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High Performance Magnetic Field Measurement Instruments

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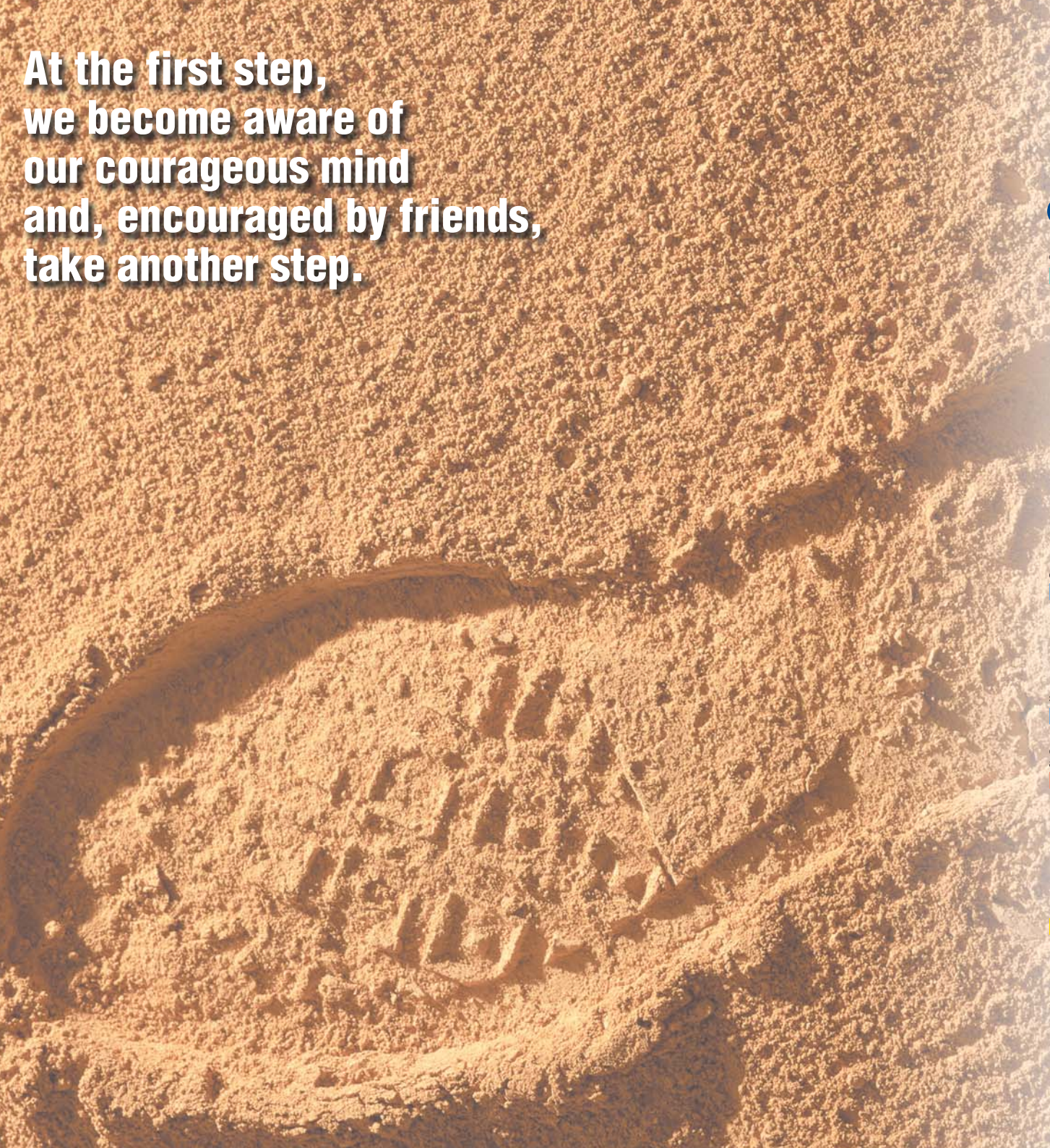

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* Please note that part of the specifications may subject to change without prior notification.

HM type gaussmeter

For DC magnetic field
HM-101 (single-axis)

Outline
A handheld-type single-axis gaussmeter, realizing easy measurement of DC magnetic field (0 to ±199.9μT) such as earth magnetism: a magnetic multivibrator sensor enables measurement with 0.1μT resolution.

Features
Low power consumption type, capable of long continuous measurement with four size-AA battery cells / Excellent temperature characteristics, capable of use just after power ON / Easy adjustment of sensor zero point / Cancelling function

Specifications

Measuring range		0～±199.9μT
Resolution		0.1μT
Linearity error		±0.5% of F.S.
Cancelling range		Approx. ±50μT
Power supply		Size AA battery cell x 4 /DC6V±20%
Continuous measurement time		Approx. 72hr
Dimensions	Body	100(W) x 45(H) x 180(D)
	Probe	Dia.:11mm, Length:130mm, Cable length:Approx. 2m
Weight		Approx. 400g
Option		Probe stand (PS-100)

For AC magnetic field
HM-150 (single-axis)

Outline
A handheld-type single-axis gaussmeter, realizing easy measurement of AC magnetic field (0 to 199.9μT) at a frequency from 50Hz to 20kHz: an air coil type sensor enables measurement with 0.1μT resolution.

Features
Low power consumption type, capable of long continuous measurement with four size-AA battery cells / Excellent temperature characteristics, capable of use just after power ON / Cancelling function

Specifications

Measuring range		0～199.9μT
Resolution		0.1μT
Linearity error		±1.0% of F.S.
Frequency response (at F.S.)		±1.5%(400Hz～10kHz) ±3.0%(50Hz～400Hz / 10kHz～20kHz)
Response time		Approx. 4 sec.
Power supply		Size AA battery cell x 4 /DC6V±20%
Continuous measurement time		Approx. 30hr
Dimensions	Body	100(W) x 45(H) x 180(D)
	Probe	Dia.:11mm, Length:130mm, Cable length:Approx. 2m
Weight		Approx. 400g
Option		Probe stand (PS-100)

Note: Display is given in peak value.

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HM type gaussmeter

For DC/AC magnetic fields
HM-201 (single-axis)

Outline
A portable-type single-axis gaussmeter combining the functions of HM-101 and HM-150: for DC magnetic field, a magnetic multivibrator sensor is equipped and, for AC magnetic field, an air coil type sensor, enabling measurement with 0.1μT resolution. Either DC or AC can be selected with a mode select switch.

