

B-H analyzer SY-8218 / 8219

Comformed to IEC62044-3 with CROSS-POWER method

B-H Analyzer (mainframe)**SY-8218**

10Hz ~ 10MHz

SY-8219

10Hz ~ 1MHz



SY-8218



[Test example]
Measurement POD
(without POD cover)

Measurement method		CROSS-POWER method (Compatible to IEC62044-3 standard)
Measurement items (symbols)		Max. Magnetic flux density(Bm), Residual magnetic flux density(Br), Max. Magnetic field strength(Hm), Coersive force(Hc), Rectangular ratio(Br/Bm), Relative amplitude permeability(μ_a), Core loss(Pc,Pcv,Pcm), Primary excitation current(I1m), Secondary induced voltage(V2m), Phase(θ), Total magnetic flux linkage($2\phi_m$), Apparent power(VA), Impedance permeability(μ_z), Complex permeability(μ' , μ''), Loss coefficient($\tan \delta$), Inductance(L), Resistance(R), Impedance(Z), Quality factor(Q), Total harmonic distortion(THD)
Waveform display		B-H curve, Primary current, Secondary voltage, Magnetic field, Flux density
Test Frequency	SINE	10Hz~10MHz (SY-8218), 10Hz~1MHz (SY-8219)
	PULSE	10Hz~1MHz (Duty50%,fixed)
Magnetic field detection		Voltage detection on non-inductive shunt, max. current at $\pm 6A$
Flux density detection		Voltage at detection coil, max voltage at $\pm 200V$
Desitizer		Resolution : 16bits (8192points/cycle)
Coil method		Two winding method or single winding method selectable
Accuracy	Phase	± 0.15 deg (typical, $f=100kHz$, 50mA, 50mV ranges or above, 80% or more amplitude)
	Amplitude	$\pm 2\%$ (typical, $f=100kHz$, 50mA, 50mV ranges or above)
	Core loss	$\pm 5.6\%$ (typical, calculated at $\theta=80^\circ$, $f=100kHz$, 50mA, 50mV ranges or above)
Display		

- Test Freq. 10Hz to 10MHz(SY-8218), 10Hz to 1MHz(SY-8219)
- Signal waveform SINE or PULSE(10Hz to 1MHz)
- Max. Input current $\pm 6A$
- Max. Input voltage $\pm 200V$
- Excitation method Automatic excitation (Target : Hm, Bm, I1m or V2m)

Power amplifiers

High power high frequency quadrant amplifiers

Power amplifier for B-H Analyzer

	Max. Frequency	Max. output current	Max. output voltage
SY-5001	3MHz	$\pm 5A_{peak}$	$\pm 150V_{peak}$
SY-5002	3MHz	$\pm 6A_{peak}$	$\pm 75V_{peak}$
HSA4101-IW	10MHz	$\pm 1.0A_{peak}$	$\pm 71V_{peak}$



SY-5001 (PMK GmbH)

SY-5002 [for BH analyzer]
(PMK GmbH)

HSA4101-IW

Model	SY-5001	
Frequency	DC~3MHz	
Output voltage	HIGH	$\pm 150V_{peak}$ ($f < 750kHz$)
	LOW	$\pm 75V_{peak}$ ($f < 1.4MHz$)
Output Current	HIGH	$\pm 5A_{peak}$ ($f > 10Hz$)
	LOW	$\pm 6A_{peak}$ ($f > 10Hz$)
Output impedance	$30m\Omega + 0.33\mu H$	
Interface	USB, GPIB	
Size (mm), weight	Approx. 449W $\times$ 178H $\times$ 435.5D, 14kg	

Model	SY-5002	
Frequency	DC~3MHz	
Output voltage	HIGH	$\pm 75V_{peak}$ ($f < 800kHz$)
	LOW	$\pm 37.5V_{peak}$ ($f < 1MHz$)
Output current	HIGH	$\pm 2.5A_{peak}$
	LOW	$\pm 5.0A_{peak}$
Output impedance	$50m\Omega + 0.30\mu H$	
Interface	USB	
Size (mm), weight	Approx. 449W $\times$ 133H $\times$ 436D, 19kg	

Model	HSA4101-IW
Frequency	DC~10MHz
output voltage	$\pm 71V_{peak}$
output current	$\pm 1A_{peak}$
Output impedance	$1.5\Omega + 0.50\mu H$
Interface	-
Size (mm), weight	Approx. 220W $\times$ 177H $\times$ 450D, 7.8kg

Wide temp. range scanner SY-330/ Chamber scanner system SY-320A / 321A

Temp. range from -55°C to +180°C
Large size samples : max. 4pcs.

