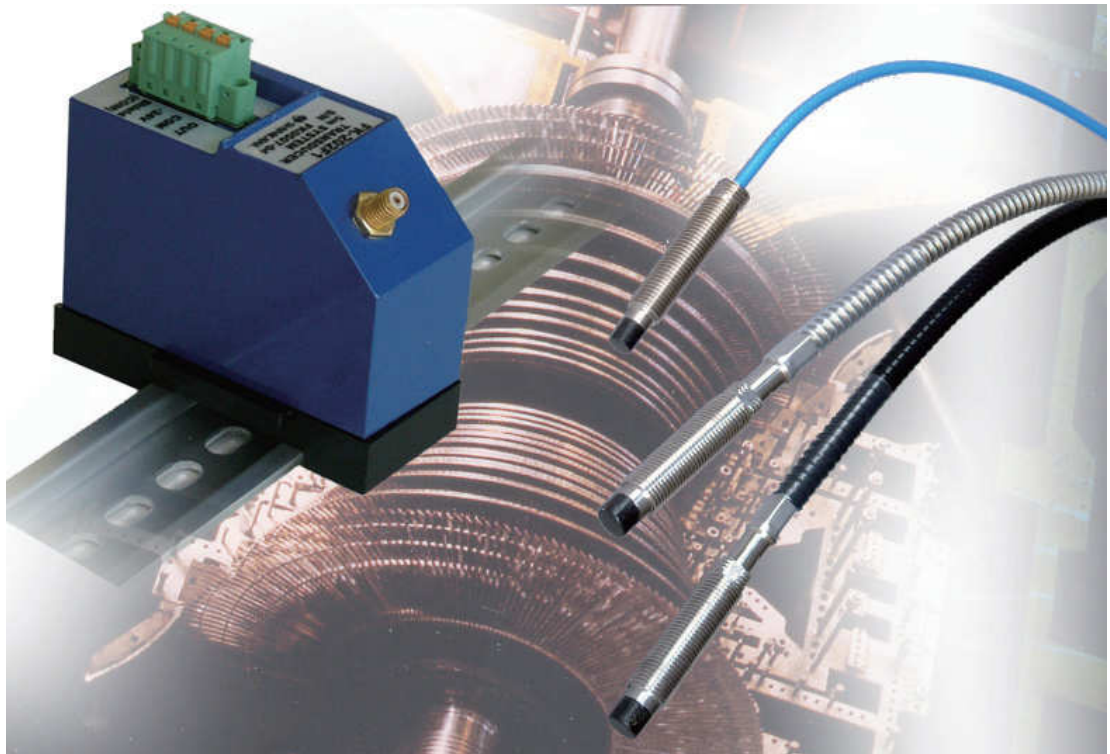


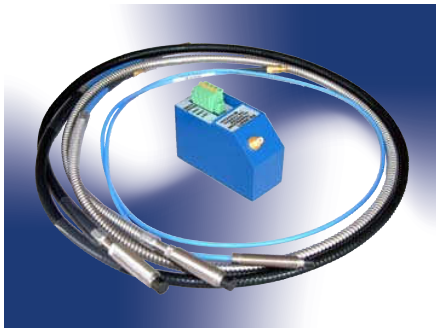
FK-202F

Non-contact Displacement / Vibration TRANSDUCER



- *Suitable for various applications: shaft vibration, axial position, rotating speed and phase mark of critical rotating machinery*
- *Environmental friendly design: lead-free soldering, RoHS compliance and reduced footprint*
- *Flexible mounting options: DIN-rail adaptor, 4-screw-cramp plate adaptor (to replace VK series and others)*
- *API standard 670 (4th Edition) compliant*
- *Intrinsically safe (TIIS, CSA, ATEX, NEPSI, KTL), and marine certified (NK)*
- *CE compliant*

FK-202F Non-contact Displacement/Vibration Transducer



The FK-202F transducer is eddy current type non-contact displacement/vibration transducer, 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.