Features
Low power consumption type, capable of long continuous measurement with four size-AA battery / Excellent temperature characteristics, capable of use just after power ON / Easy adjustment of sensor zero point, with cancelling function / Output terminals for monitor and recorder

Specifications

Measuring range	DC magnetic field	0～±199.9μT
	AC magnetic field	0～199.9μT
Resolution		0.1μT
Linearity in DC magnetic field		Error: ±0.5% of F.S.
Linearity in AC magnetic field		Error: ±1.0% of F.S.
Frequency response (at F.S.) in AC magnetic field		±1.5%(400Hz～10kHz) ±3.0%(50Hz～400Hz / 10kHz～20kHz)
Power supply		Size AA battery cell x 4 /AC100V(50/60Hz)
Continuous measurement time (in battery cell operation)		For DC: Approx. 72hr For AC: Approx. 30hr
Dimensions	Body	178(W) x 88(H) x 210(D)
	Probe	Dia.:11mm, Length: 130mm, Cable length: Approx. 2m
Weight		Approx. 2kg
Option		Probe stand (PS-100) Modification of power supply (100-240VAC)

Note: For AC magnetic field, display is given in peak value.

HM type gaussmeter

For DC magnetic field
HM-310 (three-axis)

Outline
A three-axis gaussmeter, realizing simultaneous measurement of X, Y and Z components in DC magnetic field (0 to ±199.9μT) such as earth magnetism: a magnetic multivibrator sensor enables measurement with 0.1μT resolution.

Features
Long continuous use by means of AC power supply and chargeable battery / Excellent temperature characteristics, capable of use just after power ON / Easy adjustment of sensor zero point, with cancelling function / Output terminal for recorder / Cancelling function / Available of selection to 0.01μT resolution (display only) in modified type

Specifications

Measuring range		0～±199.9μT
Resolution		0.1μT
Linearity error		±0.5% of F.S.(for each axis)
Power supply		100VAC (50/60Hz) and Built-in rechargeable battery
Dimensions	Body	250(W) x 100(H) x 300(D)
	Probe	35 x 35 x 35mm, Cable length: Approx. 3m
Weight		Approx. 3kg
Option		Cancelling function Selection of 0.01μT (display only) RS-232C interface Power source modification (100-240VAC)

For AC magnetic field
HM-315 (three-axis)

Outline
A three-axis gaussmeter, realizing simultaneous measurement of X, Y and Z components in AC magnetic field (0 to 199.9μT) at a frequency from 50Hz to 20kHz: an air coil sensor enables measurement with 0.01μT maximum resolution.

Features
Long continuous use by means of AC power supply and chargeable battery / Excellent temperature characteristics, capable of use just after power ON / Output terminals for monitor and recorder / Selection of 0.01μT resolution

Specifications

Measuring range		0～199.9/19.99μT, selectable
Resolution		0.1μT/0.01μT, selectable
Linearity error		±1.0% of F.S. (for each axis)
Frequency response (at F.S.)		±1.5%(400Hz～10kHz) ±3.0%(50Hz～400Hz / 10kHz～20kHz)
Power supply		100VAC (50/60Hz) and Built-in rechargeable battery
Dimensions	Body	250(W) x 100(H) x 300(D)
	Probe	42 x 42 x 83mm, Cable length: Approx. 3m
Weight		Approx. 3kg
Option		RS-232C interface Power source modification (100-240VAC)

Note: Display is given in root mean square value.

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HM type gaussmeter

For DC magnetic field
HM-3510 (three-axis)

Outline
A three-axis gaussmeter, realizing simultaneous measurement of X, Y and Z components in DC magnetic field (0 to ±199.9μT) such as earth magnetism: a magnetic multivibrator sensor enables measurement with 0.1μT resolution.

Features
Long continuous use by means of AC power supply and chargeable battery / Excellent temperature characteristics, capable of use just after power ON / Automatic cancelling function for bucking the influence of background magnetic field (simultaneous bucking for X, Y and Z axes) / Output terminal for recorder / RS-232C and GP-IB interface as standard accessories

Specifications

Measuring range		0 ～ ±199.9μT
Resolution		0.1μT
Linearity error		±0.5% of F.S.(for each axis)
Power supply		100VAC (50/60Hz) and integrated chargeable battery
Dimensions	Body	250(W) x 100(H) x 300(D)
	Probe	35 x 35 x 35mm, Cable length: Approx. 3m
Weight		Approx. 4.5kg
Option		Power supply modification (240VAC, designated)

For DC/AC magnetic fields
HM-3520 (three-axis)

Outline
A three-axis gaussmeter, realizing simultaneous measurement of X, Y and Z components in DC magnetic field (0 to ±199.9μT) or in AC magnetic field (0 to 199.9μT) at a frequency from 50Hz to 20kHz by selection with a mode selector switch: a magnetic multivibrator sensor for DC magnetic field and an air coil type sensor for AC magnetic field enable measurement with 0. 1μT resolution.

Features
Long continuous use by means of AC power supply and chargeable battery / Excellent temperature characteristics, capable of use just after power ON / For DC magnetic field measurement, automatic cancelling function is equipped for bucking the influence of background magnetic field (simultaneous bucking for X, Y and Z axes). / Output terminals for monitor and recorder / RS-232C and GP-IB interface as standard accessories

Specifications

Measuring range	DC magnetic field	0 ～ ±199.9μT
	AC magnetic field	0 ～ 199.9μT
Resolution		0.1μT
Linearity in DC magnetic field		Error: ±0.5% of F.S.(for each axis)
Linearity in AC magnetic field		Error: ±1.0% of F.S.(for each axis)
Frequency response (at F.S.) in AC magnetic field		±3.0%(50Hz～400Hz) ±1.5%(400Hz～10kHz) ±3.0%(10kHz～20kHz)
Power supply		100VAC (50/60Hz) and Built-in rechargeable battery
Dimensions	Body	250(W) x 100(H) x 300(D)
	Probe	35 x 35 x 35mm, Cable length: Approx. 3m
Weight		Approx. 4.5kg
Option		Power supply modification (240VAC, designated)

Note: For AC magnetic field, display is given in root mean square value.

HM type gaussmeter

●Photo shows HM-375.

For AC magnetic field HM-375/375A (three-axis)

Outline

A high-sensitive three-axis gaussmeter, realizing simultaneous measurement of X, Y and Z components in AC magnetic field (0 to 10μT) at a frequency from 40Hz to 500Hz: an air coil type sensor enables measurement with 1nT maximum resolution.

