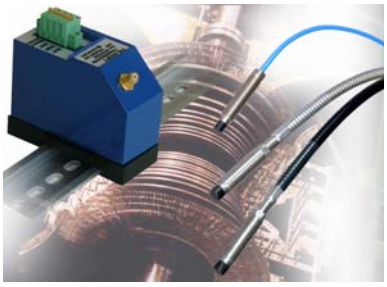
SHINKAWA PRODUCT

Accurate sensing and monitoring,
advanced analyzing and diagnostic technology.
SHINKAWA keeps on creating
new technology for the future.

SHINKAWA Sensor Technology, Inc.

SHINKAWA's Lineup of high-quality Products



FK Series Non-Contact Displacement/Vibration Transducers

The FK series are eddy current type non-contact displacement/vibration transducers, used for measuring Shaft Vibration, Axial Position, Rotating Speed and Phase Mark (Phase Reference) from small rotating machinery to large critical machinery such as turbines and compressors in plants.

- **Environmental friendly design: Lead-free soldering, RoHS Directive Compliant and Downsized.**
- **API standard 670 (4th Edition) Compliant**
- **Intrinsically Safe: TIIS, CSA, ATEX, NEPSI, KTL**
- **Complies with the CE mark.**

VK Series Non-Contact Displacement/Vibration Transducers

The VK series are non-contact displacement/vibration sensors designed for rotating machinery such as compressors and power plant turbines.
VK-A is a standard vibration transducer that conforms to API Std. 670 4th edition; VK-P is available for measurement of differential expansion, which is indispensable for monitoring large turbines. VK-R is available for power generating gas turbines which require long cable lengths.

- **Not affected by lubricating oil or dust.**
- **Hazardous area approvals: FM, CSA , ATEX, NEPSI, TIIS**
- **Complies with the CE mark.**

WK Series 2-wire Transmitters

The WK series 2-wire Transmitter system incorporates vibration or thrust monitoring into the conventional eddy current transducer, and it can supply the power transmitter signal with 2-wire current loop.
There are two kinds of transmitters, the WK-142K is for shaft vibration and the WK-142T is for thrust position.

- **Monitors or signal converters are unnecessary.**
- **Can be connected to the control instrument directly.**
- **Hazardous area approvals: CSA , ATEX**

CV & CA Series Vibration Transducers

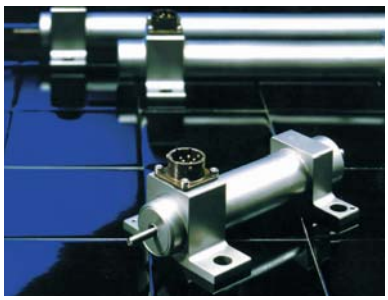
The CV and CA series are piezo-electric transducers for measuring the casing or bearing vibration of rotating machinery.
The CV series are velocity transducers and the CA series are acceleration transducers.

- **Built-in amplifier, wide dynamic range and low noise.**
- **Rugged, durable stainless steal casing.**
- **Hazardous area approvals: NEPSI, TIIS**

MS Series Magnetic Pickup

The MS Series mounted near the detection gear of rotating machinery outputs a frequency signal proportional to the rotation speed.

- **Superior rigidity, environmental resistance**
- **Vibration proof 196 m/s^2 (20 G)**



LS Series LVDT

The LS Series are highly reliable LVDTs (Linear Variable Differential Transformers) which can be applied for long-range measurement such as turbine valve position and casing expansion. The robust design permits a broad range of applications without sacrificing accuracy.

- **Various types of measuring range : Nine ranges of 0-50 to 0-450 mm.**
- **Linearity of ±0.2% of 100% stroke or ±1.5% of 110% stroke.**
- **Hazardous area approvals : CSA and FM (with VM-21P signal conditioner)**

SHINKAWA's RIVERNEW *non-contact displacement / vibration measurement systems - the culmination of superior engineering know-how.*
Let SHINKAWA's leading RIVERNEW *technology upgrade your products and factory.*

VM-5 Monitoring System

The VM-5 Monitoring System is designed in accordance with the API 670 4th Edition for use on acceleration and rotating machinery. Both 8 or 10-slot rack mount type and one-unit stand alone type with a built-in power supply are available so the monitor can be applied for any system design from a few channels of vibration monitoring for small machinery to TSI for large turbines.

