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# PEBS

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# D.2.2-8 HE-E annual monitoring report

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| **Dissemination Level** | | |
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EURATOM

# Mont Terri

# PEBS: HE-E Experiment

## Monitoring and maintenance

## D.2.2-8 HE-E annual monitoring report

| | | | |
|---|---|---|---|
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## 1 INTRODUCTION

*According to the DOW "description of work" Task 2.2 of the PEBS grant agreement, Solexperts is responsible for the monitoring and maintenance of the experiment HE-E as part of the PEBS project.*

*The HE-E Experiment is performed in 50 m long microtunnel of 1.3 m diameter. The 10 m test section of the microtunnel was characterised in detail during the Ventilation (VE) Experiment (Figure 1). Table 1 shows the task overview for the project identification and responsibility partners.*

*A series of annual monitoring reports is planned to document the data set recorded by the HE-E data acquisition system (DAS). In addition, the monitoring reports summarise the site activities, indicate DAS incidents and describe the measurements taken to guarantee a proper function of the DAS and the corresponding sensors.*

*This monitoring report covers the period between March 2011 and March 2012.*

*To monitor the engineered barrier system (EBS) and host rock behaviour during the HE-E Experiment, specific sensors were installed in three main zones and can therefore be divided in three different groups: (1) The engineered barrier system (EBS) and EBS/host rock interface, (2) the Opalinus clay host rock in the microtunnel sections and (3) the Opalinus Clay host rock in boreholes drilled from the Gallery 98. The instrumentation of the two heater elements is not included in this report as the sensors are connected to another data acquisition system.*

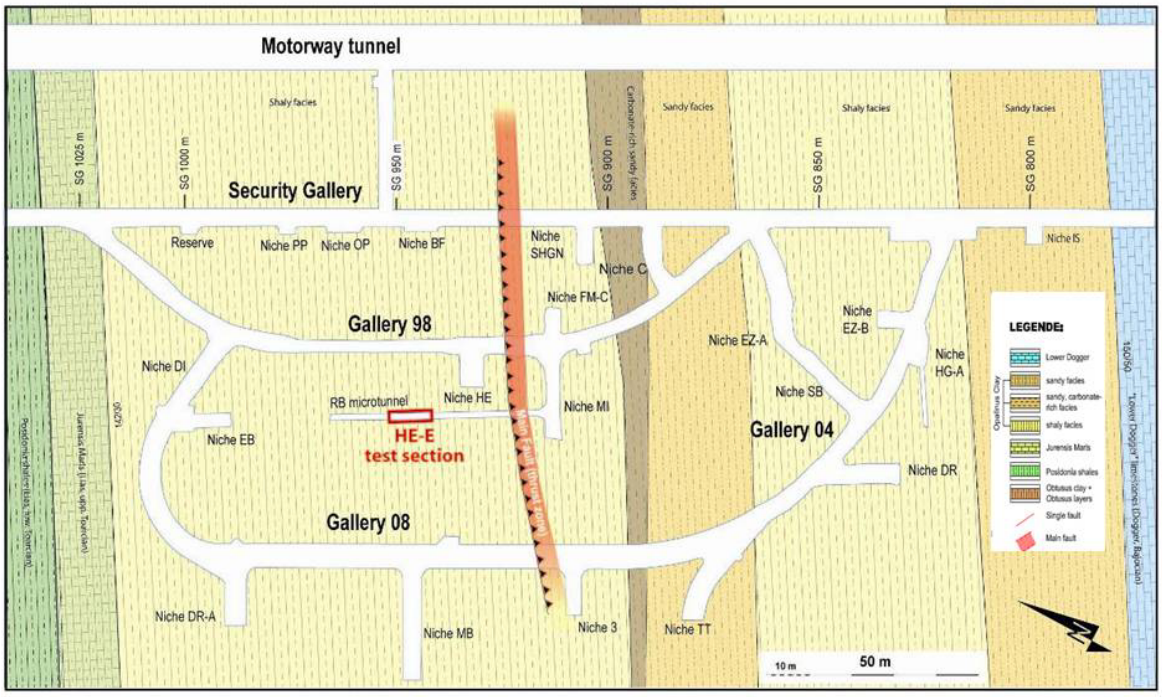



*Figure 1: Location of the HE-E test section in the Mont Terri rock laboratory*

*DAS related work is described in Chapter 3. The field activity logbook and the data acquisition logbook are included in Appendix A. A list with all the sensors and their specifications and the schematic drawings of the sensor locations are included in Appendix B. The graphs of the measurements are shown in Appendices C, D and E.*

*Table 1: Task Overview*

| | | |
|---|---|---|
| ***Project Identification*** | *PEBS: HE-E* | |
| ***Experiment Task*** | *HE-E annual monitoring report* | |
| ***Reference Document*** | *DOW "description of work" Task 2.2 of the PEBS grant agreement"* | |
| ***Responsibilities*** | *Project Manager:* | *Irina Gaus, Nagra* |
| | *Deputy:* | *Paul Marshall, Nagra* |
| | *Test Engineer:* | *Peter Achtziger, Solexperts* |
| | *Manager master-database:* | *Ursula Rösli, Solexperts* |

## *2 FIELD ACTIVITIES*

*The construction and instrumentation works took place between January and May 2011. The experiment layout is described in detail in the as-built report (Teodori S. & Gaus, I., 2012).*

*The main field activities during the monitoring period are summarized in Table 2. The detailed field activity logbook is included in Appendix A. On 28th June 2011, at 17:00, heating was started by increasing the temperature in steps. By 30th September 2011, a heater temperature of 80°C was reached for both heaters.*

*On 16th September 2011, a power alarm was installed and configured to send alarms in case of power failure at Mont Terri URL.*

*Table 2: Main field activities*

| ***Date*** | ***Activity*** | ***Observation*** |
|---|---|---|
| *16.06.2011* | *Hydraulic pressurizing tests* | |
| *28.06.2011* | *Start of heating* | |
| *23.08.2011* | *Re-inflation packer P-BE2-P4* | |
| *16.09.2011* | *Installation and configuration of power alarm* | |
| *09.01.2012* | *Check CR7-logger* | *connection ok, but no power supply* |
| *25.01.2012* | *Check sensors Ch. 278 HC-N3-5BI/ Ch. 279 T-N3-5BI* | *Sensors defective* |
| *02.02.2012* | *Check ADAM module 2 Slot 2 and connected sensors* | |
| *08.02.2012* | *Defective fuse in psychrometer unit replaced* | |
| *27.03.2012* | *Check sensors Ch.321 T-G1-9H/ Ch.367 T-G3-9H* | *Sensors defective* |

## *3 DATA ACQUISITION SYSTEM (DAS)*

*The data acquisition system (DAS) worked properly for the monitoring period. During instrumentation, all sensors of the previous VE Experiment were connected to the DAS of the HE-E*

*Experiment. However, several sensor signals were already erroneous during the last observation period of the VE Experiment. To check the performance of these sensors, they were also connected to the HE-E DAS. Most of these sensors proved to be defective and were disconnected after the end of the instrumentation.*

*The psychrometer logger showed repeated failures during the monitoring period. Between 1st December 2011 and 27th February 2012, no data are recorded for the psychrometers. The communication with the CR7 logger was restored on 27th February 2012, but the CR7 logger did not work properly.*

*Table 3 summarises the main DAS problems and the defective sensors. A detailed DAS logbook with all sensor malfunctions, failures or removals is shown in Appendix A.*

*Table 3: DAS interruptions and defective sensor*

| Date | Sensor name and type | | Section | Events |
|---|---|---|---|---|
| Since start of DAS | HC-B75<br>HC-B69<br>HC-B77 | Humidity | SB1 | Defective |
| | RD-B48 | Displacement | SD1 | Defective |
| | T-B46 | Temperature | SD1 | Defective |
| | RD-B27 | Displacement | SD2 | Defective |
| | T-B26 | Temperature | SD2 | Defective |
| Since 23.03.2011 | T-B23 | Temperature | SB2 | Defective |
| Since 05.06.2011 | P-BE2-P3 | Pressure | BHE-E2 | Defective |
| Since 06.04.2011 | HC-N3-5Bl | Humidity | Nagra Carrier 3 | Defective |
| Since 06.04.2011 | T-N3-5Bl | Temperature | Nagra Carrier 3 | Defective |
| July 2011 – March 2012 | Psychrometers | Humidity | SB1 and SB2 | CR-7 software not working, often no data |
| Since 17.01.2012 | HC-B18 | Humidity | SB2 | Defective |
| Since 17.01.2012 | T-B18 | Temperature | SB2 | Defective |
| Since 27.02.2012 | T-G3-9H | Temperature | GRS carrier 3 | Defective |
| Since 20.03.2012 | T-G1-9H | Temperature | GRS carrier 1 | Defective |

## 4 SENSORS IN MICROTUNNEL SECTIONS

*Six sections perpendiculars to the microtunnel axis are equipped with 24 Mini-Piezometer systems, humidity sensors, temperature sensors and extensometers. A great part of these sensors were already installed during the previous VE Experiment. The instrumentation is described in detail in the as-built report (Teodori & Gaus, 2012). An overview of the sections relative to the tunnel and their layouts are included in Appendix B.*

### 4.1 PORE PRESSURE AND TEMPERATURE MEASUREMENTS IN SECTIONS SA1 TO SA4, SA20 AND SD20

*The Mini-Piezometers in section SA1, SA2, SA3 and SA4 were installed during the VE Experiment. The two sections SA20 and SD20 were equipped in the framework of the HE-E Experiment.*

#### 4.1.1 Section SA1

*The corresponding data plot is included in Appendix C1. The pressure sensors in section SA1 reflected atmospheric conditions or suction below atmospheric pressure. P-B79 was continuously increasing since May 2011. The sensor P-B78 gives noisy measurements since 28th February 2012.*

#### 4.1.2 Section SA2

*The corresponding data plot is included in Appendix C2. Initially, all the pressure sensors in section SA2 except for P-B55 reflected atmospheric conditions or suction below atmospheric pressure. P-B55 showed values above atmospheric pressure. The pressures measured for the sensor P-B55 started to increase after July 2011, for P-B56 and P-B62 in October 2011. The pressure recorded for the other pressure sensors remained mostly constant.*

#### 4.1.3 Section SA3

*The corresponding data plot is included in Appendix C3. Initially, all pressure sensors in section SA3 reflected atmospheric conditions or suction below atmospheric pressure. P-B39 and P-B41 showed noisy data until July 2011, but were generally increasing from May 2011, whereas the pressure measured for the sensors P-B38 and P-B40 started to increase in January and February 2012, respectively.*

#### 4.1.4 Section SA4

*The corresponding data plot is included in Appendix C4. The pressure sensors in section SA4 reflected atmospheric conditions or suction below atmospheric pressure. In October 2011, the pressure measured for P-B7 started to increase. The sensor P-B6 recorded noisy measurements until 8th March 2012.*

#### 4.1.5 Section SA20

*The corresponding data plot is included in Appendix C5. The pressure sensors in section SA20 reflected atmospheric conditions or suction below atmospheric pressure. On 16th June 2011, hydraulic pressurizing tests were performed by the GRS team. Afterwards, all the intervals showed stable measurements at or slightly above atmospheric pressure except for sensor P-BESA23.*

*The temperatures reflected the temperature changes of the heater.*

#### 4.1.6 Section SD20

*The corresponding data plot is included in Appendix C6. The pressure sensors in section SD20 reflected the atmospheric conditions or suction below atmospheric pressure. On 16th June 2011, hydraulic pressurizing tests were performed by the GRS team. Afterwards, all the intervals showed stable measurements at or slightly above atmospheric pressure except for sensor P-BESD22 which started to increase but decreased to atmospheric pressure until September 2011. Since December 2011, P-BESD25 continuously decreased to pressure values below atmospheric pressure.*

*The temperatures reflected the temperature changes of the heater.*

### 4.2 ROCK DISPLACEMENT SENSORS INCLUDING TEMPERATURE MEASUREMENTS

*The Solexperts displacement sensors (mini-extensometers) including temperature measurements were installed in sections SD1 and SD2 during the VE Experiment.*

### 4.2.1 Section SD1

*The corresponding data plot is included in Appendix C7. Sensors T-B46 and RD-B48 were found to be defective and were disconnected. Sensor values of both temperature and rock displacement were constant until start of heating. Then, the extensometer measurements started to decrease meaning that the distance between the anchor at the deepest part of the borehole and measuring head increased. At the same time, the measurements started to be noisy. Since November 2011 the decrease diminished and no noise is recorded anymore.*

*The temperatures reflected the temperature changes of the heater.*

### 4.2.2 Section SD2

*The corresponding data plot is included in Appendix C8. Sensors T-B26 and RD-B27 were found to be defective and were disconnected. Sensor values of both temperature and rock displacement were constant until start of heating. Then, the extensometer measurements started to decrease meaning that the distance between the anchor at the deepest part of the borehole and measuring head increased. At the same time, the measurements started to be noisy. Since November 2011 the decrease diminished and no noise is recorded anymore.*

*The temperatures reflected the temperature changes of the heater.*

## 4.3 ROCK WATER CONTENT MEASUREMENTS

*The capacitive relative humidity and temperature sensors and the psychrometers were installed in boreholes in the profiles SB1 and SB2 during the VE Experiment. Several psychrometers were not identifieable after de-installation at the end of the VE Experiment and reconnection to the data acquisition. These sensors were called "Long green", "Short green", "Not identified 1" and "Not identified 2". These might correspond to the sensors HC-B15, HC-B72, HC-B70 and Surface from the VE-Experiment which are missing in the current sensor list. However, these sensors cannot be correctly correlated. The sensor "Short green" only gave valid measurements for a short period between 27$^{th}$ June and 4$^{th}$ July 2011 with values of about 93.43 % RH.*

### 4.3.1 Capacitive Sensors including Temperature in Section SB1

*The corresponding data plot is included in Appendix C9. HC-B69, HC-B75 and HC-B77 gave erroneous measurements during the entire monitoring period. The measured relative humidity values were constant above 99%. The temperatures reflected the temperature changes of the heater.*

### 4.3.2 Capacitive Sensors including Temperature in Section SB2

*The corresponding data plot is included in Appendix C10. T-B23, HC-B18 and T-B18 were found to be defective during the monitoring period. The values of the relative humidity sensors near the EBS/host rock interface, HC-B94, HC-B93, HC-B92 and HC-B95 and to a minor amount HC-SB2, started to decrease after re-connection to the DAS and to increase again after start of heating. The measured relative humidity values of all other sensors were constant above 98 %. The temperatures reflected the temperature changes of the heater.*

### 4.3.3 Psychrometers in Section SB1

*The corresponding data plot is included in Appendix C11. HC-B65, HC-B68, HC-B74, HC-B76 gave erroneous measurements during the entire monitoring period. HC-B63 only provided 5 valid measurements and HC-B67 stopped measuring on 01st December 2012. The measured relative humidity changed only slightly during the monitoring period.*

### 4.3.4 Psychrometers in Section SB2

*The corresponding data plot is included in Appendix C11. HC-B11, HC-B13, HC-B17, HC-B22 and HC-B24 gave erroneous measurements during the entire monitoring period. The measured relative humidity changed only slightly during the monitoring period.*

## 4.4 PORE PRESSURE MEASUREMENTS IN THE BOREHOLES FROM THE GALLERY GA98

*4 multi-packer systems were installed from Gallery 98 for far-field pore pressure measurements. Borehole BVE-1 and BVE-91 were drilled and equipped with a triple and a quadruple packer system during the VE Experiment. Boreholes BHE-E1 was installed on 30th March 2011 and borehole BHE-E2 on 4th May 2011, both equipped with a quadruple packer system. An overview of the borehole instrumentation is shown in Appendix B. Data plots are included in Appendices D1 to D4.*

*Packers of boreholes BHE-E1 and BHE-E2 were re-inflated on 5th and 10th May and on 16th June 2011. On 16th June 2011, hydraulic pressurizing tests were performed on all intervals in both boreholes by GRS staff. After 16th June 2011, the packer pressure P-BE2-P4 (borehole BHE-E2) started to considerably decrease towards 660 kPa. It was re-inflated again on 23rd August 2011 and stabilized at about 1380 kPa. In December 2011, the packer pressure started to continuously increase and seems to work fine. Pressure sensor P-BE-P3 was defective after the installation on March 30th, 2011. Between 18th April and 5th June 2011, noisy measurements are recorded and since 5th June 2011, the sensor is defective. Sensor P-BE2-I4 yielded erroneous measurements until 5th May 2011 when it started to give noisy measurements.*

*Generally, the interval pressures of the new boreholes BHE-E1 and BHE-E2 showed a slight pressure build-up after installation*

*The interval pressures of the packer systems installed during the VE experiment (BVE-1 and BVE-91) showed only minor pressure changes until the start of the heating. Between July and December 2011, all interval pressure started to increase.*

# 5 SENSORS IN THE EBS AND THE EBS/HOST ROCK INTERFACE

*The EBS and the host rock/EBS interface were instrumented with temperature and relative humidity sensors. An overview of sensor locations is shown in Appendix B and data plots are in Appendices E1-E6.*