Features

Excellent temperature characteristics, capable of use just after power ON / Measurement up to 10μT with a three-range selector / Display of three components (real actual value) and composite value / Integrated band-pass filter enabling selection of any measuring frequency / Output terminals for monitor and recorder, respectively / RS-232C interface

Specifications

Measuring range		0~10μT/1μT/0.1μT, selectable
Maximum resolution	HM-375	1nT
	HM-375A	0.1nT
Linearity error		±1.0% of F.S.(for each axis)
Frequency response (at F.S.)		±5.0%(40Hz~500Hz)
Power supply		100VAC (50/60Hz)
Dimensions	Body	350(W) x 132(H) x 300(D)
	HM-375 Probe	50 x 50 x 50mm, Cable length: Approx. 5m
	HM-375A Probe	120 x 120 x 120mm, Cable length: Approx. 5m
Weight		Approx. 5kg

Note: Display is given in root mean square value.

RM type gaussmeter

For AC magnetic field RM-300 (three-axis)

Outline

A three-axis gaussmeter, realizing simultaneous measurement of X, Y and Z components in AC magnetic field (0 to 100μT) at a frequency from 50Hz to 20kHz, and display of total magnetic force in root mean square value: an air coil type sensor enables measurement with 0.01μT maximum resolution.

Features

Lightweight and small-size, capable of about 18-hour continuous measurement with four size-AA battery / Excellent temperature characteristics, capable of use just after power ON / Two-range selection of 100μT and 10μT / Coaxial X, Y and Z sensors, displaying total magnetic force in real root mean square value

Specifications

Measuring range		0~100.0μT/10.00μT, selectable
Resolution		0.1μT/0.01μT, selectable
Linearity error		±1.0% of F.S.(total magnetic force)
Frequency response (at F.S.)		+1.5%(400Hz~10kHz) ±3.0%(50Hz~400Hz, 10kHz~20kHz)
Response time		Approx. 3 sec.
Temperature characteristics		−0.1%/℃
Power supply		Size-AA battery x 4 /DC6V±20%
Dimensions	Body	100(W) x 45(H) x 180(D)
	Probe	50 x 50 x 50mm, Cable length: Approx. 1.5m
Weight		Approx. 400g

Note: Display is given in root mean square value.

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AG type gaussmeter(for waveform analysis)

For AC magnetic field AG-1015 (single-axis)

Outline

A single-axis gaussmeter, realizing measurement of AC magnetic field (0 to 100μT) at a frequency from 50Hz to 20kHz together with waveform analysis of the pertinent magnetic field: an air coil type sensor enables measurement with 0.01μT maximum resolution.

Features

Selection of analysis mode between time axial waveform and power spectrum / Display of magnetic field at any point by marker shift

Specifications

Measuring range		100.0/10.00μT, selectable
Maximum resolution		0.01μT
Frequency range		50Hz~20kHz
Linearity error		±1.0% of F.S.
Frequency response (at F.S.)		±1.5%(400Hz~10kHz) ±3.0%(50Hz~400Hz,10kHz~20kHz)
Internal FFT inputting section	Filter	8-order elliptic, Chevyshev
	AD converter	12 bit
	In-band ripple	±0.4dB or less (out of 20kHz range)
	In-band ripple	±0.6dB or less (in 20kHz range)
Analyzing section	Frequency range	100,200,500,1k,2k,5k,10k,20kHz
	Frequency resolution	1/200(to frequency range)
	Window function	Rectangular, hanning
	Trigger mode	Repeat, single
Display		Time axis waveform/Power spectrum, selectable Marker value, peak value (only in power spectrum measurement) Real actual value (50Hz~20kHz)
Power supply		Size-AA battery x 4 (about 7-hour continuous measurement / by use of alkali battery cell) AC adaptor (VSM-510SW)
Dimensions	Body	190(W)x46(H)x138(D),approx.650g(including battery cell)
Weight	Probe	50 x 50 x 25mm Cable length: Approx. 1.5m, approx. 150g
Option		Printer set (Printer: BL-80RS, AC adaptor (SANEI), cable) Thermal printing paper BL-80-30, battery pack UR-100 Battery charger NC-LSC01

Note: Display is given in root mean square value.

For AC magnetic field AG-3015 (three-axis) Production stoppage

Outline

A three-axis gaussmeter, realizing simultaneous measurement of X, Y and Z components in AC magnetic field at a frequency from 50Hz to 20kHz together with waveform analysis of the pertinent magnetic field: an air coil sensor enables measurement with 0.01μT maximum resolution.

Features

Indication of X, Y and Z components and total magnetic flux density in root mean square value or wave height / Easy measurement by means of automatic setting function / Output terminal for recorder / Hard copy of current screen by optional printer connection

Specifications

Measuring range		100.0/10.00μT, selectable
Maximum resolution		0.01μT
Frequency range		50Hz~20kHz
Linearity error		±1.0%ofF.S.(for each axis)
Frequency response (at F.S.)		±1.5%(400Hz~10kHz/for each axis) ±3.0%(50Hz~400Hz,10kHz~20kHz/for each axis)
Internal FFT inputting section	Filter	8-pole elliptic, Chevyshev
	AD converter	12 bit
	In-band ripple	±0.4dB or less (out of 20kHz range)
	In-band ripple	±0.6dB or less (in 20kHz range)
Analyzing section	Frequency range	200,500,1k,2k,5k,10k,20kHz
	Frequency resolution	1/200(to frequency range)
	Window function	Rectangular, hanning, hamming
	Trigger mode	Auto, single
Display		Time axis waveform/Power spectrum, selectable Marker value, peak value (only in spectrum measurement) Real actual value (50Hz~20kHz) or wave height
Power supply		100VAC±10% (50/60Hz)
Outside dimensions	Body	350(W)x132(H)x300(D), approx. 5kg
Weight	Probe	50 x 50 x 50mm Cable length: Approx. 3m, approx. 150g
Option		Printer set (Printer: BL-80RS, AC adaptor (SANEI), cable) Thermal printing paper BL-80-30, battery pack UR-100 Battery charger NC-LSC01

Note: For AC magnetic field display, selection between root mean square value and peak value is possible.

FM type gaussmeter

●Photo shows FM-1600.

For DC/AC magnetic fields FM-1400A/1600 (single-axis)

Outline

A single-axis gaussmeter, realizing measurement of DC magnetic field and AC magnetic field (0 to 1,000μT), to be used by selection of DC/AC mode selector switch: a parallel fluxgate type sensor enables measurement with 10nT maximum resolution.