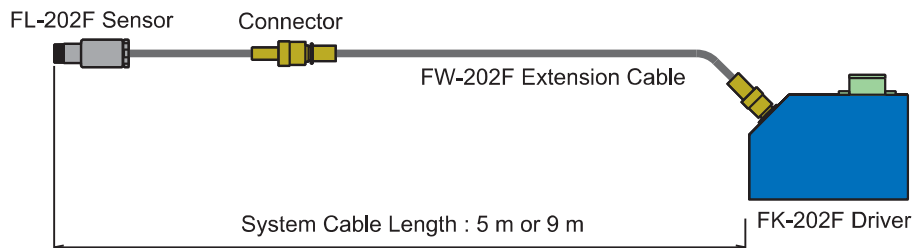
Designed with due considerations for environments, the FK-202F has achieved lead-free soldering, RoHS Directive*1 compliance, also downsizing the driver*2.

In addition, the FK-202F is designed to meet the API (American Petroleum Institute) standard 670 (4th Edition) requirements, often referred as machinery protection system for petroleum refineries and petrochemical plants around the world.

*1 RoHS (Restriction of the use of certain Hazardous Substances in electrical and electronic equipment) directive defines six restricted substances: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls and polybrominated diphenyl ethers.

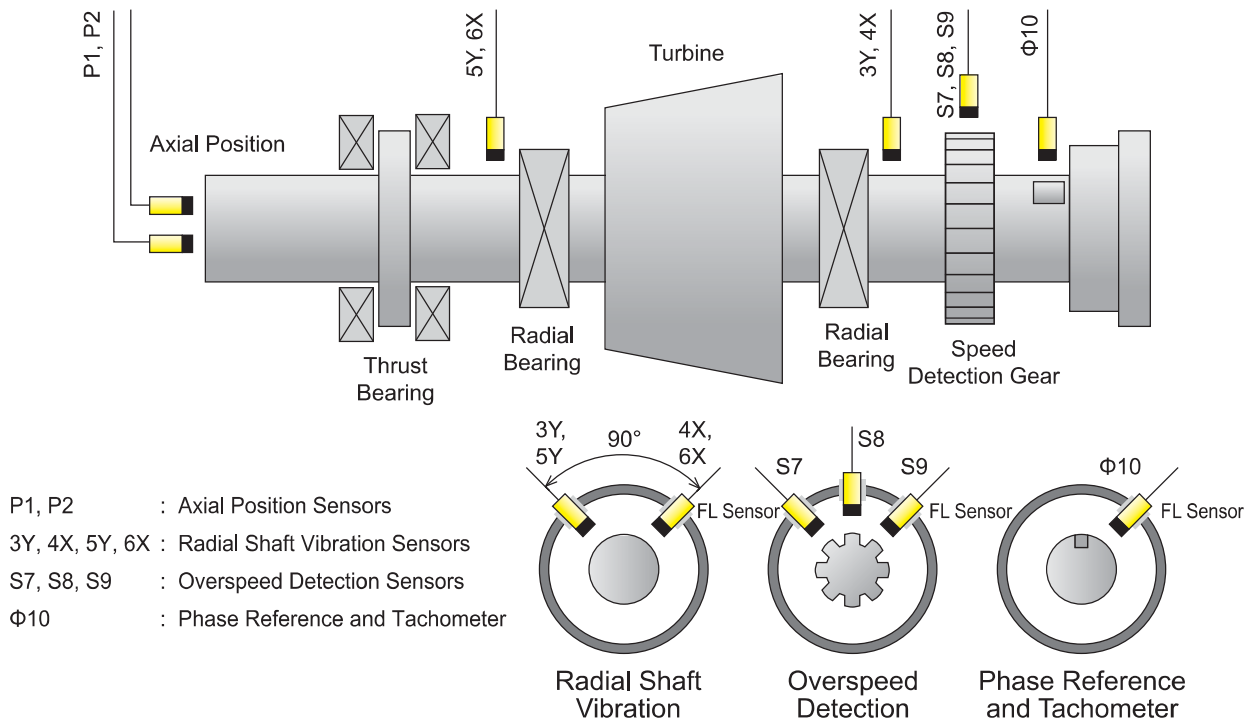
*2 The FK driver is downsized to approximately two-thirds of the existing model of the VK series.

