KROPUS
SCIENTIFIC AND PRODUCTION CENTER

UCD-50 IPS

Ultrasonic flaw detector

PHONE/FAX

+7 (495) 229-42-96 sales@kropus.com

+7 (800) 500-62-98 www.kropus.com

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

Ultrasonic flaw detector UCD-50 IPS

General information

Classic multi-purpose ultrasonic flaw detector for manual and mechanized inspection with wide functionality: encoder connector, B-scan, TOFD, DGS/AVG and auto-calibration. The model has proven itself both as in terms of ease of use and in terms of reliability in the most extreme operating conditions. A frost-resistant bright TFT color screen with a resolution of 640 x 480 pixels, anti-glare coating, increased viewing angles and rapid image regeneration, perfectly visible in sunlight, as well as an impact-resistant ABS plastic case with a protection degree according to IP65 and a built-in powerful Liion battery allow using this device under any operating conditions.

Specifications

Calibration range
Min.: 0 — 7,5 mm (steel); 0 — 2,5 us
Max.: 0 — 6 000 mm (steel); 0 — 2 000 us
Sound velocity range
1 000 — 15 000 m/s
Delay
from -5 to 2 000 us
Probe delay
0 us to 100 us
Signal damping
25 Ohm / 50 Ohm / 1000 Ohm
Excitation pulse voltage
50 /100/150/200 V radio frequency pulse
with adjustable frequency and number of periods
PRF (Pulse Repetition Frequency)
from 20 Hz to 2 000 Hz
Amplifier
wide-band 0,1–20 MHz (– 6 dB)
Built-in probe matching
7 built-in switchable circuits
Gain control range
100 dB in increments 0,1; 0,5; 1; 2 or 6 dB
Time corrected gain (TCG)
ranges up to 90 dB; 12 dB/us,
20 reference points set manually or using reference reflectors
DGS/AVG for estimating the flaw size
included
Rectification
Positive or negative half-wave; full-scale; radio-frequency signal, B-scan, TOFD
Reject (supression)
linear, from 0 to 80 % of screen height
Monitor gate
two independent monitor gates
Alarm System
light and sound for each gate; individual logic of flaw detection in gate
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 signal front. peak or zero-cross
Display of amplitude
as a percentage of the screen height
in dB reference to gate threshold level,
in dB reference to test echo (AWS1.1),
in dB reference to DAC curve
Display
high-contrast TFT 640 x 480 pixels;135 x 100 mm
with the function of working in sunlight
***A*-signal**
480 x 300 pixels with on-screen menu
640 x 480 pixels in full-screen mode
Memory
200 settings with *A*-signal, 100 sensor settings;
500 testing reports
Transducer connectors
2 x Lemo 00
Interface
USB
Battery life
up to 15 hours using built-in battery
Operation temperature range
from – 30 to 55 °C
Dimensions (H x W x L)
200 mm x 230 mm x 85 mm
Protection degree
IP65
Weight
1,4 kg

Delivery set

PC connection USB cabel

Protective bag with blind and belts

PC software + Report Builder

Transport bag

UCD-50 IPS main unit with built-in Li-ion battery

Power supply 220 V

Two Lemo00 — Lemo00 cables

Four transducers

UCD-50 IPS menu structure

1. Screen-freeze
2. Full screen
3. Fast gain change with preset dB step
4. Magnifying a-gate signal
5. Memorize
6. On/Off
7. Select a menu item
8. Additional menu
9. Select a menu item
10. LED alarms for a-Gate and b-Gate
11. Charge LED indicator
12. Set the value of selected parameter
13. Select the parameters/functions
14. Select the step of parameter setting