Features

Excellent temperature characteristics, capable of use just after power ON / Selection of measurement range between 1,000μT and 100μT / Measurement of DC and AC magnetic fields with only one probe / Coupling type waveform monitor output terminal, outputting DC and AC magnetic field measurements respectively with DC coupling and AC coupling (DC magnetic field measurement is cut off) / Output of magnetic field intensity converted in voltage through recorder terminal / Output of values in measuring mode (FM-1400A) / Simultaneous measurement of DC and AC outputs regardless of measuring mode (FM-1600) / RS-232C and GP-IB interface as standard accessories

Specifications

Measuring range	DC magnetic field	0~±100/±1,000μT, selectable
	AC magnetic field	0~100/1,000μT, selectable (rms)
Resolution		10nT/100nT
Linearity in DC magnetic field		Error: ±0.5% of F.S.(for each axis)
Linearity in AC magnetic field		Error: ±1.0% of F.S.(for each axis)
Frequency response(at F.S.) in AC magnetic field	FM-1400A	±3.0%(20Hz~40Hz) ±1.5%(40Hz~120Hz) ±3.0%(120Hz~200Hz)
	FM-1600	±3.0%(20Hz~30Hz) ±1.5%(30Hz~500Hz) ±3.0%(500Hz~1kHz)
Power supply		100VAC (50/60Hz)
Dimensions	Body	250(W) x 100(H) x 300(D)
	Probe	Dia.:11mm, Length: 130mm Cable length: Approx. 3m
Weight		Approx. 3.5kg
Option		Probe stand (PS-100)

Note: For AC magnetic field display, selection between root mean square value and peak value is possible.

●Photo shows FM-3600.

For DC/AC magnetic fields FM-3400A/3600 (three-axis)

Outline

A three-axis gaussmeter, realizing simultaneous measurement of X, Y and Z components in AC magnetic field (0 to 1,000μT), to be used by selection of DC/AC mode selector switch: a parallel fluxgate type sensor enables measurement with 10nT maximum resolution.

Features

Display of X, Y and Z components as well as total magnetic force / Excellent temperature characteristics, capable of use just after power ON / Selection of measurement range between 1,000μT and 100μT / Coupling type waveform monitor output terminal, outputting DC and AC magnetic field measurements respectively with DC coupling and AC coupling (DC magnetic field measurement is cut off) / Output of X, Y and Z components and total magnetic flux density through recorder terminal / Simultaneous measurement of DC and AC outputs regardless of measuring mode through DC and AC measurement terminals provided for each axis (FM-3600) / RS-232C and GP-IB interface as standard accessories

Specifications

Measuring range	DC magnetic field	0~±100/±1,000μT, selectable
	AC magnetic field	0~100/1,000μT, selectable (rms)
Resolution		10nT/100nT
Linearity in DC magnetic field		Error: ±0.5% of F.S.(for each axis)
Linearity in AC magnetic field		Error: ±1.0% of F.S.(for each axis)
Frequency response(at F.S.) in AC magnetic field	FM-3400A	±3.0%(20Hz~40Hz) ±1.5%(40Hz~120Hz) ±3.0%(120Hz~200Hz)
	FM-3600	±3.0%(20Hz~30Hz) ±1.5%(30Hz~500Hz) ±3.0%(500Hz~1kHz)
Power supply		100VAC (50/60Hz)
Dimensions	Body	350(W) x 132(H) x 300(D)
	Probe	35 x 35 x 35mm, Cable length: Approx. 5m
Weight		Approx. 5kg
Option		Modification of power supply (100-240VAC)

Note: For AC magnetic field display, selection between root mean square value and peak value is possible.

MTI

FM type ultrasensitive gaussmeter(with 0.5nT resolution)

For DC magnetic field FA-1010A (single-axis)

Outline

A single-axis gaussmeter, realizing easy measurement of DC magnetic field (0 to ±100μT) such as earth magnetism: a parallel fluxgate type sensor enables measurement with 0.5nT resolution.

Features

Excellent temperature characteristics, capable of use just after power ON / Selection of measurement range among 100μT, 10μT 1μT and 100nT, as well as automatic selection of the four ranges / Cancelling function enabling bucking up to ±60μT / Output terminal for recorder

Specifications

Measuring range		0~±100μT/10μT/1μT/100nT, selectable
Maximum resolution		0.5nT
Linearity error		±1.5% of F.S.
Cancelling range		Approx. ±60μT
Output voltage		10V/F.S.
Power supply		100VAC (50/60Hz)
Dimensions	Body	213(W) x 88(H) x 300(D)
	Probe	Dia.:10mm, Length: 130mm, Cable length: Approx. 3m
Weight		Approx. 3.5kg
Option		Probe stand (PS-100) RS-232C interface

For DC/AC magnetic fields FM-3500 (three-axis)

Outline

A three-axis gaussmeter, realizing simultaneous measurement of X, Y and Z components in DC magnetic field (0 to ±100μT) and AC magnetic field (0 to 100μT, peak value) at a frequency up to 1kHz, to be used by selection of DC/AC mode selector switch: a high-sensitive parallel fluxgate type sensor enables measurement with 0.5nT maximum resolution.

Features

Display of X, Y and Z components as well as total magnetic force / Selection of measurement range among three: 100μT, 10μT and 1μT / Coupling type waveform monitor output terminal, outputting DC and AC magnetic field measurements respectively with DC coupling and AC coupling (DC magnetic field measurement is cut off) / Simultaneous output of X, Y and Z components in DC and AC magnetic fields and total magnetic flux density through recorder terminal / Automatic cancelling function for bucking the influence of background magnetic field / RS-232C and GP-IB interface as standard accessories

Specifications

Measuring range	DC magnetic field	0~±1/±10/±100μT, selectable
	AC magnetic field	0~1/10/100μT, selectable (wave height)
Maximum resolution		0.5nT
Magnetic field to be measured		DC~1kHz
Linearity in DC magnetic field		Error: ±0.5% of F.S.(for each axis)
Linearity in AC magnetic field		Error: ±1.0% of F.S.(for each axis)
Frequency response (at F.S.) in AC magnetic field		±3.0%(for each axis)(20Hz~30Hz) ±1.0%(for each axis)(30Hz~500Hz) ±2.0%(for each axis)(500Hz~1kHz)
Power supply		100VAC (50/60Hz), approx. 30W
Dimensions	Body	300(W) x 132(H) x 300(D)
	Probe	35 x 35 x 35mm, Cable length: Approx. 5m
Weight		Approx.4kg

Note: For AC magnetic field display, selection between root mean square value and peak value is possible.

