Dakota FX71 Flaw Detector (DFX-7)

Can be used in accordance with: NIST & MIL-STD-45662A, EN12668-1

The Dakota FX71-DL Flaw Detector is a versatile handheld device combining advanced flaw detection and material thickness measurement. It functions as both a thickness gauge, capable of measuring coatings and material thickness simultaneously, and a flaw detector, identifying the size, position, and type of flaws in materials and welded joints.

It features hi/lo limits with audible pass/fail warnings, differential mode for quality control, and stores up to 4GB of data for later analysis via DakMaster™ software.

The device offers multiple display modes (A & B-Scan, TRIG, DAC, TCG, Flank, Peak) and includes time-corrected gain (TCG) for enhanced performance. Data logging and firmware updates are supported via USB, making it ideal for on-site or laboratory use.

Features

- Exceptional visibility in sunlight (AMOLED)
- colour VGA display (320x240 pixels)
- Sizing Toolkits: DAC, AWS, TCG, DGS
- Pulse Repetition Frequency: 8 to 2000Hz, adjustable
- Detection: Z-Cross, Flank & Peak
- Automatic: probe zero, probe recognition, and temperature compensation
- Measurement: Variety of modes to address several applications
- Large data storage with multiple formats: Alpha numeric grid and sequential with auto identifier
- Download to DakMaster data management software

Detection Methods

Zero Crossing: The gate detects the flank of the pulse, but the measurement is taken at the next crossing of the x axis. This is the most common type of detect in ultrasonic measurement.

Flank: The gate is triggered by the flank (or side) of the pulse on the graph and the measurement taken at this exact point.

Peak: The gate is triggered by the intersection with the A-scan pulse and the detection is taken from the next peak in the signal (when it stops rising and starts falling).

TRIG: TRIG enabling location of flaws in both surface distance and depth. Trigonometric display of beam path, depth, surface distance, and curved surface correction. Used with angle beam transducers.

DAC: Distance amplitude correction for the creation of DAC curves which are used to inform the operator of the size of any given flaw at any depth.

AWS: The American Weld Standard function provides automatic defect sizing in accordance with AWS D1.1 structural welding code.

TCG: Time corrected gain increases gain as distance increases to achieve an overall level of sensitivity for the same flaw/reflector at different distances.

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The hand-held Dakota FX70 Flaw Detector range combines state-of-the-art flaw detection with advanced material thickness capabilities.

Versatile

The Dakota FX71-DL Flaw Detector series has two functions, a thickness gauge and a flaw detector. When the Dakota FX71-DL Flaw Detector is set to thickness gauge it has the ability to measure coatings and material thickness simultaneously. When set to flaw detector the gauge has the ability to detect the size and position of flaws and to differentiate between flaw types in various materials and welded joints.

Intelligent

Set hi/lo limits for pass/fail indication with audible warnings and built-in differential mode for quality control inspections.
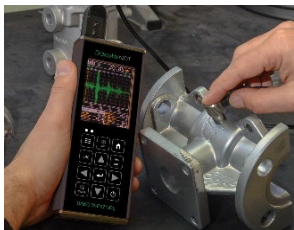
Powerful

Up to 4GB of readings can be saved into the gauge memory as each measurement is taken, which can be downloaded later into an inspection application or into DakMaster™ Software for further analysis and reporting

Customizable

The Dakota FX71-DL Ultrasonic Flaw Detector has a choice of display modes allowing the user to select the most appropriate for their needs; from A & B-Scan displays to flaw detection modes such as TRIG, DAC, TCG, Flank and Peak.

Product Features

Model	FX71-DL
Material Thickness Features	
Display Mode	■
Material thickness digits display	■
B-Scan cross sectional display	■
B-Scan with digits display	■
Scan bar display	■
Coating thickness display	■
A-Scan display	+ Rectified, - Rectified, Full Waveform (RF)
Flaw Detection Modes	TRIG, DAC, AWS, TCG, AVG/DGS
Measurement Range	Pulse Echo (PE) 0.63 – 244cm
	Pulse Echo (single contact) 1.0 – 3048cm
	Echo Echo ThruPaint (EE) 1.27 - 102mm
	Echo Echo (single delay line) 0.178 - 25.4mm
	Echo Echo (single contact) 1.0 - 305cm
	Echo Echo Verify (EEV) 1.27 - 25.4mm
	Pulse Echo Temp Comp (PETP) 0.63 – 244cm
	Coating Thickness (CT) 0.0127 - 2.54mm
	Pulse Echo Material Thickness (PECT) 0.63mm – 244cm
	Pulse Echo Coating Thickness (PECT) 0.01 - 2.54mm
Resolution	0.01mm, 0.001mm selectable
Measurement Rate (Thickness Mode)	
Manual	8 readings per second
Scan Mode	50 readings per second
Scan bar display	10 readings per second
High Speed Scan Mode	■
Differential Mode	■

