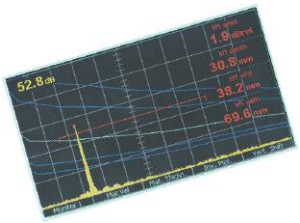
Product Information UT Flaw Detector
ECHOGRAPH 1091 Basic, DAC and DGS / DAC

DIN EN ISO 9001
KARL DEUTSCH

handy, sturdy, digital

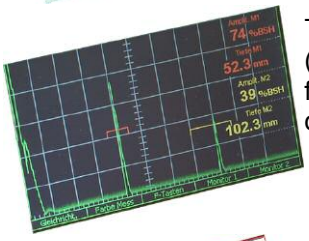
ECHOGRAPH 1091 BASIC with all necessary functions for ultrasonic testing
ECHOGRAPH 1091 DAC with additional features for an easy signal evaluation with DAC
ECHOGRAPH 1091 DGS/DAC with the additional possibility of a comfortable DGS-evaluation



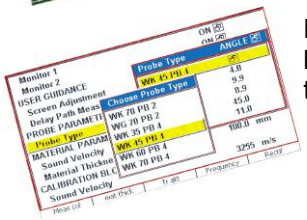
DGS/DAC-version:

DGS / DAC-curve and 4 additional evaluation curves direct on display;

amplitude evaluation relative to DGS / DAC-curve (dBrel)

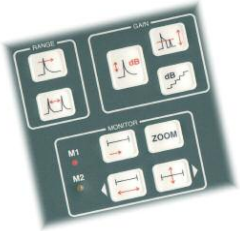


TFT-LC display with 6.3" (16 cm) A-screen size suitable for daylight, can be read in direct sunlight, 256 colours



Easy operating by plain language and windows technique

Five freely programmable function keys for additional parameters



Important instrument parameters accessible via direct keys

and...

... Compact aluminium case for harsh ambient conditions
... Li-Ion battery for up to 13 hrs operating time, safe automatic quick charge function controlled by internal charging processor
... energy saving in battery mode
... selectable colour display for measuring mode and menu operation
... operating language, parameter and help texts editable via PC and can be stored in the instrument*
... assistant for various instrument settings, e.g. for determination of the delay line of the probe, when adjusting the screen display, DAC and DGS settings
... Reference A-Scan in the background
... echo-dynamic curve
... USB interface
... pulse repetition frequency: 8 Hz to 1500 Hz
... monitor real-time output for both monitor gates
... trigger modes: internal, external (in/out), 1st echo
... update and/or upgrade of the operating software via PC (CD-ROM, e-mail, download)*
... manufactured and tested for reliability according to EN 12668-1

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DIN EN ISO 9001: 2000
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Technical Data

SCREEN

Screen type	➢ Colour LC display ➢ transmissive / transreflective ➢ suitable for daylight ➢ background illumination
Screen size	143.4 x 79.3 mm^2
Resolution	400 x 240 pix, 256 colours
A-scan size	142 x 73.5 mm^2
Scale	electronically generated, can be switched on/off
Scale division	➢ coarse: 10 sections horizontally, 5 sections vertically ➢ fine: 50 sections horizontally, 25 sections vertically

A-SCREEN REPRESENTATION AND DIGITISING

Image repetition frequency	50 Hz
A-screen representation	➢ envelope ➢ inverse (filled) ➢ freeze ➢ echo-dynamic curve ➢ zoom across gate 1
RF representation	possible across the entire adjustment range
Rectification	full-wave, RF (all versions) positiv, negativ (from DAC-version)
Suppression	selectable manually: 0 – 99% screen height in steps of 1% (linear)
Zoom	Gate range (gate 1) to full screen width
A/D converter	9 bit
Digitising process	direct, w/ A/D converters
Scan rate	80 MHz
Scan error during digitising	< ± 0.5% screen height at 4 MHz
Reaction delay	< 20ms