*Most of the newly installed sensors worked fine for the entire monitoring period. HC-N3-5Bl and T-N3-5Bl failed on 6th April 2011. The sensors T-G3-9H and T-G1-9H showed erroneous data since 27th February and 20th March 2012, respectively.*

*The sensors T-G3-R, HC-G3-R, T-N1-R and HC-N1-R are installed inside the railroad under the plug. Therefore, the measurements represent the climatic conditions of the cable channel.*

*The temperatures reflected the temperature changes of the heater. The slope of temperature increase depends on distance to the heaters. The values of the sensors installed at the centre*

*position or within the bentonite blocks showed a faster temperature increase than the sensors installed at middle position or even at the EBS-host rock interface.*

*The humidity at centre position or within the bentonite blocks started to decrease after the start of the heating, whereas the humidity at the EBS-host rock interface started to increase until 100 % humidity was reached.*

## *6 REFERENCES*

*Teodori S.P. & Gaus I. (2012): PEBS: Deliverable (D-N°: 2.2-3) Report of the construction of the HE-E experiment.*

*Rösli U. (2010): Mont Terri Project: VE experiment long term monitoring data report phase 15. TN 2010-12.*

# ***Appendix A:***

- *Data acquisition logbook*
- *Field activity logbook*

# Data Acquisition Logbook

| DATE AND TIME | SENSOR | GEO-MONITOR CH. | BOREHOLE/ SECTION | TYPE | ACTIONS/PROBLEMS |
|---|---|---|---|---|---|
| Since start of DAS | HC-B75<br>HC-B69<br>HC-B77 | 87<br>111<br>105 | SB1 | Humidity | Defective |
| | RD-B48 | 79 | SD1 | Displacement | Defective |
| | T-B46 | 125 | SD1 | Temperature | Defective |
| | RD-B27 | 75 | SD2 | Displacement | Defective |
| | T-B26 | 122 | SD2 | Temperature | Defective |
| | T-B27 | 123 | SD2 | Temperature | Noisy measurements |
| | T-B47 | 126 | SD1 | Temperature | Noisy measurements |
| | Long green | Psychro-18 | n/a | Psychrometer | No measurements |
| | HC-B65<br>HC-B68<br>HC-B74<br>HC-B76 | Psychro-09<br>Psychro-22<br>Psychro-13<br>Psychro-25 | SB1 | Psychrometer | No measurements |
| | HC-B11<br>HC-B13<br>HC-B17<br>HC-B22<br>HC-B24 | Psychro-01<br>Psychro-02<br>Psychro-03<br>Psychro-21<br>Psychro-08 | SB2 | Psychrometer | No measurements |
| | HC-B63 | Psychro-17 | SB1 | Psychrometer | 5 measurements |
| Since 23.03.2011 | T-B23 | 98 | SB2 | Temperature | Defective |
| Between 29.03.2011 and 08.03.2012 | P-B6 | 9 | SA4 | Pressure | Noisy measurements |
| Since 30.03.2011<br><br>Between 18.04. and 05.06.2011<br>Since 05.06.2011 | P-BE2-P3 | 56 | BHE-E2 | Pressure | Erroneous measurements,<br>Noisy measurements,<br><br>Defective |
| Since 06.04.2011 | HC-N3-5Bl | 278 | Nagra Carrier 3 | Humidity | Defective |
| Since 06.04.2011 | T-N3-5Bl | 279 | Nagra Carrier 3 | Temperature | Defective |
| Between 04.04.2011 and 03.07.2011 and between 02.02.2012 and 30.04.2012 | P-B41 | 24 | SA3 | Pressure | Noisy data |
| Between 26.04.11 and 05.05.11 | P-BE2-I1 | 46 | BHE-E2 | Pressure | Erroneous measurements |
| Until 05.05.2011<br><br>Since 05.05.2011 | P-BE2-I4 | 45 | BHE-E2 | Pressure | Erroneous measurements,<br>Noisy measurements |
| Until 27.06.2011<br>Since 04.07.2011 | Short green | Psychro-23 | n/a | Psychrometer | No measurements |
| Between 01.07.2011 and 23.10.2011 | RD-B46<br>RD-B47<br>RD-B49 | 77<br>78<br>80 | SD1 | Displacement | Noisy measurements |

| DATE AND TIME | SENSOR | GEO-MONITOR CH. | BOREHOLE/ SECTION | TYPE | ACTIONS/PROBLEMS |
|---|---|---|---|---|---|
| Between 01.07.2011 and 23.10.2011 | RD-B25<br>RD-B26<br>RD-B28 | 73<br>74<br>76 | SD2 | Displacement | Noisy measurements |
| 04.07. – 15.07.2012<br>19.07. – 31.08.2012<br>07.09. – 16.09.2012<br>In October 2011<br>01.12.2011 – 27.02.2012<br>09.03. – 22.03.2012 | Psychro-meters | Psychro-1-25 | SB1 and SB2 | Humidity | CR-7 software not working, mostly no data |
| Since 01.12.2011 | HC-B67 | Psychro-11 | SB1 | Psychrometer | No measurements |
| Since 15.12.2011 | P-BESD25 | 41 | SD 20 | Pressure | Pressure decreasing |
| Since 17.01.2012 | HC-B18 | 85 | SB2 | Humidity | Defective |
| Since 17.01.2012 | T-B18 | 86 | SB2 | Temperature | Defective |
| Since 27.02.2012 | T-G3-9H | 367 | GRS carrier 3 | Temperature | Defective |
| Since 28.02.2012 | P-B78 | 25 | SA1 | Pressure | Noisy measurements |
| Since 20.03.2012 | T-G1-9H | 321 | GRS carrier 1 | Temperature | Defective |

## Field Activity Logbook

| DATE | WHO | ACTIVITY |
|---|---|---|
| 16.06.2011 | GRS team | Hydraulic pressurizing tests in boreholes BHE-E1 and BHE-E2 and sections SA20 and SD20 |
| 28.06.2011 | Aitemin<br>I. Gauss (Nagra) | Start of heating |
| 23.08.2011 | GRS team | Re-inflation packer P-BE2-P4 |
| 16.09.2011 | PA, MV | Installation and configuration of a power alarm |
| 09.01.2012 | PA | Check CR7-logger -> connection ok, but no power supply |
| 25.01.2012 | PA | Check sensors Ch. 278 HC-N3-5BI/ Ch. 279 T-N3-5BI |
| 02.02.2012 | RL | Check ADAM module 2 Slot 2 and connected sensors |
| 08.02.2012 | Aitemin | Defective fuse in psychrometer unit replaced |
| 27.03.2012 | MV | Check sensors Ch.321 T-G1-9H/ Ch.367 T-G3-9H |

Abbreviations:

PA: Peter Achtziger (engineer)

MV: Miroslav Vrzba (engineer)

RL: Roland Leu (electrician)

# ***Appendix B:***

- *List of sensors for the HE-E Experiment*
- *Sensor locations*

| INTERFACE Sensor assembling box | DAS - Channel | Borehole | Sensor name | Unit | Depth [m] | Range | Sensor type | Output signal | Sensor SN | Status | Profile | Atmos-pheric pressure |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| n/a | 1 | BVE-1 | P-B1-13m | kPa | 13.00 | 100-2100 | PAA-23 | 4-20mA | | | Gallery 98 | |
| | 2 | | P-B1-11m | kPa | 11.00 | 100-2100 | PAA-23 | 4-20mA | | | Gallery 98 | |
| | 3 | | P-B1-09m | kPa | 9.00 | 100-2100 | PAA-23 | 4-20mA | | | Gallery 98 | |
| | 4 | | P-B1-07m | kPa | 7.00 | 100-2100 | PAA-23 | 4-20mA | | | Gallery 98 | |
| SA4 | 5 | BVE-2 | P-B2 | kPa | 1.55 | 0-2000 | PAA-23 | 4-20mA | 42183 | | SA4 | 88.2 |
| | 6 | BVE-3 | P-B3 | kPa | 1.04 | 0-2000 | PAA-23 | 4-20mA | 42194 | | SA4 | 92.8 |
| | 7 | BVE-4 | P-B4 | kPa | 1.05 | 0-2000 | PAA-23 | 4-20mA | 42172 | noisy | SA4 | 102.2 |
| | 8 | BVE-5 | P-B5 | kPa | 0.55 | 0-2000 | PAA-23 | 4-20mA | 42180 | | SA4 | 92.6 |
| | 9 | BVE-6 | P-B6 | kPa | 1.63 | 0-2000 | PAA-23 | 4-20mA | 42181 | | SA4 | 119.0 |
| | 10 | BVE-7 | P-B7 | kPa | 2.06 | 0-2000 | PAA-23 | 4-20mA | 42182 | | SA4 | 97.3 |
| | 11 | BVE-8 | P-B8 | kPa | 0.50 | 0-2000 | PAA-23 | 4-20mA | 42188 | | SA4 | 92.2 |
| | 12 | BVE-9 | P-B9 | kPa | 1.40 | 0-2000 | PAA-23 | 4-20mA | 42196 | | SA2 | 92.4 |
| SA2 | 13 | BVE-55 | P-B55 | kPa | 2.11 | 0-2000 | PAA-23 | 4-20mA | 42169 | | SA2 | 94.3 |
| | 14 | BVE-56 | P-B56 | kPa | 2.11 | 0-2000 | PAA-23 | 4-20mA | 42167 | | SA2 | 93.7 |
| | 15 | BVE-57 | P-B57 | kPa | 1.80 | 0-2000 | PAA-23 | 4-20mA | ? | | SA2 | 97.9 |
| | 16 | BVE-58 | P-B58 | kPa | 1.12 | 0-2000 | PAA-23 | 4-20mA | 42184 | | SA2 | 98.1 |
| | 17 | BVE-59 | P-B59 | kPa | 2.12 | 0-2000 | PAA-23 | 4-20mA | 42193 | | SA2 | 101.2 |
| | 18 | BVE-60 | P-B60 | kPa | 1.50 | 0-2000 | PAA-23 | 4-20mA | 42170 | | SA2 | 95.3 |
| | 19 | BVE-61 | P-B61 | kPa | 1.80 | 0-2000 | PAA-23 | 4-20mA | 42185 | | SA2 | 95.3 |
| | 20 | BVE-62 | P-B62 | kPa | 2.13 | 0-2000 | PAA-23 | 4-20mA | 42195 | | SA2 | 93.5 |
| SA1&SA3 | 21 | BVE-38 | P-B38 | kPa | 2.10 | 0-2000 | PAA-23 | 4-20mA | 42191 | | SA3 | 93.5 |
| | 22 | BVE-39 | P-B39 | kPa | 2.11 | 0-2000 | PAA-23 | 4-20mA | 42176 | | SA3 | 93.5 |
| | 23 | BVE-40 | P-B40 | kPa | 1.80 | 0-2000 | PAA-23 | 4-20mA | 42177 | | SA3 | 95.2 |
| | 24 | BVE-41 | P-B41 | kPa | 1.81 | 0-2000 | PAA-23 | 4-20mA | 42187 | partly noisy | SA3 | 98.8 |
| | 25 | BVE-78 | P-B78 | kPa | 2.10 | 0-2000 | PAA-23 | 4-20mA | 42173 | noisy | SA1 | 93.6 |
| | 26 | BVE-79 | P-B79 | kPa | 2.10 | 0-2000 | PAA-23 | 4-20mA | 42175 | | SA1 | 84.6 |
| | 27 | BVE-80 | P-B80 | kPa | 1.81 | 0-2000 | PAA-23 | 4-20mA | 42192 (?) | | SA1 | 96.1 |

| INTERFACE Sensor assembling box | DAS - Channel | Borehole | Sensor name | Unit | Depth [m] | Range | Sensor type | Output signal | Sensor SN | Status | Profile | Atmos-pheric pressure |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 28 | BVE-81 | P-B81 | kPa | 1.80 | 0-2000 | PAA-23 | 4-20mA | 42189 (?) | | SA1 | 93.6 |
| 421038.182 | 29 | BVE-91 | P-B91-10m | kPa | 10.00 | 0-3000 | PAA-33X | 4-20mA | 65014 | | Gallery 98 | 108.3 |
| | 30 | | P-B91-08m | kPa | 8.82 | 0-3000 | PAA-33X | 4-20mA | 65269 | | Gallery 98 | 100.2 |
| | 31 | | P-B91-07m | kPa | 7.66 | 0-3000 | PAA-33X | 4-20mA | 47458 | | Gallery 98 | 109.4 |
| n/a | 32 | BHE-ESA21 | P-BESA21 | kPa | 0.60 | 0-5000 | PAA-23X | 4-20mA | 146519 | | SA20 | 92.4 |
| n/a | 33 | BHE-ESA22 | P-BESA22 | kPa | 1.00 | 0-5000 | PAA-23X | 4-20mA | 146520 | | SA20 | 92.0 |
| n/a | 34 | BHE-ESA23 | P-BESA23 | kPa | 0.60 | 0-5000 | PAA-23X | 4-20mA | 146521 | | SA20 | 92.0 |
| n/a | 35 | BHE-ESA24 | P-BESA24 | kPa | 1.00 | 0-5000 | PAA-23X | 4-20mA | 146522 | | SA20 | 92.0 |
| n/a | 36 | BHE-ESA25 | P-BESA25 | kPa | 0.30 | 0-5000 | PAA-23X | 4-20mA | 146523 | | SA20 | 92.0 |
| n/a | 37 | BHE-ESD21 | P-BESD21 | kPa | 0.60 | 0-5000 | PAA-23X | 4-20mA | 146514 | | SD20 | 92.9 |
| n/a | 38 | BHE-ESD22 | P-BESD22 | kPa | 1.00 | 0-5000 | PAA-23X | 4-20mA | 146515 | | SD20 | 92.9 |
| n/a | 39 | BHE-ESD23 | P-BESD23 | kPa | 0.60 | 0-5000 | PAA-23X | 4-20mA | 146516 | | SD20 | 92.5 |
| n/a | 40 | BHE-ESD24 | P-BESD24 | kPa | 1.00 | 0-5000 | PAA-23X | 4-20mA | 146517 | | SD20 | 92.0 |
| n/a | 41 | BHE-ESD25 | P-BESD25 | kPa | 0.30 | 0-5000 | PAA-23X | 4-20mA | 146518 | | SD20 | 90.1 |
| 421038.182 | 42 | BHE-E1 | P-BE1-I1 | kPa | | 0-5000 | PAA-23X | 4-20mA | | | Gallery 98 | |
| | 43 | BHE-E1 | P-BE1-I2 | kPa | | 0-5000 | PAA-23X | 4-20mA | | | Gallery 98 | |
| | 44 | BHE-E1 | P-BE1-I3 | kPa | | 0-5000 | PAA-23X | 4-20mA | | | Gallery 98 | |
| | 45 | BHE-E1 | P-BE1-I4 | kPa | | 0-5000 | PAA-23X | 4-20mA | | | Gallery 98 | |
| | 46 | BHE-E2 | P-BE2-I1 | kPa | | 0-5000 | PAA-23X | 4-20mA | | | Gallery 98 | |
| | 47 | BHE-E2 | P-BE2-I2 | kPa | | 0-5000 | PAA-23X | 4-20mA | | | Gallery 98 | |
| | 48 | BHE-E2 | P-BE2-I3 | kPa | | 0-5000 | PAA-23X | 4-20mA | | | Gallery 98 | |
| | 49 | BHE-E2 | P-BE2-I4 | kPa | | 0-5000 | PAA-23X | 4-20mA | | noisy | Gallery 98 | |
| | 50 | BHE-E1 | P-BE1-P1 | kPa | | 0-5000 | PAA-23X | 4-20mA | | | Gallery 98 | |
| | 51 | BHE-E1 | P-BE1-P2 | kPa | | 0-5000 | PAA-23X | 4-20mA | | | Gallery 98 | |
| | 52 | BHE-E1 | P-BE1-P3 | kPa | | 0-5000 | PAA-23X | 4-20mA | | | Gallery 98 | |
| | 53 | BHE-E1 | P-BE1-P4 | kPa | | 0-5000 | PAA-23X | 4-20mA | | | Gallery 98 | |
| | 54 | BHE-E2 | P-BE2-P1 | kPa | | 0-5000 | PAA-23X | 4-20mA | | | Gallery 98 | |

