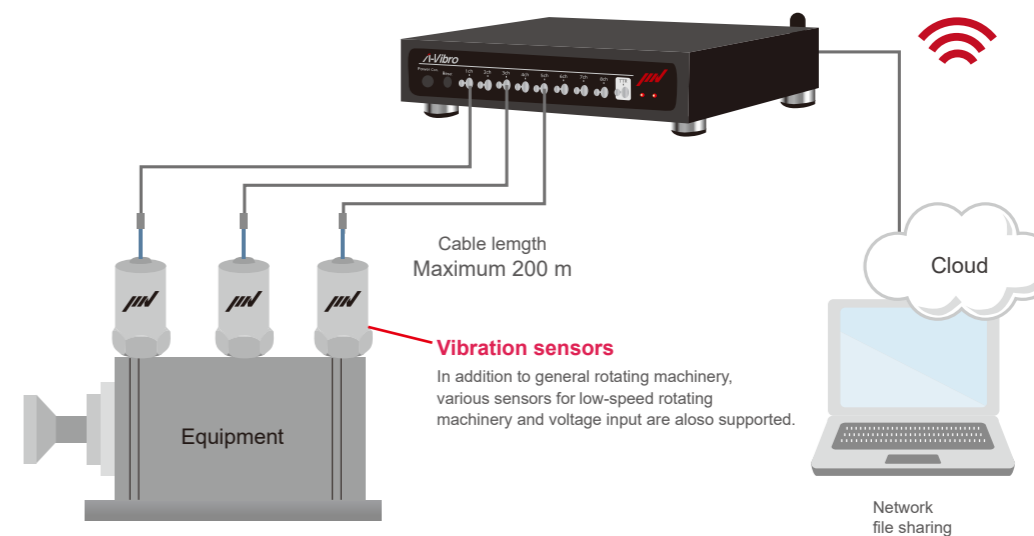


Option

Item	Model	Notes
Output BNC cable 3 pcs.	CXC-N-PPRG-1.5/3	Connector with BNC plug on both ends / 1.5 m
Output BNC cable	CXC-N-PPRG-1.5	BNC connector on both ends / 1.5 m
Output cable	CO-1970	Connector with BNC and alligator clip / 1.5 m
Water-proof long cable	CB-X013-10	10 m, separately quotation for longer cable
Magnet	YA1870	Fixable only in longitudinal direction
Magnet (2 pcs/set)	YA1870/2	Vibration analysis application

*Please contact us for further details.

System composition



Specifications

Item	VM-8018-UT
Analog channel	8 ch (Maximum ± 15 V)
Sampling resolution	16 Bit (Serial type)
Sampling frequency	400 Hz – 51.2 kHz (Supports simultaneous sampling)
Connected sensor	VP-100M, VP-8021C, VP-8013
ICP output current	3.5 mA/24 V
Trigger channel	1 ch (input) Maximum 24 V
Channel terminal shape	HD-BNC (MicroBNC)
Function port	USB2.0 typeB (Host mode) Wired LAN (file sharing)
Wireless connectivity	WLAN 802.11 b/g/n (file sharing)
Installed OS	Linux4.14.96 (linaro-alip)
LED display	red green, orange blue(2LED)
Power supply	AC100 – 240 V (AC adapter)
Size/Mass	63 (H) × 250 (W) × 210 (D) mm/2.5 kg (excluding connectors etc.)
Operating temperature range	-10 – 50°C
Storage capacity	32GB

Measurement specifications

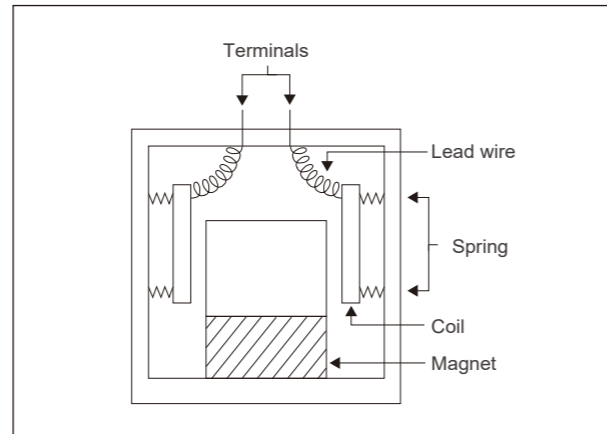
Item	VM-8018-UT
Measurement object	Acceleration: m/s ² , gal, G Velocity (calculated value): mm/s Displacement (calculated value): μm Voltage: V, mV
Sampling rate	51200sps, 25600sps, 12800sps, 10240sps, 6400sps, 5120sps, 3200sps, 2560sps, 2048sps, 1600sps, 1280sps, 1024sps, 800sps, 640sps, 512sps, 400sps
Voltage range	±2.56 V, ±5.12 V, ±10.24 V, ±20.48 V (Measurement range is ±15V.)
Measurement time	0.1 s – 20.0 s
Trigger	Measurement start by external trigger and reserved trigger

Vibration Sensors

Electrodynamic velocity sensor

Principle of reciprocal pendulum type sensor is to induce voltage by reciprocal motion of the seismic mass with a coil in the magnetic field being suspended by a diaphragm or coil spring. Because of its high sensitivity and advanced linearity, it is suitable for detection of malfunction or deterioration of rotational machineries. Due to its structure, mounting should be done carefully for its direction or angle.

