

Technical data sheet

SONOWALL 70

Ultrasonic A-scan / B-scan wall thickness measuring device for nondestructive testing



SONOWALL 70 is an ultrasonic thickness gauge, intended for the nondestructive measurement of wall thicknesses and nondestructive material inspection. Amongst others, the following materials can be inspected:

- Steel
- Aluminum
- Plastic
- Acrylic glass

General data

Article number	200 01 0302: SONOWALL 70	
	200 01 0303: SONOWALL 70 with video output and remote control	
Dimensions (h x w x d)	208 x 130 x 51 mm	
Weight	990 g (without optional accessories)	
Voltage stability	Amplitude	< ± 5 %
	Sound path	< ± 1 %
Temperature stability	Amplitude	< ± 5 %
	Sound path	< ± 1 %
Stability after warm-up	Amplitude	< ± 2 %
	Sound path	< ± 1 %
Maximum power consumption	900 mA	
Available measuring units	Sound path: mm, inches	
	Signal amplitude: % FSH	
	Time of flight: µs	

Ambient conditions

Storing temperature -20 ... +60 °C

Operating temperature -20 ... +60 °C

Protection class IP67

ⓘ The stated protection class (IP67) does not apply to devices with video output (article number: 200 01 0303).

Display/data collection

Screen Type: TFT LCD color display
 Dimensions: 5" (aspect ratio 16:9)
 Resolution: 800 × 480 pixels

Sound velocity range 500 ... 20000 m/s

Range of time axis delay 0 ... 5000 mm @ c = 5920 m/s (corresponds to 1.7 ms)

Available display formats Portrait, landscape

Screen refresh rate 60 Hz

Maximum digitalization frequency without processing 100 MSPS

Digitization frequency with processing n/a

Vertical resolution 12 bit

Highest digitizable frequency 50 MHz

Response time	Measurement range [mm] @ c = 5920 m/s	Pulse repetition frequency	Response time [ms]
	13.9	Max	20
100	Max	21.8	
5000	Max	186	
10000	Max	348	
13.9	Medium	130	
100	Medium	130	

Display/data collection			
	5000	Medium	186
	10000	Medium	348
	13.9	Low	400
	100	Low	400
	5000	Low	400
	10000	Low	400
Time axis linearity (max. deviation)	< ± 0.5 %		
Maximum sample depth per A-Scan	340000		

Connections and interfaces	
Probe transmitter	LEMO EXG.00.250.NTNY
Probe receiver	LEMO EXG.00.250.NTNY
Charger	Coaxial power connector 2.5 mm
USB	Mini USB OTG
Video output (optional)	SAMTEC ASD-199388-03

Voltage supply	
Battery	1 × Lithium-Ion battery
Nominal voltage	7.2 V
Voltage range	6.3 ... 12.5 V
Runtime	7 ... 9 h (depending on the particular device settings)
Charging time	3 ... 4 h
Charging display and control	<ul style="list-style-type: none"> • Battery residual capacity in percent, battery symbol becomes red at low battery charge • Device automatically turns off when the battery is drained. • The device meets the technical specifications for the whole operational range of the battery

Voltage supply

Charger

Input 100 ... 240 VAC; 1.5 A; 50-60 Hz

Output 12 VDC; 5 A

Gates/signal processing

Number of gates 2 (gate 1: blue, gate 2: green)

Threshold operation mode Coincidence, anti-coincidence

Measurement mode of the gates Zero crossing, flank, peak (material testing mode only)

Gate synchronization Transmitting pulse, echo

Gate characteristics

- Start: 0 ... 15000 mm
- Width: 0.2 ... 1000 mm
- Trigger threshold adjustable between 5 and 90 % of the display height in 1 % steps
- Zooming in of the gate range over the complete screen width with the zoom function

Measurement resolution Sound path: 0.001 mm (steel)
Amplitude: 1 %

Amplitude linearity within the gate $\pm 2 \%$

Time of flight linearity within the gate $< \pm 40 \text{ ns}$

Customizable display of measurement values and settings

- Sound path in gate 1
- Maximum echo height in gate 1
- Sound path difference between the gates
- Sound velocity
- Probe delay
- Sound path in gate 2
- Maximum echo height in gate 2
- Filter
- Serial number (device)

Rectification Full wave, negative and positive half wave, unrectified

Averaging None, $\times 2$, $\times 4$, $\times 8$

Gates/signal processing

Sound path measurement	Digital display of the sound path between transmitting pulse and first echo in the gate or between the echoes of both gates <ul style="list-style-type: none"> • Measurement at zero crossing • Measurement at echo edge • Measurement at echo peak (material testing mode only)
A-scan display modes	A-scan, comparison curve or envelope

