

# Ultrasonic Thickness Gauges

## TI-45N/45B/45C

ISO 9001  
  
 JQA 0950

TI-45N



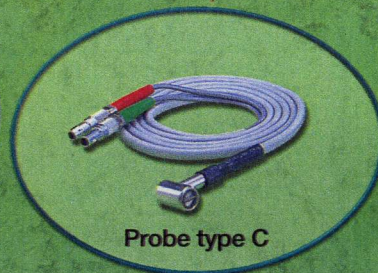
### Options

Attachment for measuring pipes  
 (Equipment for standard probe)

\* Picture : the attachment with the standard probe



Probe for narrow and small  
 measuring points



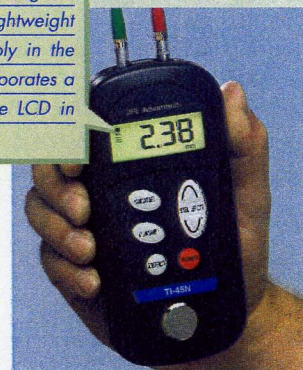
Probe type C

**The new Ultrasonic Wall Thickness Gauges TI-45N, TI-45B & TI-45C accurately measure wall thickness of all metals, ceramics, glass and most rigid plastics**

### Features

- Resolution of 0.01 mm
- Extremely compact & lightweight
- Switch-selectable units - mm or inches
- Built-in calibration test plate
- Quick display update with last reading retained on the display
- Display symbols alert user to poor coupling and low battery conditions

*The attractive, ergonomic housing design is extremely compact, lightweight and rugged. It fits comfortably in the palm of your hand and incorporates a back light that illuminates the LCD in poorly lit areas.*



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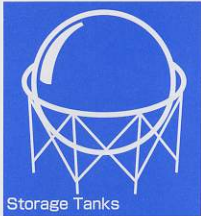
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## Ultrasonic Thickness Gauges

### TI-45N/TI-45B/TI-45C

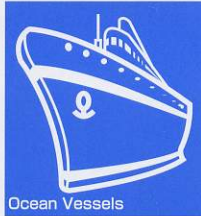
- Applicable to measure wall thickness and state of corrosion of tanks, pipings, hull plate of ships, and structures.
- Also applicable to product inspection of various materials.  
Metals : steel, cast steel, cast iron (malleable cast iron, spheroidal graphite cast iron), aluminium, copper, brass, titanium, etc.  
Non-metallic materials : glass, hard plastics (except acrylic), etc.



Storage Tanks



Piping Systems



Ocean Vessels



Bottle



Parts Inspection



Resin

#### Front Panel

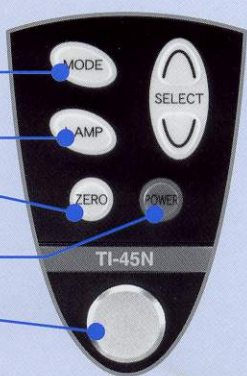
Mode select switch

Back light switch

Zero adjustment switch

Power on-off switch

Test plate (5mm)



#### Velocity table

Materials	CL (m/s)
Steel	5930
SUS 304	5790
Glass	5570
Copper	4700
Zinc	4170

#### TI-45 series Complete Kit

The TI-45 series is supplied as a complete kit with the gauge and wrist strap, probe and cable assembly, 1 bottle of coupling fluid, battery and instruction manual - all supplied in a fitted, hard plastic carrying case.



Specifications	TI-45N	TI-45B	TI-45C
Measuring range in steel & pipe dia	1.00—199.99mm φ30.0 × thickness 1.50mm or more	0.40—15.00mm φ10.5 × thickness 1.25mm or more	0.50—19.00mm φ8.0 × thickness 0.8mm or more
Resolution accuracy	±0.05mm or ±0.2%rdg	±0.03mm	±0.03mm
Probe Diameter	5Z10NDT-M (5MHz) φ13.0mm	10Z10NDT-B (10MHz) φ13.0mm	10Z6NDT-A (10MHz) φ7.5mm
Display	4 2/1 - digit LCD display, light with push button illumination		
Display resolution	0.01mm		
Velocity range	1,000m—1,2000m/s		
Cable	1m long cable with locking, quick removable connections		
Battery	One AA battery		
Calibration plate	5.00mm steel plate, built-into the front of the housing		
Size	69 (W) × 144 (H) × 30 (T) (mm)		
Weight	Gauge 200g, Probe 50g		
Temperature	-5°C—50°C (Ambient•Materials)		
Warranty	Gauge:1 year, Probe:6 months		

