PUNDIT® PL-200
ULTRASONIC PULSE VELOCITY

PUNDIT® PL-200PE
ULTRASONIC PULSE ECHO


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PUNDIT® TOUCHSCREEN
UNIVERSAL

WORLD PREMIERE

Proceq – History of Innovation since 1954

Proceq SA of Switzerland, founded in 1954, is a leading manufacturer of the highest quality portable instruments for non-destructive testing of materials. The ubiquitous Original Schmidt concrete test hammer and the patented SilverSchmidt (Q-value) are just an excerpt of Proceq's proud inventions.

Industry Standard Pundit

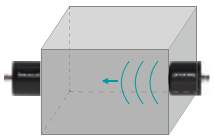
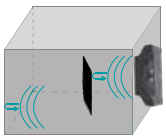
Pundit is a de facto industry standard brand and widely recognized as the first commercial field (on-site) device to measure Ultrasonic Pulse Velocity. Proceq acquired Pundit in 2009 and later launched the popular Pundit Lab and Pundit Lab+.

New Pundit Touchscreen

The **Pundit PL-200** and **Pundit PL-200PE** continue the illustrious Pundit tradition that began in the 1970s. They are the first Proceq products to be developed using a new generation and design-protected Touchscreen Unit.

- **Housing specially designed to be used on-site in harsh environments**
- **Screen with highest resolution and sharpest image available in the market allowing best possible analysis of the measured waveforms**
- **8 GB Flash memory allowing storage of up to 100'000 A-Scans**
- **Dual core processor supporting diverse communication and peripheral interfaces**
- **Modular concept: Expandable with all Proceq Pulse Velocity and Pulse Echo transducers**
- **Future proof investment: upcoming Pundit ultrasonic products will be directly compatible**

Applications Overview

Pundit PL-200	Pundit PL-200PE
Through Transmission: Access from two sides	Pulse Echo: Single side access
	
Assessment of Concrete Quality	
Ultrasonic Pulse Velocity	
Uniformity	
Compressive strength and SONREB	Slab thickness from a single side
Determination of crack depth	Detection and localization of voids, pipes, cracks (parallel to surface), and honeycombing
Modulus of elasticity	
Scan Modes	
A-Scans Line Scans	A-Scans B-Scans

- **Never before has the user had such a control over the measurement procedure in real time directly on-site!**

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PUNDIT® PL-200
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Pundit PL-200 – The new Benchmark for Ultrasonic Pulse Velocity Testing

Best-in-class Ultrasonic testing instrument providing superior features for on-site testing:

- **Line Scans for concrete uniformity assessment**
- **Zoom and scroll for precise A-Scan inspection**
- **On board storage and review of waveforms**
- **Settings directly accessible on measuring screen**
- **Dual cursor for manual A-Scan evaluation**
- **Separate cursor to measure signal amplitude**
- **Improved surface velocity measurement**
- **Automatic and manual triggering and user adjustable trigger threshold**
- **A-Scan update rate up to 25 Hz**
- **Expandable with Pundit Pulse Echo transducer**

Ordering Information Pundit PL-200

Part Number: 327 10 001

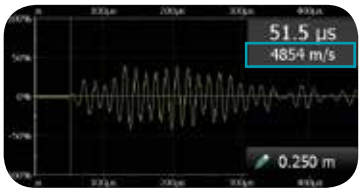
Consisting of: Pundit Touchscreen, 2 Transducers 54 kHz, 2 BNC cables 1.5 m, couplant, calibration rod, BNC adapter cable, battery charger, USB cable, DVD with software, documentation, carrying strap and carrying case

Comprehensive Measurement Modes

Line Scans

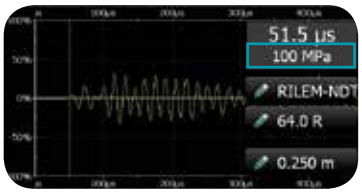
Assesses the concrete uniformity and detects cracks as well as other defects. The measured pulse velocities are displayed as a line.

