Waygate Technologies
a Baker Hughes business

KRAUTKRÄMER

USM 36

Universal portable ultrasonic flaw detector



The universal portable ultrasonic flaw detector from Waygate Technologies, combining ergonomic and robust design and the biggest display screen of its class with state-of-the-art UT performance.

A proven reliable and robust ultrasonic flaw detector performer

The Krautkrämer combines the 21st century operating platform with the reliable and robust hardware of Waygate Technologies' well-established Krautkrämer portable flaw detection instruments. It incorporates a range of innovative features to ensure that this new instrument is adopted as the everyday workhorse of flaw detectors by NDT inspectors globally.





1

Largest Viewable A-Scan Display in its Class

- An important improvement in the Krautkrämer USM 36 is its large 7 inch screen, with an 800x480 pixel resolution. The entire area is available to display crispy A-scans, making it the best in its class. Signals can be easily viewed and accurately interpreted, even in bright sunlight, with tired eyes at the end of a long working day.

2

Simple and Efficient Operation

- The Krautkrämer USM 36 uses the familiar rotary knobs of previous models but the function keys have now been minimized into a simple, intuitive 6-key keyboard, allowing simple and efficient operation
- Inspection set-up is also easy. Not only for technicians who have used USM Go or USM Go+ for previous inspections, as set-up data is transferable directly from these instruments, which share the same user interface. This commonality of interface also ensures a rapid learning curve for technicians familiar with the USM Go instruments.

3

Flexible Data Reporting and Storage

- As well as easy-to-interpret the crispy A-scans, data reporting on the Krautkrämer USM 36 can also include screen shots and A-scan videos, where A-scans can be recorded for subsequent analysis or to provide proof of inspection. All data is stored on a removable SD-card and reports can be in jpeg or BMP format.







4

Comprehensive Connectivity

- Connectivity is a major feature of the Krautkrämer USM 36. Data can be stored on removable SD-card or USB memory stick, either for record purposes or to allow data sharing. A VGA connection allows the instrument's display to be shown on an external monitor or on a projector screen for training purposes.



5

Can be Used in the Harshest of Environments

- The Krautkrämer USM 36 is fully protected against dust and water ingress to IP66 and can be operated in ambient temperatures from -10°C to +55°C. It can be used in sandy deserts, frozen wastes and in the humid tropics.
- The Krautkrämer USM 36 flaw detector weighs just 2.2 kg and is battery- or mains- operated. Its Li-ion battery has an operating life of more than 13 hours, with an integrated battery charger for those longer shifts.

6

Available in Three Versions

- The versatile instrument is offered in three versions to meet the most standard inspection codes. The most advanced version can operate in DAC, AWS and DGS modes, features a powerful square wave pulser for excellent material penetration and can accommodate Waygate Technologies patented trueDGS probe technology, which offers unrivalled accuracy in sizing of flaws using the DGS method, as well the patented Phantom Echo Detection technology.

Applications

The Krautkrämer USM 36 has been developed for day-to-day use throughout the industrial spectrum, from weld inspection and corrosion measurement in the power generation and petrochemical industries, to castings and forgings inspection and thickness measurement in the automotive, metals and aerospace sectors to the inspection of special materials.

Weld Inspection in the Power Generation and Petrochemical Industries

Intuitive tools facilitate analysis and the use of color on the ultra-bright, 7 inch screen allows significant display benefits during weld inspection:

- Monitor gates and curves are displayed in various colors
- Messages and alarms are displayed in red
- A-scans can be displayed in different colors to assist comparison
- Color display of all parameters involved in flaw location, including sound path, surface distance, depth position and leg number
- Waygate Technologies' patented color coded display of legs for angle beam inspection



Precise Thickness Measurement in the Automobile Industry

The Krautkrämer USM 36 provides precise thickness measurement, as the sound path differences are measured very accurately at the peaks of an echo sequence.

Corrosion Measurement in the Power Generation and Petrochemical Industries

Corrosion measurement can be carried out using dual element probes, where the screen displays both the thickness measurement and the A-scan, ensuring maximum reliability. A minimum capture mode provides the thinnest measured reading at the end of a continuous scan. An auto-freeze function, which minimizes the probe's surface contact time, is used for measuring structures and components with hot surfaces.

Inspection of Forgings

The instrument's Phantom Echo Detection technology is used in the inspection of fine grained and long work pieces to ensure accurate detection of flaws but not Ghost Echoes.

Inspection of Special Materials

The powerful square wave pulser which is an available option for the Krautkrämer USM 36 provides excellent penetration of difficult materials, such as those sometimes used in the aerospace and automobile industries.