Chamber scanner system

SY-330 4pcs.

Autovehicle std. AEC-Q200 Grade0 compatible

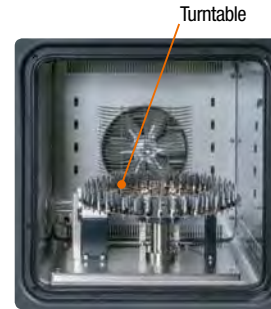


Model		SY-330
Chamber	Power supply	AC200V 3φ 3W 50/60Hz
	Max. current	14A,max.
	Temp. range	-55°C ~ +180°C
Scanner Unit	Power supply	AC 100V ~240V 50/60Hz
	Max. power	21VA,max.
	Frequency range	10Hz~3MHz (SY-8218) / 10Hz~1MHz (SY-8219)
	Sample	4pcs.,max.
	Max. current	±6A
	Max. voltage	±200V
Dimension (mm) , weigh		Approx. 1,023W×607L×1,200H, 190kg
Accessories		RS-232 cable, Chamber cable (SY-912) Sample pushing JIG (SY-516) , Power cable, Instruction manual

Temp. range from -30°C to +150°C
Automatic test for max. 41pcs. samples

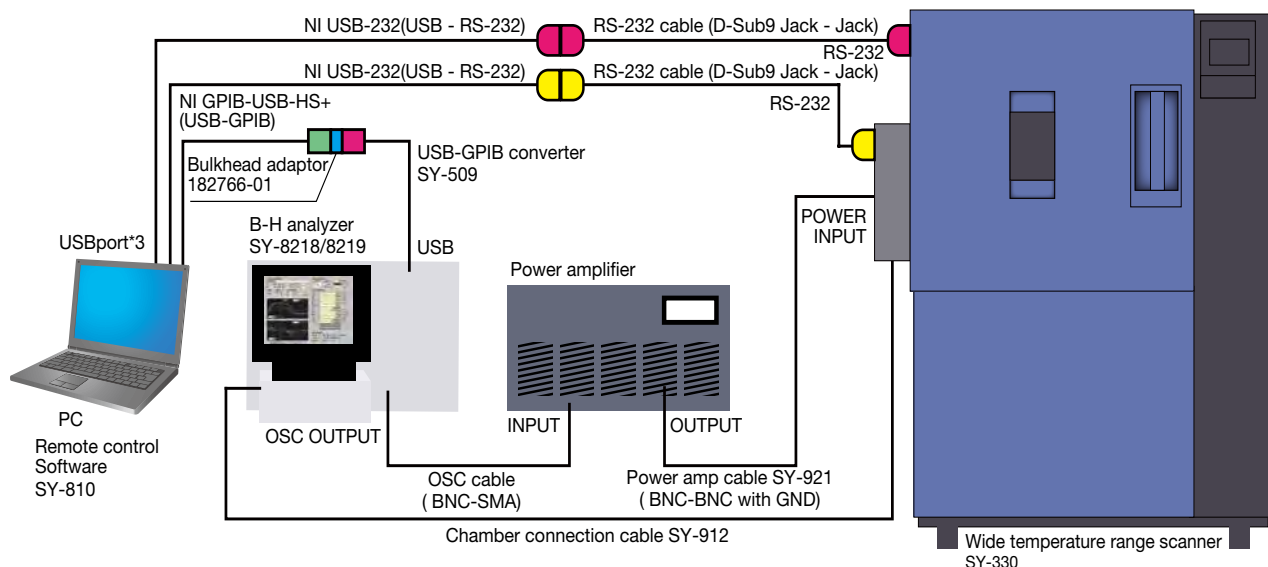
Chamber scanner system

SY-320A 20pcs. / **SY-321A** 41pcs.

