



EDDYSUN (XIAMEN) ELECTRONIC CO.,LTD.

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SMART-8005 ET/ACOUSTICS DETECTOR



SMART-8005 is an all-in-one detector including eddy current array (ECA), remote field testing (RFT), metal magnetic memory (MMM), magnetic flux leakage (MFL), high sensitivity high-resolution UT, swept frequency, MIA. It is designed for flaw inspection of metal material, and for sorting of alloy, heat treatment condition and thickness. Results from different inspection methods make engineers easy to analyze and easy to verify. This helps to obtain a more objective and true evaluation. The application fields including aviation, aerospace, electric power, nuclear industry, metallurgy, shipbuilding, petrochemical industry, automobile and so on.



01 ECA and RFT

- 32-64 channels (optional) of eddy current array, multi-frequency RFT
- Welding inspection with no direction limit
- Compensation for lifting and shaking
- Distinct inspection for crack depth
- Special alarm mode of unequal amplitude and phase
- Various display modes: impedance display, time-base scanning display, time-base superposition display, ECA scanning (B/C) 2D/3D imaging display
- High definition and sensitivity
- Easy to operate, optional language of Chinese and English
- Data acquisition of C scanning
- Enable to test wall thickness reduction of tube, surface inspection, depth measurement, thickness measurement of coating and cladding on metal surface, sorting of metal material and hardness
- Designed with 8 mixing units to separate and suppress multiple interfering signals at the same time
- Various filter modes
- Enable to preset special process parameters for further use
- Various ways of storing data
- Provide the function of multi-frequency inspection configuration analysis
- Video inspection is available at the same time of eddy current testing.

02 MAGNETIC FLUX LEAKAGE

- With real-time inspection technology of 32-64 channels, this machine has the ability to effectively inspect defects from tube OD, tube ID and plate of ferromagnetic material
- It doesn't require any process on the workpiece surface before testing, this makes fast inspection and high sensitivity
- Capable of effective diagnosis of ferromagnetic component damage, with stable and reliable performance and high signal-to-noise ratio



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- Can work with different sensors and length meters to meet various testing requirements
- It can be used for pre-service and in-service inspection of ferromagnetic material such as steel pipe, steel rod, steel structure, billet, wire, as well as tank bottom plate.
- Enable to preset special process parameters for further use
- Various ways of storing data

03 METAL MAGNETIC MEMORY

- The stress concentration area can be determined by detecting the normal component of the leakage magnetic field on the workpiece surface
- It doesn't require any process on the workpiece surface
- There is no need to specifically magnetize the workpiece to be tested
- The unknown stress concentration area and metal defect position can be confirmed during inspection
- Easy to operate, special process parameters can be preset
- Various ways of storing data
- Be used for stress concentration and fatigue crack detection of ferromagnetic boiler, pressure vessels, pipes, blades, bearings, rails, gear pairs, welded parts and metal components

04 UT, SWEEP FREQUENCY, MIA

- There are two emission modes including square wave and sharp pulse, which have very high emission pulse amplitude and enough steep rise time of front edge, as well as very low effective output impedance (that is, its load capacity is quite strong). Therefore, both high and low frequency probes of different chip size can be excited to realize high-sensitivity and high-resolution flaw inspection. It has B scan/C scan/TOFD imaging functions and DAC/AVG curves.
- Swept frequency: the bonding quality is determined by amplitude change of return signals detected, processed and displayed by transmitting transducer, which is excited by electronic swept frequency (no couplant required, frequency



range 20K~80KHz).