FK System Configuration

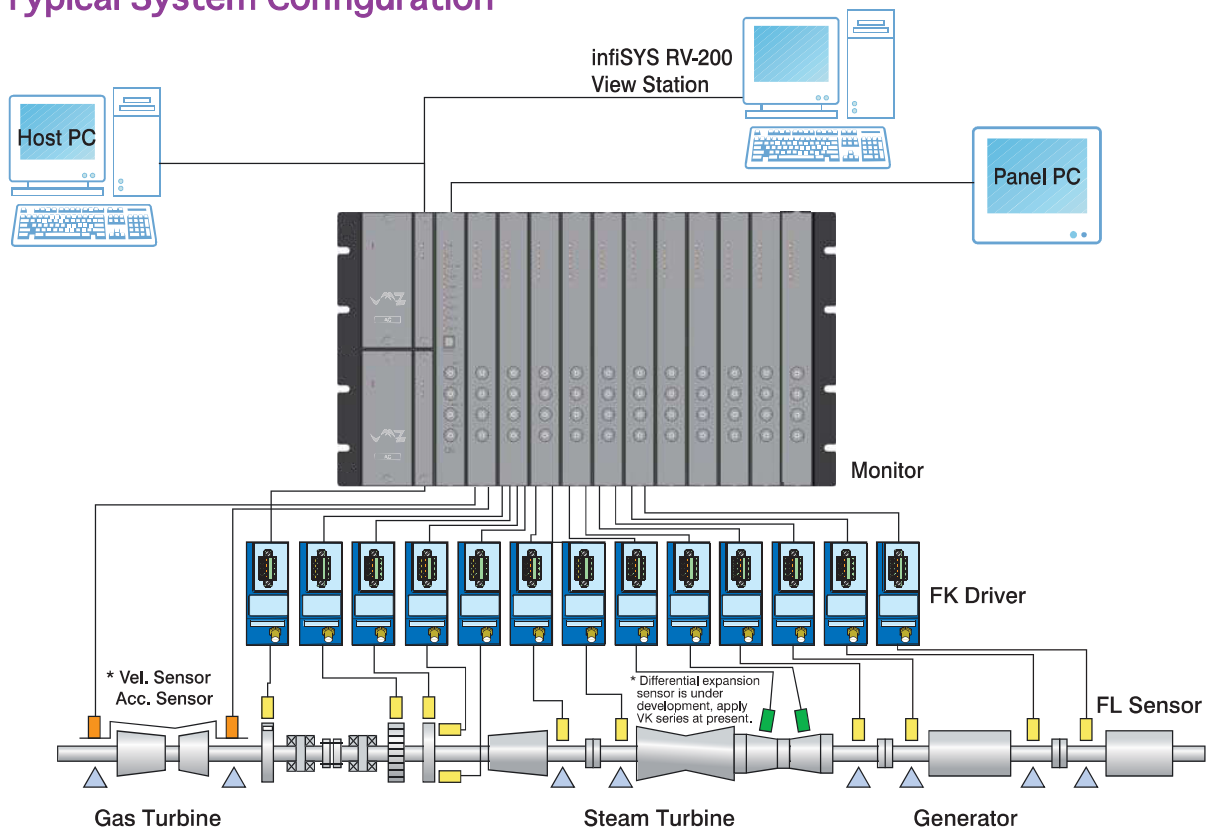


Example of Application

Typical system arrangement for a turbine (Quotation from API 670 (4th Edition) APPENDIX H)



■ Typical System Configuration



■ Specifications

Standard Calibration Target	JIS SCM440 flat surface
Measurement Range	0.25 to 2.25 mm from sensor tip
Scale Factor	7.87 V/mm
Scale Factor Tolerance ¹	Within 7.87 V/mm ±5% (When system cable length is 5 m.) Within 7.87 V/mm ±6.5% (When system cable length is 9 m.)
Linear Characteristics ¹	Within ±25 μm for a straight line of 7.87 V/mm (When system cable length is 5 m.) Within ±38 μm for a straight line of 7.87 V/mm (When system cable length is 9m.)
Frequency Response ¹	DC to 10 kHz (-3 dB)
Sensor Tip Diameter	Approx. φ5 mm or Approx. φ8 mm
System Cable Length	5 m or 9 m
Operational Temperature Range ²	FL sensor : -35 to +177°C FW extension cable : -35 to +177°C FK driver : -35 to +80°C
Operational Humidity Range	30 to 95% RH (No condensation, submerge) (However, the sensor itself is 100%RH)
Power	Within -24 VDC±10%
Terminal Block	Spring lock terminal