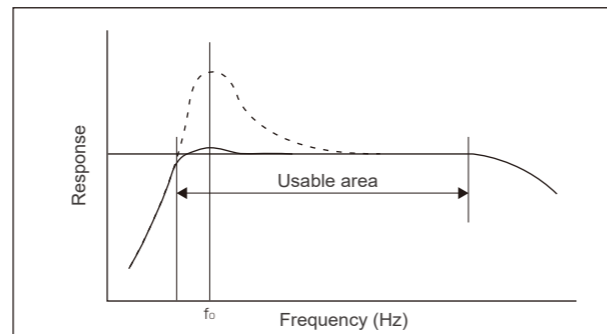
- High sensitivity, stable performance, advanced linearity in wide amplitude range
- Relatively large output
- Because of small internal resistance, long cable can be used.
- External power supply is not necessary (self-power generation)
- Suitable for sleeve bearing vibration measurement



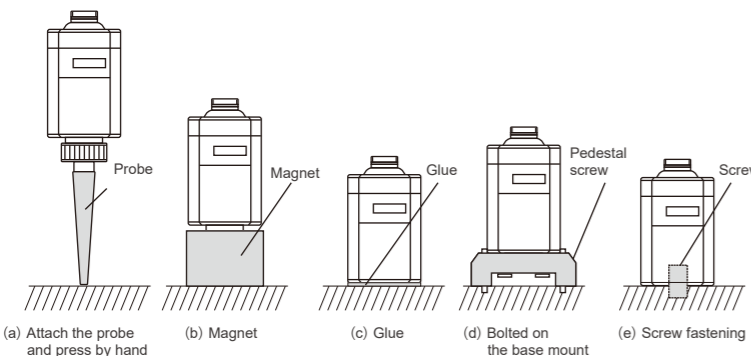
Features

[Frequency response]

The upper frequency limit is to be defined by the response of the low-pass filter. The lower frequency limit depends on its own natural frequency. Use in the frequency range lower such frequency is possible by damping the peak of the resonance.

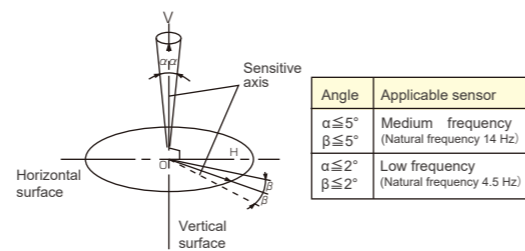


Fixing methods

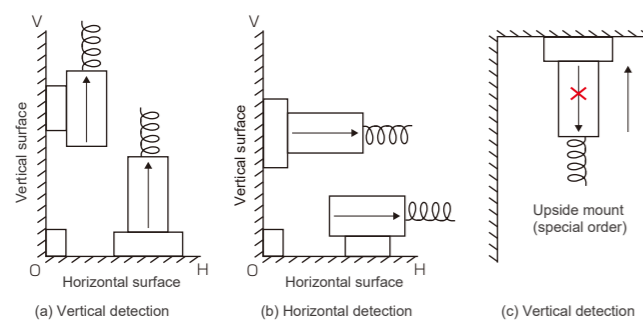


► Fixing angle

The table below shows the fixing angle of sensor whose natural frequency is 14 Hz or 4.5 Hz.



► Fixing direction



Both (a) and (b) are available for the sensor whose natural frequency is 14 Hz, but the sensor whose natural frequency is 4.5 Hz is limited to any one of the (a) or (b). Can not be fixed downwardly. Special fixture is needed to fix upwardly.

Electrodynamic velocity sensor

VP-3144C/D

Linear pendulum type

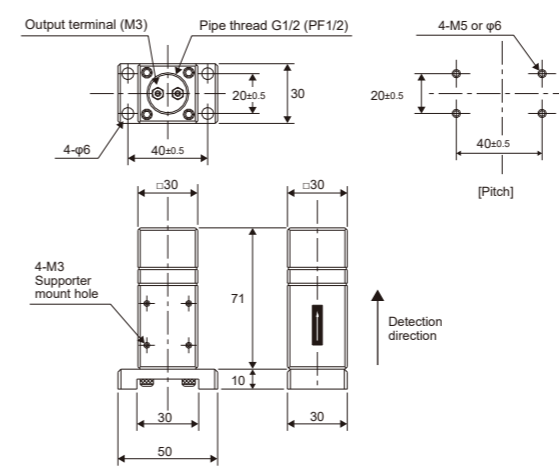
Medium frequency



■ Specifications

Sensitivity	10 mV/(mm/s)
Detection axis	Horizontal or vertical
Natural frequency	14 Hz
Frequency range	10 to 1,000 Hz ⁻¹
Maximum allowable acceleration	100 m/s ²
Maximum measurable displacement	1,000 μmp-p
Operating temperature range	-20 to +80°C
Structure	Drop-proof (Equivalent to IP32)
Cable connection	Pipe thread type (C, direct connection of clamp type D)
Suitable cable	2 core shielded cable
Weight	200 g
Case material	Aluminum

Outward dimensions



Type C

VP-3144F

Linear pendulum type

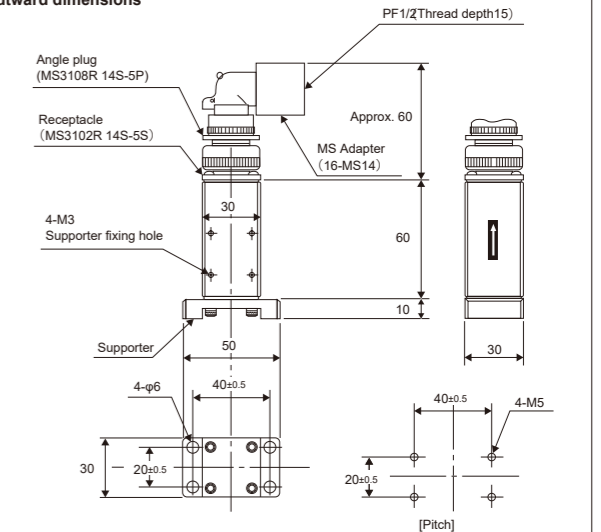
Medium frequency



■ Specifications

Sensitivity	10 mV/(mm/s)
Detection axis	Horizontal or vertical
Natural frequency	14 Hz
Frequency range	10 to 1,000 Hz ⁻¹
Maximum allowable acceleration	100 m/s ²
Maximum measurable displacement	1,000 μmp-p
Operating temperature range	-20 to +80°C
Structure	Drop-proof (Equivalent to IP32)
Cable connection	MS connector
Suitable cable	2 core shielded cable with connector
Weight	300 g
Case material	Aluminum