Opiton

Attachment for measuring pipes and tubes	TI-P01
Couplant	TI-C01

#### PRECAUTIONS

- The probe surface is fabricated from acrylic resin and care should be placed down for measurements and lifted vertically when complete. Do not slide on surfaces.
- Do not use these gauges where material temperatures exceed 60°C (140°F) as the probe will be damaged. Use the Temperature Thickness Gauge for these applications.
- Keep the gauge free of dust (especially metal powders, carbon, etc.) as they will damage the PC Board. Use a damp cloth to clean the gauge after use. DO NOT USE CHEMICAL SOLVENTS OF ANY KIND.

\*Specifications may be changed without notice due to proceeding improvements.

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# Vibrometer for Simple Diagnosis Use

# MK-21



An Easy to Operate, Portable Vibrometer with Diagnostic Function

## Features

- Has 3 measurement modes: acceleration, velocity and displacement
- Equipped with a diagnostic function compliant with ISO 10816-1 (JIS B 0906). Capable of automatically diagnosing the state of rotary machines.
- Also allows easy diagnosis of bearings with assessment criteria indicated on the back of the main unit
- Capable of continuously operating for more than 8 hours with one AA cell battery (equipped with an auto turn-off function)
- Uses a vibration pickup provided with a magnet to ensure stable measurement accuracy
- Capable of measurement even in a dark place with a backlit display
- Attached with a firm carry case that allows you to easily carry and store the vibrometer



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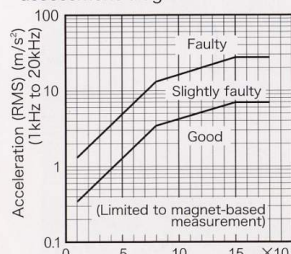


■ Equipped with an automatic diagnostic function compliant with vibration severity standards

Velocity - assessment diagram

Velocity : RMS value (mm/s)	1	2	3	4
20.0	D	D	D. Faulty	D
10.0	C	C	C. Slightly faulty	C
5.0	B	B	B. Passably good	B
2.5	A	A	A. Good	A
CLASS	1	2	3	4
	Small machine	Medium-sized machine	Large machine	Large machine

Acceleration - rotary bearing assessment diagram



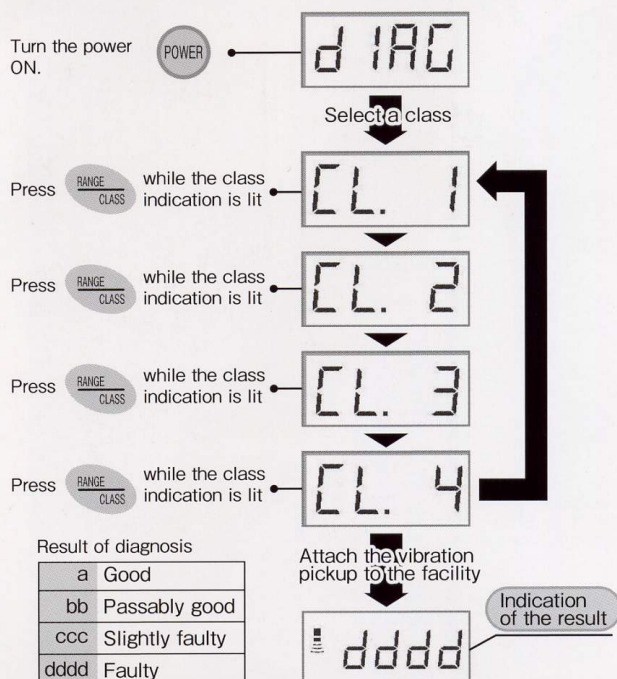
DN value  
(shaft diameter [mm] × rotating speed N [min<sup>-1</sup>])

Vibrometer for simple diagnosis use model MK-21 is equipped with an automatic diagnostic function compliant with vibration severity standards (ISO-10816, JIS B 0906), allowing even those operators who have never used a vibrometer to diagnose the status of their facilities.