| INTERFACE Sensor assembling box | DAS - Channel | Borehole | Sensor name | Unit | Depth [m] | Range | Sensor type | Output signal | Sensor SN | Status | Profile | Atmos-pheric pressure |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 55 | BHE-E2 | P-BE2-P2 | kPa | | 0-5000 | PAA-23X | 4-20mA | | | Gallery 98 | |
| | 56 | BHE-E2 | P-BE2-P3 | kPa | | 0-5000 | PAA-23X | 4-20mA | | defective | Gallery 98 | |
| | 57 | BHE-E2 | P-BE2-P4 | kPa | | 0-5000 | PAA-23X | 4-20mA | | | Gallery 98 | |
| AITEMIN Humidity cabinet | 65 | BVE-95 | HC-B95 | %RH | | 0-100 | Rotronic | 4-20mA | - | | SB2 | - |
| | 66 | BVE-95 | T-B95 | °C | | -40-180 | Pt100 | 4-20mA | | | | - |
| | 67 | BVE-92 | HC-B92 | %RH | | 0-100 | Rotronic | 4-20mA | - | | SB2 | - |
| | 68 | BVE-92 | T-B92 | °C | | -40-180 | Pt100 | 4-20mA | | | | - |
| | 69 | BVE-94 | HC-B94 | %RH | | 0-100 | Rotronic | 4-20mA | - | | SB2 | - |
| | 70 | BVE-94 | T-B94 | °C | | -40-180 | Pt100 | 4-20mA | | | | - |
| | 71 | BVE-93 | HC-B93 | %RH | | 0-100 | Rotronic | 4-20mA | - | | SB2 | - |
| | 72 | BVE-93 | T-B93 | °C | | -40-180 | Pt100 | 4-20mA | | | | - |
| n/a | 73 | BVE-25 | RD-B25 | mm | 0.0-2.0 | 25 | displacement | 0-5 V | - | | SD2 | - |
| n/a | 74 | BVE-26 | RD-B26 | mm | 0.0-2.0 | 25 | displacement | 0-5 V | - | | SD2 | - |
| n/a | 75 | BVE-27 | RD-B27 | mm | 0.0-2.0 | 25 | displacement | 0-5 V | - | defective | SD2 | - |
| n/a | 76 | BVE-28 | RD-B28 | mm | 0.0-2.0 | 25 | displacement | 0-5 V | - | | SD2 | - |
| n/a | 77 | BVE-46 | RD-B46 | mm | 0.0-2.0 | 25 | displacement | 0-5 V | - | | SD1 | - |
| n/a | 78 | BVE-47 | RD-B47 | mm | 0.0-2.0 | 25 | displacement | 0-5 V | - | | SD1 | - |
| n/a | 79 | BVE-48 | RD-B48 | mm | 0.0-2.0 | 25 | displacement | 0-5 V | - | defective | SD1 | - |
| n/a | 80 | BVE-49 | RD-B49 | mm | 0.0-2.0 | 25 | displacement | 0-5 V | - | | SD1 | - |
| AITEMIN Humidity cabinet | 81 | BVE-20 | HC-B20 | %RH | 0.78 | 0-100 | Rotronic | 0-5 V | 23786 008 | | SB2 | - |
| | 82 | BVE-20 | T-B20 | °C | | -40-180°C | Pt100 | 0-5 V | | | | - |
| | 83 | surface | HC-SB2 | %RH | 0.00 | 0-100 | Rotronic | 0-5 V | 23786 007 | | SB2 | - |
| | 84 | surface | T-SB2 | °C | | -40-180°C | Pt100 | 0-5 V | | | | - |
| | 85 | BVE-18 | HC-B18 | %RH | 0.35 | 0-100 | Rotronic | 0-5 V | 23786 006 | defective | SB2 | - |
| | 86 | BVE-18 | T-B18 | °C | | -40-180°C | Pt100 | 0-5 V | | defective | | - |
| | 87 | BVE-75 | HC-B75 | %RH | 0.52 | 0-100 | Rotronic | 0-5 V | 23786 005 | defective | SB1 | - |
| | 88 | BVE-75 | T-B75 | °C | | -40-180°C | Pt100 | 0-5 V | | | | - |

| INTERFACE Sensor assembling box | DAS - Channel | Borehole | Sensor name | Unit | Depth [m] | Range | Sensor type | Output signal | Sensor SN | Status | Profile | Atmos-pheric pressure |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 89 | BVE-16 | HC-B16 | %RH | 1.50 | 0-100 | Rotronic | 0-5 V | 23786 004 | | SB2 | - |
| | 90 | BVE-16 | T-B16 | °C | | -40-180 | Pt100 | 0-5 V | | | | - |
| | 91 | BVE-12 | HC-B12 | %RH | 1.25 | 0-100 | Rotronic | 0-5 V | 23786 003 | | SB2 | - |
| | 92 | BVE-12 | T-B12 | °C | | -40-180 | Pt100 | 0-5 V | | | | - |
| | 93 | BVE-14 | HC-B14 | %RH | 0.53 | 0-100 | Rotronic | 0-5 V | 23786 002 | | SB2 | - |
| | 94 | BVE-14 | T-B14 | °C | | -40-180 | Pt100 | 0-5 V | | | | - |
| | 95 | BVE-10 | HC-B10 | %RH | 0.27 | 0-100 | Rotronic | 0-5 V | 23786 001 | | SB2 | - |
| | 96 | BVE-10 | T-B10 | °C | | -40-180 | Pt100 | 0-5 V | | | | - |
| | 97 | BVE-23 | HC-B23 | %RH | 1.05 | 0-100 | Rotronic | 0-5 V | 23786 009 | | SB2 | - |
| | 98 | BVE-23 | T-B23 | °C | | -40-180 | Pt100 | 0-5 V | | defective | | - |
| | 99 | surface | HC-SB1 | %RH | 0.00 | 0-100 | Rotronic | 0-5 V | 23786 010 | | SB1 | - |
| | 100 | surface | T-SB1 | °C | | -40-180 | Pt100 | 0-5 V | | | | - |
| | 101 | BVE-73 | HC-B73 | %RH | 1.25 | 0-100 | Rotronic | 0-5 V | 23786 011 | | SB1 | - |
| | 102 | BVE-73 | T-B73 | °C | | -40-180 | Pt100 | 0-5 V | | | | - |
| | 103 | BVE-71 | HC-B71 | %RH | 0.27 | 0-100 | Rotronic | 0-5 V | 23786 012 | | SB1 | - |
| | 104 | BVE-71 | T-B71 | °C | | -40-180 | Pt100 | 0-5 V | | | | - |
| | 105 | BVE-77 | HC-B77 | %RH | 1.54 | 0-100 | Rotronic | 0-5 V | 23786 013 | defective | SB1 | - |
| | 106 | BVE-77 | T-B77 | °C | | -40-180 | Pt100 | 0-5 V | | | | - |
| | 107 | BVE-66 | HC-B66 | %RH | 0.78 | 0-100 | Rotronic | 0-5 V | 23786 014 | | SB1 | - |
| | 108 | BVE-66 | T-B66 | °C | | -40-180 | Pt100 | 0-5 V | | | | - |
| | 109 | BVE-64 | HC-B64 | %RH | 0.37 | 0-100 | Rotronic | 0-5 V | 23786 015 | | SB1 | - |
| | 110 | BVE-64 | T-B64 | °C | | -40-180 | Pt100 | 0-5 V | | | | - |
| | 111 | BVE-69 | HC-B69 | %RH | 1.02 | 0-100 | Rotronic | 0-5 V | 23786 016 | defective | SB1 | - |
| | 112 | BVE-69 | T-B69 | °C | | -40-180 | Pt100 | 0-5 V | | | | - |
| n/a | 121 | BVE-25 | T-B25 | °C | 0.10 | 0-100 | Pt100 | Pt100 | - | | SD2 | - |
| n/a | 122 | BVE-26 | T-B26 | °C | 0.10 | 0-100 | Pt100 | Pt100 | - | defective | SD2 | - |
| n/a | 123 | BVE-27 | T-B27 | °C | 0.10 | 0-100 | Pt100 | Pt100 | - | noisy | SD2 | - |

| INTERFACE Sensor assembling box | DAS - Channel | Borehole | Sensor name | Unit | Depth [m] | Range | Sensor type | Output signal | Sensor SN | Status | Profile | Atmos-pheric pressure |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| n/a | 124 | BVE-28 | T-B28 | °C | 0.10 | 0-100 | Pt100 | Pt100 | - | | SD2 | - |
| n/a | 125 | BVE-46 | T-B46 | °C | 0.10 | 0-100 | Pt100 | Pt100 | - | defective | SD1 | - |
| n/a | 126 | BVE-47 | T-B47 | °C | 0.10 | 0-100 | Pt100 | Pt100 | - | noisy | SD1 | - |
| n/a | 127 | BVE-48 | T-B48 | °C | 0.10 | 0-100 | Pt100 | Pt100 | - | | SD1 | - |
| n/a | 128 | BVE-49 | T-B49 | °C | 0.10 | 0-100 | Pt100 | Pt100 | - | | SD1 | - |
| n/a | 129 | BHE-ESA21 | T-BESA21 | °C | 0.40 | 0-100 | Pt100 | Pt100 | - | | SA20 | - |
| n/a | 130 | BHE-ESA22 | T-BESA22 | °C | 0.80 | 0-100 | Pt100 | Pt100 | - | | SA20 | - |
| n/a | 131 | BHE-ESA23 | T-BESA23 | °C | 0.40 | 0-100 | Pt100 | Pt100 | - | | SA20 | - |
| n/a | 132 | BHE-ESA24 | T-BESA24 | °C | 0.80 | 0-100 | Pt100 | Pt100 | - | | SA20 | - |
| n/a | 133 | BHE-ESA25 | T-BESA25 | °C | 0.10 | 0-100 | Pt100 | Pt100 | - | | SA20 | - |
| n/a | 134 | BHE-ESD21 | T-BESD21 | °C | 0.40 | 0-100 | Pt100 | Pt100 | - | | SD20 | - |
| n/a | 135 | BHE-ESD22 | T-BESD22 | °C | 0.80 | 0-100 | Pt100 | Pt100 | - | | SD20 | - |
| n/a | 136 | BHE-ESD23 | T-BESD23 | °C | 0.40 | 0-100 | Pt100 | Pt100 | - | | SD20 | - |
| n/a | 137 | BHE-ESD24 | T-BESD24 | °C | 0.80 | 0-100 | Pt100 | Pt100 | - | | SD20 | - |
| n/a | 138 | BHE-ESD25 | T-BESD25 | °C | 0.10 | 0-100 | Pt100 | Pt100 | - | | SD20 | - |
| INTERFACE Humidity Nagra Zone SN 421119.255 | 202 | NSC3 | HC-N3-12H | %RH | 0.00 | 0-100 | IST humidity | digital | - | | Nagra carrier 1 | - |
| | 203 | NSC3 | T-N3-12H | °C | 0.00 | 0-165 | Pt1000 | digital | - | | Nagra carrier 1 | - |
| | 204 | NSC3 | HC-N3-3H | %RH | 0.00 | 0-100 | IST humidity | digital | - | | Nagra carrier 1 | - |
| | 205 | NSC3 | T-N3-3H | °C | 0.00 | 0-165 | Pt1000 | digital | - | | Nagra carrier 1 | - |
| | 206 | NSC3 | HC-N3-9H | %RH | 0.00 | 0-100 | IST humidity | digital | - | | Nagra carrier 1 | - |
| | 207 | NSC3 | T-N3-9H | °C | 0.00 | 0-165 | Pt1000 | digital | - | | Nagra carrier 1 | - |
| | 208 | NSC3 | HC-N3-5Bt | %RH | -0.35 | 0-100 | IST humidity | digital | - | | Nagra carrier 1 | - |
| | 209 | NSC3 | T-N3-5Bt | °C | -0.35 | 0-165 | Pt1000 | digital | - | | Nagra carrier 1 | - |
| | 210 | NSC2 | HC-N2-5Bl | %RH | -0.20 | 0-100 | IST humidity | digital | - | | Nagra carrier 1 | - |
| | 211 | NSC2 | T-N2-5Bl | °C | -0.20 | 0-165 | Pt1000 | digital | - | | Nagra carrier 1 | - |
| | 212 | NSC2 | HC-N2-5Bt | %RH | -0.35 | 0-100 | IST humidity | digital | - | | Nagra carrier 1 | - |
| | 213 | NSC2 | T-N2-5Bt | °C | -0.35 | 0-165 | Pt1000 | digital | - | | Nagra carrier 1 | - |

| INTERFACE Sensor assembling box | DAS - Channel | Borehole | Sensor name | Unit | Depth [m] | Range | Sensor type | Output signal | Sensor SN | Status | Profile | Atmos-pheric pressure |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 214 | NSC3 | HC-N3-12C | %RH | -0.35 | 0-100 | IST humidity | digital | - | | Nagra carrier 1 | - |
| | 215 | NSC3 | T-N3-12C | °C | -0.35 | 0-165 | Pt1000 | digital | - | | Nagra carrier 1 | - |
| | 216 | NSC3 | HC-N3-12M | %RH | -0.20 | 0-100 | IST humidity | digital | - | | Nagra carrier 1 | - |
| | 217 | NSC3 | T-N3-12M | °C | -0.20 | 0-165 | Pt1000 | digital | - | | Nagra carrier 1 | - |
| | 218 | NSC3 | HC-N3-3M | %RH | -0.20 | 0-100 | IST humidity | digital | - | | Nagra carrier 1 | - |
| | 219 | NSC3 | T-N3-3M | °C | -0.20 | 0-165 | Pt1000 | digital | - | | Nagra carrier 1 | - |
| | 220 | NSC3 | HC-N3-3C | %RH | -0.35 | 0-100 | IST humidity | digital | - | | Nagra carrier 1 | - |
| | 221 | NSC3 | T-N3-3C | °C | -0.35 | 0-165 | Pt1000 | digital | - | | Nagra carrier 1 | - |
| | 222 | NSC1 | HC-N1-3M | %RH | -0.20 | 0-100 | IST humidity | digital | - | | Nagra carrier 1 | - |
| | 223 | NSC1 | T-N1-3M | °C | -0.20 | 0-165 | Pt1000 | digital | - | | Nagra carrier 1 | - |
| | 224 | NSC1 | HC-N1-3C | %RH | -0.35 | 0-100 | IST humidity | digital | - | | Nagra carrier 1 | - |
| | 225 | NSC1 | T-N1-3C | °C | -0.35 | 0-165 | Pt1000 | digital | - | | Nagra carrier 1 | - |
| | 226 | NSC3 | HC-N3-9M | %RH | -0.20 | 0-100 | IST humidity | digital | - | | Nagra carrier 1 | - |
| | 227 | NSC3 | T-N3-9M | °C | -0.20 | 0-165 | Pt1000 | digital | - | | Nagra carrier 1 | - |
| | 228 | NSC1 | HC-N1-5Bt | %RH | -0.35 | 0-100 | IST humidity | digital | - | | Nagra carrier 2 | - |
| | 229 | NSC1 | T-N1-5Bt | °C | -0.35 | 0-165 | Pt1000 | digital | - | | Nagra carrier 2 | - |
| | 230 | NSC2 | HC-N2-12H | %RH | 0.00 | 0-100 | IST humidity | digital | - | | Nagra carrier 2 | - |
| | 231 | NSC2 | T-N2-12H | °C | 0.00 | 0-165 | Pt1000 | digital | - | | Nagra carrier 2 | - |
| | 232 | NSC2 | HC-N2-3M | %RH | -0.20 | 0-100 | IST humidity | digital | - | | Nagra carrier 2 | - |
| | 233 | NSC2 | T-N2-3M | °C | -0.20 | 0-165 | Pt1000 | digital | - | | Nagra carrier 2 | - |
| | 234 | NSC2 | HC-N2-3H | %RH | 0.00 | 0-100 | IST humidity | digital | - | | Nagra carrier 2 | - |
| | 235 | NSC2 | T-N2-3H | °C | 0.00 | 0-165 | Pt1000 | digital | - | | Nagra carrier 2 | - |
| | 238 | NSC2 | HC-N2-3C | %RH | -0.35 | 0-100 | IST humidity | digital | - | | Nagra carrier 2 | - |
| | 239 | NSC2 | T-N2-3C | °C | -0.35 | 0-165 | Pt1000 | digital | - | | Nagra carrier 2 | - |
| | 240 | NSC1 | HC-N1-12H | %RH | 0.00 | 0-100 | IST humidity | digital | - | | Nagra carrier 2 | - |
| | 241 | NSC1 | T-N1-12H | °C | 0.00 | 0-165 | Pt1000 | digital | - | | Nagra carrier 2 | - |
| | 242 | NSC1 | HC-N1-3H | %RH | 0.00 | 0-100 | IST humidity | digital | - | | Nagra carrier 2 | - |