Outward dimensions



VP-3144W

Linear pendulum type

Medium frequency

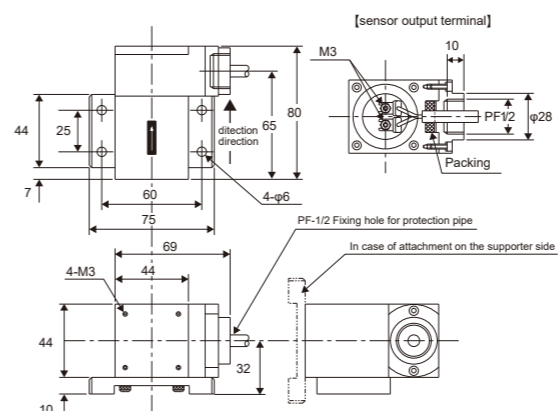
Waterproof



■ Specifications

Sensitivity	10 mV/(mm/s)
Detection axis	Horizontal or vertical
Natural frequency	14 Hz
Frequency range	10 to 1,000 Hz ⁻¹
Maximum allowable acceleration	100 m/s ²
Maximum measurable displacement	1,000 μmp-p
Operating temperature range	-20 to +80°C
Structure	Waterproof (Equivalent to IP66)
Cable connection	Pipe thread
Suitable cable	2 core shielded cable
Weight	600 g
Case material	Aluminum

Outward dimensions



VP-3374C/D

Linear pendulum type

Medium frequency

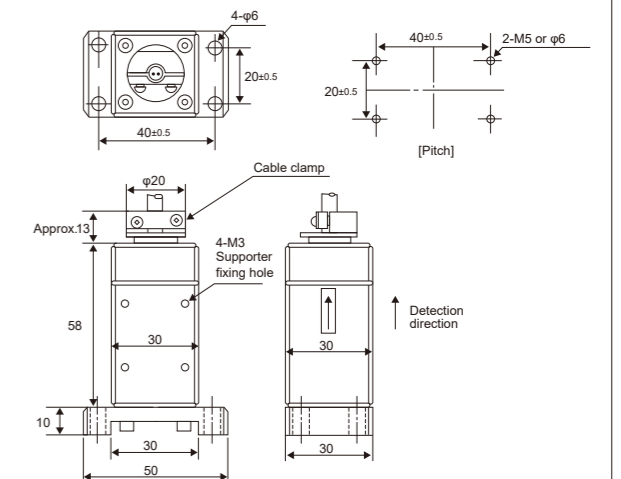
High temperature



■ Specifications

Sensitivity	10 mV/(mm/s)
Detection axis	Horizontal or vertical
Natural frequency	14 Hz
Frequency range	10 to 1,000 Hz ⁻¹
Maximum allowable acceleration	100 m/s ²
Maximum measurable displacement	1,000 μmp-p
Operating temperature range	-30 to +105°C
Structure	Drop-proof (Equivalent to IP32)
Cable connection	Pipe thread type (C, direct connection of clamp type D)
Suitable cable	2 core shielded cable
Weight	200 g
Case material	Aluminum

Outward dimensions



Type D

*1 Frequency range is limited by the range of connected monitoring device.

Electrodynamic velocity sensor

VP-3544 C/D

Linear pendulum type

Medium frequency High temperature

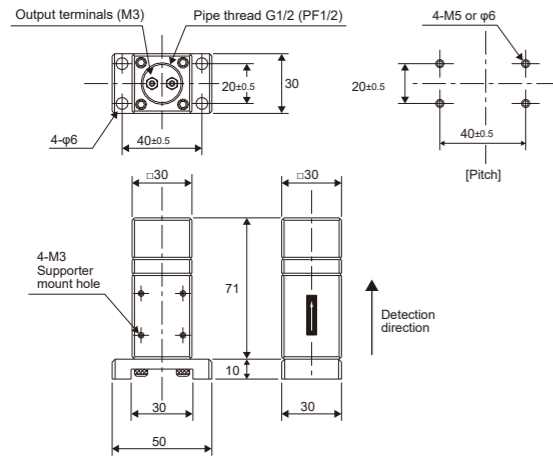


Type C

Specifications

Sensitivity	10 mV/(mm/s)
Detection axis	Horizontal or vertical
Natural frequency	14 Hz
Frequency range	10 to 1,000 Hz ¹
Maximum allowable acceleration	100 m/s ²
Maximum measurable displacement	1,000 μm-p
Operating temperature range	-30 to +130 °C
Structure	Drop-proof (Equivalent to IP32)
Cable connection	Pipe thread type C, direct connection of clamp type D
Suitable cable	2 core shielded cable
Weight	200 g
Case material	Aluminum

Outward dimensions



Type C

VP-3354A / VP-3364A

Linear pendulum type

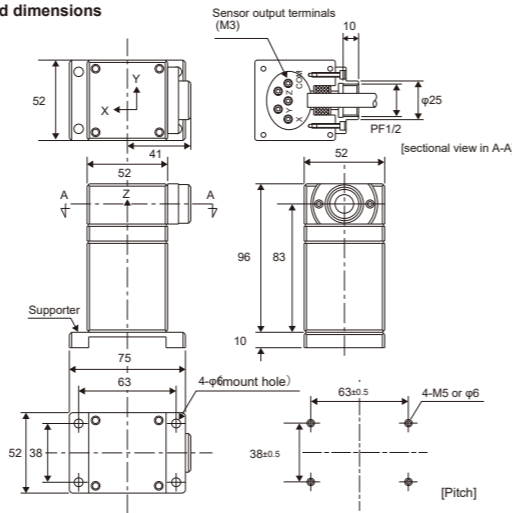
Medium frequency 2/3 direction Waterproof



Specifications

Sensitivity	10 mV/(mm/s)
Detection axis	VP-3354A (2direction) Horizontal×2 or Horizontal & Vertical VP-3364A (3direction) Horizontal×2 & Vertical×1
Natural frequency	14 Hz
Frequency range	10 to 500 Hz ¹
Maximum allowable acceleration	100 m/s ²
Maximum measurable displacement	1,000 μm-p
Operating temperature range	-20 to +80 °C
Structure	Waterproof (Equivalent to IP66)
Cable connection	Direct connection of clamp
Suitable cable	3 or 4 core shielded cable
Weight	700 g
Case material	Aluminum