¹ Specifications marked with ("1") apply under the following conditions:

- Standard calibration target SCM440 flat surface (Φ15 mm or more, t=5 mm or more)
- -24.0 VDC Power source voltage
- Load resistance 10 kΩ
- Ambient temperature 25°C

² The operating temperature range (upper limit) for connectors of the sensors and the extension cables shipped on July 31, 2011 or earlier is 125°C.

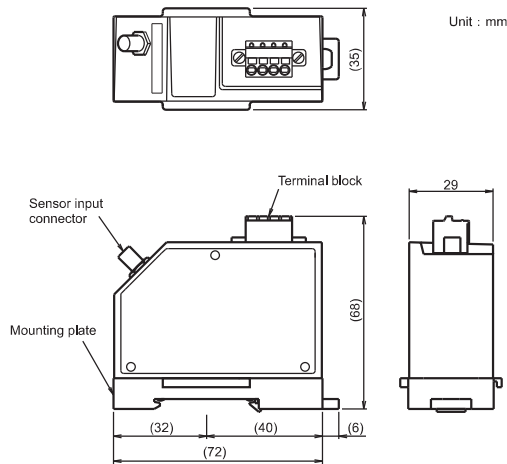
FK Driver Model Code Number and Outline Drawing

Model Code Number

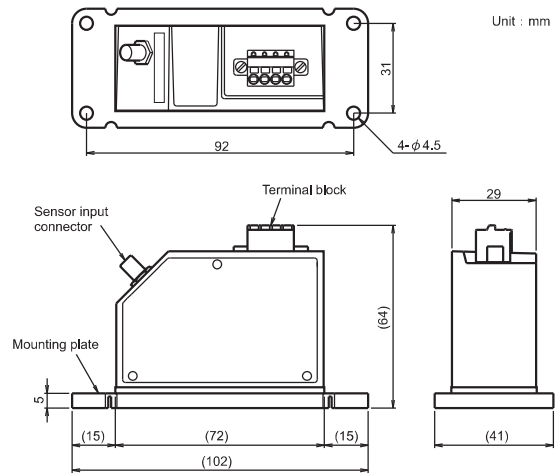
FK-202F□-□

System Cable Length		Mounting Plate	
1	5 m	1	3DIN Rail (35 mm) Mount
2	9 m	2	Screw Mount (50,8×50,8 mm)
		3	Screw Mount (92×31 mm : For VK Replacement)
		4	Screw Mount Multi-pitch (50,8×50,8 mm and 92×31 mm)

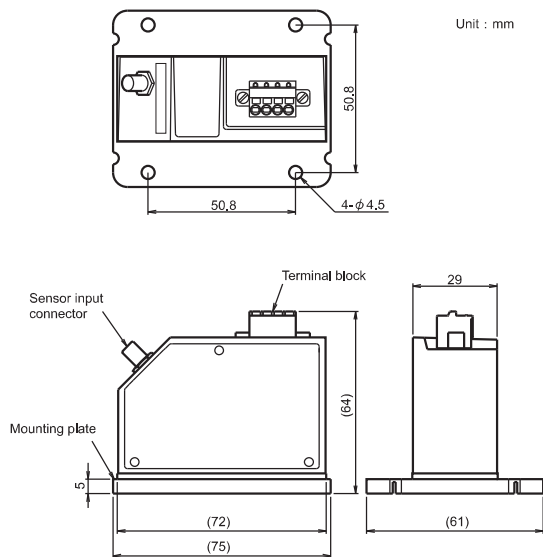
FK-202F□-1 (DIN Rail Mount)