| INTERFACE Sensor assembling box | DAS - Channel | Borehole | Sensor name | Unit | Depth [m] | Range | Sensor type | Output signal | Sensor SN | Status | Profile | Atmos-pheric pressure |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 243 | NSC1 | T-N1-3H | °C | 0.00 | 0-165 | Pt1000 | digital | - | | Nagra carrier 2 | - |
| | 244 | NSC1 | HC-N1-9H | %RH | 0.00 | 0-100 | IST humidity | digital | - | | Nagra carrier 2 | - |
| | 245 | NSC1 | T-N1-9H | °C | 0.00 | 0-165 | Pt1000 | digital | - | | Nagra carrier 2 | - |
| | 246 | NSC2 | HC-N2-9H | %RH | 0.00 | 0-100 | IST humidity | digital | - | | Nagra carrier 2 | - |
| | 247 | NSC2 | T-N2-9H | °C | 0.00 | 0-165 | Pt1000 | digital | - | | Nagra carrier 2 | - |
| | 248 | NSC2 | HC-N2-12M | %RH | -0.20 | 0-100 | IST humidity | digital | - | | Nagra carrier 2 | - |
| | 249 | NSC2 | T-N2-12M | °C | -0.20 | 0-165 | Pt1000 | digital | - | | Nagra carrier 2 | - |
| | 250 | NSC3 | HC-N3-9C | %RH | -0.35 | 0-100 | IST humidity | digital | - | | Nagra carrier 2 | - |
| | 251 | NSC3 | T-N3-9C | °C | -0.35 | 0-165 | Pt1000 | digital | - | | Nagra carrier 2 | - |
| | 252 | NSC2 | HC-N2-7Bl | %RH | -0.20 | 0-100 | IST humidity | digital | - | | Nagra carrier 2 | - |
| | 253 | NSC2 | T-N2-7Bl | °C | -0.20 | 0-165 | Pt1000 | digital | - | | Nagra carrier 2 | - |
| | 254 | NSC2 | HC-N2-9C | %RH | -0.35 | 0-100 | IST humidity | digital | - | | Nagra carrier 2 | - |
| | 255 | NSC2 | T-N2-9C | °C | -0.35 | 0-165 | Pt1000 | digital | - | | Nagra carrier 2 | - |
| | 256 | NSC3 | HC-N3-7Bl | %RH | -0.20 | 0-100 | IST humidity | digital | - | | Nagra carrier 3 | - |
| | 257 | NSC3 | T-N3-7Bl | °C | -0.20 | 0-165 | Pt1000 | digital | - | | Nagra carrier 3 | - |
| | 258 | NSC2 | HC-N2-9M | %RH | -0.20 | 0-100 | IST humidity | digital | - | | Nagra carrier 3 | - |
| | 259 | NSC2 | T-N2-9M | °C | -0.20 | 0-165 | Pt1000 | digital | - | | Nagra carrier 3 | - |
| | 260 | NSC1 | HC-N1-12C | %RH | -0.35 | 0-100 | IST humidity | digital | - | | Nagra carrier 3 | - |
| | 261 | NSC1 | T-N1-12C | °C | -0.35 | 0-165 | Pt1000 | digital | - | | Nagra carrier 3 | - |
| | 262 | NSC1 | HC-N1-9M | %RH | -0.20 | 0-100 | IST humidity | digital | - | | Nagra carrier 3 | - |
| | 263 | NSC1 | T-N1-9M | °C | -0.20 | 0-165 | Pt1000 | digital | - | | Nagra carrier 3 | - |
| | 264 | NSC1 | HC-N1-12M | %RH | -0.20 | 0-100 | IST humidity | digital | - | | Nagra carrier 3 | - |
| | 265 | NSC1 | T-N1-12M | °C | -0.20 | 0-165 | Pt1000 | digital | - | | Nagra carrier 3 | - |
| | 266 | NSC3 | HC-N3-7Bt | %RH | -0.35 | 0-100 | IST humidity | digital | - | | Nagra carrier 3 | - |
| | 267 | NSC3 | T-N3-7Bt | °C | -0.35 | 0-165 | Pt1000 | digital | - | | Nagra carrier 3 | - |
| | 268 | NSC2 | HC-N2-7Bt | %RH | -0.35 | 0-100 | IST humidity | digital | - | | Nagra carrier 3 | - |
| | 269 | NSC2 | T-N2-7Bt | °C | -0.35 | 0-165 | Pt1000 | digital | - | | Nagra carrier 3 | - |

| INTERFACE Sensor assembling box | DAS - Channel | Borehole | Sensor name | Unit | Depth [m] | Range | Sensor type | Output signal | Sensor SN | Status | Profile | Atmos-pheric pressure |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 270 | NSC1 | HC-N1-9C | %RH | -0.35 | 0-100 | IST humidity | digital | - | | Nagra carrier 3 | - |
| | 271 | NSC1 | T-N1-9C | °C | -0.35 | 0-165 | Pt1000 | digital | - | | Nagra carrier 3 | - |
| | 272 | NSC1 | HC-N1-7Bl | %RH | -0.20 | 0-100 | IST humidity | digital | - | | Nagra carrier 3 | - |
| | 273 | NSC1 | T-N1-7Bl | °C | -0.20 | 0-165 | Pt1000 | digital | - | | Nagra carrier 3 | - |
| | 274 | NSC1 | HC-N1-7Bt | %RH | -0.35 | 0-100 | IST humidity | digital | - | | Nagra carrier 3 | - |
| | 275 | NSC1 | T-N1-7Bt | °C | -0.35 | 0-165 | Pt1000 | digital | - | | Nagra carrier 3 | - |
| | 276 | NSC2 | HC-N2-12C | %RH | -0.35 | 0-100 | IST humidity | digital | - | | Nagra carrier 3 | - |
| | 277 | NSC2 | T-N2-12C | °C | -0.35 | 0-165 | Pt1000 | digital | - | | Nagra carrier 3 | - |
| | 278 | NSC3 | HC-N3-5Bl | %RH | -0.20 | 0-100 | IST humidity | digital | - | defective | Nagra carrier 3 | - |
| | 279 | NSC3 | T-N3-5Bl | °C | -0.20 | 0-165 | Pt1000 | digital | - | defective | Nagra carrier 3 | - |
| | 280 | NSC1 | HC-N1-R | %RH | -0.10 | 0-100 | IST humidity | digital | - | | Nagra carrier 3 | - |
| | 281 | NSC1 | T-N1-R | °C | -0.10 | 0-165 | Pt1000 | digital | - | | Nagra carrier 3 | - |
| INTERFACE Humidity GRS Zone | 302 | GSC3 | HC-G3-7Bt | %RH | -0.35 | 0-100 | IST humidity | digital | - | | GRS carrier 3 | - |
| | 303 | GSC3 | T-G3-7Bt | °C | -0.35 | 0-165 | Pt1000 | digital | - | | GRS carrier 3 | - |
| | 304 | GSC2 | HC-G2-9M | %RH | -0.20 | 0-100 | IST humidity | digital | - | | GRS carrier 2 | - |
| | 305 | GSC2 | T-G2-9M | °C | -0.20 | 0-165 | Pt1000 | digital | - | | GRS carrier 2 | - |
| | 306 | GSC1 | HC-G1-7Bl | %RH | -0.20 | 0-100 | IST humidity | digital | - | | GRS carrier 1 | - |
| | 307 | GSC1 | T-G1-7Bl | °C | -0.20 | 0-165 | Pt1000 | digital | - | | GRS carrier 1 | - |
| | 308 | GSC1 | HC-G1-9M | %RH | -0.20 | 0-100 | IST humidity | digital | - | | GRS carrier 1 | - |
| | 309 | GSC1 | T-G1-9M | °C | -0.20 | 0-165 | Pt1000 | digital | - | | GRS carrier 1 | - |
| | 310 | GSC1 | HC-G1-5Bl | %RH | -0.10 | 0-100 | IST humidity | digital | - | | GRS carrier 1 | - |
| | 311 | GSC1 | T-G1-5Bl | °C | -0.10 | 0-165 | Pt1000 | digital | - | | GRS carrier 1 | - |
| | 312 | GSC1 | HC-G1-12M | %RH | -0.20 | 0-100 | IST humidity | digital | - | | GRS carrier 1 | - |
| | 313 | GSC1 | T-G1-12M | °C | -0.20 | 0-165 | Pt1000 | digital | - | | GRS carrier 1 | - |
| | 314 | GSC2 | HC-G2-12C | %RH | -0.35 | 0-100 | IST humidity | digital | - | | GRS carrier 2 | - |
| | 315 | GSC2 | T-G2-12C | °C | -0.35 | 0-165 | Pt1000 | digital | - | | GRS carrier 2 | - |
| | 316 | GSC1 | HC-G1-12H | %RH | 0.00 | 0-100 | IST humidity | digital | - | | GRS carrier 1 | - |

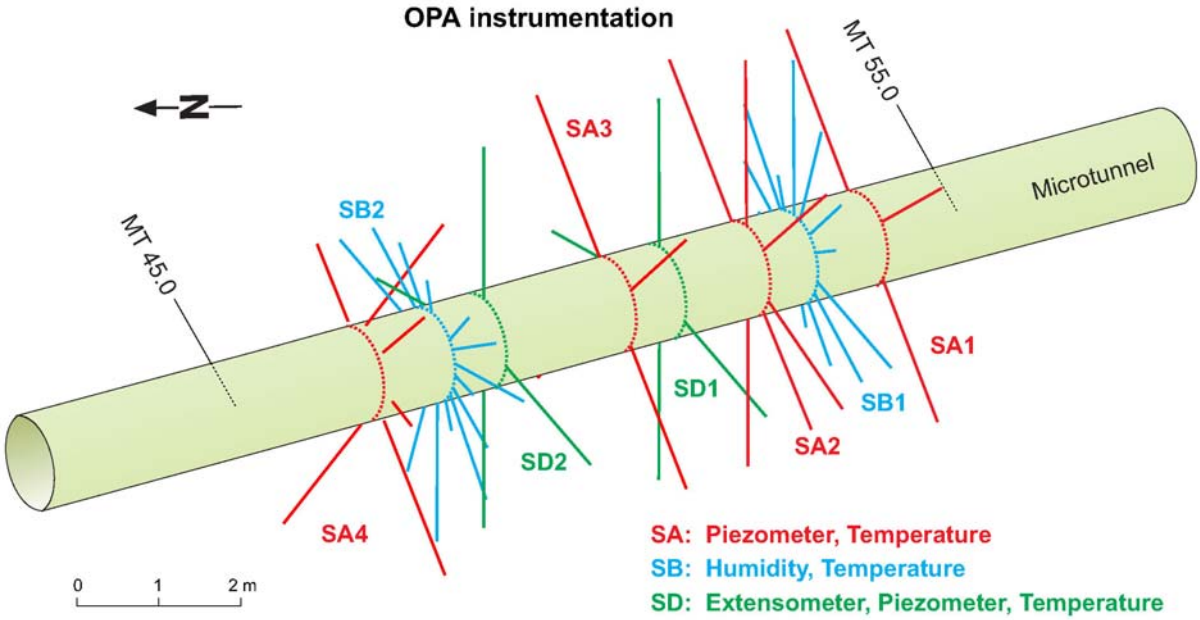
| INTERFACE Sensor assembling box | DAS - Channel | Borehole | Sensor name | Unit | Depth [m] | Range | Sensor type | Output signal | Sensor SN | Status | Profile | Atmos-pheric pressure |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 317 | GSC1 | T-G1-12H | °C | 0.00 | 0-165 | Pt1000 | digital | - | | GRS carrier 1 | - |
| | 318 | GSC1 | HC-G1-7Bt | %RH | -0.35 | 0-100 | IST humidity | digital | - | | GRS carrier 1 | - |
| | 319 | GSC1 | T-G1-7Bt | °C | -0.35 | 0-165 | Pt1000 | digital | - | | GRS carrier 1 | - |
| | 320 | GSC1 | HC-G1-9H | %RH | 0.00 | 0-100 | IST humidity | digital | - | | GRS carrier 1 | - |
| | 321 | GSC1 | T-G1-9H | °C | 0.00 | 0-165 | Pt1000 | digital | - | defective | GRS carrier 1 | - |
| | 322 | GSC2 | HC-G2-12H | %RH | 0.00 | 0-100 | IST humidity | digital | - | | GRS carrier 2 | - |
| | 323 | GSC2 | T-G2-12H | °C | 0.00 | 0-165 | Pt1000 | digital | - | | GRS carrier 2 | - |
| | 324 | GSC2 | HC-G2-7Bt | %RH | -0.35 | 0-100 | IST humidity | digital | - | | GRS carrier 2 | - |
| | 325 | GSC2 | T-G2-7Bt | °C | -0.35 | 0-165 | Pt1000 | digital | - | | GRS carrier 2 | - |
| | 326 | GSC2 | HC-G2-9C | %RH | -0.35 | 0-100 | IST humidity | digital | - | | GRS carrier 2 | - |
| | 327 | GSC2 | T-G2-9C | °C | -0.35 | 0-165 | Pt1000 | digital | - | | GRS carrier 2 | - |
| | 328 | GSC2 | HC-G2-7Bl | %RH | -0.20 | 0-100 | IST humidity | digital | - | | GRS carrier 2 | - |
| | 329 | GSC2 | T-G2-7Bl | °C | -0.20 | 0-165 | Pt1000 | digital | - | | GRS carrier 2 | - |
| | 332 | GSC3 | HC-G3-7Bl | %RH | -0.20 | 0-100 | IST humidity | digital | - | | GRS carrier 3 | - |
| | 333 | GSC3 | T-G3-7Bl | °C | -0.20 | 0-165 | Pt1000 | digital | - | | GRS carrier 3 | - |
| | 334 | GSC3 | HC-G3-9C | %RH | -0.35 | 0-100 | IST humidity | digital | - | | GRS carrier 3 | - |
| | 335 | GSC3 | T-G3-9C | °C | -0.35 | 0-165 | Pt1000 | digital | - | | GRS carrier 3 | - |
| | 336 | GSC1 | HC-G1-9C | %RH | -0.35 | 0-100 | IST humidity | digital | - | | GRS carrier 1 | - |
| | 337 | GSC1 | T-G1-9C | °C | -0.35 | 0-165 | Pt1000 | digital | - | | GRS carrier 1 | - |
| | 338 | GSC3 | HC-G3-12H | %RH | 0.00 | 0-100 | IST humidity | digital | - | | GRS carrier 3 | - |
| | 339 | GSC3 | T-G3-12H | °C | 0.00 | 0-165 | Pt1000 | digital | - | | GRS carrier 3 | - |
| | 340 | GSC1 | HC-G1-3H | %RH | 0.00 | 0-100 | IST humidity | digital | - | | GRS carrier 1 | - |
| | 341 | GSC1 | T-G1-3H | °C | 0.00 | 0-165 | Pt1000 | digital | - | | GRS carrier 1 | - |
| | 342 | GSC3 | HC-G3-9M | %RH | -0.20 | 0-100 | IST humidity | digital | - | | GRS carrier 3 | - |
| | 343 | GSC3 | T-G3-9M | °C | -0.20 | 0-165 | Pt1000 | digital | - | | GRS carrier 3 | - |
| | 344 | GSC3 | HC-G3-12C | %RH | -0.35 | 0-100 | IST humidity | digital | - | | GRS carrier 3 | - |
| | 345 | GSC3 | T-G3-12C | °C | -0.35 | 0-165 | Pt1000 | digital | - | | GRS carrier 3 | - |

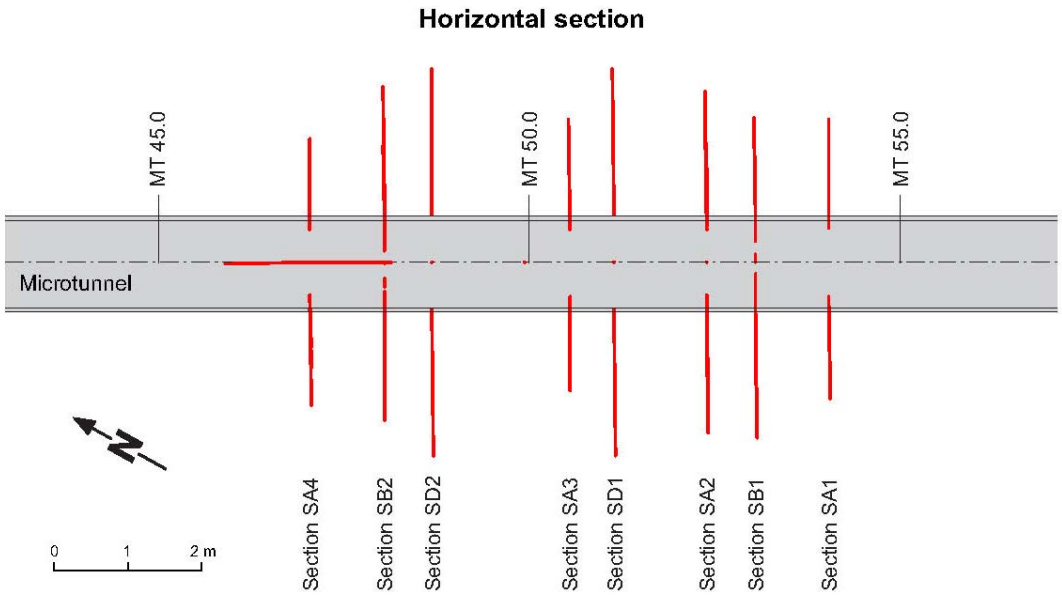
| INTERFACE Sensor assembling box | DAS - Channel | Borehole | Sensor name | Unit | Depth [m] | Range | Sensor type | Output signal | Sensor SN | Status | Profile | Atmos-pheric pressure |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 346 | GSC1 | HC-G1-3M | %RH | -0.20 | 0-100 | IST humidity | digital | - | | GRS carrier 1 | - |
| | 347 | GSC1 | T-G1-3M | °C | -0.20 | 0-165 | Pt1000 | digital | - | | GRS carrier 1 | - |
| | 348 | GSC1 | HC-G1-3C | %RH | -0.35 | 0-100 | IST humidity | digital | - | | GRS carrier 1 | - |
| | 349 | GSC1 | T-G1-3C | °C | -0.35 | 0-165 | Pt1000 | digital | - | | GRS carrier 1 | - |
| | 350 | GSC3 | HC-G3-12M | %RH | -0.20 | 0-100 | IST humidity | digital | - | | GRS carrier 3 | - |
| | 351 | GSC3 | T-G3-12M | °C | -0.20 | 0-165 | Pt1000 | digital | - | | GRS carrier 3 | - |
| | 352 | GSC2 | HC-G2-12M | %RH | -0.20 | 0-100 | IST humidity | digital | - | | GRS carrier 2 | - |
| | 353 | GSC2 | T-G2-12M | °C | -0.20 | 0-165 | Pt1000 | digital | - | | GRS carrier 2 | - |
| | 354 | GSC1 | HC-G1-12C | %RH | -0.35 | 0-100 | IST humidity | digital | - | | GRS carrier 1 | - |
| | 355 | GSC1 | T-G1-12C | °C | -0.35 | 0-165 | Pt1000 | digital | - | | GRS carrier 1 | - |
| | 356 | GSC1 | HC-G1-5Bt | %RH | -0.35 | 0-100 | IST humidity | digital | - | | GRS carrier 1 | - |
| | 357 | GSC1 | T-G1-5Bt | °C | -0.35 | 0-165 | Pt1000 | digital | - | | GRS carrier 1 | - |
| | 358 | GSC2 | HC-G2-3H | %RH | 0.00 | 0-100 | IST humidity | digital | - | | GRS carrier 2 | - |
| | 359 | GSC2 | T-G2-3H | °C | 0.00 | 0-165 | Pt1000 | digital | - | | GRS carrier 2 | - |
| | 360 | GSC2 | HC-G2-9H | %RH | 0.00 | 0-100 | IST humidity | digital | - | | GRS carrier 2 | - |
| | 361 | GSC2 | T-G2-9H | °C | 0.00 | 0-165 | Pt1000 | digital | - | | GRS carrier 2 | - |
| | 362 | GSC2 | HC-G2-3C | %RH | -0.35 | 0-100 | IST humidity | digital | - | | GRS carrier 2 | - |
| | 363 | GSC2 | T-G2-3C | °C | -0.35 | 0-165 | Pt1000 | digital | - | | GRS carrier 2 | - |
| | 364 | GSC2 | HC-G2-3M | %RH | -0.20 | 0-100 | IST humidity | digital | - | | GRS carrier 2 | - |
| | 365 | GSC2 | T-G2-3M | °C | -0.20 | 0-165 | Pt1000 | digital | - | | GRS carrier 2 | - |
| | 366 | GSC3 | HC-G3-9H | %RH | 0.00 | 0-100 | IST humidity | digital | - | | GRS carrier 3 | - |
| | 367 | GSC3 | T-G3-9H | °C | 0.00 | 0-165 | Pt1000 | digital | - | defective | GRS carrier 3 | - |
| | 368 | GSC3 | HC-G3-5Bl | %RH | -0.35 | 0-100 | IST humidity | digital | - | | GRS carrier 3 | - |
| | 369 | GSC3 | T-G3-5Bl | °C | -0.35 | 0-165 | Pt1000 | digital | - | | GRS carrier 3 | - |
| | 370 | GSC3 | HC-G3-R | %RH | -0.10 | 0-100 | IST humidity | digital | - | | GRS carrier 3 | - |
| | 371 | GSC3 | T-G3-R | °C | -0.10 | 0-165 | Pt1000 | digital | - | | GRS carrier 3 | - |
| | 372 | GSC3 | HC-G3-3M | %RH | -0.20 | 0-100 | IST humidity | digital | - | | GRS carrier 3 | - |

