

# UCD-46 LITE Ultrasonic flaw detector



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- Powerful
- Light and portable
- Ergonomic design
- High reliability
- High measurement accuracy
- Usability

#### **General information**

The new, portable and user-friendly ultrasonic flaw detector UCD-46 Lite is suitable for long-distance business trips and field work. Based on the powerful and time-proven circuitry of the previous model range, the new flaw detector has all the advantages for solving any problems of manual ultrasonic testing. Despite the low weight (less than 900 g) and dimensions, the device has all the technical characteristics of the well-proven model UD2V-P46.



#### Specifications

Calibration range min.: 0 — 22 mm, max.: 0 — 2975 mm (steel) Sound velocity range 1000 — 9999 m/s Delay - 0,5 to 994,5 us Probe delay 0 to 100 us Signal damping 25 Ohm / 50 Ohm / 1000 Ohm Excitation pulse voltage radio-frequency pulse, 200 V; with adjustable frequency and number of periods PRF (Pulse Repetition Frequency) 40 to 400 Hz Bandwidth (amplifier bandpass) wide-band: 0,5-20 MHz (- 6 dB) Built-in probe matching 7 built-in circuits Gain 110 dB; in increments of 0,5; 1; 2 or 6 dB Time corrected gain (TCG) ranges up to 90 dB; 12 dB/us; 10 reference points set manually or using reference reflectors Rectification positive or negative half-wave, full-wave, radio-frequency signal Reject (suppression) linear, 0 to 80 % of screen height Monitor gate two independent gates; individual logic of flaw detection

Alarm System luminous for each gate and sonorous; individual logic of flaw detection Alarm System operation modes set for each gate separately Time interval measurement between pulse start and the first echo signal, or between signals (echo-echo), by fronts or peaks **Display of amplitude** as a percentage of the screen height, in dB reference to gate threshold level, in dB reference to test echo (AWS 1.1), in dB reference to DAC Display high-contrast TFT; 320 x 240 pixels; 115 x 85 mm A-signal 220 x 200 pixels in setting mode, 320 x 240 pixels in full-screen mode Memory 100 settings with A-signal, 100 transducer settings, 1000 testing reports **Transducer connectors** 2 x Lemo 00 Interface USB **Battery life** up to 12 hours using built-in battery **Operation temperature range** - 25 to 55 °C Dimensions (H × W × L) 205 mm x 160 mm x 43 mm Weight 0,87 kg with built-in battery

# Ultrasonic flaw detector UCD-46 Lite

#### **Delivery set**

UCD-46 main unit with built-in Li-ion battery

Power supply / battery charger 220 V.

Two Lemo00 — Lemo00 cables

Four transducers

## UCD-46 menu structure



#### PC connection cable

Protective bag with harness on case

PC software + Report Builder

Transport bag

11

- 1. Select the parameter from the list
- 2. Parameter value adjustment
- 3. Move through the items of the main menu
- 4. Change the step of parameter adjustment
- 5. Save the result
- 6. Screen-freeze
- 7. Change the gain by a given step
- 8. Zoom, A-gate full-screen
- 9. Full-screen
- 10. Alarm System indicators
- 11. On/Off

#### Connectors

- 1. Power supply + 15 V
- 2. Receiver
- 3. Pulser
- 4. USB



#### Ease of use and reliability

This flaw detector combines the latest achievements of analog and digital technology, ease of use, ergonomic design and high reliability.

#### User-friendly interface

The device has an user-friendly feature of recording results. Each ultrasonic testing report consists of an A-signal, peak freeze (if the result is recorded in this mode), a value of the measurement results (amplitude and coordinates, distance along the beam and ultrasonic testing coordinates or speed), all device operation parameters, date, time and result name entered from the device keyboard.

All results can be viewed and renamed both in the flaw detector itself and using the PC software. For this, special software is designed to fully automate the processing of ultrasonic testing results, dividing them into different report databases.



Signals after switching on analog filters 2,7-4,1 MHz.



# Display

The new, high-contrast and easy-to-read from any viewing angle frost-resistant 115 x 85 mm TFT display (320x240 pixels)

### Standard software features

Simultaneous measurement of the amplitude and position coordinates of signal peak

Simultaneous measurement of the distance along the beam and the coordinates of the defect at a given transducer input angle Peak freeze recording mode of in the inspection gate Large memory of flaw detector settings and results of ultrasonic

testing

Support for maintaining several databases of ultrasonic testing reports on a PC with the feature of Report Builder of any kind



Automatic prism calibration using CO-3 or V-2 Auto-calibration of the control range and the position of the gates according to the given thickness of the welded joint Auto-calibration of ultrasonic testing speed at a given thickness Unique signal processing features that allow the user to work with a "frozen" image on the screen, including changing the image scale, position of gates and taking measurements Opportunity to connect one of 7 built-in matching circuits for optimal

