

YOUR ALL-IN-ONE SOLUTION



HEP

*The intelligent **testing device**
with the ready-to-submit test report
directly on the construction site.*



SWISS ENGINEERING

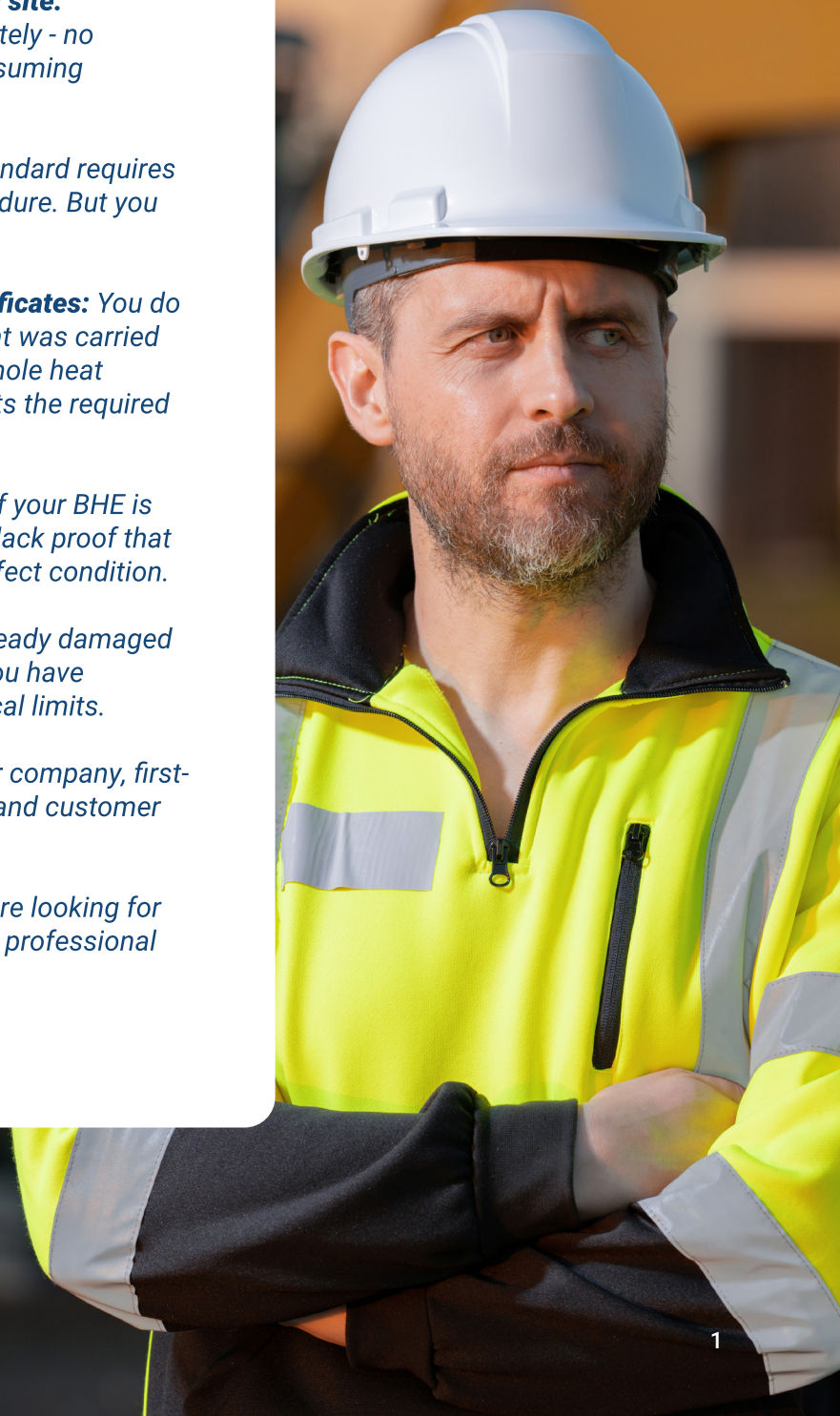


The challenges of your industry

We have the solution

As a **drilling company**, you face major challenges every day that require time, precision and responsibility. **If these problems sound familiar to you, you've come to the right place:**

