

Penetration - PNR 12 (automatic)

Standards depend on the selected accessories

ASTM D 5, ASTM D 937, ASTM D 1321, ISO 2137, ISO 6873, DIN 10331, DIN 51580, DIN 52010 (obs.), EN 1426, EN 13880-2, IP 50, IP 179, IP 310, JIS K2207, AASHTO T49, AOSC Cc16-60, SMS 658

Product group(s): Penetration, Various

User group(s): Adhesives, Airports & Aviation, Asphalt, Automotive, Beverages, Bitumen, Chemicals, Confectionery, Constituent, Cosmetics, Fats, Food, Lubricant, Mastics, Motor Vehicles, Paraffin, Penetration, Pharmaceuticals, Plastics, Polishes, Regulatory Authorities, Road Research, Rubber, Tar, Various, Wax

Scope: The Penetrometer PNR 12 is widely used in the field of research, engineering and production control of various sectors of industry.

Suitable for NEEDLE-, CONE-, ROD- and further penetration methods.

The Penetration is used to measure the resistance which a material under specified test conditions provides against being pierced by a specifically shaped penetrator.

Beside the configuration of the penetrator used, prime importance attaches to such factors as temperature, time and load specified by the different standard methods of test.

PNR 12 allows fully automatic measurements on electrically conductive samples, as well as on non-conductive samples with the optional patented Force-Sensor-Plunger.

The *Surface-Detection Software* of the PNR 12 will be activated by sensor-plungers. This option will detect the surface of bitumen-samples underneath a layer of water, it starts the standardized test sequence and reports the results automatically.

- Fully "Automatic Surface-Detection"
- Jog-Shuttle driven menu (turn & push)
- Manual & electronic positioning
- Movement by stepper motor
- LED illumination



PNR 12 - Automatic Penetrometer

Depending on accessories suitable for:

- Needle-Penetration
- Cone-Penetration
- Rod-Penetration
- and further applications

Accessories (plungers, needles etc.) are required, but not included.

All test kits that fit the PNR 10 & 21 models are suitable for the PNR 12, too.
(Except for the Ball-Penetration Method)

More details are mentioned in the "Order Number" section

Technical Data

Measuring Range:	0 to 80 mm
Max. Test Load:	2 kg
Resolution:	0.01 mm
Test Duration:	0.1 to 18000 seconds (preset standard duration: 5 seconds)
Start Delay:	adjustable up to max. of 600 sec. (10 minutes)
Value Conversion:	NLGI-class, EN-bitumen value, c-value, 1/4-cone to solid-cone, 1/2-cone to solid-cone
Surface Detector:	for electrically conductive samples (optional for non-conductive samples)
Data Output:	USB interface to connect printer or USB-stick
Bench space:	(WxHxD) 350 x 350 x 600 mm
Weight:	11 kg

Main Unit

18-1120

PNR 12 - Automatic Penetrometer

For numerous test methods and applications.
Accessories have to be selected according to the standard.
(Suitable for: Needle-, Cone-, Rod-Penetration and further methods)



Features:

- manual positioning by Jog-Wheel operation
- electronic positioning to a preset depth with Memory-function
- automatic surface detection
- fully automatic measurements of electrically conductive samples
- fully automatic measurements of non-conductive samples (optional)
- automatic data evaluation against limit values set
- auto-start function
- 16 user programs possible
- magnifier & extra bright LED-sample illumination

Consisting of:

Microcomputer, graphical display, electronic distance measuring device, stepper motor for exact positioning, conductivity sensor, plastic housing with stable base plate and software for fully automatic measurements of electrically conductive samples, as well as of non-conductive samples using the optional patented Force-Sensor-Plunger.

Microcomputer:

Microprocessor with FPGA for real-time measurement, large display (blue / white), intuitive Jog-Wheel driven graphical menu (turn & push), help and guide functions, data-management via LAN and USB, LIMS compatibility, statistics and database function, automatic data evaluation against limit values set.