Connectors

1. Encoder
2. Pulser
3. Receiver
4. Adapter/battery charger +15 В DC
5. USB

Ease of operation and reliability

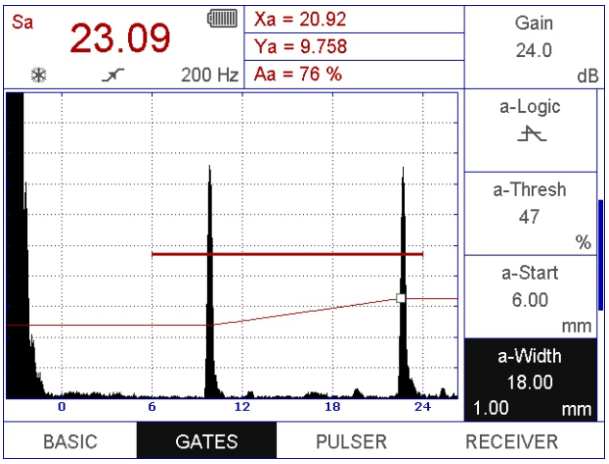
This flaw detector combines the latest achievements in analog and digital electronics, usability, ergonomic design and high reliability.

User-friendly interface

Flaw detector UCD-50 IPS use does not pose any problem even for first-time users.

Display

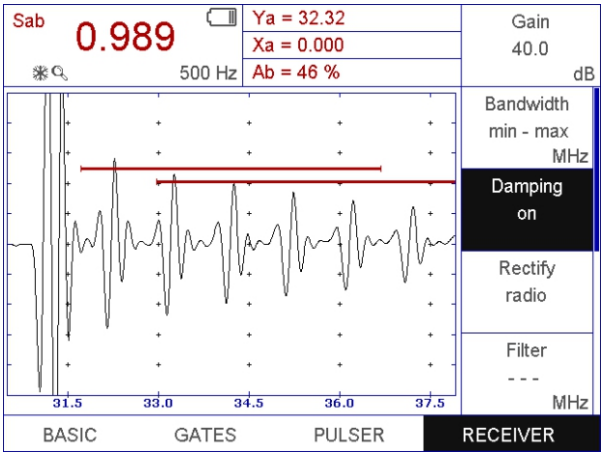
Unique frost-resistant modern display with color TFT (640x480 pix), excellent performance and wide viewing angle is the best choice for working in the field in direct sunlight, as well as at low temperatures.



TCG signal equalization

Optimized access to all features

Flaw detector menu structure allow the operator to flexibly change operating parameters for any task and includes:
Main menu - to set up the device before the inspection, including change of pulser and reciever settings, inspection gates and alarm system setup, etc.
Additional menu - for specific adjustments - screen color, date, time setup, etc.



RF signal display

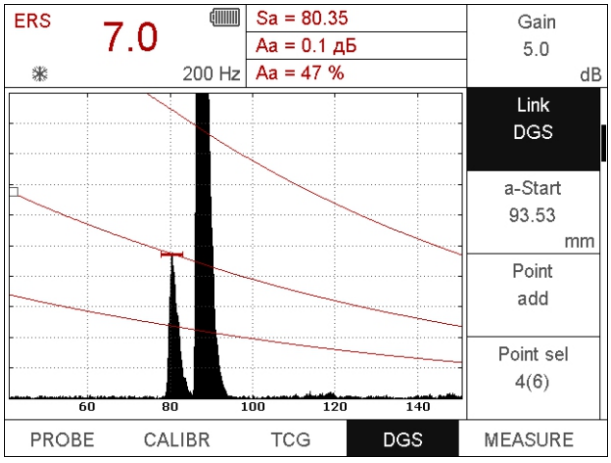
Standard software features

DAC & TCG functions: compensate for the impact of the echo signal drop from the identical reflectors when their depths changes. Provides either an equalization of the amplitudes of the echo signals by correcting the gain at different depths (TCG), or an accurate amplitude measurement of the echo signal in % or dB in relation to the curve DAC (gate height correction depending on depth).
In addition to basic DAC, it is possible to display two additional curves on the screen with adjustable offset from the main one.

DGS/AVG: This method of determining the flaw size provides for the echo signal analysis using DGS/AVG relevant to a specific type of transducer and material; shows the ratio between signal amplitude, flaw size, and distance from the transducer. DGS/AVG can be imported from the transducer setting or entered by the user himself.