Pulse Velocity



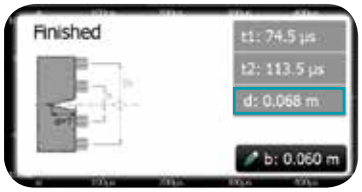
Calculates the pulse velocity of the material under test.

Compressive Strength



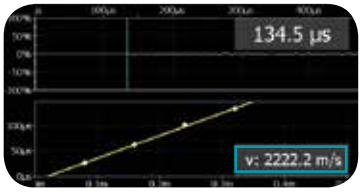
Determines the compressive strength using Ultrasonic Pulse Velocity correlation, or by using SONREB.

Crack Depth



Determines the depth of perpendicular cracks according to BS 1881.

Surface Velocity



Determines surface velocity according to BS 1881.

Transmission Time: Measures the transmission time.

Distance: Calculates the distance between the transducers.

Standards and Norms: EN12504-4 (Europe), ASTM C 597-02 (North America), BS 1881 Part 203 (UK), ISO1920-7:2004 (International), IS13311 (India), CECS21 (China).

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Pulse Velocity Transducers

Proceq offers an extensive range of transducers providing highest accuracy and a proven field track record. The selection of the correct transducer is dependent on the aggregate/grain size and the dimensions of the test object.

Bandwidth and aperture size	**Test Object Limitations**			**Applications**
	Wavelength*	Maximum grain size	Minimum lateral dimension	
P-wave Transducers				
24 kHz Ø50 mm x 95 mm 	154 mm	≈ 77 mm	154 mm	» Concrete: Very coarse aggregate and large objects (several meters)
54 kHz Ø50 mm x 46 mm 	68.5 mm	≈ 34 mm	69 mm	» Concrete » Wood » Rock
150 kHz Ø28 mm x 46 mm 	24.7 mm	≈ 12 mm	25 mm	» Fine grained material » Refractory bricks » Rock (NX cores)
250 kHz Ø28 mm x 46 mm 	14.8 mm	≈ 7 mm	15 mm	» Fine grained material » Refractory bricks » Rock » Use on small samples
500 kHz Ø57 mm x 32 mm 	7.4 mm	≈ 3 mm	7 mm	» Fine grained material » Refractory bricks » Rock » Use on small samples
54 kHz Ø50 mm x 100 mm 	68.5 mm	≈ 34 mm	69 mm	» Concrete: Rough and rounded surfaces (no couplant required) » Wood » Rock (heritage sites)
S-wave Transducer				
250 kHz Ø41 mm x 32 mm 	10 mm	≈ 5 mm	Greater than the thickness of the object.	» Used for determination of elastic modulus » Concrete, wood, rock (small samples only) » Requires special shear wave couplant

*A pulse velocity of 3700 m/s (longitudinal wave) and 2500 m/s (shear wave) have been used for the computation of the wavelengths.

PUNDIT® PL-200PE
ULTRASONIC PULSE ECHO

Pundit PL-200PE – Groundbreaking Ultrasonic Pulse Echo Testing

The Pulse Echo technology widely extends the application range of the Pundit Touchscreen Unit and offers a variety of special features:

- **Single side determination of slab thickness**
- **Detection and localization of voids, pipes, cracks (parallel to surface) and honeycombing**
- **Advanced echo tracking technology helps identifying the main echo**
- **Control buttons and optical feedback directly on the probe increase measurement efficiency**
- **Automatic estimation of the Pulse Velocity**
- **Easy B-Scan measuring through center marker and rulers directly on the probe**
- **Dry-contact transducer: no couplant required, suited for measuring on rough surfaces**
- **Lightweight and ergonomical handling**
- **Expandable with Pulse Velocity transducers**

Ordering Information Pundit PL-200PE

Part Number: 327 20 001

Consisting of: Pundit Touchscreen, Pundit Pulse Echo Transducer incl. cable, contact tester, battery charger, USB cable, DVD with software, documentation, carrying straps and carrying case