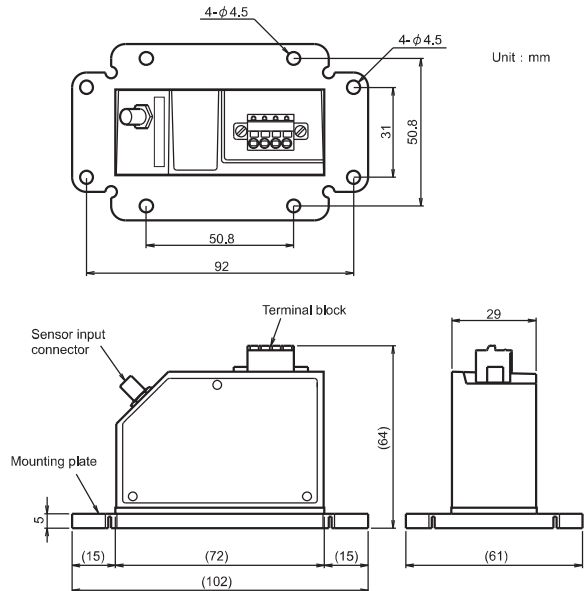
FK-202F□-3 (Screw Mount : For VK replacement)



FK-202F□-2 (Screw Mount : 50.8×50.8 mm)



FK-202F□-4 (Screw Mount : Multi-pitch)



Note) Exchange the transducer as a loop of the sensor, the extension cable and the driver, when replacing the VK-202A, the RD-05A or the transducer made by the other manufacturers with the FK-202F transducer.

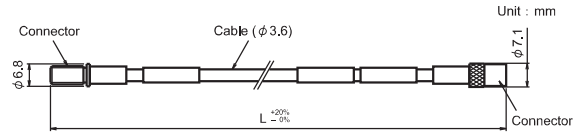
FW Extension Cable Model Code Number and Outline Drawing

Model Code Number

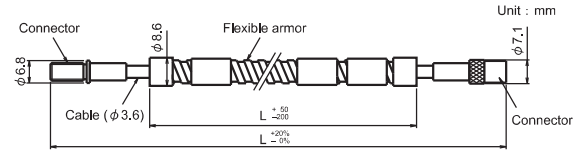
FW-202F -

Armor		Cable length (L)	
L	Without armor	40	4.0 m
A	With armor (Without fluoro resin coating)	45	4.5 m
		80	8.0 m
T	With armor (With fluoro resin coating)	85	8.5 m

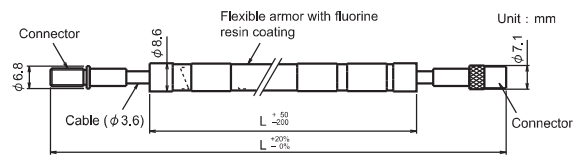
FW-202FL (Without Armor)



FW-202FA (With Armor [Without fluoro resin coating])



FW-202FT (With Armor [With fluoro resin coating])



FL Sensor Model Code Number and Outline Drawing

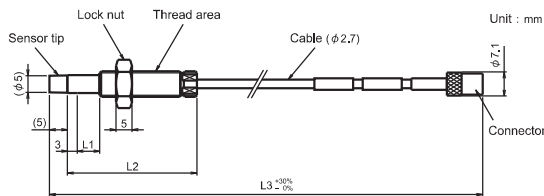
Standard Type Sensor Model Code Number (Sensor Tip Diameter : φ5 mm)

FL-202F05 - - - -

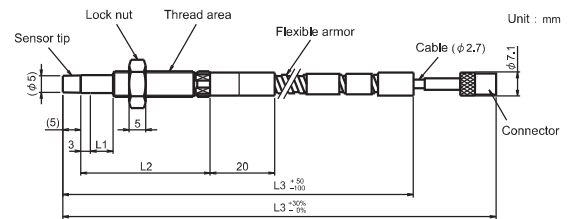
Armor		Thread size		Unthreaded length (L1)	Case length (L2)	Cable length (L3)	
L	Without armor	M1	M8×1	10 mm STEP, 0-230 mm $L1 \leq L2 - 20$ mm e.g.) 06=60 mm	10 mm STEP, 20-250 mm e.g.) 25=250 mm	05	0.5 m
A	With armor (Without fluoro resin coating)	U1	1/4-28UNF	0.1 inch STEP, 0-9.2 inches $L1 \leq L2 - 0.7$ inches e.g.) 04=0.4 inch	0.1 inch STEP, 0.8-9.9 inches e.g.) 35=3.5 inches	10	1.0 m
						50	5.0 m
T	With armor (With fluoro resin coating)					90	9.0 m

When a metric screw is selected, specified in mm.
When a unify screw is selected, specified in inch.