Outward dimensions



VP-3134AEX

Linear pendulum type

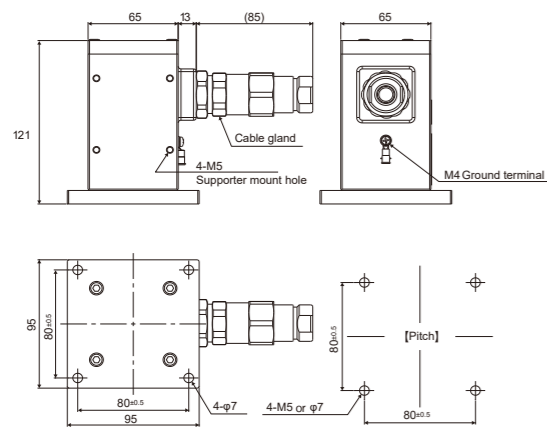
Medium frequency Flame-proof



Specifications

Sensitivity	10 mV/(mm/s)
Detection axis	Horizontal or vertical
Natural frequency	14 Hz
Frequency range	10 to 500 Hz ¹
Maximum allowable acceleration	98 m/s ²
Maximum measurable displacement	1,000 μm-p
Operating temperature range	-20 to +70 °C
Structure	Flame-proof (EX d II BT4Gb)
Cable connection	Pressure-resistant packing
Suitable cable	2 Core shielded cable
Weight	2,300 g
Case material	Aluminum

Outward dimensions



VP-3213AC/AD (Horizontal only) VP-3223AC/AD (Vertical only)

Linear pendulum type

Low frequency

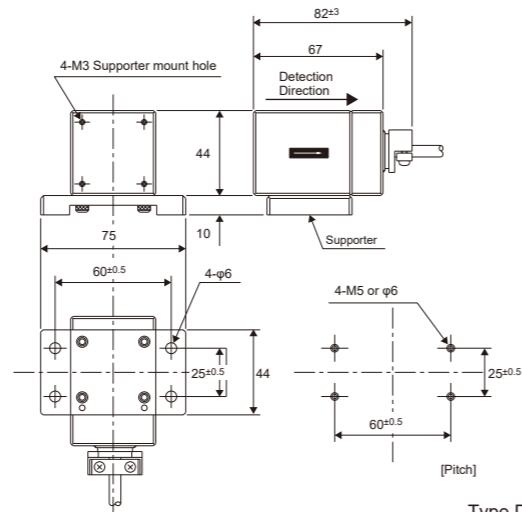


Type C

Specifications

Sensitivity	17.5 mV/(mm/s)
Detection axis	VP-3213 (horizontal only), VP-3223 (vertical only)
Natural frequency	4.5 Hz
Frequency range	5 to 500 Hz ¹
Maximum allowable acceleration	30 m/s ²
Maximum measurable displacement	1,000 μm-p
Operating temperature range	-20 to +70 °C
Structure	Drop-proof (Equivalent to IP32)
Cable connection	Pipe thread type C, direct connection of clamp type D
Suitable cable	2 Core shielded cable
Weight	500 g
Case material	Aluminum

Outward dimensions



Type D

¹ Frequency range is limited by the range of connected monitoring device.

Electrodynamic velocity sensor

VP-3213AW (Horizontal only) VP-3223AW (Vertical only) Linear pendulum type

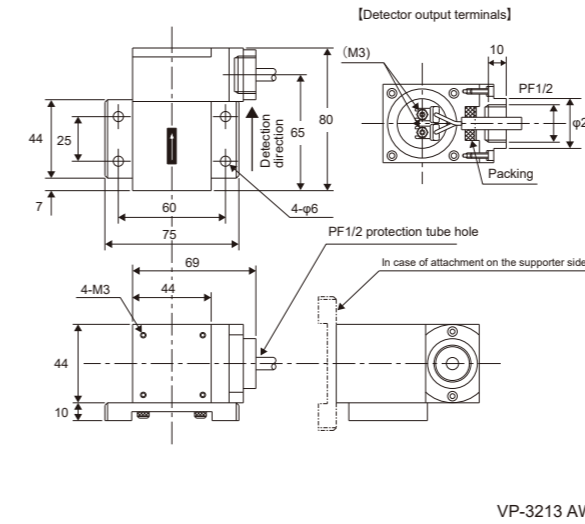
Low frequency Water-proof



Specifications

Sensitivity	17.5 mV/(mm/s)
Detection axis	VP-3213 (horizontal only), VP-3223 (vertical only)
Natural frequency	4.5 Hz
Frequency range	5 to 500 Hz ¹
Maximum allowable acceleration	30 m/s ²
Maximum measurable displacement	1,000 μm-p
Operating temperature range	-20 to +70 °C
Structure	Waterproof (Equivalent to IP66)
Cable connection	Direct connection of clamp
Suitable cable	2 core shielded cable
Weight	600 g
Case material	Aluminum

Outward dimensions



VP-3213 AW

VP-3133HEX (Horizontal only) VP-3133VEX (Vertical only) Linear pendulum type

Low frequency Flame-proof

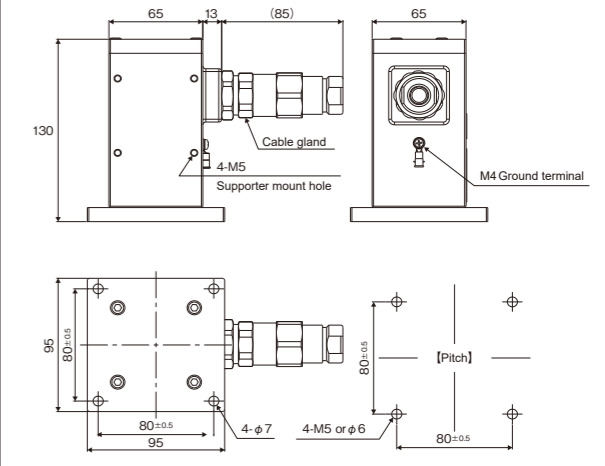


Type V

Specifications

Sensitivity	17.5 mV/(mm/s)
Detection axis	VP-3133 (horizontal only), VP-3133 (vertical only)
Natural frequency	4.5 Hz
Frequency range	5 to 500 Hz ¹
Maximum allowable acceleration	29 m/s ²
Maximum measurable displacement	1,000 μm-p
Operating temperature range	-20 to +70 °C
Structure	Flame-proof (EX d II BT4Gb)
Cable connection	Pressure-resistant packing
Suitable cable	2 core shielded cable
Weight	2,400 g
Case material	Aluminum