MK-21 also enables the user to assess whether a rotary bearing is a conforming article by referring to the assessment diagram provided on the back of the main unit.

※The rotary bearing assessment diagram is an original standard of JFE Advantech Co., Ltd

■ Flow of diagnostic operation



■ Specifications

Sensor	Piezoelectric vibration pickup (with magnet)		
Measurement mode	Acceleration (ACC) Acceleration peak (ACC PEAK) Velocity (VEL) Displacement (DISP)		
Measurement range		Low range	High range
	Acceleration	0.0~20.0m/s <sup>2</sup>	0~200m/s <sup>2</sup>
	Acceleration peak	0.0~20.0m/s <sup>2</sup>	0~200m/s <sup>2</sup>
	Velocity	0.0~20.0mm/s	0~200mm/s
	Displacement	0~200μm	0~1990μm
Measurement frequency range	Acceleration : 1 kHz~20 kHz Acceleration peak : 1 kHz~20 kHz Velocity : 10Hz~1 kHz Displacement : 10Hz~1 kHz		
Arithmetic processing	Acceleration : RMS value Acceleration peak : PEAK value Velocity : RMS value Displacement : P-P value		
Display type	LCD 4.5 digits with backlighting		
Low-battery indication	Low-battery mark appears on LCD		
Service temperature range	0 to 50-C (90% RH, no condensation)		
Storage temperature range	-10 to 60-C (90% RH, no condensation)		
Power source	AA alkali dry battery (x1), continuously operable for over 8 hours		
Outer dimensions	69W×154H×30D		
Mass	Approximately 140 g (including battery)		

■ Standard configuration

Main unit	MK-21	x1
Piezoelectric vibration pickup	PU-626D	x1
Magnet	MK-9002	x1
Curl cord	CD-C1-3N	x1
AA dry battery	LR-6	x1
Carry case		x1
Instruction manual		x1

■ Option

Vibration pickup (hand-held)	PU-601R-A
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※ Bearing diagnosis with the assessment table is not available if the hand-held vibration pickup is used.

※ The catalog is subject to change without notice for improvement.

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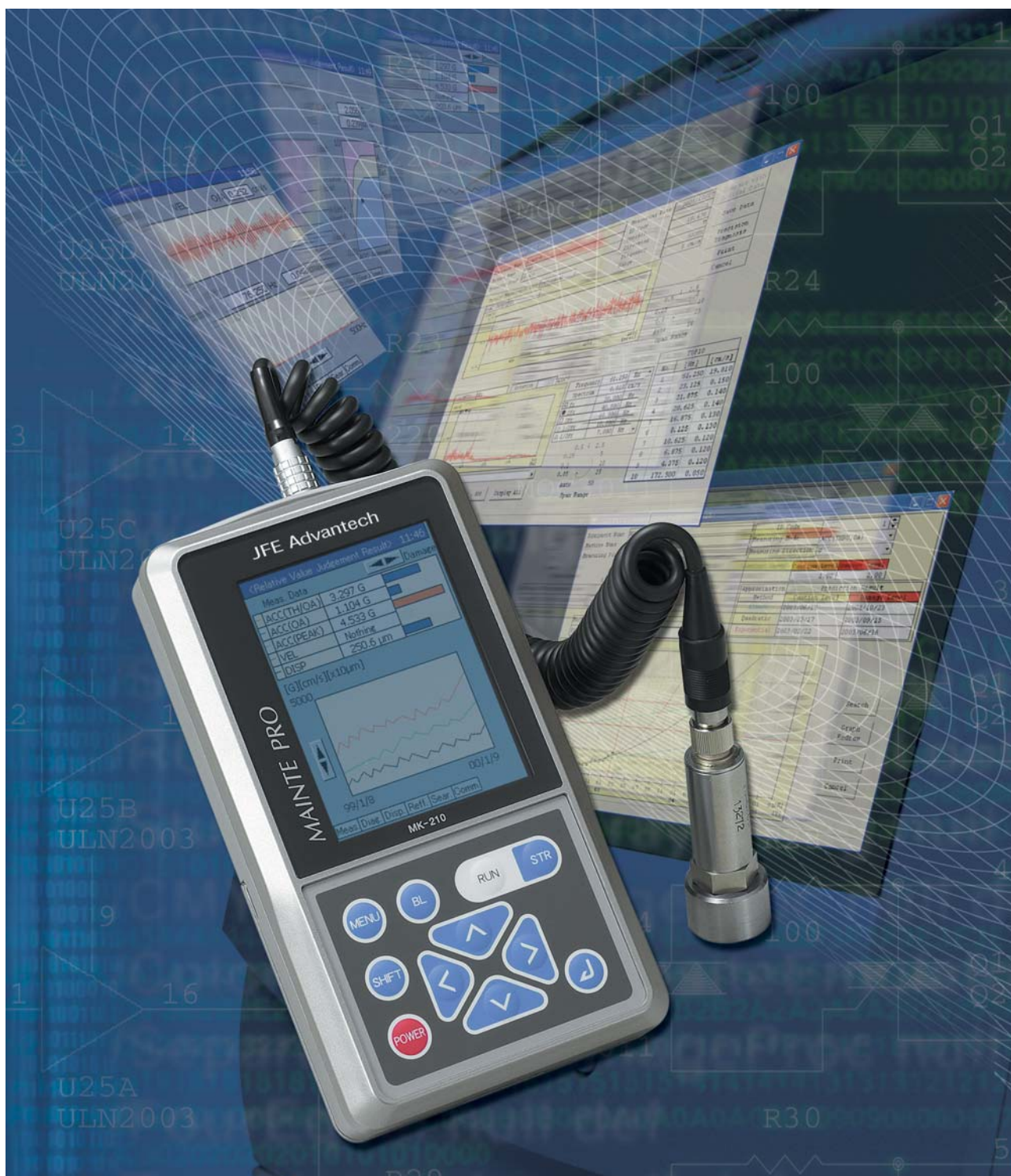