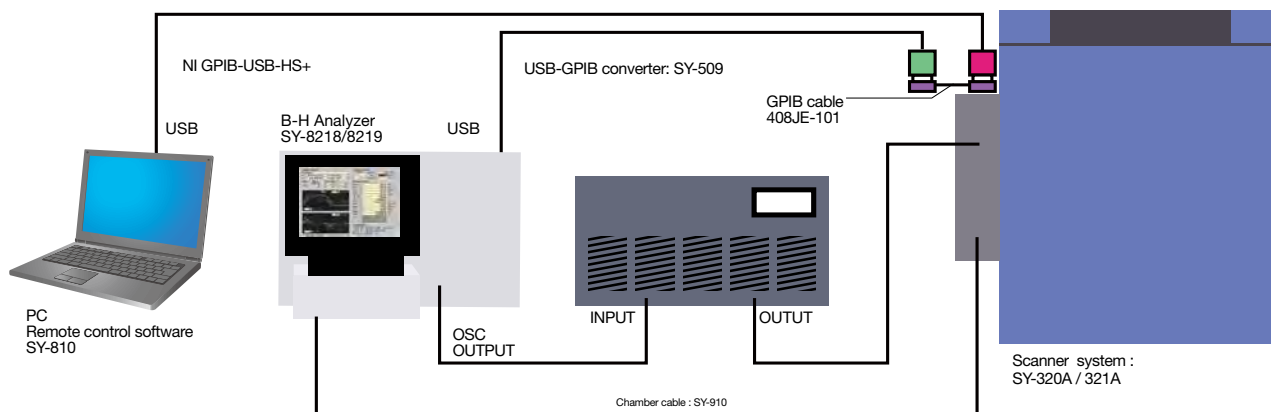


Model		SY-320A	SY-321A
Chamber	Power supply	AC100V 50/60Hz	
	Max. current	12.5A,max.	21.0A,max.
	Temp. range	-30°C ~ +150°C	
Scanner Unit	Power supply	AC 100V ~120V 50/60Hz	
	Max. power	28VA,max.	
	Frequency range	10Hz~5MHz (SY-8218) / 10Hz~1MHz (SY-8219)	
	Sample	20pcs.,max.	41pcs.,max.
	Max. current	±6A	
	Max. voltage	±200V	
Dimension (mm) , weigh		Approx. 543W×695L×620H, 85kg	Approx. 640W×920L×660H, 135kg
Accessories		Chamber cable (SY-910) , GPIB cable 1m, Power cable, Manual	Turntable SY-510

Remote control system with the wide temperature chamber scanner system.



Remote control system with chamber scanner system : SY-320A / SY-321A



AC BH analysis on single sheet / ribbon

Mini single sheet tester
SY-956

- Test frequency : 10Hz to 20kHz
- Max. Magnetic field strength : 10,000A/m
- Sample size : 36mm(L) or longer, 35mm(W)max., 3mm(Thickness)max.
- Vertical single yoke test method
- Core loss in yoke cancelling compensation (Patent pending : No. 5885646)
- Controlable pressing pressure on specimen for test reproductivity

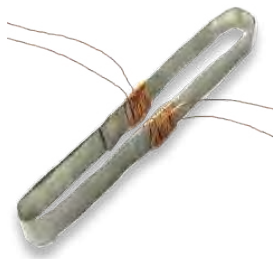
Conformed test method	Vertical single yoke single sheet test method (IEC 60404-3 with yoke core loss compensation)
Max. Magnetic field	Approx. 10,000A/m(with excitation current at 5A)
Test frequency	SINE : 10Hz to 20kHz
Max. sample size	36mm(L) or <, 35mm(W)max., 3mm(Thickness)max.
Max. current	±6A
Max. voltage	±200V
Power supply	AC100V~AC240V, 50Hz/60Hz, 27VA,max.
Temp. range	+18°C~+28°C
Dimension(mm), weight	Approx.330W×200H×320D, 8.5kg

B coil for voltage detection

Model	B coil 01	B coil 02
Outer look		
Sample size	t:1mm or less, W:10mm or less, 35turns	t:1mm or less, W:30mm or less, 100turns

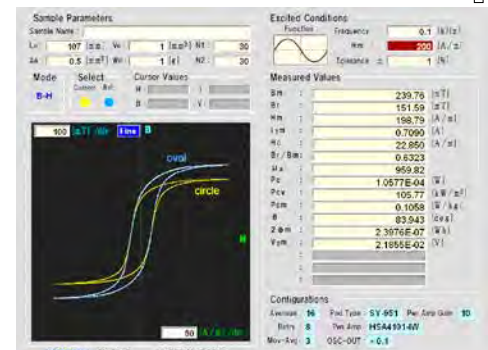
※ B coil can be wound for preferable turns.