Scan Modes

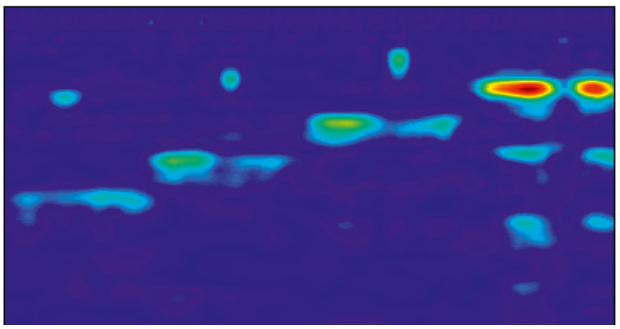
A-Scan

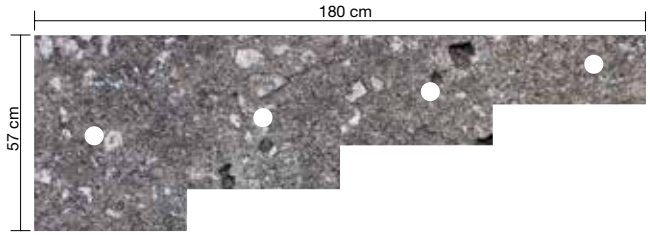
- A-Scan allows direct analysis of the raw signal.
- Digital filters for better echo visibility and noise suppression.
- Automatic readout of slab thickness (Echo tracker).

B-Scan

- A cross-sectional view perpendicular to the scanning surface is provided. It facilitates the search for pipes, cracks, voids, etc.
- State-of-the-art image processing for improved image quality.
- Cursor placement allows a direct readout of the slab thickness and the location of hidden objects or defects.

Example: B-Scan of a concrete object containing steel pipes:





Center marker and rulers directly on the transducer help generating the B-Scan:

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Made in Switzerland

PUNDIT® PL-200PE
ULTRASONIC PULSE ECHO

Pulse Echo Transducer

The Pulse Echo transducer is a shear wave transducer designed for single-handed and two-handed operation. It is particularly suited to testing where access is limited to a single side.

Bandwidth and aperture size		**Test Object Limitations**				
		Wavelength*	Maximum grain size	Minimum lateral dimension	Penetration depth	Minimum object detectable
50 kHz 2x25 cm²		50 mm	50 mm	2x thickness	Typically 500 mm (up to 1000 mm under ideal conditions)	30 mm air cylinder

*A pulse velocity of 2500 m/s has been used for the computation of the wavelength.

Expert Ultrasonic Training

Testing with the Pulse Echo technology requires in-depth knowledge of the test object and application characteristics. Proceq offers comprehensive ultrasonic training seminars imparting this knowledge as well as all functionalities and features of the Pundit instruments. Pundit PL-200PE customers are recommended by Proceq to register for the **Advanced Ultrasonic Tomography Applications** training. See details on the next page.

ASK MALCOLM

On successful completion of the **Advanced Ultrasonic Tomography Applications** training, Pundit PL-200PE customers get access* to “Ask Malcolm”, a global Application Support Service provided by a team of renowned experts who have years of hands-on, on-site NDT inspection expertise.

*Terms and conditions apply.

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TECHNICAL SERVICES

NDT Concrete Ultrasonic Training Concept

Proceq's training modules are strongly focused on a practical approach to routine testing of in-situ concrete quality using the **Pundit range of ultrasonic products**.

Training facilities are located at Proceq headquarters in Schwerzenbach (Switzerland), Chicago (USA), Singapore and London (UK). All training modules are conducted in English (German, French and Spanish can be organized on demand).

Training fees include all necessary training material and documentation and exclude all travel, accomodation and meal. Course dates are determined by Proceq. Please contact your local Proceq representative.