| INTERFACE Sensor assembling box | DAS - Channel | Borehole | Sensor name | Unit | Depth [m] | Range | Sensor type | Output signal | Sensor SN | Status | Profile | Atmos-pheric pressure |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 373 | GSC3 | T-G3-3M | °C | -0.20 | 0-165 | Pt1000 | digital | - | | GRS carrier 3 | - |
| | 374 | GSC3 | HC-G3-3C | %RH | -0.35 | 0-100 | IST humidity | digital | - | | GRS carrier 3 | - |
| | 375 | GSC3 | T-G3-3C | °C | -0.35 | 0-165 | Pt1000 | digital | - | | GRS carrier 3 | - |
| | 376 | GSC2 | HC-G2-5Bl | %RH | -0.20 | 0-100 | IST humidity | digital | - | | GRS carrier 2 | - |
| | 377 | GSC2 | T-G2-5Bl | °C | -0.20 | 0-165 | Pt1000 | digital | - | | GRS carrier 2 | - |
| | 378 | GSC2 | HC-G2-5Bt | %RH | -0.35 | 0-100 | IST humidity | digital | - | | GRS carrier 2 | - |
| | 379 | GSC2 | T-G2-5Bt | °C | -0.35 | 0-165 | Pt1000 | digital | - | | GRS carrier 2 | - |
| | 380 | GSC3 | HC-G3-3H | %RH | 0.00 | 0-100 | IST humidity | digital | - | | GRS carrier 3 | - |
| | 381 | GSC3 | T-G3-3H | °C | 0.00 | 0-165 | Pt1000 | digital | - | | GRS carrier 3 | - |
| AITEMIN Humidity CR7 system | Psychro-01 | BVE-11 | HC-B11 | %RH | 0.77 | 95-99.96 | Wescor PST-55 | digital | - | Humidity > 99.96% | SB2 | - |
| | Psychro-02 | BVE-13 | HC-B13 | %RH | 1.76 | 95-99.96 | Wescor PST-55 | digital | - | Wrong humidity | SB2 | - |
| | Psychro-03 | BVE-17 | HC-B17 | %RH | 2.00 | 95-99.96 | Wescor PST-55 | digital | 39870 | Wrong humidity | SB2 | - |
| | Psychro-04 | BVE-19 | HC-B19 | %RH | 1.25 | 95-99.96 | Wescor PST-55 | digital | - | | SB2 | - |
| | Psychro-06 | BVE-21 | HC-B21 | %RH | 0.26 | 95-99.96 | Wescor PST-55 | digital | - | | SB2 | - |
| | Psychro-08 | BVE-24 | HC-B24 | %RH | 0.52 | 95-99.96 | Wescor PST-55 | digital | - | Humidity > 99.96% | SB2 | - |
| | Psychro-09 | BVE-65 | HC-B65 | %RH | 1.31 | 95-99.96 | Wescor PST-55 | digital | - | Wrong humidity | SB1 | - |
| | Psychro-11 | BVE-67 | HC-B67 | %RH | 0.27 | 95-99.96 | Wescor PST-55 | digital | - | Wrong humidity | SB1 | - |
| | Psychro-13 | BVE-74 | HC-B74 | %RH | 1.75 | 95-99.96 | Wescor PST-55 | digital | - | Humidity > 99.96% | SB1 | - |
| | Psychro-16 | Not identified | 1 | %RH | | 95-99.96 | Wescor PST-55 | digital | - | Wrong humidity | n/a | - |
| | Psychro-17 | BVE-63 | HC-B63 | %RH | 2.02 | 95-99.96 | Wescor PST-55 | digital | 39884 | Wrong humidity | SB1 | - |
| | Psychro-18 | - | Long green | %RH | | 95-99.96 | Wescor PST-55 | digital | - | Wrong humidity | n/a | - |
| | Psychro-20 | Not identified | 2 | %RH | | 95-99.96 | Wescor PST-55 | digital | - | Wrong humidity | n/a | - |
| | Psychro-21 | BVE-22 | HC-B22 | %RH | 1.50 | 95-99.96 | Wescor PST-55 | digital | 39867 | Wrong humidity | SB2 | - |
| | Psychro-22 | BVE-68 | HC-B68 | %RH | 1.53 | 95-99.96 | Wescor PST-55 | digital | - | Wrong humidity | SB1 | - |

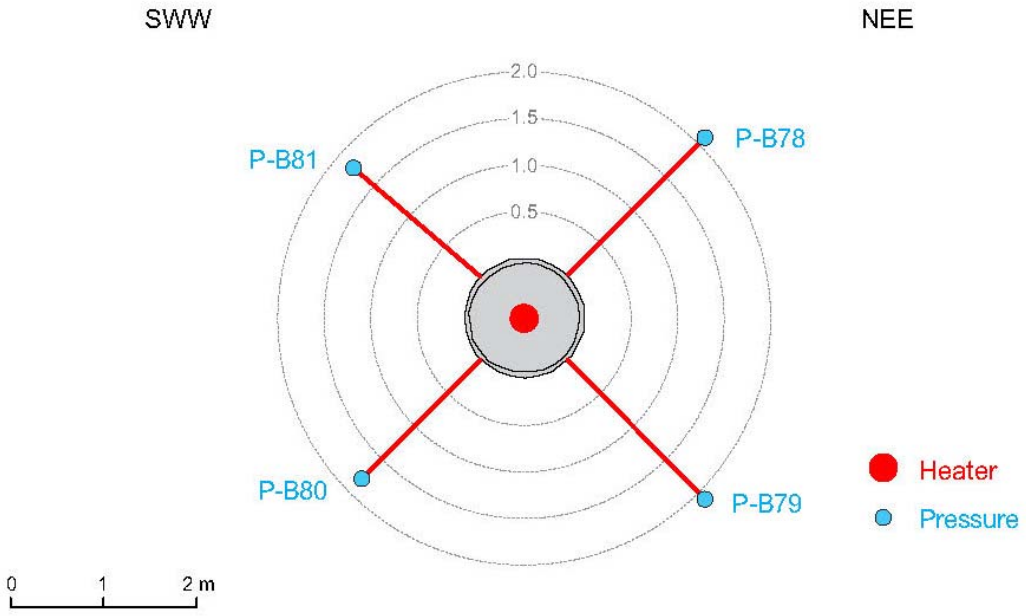
| INTERFACE Sensor assembling box | DAS - Channel | Borehole | Sensor name | Unit | Depth [m] | Range | Sensor type | Output signal | Sensor SN | Status | Profile | Atmos-pheric pressure |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Psychro-23 | - | Short green | %RH | | 95-99.96 | Wescor PST-55 | digital | - | Humidity > 99.96% | n/a | - |
| | Psychro-25 | BVE-76 | HC-B76 | %RH | 1.07 | 95-99.96 | Wescor PST-55 | digital | - | Humidity < 95% | SB1 | - |