- **High reliability by the use of redundant power supply (VM-5W1).**
- **System wide expandability via data communication (VM-53)**
- **Flexible configuration by the use of modular monitor units.**
- **All operations and checks enabled from the front panel with the monitor in operation.**
- **Easy monitoring by the perfect display function.**
- **Provided with the self diagnostic function.**
- **Complies with the CE mark (except for some units)**

VM-7 Monitoring System

The VM-7 Monitoring System is designed to meet the requirements of International Organization for Standardization (ISO) standards and the American Petroleum Institute (API) standard 670. The system covers the features for protective monitoring of critical rotating machinery in plants in accordance with API Std. 670. The fully digitalized monitor modules respond to 17 different monitoring parameters. Its multi purpose modules can be set to measure desired parameters on a PC.

- **One 19 inch rack handles up to 44 vibration channels**
- **5 monitor modules handle 17 monitoring parameters**
- **Monitor module configuration setup can be done on PC**
- **All modules can be removed/installed from the front, which allows for hot swap**
- **High reliability with redundant power supply and host communication**
- **By incorporating the analysis board, the system directly connects to the infiSYS RV-200 analysis and diagnostic system.**
- **CE marking (in preparation)**

VM-21 Series Signal Conditioners

The VM-21 series signal conditioners accept the signal from transducers installed on rotating machinery and convert it to a 4 to 20 mA DC or 1 to 5 VDC output.
Parameters: Displacement, velocity, acceleration, LVDT, thrust, revolution, temperature and other processes.
Their compact, low-cost design makes them ideal for online predictive maintenance system.

- **Free choice between DIN rail or wall mounting in any convenient location.**
- **Burn-down function on the output side for quick fault detection.**
- **Equipped with vibration waveform output for precise diagnosis.**

VM-15 / 16 Monitoring System

VM-15 and VM-16 are designed for continuous vibration monitoring of general purpose rotating machinery.
The compact package contains all necessary functions for vibration monitoring and multi-channel processing circuits into one small box, VM-15 / VM-16 allow cost reduction while keeping the functionality. Realizing high performance to cost ratio of the monitoring system.

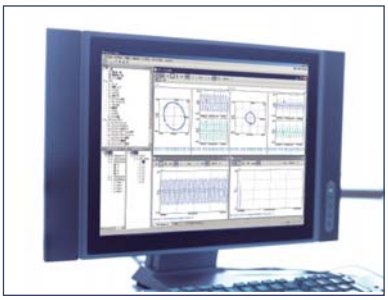
- **VM-15: 4 channels VM-16: Max. 12 Channels**
- **Trend data memory function: CompactFlash Memory*1 card and USB port*2**
- **Monitoring parameters: Displacement vibration, Velocity vibration, Acceleration vibration, Axial position*2 and Temperature*2**

*1 VM-15 is option. *2 Only VM-16.

MP Series Machine Protection System

The MP series machine protection system is designed for critical machines such as turbines, and trip output can be used for urgent stopping of the turbine to protect it from damage caused by overspeed rotation or abnormal shaft thrust position. A version which outputs zero-speed signal is also available (MP-1 only). The MP-2S overspeed unit is designed in accordance with API 670 4th edition.

- **There are three types of units: Overspeed, Zerospeed and Thrust**
- **Design in consideration of safety by the use of redundant power supply**
- **One system consisting of three units (corresponding to 2 out of 3).**
- **Fast response speed (within 30 seconds from overspeed detection to contact output).**



infiSYS RV-200 Complete Vibration Analysis & Diagnostic System

The infiSYS RV-200 is a vibration analysis and diagnostic system that fits a range of rotating machinery of all sizes, from small to large. One system allows for monitoring, analysis and diagnostics of both rolling-element bearings and journal bearings. It offers affluent analysis/display functions that cover the functions required by the ISO18436-2* certified engineers with superior operating experience, including drag and drop layout of desired analysis graphs, creation of multiple graph display pages and instant page switching by using the tabs – simple GUI.

* ISO 18436-2: Condition monitoring and diagnostics of machines -- Requirements for training and certification of personnel -- Part 2: Vibration condition monitoring and diagnostics

- **High speed data collection: trend data every 1sec, waveform data every 10 sec fastest. Capability to accept various inputs: VM-7, VM-5 (with DAQpod), other commercial monitors**
- **Maximum number of vibration inputs: 480 channels**
- **Ample analysis/graph plot functions**
- **Accessible data by employing a SQL Server**
- **User-friendly, intuitive user interface**

Kenjin Portable Vibration Analysis System

The Kenjin system is a simple system composed of a small, lightweight, portable data acquisition unit when used with a laptop computer with analysis software installed. Perfect for measurement and analysis during run-up/coast down operation. Immediate analysis of abnormal vibration as an emergency response, etc. Its high speed data acquisition allows for detailed transient response analysis during run-up/coast down; while assisting the engineers' vibration analysis/diagnostics with a range of analysis data including the functions required by the ISO18436-2* certified engineers as well as the superior usability.