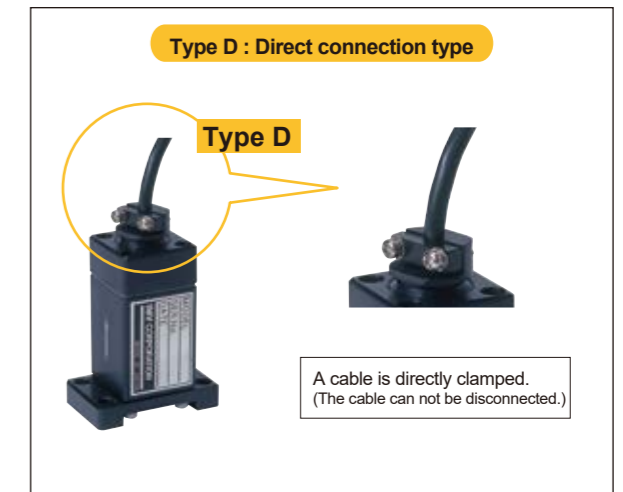
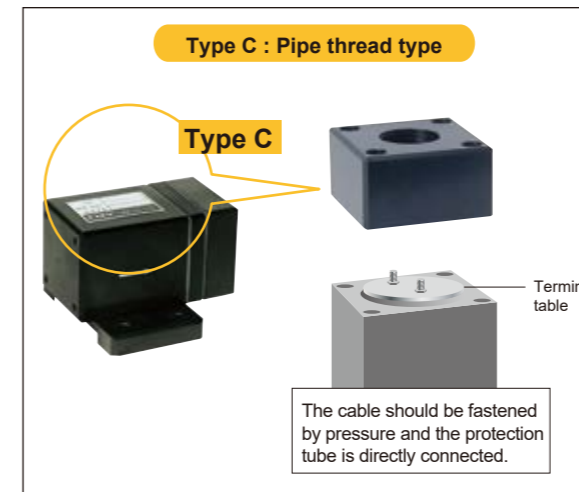
Outward dimensions



¹ Frequency range is limited by the range of connected monitoring device.

Comment

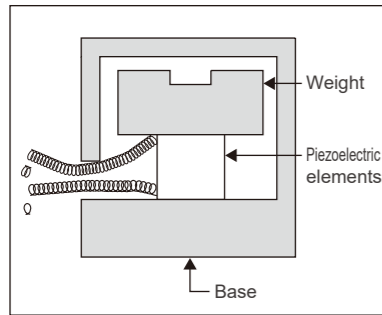
The difference between C and D is the shape of cable connection.



Piezoelectric sensor (Charge type)

Compression type

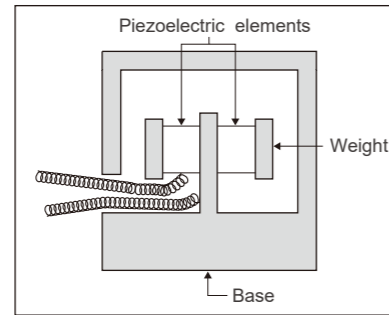
Compression type has a piezoelectric element fastened by a screw between a piece of weight and the base. Measurement of pretty large shock is possible because of its advanced mechanical strength. The resonant frequency is high for its sensitivity. Therefore, the accelerometers of this type can be used not only for general applications but also for measurements of the high speed rotational machinery or detection of leakage from the pipe lines.



- Suitable for measurements of high frequency or high acceleration vibrations
- Stable works, advanced linearity
- Wide operating temperature range

Shear type

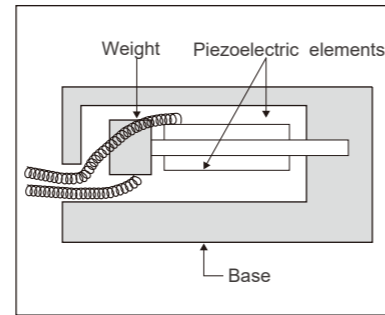
Shear type is constructed so that each piezoelectric element has shear that is proportional to applied acceleration between the poles. It is useful for low frequency vibration measurement even in the environments of large temperature change because it is hard to be effected by the pyroelectricity. Furthermore, it is less sensitive to the strain in the base.



- Suitable for measurements of high frequency or high acceleration vibrations
- Tough against the temperature change and disturbance caused by the strain in mounting section
- Covering small and light to high sensitivity

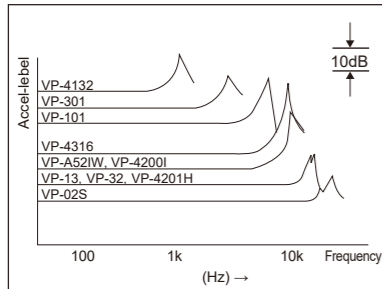
Bending type

Bending type has a construction to get the signal from the piezoelectric elements glued on a metal plate which is bent being applied an acceleration. This is light weight and has high acceleration sensitivity to be suitable to monitor earthquakes or small vibration of the testing models of dam, power station or small equipments, for example.



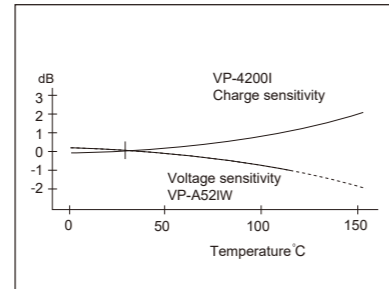
- Small size, light weight, high sensitivity
- Stable works, advanced linearity

Features



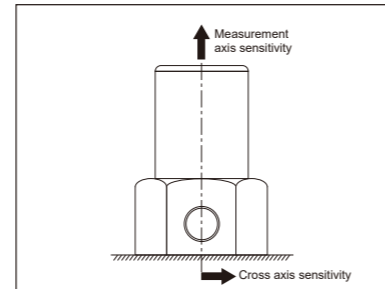
[Frequency response]

Upper usable frequency limit depends on its own resonant frequency or rigidity of mounting. Lower useful frequency is limited by the time constant of the amplifier.