SWEEP RANGE

Time base range	2.5 – 4850 mm steel
Sound velocity	100 – 15000 m/s in steps of 1 m/s
Delayed time base sweep	0 – 3000 mm in steps of 0.1 mm
Linearity of time base	± 0.5 % of the screen width
Pulse repetition frequency	8 Hz to 1500 Hz (depending on time base range, selectable from - 85% to +50% in steps of 1%)
Trigger modes	internally, externally, 1st echo

TRANSMITTERS

Number of transmitters	2 (1 resolution, 1 power)
Shape of the TX pulse	Unidirectional (negative) needle pulse
TX damping	10, 50, 220, without [Ω]

AMPLIFIER AND DAMPING

Number of frequency ranges	3 (NF and RF range, broadband)
Adjustable damping	100 dB in 0.1, 1, 2, 6, 12, 20 dB-steps

ECHO EVALUATION, DETERMINATION OF FLAW SIZE

Indication of echo height in (valid for both gates)	➢ % screen height (%FSH) ➢ dBrel (from DAC-version) ➢ dBabs (from DAC-version) ➢ mmFBH (DGS/DAC-version)
Indication of echo run time	➢ sound path ➢ depth and projection distance and/or reduced projection distance ➢ resolution 0.1 mmSt

DISTANCE AMPLITUDE CORRECTION (DAC-version)

Number of points	max. 11
DAC-curve shift	max. ± 80 dB
Additional eval. curves	4 (max. ± 15 dB shift to DAC curve)

DGS METHOD (DGS/DAC-version)

DGS curve	0 to 30 mmFBH and backwall
Reference reflector	backwall or FBH
Additional eval. curves	4 (max. ± 15 dB shift to DGS curve)

MONITOR GATES

Number of monitor gates	2
Response time	Pulse repetition frequency (≤1500 Hz)
Operating modes	normal, inverted, off
Adjustment range	➢ Gate start: 0 – 3000 mm in steps of 0.1 mm ➢ Gate width: 0 – 1000 mm in steps of 0.1 mm
Statistical clearing	0 – 250 occurrences
Switching outputs Go/NoGo (both monitor gates)	➢ Level: TTL (5V) , low: active, ZA = 100 Ω Response accuracy: ± 0.5%FSH ➢ Switching hysteresis: < 0.5%FSH ➢ Hold time: max 12 ms
Optical indication (both monitor gates)	2 LED's on the front panel

INPUTS AND OUTPUTS

USB interface	USB 1 interface for PC connection and for printing via PC
VGA output*	for an external monitor
Synchronising input/output	TTL level (5V), low active, trigger threshold 2 V approx.

MISCELLANEOUS

Measuring systems	Selectable mm, inch
Date and time	Built-in real-time clock
Languages	German, Englisch, one additional language* can be stored in the instrument via PC (the texts are editable by means of a PC)

STORAGE FACILITIES

A-scan representation	Current A-scan representation on the screen by means of the FREEZE key
Data sets	224 data sets incl. A-scans, parameters, time and text* (8 lines with 37 characters each) in the internal memory

ENVIRONMENTAL CONDITIONS

Operating temperature	0 °C - +50 °C
Storage temperature	-40 °C - +85 °C
Permissible humidity	0 – 95%

POWER SUPPLY

Power supply	85 – 264 VAC, 47 – 63 Hz
Operating time w/ battery supply (with full load)	with Li-Ion battery ➢ 7 hrs approx. and ➢ 13 hrs when the illumination is switched off
Battery replacement	from backside
Energy save modus	on / off
Automatic switch-off	with undervoltage of mains or battery supply

MECHANICS

Size (H x W x D)	280 x 130 x 240 mm^3
Weight	4.0 kg (w/ Li-Ion battery)
Connectors	➢ 2 x Lemo 1 for probes ➢ PC: USB 1 ➢ D-type sub (9 pin) for service, flaw output and external trigger

* available on request