operation with any ultrasonic probes

Radio-frequency signal



Effect of using the TCG

# Ultrasonic flaw detector UCD-46 Lite

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# Specifications

	H=39 Y=151,9	V 📗
		Gain 🗤
The high-contrast, color TFT display (320x240 pixels).	1 · ·	0.0 dD
Great visibility from different viewing angles.	f · · ·	100 %
Three adjustable color sets.		Colors
Opportunity to work in sunlight		set 1
opportunity to work in sunlight.		Peak Freez No
		TCG Plot
		0ff
	DISPLAY SETTINGS CALIBRATI	ON RESULTS
	H=-1,7 Y=32,80	_ Q 77 🗎
		Gain 05 38 0 dB
Powerful pulse generator 200 V and high resolution of receiver path	•	Pulse freg
	<u>h</u> o	16.00 MHz
	[/]/h	Pls. count
		0.50
	· · ·	Dampnig 50 Ohm
	ι - υ	Inductance
		Off
	RECEIVER PULSER PROBE MI	EASUREMENT
	H=87 Y=251,9	<u> </u>
	• • • • • • • • • •	6ain - 8.0 dB
ICG with dynamic range of 90 dB and up to 12 dB/us slope		Point 3
		total 5
	• • • • • • • • • •	Position
	la cara e e e e e e	Cain
		15.0 dB
		Enable
	And And Area Area and Area and	Yes
		RM TCG V₹ ∭
	<u> </u>	Gain 1
DAC with two additional adjustable curves		8.0 dB
Opportunity to measure the defect amplitude in reference to $DAC$ curve	· · · · · · · · · · · · ·	Point 4
Opportunity to measure the delect amplitude in relevence to DAC curve.	• • • • • • • • • • • •	Dosition
	$\vdash \  \  \  \  \  \  \  \  \  \  \  \  \ $	180.8 mm
		Gain
		43.0 dB
		Enable No
	BASIC a-GATE b-GATE ALA	RM TCG
	S=27,25	<u>v</u>
		Gain 1
The feature of signal peak freeze, which makes it easy to fix the	•••••A•••••	Brightporc
maximum amplitude and evaluate the flaw form	· · · · · · · · · · · · · · · · · · ·	100 %
		Colors
	· · · · · · · · · · · · · · · ·	set 2
	• • • • / <mark>•</mark> \• • • • •	Peak Freez Yes
	la a sul 🖌 a a a s	TCG Plot
	that the Cather	Ott
	DISPLAY SETTINGS CALIBRATI	ON RESULTS

#### General technical specifications

# Calibration range

min.: 0 - 1,37 us (0-4,1 mm) max.: 0 - 1000 us (0-2975 mm, steel) Sound velocity range 1000 - 9999 m/s Delay -0,5 us to 994.5 us Max. length of material (steel) up to 2975 mm (echo mode), 5950 mm (shadow mode) Probe delay 0 - 100 us with an accuracy of 0,01 us Damping 50 Ohm / 1000 Ohm (up to 25 Ohm in combined mode) Input impedance 50 Ohm / 600 Ohm Excitation pulse voltage radio-frequency signal, 200 V; with adjustable periodicity from 0,5 to 5, in increments of 0,5 (half of period frequency) PRF (Pulse Repetition Frequency) up to 400 Hz in max. frequency mode; 40 Hz in special mode Bandwidth (amplifier bandpass) wide-band 0.5-20 MHz (-6 dB) 4 narrow-band filters Built-in probe matching 7 matching circuits 0,66; 1; 2,2; 3,3; 4,7; 6,8 и 15 иНz Gain 110 dB; in increments of 0.5, 1, 2 or 6 dB Time corrected gain (TCG) ranges up to 90 dB, 10 dB/us 10 reference points set manually or using reference reflectors Distance-Amplitude Correction (DAC) 10 reference points, height-adjustable two additional curves ±12 dB from the main one (in increments of 1 dB) Rectification positive or negative half-wave, full-wave, radio-frequency signal (in all calibration range) Visualization A-scan Additional key +dB programmed Probe delay auto-calibration using CO-3, V-2 samples with reflectors Auto-calibration of the control range at a given joint thickness included Automatic ultrasonic testing calibration included Reject (suppression) linear, 0 - 80% of screen height Monitor gate two independent monitor gates, start and width change in all calibration range, threshold levels set from 0 to 95% of screen height during detection and from -95% до +95% by radio-frequency signal in increments of 1%, individual logic of flaw detection Alarm System luminous for each gate and sonorous

# Ultrasonic flaw detector UCD-46 Lite

#### Alarm System operation modes

flaw in the first gate/flaw in the second gate/flaws in both gates/ flaw in either gate/comparison of the first gate signal with DAC curve DGS/AVG no **Digital signal filtering** included Analog signal filtering included Time interval measurement between pulse start and the first echo signal, or between signals (echo-echo), by fronts or peaks **Display of amplitude** as a percentage of the screen height, in dB reference to threshold levels, in dB reference to test echo (AWS D1.1) in dB reference to DAC curve, simultaneously with indication of the reflector coordinates measured by the signal peak Comparison with saved reference Automatic in all calibration range AWS D1.1 support reference signal recording only Image processing after screen-freeze Full-functional processing and analysis Display high-contrast color TFT, 320 x 240 pixels, (115 x 85 mm) feature of operating in sunlight Display color set changing according to the vision peculiarities and lighting included Languages Russian, English Memory 100 settings with A-signal and names, 100 transducer datasets; 1000 testing reports (50 files containing 25 test reports each) Interface USB **Transducer connectors** 2 x Lemo 00 Batterv built-in, 11 V, 5 A/h **Battery life** up to 12 hours Power supply 220 V AC Power supply voltage 9 V / 2,5 A DC **Operation temperature range** from -25°C to +55°C Dimensions (H x W x L) 205 mm x 160 mm x 43 mm Weight

0,87 kg with battery