- MIA: the transmitting transducer vibrates the work piece being tested. The mechanical impedance reflecting the work piece vibration performance reacts on the receiving chip to constitute the load of the transducer. When there's any defect or any bonding quality change, the vibration performance will change too. By measuring these changes, the discontinuity of the work piece under test can be found (no couplant required)

05 OTHER FEATURES

- Testing parameters and data can be saved, and reports can be exported in PDF\EXCEL\WORD format
- Designed with satellite positioning function
- The testing signal all through the inspection process can be saved and replayed
- Integrated with video inspection for visible surface defects
- To minimize personal error, SMART-8005 has functions of real-time menu prompt, man-machine interaction, touch screen operation, and keyboard/mouse operation
- Built-in lithium battery to operate more than 4 hours

06 TECHNICAL SPECIFICATION

ITEM	SPECIFICATION
ECA and RFT	
Number of channel	32-64 (optional) ECA and multi-frequency RFT
Probe connector	LEMO
Number of frequency	4
Frequency range	64Hz~5MHz for ECA, and 5Hz~5KHz for RFT
Impedance display	8
Number of mixing unit	8



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High pass filter	0~500Hz
Low pass filter	10Hz~10KHz
Digital filter	1~100
Pregain	10~35dB
Drive	8 levels
AMP & PHA measure	Automatic/manual
Phase	0~359 °
Gain	0~90dB, in 0.5 dB steps
Display mode on the same screen	Impedance, time-base scanning, B/C imaging, time-base superposition
Alarm type	Half AMP-PHA, AMP-PHA, Rectangle
Filter modes	High pass/low pass/digital filter
Balance mode	Digital electronic balance
MFL	
Number of channel	32-64
Display mode	Time base, shade, digital, superimposition
Distance Measure Clock	Inner clock, outer clock
Step	1~256mm
Max. scan speed	0.5m/s
Gain	0-90 dB in 0.5 dB steps
High pass filter	0~500Hz
Low pass filter	10Hz~10KHz
Digital filter	1~100
MMM	
Number of channel	32
Display mode	Time base, shade, digital, superimposition
Signal displayed	S/K
Calibration Method	Probe/Geomagnetic Field



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Distance Measure Clock	Inner clock, outer clock
Step	1~256mm
Gain	0-90 dB in 0.5 dB steps
Digital filter	1~100
Alarm mode	HP value goes through ZERO level (gate 10-1000), K alarm (1-500)
Background Suppression	Off, +S1, -S1
UT	
Emission	Emission amplitude 200/600V, rise time ≤ 10 ns
Frequency range	1~5, 0.5~15, 3~16MHz
Gain	0~110dB, in 0.5/1/2/6dB steps
Gain fine-tuning	-2~+2dB, in 0.1dB steps
Detection mode	Full wave, positive, negative and radio frequency (RF)
Detection range	continuously tunable from 3~99990mm (longitudinal wave in steel), the minimum display range is 3mm
Pulse shift	-10.0~2000mm (longitudinal wave in steel)
Probe delay	0~199.99us
Material velocity	1000~15000m/s
Damping	High/medium/low/narrow pulse
suppression	0~90%, linear suppression
Vertical linear error	$\leq 3\%$
Inspection sensitivity margin	≥ 65 dB
Remote field resolution	≥ 30 dB
Horizontal linear error	$\leq 0.5\%$
Repetition frequency	20, 50, 100, 200, 500, 1K, 2K. It can 5K/10K when it is weak.
DAC curve	Record 10 echo reference points at most, distances of the three DAC lines are adjustable, echo reference points can be modified



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Gate	a/b/c three independent alarm gates, gate a with function of tracking, gate b/c with function of echo expand
Scan imaging	B scan/C scan/TOFD
SWEPT FREQUENCY	
Frequency range	20~80kHz
Mode selection	Compare/separate
Characteristic display	Amplitude-frequency characteristic, probe calibration
MIA	
Frequency range	2.5~10kHz
Characteristic display	Flying spot/difference compare, automatic setting of best frequency, probe calibration
OTHER SPECIFICATION	
Microprocessor	32bit dual-core
Storage	16G
Memory	1G
Interface	USB, network, HDMI, WIFI, mouse, shuttle knob operation
Display screen	8.4 in TFT touch screen with resolution 1024*768
Operating temperature	-20°C ~ +55°C
Power requirements	DC 19V adapter, 14.8V 6.3AH rechargeable lithium battery