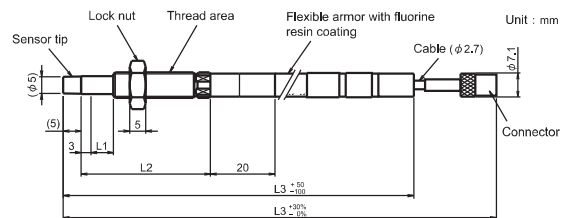
FL-202F05L (Without Armor)



FL-202F05A (With Armor [Without fluoro resin coating])



FL-202F05T (With Armor [With fluoro resin coating])

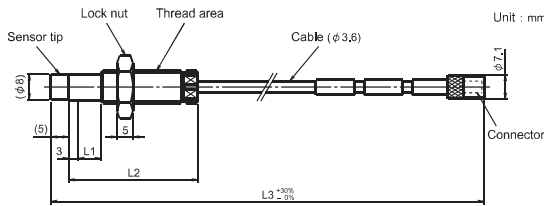


■ Standard Type Sensor Model Code Number (Sensor Tip Diameter : $\phi 8$ mm)

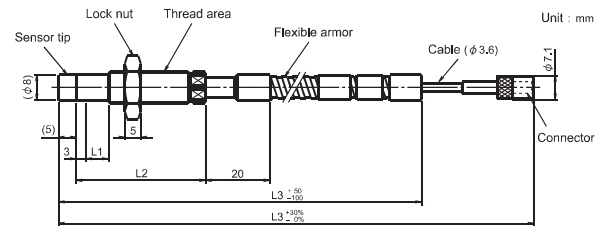
FL-202F08 - - - -

Armor		Thread size		Unthreaded length (L1)	Case length (L2)	Cable length (L3)	
L	Without armor	M2	M10×1	10 mm STEP, 0-230 mm L1 ≤ L2 - 20 mm e.g.) 06=60 mm	10 mm STEP, 20-250 mm e.g.) 25=250 mm	05	0.5 m
A	With armor (Without fluoro resin coating)	U2	3/8-24UNF			10	1.0 m
T	With armor (With fluoro resin coating)			0.1 inch STEP, 0-9.2 inches L1 ≤ L2 - 0.7 inch e.g.) 04=0.4 inch	0.1 inch STEP, 0.8-9.9 inches e.g.) 35=3.5 inches	50	5.0 m
						90	9.0 m
When a metric screw is selected, specified in mm. When a unify screw is selected, specified in inch.							

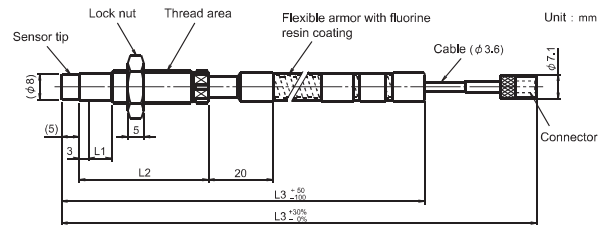
■ FL-202F08L (Without Armor)



■ FL-202F08A (With Armor [Without fluoro resin coating])



■ FL-202F08T (With Armor [With fluoro resin coating])

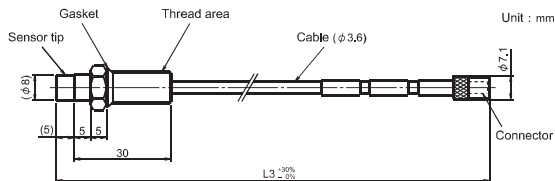


■ Reverse Mount Type Sensor Model Code Number (Sensor Tip Diameter : $\phi 8$ mm)