- ▶ **Time pressure on the construction site:** *everything has to be done immediately - no time for complicated and time-consuming measurement setups.*
- ▶ **Uncertainties in protocols:** *The standard requires a complicated measurement procedure. But you are insecure in execution.*
- ▶ **Lack of certainty with quality certificates:** *You do not know whether the measurement was carried out correctly and whether the borehole heat exchanger (BHE) is intact and meets the required quality standards.*
- ▶ **No evidence in case of a dispute:** *If your BHE is later damaged or soiled, you often lack proof that it was originally handed over in perfect condition.*
- ▶ **Overloading the BHE:** *You have already damaged a BHE with the grouting because you have unconsciously exceeded the physical limits.*
- ▶ **Quality as the top priority:** *For your company, first-class quality is the key to success and customer satisfaction.*
- ▶ **No reliable point of contact:** *You are looking for a partner who can provide you with professional expertise and support all times.*



YOUR ALL-IN-ONE SOLUTION

HEP

We understand these challenges

That's why we've developed a **solution** that supports you ideally. With our **intelligent automatic testing devices**, you can take quality assurance to a whole new level:

Quality redefined!

Efficiency, precision and control - with our automatic testing machines, you can effortlessly create all the required standard certificates and the functionality can be tested in real time.

Why our devices?

In contrast to conventional automatic testing machines, which only measure, we go one a step further:

- ✓ **Built-in intelligence:** Thanks to intelligent algorithms, our software actively supports you in carrying out the measurements correctly.
- ✓ **Maximum control:** The display shows you the status of your BHE during the measurement - no more unpleasant surprises.
- ✓ **Optimum results with minimum effort:** You enter the most necessary data for the BHE and grouting only - our system takes care of the rest. **Based on physical principles, it calculates all target values and automatically evaluates the BHE without any additional effort on your part.**

More than just measuring

Our devices don't just provide measured values - they give you absolute certainty through automatic assessment. This is convincing quality!





The intelligent software

Know-how and precision in one device

Our automatic testing devices are equipped with a unique advantage: The **expert knowledge** of the relevant **standards is integrated** directly in the **software**.

- ✓ **SIA 384/6:2021 standard:** The calculation principles of this Swiss Standard (SN) are fully integrated.
- ✓ **Extended compatibility:** Our software now also supports the VDI-4640-2, NFX10-970 and EN 17522:2023 standards. Further standards can be integrated.

Intelligent support for perfect results

The standard probes and grouting are stored in a database, which makes input much easier. Therefore, every measurement is carried out precisely and in accordance with the standard - without effort and uncertainties.

Simple and user-friendly

You **don't need any expert knowledge** of standards and physics:

- ▶ The **software guides you step by step through the measurement**.
- ▶ All standard-compliant **measurement parameters** and limit values are **determined automatically** and do not have to be looked up manually by the user.

This intelligent software makes quality assurance easier, faster and more reliable - for professionals and beginners equally.





The most important facts At a glance



Immediate results on site:

- ✓ Our automatic testing device **evaluates** and assesses **measurements** and creates a **forgery-proof report directly on the construction site**.
- ✓ Protocols can be sent **by email**, get synchronized via the **cloud** or **your server** or be saved on a **USB stick**.
- ✓ **Construction approval** possible live on site, including digital signature.



Standard-compliant and future-proof:

- ✓ Meets the regulations of the **SIA 384/6:2021 standard** as well as the requirements of the Swiss cantons and the e-labels of the swiss drillers association.
- ✓ **Additional standards** can be implemented. "Over-the-air" updates keep the software, new geothermal BHE, grouting material backfills and language options up to date.



Measurement in real time:

- ✓ Live **display** of the measurement results as a **graph with clearly defined limit values** - incorrect measurements are immediately recognizable.
- ✓ Progress of the measurement is displayed with **time projections** to enable precise work planning.



User-friendliness and flexibility:

- ✓ Control via **touchscreen and keyboard** directly on the device or remotely over **4G/LTE using a smartphone, tablet or PC/Mac**.
- ✓ **Intuitive operation**.
- ✓ **Pre-configured quick settings** for specific customer requirements.