[Temperature characteristics]

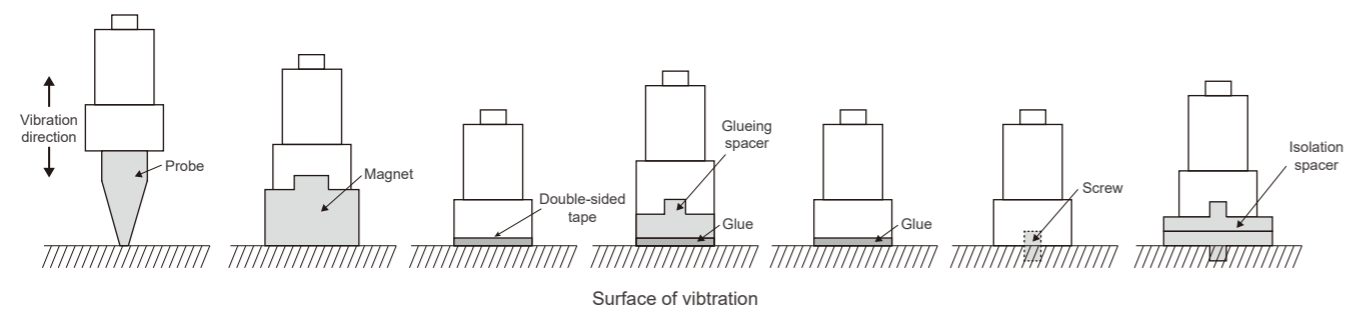
Acceleration sensitivity of a piezoelectric element is effected by temperature. While such effect is dependent on material and structure, high temperature gives larger capacitance, higher charge sensitivity and smaller voltage sensitivity generally.



[Cross axis sensitivity]

Sensitivity to the acceleration applied along the axis of 90° to the sensitive axis is designed to be less than 5%.

Fixing methods



*Bending type should be of stationary or fixed by glue/double-sided adhesive tape.

Piezoelectric sensor

VP-431W

Charge/compression type

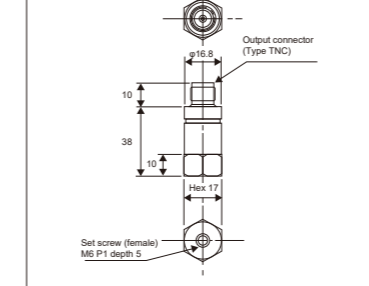
Drip proof



Specifications

Resonance frequency	> 29,000 Hz
Frequency range	fc ^{*1} to 5,000 Hz ±1 dB
Charge sensitivity	5.0 pC/(m/s ²) ±10 %
Capacitance	1,200 pF ±20%
Maximum allowable acceleration	5,000 m/s ²
Operating temperature range	-30 to +150°C
Structure	Insulative and drip proof (Equivalent to IP54 [*])
Cable connection	Upward TNC connector
Weight	53 g
Material	Stainless steel (SUS303)

Outward dimensions



VP-4201H

Charge/compression type

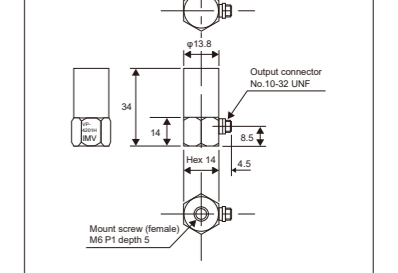
High temperature



Specifications

Resonance frequency	> 23,000 Hz
Frequency range	fc ^{*1} to 5,000 Hz ±1 dB
Charge sensitivity	5.0 pC/(m/s ²) ±20%
Capacitance	1,000 pF
Maximum allowable acceleration	16,000 m/s ²
Operating temperature range	-20 to +250°C
Cable connection	Sidewise 10-32 threaded connector
Weight	42 g
Material	Stainless steel (SUS304)

Outward dimensions



VP-4200I

Charge/shear type

Isolated

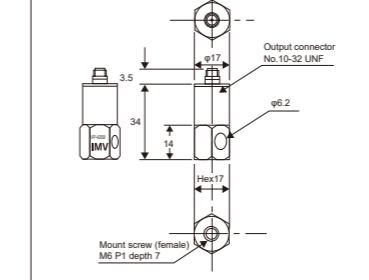
General type



Specifications

Resonance frequency	> 25,000 Hz
Frequency range	fc ^{*1} to 7,000 Hz ±1 dB
Charge sensitivity	5.0 pC/(m/s ²) ±10%
Capacitance	1,000 pF
Maximum allowable acceleration	100,000 m/s ²
Operating temperature range	-20 to +120°C
Cable connection	Upward 10-32 threaded connector
Weight	45 g
Material	Stainless steel (SUS303)

Outward dimensions



VP-A52IW

Built-in pre-amplifier/compression type

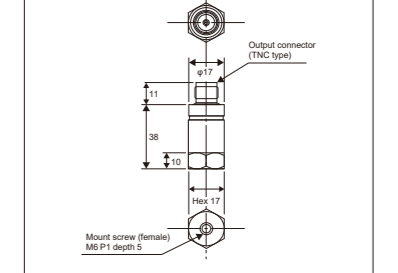
Isolated Drip-proof



Specifications

Resonance frequency	> 35,000 Hz
Frequency range	3 to 10,000 Hz ±3 dB
Voltage sensitivity	5 mV/(m/s ²) ±10%
Maximum measurable acceleration	700 m/s ²
Power supply	0.5 to 10 mA constant current, voltage 12 to 30V
Operating temperature range	-30 to +110°C
Structure	Insulative and water proof
Cable connection	Upward TNC connector
Weight	Approx. 49 g
Material	Stainless steel (SUS303)

