

A wide range of Ultrasonic Inspection Tasks are effortlessly addressed, making this flaw detector a versatile tool for various applications. Ease of use and application makes it accessible even for specialists with less experience in ultrasonic testing, enabling the seamless integration of advanced technologies into everyday practise.

PhaseX

Ultrasonic Flaw Detector

Phased Array + TFM



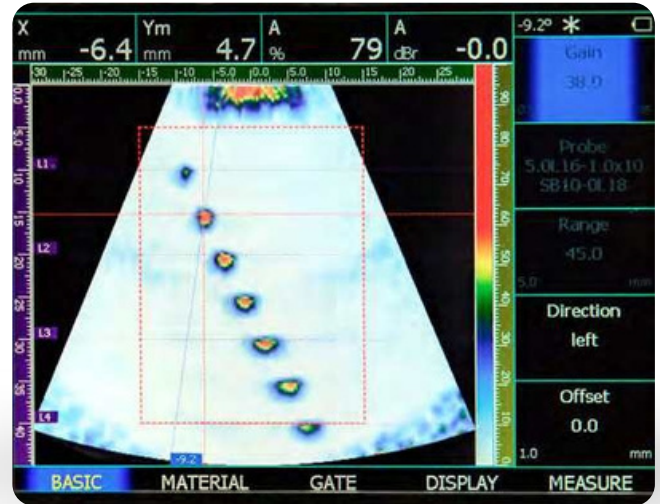
- HIGH MEASUREMENT ACCURACY
- CONVENIENCE AND EASE OF USE
- LIGHTWEIGHT AND ERGONOMIC DESIGN

Advanced Technologies

The PhaseX utilizes cutting-edge digital aperture focusing with the classic phased array transducers, transforming it into a powerful tool with TFM algorithm capabilities.

TFM Technology

The technology of collecting a complete set of signal realizations and reconstructing the TFM image allows obtaining a clear and detailed picture across the entire volume of the inspected object, giving the utmost image quality and resolution with 16 element Phased Array. Sensitivity alignment by angle (ACG) and depth (TCG) ensures highly reliable assessment of signal amplitudes. This simplifies the control of thick-walled objects and facilitates defect size assessment.



Ease of Use and Reliability

The flaw detector easily integrates the latest advancements in analog and digital technology, user-friendly simplicity and high reliability in a lightweight and ergonomic design.





Lightweight (only 1.57 kg) with 16-element phased arrays provides the highest resolution capability and image quality comparable to 32 and 64 element probes.



Shock-resistant rubberized case, IP65 protection, TFT color matrix screen with a 640 x 480, excellent performance and a wide viewing angle is the best choice for field application.



The unique technology of all beams calculation based on wedge geometry enables operators to easily load the necessary combination of transducer and wedge models from the library for straightforward operation. This saves setup time and gives best possible pre-calculated scanning image with precise flaw coordinates across the entire S-scan.



Weld Wizard and Scan Plan Wizard based on real thickness and geometry of weld and probe position, allows easily detect the position of the defect in the weld with detailed visualization.

