Sonatest

MASTERSCAN SERIES

HIGH PERFORMANCE DIGITAL ULTRASONIC FLAW DETECTORS

Exceptional near surface resolution

High performance 450V pulser for attenuative materials

Minimum range 1mm, maximum 20 metres

Programmable pulser with **ActiveEdge**™

Interface trigger for water path compensation

5 KHz PRF suitable for high speed scanning

THE **MASTERSCAN** SERIES
Digital flaw detectors that set standards of performance and reliability

For over 20 years the Masterscan name has meant exceptional performance with class leading design, the 350^M and 380^M continue this tradition. The latest developments in amplifier and pulser technology deliver higher levels of near surface resolution, penetrating power and excellent signal to noise ratio. Typical applications are thin walled components, turbine blades, spot welds, power generation (including EMATs), large castings and forgings.

Unique ActiveEdge™ Transmitter Technology

The Masterscan series has an ActiveEdge transmitter that drives the pulse on both the leading edge and trailing edge. This development enhances near surface resolution, and removes the need for sensitivity reducing damping resistors. The added control achieved by the design helps the Masterscan optimise characteristics for a wide range of transducers, reaching even higher performance.

Robust and Reliable

Sonatest's reputation for robust design and proven reliability is an important aspect of flaw detector ownership. Down time is expensive and should be minimised to ensure maximum productivity. The Masterscan series is constructed to high standards using Xenoy plastics and sealed to IP67, giving excellent water resistance so it can withstand the tough environments in which operators work.

The Masterscan comes with 2 years warranty, extendable to 5 years with Sonacover, and a worldwide service network.

High Performance with Total Control

The 350^M and 380^M deliver high performance and advanced features, yet our engineer's experience in user interface design has ensured it is easy and quick to use. The acknowledged ease of use of previous generation Masterscans has been enhanced with the menu navigation key, providing easy access to functions. The menu structure has been designed to guide the user through their task with operation quickly becoming second nature.

High Visibility Display

For any flaw detector the display is a crucial element. The Masterscan has a colour transflective TFT display as standard, providing high visibility at any light level. The choice of colours for menus and waveform display enhance clarity, with the LCD simulation mode giving direct sunlight readability. The TFT does not suffer the typical black out problems or temperature limitations of LCD giving full weather capability. The new Full Screen mode maximises the A-scan area to improve readability further whilst testing and its fast response and peak capture functional- ity ensure any indication is clearly displayed, even if it only appears for one cycle of the 5 KHz PRF.
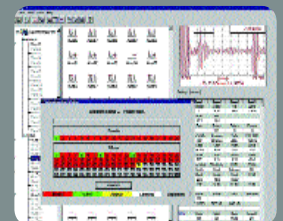
380^M - Systems Integration

The 380^M has additional features designed to integrate with automated test systems. The high 5 KHz PRF, interface trigger (IFT) and back wall echo attenuation (BEA) make it an ideal flaw detector for many system applications that require portability or the need to support manual inspection with the same unit. Proportional outputs and alarms update at the PRF, so high speed test- ing is easily handled, and full remote control via USB interface provides fast set up changes.

SDMS (Optional Sonatest Data Management Software)

This Windows based data management tool allows the user to interface a Sonatest digital flaw detector with a PC. The software uploads and downloads panel settings and A-scans, which can also be copied and pasted into Word for customised reporting. Thickness readings can be transferred directly into Excel with the ability to produce charts for B & C-Scans, colour 3D mapping etc.