Magnetic sheet can be varied of it's magnetic characteristics according to it's shape and before/after shaping process.



Example of Permalloy

Hc	Circle = Oval
Br	Circle > Oval
bs	Circle < Oval
Core loss	Circle < Oval



Accessories

LF AC coupler SY-514

Best to eliminate offset voltage of power amplifier SY-514 enables measurement with cut-off frequency at 300Hz while SY-504 (std. accessory) offers cut-off frequency at 10kHz.



BNC cable(0.6m)

Cut-off freq. : Approx. 300Hz, Max. input voltage : ±200V
Max. input current : ±6A, BNC cable (0.6m/std. accessory)

10kHz AC coupler SY-504

※ Standard accessory for BH analyzer

GPIB interface
NI GPIB-USB-HS+

※NATIONAL INSTRUMENTS Corp.

Bulkhead adaptor
182766-01

※ come with SY-810
※ NATIONAL INSTRUMENTS Corp.

GPIB adaptor
SY-509

※ come with SY-810

RS232-USB Serial Interface
NI USB-232

※NATIONAL INSTRUMENTS Corp.



Turntable SY-510 / 511

Table for mousing specimen for auto test
SY-510 (SY-320A, std. 1pc.)
SY-511 (SY-321A, std. 1pc.)



Spare contact pin SY-512

Spare contact pin (for SY-320A/321A, std. 1set)



DC bias power supply SY-931

Max. DC bias current: 10A
Max. Test frequency: 1MHz



Empty toroidal case SY-513

Case for powdered sample at
toroidal shape for winding



AC BH Analysis with DC biasing

DC bias tester
SY-960/961/962

AC blocker : SY-962



DC bias source : SY-961

DC bias tester: SY-960

DC bias test system : SY-960

Item	Specification
Test frequency	SINE SY-8218 : 10kHz ~ 3MHz, SY-8219 : 10kHz ~ 1MHz PULSE 10kHz ~ 1MHz (Duty 10~90%)
Test temperature	0°C ~ +25°C
Max. test current	±6A
Max. test voltage	±200V
Specification guarantee temp. range	+18°C ~ +28°C
Operation humidity	85%RH or less (at +35°C, no dued)
Warm-up time	Current accuracy guaranteed at power on 30min or later
Dimension (mm)	Approx. 330 (W) × 320 (D) × 200 (H)
Weight	Approx. 6.7kg
Accessories	DCT cable (SY-963) x1pc., PCB1528-030 x1pc., PCB5650-079 x1pc. Terminal tightening screw x2pcs., Blower blush x1pc., Accessory case x1pc. Instruction manual x1 (CD-ROM), Users guide(paper version) x1pc.

DC bias power source : SY-961

Item	Specification
Input voltage	AC100V~240V
Power consumption	640VA,max. (with SY-962)
Current : I_{dc}	DC 0.00A~DC30.0A
Current setting	0.01A resolution
Compliance voltage	10V,max. (between High-Low)
Specification guarantee temp.	+18°C ~ +28°C
Operation humidity	85%RH or less (at +35°C, no dued)
Dimension (mm)	Approx. 420 (W) × 480 (D) × 221 (H)
Weight	Approx. 15.3kg

AC Blocker : SY-962

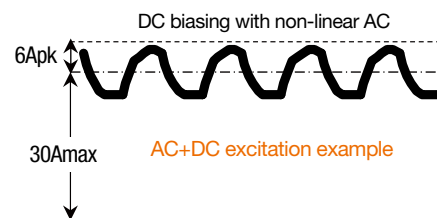
Item	Specification
Input voltage	DC24V (supplied from SY-961)
Inductance	Approx. 1.68[mH] ± 15% (H-L)
Max. input DC	30[A]
Specification guarantee temp.	+18°C ~ +28°C
Dimension (mm)	Approx. 420 (W) x 480 (D) x 110 (H)
Weight	Approx. 14.0kg

- Max. DC biasing
- Max. AC ripple
- Test freq.(SINE)