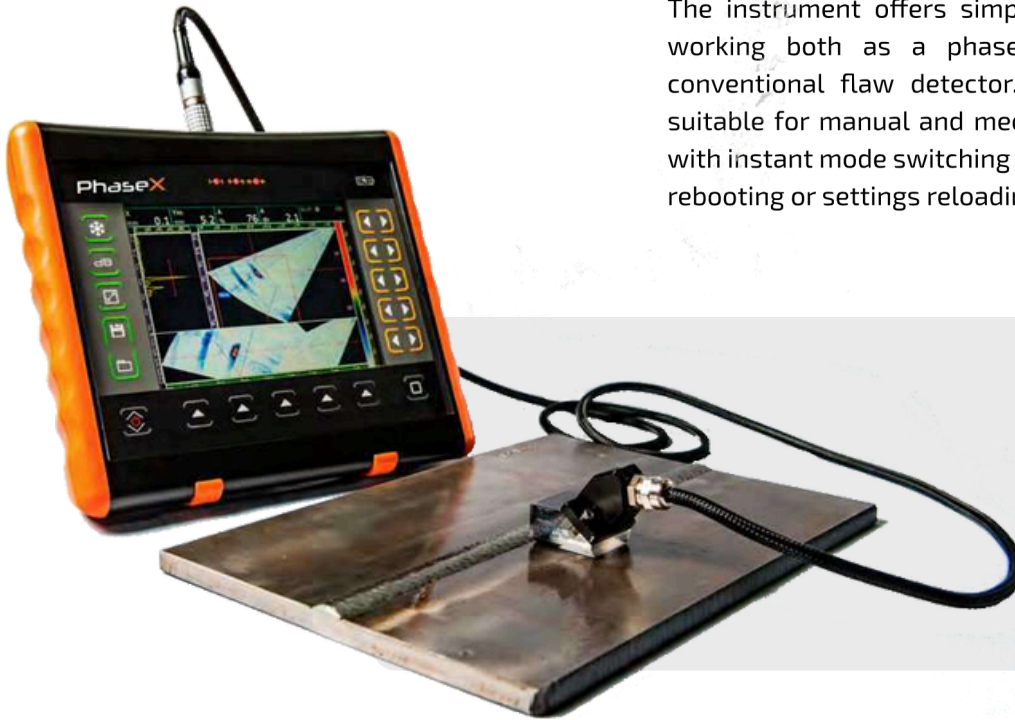


Angle Corrected Gain (ACG) and TCG function with the ability to set a signal level based on the area of a reference flaw, allow for an immediate assessment of the equivalent defect size.



Input for 2-x coordinate encoder allows the connection of various mechanized scanners for C, B and other scans, as well as TOFD deployment inspection of complex objects.

Easy switch between Phased array and Conventional mode. Optimized and easy access to all functions

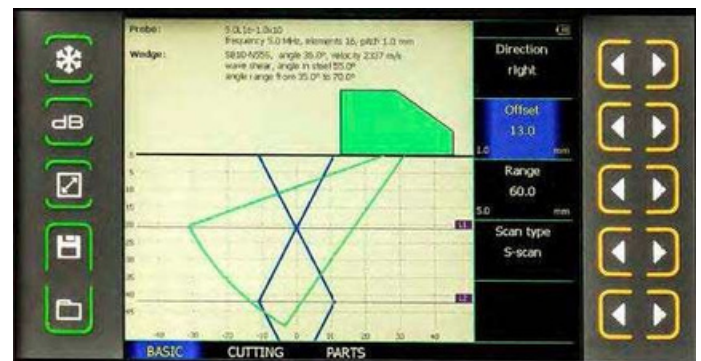


The instrument offers simple access to all functions, working both as a phased array and a standard conventional flow detector. This versatility makes it suitable for manual and mechanized ultrasonic testing, with instant mode switching that does not require device rebooting or settings reloading.

Additional functions help results interpretation

The PhaseX flow detector is equipped with add on functionality to make faster and easier interpretation and sizing of the defects.

Weld wizard and true geometry setup of inspection object, ACG and TCG capabilities ensures sizing and visualization of the defect on the graphical image of the object on the scan, different scan views and zoom function allows detailed analysis on board.





Special features

16-element phased array transducers, offering flexibility and precision. The use of interchangeable wedges helps prevent transducer wear and facilitates control over curved surfaces.

Full-screen image reconstruction ensures a comprehensive and detailed view of signals without sacrificing performance. This capability allows for the utmost detailing of signals during inspections.

Sectorial (S-Scan) and linear (L-Scan) scan. Supports both sectorial and linear scan at fixed angles to align with classic methods for conventional flaw detectors.



B-Scan construction. Constructs B-scans of beams transmission considering material thickness and weld geometry. Facilitates visual observation of defect locations in the real geometry of the weld.

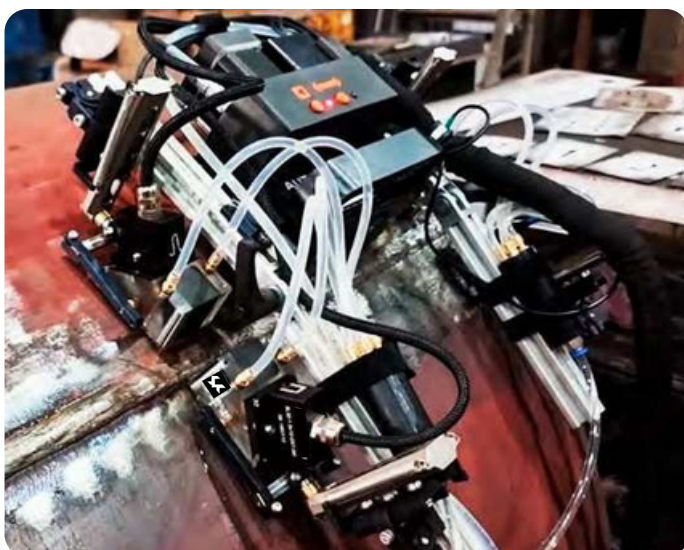
Marker. Measurement of relative sizes using markers. This allows to measure distance between two defects.