FM type gaussmeter(small size)

For DC/AC magnetic fields FM-35M (three-axis)

Outline

A small-size three-axis gaussmeter, realizing simultaneous measurement of X, Y and Z components in DC magnetic field and AC magnetic field (0 to 1,000μT): the output of parallel fluxgate type sensor can be set to 10nT/mV.

Features

Designed for collecting data via recorder and A/D card, etc. / Compact and lightweight body of 150 (W) x 50 (H) x 200 (D) and 800g, displaying the magnetic field in the direction of selected axis / Two selectable measuring ranges of 1,000μT and 100μT / Selectable output terminals: DC and up to 200Hz AC monitor output as well as recorder output of AC magnetic field converted into DC voltage / Selectable output sensitivity of 10V/range FS and 1V/range FS / Excellent temperature characteristics, capable of use just after power ON / Operation via auxiliary AC adaptor (100VAC) / Cancelling function for bucking the background magnetic field, providing convenience in measuring variation / Dedicated carrying case

Specifications

Measuring range		0～±100/±1,000μT, selectable
Resolution		10nT/100nT, selectable
Linearity error		±0.5% of F.S(for each axis)
Frequency response (at F.S.)		±2.0%(DC～200Hz)
Display mode		DC/AC selection
Power supply		12VDC (with AC adaptor)
Dimensions	Body	150(W) x 50(H) x 200(D)
	Probe	35 x 35 x 35mm Cable length: Approx. 5m
Weight		Body: 800g, Sensor: 500g, Adaptor: 150g, Carrying case: 800g

Note: For AC magnetic field, display is given in root mean square value.

FMS type gaussmeter

For DC/AC magnetic fields FMS-3012M (three-axis)

Outline

A three-axis gaussmeter, realizing high-sensitive measurement of DC and AC magnetic fields, having two sensors for measuring DC and AC magnetic fields enabling simultaneous measurement of X-Y-Z-axis components: parallel fluxgate type sensor is for DC magnetic field, and air coil type, for AC magnetic field.

Features

Simultaneous measurement of components (X-Y-Z-axis elements) in vector magnetic field, and display of them together with total magnetic flux density / Measurement of DC magnetic field and AC magnetic field at a frequency from 40Hz to 500Hz with maximum resolution of 1nT / Three measuring ranges of 100μT, 10μT and 1μT, and automatic range as well / Cancelling function for bucking the background magnetic field / Dedicated trunk case (430 (W) x 340 (H) x 190 (D))

Specifications

Measuring range	DC magnetic field		0～±100μT/10μT/1μT, selectable
	AC magnetic field		0～100μT/10μT/1μT, selectable
Resolution			100nT/10nT/1nT, selectable
Magnetic field to be measured			DC and AC40Hz～500Hz
Linearity error			±1.0% of F.S(for each axis)
Frequency response (at F.S.) in AC magnetic field			±3.0%(for each axis)(40Hz～500Hz)
Power supply			100VAC (50/60Hz)
Dimensions	Body		370(W) x 330(H) x 128(D)
	Probe	For DC	36 x 36 x 36mm Cable length: Approx. 5m
		For AC	50 x 50 x 50mm Cable length: Approx. 5m
Weight			Approx. 3.8kg

Note: For AC magnetic field, display is given in root mean square value.

Magnetic exploration system

Magnetic exploration system MES-4700S

Outline

A system having a probe equipped with two three-axis magnetic sensors enabling simultaneous measurement of X, Y and Z components of DC magnetic field (0 to ±199.9μT) such as earth magnetism, also provided with a function to output two sensor signals and a function to output them after differential amplification: exploring the magnetism under ground or in water by collecting the data outputted from sensors.

Features

A fluxgate type sensor, realizing 30nT resolution / 3-bar pressure resistant probe case made of titanium alloy, enabling measurement in seawater / Excellent temperature characteristics, capable of use just after power ON / Output terminal for recorder

Application

Exploration, etc. of object buried under ground

Specifications

Measuring range		0～±199.9μT
Resolution		30nT
Linearity error		±0.5% of F.S(for each axis)
Power supply		100VAC (50/60Hz)
Dimensions	Body	370(W) x 330(H) x 128(D)
	Probe	Length: Approx. 1200mm Diameter: Approx. 40ϕ Adjustable to 47ϕ aluminum pipe casing Material: Titanium alloy Cable length: 50m at max.
Weight		Body: Approx. 4kg
Option		RS-232C interface

Magnetic field canceller

Magnetic field canceller MFC-2000

Outline

A device for bucking a disturbance magnetic field by detecting the disturbance with high-sensitive three-axis magnetism sensor and generating magnetic field of the same intensity in inverse direction under accurate control of current flow in the cancelling coil, adopting our original parallel fluxgate type sensor having good frequency characteristics; eliminates slow variation of DC magnetic field and AC (within commercial frequency) magnetic field, creating a stable magnetic field environment.

Features

Application to DC and AC magnetic fields / Lower cost comparing to a shielding room / Easy operation / Temporary assembling type, enabling easy installation and relocation

Specifications

Cancelling frequency range		DC~60Hz(Attenuance at 60Hz: Approx. 1/20)
Max. cancelling magnetic field		10μT(for each axis)
Cancelling space		Aprox. 100x100x100mm
Sensor system		Parallel fluxgate
Dimensions and weight	Controller	300(W) x 148(H) x 300(D), approx. 5kg
	Cancelling coil	1,000(W) x 1,000(H) x 1,000(D), approx. 28kg
	Magnetic sensor probe	35(W) x 35(H) x 35(D)mm
	Cancelling coil stand	1,010(W) x 500(H) x 1,010(D), approx. 8kg
Connecting cable length		Approx. 5m
Power supply		100VAC (50/60Hz)

※Setting of the probe stand is for photographing.

Please contact us for changing specifications such as changing coil size for adjusting to the installation site.