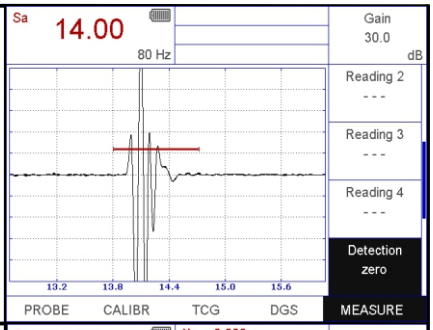
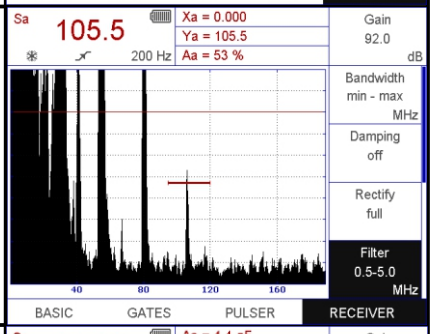
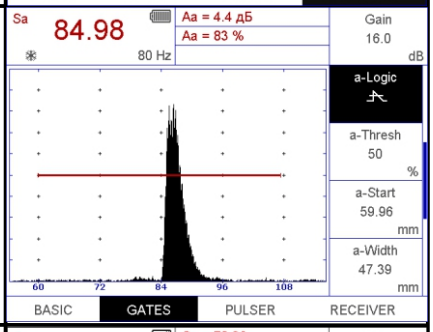
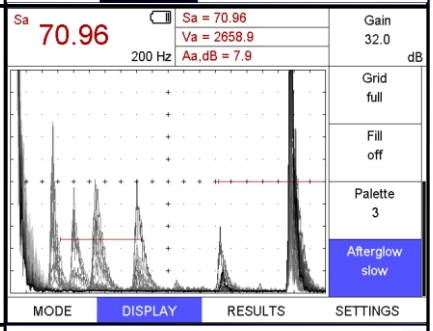
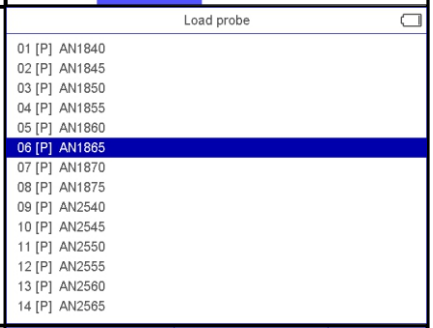
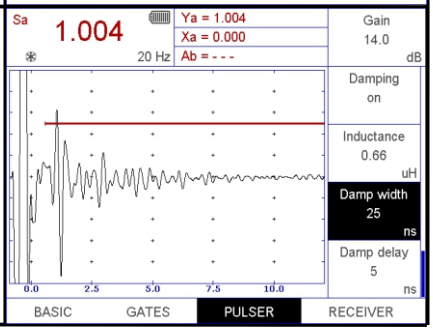
The device implements dynamic DGS/AVG attached to the reference signal, which do not require manual calculations from the user, regardless of changes in the overall device gain.

AWS D1.1 - amplitude binding to the reference level for the inspection of welds according to the AWS standards.