Outward dimensions



VP-A12IW

Built-in pre-amplifier/compression type

Isolated Drip-proof

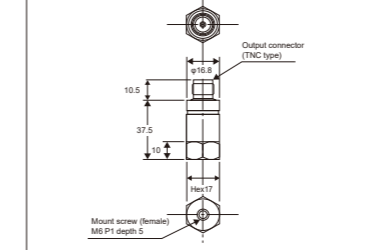
Large acceleration



Specifications

Resonance frequency	> 50,000 Hz
Frequency range	3 to 10,000 Hz ±3 dB
Voltage sensitivity	1 mV/(m/s ²) ±20%
Maximum measurable acceleration	3,500 m/s ²
Power supply	0.5 to 5 mA constant current, voltage 12 to 30V
Operating temperature range	-30 to +110°C
Structure	Insulative and drip proof (Equivalent to IP54 [*])
Cable connection	Upward TNC connector
Weight	44 g
Material	Stainless steel (SUS303)

Outward dimensions



HS-100I

Built-in pre-amplifier/Shear type

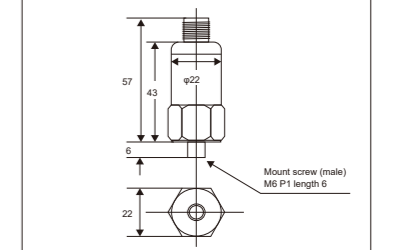
Intrinsic safety



Specifications

Resonance frequency	> 32,000 Hz
Frequency range	2 to 10,000 Hz ±10%
Voltage sensitivity	50 mV/G ±10%
Maximum measurable acceleration	1,568 m/s ²
Power supply	0.5 to 5 mA constant current, voltage 15 to 30V
Operating temperature range	-20 to +80°C
Structure	Intrinsic safety (Ex ia II C T4 Ga)
Cable connection	M12 connector
Weight	106 g
Material	Stainless steel (SUS303)

Outward dimensions



*1 fc: The value to be defined by the time constant of charge amplifier
*2 When using the dedicated cable

Piezoelectric sensor

PA-2

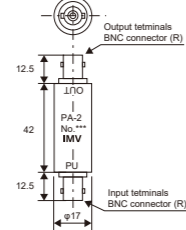
Dual-line output charge amplifier



Specifications

Gain	-1 mV/pC ±2%
Power supply	0.5 to 5 mA constant current, voltage 5 to 30 V
Frequency range	2 to 50,000 Hz (in the case of 1,000 pF)
Maximum output voltage	> 3.5 Vp
Output impedance	> 20 Ω
Operating temperature range	-20°C to +70°C (No freezing)
Noise threshold	> 20 μVrms
Cable connection	BNC connector
Weight	Approx. 30 g
Ground	Housing
Material	Aluminum

Outward dimensions



Mounting adaptor for piezoelectric accelerometer

<p>Strong magnet MH-201R Isolated type with strong magnetic force</p>	<p>Strong magnet MH-203R (for spherical surface)</p>	<p>Strong magnet MH-205R Non-insulated type</p>
<p>Isolating spacer IS-6 cuts noise from the object</p>	<p>Glueing spacer AS-6 to be fixed by glue</p>	<p>Mechanical filter MCF-6H cuts excessive high frequency components</p>

Cable assemblies for piezoelectric accelerometer

Accelerometer	Connector	Cable	Connector on equipment side	Code name
VP-4200I	10-32 screw plug (MTS)	HB-2C (200°C)	BNC plug or 10-32 screw plug (MTS)	HB-2C□/MB HB-2C□/MM
VP-4201H	10-32 screw plug (heat resistant)	HR-2C (260°C)	BNC plug or 10-32 screw plug (MTS)	HR-2C□/MB HR-2C□/MM
VP-42IW	TNC screw plug	HB-3C (200°C)	BNC plug	HB-3C□/TB
VP-A52IW VP-A12IW	TNC screw plug Rubber cap is attached	RG-58AU (60°C)	BNC plug or no connector	RG-58AU□/TB RG-58AU□/TF
HS-100I	M12 4 pole	LIF9YHC11YH	No connector	MS-AC266□

*□ represents cable length
*The length of cable varies according to settings and monitoring conditions. Please contact us for details.

Interconnection conversion connector

<p>BNC-P-C25J-A Converts MTS to BNC</p>	<p>ZR-ZR Converts MTS to MTS</p>	<p>BNC323-BA/BNC-PA-JJ Setting BNC connector on a panel</p>
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Technical Guide

Vibration monitoring system is to monitor vibration using pickups or accelerometers fixed on the object. Please pay attention the following points for fixing such vibration detectors.