System configuration

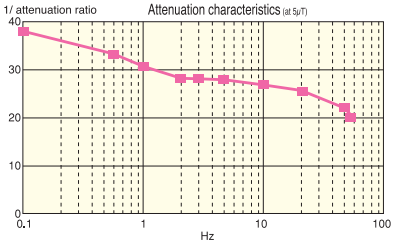
1. Controller
2. Cancelling coil
3. Magnetic sensor
4. Cancelling coil stand (with level adjustor)

Application

Stabilization of magnetic field environment for electron beam device

Stabilization of magnetic field environment for electron microscope

Example of magnetic field attenuation characteristics



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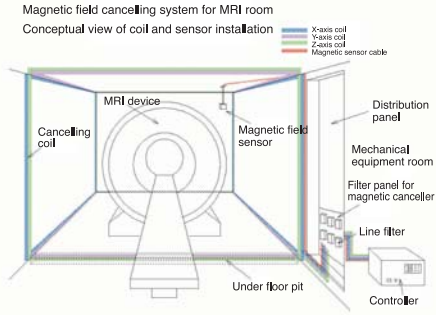
Magnetic field canceller for MRI

Magnetic field canceller for MRI MRIC-3000

Typical view of installation



Outline

A device for bucking a variable magnetic field which disturbs MRI, detecting a variable magnetic field with three-axis magnetic sensor installed in an MRI room and bucking the variable magnetic field by generating a reversed magnetic field in the coil laid around the MRI room (or in walls).

Features

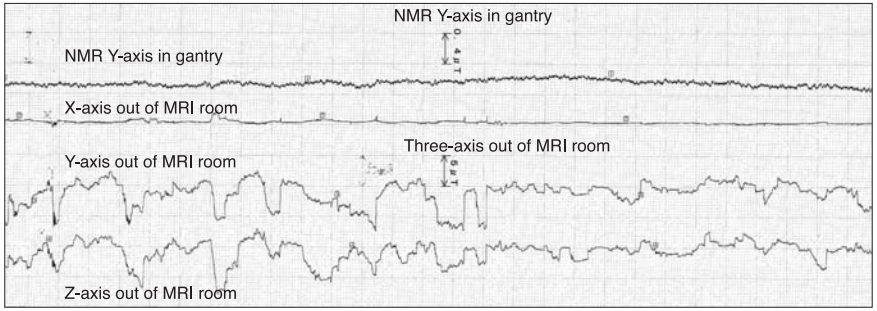
Active magnetic field cancelling system for bucking a variable magnetic field in three axial directions (X, Y and Z axes) / Through-circuit correction of difference in variable magnetic field generated due to difference in the distance between gantry and magnetic sensor, as well as the correction of gradient in cancelling magnetic field / Design to enable cancelling with a small magnetic field gradient by the use of two opposed coils having near form as that of Helmholtz coil

Specifications

Max. cancelling range		10μT ※1
Cancelling response frequency		DC~5Hz
Control axis		Three axes (X, Y, Z)
Sensor type		Parallel fluxgate
Dimensions	Controller	445(W) x 220(H) x 350(D)
	Sensor	90(W) x 90(H) x 200(D)mm
Weight	Controller	Approx. 11kg
	Sensor	Approx. 1kg
Power supply		100VAC(50Hz/60Hz)

Example of control for cancelling magnetic field

Comparison of variable magnetic field between that in a gantry where magnetic field is cancelled and that out of MRI room



Earth magnetism simulator

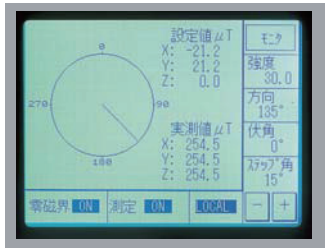
Earth magnetism simulator EMS-100

Outline
A device for simulating earth magnetism by controlling the magnetic field generated from three-axis Helmholtz coils, capable of generating any intended earth magnetism in Helmholtz coil by bucking external magnetic field

System configuration
1. Magnetic field generating section
2. Magnetic field detecting section
3. Displaying section
4. Software

Application
Calibration of direction sensor, etc.

Typical screen of control unit



Specifications

Magnetic field generating section	Magnetic field control direction		Three-axis (X, Y, Z)
	Magnetic field generated		Max. 150μT for X, Y, Z
	Effective controlling space		100 x 100 x 100mm
	Power supply		100VAC(50/60Hz)
Detecting/Displaying sections	Magnetic field to be detected		DC magnetic field
	Detecting direction		Three axial directions
	Dimensions	MF-generating device	1,020(W) x 1,000(H) x 1,020(D)
		Control unit	430(W) x 160(H) x 400(D)
		Power unit	430(W) x 260(H) x 400(D)
		Displaying section	220(W) x 80(H) x 150(D)

※Please contact us for changing specifications such as the dimensions of magnetic field generating device.

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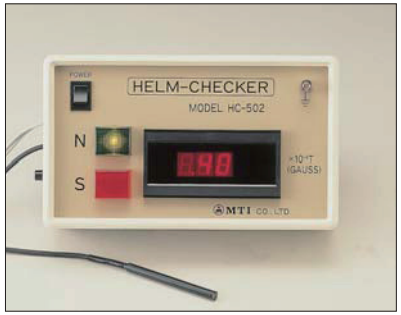
Magnetic field monitor



For DC magnetic field Helm-Checker HC-502

Production stoppage

Outline
A device for monitoring magnetic field generated from Helmholtz coil: detects and displays strength and polarity of DC magnetic field applied in longer axis direction of sensor probe; as polarity indication, "N" lamp lights up in north hemisphere when the sensor probe tip is pointed down, and, in south hemisphere, "S" lamp lights up (excluding certain zones).

Features
Operation by AC power / Zero-adjusting and gain-adjusting volumes for bucking unnecessary bias magnetic field applied to probe, enabling adjustment according to the site conditions

Application
Color tone adjustment of color CRT, etc.

Specifications

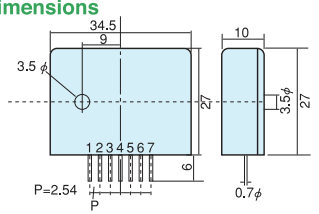
Magnetic field to be monitored	DC magnetic field
Monitoring range	0～±80μT
Polarity display	N (green), S (red)
Linearity	±3.0% of F.S. in monitoring range
Working temperature	10～30℃
Over-range alarm	Flickering of 1.99 for DC magnetic field over the maximum display range
Power supply	100VAC～240V(50/60Hz)
Dimensions	210(W) x 125(H) x 70(D)
Sensor cable length	Approx. 2m

DC current sensor

CS-2803K

Outline
A device for converting a small magnetic field generated by input current into voltage, with complete insulation between input and output terminals; DC current is detected only by an insertion of conductor wire into through hole.