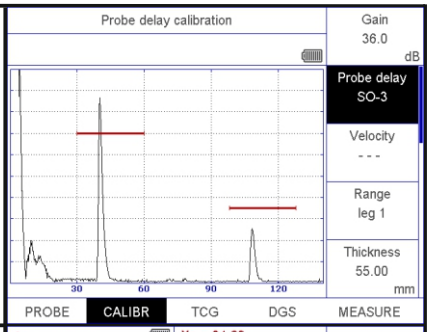
DGS/AVG

UCD-50 IPS specifics

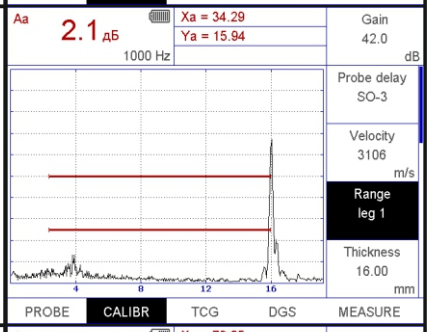
Ultrasonic signal display in RF form allows understanding the echo signal form, performing high-accuracy thickness measurement, using transducers with a delay line, applying the TOFD method and using all the possibilities for working with a real signal without losing data	
Highly configurable digital and analog signal filters compensate for the effect of structured noises when inspecting coarse-grained materials and allow increasing signal-to-noise ratio at great depths	
Unique signal processing technology allows the user to completely store it in memory using the screen-freeze, which makes it possible to analyze the screen image of the selected signal with free hands, including changing the signal calibration range and delay, monitor gates position, detection mode, all signal parameters measurement, etc.	
Using the adjustable A-scan delay feature - “signal trace” - allows the user not to miss small defects during fast scanning	
Most of the standard transducers parameters, including DGS/AVG, are already saved into the flaw detector memory, which allows the user not to waste time on setting	
The special feature of electrical damping of the probing pulse makes it possible to achieve an outstanding flaw detector resolution in the near field and to detect closely located defects with a direct transducer	

UCD-50 IPS specifics

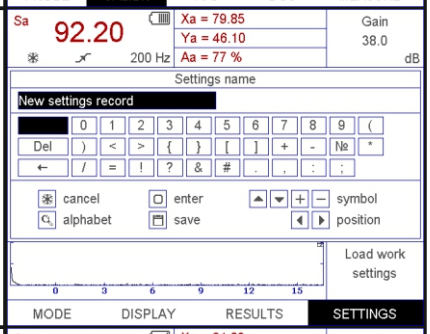
Feature of auto-calibration of the transducer probe using the SO-3, V-2 or any similar sample allows the user to quickly and accurately calibrate the transducer probe using two depth signals without entering the sound velocity in the sample



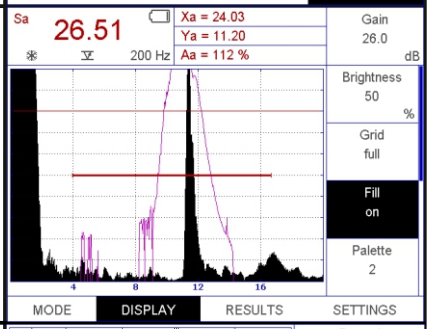
Unique feature of quick calibration of the control range gives the user the opportunity to set up the control range by the entered thickness of the welded joint and the ultrasonic testing speed with one click; the start and the end of the calibration range and the monitor gates for the thickness of the welded joint will be immediately set. All the user has to do is to set the inspection sensitivity by the existing artificial defect.



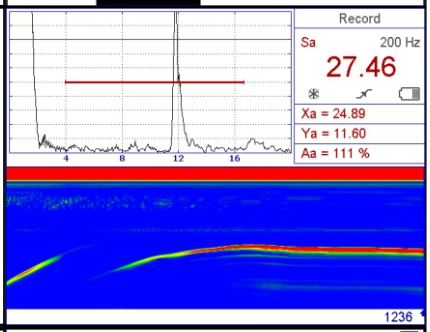
The feature that gives the user the opportunity to set up simple and clear names for settings and results using the Russian and Latin alphabets makes it easier to identify them. An A-signal will be saved with each setting.
With each result, the date/name and full settings under which the result was obtained are always saved in the device memory.



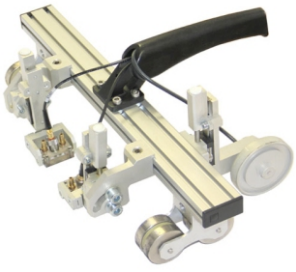
The signal maximum envelope mode allows the user to reliably fix the time of the peak, as well as to evaluate the features of different defect types.

