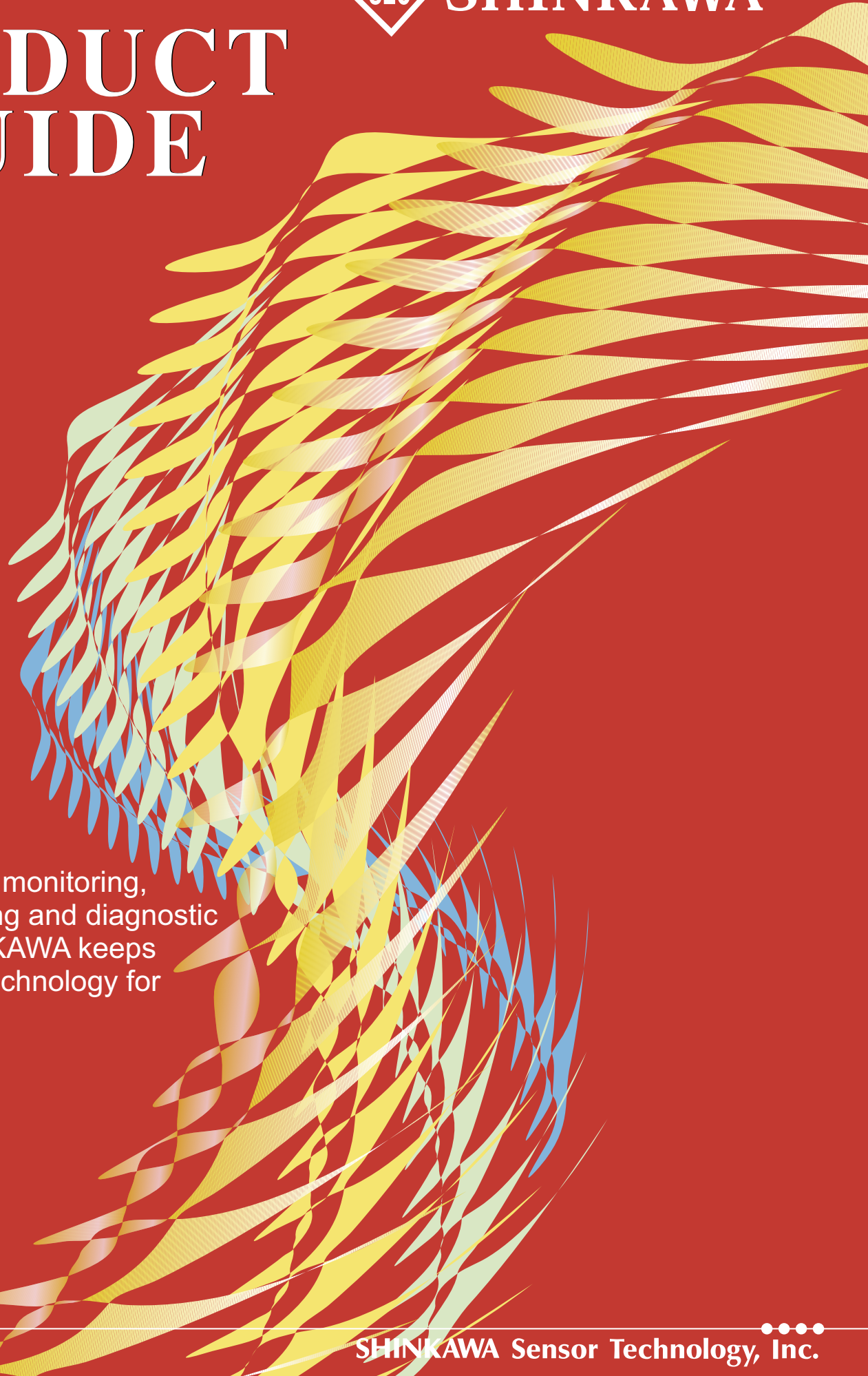




SHINKAWA

PRODUCT GUIDE



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

SHINKAWA's Lineup of high-quality Products



VK Series Displacement/Vibration Transducers

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

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



FK-202F Series Vibration Transducers

The FK-202F is a non-contact transducer which is 100% compliant with the API Standard 670 (4th Edition) and can be applied to measure shaft vibration, axial position and rotating speed for critical machines. The FK is designed with concern for the environment such as lead-free and no hazardous substances. Mounting method of the FK driver is selectable from DIN rail mounting and adaptor plate for replacement VK driver or BN 3300