Essentials of Non-Destructive Testing (NDT) of Concrete using Ultrasonic Methods

Description	Prerequisites	Duration	Locations	Course No.
Characteristics of concrete; overview of NDT methods; ultrasonic pulse velocity principles and methods for assessing compressive strength of concrete, detecting voids and cracks; transducer types; product and practical training (Pundit Lab, Pundit Lab+, Pundit PL-200).	Any technical background or prior experience with NDT products will allow quicker and deeper comprehension of the course material.	2 days	• Schwerzenbach (Zuerich, Switzerland) • Chicago (United States of America) • Singapore • London (United Kingdom)	970 00 300

Advanced Ultrasonic Tomography Applications

Description	Prerequisites	Duration	Locations	Course No.
NDT ultrasonic methods to evaluate concrete from a single surface; using tomography to detect air filled voids and cracks; locate structural elements, pipes, ducts and honeycombing. Product and practical training (Pundit PL-200PE); detailed review and interpretation of specific tomographic application examples.	Participants are expected to be experienced NDT users, any on-site ultrasonic experience will allow a focused discussion on specific application issues.	2 days	• Schwerzenbach (Zuerich, Switzerland) • Chicago (United States of America) • Singapore • London (United Kingdom)	970 00 400

Application Support Service		Prerequisites	Access
ASK MALCOLM	"Ask Malcolm" is an Application Support Service provided by Proceq to owners and users of the PL-200PE who have completed the corresponding advanced training module. It is supported by a team of renowned experts who have years of hands-on, on-site NDT inspection expertise.	Purchase of a PL-200PE; Completion of the module "Advanced Ultrasonic Tomography Appliactions" with course no. 970 00 400	Proceq website

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Ordering Information

Units

PART NO.	DESCRIPTION
327 10 001	Pundit PL-200
327 20 001	Pundit PL-200PE
327 10 002	Pundit Touchscreen without transducers

Supplementary Transducers

325 40 026S	2 Transducers 24 kHz
325 40 131S	2 Transducers 54 kHz
325 40 141S	2 Transducers 150 kHz
325 40 177S	2 Transducers 250 kHz
325 40 175S	2 Transducers 500 kHz
325 40 176	2 Exponential Transducers 54 kHz, incl. calibration rod
325 40 049	2 S-Wave Transducers 250 kHz, incl. couplant
327 40 130	Pundit Pulse Echo Transducer, incl. cable and contact tester

Accessories

327 01 043	Carrying strap complete
325 40 150	Transducer holder complete
327 01 049	BNC adapter cable for Pundit PL-200
325 40 021	Cable with BNC-plug, 1.5 m (5 ft)
325 40 022	Cable with BNC-plug, 10 m (33 ft)
710 10 031	Ultrasound couplant, 250 ml
325 40 048	Shear wave couplant, 100 g
327 01 033	Battery complete
327 01 053	Quick charger (external)
710 10 028	Calibration rod 25 µs for Pundit PL-200
710 10 029	Calibration rod 100 µs for Pundit PL-200

Technical Specification

		Pundit PL-200	Pundit PL-200PE
Range		0.1 – 7930 µs	
Resolution		0.1 µs (< 793 µs), 1 µs (> 793 µs)	
Display		7” colour display 800x480 pixels	
Pulse Voltage	UPV	100 – 450 Vpp	
	UPE	–	100 – 400 Vpp
Bandwidth		20 – 500 kHz	
Receiver Gain		1x – 10’000x (0 – 80dB) [11 steps]	
Memory		Internal 8 GB Flash memory	
Regional Settings		Metric and imperial units and multi-language supported	
Battery		Lithium Polymer, 3.6 V, 14.0 Ah	
Battery Lifetime		> 8h (in standard operating mode)	
Operating Temperature		0°C – 30°C (Charging, running instrument) 0°C – 40°C (Charging, instrument is off) -10°C – 50°C (Non-charging)	
Humidity		< 95 % RH, non condensing	
IP Classification		IP54	

Service and Support

Proceq is committed to providing the best support and service available in the industry through the Proceq certified service centers worldwide. This results in a complete support for the Pundit PL-200 and Pundit PL-200PE by means of our global service and support facilities.

Warranty Information

Each instrument is backed by the standard Proceq warranty and extended warranty options.

» Electronic portion of the instrument: 24 months
» Mechanical portion of the instrument: 6 months

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0%
-50%
-100%
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