Display screen	
Size Diagonal	7”
Active range (W × H)	152.4 × 91.44 mm²
Resolution (W × H)	800 × 480 pixels
Range	4 … 14,108 mm (555“) for longitudinal wave

Display	
Display shift (delay)	-15 … 3,500 µs
Probe delay	0 … 1,000 µs
Velocity	250 … 16,000 m/s
PRF	Automatically optimized 15 … 2,000 Hz, 3 automatic setting modes: Auto Low, Auto Med, Auto High, Manual

Connectors	
Probe connectors	2 × LEMO-1 or 2 × BNC
USB interface	USB type B connector
Service interface	LEMO-1B, 8 pin

Pulser	
Pulser mode	Spike pulser, optionally: Square-wave pulser
Pulser voltage (SQ mode)	120 … 300 V, in steps of 10 V with a tolerance of 10%
Pulser falling/rising time	max. 10 ns
Pulser width (SQ mode)	30 … 500 ns, in steps of 10 ns
Pulser amplitude (Spike mode)	low: 120 V, high: 300 V
Pulser energy (Spike mode)	low: 30 nS, high: 100 nS
Damping	50 ohms, 1000 ohms

Receiver	
Digital gain	Dynamic range 110 dB, adjustable in steps of 0.2 dB
Analog bandwidth	0.5 … 20 MHz
Equivalent input noise	<80 nV/√Hz
Filters	Broadband: 1-5 MHz / 2, 2.25 MHz / 4, 5 MHz / 10 MHz / 13, 15 MHz
Rectification	Positive half-wave, negative half-wave, full wave, RF signal

Gates	
Independent gates	Gates A and B (triggering by gate A), Gate C (option, triggering by gate A or B)
Measurement mode	Peak, Flank, J-FLANK, FIRST PEAK

Memory	
Card slot	SD-card slot for all standard SD-cards
Capacity	8 GB, SD-card
Datasets	UGO data structure in ASCII
Reports	JPG or BMP format

General	
Battery	Li-Ion, operating time: 13 hours with full charge / Charging method (standard): internal with power adapter / Charging method (optional): external charger / Charge level: proportional charge level indicator
Power adapter	Universal power supply unit 100 … 240 VAC, 50/60 Hz
Size (W × H × D)	255 × 177 × 100 mm (10” × 7.0” × 3.9”)
Weight	2.2 kg incl. battery
Languages	Bulgarian, Chinese, Czech, Dutch, English, Finnish, French, German, Hungarian, Italian, Japanese, Norwegian, Polish, Portuguese, Romanian, Russian, Spanish, Swedish
Damp heat and humidity (storage)	EN 60068 Part 2-30 6 cycles: 9 hrs at +25°C up in 3 hrs to +55°C, 9 hrs at +55°C then down to +25°C in 3 hrs, at 93% humidity
Vibration	EN 60068 Part 2-6 2g per axis, 5 … 150 Hz, 1 oct/min, 25 cycles
Shocks	EN 60068 Part 2-27 1000 cycles per axis, 15 g, 11 ms, half-sine
Enclosure	IP66 according to IEC 60529
Operating temperature	-10 … 55°C
Cold operation	-10°C for 16 hrs, 502.5 Procedure II
Heat operation	+55°C for 16 hrs, 501.5 Procedure II
Storage temperature	-20 … +60°C, without battery
Cold storage	-20°C for 72 hrs, 502.5 Procedure I
Heat storage	+70°C for 48 hrs, 501.5 Procedure I

Options	
AWS	AWS calibration tool, according to AWS D1.1 Structural Welding Code
DAC/JISDAC/CNDAC	DAC calibration tool, 16 points, according to EN 1712, EN 1713, EN 1714, ASTM E164, ASME, ASME III, JIS Z3060, GB11345 TCG: 120 dB dynamic, 110 dB/µs slope
DGS	DGS calibration tool, according to: EN 1712, EN 1713, EN 1714, ASTM E164
Data logger	Grid file creation
3G	Gate C
SWP	For pulser parameter optimization, voltage setting 120 … 300 V in steps of 10 V, pulse width setting 30 … 500 ns in steps of 10 ns
Phantom-PRF	Phantom-PRF for the identification of erroneous echoes caused by multiple reflections in low-attenuation materials
BEA	Blackwall Echo Attenuation

Specifications according to EN 12668
You will find the specifications according to EN 12668 for your instrument on the product CD included in the standard package.

Waygate Technologies

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