Transmitter

Pulse shape	Square wave; unidirectional				
Polarity	Negative				
Transmitting voltage idling	50 ... 400 V (adjustable in 10 V steps)				
Max. current	40 mA @ 400 V				
Max. power	16 W				
Nominal pulse width	25 ... 1275 ns, adjustable in 5 ns steps				
Damping	50 or 400 Ω				
Effective output impedance	Voltage [V]	Damping [Ω]	Pulse frequency	PRF	Effective output impedance [Ω]
	50	50	500 kHz	Max/min	9
	50	50	5 MHz	Max/min	8.8
	50	400	500 kHz	Max/min	10.2
	50	400	5 MHz	Max/min	9.9
	400	50	500 kHz	Max/min	10.9
	400	50	5 MHz	Max/min	9
	400	400	500 kHz	Max/min	13.7
	400	400	5 MHz	Max/min	10.1
Operating modes	Pulse echo; Transmitter/receiver; Thru transmission				
Pulse repetition frequency	Max: 95 Hz; medium: 15 Hz; low: 5 Hz (measured at 20 mm measurement range, sound velocity 5920 m/s)				

Transmitter characteristics (for min. and max. PRF)

① The device has been tested with minimum and maximum PRF. The following values apply to minimum as well as maximum PRF.

Voltage 50 V, damping 50 Ω

	500 kHz	1 MHz	2 MHz	4 MHz	5 MHz
Transmitting voltage (± 10 %)	39.9 V	40.6 V	40.8 V	40.7 V	40.6 V
Pulse width (± 10 %)	1060 ns	561 ns	312 ns	185 ns	160 ns
Max. pulse rise time	30 ns	30 ns	30 ns	30 ns	30 ns
Max. pulse fall time	144 ns	144 ns	144 ns	144 ns	144 ns

Voltage 50 V, damping 400 Ω

	500 kHz	1 MHz	2 MHz	4 MHz	5 MHz
Transmitting voltage (± 10 %)	46.3 V	46.8 V	46.9 V	46.7 V	46.8 V
Pulse width (± 10 %)	1104 ns	606 ns	357 ns	230 ns	205 ns
Max. pulse rise time	30 ns	30 ns	30 ns	30 ns	30 ns
Max. pulse fall time	215 ns	215 ns	215 ns	215 ns	215 ns

Voltage 400 V, damping 50 Ω

	500 kHz	1 MHz	2 MHz	4 MHz	5 MHz
Transmitting voltage (± 10 %)	284 V	298 V	307 V	310 V	310 V
Pulse width (± 10 %)	994 ns	496 ns	246 ns	120 ns	94 ns
Max. pulse rise time	38 ns	38 ns	38 ns	38 ns	38 ns
Max. pulse fall time	115 ns	115 ns	115 ns	115 ns	115 ns

Voltage 400 V, damping 400 Ω

	500 kHz	1 MHz	2 MHz	4 MHz	5 MHz
Transmitting voltage (± 10 %)	336 V	348 V	355 V	357 V	357 V
Pulse width (± 10 %)	1008 ns	510 ns	261 ns	135 ns	110 ns
Max. pulse rise time	36 ns	36 ns	36 ns	36 ns	36 ns
Max. pulse fall time	87 ns	87 ns	87 ns	87 ns	87 ns

Receiver/attenuator

Frequency characteristics

Measurement conditions PRF = high | gain = 55 dB

Filter [MHz]	Center frequency min. [MHz]	Center frequency max. [MHz]	Bandwidth min. [MHz]	Bandwidth max. [MHz]
0.5 ... 20	6.75	8.25	12.80	15.65
1	1.22	1.49	1.54	1.88
2	1.94	2.37	1.87	2.28
4	3.15	3.85	2.70	3.30
5	4.50	5.50	3.57	4.37

Gain

Gain range 0 ... 110 dB (adjustable in 0.5 dB steps)

Input voltage at full screen height 79.4 V @ 0 dB

Maximum input voltage 79.4 V @ 0 dB

Minimum input voltage < 1 mV

Vertical axis linearity $\pm 2\%$

Dead time after transmitting pulse

Filter [MHz]	Dead time [μ s]
0.5 ... 20	< 10
1	< 5
2	< 5
4	< 5
5	< 7

Input noise level (method B) < $80 \text{ nV}/\sqrt{\text{Hz}}$

Dynamic range

Filter [MHz]	Dynamic range [dB]
1	122.1
2	121.6
4	118.5

Receiver/attenuator

5

114.5

0.5 ... 20

98.9

Input impedance

Pulse/echo 180 Ω
(Transmitter damping
400 Ω)