* ISO 18436-2: Condition monitoring and diagnostics of machines -- Requirements for training and certification of personnel -- Part 2: Vibration condition monitoring and diagnostics

- **Small footprint, lightweight design for better portability (Dimensions of data acquisition unit: W 96 x H 224 x D 163 mm, Weight: 2.6kg)**
- **High speed data collection: vibration amplitude/phase mark data every 0.1 sec**
- **High resolution: input range ±20V, A/D resolution 24bit**
- **User-friendly, intuitive user interface**

BV-100 General-Purpose Rotating Machinery Diagnostic System

On personal computers, you can analyze, diagnose and manage all data required by general-purpose rotating machines by the powerful and easy-to-use software based upon the WindowsNT platform.

- **800 lines of resolution spectrum analysis.**
- **Configurable up to 32 Local stations available.**
- **Max. vibration inputs: 2048 points**
- **Diagnostics based on cause & effect matrix of specific frequencies.**

VM-13V1 Vector Monitor

The VM-13V1 vector monitor is multifunctional data collection and analysis instrument that provide high data accuracy for dynamic diagnostics and balancing of rotating machinery.

- **1X (1N) / 2X (2N) vibration analysis.**
- **Digital readout of amplitude, phase angle and rotating speed.**
- **Equipped with a variety of outputs for a wide range of applications.**

MF-1220 Vector Filter

The MF-1220 vector filter accepts vibration outputs up to 12 channels and phase reference signals for continuous real time output of vibration vector X-Y components and overall amplitude on separate channels.

- **Easy change - over between single and dual rotor arrangements.**
- **1X (1N) / 2X (2N) vibration analysis.**
- **High accuracy and sophisticated analytical functions realized by utilizing a tracking filter incorporating a high performance A/D converter.**

VC Series Non-contact Displacement Converter

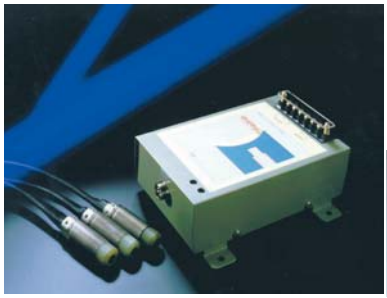
The VC series displacement converter has eddy-current type non-contact displacement/vibration sensors. The displacement, thickness and the shaft vibration can be measured with high precision and speed.

- **Measurement: 0-500 mm to 0-25,000 mm**
- **Linearity: ±0.5% of F.S. (VC-M)**
- **Sensor temperature characteristics: ±0.015% of F.S. / °C (typ.)**
- **Frequency response: DC to 20 kHz (-3 dB)**

VG Series Non-contact Displacement Converter

A new sensor utilized by the VG series allows displacement measurements in high temperature environments never before possible --- up to 600°C. This is a unique system that allows various measurements of continuous steel casting equipment.

- **Operating temperature: 0 to 600°C**
- **Sensor temperature characteristics: ±0.0035% of F.S. / °C (Typ.)**



VN Series Non-contact Displacement Converter

The VN series are high-grade displacement converters with high linearity and superior temperature characteristics. These features are possible due to the use of sensor coils made of new material and by the introduction of the double cable type.

This converter with the touch roller attachment can accurately measure the thickness of non-conductors such as polymeric films, rubber sheets, etc.

- **Linearity: ±0.5% of F.S.**
- **Sensor temperature characteristics: ±0.010% of F.S. / °C (NS-020B) (typ.)**

KP-100A KM Post Sensor

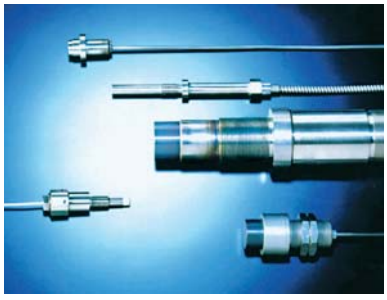
This sensor is used for accurate detection of positions of railroad maintenance/inspection cars.

- **Car speed: up to 110 km/h**
- **Weatherproof**

KC Series Magnetic Rail Displacement Sensor

This sensor detects distortion (how straight it is) of rail gauge or railroad.