Interface:

USB for keyboard, printer and stick, LAN for data transfer to PC. Easy firmware-update via USB.

Software:

- Auto-Start function for program 1+2+3
- 16 program positions for user defined programs
- Automatic surface detection:
 - by conductivity sensor (included)
 - with force sensor (Requires a Force-Sensor-Plunger - not included)
- Conversion of results:
 - NLGI-classification ASTM D 217
 - Bitumen classification EN 1426
 - Quarter- and Half-Scale Cone into Full-Scale Cone
 - Margarine C-value 80g and 160g

Electronic Elements:

Distance measuring device (1/100 mm), stepper motor, LED-sample illumination with flexible arm, electronic detector for conductive samples (conductivity sensor), PT-100 receptacle for temperature logging.

Mechanical Elements:

Penetrometer base plate with leveling feet and removable aluminum test table, instrument housing made of plastics, magnifier with flexible arm, plunger holder with solenoid release mechanism for test bodies up to 2 kg.

Supplied with:

1 conductivity sensor, 1 Leveling bulb

Note - To be ordered separately:

Accessories in compliance with different test standards or samples (plunger, needle, cone etc.)
Recommended extensions: force-sensor plunger, temperature-sensor PT-100, calibration-set, keyboard

Power supply: 100/240 V, 50/60 Hz

Options & Accessories

18-1136

Sensor-Plunger - Force 97.5 g (PNR 12 only)

1 load weight of 2/5/10/50 or 100 g can be added.



A plunger with an extremely sensitive force sensor for the automatic surface detection underneath a layer of water. It activates the related the PNR 12 software automatically.

Suitable for Bitumen-samples <160 PU!

18-1137 Sensor-Plunger - Force 97.5 g extra long (PNR 12 only)



Up to 4 load weights of 2/5/10/50 or 100 g can be added.

(Same like 18-1136)

18-1135 Sensor-Plunger - Force 47.5 g (PNR 12 only)



1 load weight of 2/5/10/50 or 100 g can be added.

(Same like 18-1136)

18-1149 Temperature Sensor with PT-100

to monitor the sample-bath temperature

18-1145 Calibration Kit - PNR 12

for calibration of distance, time and temperature



Supplied with:

for distance calibration: 1 test ram & 4 gauge blocks (5 / 9 / 15 & 25 mm)

for time calibration: 1 contact-rod & 1 stop watch (electric input)

for temperature calibration: 2 reference-plug (+20°C & +90°C)
optional order: 21-0662 thermometer ASTM D 63C, officially certified

25-0911 Keyboard - english layout



86 keys (no numeric block), black housing & keys,
incl. adapter (USB socket on PS/2 plug)

Dimensions approx.: 282 x 132 x 26 mm, 400 g, cable length 1.75 m

18-1144 Electronic Stop Watch with electric start-input



Power supply: 100/240 V, 50/60 Hz

25-0282 Impact Printer (mono)



for single sheets & continuous paper

to record data like test results, duration of test, etc. (instead of a PC)

Supplied with: 2 data cables (9-pin 25-0304, USB 25-0918), 1 ink ribbon (black)

Technical Data:

Line spacing: 80 characters per line (10 cpi)

Page size : 257 x 364 mm (sheet), 254 x 558.8 mm (roll)

Ports: serial (9-pin), USB (1.1)

Dimensions: 37 x 28 x 16 cm (WxDxH)

Weight: 5 kg

Power supply: 220/240 V, 50/60 Hz

25-0283 Impact Printer

Like 25-0282 but:

Power supply: 110/130 V, 50/60 Hz

Spare Parts

18-0705 Electronic surface detector for conductive samples

with contact hook and connection wire

18-1146 Leveling Bulb - PNR (with pole for horizontal adjustment)

25-0284 Ink Ribbon, black, for serial impact printer

Order Guideline

Minimum equipment: 1 x 18-1120 & Test Kit (needle, cone etc.),

Accessories

Spares (approx. 1 year): Needle, ect.

Additional requirements: Stop watch