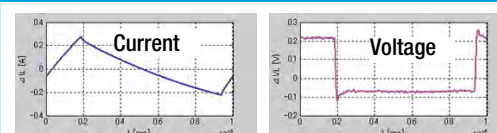
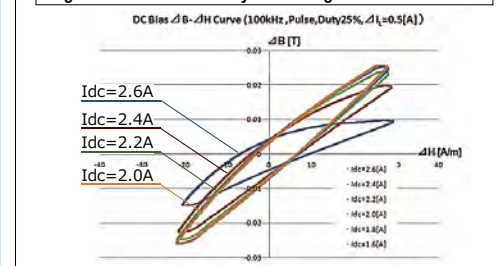
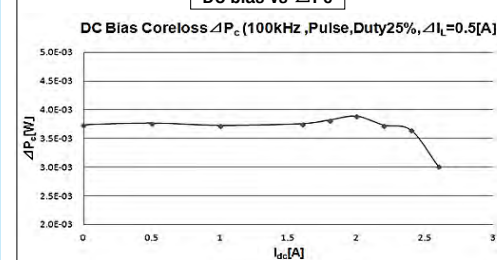
30A
±6A
10kHz~3MHz

(Lowest frequency can be 10kHz or higher according to inductance value of specimen)

- Test freq. (PULSE) -10kHz~1MHz (Duty10%-90%)



Example of chip inductor test (Chopper excitation)

Magnetic characteristics by increasing DC bias at fixed ΔH DC bias vs ΔP_c 

Examples of hysteresis curves of DC biasing. AC+DC excitation shows changes of hysteresis curve following DC bias level.



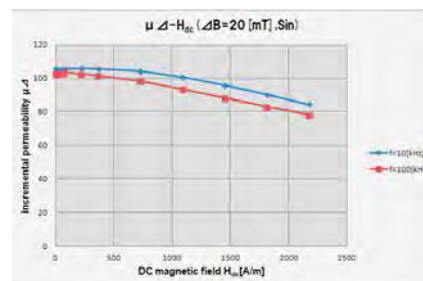
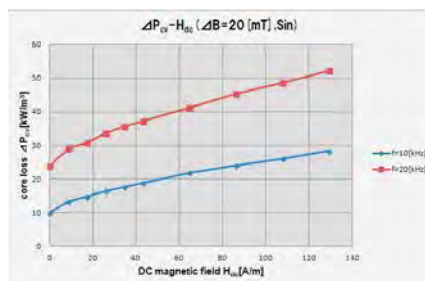
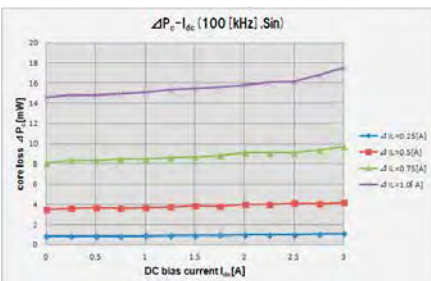
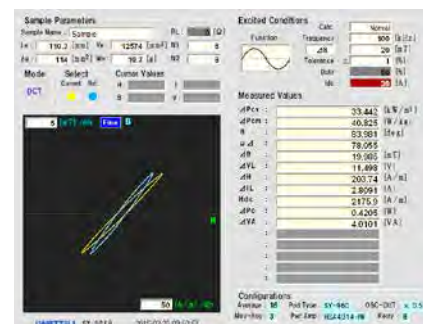
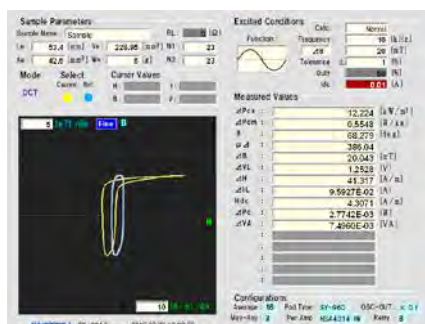
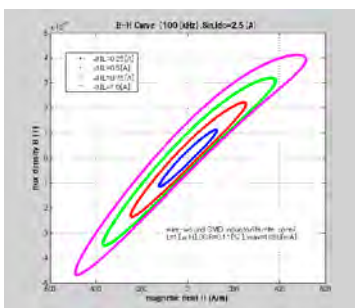
Ferrite, Inductor
 $L=1.0 \mu H$