*OPA Instrumentation - microtunnel sections*

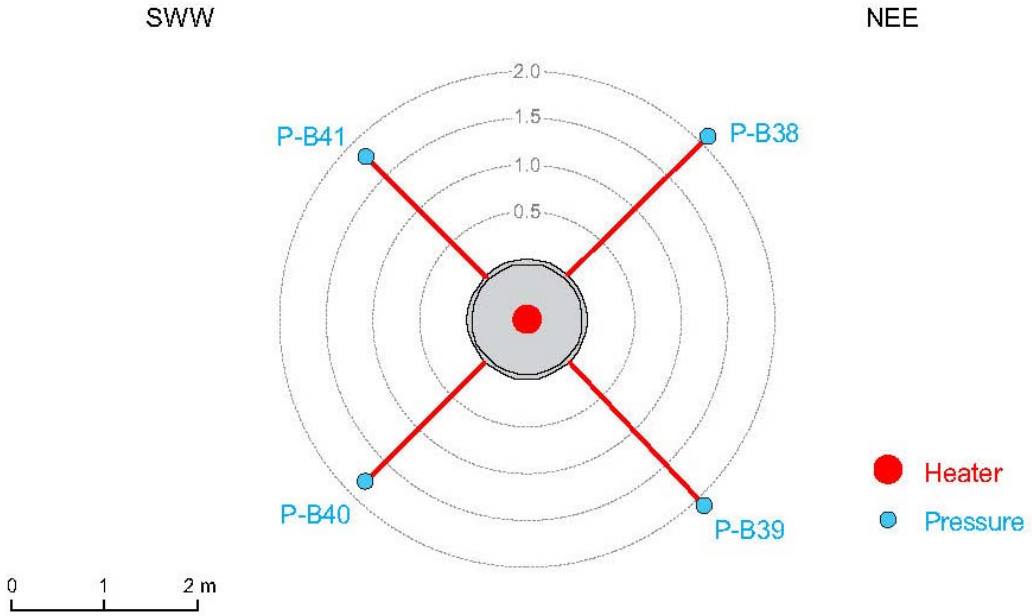


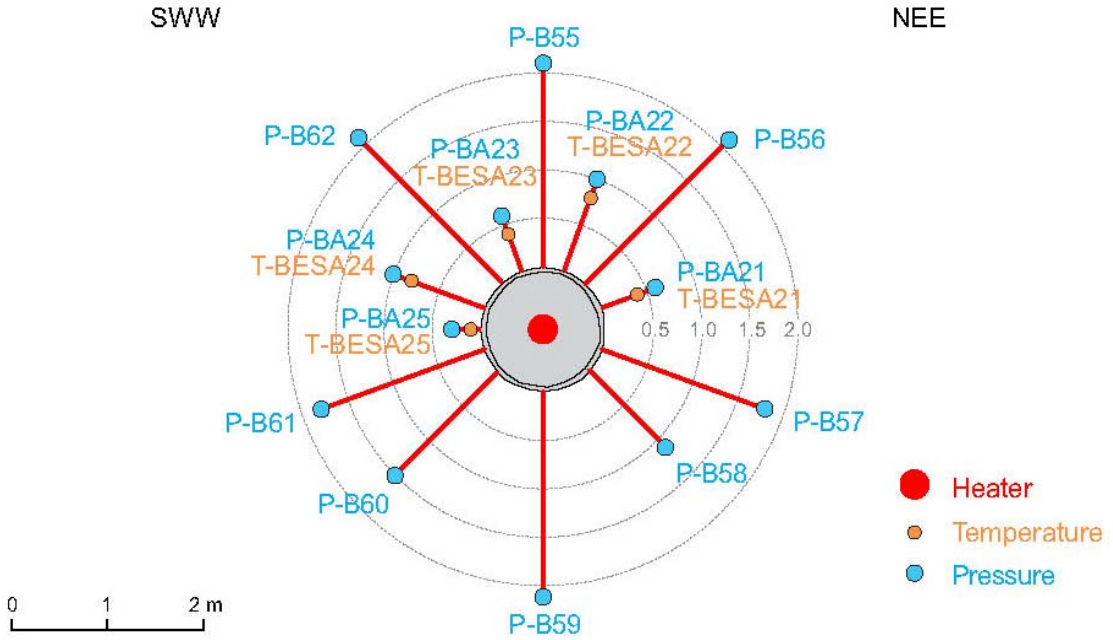
## Section SA1



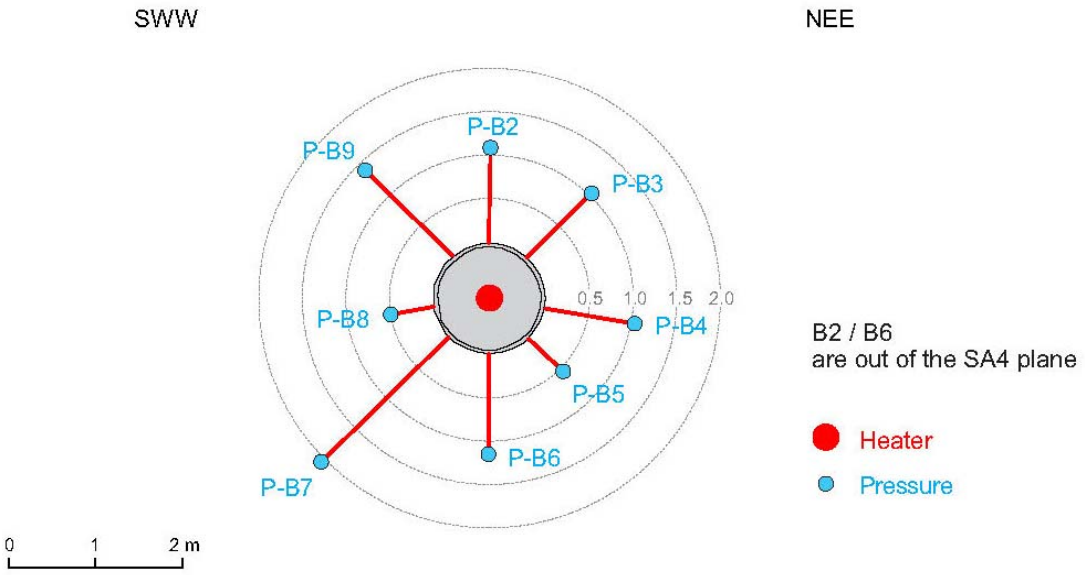

## Section SA3



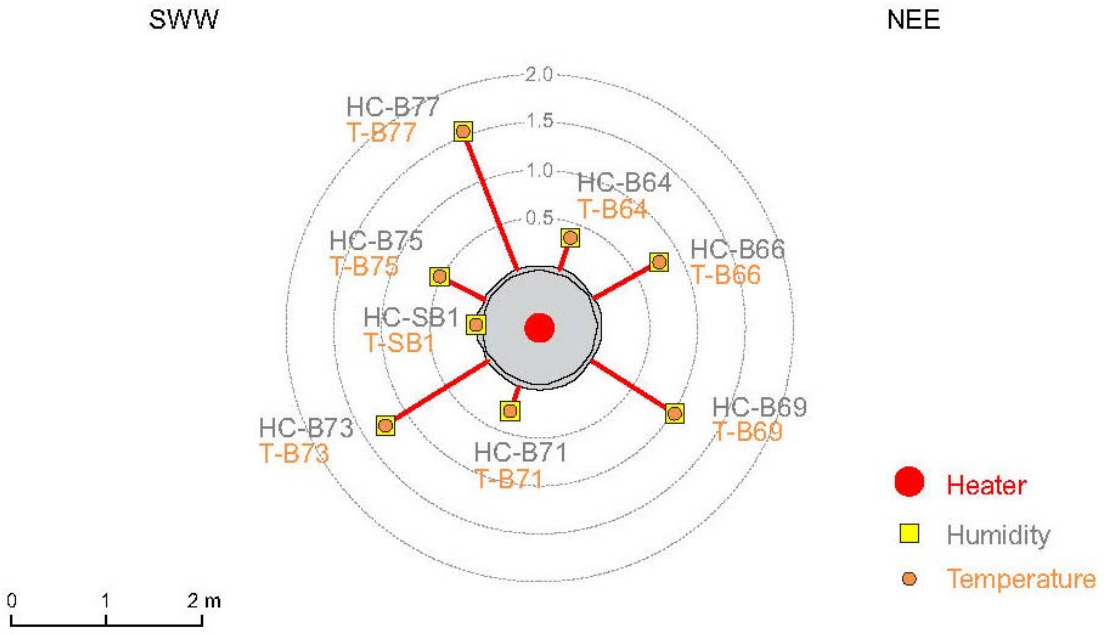
## Section SA2



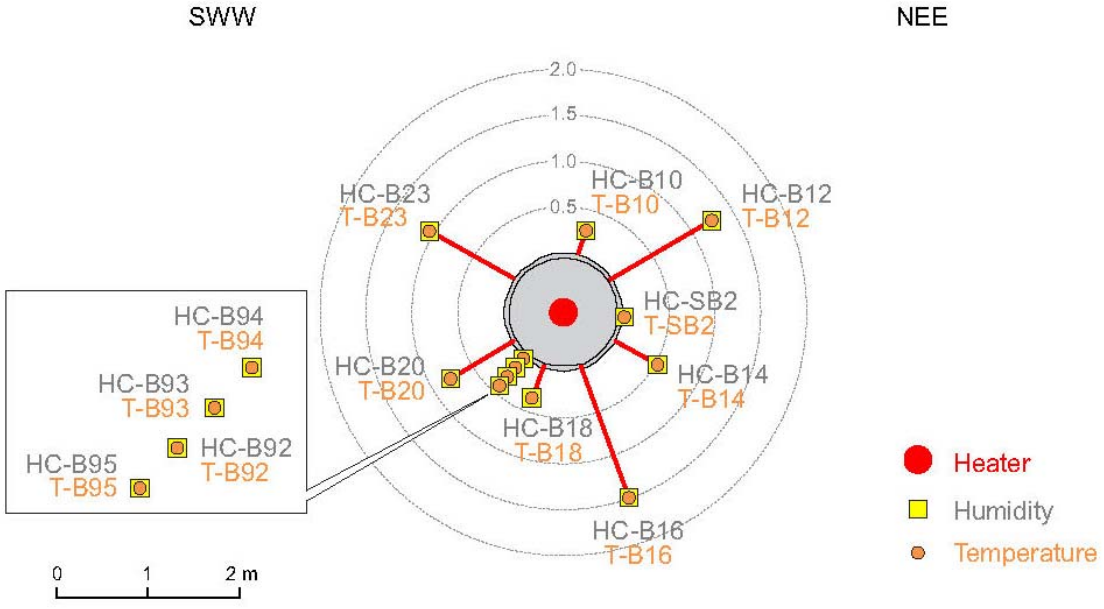

## Section SA4



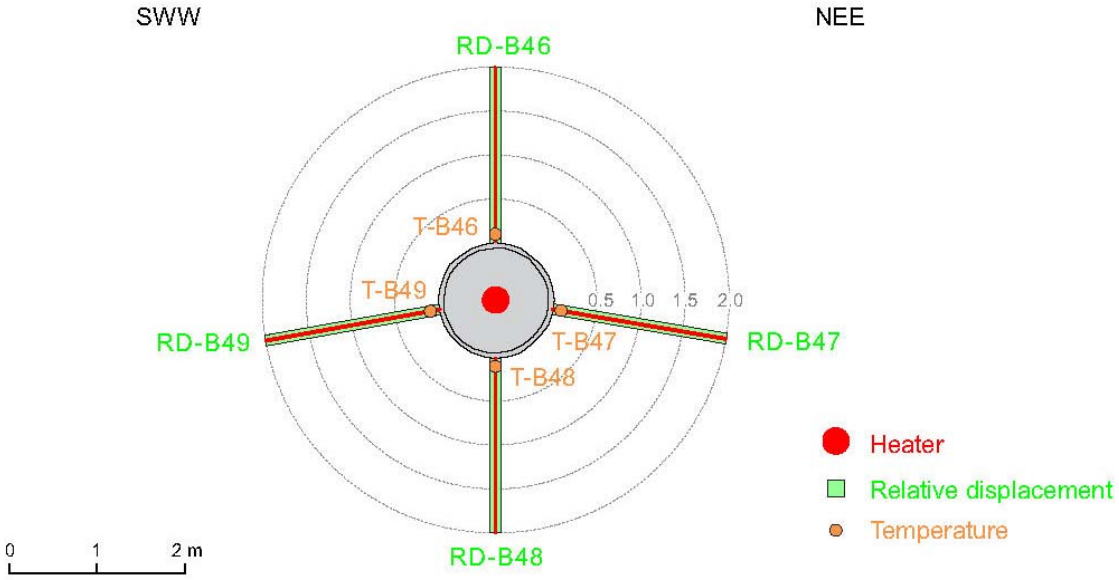
## Section SB1



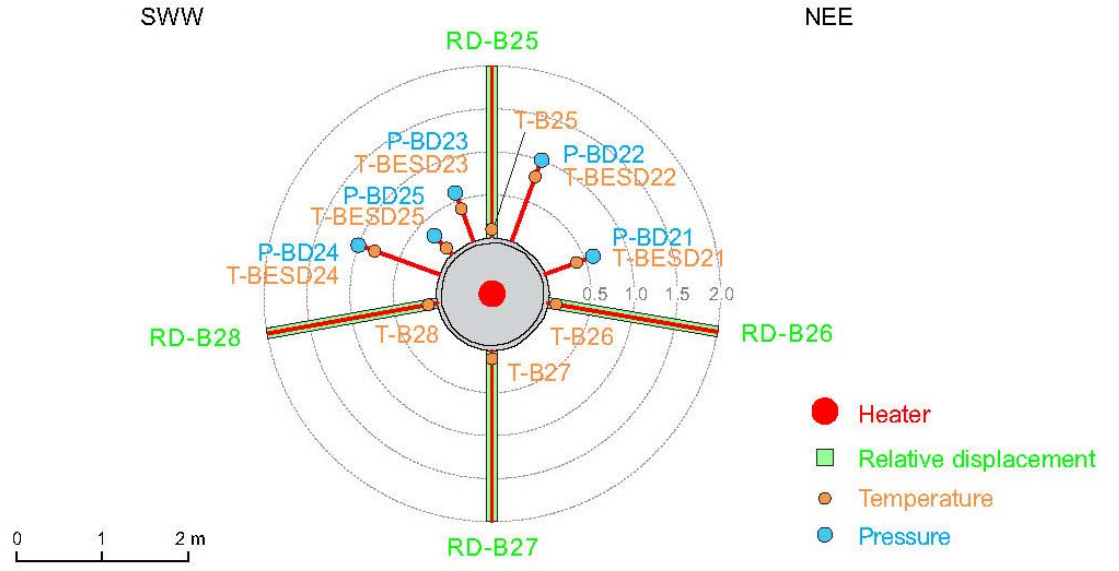

## Section SB2



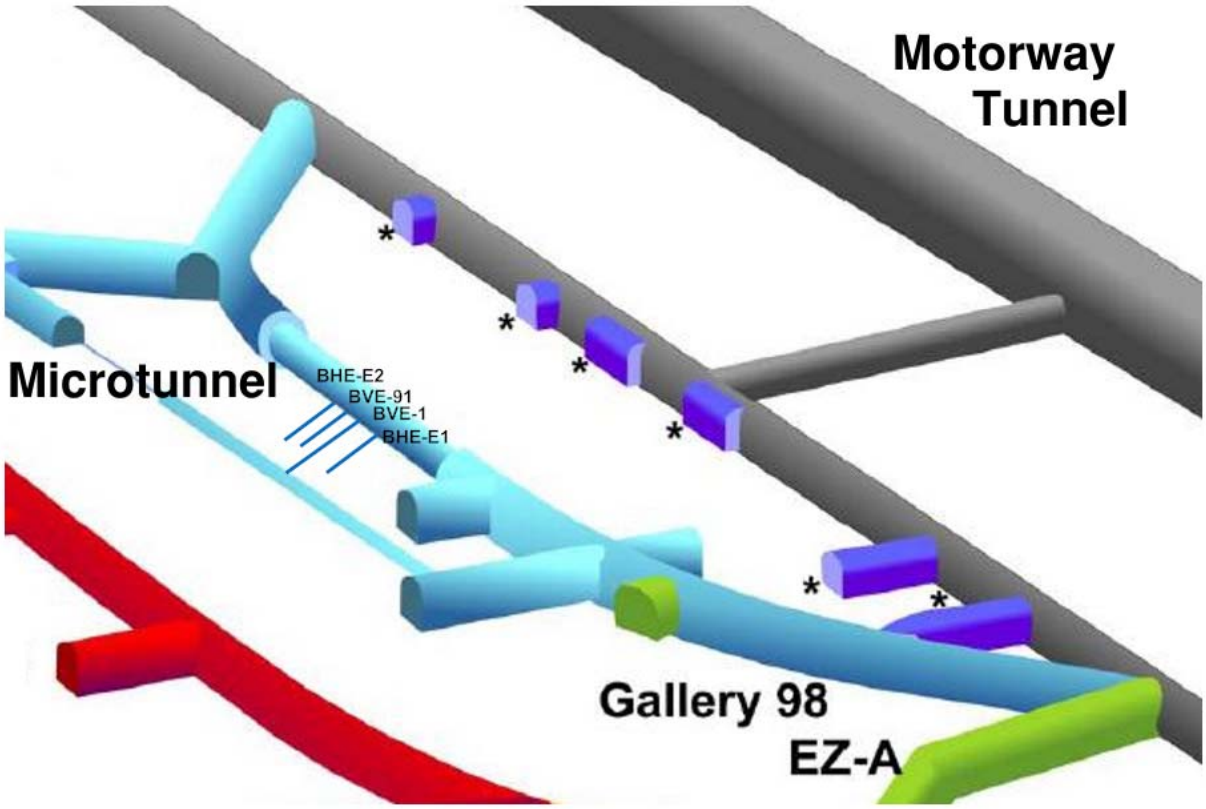
## Section SD1



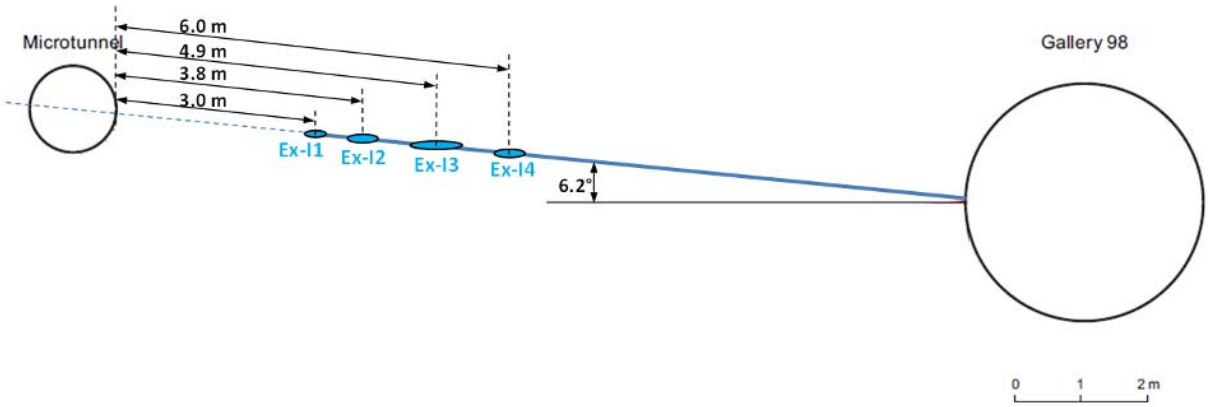

## Section SD2



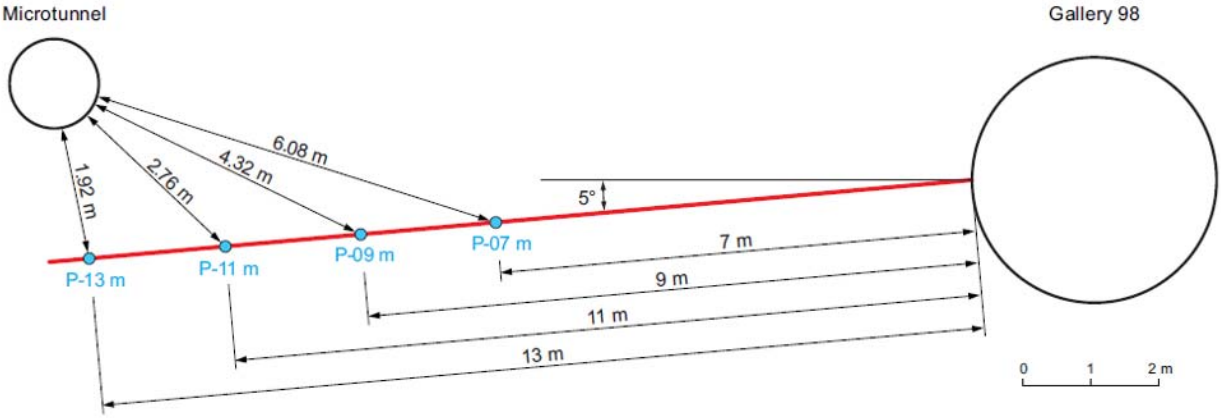
*OPA instrumentation - gallery boreholes*