Vibration Data Management System **MAINTe PRO<sup>®</sup>**

# MK-210HEII for Windows



Next-Generation Diagnosis Tool for the IT Age



**JFE Advantech Co., Ltd.**

(Former name : Kawatetsu Advantech Co., Ltd. )



# MK-210HE II for Windows

identifies signs of equipment deterioration, assesses the causes of trouble, predicts when to make repairs, reduces the required number of maintenance personnel, lowers maintenance costs, and improves production efficiency.

## Features

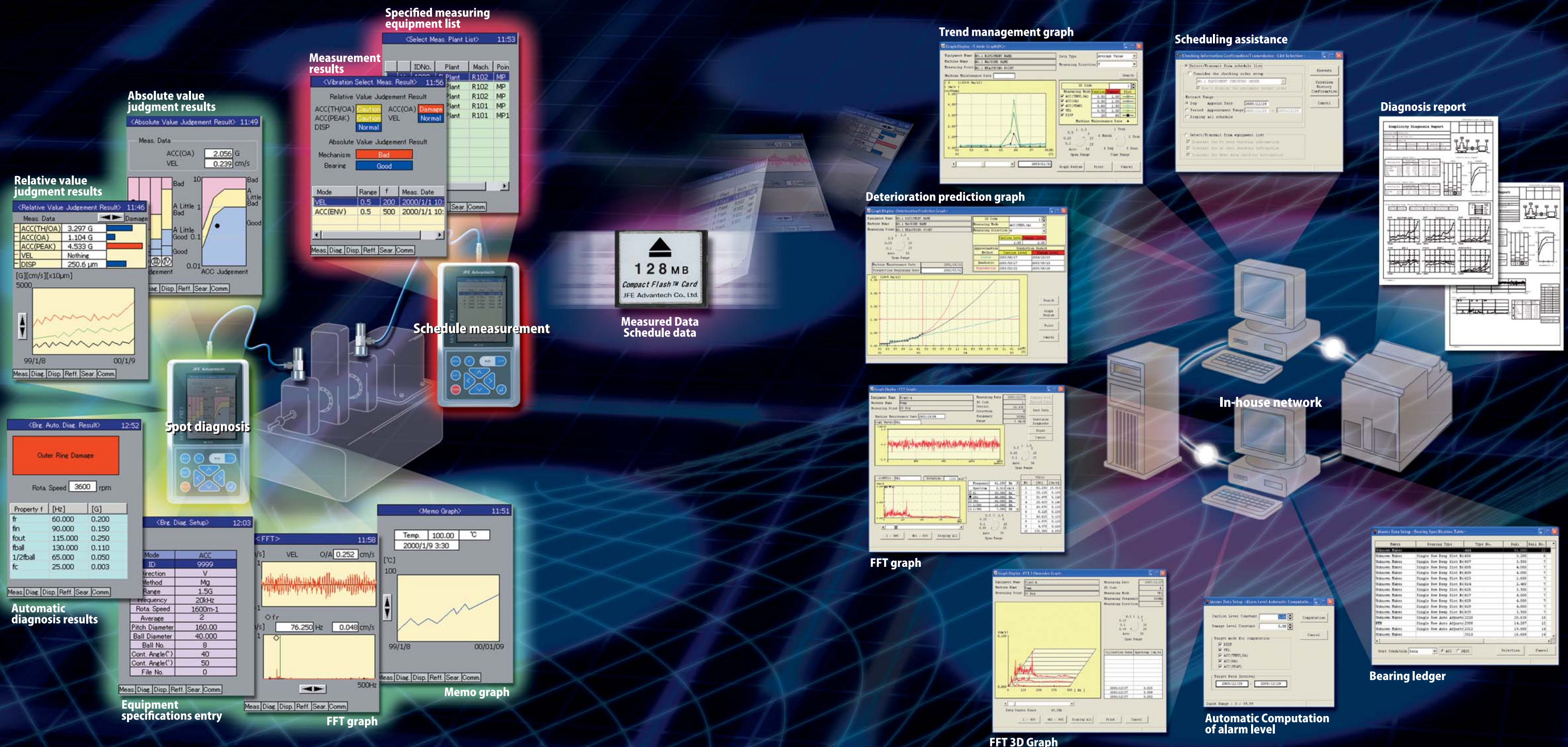
- Simple operation**  
Automatic measurement function, inspection information automatic creation
- Large capacity memory**  
Uses a large capacity compact flash memory card.
- Wide variety of configurations**  
Route measurement, schedule measurement, non-schedule measurement
- Abundant know-how**  
Complete diagnostic logic, automatic report creation
- Uses Windows CE**  
Easy-to-use user interface
- Vertical color liquid crystal display**  
Colorful graphic displays, identifies the diagnostic results by color
- 2-mode measurement**  
Measures vibration and temperature
- Built-in automatic diagnostic functions**  
Automatic diagnostics can be conducted on site
- Diagnosis of variable speed equipment**  
Automatic detection and free setting of rotation speed
- Water resistance comparable to IP66**  
Can be used without worry even during rainy weather
- Linked with an equipment maintenance/management system**  