Dimensions



General specifications

Rated power voltage	DC±15V
Power consumption	560mW or less
I/O dielectric resistance	2,000MΩ or more
I/O dielectric strength	AC2kV(50/60Hz)for 1 minute
Input hole diameter	3.5mm
Output load resistance	500Ω or more

Characteristic specifications (Power: ±15.0V, Temp.: 23℃)

Detection range	±300mA
Detecting sensitivity	10mV/mA
Linearity	0～100mA (±5%) ～300mA (±10%)
Resolution	0.2mA or less
Response time	Within 30mSec.
Output ripple voltage	20mVP-P or less
Temperature characteristics	0.09mA/℃
Zero-point shift (hysteresis)	3mA or less

Terminal number table

Terminal number	Application
1	OUTPUT
2	GND
3	Offset
4	-15V power supply
5	GND
6	GND
7	+15V power supply

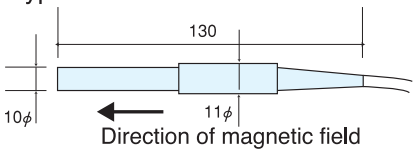
Gaussmeter accessories

Single-axis probe (Type-S, Type-R)

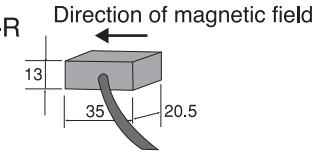
Outline
For HM series single-axis gaussmeter, two types are available: Type-S and Type-R.

Acceptable models
HM-101, HM-150, HM-201

Shape
Type-S



Type-R



On-axis Type-S probe stand (PS-100)

Outline
Dedicated stand for Type-S probe of single-axis gaussmeter

Acceptable modelse
HM-101, HM-150, HM-201, FM-1010A
FM-1400A, FM-1600

Three-axis probe stand (PS-300)

Outline
Dedicated stand for three-axis gaussmeter

Acceptable models
Three-axis gaussmeters
HM-310, HM-3510, HM-3520, FM-3400A, FM-3600、FM-35M, FMS-3012M, FM-3500

Solenoid coil for single-axis Type-S probe (SC-2G/10G)

Outline
Solenoid coil dedicated for Type-S probe of single-axis gaussmeter (dedicated for DC magnetic field)

Acceptable models
HM-101, HM-201, FM-1010A
FM-1400A, FM-1600

Spherical magnetic field shielding case (MSC-450)

Outline
To be used for shielding magnetic field such as earth magnetism, having a shape of polyhedral sphere with 450mm outside diameter, and given an opening on top

Trunk case (TC-300)

Outline
To be used for storing gaussmeter, notebook PC, etc.

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Detection method

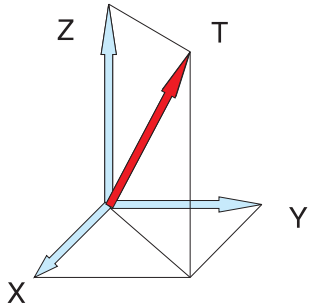
Method of detecting magnetic field

- Air core coill method ····· Application of Faraday's law
- Hall element method ····· Application of Hall effect struck out by E. H. Hall in 1879
- Fluxgate method ····· A method brought out by H. Aschenbrenner and G. Gaubau in 1936
- Magnetic oscillation method ····· A method brought out by MTI and Kyushu University in 1984
- Others ····· MI component, MR component, SQUID

Difference between fluxgate method and Hall component method

	method	Hall component method
Merit	Temperature characteristic of sensor is good.	Size of sensor is small.
	Suitable for the measurement of small variable magnetic field	Capable of measuring extremely strong magnetic field
	Zero-point drift is very small.	Capable of measuring high-frequency magnetic field, comparing to fluxgate method
Demerit	Size of sensor is large.	Zero-point adjustment is necessary every time before use.
	Not suitable for the measurement of strong magnetic field	Temperature characteristic of sensor is not good, comparing to fluxgate method.
	Incapable of measuring high-frequency magnetic field	Not suitable for the measurement of small variable magnetic field, because of large zero-point drift

Formula of calculating total magnetic flux density



$$T=\sqrt{X^2+Y^2+Z^2}$$

T: Total magnetic flux density
X: Magnetic flux density in X-axis direction
Y: Magnetic flux density in Y-axis direction
Z: Magnetic flux density in Z-axis direction

Conversion table for magnetic unit

Magnetic quantity	Symbol	MKS unit	CGS electromagnetic unit	CGS electrostatic unit
Magnetomotive force	m	1〔A〕	$4\pi/10$〔Gilbert〕	4π x 3 x 10^{9}〔esu〕
Intensity of magnetic field	H	1〔A/m〕	4π x 10^{-3}〔Oersted〕	4π x 3 x 10^{7}〔esu〕
Magnetic flux	Φ	1〔Wb〕	10^{8}〔Maxwell〕	1/(3 x 10^{2})〔esu〕
Magnetic flux density	B	1〔T〕	10^{4}〔Gauss〕	1/(3 x 10^{6})〔esu〕
Magnetic pole		1〔Wb〕	$10^{8}/4\pi$〔emu〕	1/(4π x 3 x 10^{2})〔esu〕
Inductance	L	1〔H〕	10^{9}〔emu〕	1/(9 x 10^{11})〔esu〕
Permeability	μ	1〔H/m〕	$10^{7}/4\pi$〔emu〕	1/(4π x 9 x 10^{13})〔esu〕

Quick reference matrix

T (Tesla)				G (Gauss)	
1	T	1,000	mT	10^{4} G	10 kG
0.1	T	100	mT	1,000 G	1 kG
0.01	T	10	mT	100 G	0.1 kG
0.001	T	1	mT	10 G	10 G
1 x 10^{-4}	T	100	μT	1 G	1 G
1 x 10^{-5}	T	10	μT	0.1 G	100 mG
1 x 10^{-6}	T	1	μT	0.01 G	10 mG
1 x 10^{-7}	T	100	nT	0.001 G	1 mG
1 x 10^{-8}	T	10	nT	1 x 10^{-4} G	100 μG
1 x 10^{-9}	T	1	nT	1 x 10^{-5} G	10 μG
1 x 10^{-10}	T	0.1	nT	1 x 10^{-6} G	1 μG
1 x 10^{-11}	T	0.01	nT	1 x 10^{-7} G	0.1 μG