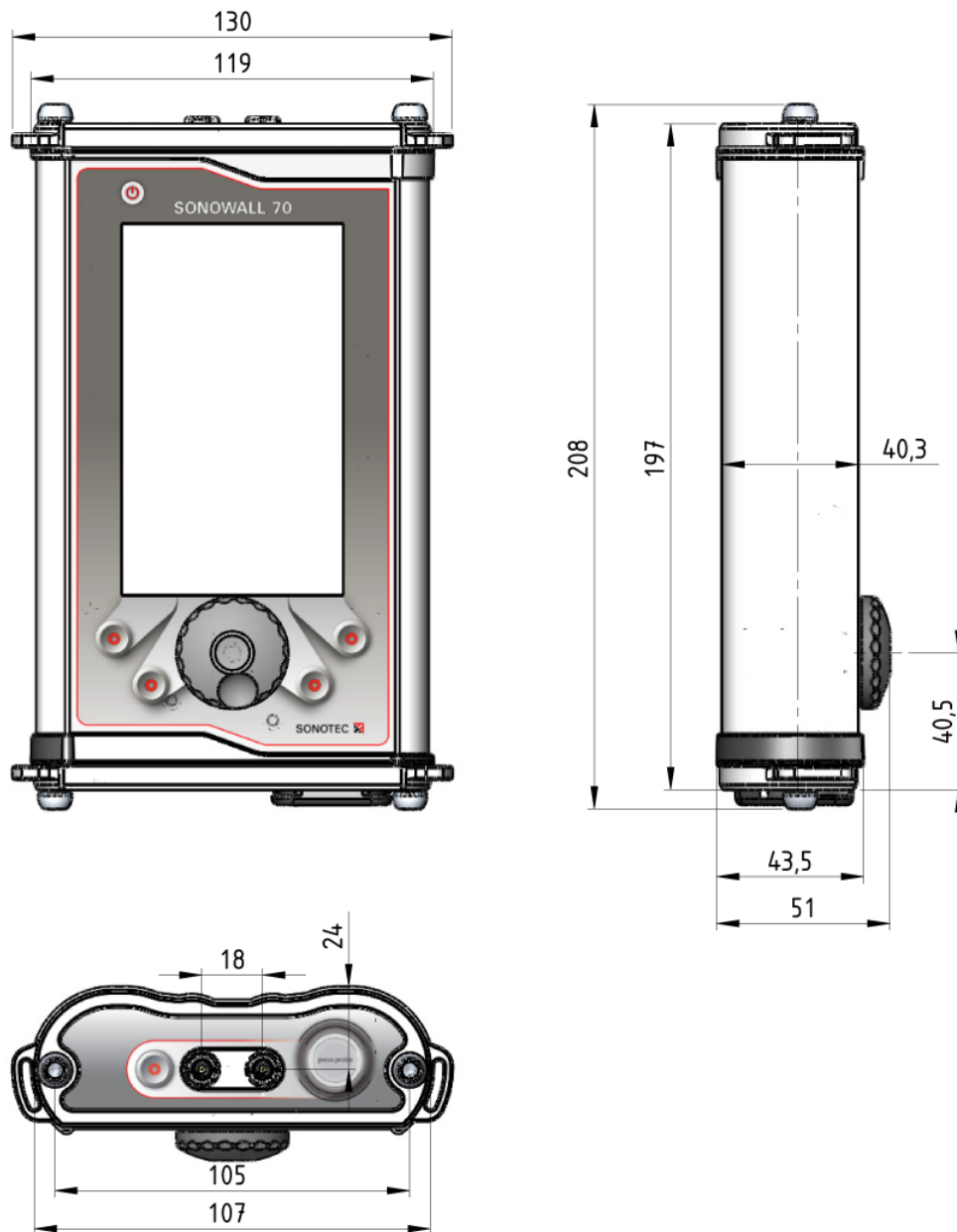
Pulse/echo 45 Ω
(Transmitter damping
50 Ω)

T/R operation 435 Ω

**Transmitter/receiver
cross-talk** -96 dB

**Gain linearity (max.
deviation)** < 0.5 dB per 1 dB interval
 < 1 dB per 20 dB interval
 < 2 dB per 60 dB interval

Technical drawing



Illustrations are not to scale. Dimensions in mm unless specified. Subject to technical changes. SONOTEC is a registered trademark.

Manufacturer

SONOTEC GmbH
Nauendorfer Str. 2
06112 Halle (Saale)
Germany

Tel.: +49 345 13317-0
mySONAPHONE@sonotec.de
www.sonotec.de

Contact USA

SONOTEC US Inc.
190 Blydenburgh Rd
Suite 8, 2nd Floor
Islandia, New York 11749, USA

Tel.: +1 631 4154758
sales@sonotecusa.com
www.sonotecusa.com