Amorphous
 $L=311 \mu H$



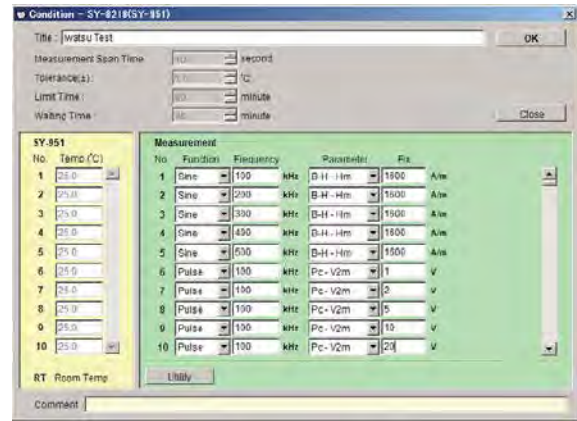
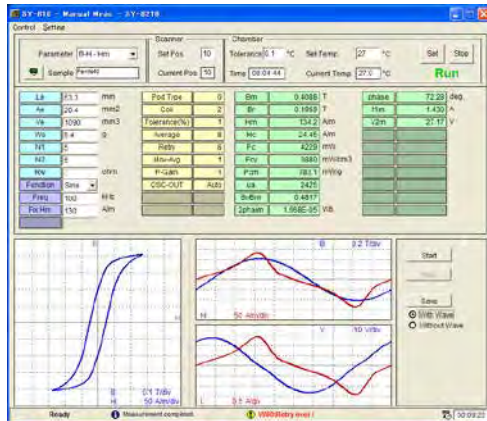
Iron Powder
 $L=8.4 \mu H$



Automatic control changing test frequency and excitation condition

Remote control software SY-810 (for SY-8218 / SY-8219)

- Max. 800kinds (Temp. 20kinds x excitation condition x 40kinds) of test conditions are available for each sample.
- Test data (waveform at CSV format) and display hardcopy (JPEG, PNG) are available.
- SY-810 can control wide temp. range scanner(SY-330), scanner system(SY-320A/SY-321A), DC bias tester and single sheet test system for automatic tests.



SY-810 contains CD (software & operation manual at PDF), GPIB converter SY-509, Bulkhead adaptor 182766-01 and software license agreement OS: Windows Vista SP2, Windows7 32bit/64bit, Windows8 32bit/64bit, Windows10 32bit/64bit .NET Framework(packed), CPU Pentium133M or above, Memory at 64Mbyte or more, Display resolution at 1024x768 or above, USB port x3
 ※ Contact our sales for the most recommended system configurations.
 ※ NI GPIB-USB-HS+ (NATIONAL INSTRUMENTS) is required for PC interface with SY-8218/SY-8219. PC is not included with this system and supplied by customer.

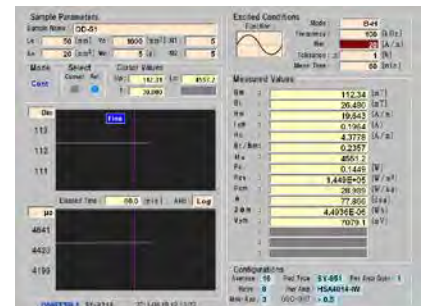
Built-in software function for BH Analyzer (Optional)

Continuous measurement function SY-811

Time-tendency property test can be performed with continuous excitation.

- Test timeframe at 99,999minutes(Approx. 70days), max. 60second/test
- 2 kinds of properties can be monitored on display and extracted to memory.
- Measurement item can be changed during test.
- Comparison between reference and test result on the same display.
- Test data at CSV and display hardcopy at JPG/PNG are available.

※Implementation of SY-811 on SY-8218/SY-8219 after purchasing must be done in our factory in Japan for the installation and inspection.



Various types of soft magnetic material property test

Soft materials

- Ferrite
- Parmalloy
- Amorphous
- Si steel sheet
- Powder core

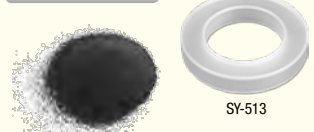
Shape

- Troidal
- EE core
- EI core
- Sheet
- Powder

Troidal



Powder



EE Core



Powder