Test Range	0 - 1mm (0.05in) up to 0 - 20000 mm (800 in.) at steel velocity. Variable in 1,2,5 sequence or continuously in 1mm (0.05in) increments. Also from 1 to 5000(µs).
Velocity	256 to 16000m/s continuously variable.
Probe Zero	0 to 999.999 µs, continuously variable.
Delay	Calibrated delay from 0 -20000mm in 0.05 mm steps at steel velocity (0-400in. in 0.002 in. steps).
Gain	0 to 110dB. Adjustable in 0.5, 2, 6, 10, 14 and 20dB steps. Direct access to gain control at all times.
Test Modes	Pulse echo and transmit/receive.
Pulser	100V - 350V (450V MS380) square wave pulser. Pulse width from Spike to 2000ns duration - rise/fall times <5ns into 50 ohms: Width adjustable in 2% of nominal width, minimum 1ns maximum 40ns.
ActiveEdge	Unique active pulse control for enhanced near surface resolution and signal response. Replaces traditional damping control.
P.R.F	Selectable 35 to 5000 Hz in 5 Hz steps.
Update Rate	60Hz (NTSC Mode); 50Hz (PAL Mode).
Rectification	Full wave, positive or negative halfwave and unrectified rf.
Frequency Range	6 narrow bands centred at 0.5 MHz, 1MHz, 2.25MHz, 5MHz, 10MHz and 15MHz. Broad band at 2 MHz to 22MHz (-6dB) and 1MHz to 35 MHz (-20dB).
System Linearity	Vertical = 1% Full Screen Height (FSH). Amplifier Accuracy ± 0.1dB. Horizontal ±0.4% Full Screen Width (FSW).
Reject	80% linear reject. LED warning light when selected.
Units	Metric (mm), inch (in) or time (µs).
Display	Colour Transflective TFT: Display area 111.4 x 83.5 mm (4.39 x 3.29 in) 320 x 240 pixels. A-Scan Area 255 x 200 pixels (315 x 200 expanded), 8 colour options and variable brightness.
Gate Monitor	Two fully independent gates for echo monitoring and thickness measurement. Start and width adjustable over full range of unit, amplitude variable from 0 to 100% FSH. Bar presentation. Positive or negative triggering for each gate with audible and visual alarms.
Gate Expansion	Expands range to width of Gate 1.
Gate Monitor Delay	Selectable 0.6 seconds delay on gate 2 negative monitor tracking.
Measurement Modes	
Mode 1	Signal Monitor
Mode 2	Depth and amplitude of first signal in gate.
Mode 3	Echo-to-Echo distance measurement. (single gate)
Mode 4	Trigonometric display of beam path, surface distance and depth of indication, curve surface correction and X-OFFSET for probe index. Half skip indication on screen.
Mode 5	Gate to Gate distance measurement. (independant gates).
Mode 6	T-Min mode for holding minimum thickness reading. Resolution to 0.01mm (0.001in) for distance measurement or 1% FSH for amplitude measurement. Large display of measurement at top of A-Scan display. Measurement mode selectable between peak and flank.
A-Scan Memory	Maximum of 800 waveforms can be printed or transferred to a PC using opitional SDMS software.
Panel Memory	100 stores for retaining calibrations.
Thickness Logging	Storage for 8000 thickness readings configured either by Block/Location/Number mode or pre-programmable work sheets in sequential mode. Readings can be exported to MS Excel using optional SDMS software.
AGC	Automatic Gain Control automatically sets the signal to a level between 10-90% FSH with tolerance between 5-20% accuracy.

DAC	DAC defined by up to 10 points and digitally drawn on screen. DAC curves meet requirements of EN 1714, JIS and ASME standards, select able between -2, -6, -10, -12 and -14dB. Amplitude read out selectable between % DAC or relative dB.
TCG	Time Corrected Gain, also known as Swept Gain. 40dB dynamic range greater than 30dB per microsecond and up to 10 points may be used, setting all signals initially to 80% FSH.
Backwall Echo Attenuation	0- 40dB attenuation.
AWS	Built in software for evaluation of defect indications in accordance with AWS D1.1 structural weld code.
AVG/DGS	Automatic calculation from probe data, up to 10 probes stored.
API	Flaw sizing complying with API 5UE
Auto-Cal	Provides automatic calibration from two echoes.
Clock	Sets time and date.
Reference Waveform	This menu displays a waveform from one of the A-log stores as a reference or fingerprint display in a colour different from the active display highlighting differences from the reference.
Notes	Alphanumeric labelling for panel and A-log allows the user to enter Notes for storage with panel settings and A-scans.
Display Freeze	For capturing the current A-scan image.
Peak Memory	For echodynamic pattern determination.
Keylock	Prevents accidental alteration of parameters.
Help Key	For instant operator guidance on using the Masterscan Series.
Language Support	Supports multiple languages. User selectable between English, German, Spanish, French, Dutch. Others available on request.
Waveform Smoothing	Gives a smooth signal envelope, simulating analogue equipment.
Outputs	Full bi-directional serial interface to transfer parameters, thick ness readings and waveform memories. Composite video, PAL or NTSC compatibility. Analogue proportional outputs programmable to distance or amplitude of signal in the gate. Transmitter sync output
Front USB	For connection to printers, keyboards and PC.
Printers	Supports Hp Deskjet, Epson.
Power	Lithium Ion battery pack 14.4V, 5.0 ampere hours, gives up to 11 hours duration from a fully charged pack. Indication of low battery status. Recharge time 3-4 hrs.

Addtional 380^M Features	
Interface Trigger	Interface gate locks to surface echo and eliminates water path variation.
High Power Pulser	As 350^M, plus -450 Volt peak voltage.

Charger	100 - 240 VAC, 50-60 Hz.
Transducer Sockets	BNC or LEMO (factory option)
Environmental	Case sealed to IP67
Temperature	Operating -10°C to +55°C (14 to 131°F). -20°C to +70°C. (-4 to 158°F) survivable. Storage: -40° to +75°C. (-40 to = 167°F)
Size	255 x 145 x 145mm (10.0 x 5.7 x 5.7 in)
Weight	2.5kg (5.5lbs) with Li-Ion cells.
Standard Kit Includes	Masterscan 350^M or 380^M Li-ion Battery& Battery Charger Fabric Carry Bag Calibration Certificate Instruction Manual (EN12668)

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Certificate No: Q5036

Distributed by:

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Part No: 147311