Limit alarm mode	∎
B-Scan display speed	Adjustable display speed
Calibration setups	64 user-definable setups transferrable to and from a PC archive
Gates	2 (flaw) and 3 (thickness) adjustable gates: start, stop, width & threshold
Damping	50, 75, 100, 300, 600, & 1500 ohms
Pulser type	Two adjustable square wave pulsers and receivers
Gain	Manual, automatic gain control (AGC) with 110dB range with 0.2dB resolution
Timing	Precision TCXO timing with single shot 100 MHz 8 bit ultra-low power digitizer
Memory and Data Logging	• 4GB internal memory
	• Sequential and grid logging
	• Alpha numeric batch identification
	• OBSTRUCT indicates inaccessible locations
	• Bitmap graphic capture and capture viewer
Data Output	USB-C
Calibration Options	Single, two-point, velocity, material type
Transducer recognition	Automatic
V-path / dual path error correction	Automatic
Probe Zero	Automatic
Automatic Calibration	Longitudinal (straight), or Shear (angle)
Flaw Detection Product Features	
Probe Types	Single Contact, Dual, Delay & Angle
Material Velocity Table	Contains longitudinal and shear velocities for a variety of material types
TRIG	Trigonometric display of beam path, depth, surface distance, and curved surface correction. Used with angle beam transducers
DAC	Up to 8 points may be entered and used to digitally draw a DAC curve. Reference -2, -6, -10, (-6/-12), (-6/-14), (-2/-6/-10) dB. Amplitude displayed in %DAC, dB, or %FSH
AWS	Automatic defect sizing in accordance with AWS D1.1 structural welding code.
AVG/DGS	Automatic defect sizing using probe data. Stores up to 64 custom setups
TCG	Time corrected gain. 50 dB dynamic range, 20 dB per microsecond, up to 8 points for curve definition
Detection Modes	Zero Crossing, Flank and Peak
Display Freeze	Hold current waveform on screen
Peak Memory	Captures peak signal amplitude
PRF	8 to 2000Hz in selectable steps (8, 16, 32, 66, 125, 250, 333, 1000, 2000Hz)
Skip Bar	Displays skip legs in the waveform area
Pulse Width	40 to 400 ns. Selectable step options 40, 80 & 400 ns (labeled spike, thin & wide)
Frequency Bands	FX70-DL & FX71-DL: Broadband 1.8 - 19MHz (-3dB)
	FX71-DL: Three narrow bands at 2MHz, 5MHz, 10MHz
Horizontal Linearity	+/- 0.4% FSW
Vertical Linearity	+/- 1% FSH
Amplifier Linearity	+/- 1 dB
Amplitude Measurement	0 to 100% FSH, with 1% resolution
Delay	25,375mm at steel velocity
Display	1/4 VGA AMOLED colour display 57.6 x 43.2mm viewable area
Display Refresh Rate	60Hz
Units (selectable)	mm
Backlight	Adjustable brightness
Repeatability / Stability Indicator	∎
Low Battery Indicator	∎
Battery Save Mode	Auto

Technical Specifications

Part Number	Description	Certificate
Z-221-0005	Dakota FX71-DL Flaw Detector (DFX-7+)	●
Operating Temperature	-10 to 60ºC	
Power Supply	3 x AA batteries and via USB	
Battery Life[2]	Alkaline (12hrs), Nicad (5hrs), and NI-MH (12hrs)	
Gauge Weight	397g - including batteries	
Gauge Dimensions	63.5 x 165 x 31.5mm	

● Certificate of Calibration supplied as standard

Packing List

Dakota FX71-DL Flaw Detector
Selectable Transducer
Couplant
Manual
Plastic Carrying Case
Certificate of Calibration
AA Batteries
PC Software
Data Transfer Cable