Online from anywhere:

- ✓ GPS coordinates for each measurement.
- ✓ **Worldwide Internet reception**, the best roaming partner is selected regardless of the provider.



Multilingual

- ✓ Multilingual operation and log output (German, English, French, Italian, Spanish, Albanian, Serbian, etc.).



All-round carefree service:

- ✓ **Remote support** and remote diagnosis if required.
- ✓ **Service packages** with repairs and replacement devices within 24 hours Switzerland-wide.



CE-compliant

Our automatic testing devices

Which one is right for you?

We offer our automatic testing devices in **different variations** so that you can buy or rent the device that best meets your company's requirements.

Our bestsellers:

Our most popular devices are the **HEP combination versions** (grouting- & geothermal BHE testing equipment) because it offers the all-in-one solution you need for your high-quality BHE.

YOUR ALL-IN-ONE SOLUTION

HEP



Our **ALL-IN-ONE** device combines **two powerful functions in one device** - for maximum efficiency and precision.

The HEP combination variants offer you:

- ▶ **Intelligent logging of your grouting** – The device automatically generates the correct specifications for the subsequent geothermal BHE test.
- ▶ **Independent execution of the BHE-testing** – The entries from the grouting measurement and the measured density are used for the subsequent geothermal BHE test. The device performs the test automatically in accordance with the standard.

Your advantage:

Since the device **calculates** all the **test parameters independently** and evaluates them in real time, there is no risk of incorrect entries. This not only **saves** you valuable **time**, but also **minimizes** the **error rate**. Thus you always achieve a precise, reliable result - without compromise!



HEP during geothermal BHE testing

Overview

Combo variants

Our ALL-IN-ONE solutions intelligently combine geothermal BHE testing and grouting logging.



HEP combination appliance

Grouting and geothermal BHE testing device

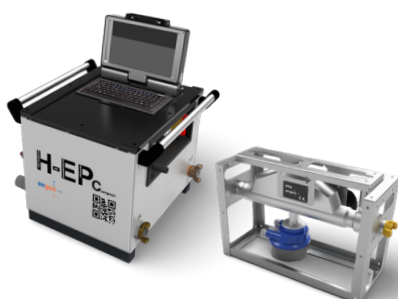
- ✓ **Intelligent logging of your grouting** - The device automatically generates the correct parameters for the subsequent geothermal BHE test.
- ✓ **Mobile on wheels**, which ensures **back-friendly** transportation.
- ✓ With **bag** for accessories.
- ✓ **Dimensions:** 53 cm wide, 49 cm deep, 122 cm high



EP with HPc - Compact

Geothermal BHE testing device with grouting logging device

- ✓ **Intelligent logging of your grouting** – The device automatically generates the correct parameters for the subsequent geothermal BHE test.
- ✓ **Mobile on wheels**, which ensures **back-friendly** transportation.
- ✓ **Separate grouting sensor** for installation on drilling rig or grouting unit.
- ✓ With **bag** for accessories.



HEPc - Compact

Geothermal BHE testing device with grouting logging device

- ✓ **Intelligent logging of your grouting** – The device automatically generates the correct parameters for the subsequent geothermal BHE test.
- ✓ **Compact and modular** – structure for easy transportation by car or pick-up truck
- ✓ **Dimensions:** EPc: 40 cm wide, 45 cm deep, 35 cm high
HPc: 50 cm wide, 20 cm deep, 34 cm high

SINGLE variants

You only need one of the two examinations? The perfect solution for you.

Our system - simply explained:

The smart naming makes the functions of the types immediately recognizable.

- H** ▶ grouting
- E** ▶ Geothermal BHE
- P** ▶ Testing device / logging device
- c** ▶ compact



EP

Geothermal BHE testing device (without grouting)

- ✓ **Mobile on wheels**, which ensures **back-friendly** transportation.
- ✓ With **bag** for accessories.
- ✓ **Dimensions:** 53 cm wide, 49 cm deep, 122 cm high



EPc - Compact

Geothermal BHE testing device

- ✓ **Compact and modular** – structure for easy transportation by car or pick-up truck
- ✓ **Dimensions:** 40 cm wide, 45 cm deep, 35 cm high