Increases efficiency of the maintenance operation using maintenance/management information and equipment diagnosis information

## Precision diagnostic functions

- Bearings**  
Inner race damage, outer race damage, ball damage, defective supports
- Gears**  
Single-side contact, shaft center misalignment, tooth wear, defaced teeth, local defect
- Mechanisms**  
Unbalance, misalignment, bent shaft, insufficient rack rigidity, shaft wear, play/looseness, installation misalignment
- Pumps and fans**  
Pressure pulsation, uniform wear, uneven wear, local defect
- Motors**  
High-frequency vibration, unbalanced voltage



Automatic diagnosis





# MK-210HE II for Windows

## Equipment Diagnosis Instrument MK-210HE II Specifications

### Vibration meter unit

Input signal	Acceleration pickup signal, 1 channel		
Measurement mode Measurement frequency range Measurement range	Measurement mode	Measurement frequency range	Measurement range
	Acceleration ACC (TH/OA)	5 - 20kHz	0.5, 1.5, 5, 15, 50 G <sub>0-P</sub> (1G=9.8m/s <sup>2</sup> )
	Acceleration ACC (OA)	1k - 20kHz	
	Acceleration ACC (PEAK)	1k - 20kHz	
	Acceleration ACC (ENV)	1k - 20kHz	
	Velocity VEL	5 - 1kHz	0.5, 1.5, 5, 15, 50 cm/s <sub>0-P</sub>
	Displacement DISP	5 - 250Hz	50, 150, 500, 1500, 5000 μm <sub>0-P</sub>
Analysis frequency range	100, 200, 500, 1k, 2k, 5k, 10k, 20kHz (F.S)		
Resolution	1/400, 1/800 of the analysis frequency range		