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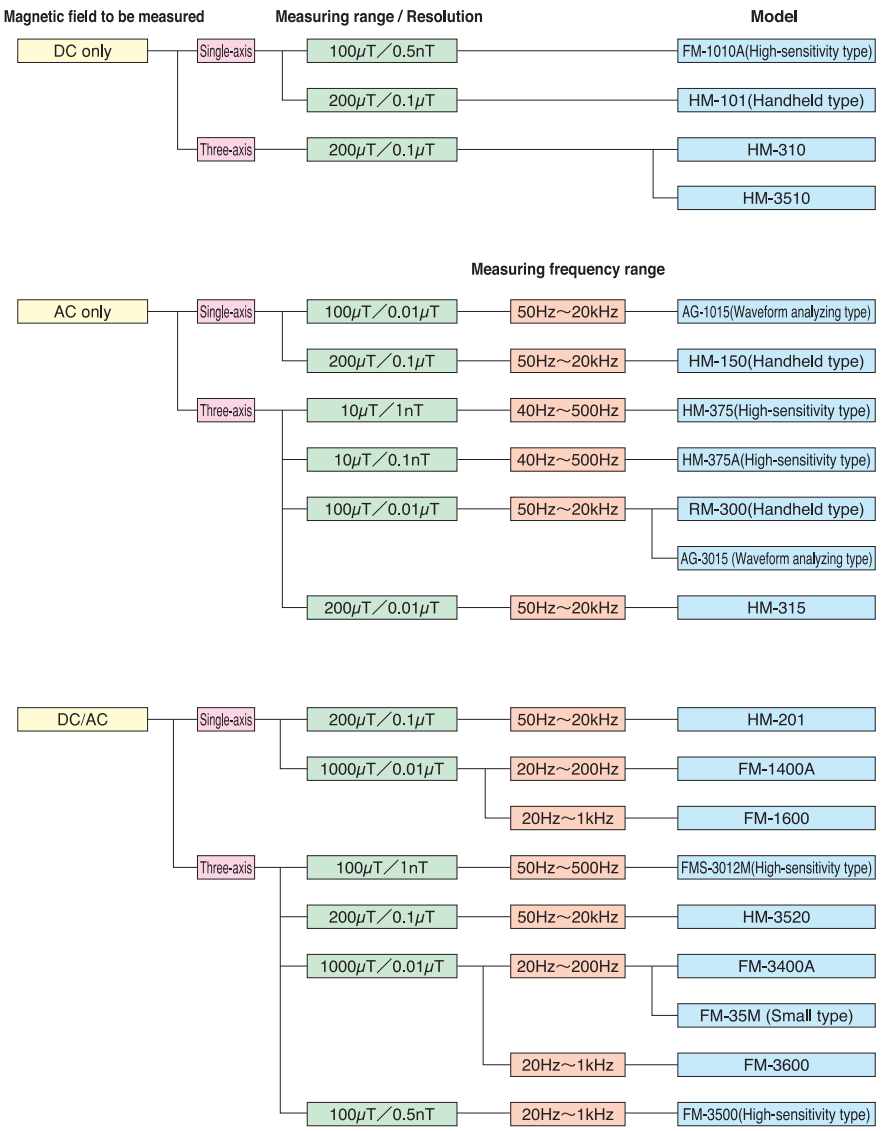
Classification of gaussmeters



Typical application of gaussmeters and other magnetic devices

Private enterprises	Models
CRT manufacturers ・To be used for correcting the earth magnetism on color CRT	・HM type, single-axis (HM-101/201) ・HM type, three-axis (HM-310/3510/3520)
Construction companies ・To be used for measuring the environmental magnetic field at construction site	・FM type, three-axis (FM-35M/3400A/3600)
Railway companies ・To be used for measuring the magnetic field generated by electric locomotive along the railway line	・FM type, three-axis (FM-35M/3400A/3600)
Magnetic shielded room installation companies ・To be used for measuring the variable magnetic field to be the basic data for design and execution of a shielded room ・To be used for measuring the variable magnetic field in a shielded room for verifying the shielding performance after installation	・FM type, three-axis, ultrasensitive (FM-3500) ・FM type, three-axis (FM-35M/3400A/3600) ・FMS type, three-axis (FMS-3012M) ・AG type, single-axis (AG-1015) ・AG type, three-axis (AG-3015)
Magnetic material manufacturers ・To be used for the inspection, etc. on the magnetic characteristics of various magnetic materials	・FM type, single-axis, ultrasensitive (FM-1010A) ・FM type, three-axis, ultrasensitive (FM-3500) ・FM type, three-axis (FM-3400A/3600)
Small-size precision motor manufacturers ・To be used for the magnetizing inspection, etc. of motor poles	・FM type, single-axis (FM-1400A/1600)
Transformer manufacturers ・To be used for measuring the magnetic field leaked from transformer and transformer room	・FM type, three-axis (FM-3400A/3600)
Electric power companies ・To be used for measuring the magnetic field generated from power cable and power station	・HM type, single-axis (HM-101/150)
Companies relating to linear motor car ・To be used for measuring the magnetic field generated from linear motor car	・FM type, single-axis (FM-1400A/1600) ・FM type, three-axis (FM-3400A/3600)
Manufacturers and installation companies of electron microscope ・To be used for bucking the disturbance to electron microscope	・Magnetic field canceller (MFC-2000)
Direction sensor manufacturers and its accessory manufacturers ・To be used for calibrating electron compass, etc.	・Earth magnetism simulator (EMS-100)
Underground exploration companies ・To be used for detecting sheet pile, etc. underground, during boring	・Magnetic field exploration system (MES-4700S)
Railway signal manufacturers ・To be used as a part of sensor for railway control devices	・DC current sensor (CS-2803K)

Collages, universities and government/public institutes	Models
Seismic study and ore study ・To be used for measuring the abnormal magnetic filed before and after an earthquake ・To be used for the analysis, etc. of mined ores	・FM type, single-axis, ultrasensitive (FM-1010A) ・FM type, three-axis, ultrasensitive(FM-3500)
Biological study ・To be used for studying the influence of exposure to magnetic field on experimental animals, etc.	・FM type, three-axis (FM-3400A/3600) ・FM type, three-axis, ultrasensitive (FM-3500)
Environmental magnetic field study ・To be used for studying standards and regulations relating to environmental magnetic field	・FM type, three-axis (FM-3400A/3600)
Other studies ・To be used for developing magnetic materials and studying measures against variable magnetic field	・FM type, three-axis (FM-3400A/3600) ・FM type, three-axis, ultrasensitive (FM-3500)

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