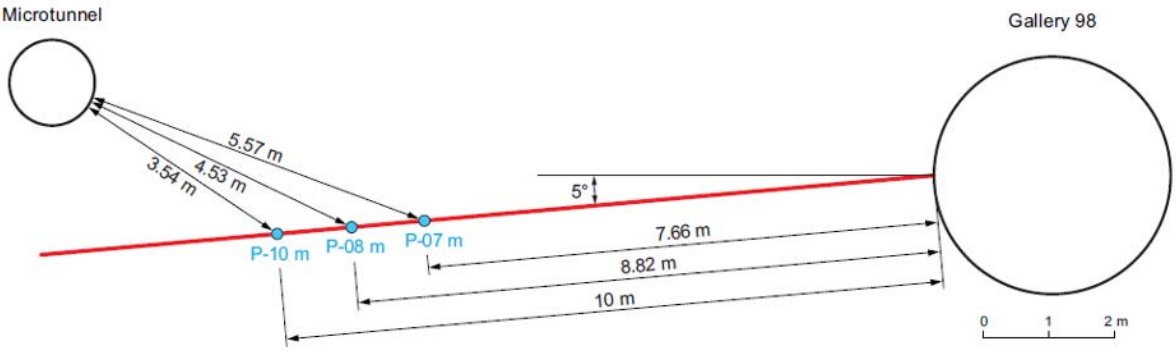
***Borehole BHE-E1 and BHE-E2***



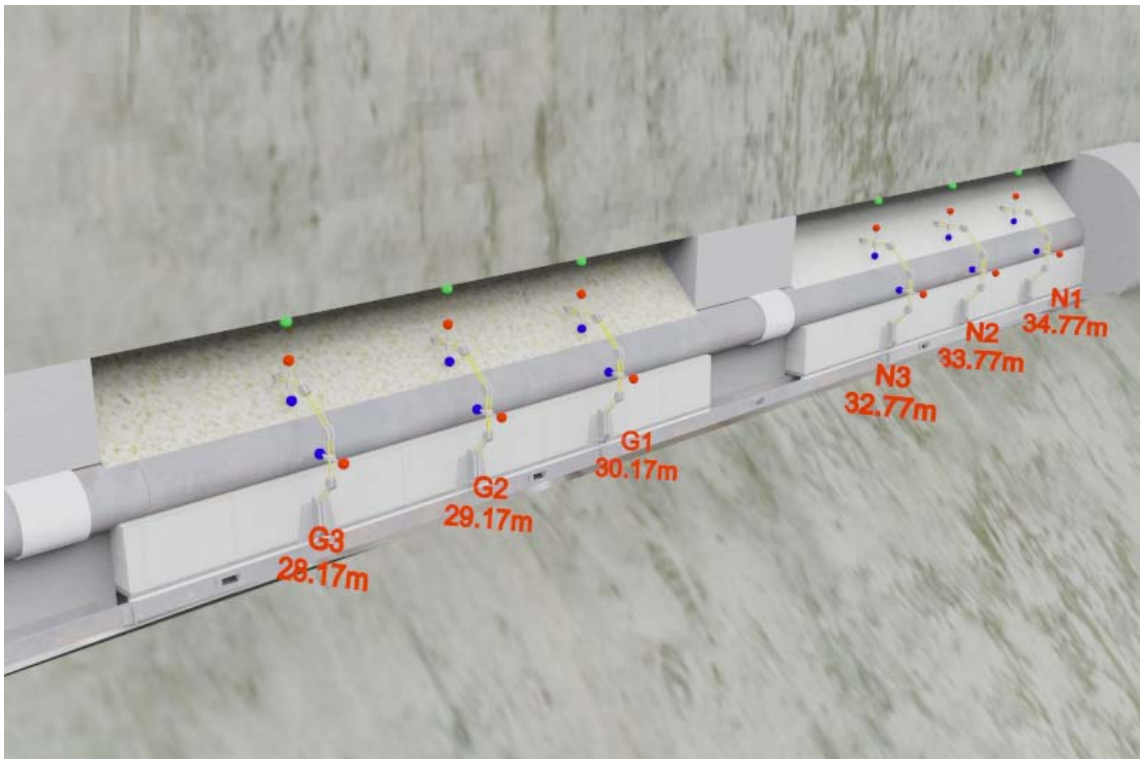

***Borehole BVE-1***

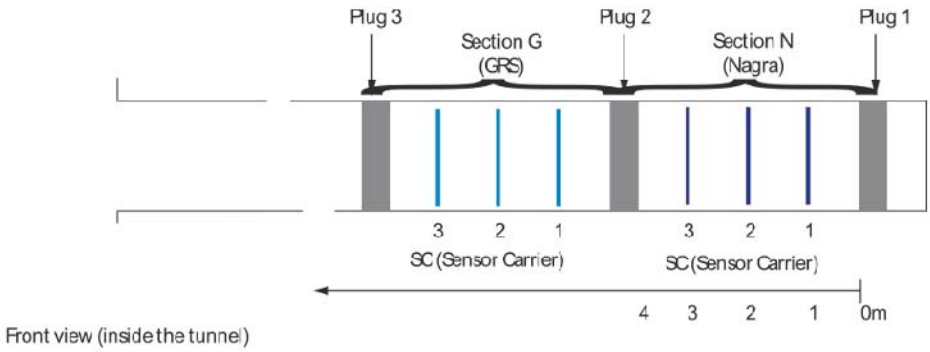



***Borehole BVE-91***

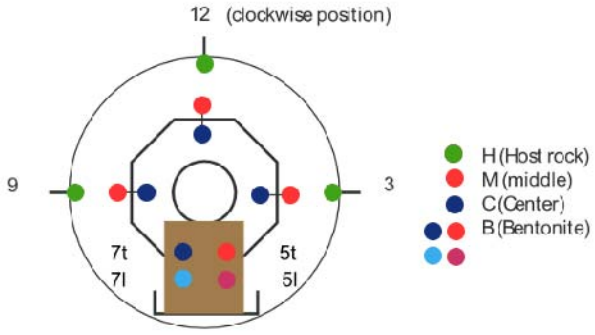


## *Engineered barrier instrumentation*



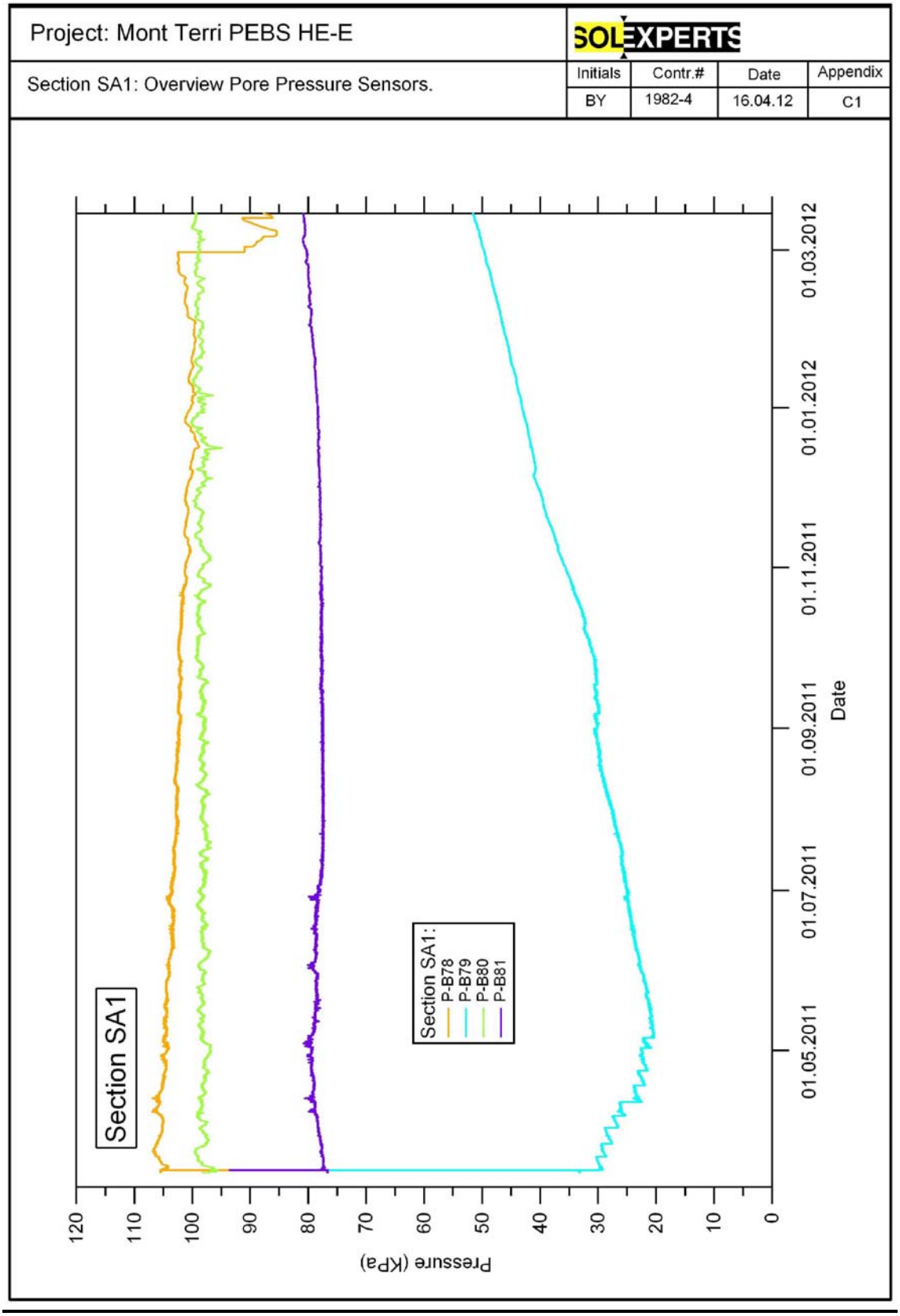




Front view (inside the tunnel)



# ***Appendix C:***

- *Data plots of the sensor in microtunnel sections*


Project: Mont Terri PEBS HE-E
SOLEXPERTS
Section SA1: Overview Pore Pressure Sensors.
Initials
Contr.#
Date
Appendix
BY
1982-4
16.04.12
C1
Section SA1
Section SA1:
P-B78
P-B79
P-B80
P-B81
Pressure (kPa)
120
110
100
90
80
70
60
50
40
30
20
10
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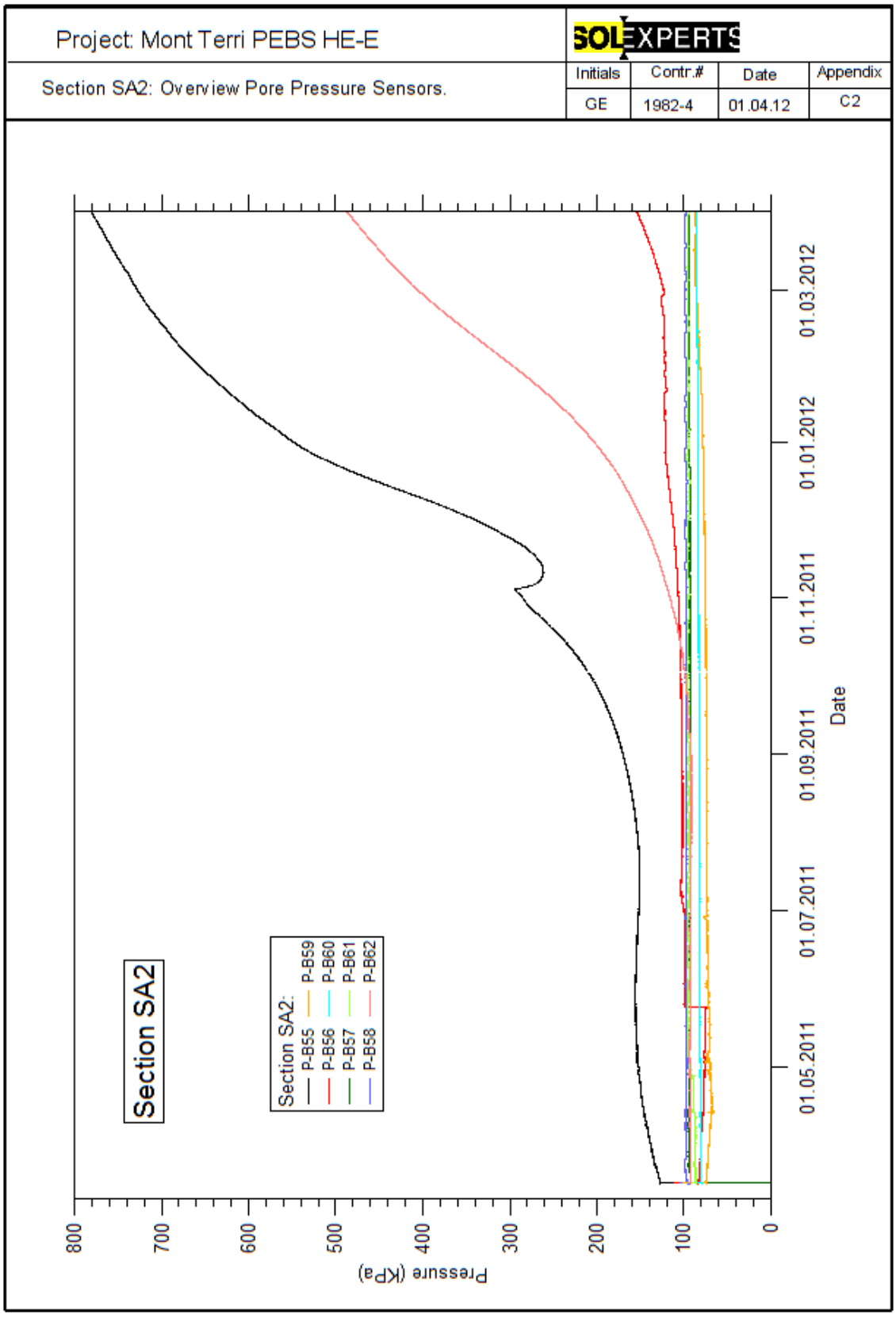
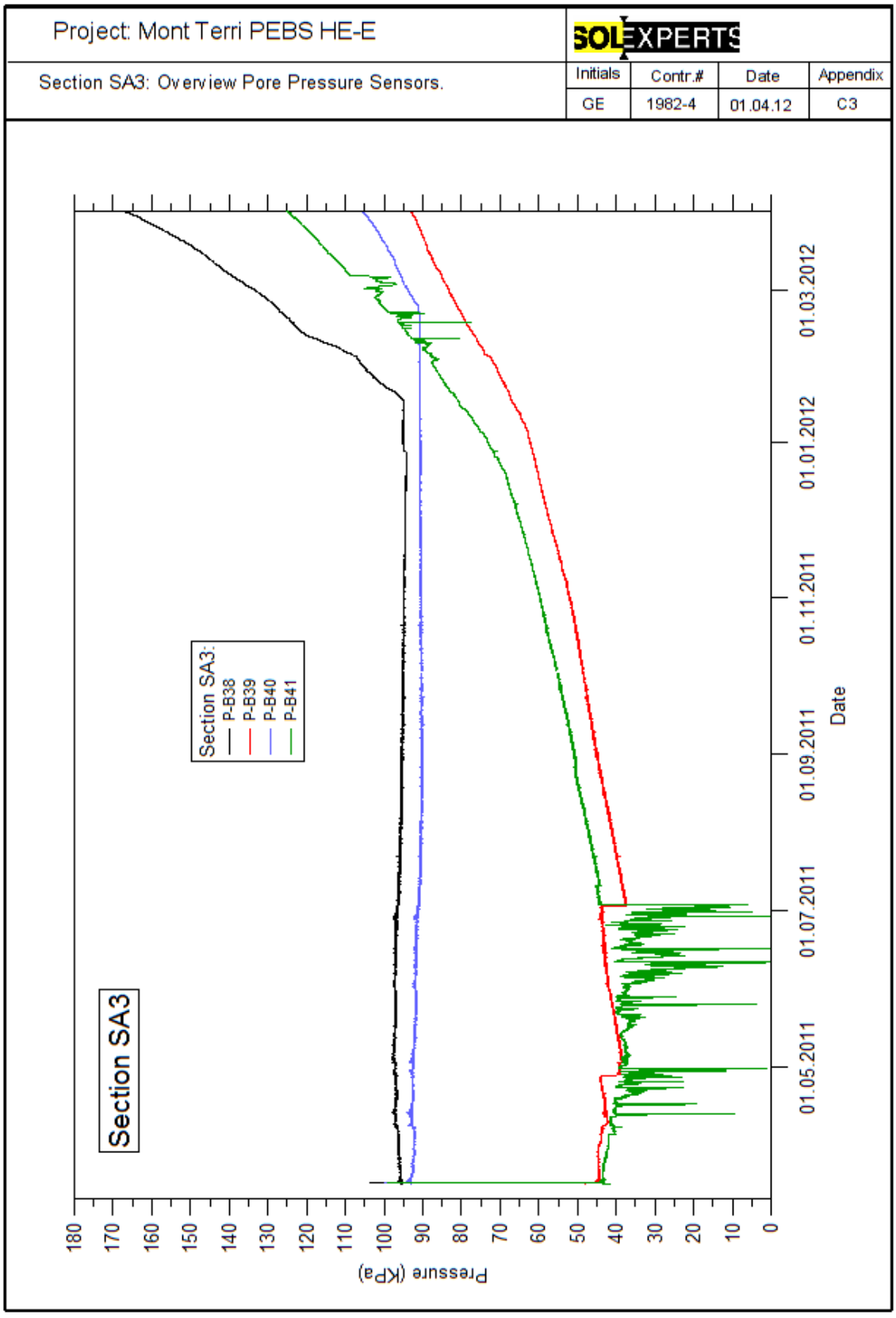
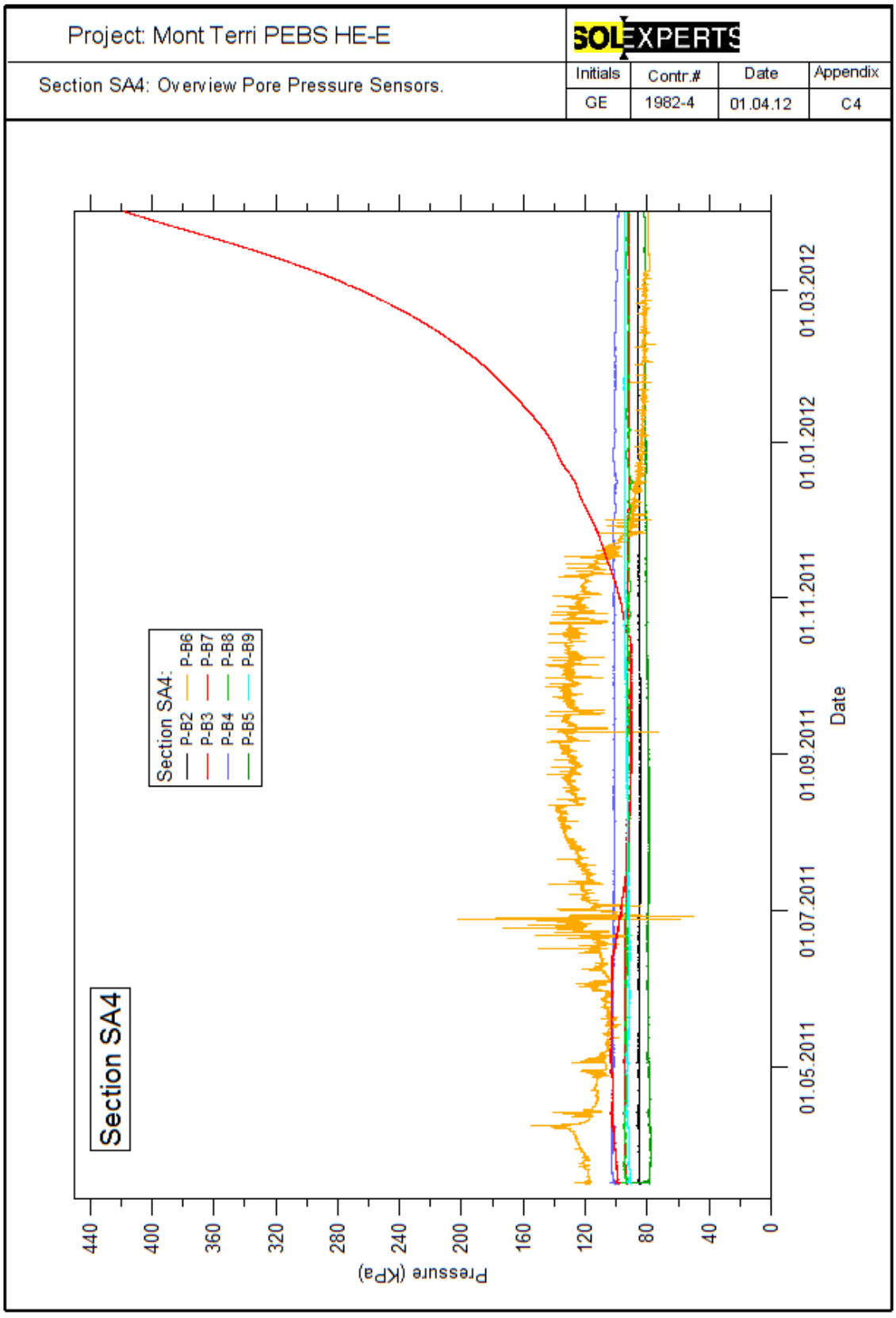
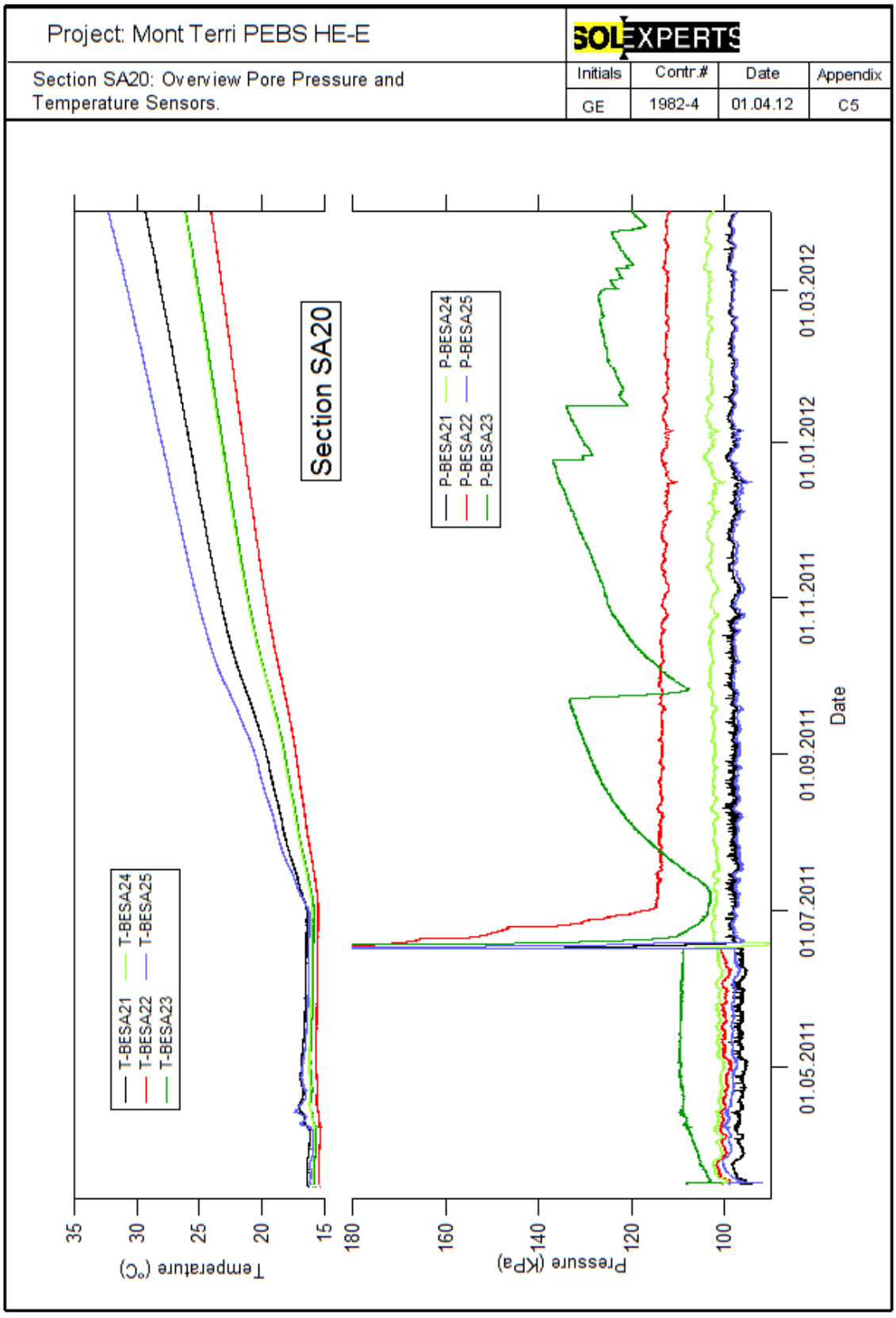
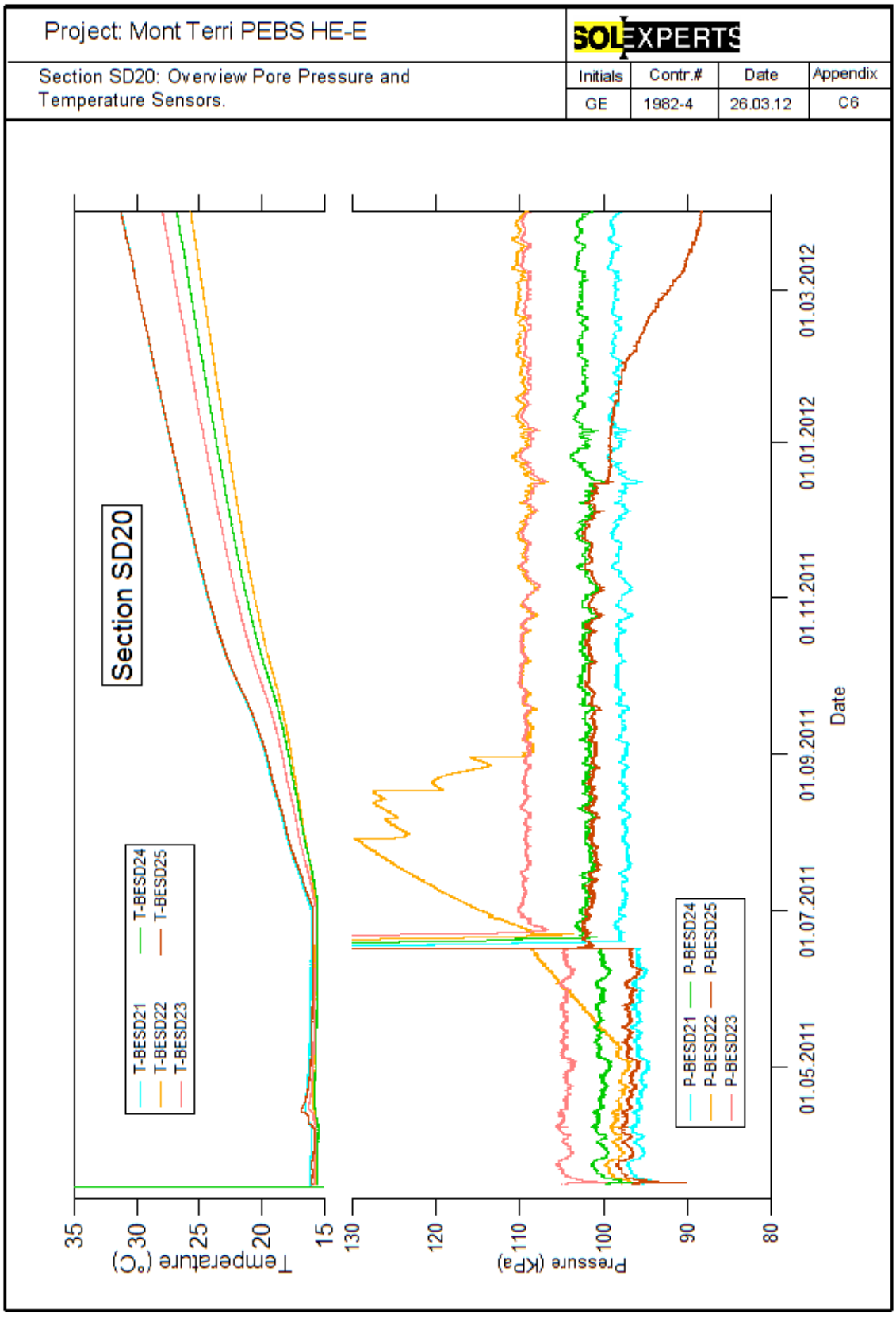
01.09.2011
01.11.2011
01.01.2012
01.03.2012
Date