1 Installation environments

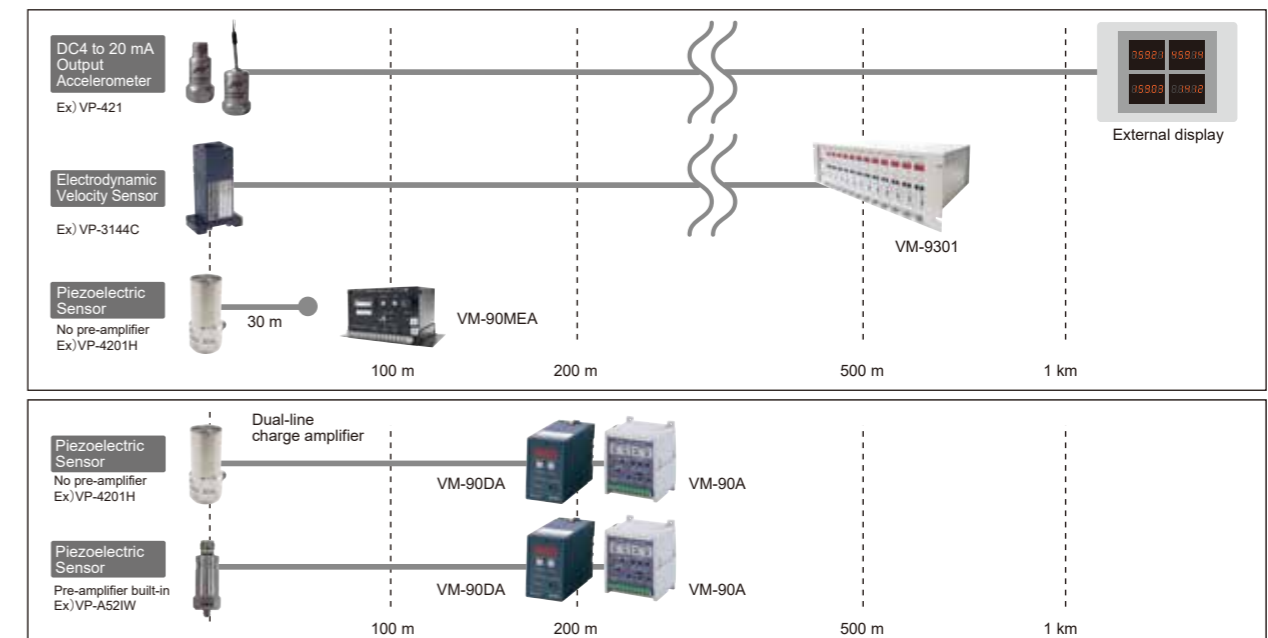
Sensors

- Water drop/Rain ... For outdoor installation, use of water protection case is recommended.
- Temperature ... For use out of -10 to 60 °C temperature range, make sure about the specified usable range.
- Flame-proof ... Flame-proof, Intrinsic safe structures are available.
- Cable length ... Cable length between sensors and alarm controllers or interconnection should be determined.

Followings are for reference:

Type of sensors	Cable	Maximum length
Electrodynamic velocity sensor	Shielded cable	500 m
Piezoelectric sensor	No pre-amplifier	30 m
	Pre-amplifier built-in	200 m

*Depends on the condition. Please contact us for the further information.



2 Function

Please check the following items to select the systems. Please contact us before order.

Monitoring mode

One of displacement, velocity or acceleration is monitored generally

Monitoring level

Sensors and full scale value are determined by the level to be monitored.

Alarm relay contacts

Alarms are outputted by the relay contacts. 1 or 2 alarm outputs (depends on the model) are available.

Output level

DC 4 to 20 mA output is available for full scale. Models whose output can be changed to DC1 to 5 V are also available.

Sensor cable break alarm

Standard equipment for VM-9301 connected with electrodynamic pickup

Power supply break alarm

Alarm is outputted on the loss of the power supply performing no operation of the monitor.

System selection table

Object	Frequency(Hz)	Recommended model	Sensor type	Measurement mode
Abnormal detection	10 to 1000	VM-90DV	Electrodynamic velocity Medium frequency type	Velocity/ Displacement
		VM-90A		
	5 to 300	VM-9301	Electrodynamic Velocity Low frequency type	Displacement
Initial failure detection	From 1000	VM-90DVL	Piezoelectric sensor	H function/Acceleration
		VM-90A		Velocity
		VM-9301A		H function/Acceleration

Warranty and Maintenance

■ Warranty

All IMV products are shipped after passing the strict quality control inspection, but if you find any failure, please inform us the details.

Warranty period

The warranty period is one or two years. (It depends on the product. Please contact us for further information.)

Warranty coverage

(1) If failure happens in the above mentioned period due to the fault of IMV, repair will be made free of charge. However, the following cases are excepted.

1. Damage caused during transportation / transfer at your side by handling mistake.
2. Damage caused by natural disaster such as fire, earthquake, flood and lightning or abnormal voltage.
3. Damage caused by use with another product.
4. Damage caused by disassembling, repair or remodel by others who is not our personnel.

(2) Limit of coverage is the extent described in (1). Any secondary damages (failure of other equipments, opportunity loss, lost profit etc.) caused by failure of IMV products at the customers are exempted from the coverage.

■ Field inspection

●Details

- Function inspection for each section by input of equivalent electronic signal
- Sensitivity calibration and performance check
- Replacement and maintenance of consumable goods
- Submission of report and test results

*An official quotation will be provided if repair or replacement of consumable goods are needed.

●Required days

In two weeks after a request

■ Inspection at our factory

●Details

- Inspection, unit calibration, operation check, total calibration by excitation

*An official quotation will be provided if repair or replacement of consumable goods are needed.

●Required days

10 days after receipt at our factory

*Required days may be varied as the case.

Contact/Delivery address

IMV CORPORATION MES Business Division

2-6-10 Takejima, Nishiyodogawa-ku, Osaka, 555-0011, Japan

TEL: +81-6-6471-3155

FAX: +81-6-6471-3158

*Refer to IMV website for the old systems which is not listed above.



Other product and service information

■ Vibration test systems

Vibration test systems reproduce vibrating environments onto products. It enables evaluation of the product durability and the reliability. As part of our focus, IMV produces 6 degree of freedom (6DOF) vibration test systems which reproduce real vibrating environments as ecologically friendly intelligent systems. IMV has the largest share in vibration test systems in the world market.



6 degree of freedom vibration test systems



Vibration test systems (A-series)

■ Test laboratory

Since Japan's first establishment of vibration/shock test laboratory in Tokyo in 1998, we have been developing test laboratory businesses as Osaka test laboratory in 2005, Nagoya test laboratory in 2007 and the first overseas test laboratory in Thailand in 2012. Corresponding to development of the hybrid car, we opened the Advanced Technology Centre for Environmental Testing which is specialized in the battery testing and test for the large specimens in Uenohara, Yamanashi in 2015.



Advanced Technology Centre



IMV TECHNO VIETNAM COMPANY LIMITED

■ Environmental reliability evaluation system

IMV has released 1 ch / 1 power supply / 1 measurement circuit Migration Testers (of MIG series) first in the test equipment industry and others.



MIG-8600B



MIG-87

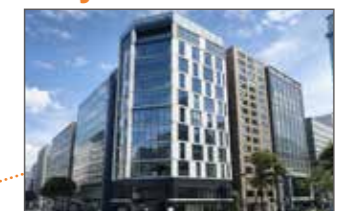
Head office / Sales Office

Osaka



Please contact the head office for product details.
Tel +81 6 6471 3155

Tokyo



Sagamihara