- **Built-in amplifier**
- **Weatherproof**



Special-Purpose Sensors

RIVERNEW offers a wide range of sensors for measurement of displacement and vibration in hostile environments.
Some examples are;

- **Sensor for Rider-ring of LNG compressor: −160 to +180°C, 8 MPa**
- **Low-temperature High-pressure sensor for space rocket: −253°C, 25 MPa**
- **Metal top sensor for nuclear plant: 13 MPa, 1X10^5 Gy max.**

SWiNS Wireless Network System (SD/SS Series)

SWiNS is a system to transmit and collect data measured with sensors. The SD series is suitable for collection and transmission of vibration waveform data on buildings and machinery; the SS series is suitable for collection and transmission of environmental data such as ground and atmosphere. The SD series can be used for a variety of applications – the sensor can be wireless with its originally engineered wireless acceleration sensor, or can be wired using the existing wired sensors.

- **Up to 256 sensors per system (SD-1 series), up to 1024 sensors per system (SS-1 series)**
- **Data collection interval: 10 minutes fastest (SD-1 series), 2 minutes fastest (SS-1 series)**

SHINKAWA Sensor Technology has certificates from internationally recognized Quality Assurance System and Environment Management Systems

ISO 9001

ISO14001

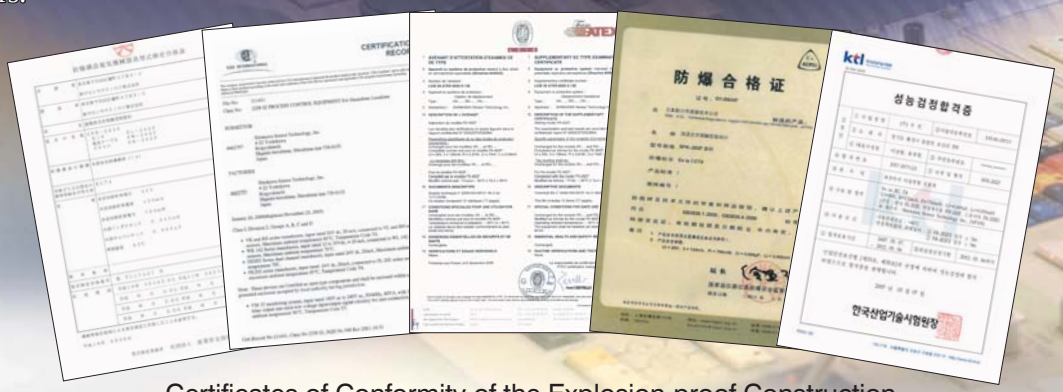
JQA Certificate of Registration (Japan)

UL Certificate of Registration (U.S.A.)

JQA Certificate of Registration (Japan)

In 1994, the quality assurance system used for our Displacement / Vibration Transducer Systems and Rotating Machinery Monitoring Systems. SHINKAWA Sensor Technology, Inc. Hiroshima factory was promptly certified as conforming to the international quality assurance standard ISO 9001 and registered with the respective Japanese and U.S. certification agencies.
By bringing our products into line with various standards and having them certified under Japanese and international safety, type, and explosion-proof standards, we perfected a system that enables us to supply products sure to satisfy our customers.

In 1996, SHINKAWA Sensor Technology obtained ISO 14001 approval for the Environment Management System at its Hiroshima Factory out of concern for the global environment.
Our company philosophy is to manufacture environment-friendly products to protect the future of our globe.



Certificates of Conformity of the Explosion-proof Construction of Electric Equipment and Devices

"Shipping Standard Type Approval" Certificates

Conform to the CE marking

Due to rapid progress in the development of electronics technology and new materials, high-performance and intelligent sensing technology is required.
To meet the needs of today's technological users, We at SHINKAWA Electric Co., Ltd. and SHINKAWA Sensor Technology, Inc., are conducting research and development.

Hiroshima Factory of SHINKAWA Sensor Technology

We are proud that we can contribute to the world-wide development of state-of-the-art technologies, particularly through our development of sensing technology and peripheral equipment.

With a motto of " at a higher speed, with more safety and punctuality, and for more passengers ", the Shinkansen (Super Express Train) leads in the development of high-speed railway transit systems now being introduced in various parts of the world. SHINKAWA's Eddy-current Track Analyzer System is capable of inspecting rail conditions while the trains are running at high speed, and instantly detecting abnormalities.
This system is used very effectively to ensure safe operation in the extensive system of the Shinkansen.

Courtesy of JAXA

Japanese technology for launching satellites has now achieved a world-wide reputation. RIVERNEW has been successfully employed in monitoring shaft vibration of turbo pumps for rocket engines, the heart of this technology. SHINKAWA is also engaged in the process of research and development of various types of sensors for use in satellites.
These sensors are required to withstand harsh environments while maintaining high precision over a long period of time. We expect SHINKAWA, with its high level of technology, to make contributions in this field.

SHINKAWA

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