- 100% compliance with the API Standard 670 (4th Edition)
- Environment-friendly: Lead-free, no hazardous substances and small size driver
- Driver mounting: DIN rail or replacing adaptor for VK or BN 3300
- Hazardous area approvals (Pending): CSA, ATEX, TIIS (Japan)
- Compliance with CE mark



WK Series 2-wire Transmitters

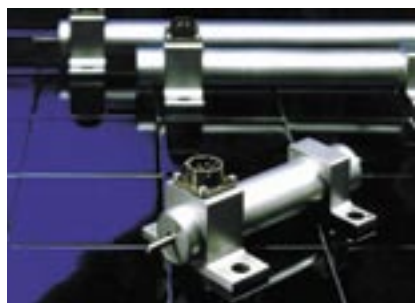
The WK series 2-wire Transmitter system incorporates part of the vibration or thrust monitor into the conventional eddy current transducer, and can supply the power and transmit the signal with 2-wire current loop. There are two kinds of transmitters, the WK-142K is for shaft vibration and the WK-142T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

- Monitors or signal converters are unnecessary.
- Can be connected to the control instrument directly.
- Hazardous area approvals : CSA, ATEX, TIIS (Japan)
- Complies with the CE mark.



RN Series Vibration Transducers

- **Multi Purpose and Intrinsically Safe Accelerometers.**
Available in both top and side connectors, or with top and side exit integral cables.
- **High Temperature, Low Frequency and Piezo Velocity Transducers.**
Available in both top and side connector versions
- **Loop Power, Velocity 4-20 mA Output Sensors**
Available in both top and side connectors, or with top and side exit integral cables.



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. It can be used for a broad range of applications due to its durability and accuracy.

- Various types of measuring range : Nine ranges of 0-50 to 0-450mm.
- Linearity of +/- 0.2% of 100% stroke or +/-1.5% of 110% stroke.
- Hazardous area approvals : CSA and FM (with VM-11P 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 Series Monitors

The VM-5 series Monitors are 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 standalone 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 duplex power supply (VM-5W1).
- System in wide expandability via data communication (VM-5P3, 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 one-unit standalone type and some of units)



VM-11 Series Signal Conditioners

The VM-11 series signal conditioners accept the signal from transducers installed on rotating machinery and convert it to a 4 to 20mA DC or 1 to 5VDC output.

- Full line-up of models for displacement, velocity and acceleration input.
- Their compact, low-cost design makes them ideal for online predictive maintenance system.
- Free choice between rack, DIN rail or wall mounting in any convenient location.
- Burn-down function at the output side for quick fault detection.
- Equipped with vibration waveform output for high precision diagnosis.
- CSA & FM approval for VM-11P (LVDT).



VM-21 Series Signal Conditioners

The VM-21 is a new series of the plug-in type signal conditioners. The backplane allows you to install eight (8) units of signal conditioners, and two backplanes which can be connected to each other with D-sub connectors and output 16 channels from one ELCO connector. The DIN rail mounting socket can be used for single conditioner or small channel applications.

- Full line-up of models for vibration and LVDT input.
- 8-channel backplane for wall mounting, and single-channel socket for DIN rail and wall mounting.
- Burn-down function at the output side for quick fault detection.
- Equipped with vibration waveform output (buffered output) for diagnosis of machines.
- CSA approval (pending)



VM-15/VM-16 Series Monitoring System

The VM-15 is a 4-channel and VM-16 is a 4, 8, or 12-channel vibration monitor to realize a high cost performance of monitoring system for general-purpose machinery. These monitoring systems provide all functions necessary for monitoring vibration input from rotating machinery in the form of displacement, velocity, acceleration and temperature signals, and therefore allow any system design to suit a variety of applications.

- VM-15 : Displacement vibration, Velocity vibration or Acceleration vibration
- VM-16 : Displacement vibration, Velocity vibration, Acceleration vibration, Thrust and Temperature
- CompactFlash Memory function : Standard (VM-16), Option (VM-15)
- Hazardous area approvals : CSA



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. Unit 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).