### Temperature measurement unit

Input signal	3-wire type resistance temperature probe, Pt100Ω 1 channel
Measurement range	0 - 100°C

### Digital circuit unit

Display	STN color liquid crystal (240 x 320 dots) with back light
OS	Microsoft® Windows® CE Version 3.0
External memory	128MB compact flash memory card (installed in card slot)
Card slot	Compact flash card slot, TYPE I/II (3.3V specifications)

### Software function specifications

Measurement	Specific measurement, free measurement, vibration frequency analysis, vibration automatic precision diagnosis
Display	Relative value, absolute value assessment results, relative comparison graph, absolute comparison graph, vibration time axis waveform, vibration frequency analysis results, measurement ID list, bearing ledger

### General specifications

Main power	Rechargeable battery pack (lithium ion rechargeable batteries, hard pack) Charger specifications: Input AC 100V ±10%, 50/60 Hz
Continuous operation time	5 hours or more (when backlight is not used)
Charging time	Approx. 1 hour (time to fully charge)
Body protective construction	Dust-resistant and water-resistant construction (comparable to IP66)
Usage temperature range	0 °C to 50°C (90%RH, no condensation)
Storage temperature range	-10°C to 60°C (90%RH, no condensation)
External dimensions (body)	97W X 50D X 170H (mm)
Weight (body)	Approx. 550g (including rechargeable battery pack)

## MK-210HE II Data Processing Software Specifications

### Data files that can be managed

Equipment management	Maximum of 10,000 files
Vibration level data	Maximum of 10 million files
Vibration waveform data	Maximum of 30,000 files
Vibration waveform initial data	Maximum of 10,000 files x 5 modes
Temperature, memo data	Maximum of 10 million files

### Data transfer method (between MK-210HE II and a personal computer)

Memory card (standard)	Compact flash memory card
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### Data display and output

Vibration data	Relative comparison graph, mutual comparison graph, vibration time axis waveform, vibration frequency analysis results
	Vibration frequency analysis results 3D display, simple and precision diagnosis reports
	Diagnosis report output in Excel (Excel 2000 or later) List of vibration DC data assessments
Temperature, memo data	Relative comparison graph, mutual comparison graph
Inspection information	Inspection schedule management
Data registration management	ID code, equipment specifications, diagnosis conditions, inspection route, schedule, equipment maintenance record, bearing ledger, operation, network environment settings

### Operation environment

Personal computer	PC/AT 100% compatible CPU: Pentium 200 MHz, RAM: 64MB or more Required hard disk capacity: 150MB or more Card slot: PC card or Compact Flash memory card
OS	Standard support: Windows 98, ME, 2000 and XP
Printer	Printer that supports Windows

## Standard accessories

### MK-210HE II for Windows

Equipment diagnostic instrument: MK-210HE II-E			MK-210HE II Data Management Software MK-9802-E		
Measurement instrument main unit		1 set	Software CD		1 piece
Vibration pick-up	PU-626D-C1-NC	1 piece			
Magnet	MK-9002	1 piece	PC card adapter	CFC-ADP02	1 piece
Rechargeable battery pack	MK-8401	1 piece			
Recharger	MK-8220	1 piece			
Compact flash memory card 128MB	CFI-128MDG (H02AA)	1 piece	User's manual		1 copy
Carrying case	MK-9701	1 piece			
MK-210HE II instruction manual		1 copy			

※ Windows® is a registered trademark of Microsoft Corporation of the United States.  
Pentium is a registered trademark of Intel Corporation.

## Option

### Optional accessories

Vibration pick-up	PU-616D-C1-NC
Vibration pick-up	PU-601R-C
Magnet type temperature sensor	MK-9401
Spare rechargeable battery pack	MK-8401
Spare recharger	MK-8220
AC adaptor	MK-9501
Compact flash memory card 32MB	CFI-128MDG (H02AA)
PC card adaptor	CFC-ADP02
USB-CF reader/writer	REX-CF03F
Carrying case	MK-9701
MK-210HE II client software	MK-9802-E
12-channel switch box	MK-8310A
Connection cable for switch box	CJ-01-5

※ Specifications may be changed without notice according to technical improvements.

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Kawatetsu Advantech Co., Ltd. has been renamed to JFE Advantech Co., Ltd. since April 1, 2004.