HP

Grouting logging device

- ✓ **Intelligent logging of your grouting**
- ✓ **Compact and modular** – structure for easy transportation by car or pick-up truck
- ✓ **Dimensions:** 60 cm wide, 20 cm deep, 40 cm high

Technical data

Geothermal BHE Testing

Flushing

- ✓ Real-time calculation for required flushing time
- ✓ SIA 384/6 Flushing according to F.6 for sand and gravel
- ✓ SIA 384/6 Flushing according to F.6 "Worst Case"
- ✓ Controlled external socket for optional external flushing pump

Flow and differential pressure test according to SIA 384/6 B1

- ✓ Differential pressure test up to 25 bar
- ✓ Flow rate: 0-6 m³/h (0-100 liters/min)
- ✓ With graphical live display and continuous assessment.
- ✓ Independent differential pressure measurement of the two circuits of a BHE

Pressure test according to SIA 384/6 Annex B2

- ✓ Up to a maximum of 60 bar for all commercially available BHE types (continuously updated with "Over the Air" update)
- ✓ Calculates necessary and permissible test pressure automatically
- ✓ With live measurement and status display
- ✓ Result evaluation

Grouting logging

- ✓ Flow rate 0 - 18m³/h, density 0 - 2.5 kg /l, injection pressure -1 - 50 bar (max. 120 bar)
- ✓ Display of flow rate, press-in pressure, BHE head pressure, density, volume. The progress is displayed and the deviations from the target value are highlighted in color.
- ✓ Overload protection: calculates and monitors permissible head and outlet pressure and automatically regulates the BHE pre-pressure (calculated according to probe type and grout density)
- ✓ Grouting via separate 1" connections, easy to clean

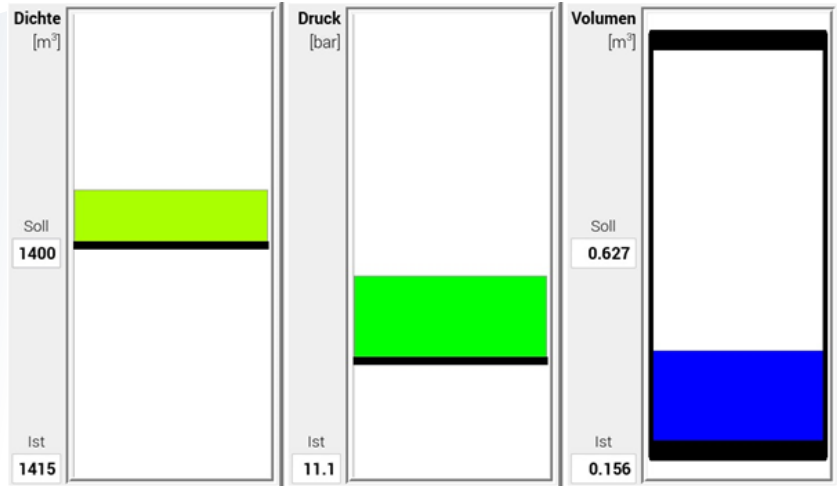
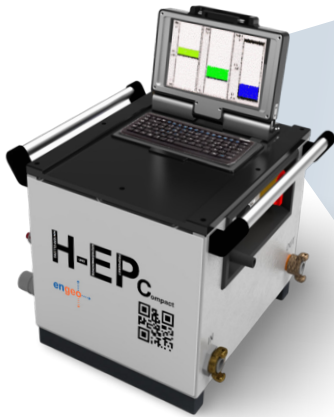
Control system

- ✓ **Autonomous**, rechargeable battery for grid-independent measurement up to 20h (HEPc 12h)
- ✓ **Independently** controllable - directly on site via touch display and keyboard or worldwide via smartphone, tablet or PC on all common operating systems.
- ✓ **Safety through redundancy**: A PLC protects the geothermal BHE in the event of malfunctions or system crashes of the main control unit.
- ✓ **Focus Mode**: Auto screensaver mode, core information during the measurement is visible from a greater distance.

Focus Mode

Focus mode allows you to quickly and easily recognize and monitor the most important progress parameters during measurement operation - even from a distance!