Built-in diagnostics. Offers capabilities for self-check of cable, phased array transducer and device switch board conditions.



Scanners connectability

The flaw detector is able to operate with a 2D coordinate encoder, recording B-Scan. The results can be analyzed in real time on the device or on PC. This makes the flaw detector a convenient tool for mechanized ultrasonic testing.



The AutoPAScan can be used in configuration with 1 PA or 2 TOFD probes.

Technical Specification

PA Transducer type: 16-element phased array transducer.

Signal processing algorithm: TFM (Total Focusing Method).

Working aperture : 4, 8, and 16 active elements.

Scanning step by angle: 0.3 to 2 degrees.

Sensitivity alignment for PA (ACG): 2D correction (10 lines x 20 angle correction points).

Depth sensitivity alignment for PA (TCG): up to 10 dB/ μ s with an accuracy of 0.01 dB/ μ s.

Prism delay: 0–100 μ s

Automatic delay calibration: using S0-3, V-2, sample with reflector, TOFD transducer calibration.

Scan range: min 0–2 μ s (0–5.9 mm). Max: 0–1000 μ s (0–5950 mm, steel).

Delay range: –4 μ s to 1000 μ s.

Max scanning length (steel): up to 3000 mm (echo mode), 6000 mm (shadow mode).

PA scanning modes: S-scan, L-scan (with a constant angle).

Velocity range: 100–10,000 m/s.

Pulse: radio pulse with an amplitude of 50 V, adjustable number of periods (0.5–5), and variable radio pulse frequency.

PRF: 50Hz to 50 kHz in the classic mode. In the PA mode, it is set automatically based on the specified parameters.

TOFD usage: single-channel TOFD.

B-Scan: B-scan in the conventional mode, display weld geometry in the PA mode.

Amplifier: wideband: 0.1–20 MHz, with the option to select narrow-band filters.

Detection: positive or negative half-wave, full wave, radio signal. Measurement of time intervals: from 0 to the first signal in the gate or between signals in the gate, by the front, by the signal maximum, or by crossing "0".

Time Corrected Gain (TCG): range up to 70 dB, 12 dB/ μ s; 20 points.

Distance-amplitude correction (DAC): 20 points.

Cutoff: compensated, 0–80% of the screen height.

Damping: 25 ohms / 50 ohms / 1000 ohms.

Input impedance: 50 ohms / 600 ohms.

Gain adjustment range: up to 100 dB.

Digital signal filtering: available. Analog signal filtering: available. Additional +dB button: programmable.

Signal modes: A-scan, B-scan, C-scan, D-scan, S-scan, L-scan, TOFD.

Gates.

In the PA mode: a rectangular area on the S-scan;

In the classic mode: 2 adjustable gates, threshold levels 0 to 95 % of the screen height for detection and from –95 % to +95 % for radio signal, individual logic of defect detection.

ASD modes: defect in the first gate, defect in the second gate, defect in the first and second gates, defect in one of the gates, by DAC — comparison of the signal in the first zone with the amplitude-distance curve.

Gate Defect detection in the PA mode: by MAX, by Beam, manual.

Calculation of reflector coordinates on S-scan: automatic on the Scan, by math model of wedge, accuracy up to 0.1 mm.

Signal display modes in PA mode: S-scan; A+S-scan; A+B-scan; S+B-scan; A+S+B-scan.

Automatic defect alarm : visual and audible for each zone.

Amplitude measurement: In % of the screen height, in dB to the threshold level in gate, in dB to the reference signal, by DAC.

Defect sizing in conventional mode: built-in DAC diagrams.

Support for the AWS D1.1 Weld inspection standard: yes, with automatic D1.1 Ratio calculation.

Display: color high-contrast TFT 640 x 480 pixels (130 x 100 mm). sunlight visible.

Screen color scheme change: yes.

Memory: 200 settings with A-scan, 1000 control protocols and scan results.

Menu language: English.

Interface: USB.

Self-diagnostic capabilities: yes.

Software update: via USB.

Probe connectors: 2 x Lemo00, 1 x Lemo 2B356.

Battery: Li-Ion 10.8 V, 5000 mAh.

Operating time: not less than 10 hours from the built-in battery.

External power supply: unit 220V, AC, 15V/2.5A DC

Operating temperatures: from –30 °C to +55 °C

Size: 200 x 225 x 80 mm

Weight: 1.57 kg with battery