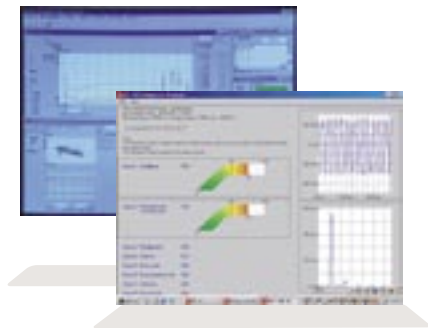
- There are three types of units : Overspeed, Zerospeed and Thrust
- Designed with consideration of safety by the use of duplex power supply (Redundancy).
- One system consisting of three units (corresponding to 2 out of 3).
- Fast response speed (within 30 from overspeed detection to contact output).



RV-100 Large Rotating Machinery Analysis/Diagnostics System

With the latest analysis technology, online vibration analysis systems are capable of analyzing and managing, all sorts of data essential to large rotating machinery on personal computers. The software based upon the WindowsNT® platform allows easy operation and various analysis.

- High resolution spectrum analysis (800 lines).
- High speed data acquisition through Ethernet link.
- Maximum 24 Analyzing Processors available.
- Max. vibration inputs : 576 points



6A01-001 Diagnostics Program for RV-100

The RV-100 system can diagnose the machine vibration problem and show the causes. The 6A01-001 Diagnostics Program is a optional program for the RV-100 View Station.

The 6A01-001 Diagnostics Program derives causes from analysis data of the RV-100 with a new unique algorithm by using the relation between the machine operation speed and its natural vibration frequency.

- Easy operation : Necessary data for diagnosis are collected automatically from RV-100 View Station.
- Remote diagnosis is available with RV-100 Remote Display Station (Option)



BV-100 General-Purpose Rotating Machinery Diagnostic System

On personal computers, they 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.

- High resolution spectrum analysis (800 lines).
- Expandable system configuration 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 instruments that provide highly accurate data for dynamic diagnosis and balancing of rotating machinery.

- High accuracy and sophisticated analytical functions realized by adoption of a tracking filter incorporating a high performance D/A converter.
- 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 output on 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 adoption of a tracking filter incorporating a high performance D/A converter.



VC Series Non-contact Displacement Converter

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

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



VN Series Non-contact Displacement Converter

The VN series are high-grade displacement converter with high linearity and superior temperature characteristics by 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 highly 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. / deg.C (VS-020B)(typ.)



VG Series Non-contact Displacement Converter

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

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



Special-Purpose Sensors

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

- For example
- Sensor for Rider-ring of LNG compressor : -160 to +180 deg.C, 8MPa
- Low-temperature High-pressure sensor for space rocket : -253 deg.C, 25MPa
- Metal top sensor for nuclear plant : 13MPa, 1X105 Gy max.



MS Series Magnetic Pickups

The MS Series are non-contact sensors installed near a detection gear that rotates with the shaft and produce an electric signal with a frequency proportional to the revolution of the gear.

- Rugged construction and high environmental resistance
- High voltage and low impedance output
- Vibration limit : 196m/s² (20G)

SST's Internationally recognized Quality Assurance System and Environment Management System

ISO 9001



JQA Certificate of Registration (Japan)



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

ISO14001



JQA Certificate of Registration (Japan)

In 1994, for the quality assurance system applied to 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.

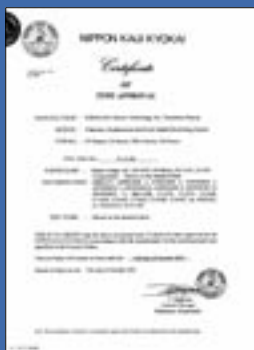
By bringing our products into line with various standards and having them certified under Japanese and international safety, type, and explosion-proof standards, we perfected a system that enables us to supply products sure to satisfy our customers.

In 1996, SHINKAWA Sensor Technology obtained ISO 14001 approval for the Environment Management System at its Hiroshima Factory out of concern on 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

Conform to CE Mark



"Shipping Standard Type Approval" Certificates



In keeping rapid progress in the development of electronics technology and new materials today, high-performance and intelligent sensing technology is required.

To meet the needs of today's technological society, We at SHINKAWA Electric Co., Ltd. and SHINKAWA Sensor Technology, Inc., are conducting research and development.

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.



Hiroshima Factory of SHINKAWA Sensor Technology



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.



Photo by NASDA



Japanese technology for launching artificial 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 artificial satellites.

These sensors are required to withstand severe treatment while maintaining high precision over a long period of time. We expect SHINKAWA, with its high level of technology, to make contributions this field, also.



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* Specifications, outline drawings and other written information can be changed without notice.