Display: Grouting logging



Density

Difference between actual vs. target density.
Green: small difference
Red: large difference

Press-in pressure

Press-in pressure: 1-40
Green: 0-25 bar
Green-red: > 0-25 bar
Red: over 35 bar

Filling volume

Black container:
Target volume
Blue: 0-80% / filling
Green: 80-120% / optimal
Green-red: 120-200% / still ok
Red: over 200% / problem

Display: Geothermal BHE testing

Flushing, flow & pressure testing



Measurement active

Yellow screen as long as one of the required measurements is still active. Signal lights on the left show the current process step.

Measurement completed

Green screen when all the required measurements are completed and passed. The measuring device may now be removed.

Intervention required

Red screen if measurement not successful / failed. Intervention required to clarify/remove cause.

Accessories

Included in the scope of delivery

For optimal use of our devices, we provide the following products free of charge!



Highpress connection set

BHE connection coupling with High Press Quick Release coupling, for safe and quick connection to the geothermal probes.

Made of anodized aluminium or INOX version.



Cover sheet

Protects all devices from dirt and weather.



Weather protection screen

Weather protection umbrella for rain and strong sun.

Additional products

The following products are designed for our devices and are available for purchase additionally.



Highpress connection set

The BHE connection coupling with High Press Quick Release coupling (made of anodized aluminium or INOX) is available for all common types of geothermal probes. Accessory box for sets of 2 and 4. (Ø 32, PN16 / Ø 40, PN16-20 / Ø 42, HighPress / Ø 43, Flux / Ø 50, PN16-25)



Pump cart

External rinsing cart with filter for accelerated flushing and flow test. 240VAC, 3.3 bar at 6m³/h (max. 9 bar)



BHE head pressure sensor

Bluetooth BHE head pressure sensor for monitoring the grouting and drilling-depth-dependent visualization of the borehole calibre.



Storage box

Heated, lockable storage box that can be transported by pallet truck or crane. Additional flaps allow hose feedthroughs. The devices can remain securely closed in the box during measurement.

Training courses

Precise measurements - practical training for professionals

Our training courses impart practical knowledge about our measuring devices and how to use them optimally. Whether you are a beginner or an experienced user - benefit from well-founded training content, practice-oriented exercises and valuable tips from our experts.

Practical training

This practical training course specifically teaches the use of the measuring device in everyday work.

Duration: 1-2 h
Contents: Practical training
Target group: Equipment operators, drilling assistants and project managers
Location: Construction site
workyard Engeo AG
training bus with mobile probe



Practical training with theory & SIA 384/6 explanation

This training course combines explanations and requirements of the SIA 384/6 standard for geothermal probe testing with practical training on how to use the measuring device in everyday work.

Duration: 2.5 - 6 h
Contents: Theory & practical training
Target group: Equipment operators, drilling assistants and project managers
Location: workyard Engeo AG or partner companies
Training room
Training bus with probe and presentation screen



Practice with extended theory training Course for equipment operators and geology for drillers

This full-day course provides practical training on the measuring devices. In addition, comprehensive knowledge is imparted by other speakers. Important points of the SIA 384/6 standard for drilling companies: Intervention (gas / water / ground failure), responsibilities on the construction site, expectations of the quality seal commission and geology for drilling masters.

Duration: 8 h
Content: Theory, geology & practical training
Target group: Equipment operators, drilling assistants and project managers
Location: Training room with forecourt for training bus





The faces behind

Founder **Ernst Rohner** has been active in the industry **since** the first BHE in **1979**. As early as 1981, he calculated geothermal probes from a metrological perspective in his thesis. This many years of engineering expertise is incorporated into our work. **Our devices** have been **developed in** close collaboration with dozens of drilling companies, focusing on practical applications, **and are continuously** optimized according to the latest technological standards.



Markus Rohner

Management
Development and sales

Bachelor of Science (B.Sc.),
Mechanical Engineering
FWS instructor course



Carlos Rohner

Management
Software programming

Dipl. Ing. FH,
Mechanical Engineering
Master of Science (M.Sc.)
ZFH Engineering



Ernst Rohner

Holder
Consulting, development,
simulation calculations

Dipl. Masch. Ing. HTL
FWS Specialist Course Instructor
FWS Seal of Approval Commission
SIA standard SN 384/6 specialist
for many years VKR specialist
course Instructor



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