FL-202F08R - - - -

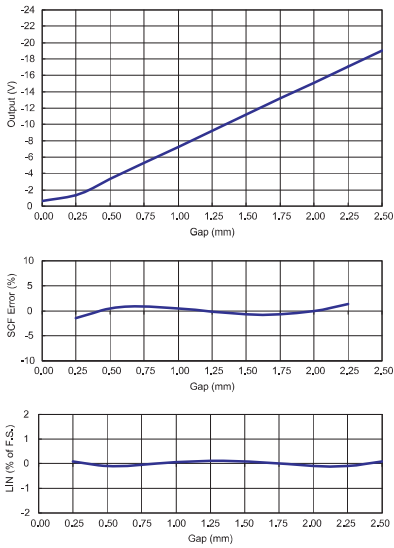
Thread size		Unthreaded length (L1)	Case length(L2)	Cable length(L3)	
M2	M10×1	R5=5 mm	03=30 mm	05	0.5 m
U2	3/8-24UNF	02=0.2 inch	12=1.2 inches	10	1.0 m
		When a metric screw is selected, specified in mm. When a unify screw is selected, specified in inch.		50	5.0 m
				90	9.0 m

■ FL-202F08R (Without Armor)

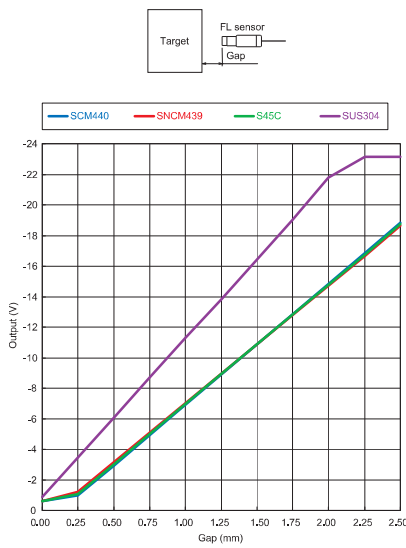


Characteristics Data

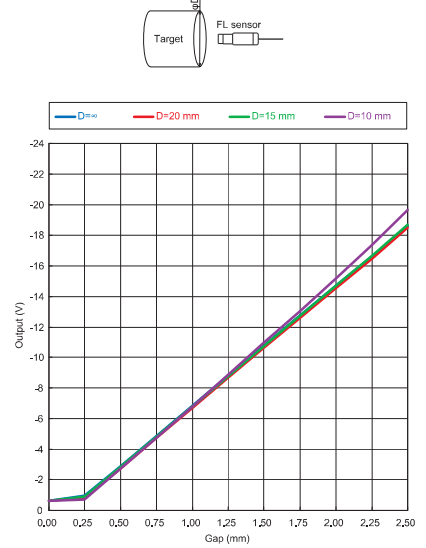
Standard Static Characteristics Target Material : SCM440 Flat Face (dia. 15 mm or more)