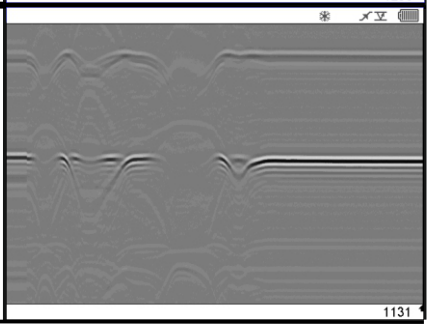


The B-scan mode allows the user to record the entire depth scan of the product with subsequent viewing and analysis of reflectors directly in the device.



TOFD scanners support allows the user to record and analyze the quality of welded joints according to TOFD world standards with fixing the defects height.





General technical specifications

Bandwidth (amplifier bandpass)
wide-band: 0.1-20 MHz (-6 dB)
with narrow-band option
Gain
100 dB, in increments 0.1, 0.5, 1, 2 or 6 dB
Additional key +dB
programmed
PFR (Pulse Repetition Frequency)
from 20 to 2000 Hz adjustable in selectable steps
10, 100 or 1000 Hz
Excitation pulse damping
adjustable 0-500 ns with a damping delay
from 0 to 500 ns
Built-in probe matching
7 circuits:
0,66; 1; 2,2; 3,3; 4,7; 6,8 and 15 uH
Digital signal filtering
7 narrow-band filters
Analog signal filtering
more than 30 filter options
Reject (suppression)
linear, 0 - 90% screen height
Monitor gates
two independent gates,
start and width change in all calibration range,
threshold levels set from 0 to 95% of the screen height
during detection and from -95% to +95% with radio signal
in increments of 1%, individual logic of flaw detection
Alarm system
luminous for each zone separately and sonorous
Time interval measurement
from 0 to first signal in gate or between
signal in gates, by fronts, peaks or zero-cross
Display of amplitude
as a percentage of the screen height,
in dB reference to gate threshold level,
in dB reference to test echo,
in dB reference to DAC
Time corrected gain (TCG)
ranges up to 90 dB, 12 dB/us
using 32 reference points
entered manually or from inspection reflectors
Flaw size estimation in classic flaw detector mode
built-in DGS/AVG
Comparison with saved reference signal
Automatic in all gain range
AWS D1.1 welds inspection standards support
(reference signal record only)
Screen image processing after screen-freeze
Full-functional processing and analysis
Scanner use
Any two-coordinate scanners with optical encoders,
scans record in the device memory, scans analysis
both in the device and in special
analytical software
TOFD use
Single-channel TOFD with recording by path sensor or
by time
B-scan
B-scan by path sensor

Alarm system operation modes
flaw in the first gate,
flaw in the second gate,
flaw in both gates,
flaw in either gate,
comparison of the first gate signal with DAC curve
Distance-Amplitude Correction (DAC)
using 32 reference points, height adjustable
two additional DAC curves 0-12 dB from the basic curve
DGS/AVG
using 32 reference points, height adjustable
with auto-binding to the gain and two additional curves
Probe delay auto-calibration
using SO-3, V-2 samples with reflectors,
TOFD transducers calibration
Automatic calibration of control range at specified weld thickness
included
Automatic calibration UT speed
included
Rectification
positive or negative halfwave,
fullwave, radio-frequency signal, B-scan
Visualization
A-scan, B-scan, TOFD
Display
Color high-contrast TFT 640 x 480 pixels,
(130 x 100 mm) with the feature of working in sunlight
Display color set changing according to the vision peculiarities and lighting
included
Menu language
Russian, English
Memory
200 settings with A-signal
1000 testing reports (signal, peak freeze, measurement
result, device operation parameters, date, time and
report name)
Interface
USB
Transducer connectors
2 x Lemo00
Battery
quick-release, Li-ion 10.8B, 5000 mA/h
Battery life
up to 15 hours using built-in battery
External power supply
220B AC
Power supply voltage
15 B / 2,5A DC
Operation temperature range
from -30 to +55 C
Dimensions (H x W x L)
200 mm x 225 mm x 80 mm
Dust and moisture protection
IP65
Weight
1,4 kilos with built-in battery