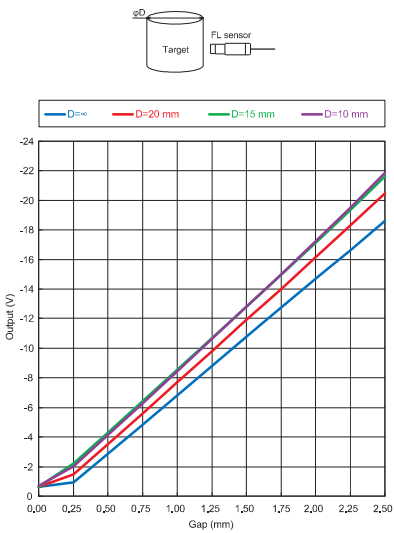
Target Material Effect



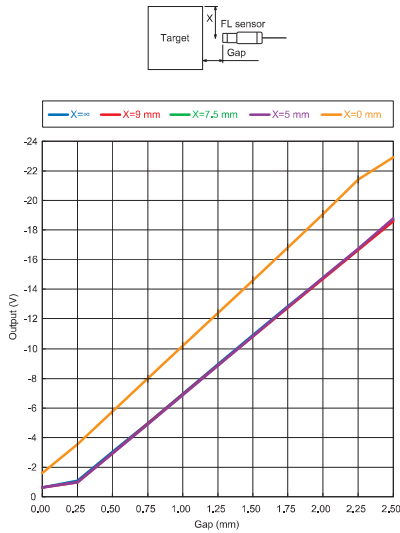
Target Diameter Effect



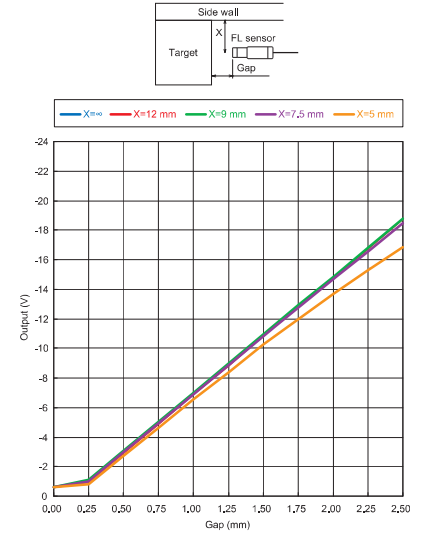
Curved Surface Target Effect



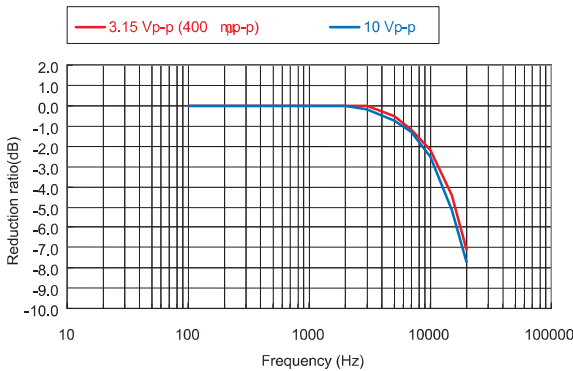
Target Edge Effect



Side Wall Effect



Frequency Response



Monitors



VM-5 Series Monitor

The VM-5 series Monitors are designed in accordance with the API 670 4th Edition for use on rotating machinery. 8 or 10-slot rack mount type and one-unit standalone type with a built-in power supply are available, allowing for use in various applications from vibration monitoring of few channels for small machinery to TSI for large turbines.

- High reliability with redundant power supply
- Easy monitoring with full display function
- Provided with self diagnostic function.



VM-7 Series Monitoring System

The VM-7 series monitoring System is designed according to the ISO International Standards and the API Standards, and offers features as a machine condition monitor for critical machines in plants. It is used for the Machine Protection System defined in the API standard 670 in particular.

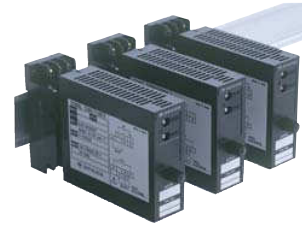
- 4-CH Vibration/Displacement Monitor Module & 6-CH Temperature Monitor Module
- Up to 44 Vibration channels can be connected to its 19" rack
- All modules can be installed/removed from the front. Hot swappable
- Redundant power supply



VM-16 Series Monitor

The VM-16 is a 4, 8 or 12-channel machine condition monitor to measure vibration, axial position and temperature. The monitoring parameters can be assigned to any channel. The color LCD touch display indicates full information and allows for setup configuration.

- Trend data memory function : CompactFlash™ Memory card and USB port
- Displacement, Velocity, Acceleration, Axial position and Temperature
- Hazardous area approvals: CSA (pending)



VM-21 Series Signal Conditioner

The VM-21 series signal conditioners accept signals from transducers installed on rotating machinery and convert it to a 4 to 20 mADC or 1 to 5 VDC output.

- Displacement, velocity, acceleration and LVDT
- Small and light-weight
- Free choice between 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

* We have more vibration analysis/diagnostics and remote monitoring systems. Please contact us for further information.



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