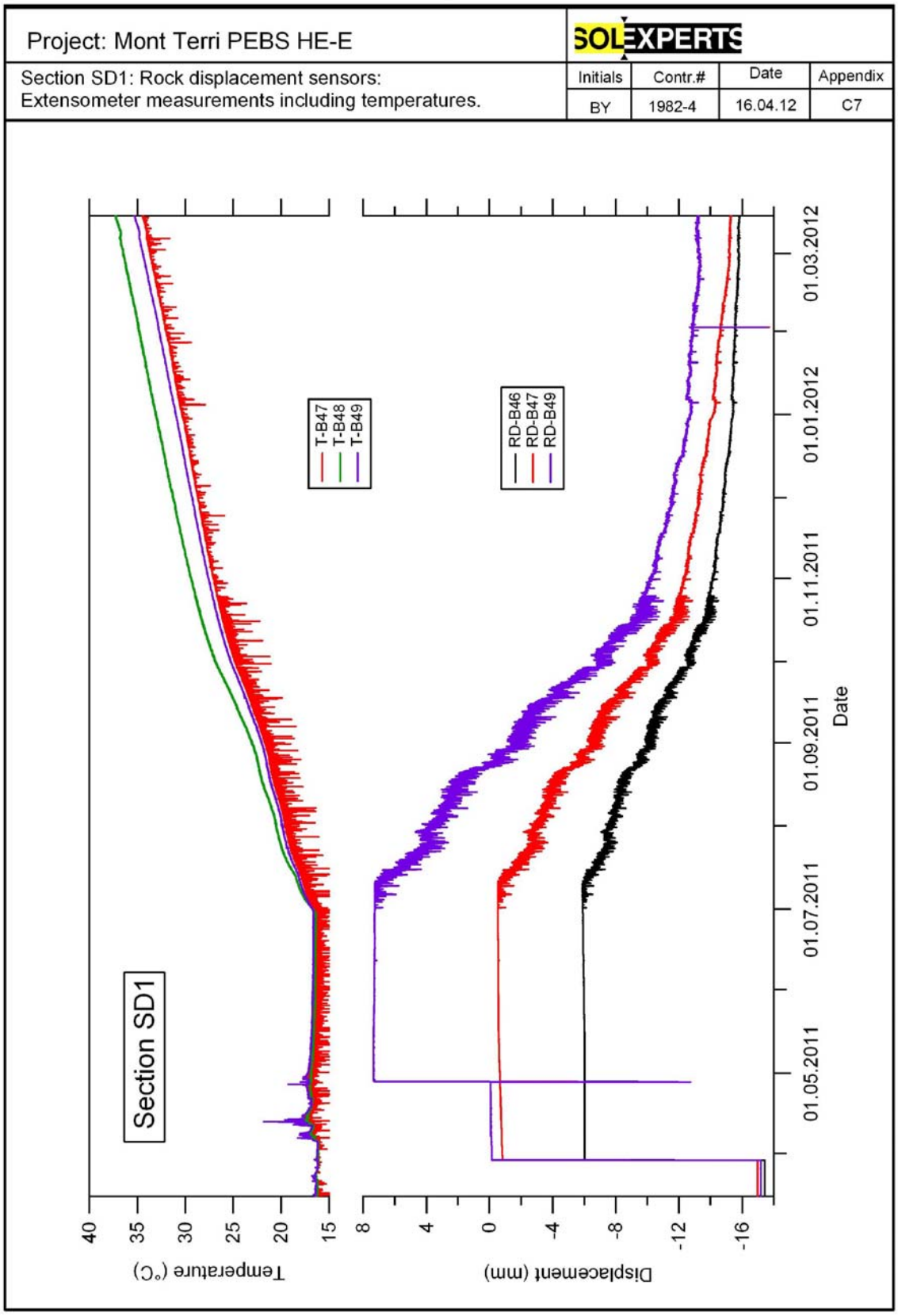

Project: Mont Terri PEBS HE-E
Section SA2: Overview Pore Pressure Sensors.
SOLEXPERTS
Initials
Contr.#
Date
Appendix
GE
1982-4
01.04.12
C2
Section SA2
Section SA2:
P-B55
P-B56
P-B57
P-B58
P-B59
P-B60
P-B61
P-B62
800
700
600
500
400
300
200
100
0
Pressure (kPa)
01.05.2011
01.07.2011
01.09.2011
01.11.2011
01.01.2012
01.03.2012
Date

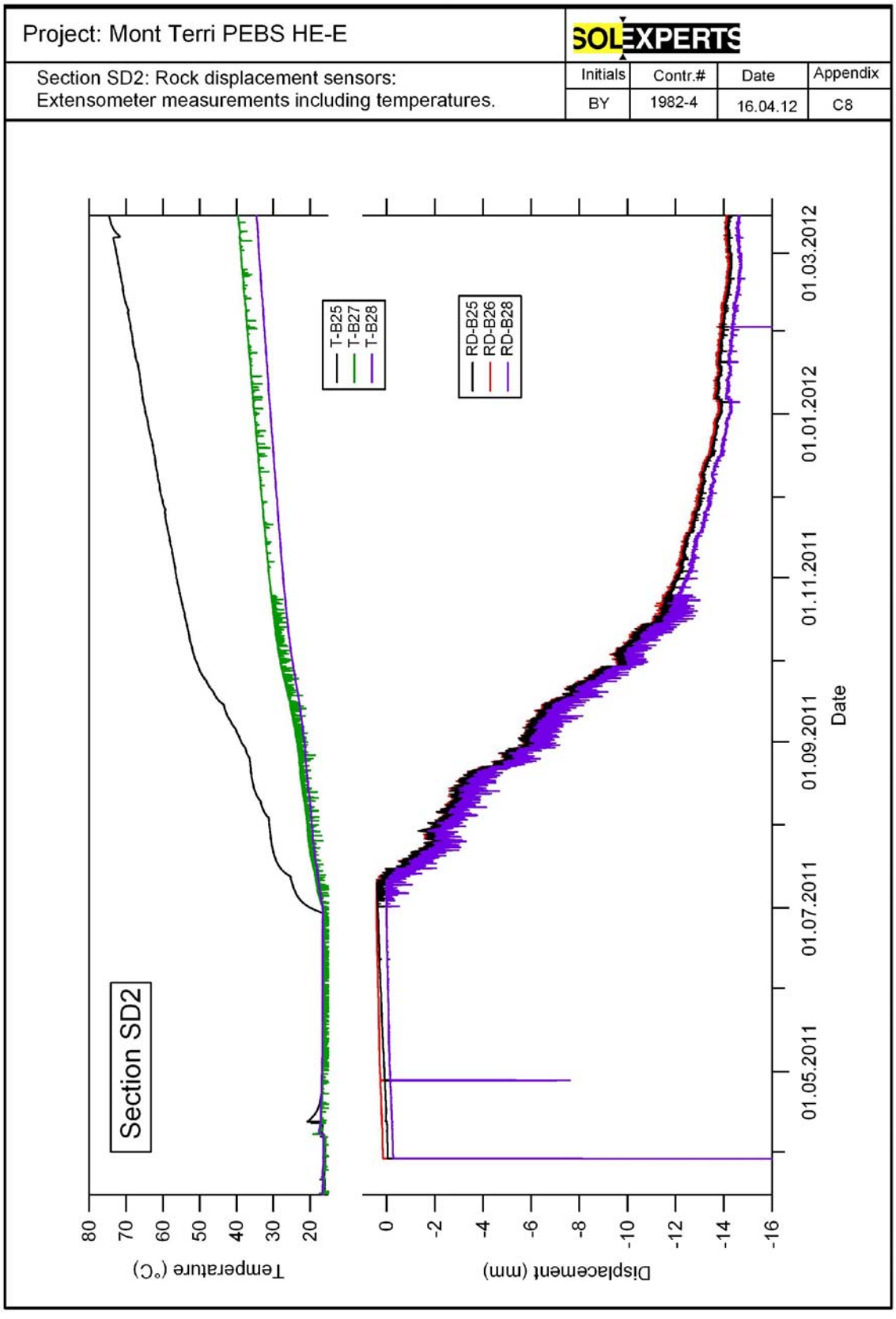

Project: Mont Terri PEBS HE-E
Section SA3: Overview Pore Pressure Sensors.
SOLEXPERTS
Initials
Contr.#
Date
Appendix
GE
1982-4
01.04.12
C3
Section SA3
Section SA3:
P-B38
P-B39
P-B40
P-B41
Pressure (KPa)
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
01.05.2011
01.07.2011
01.09.2011
01.11.2011
01.01.2012
01.03.2012
Date

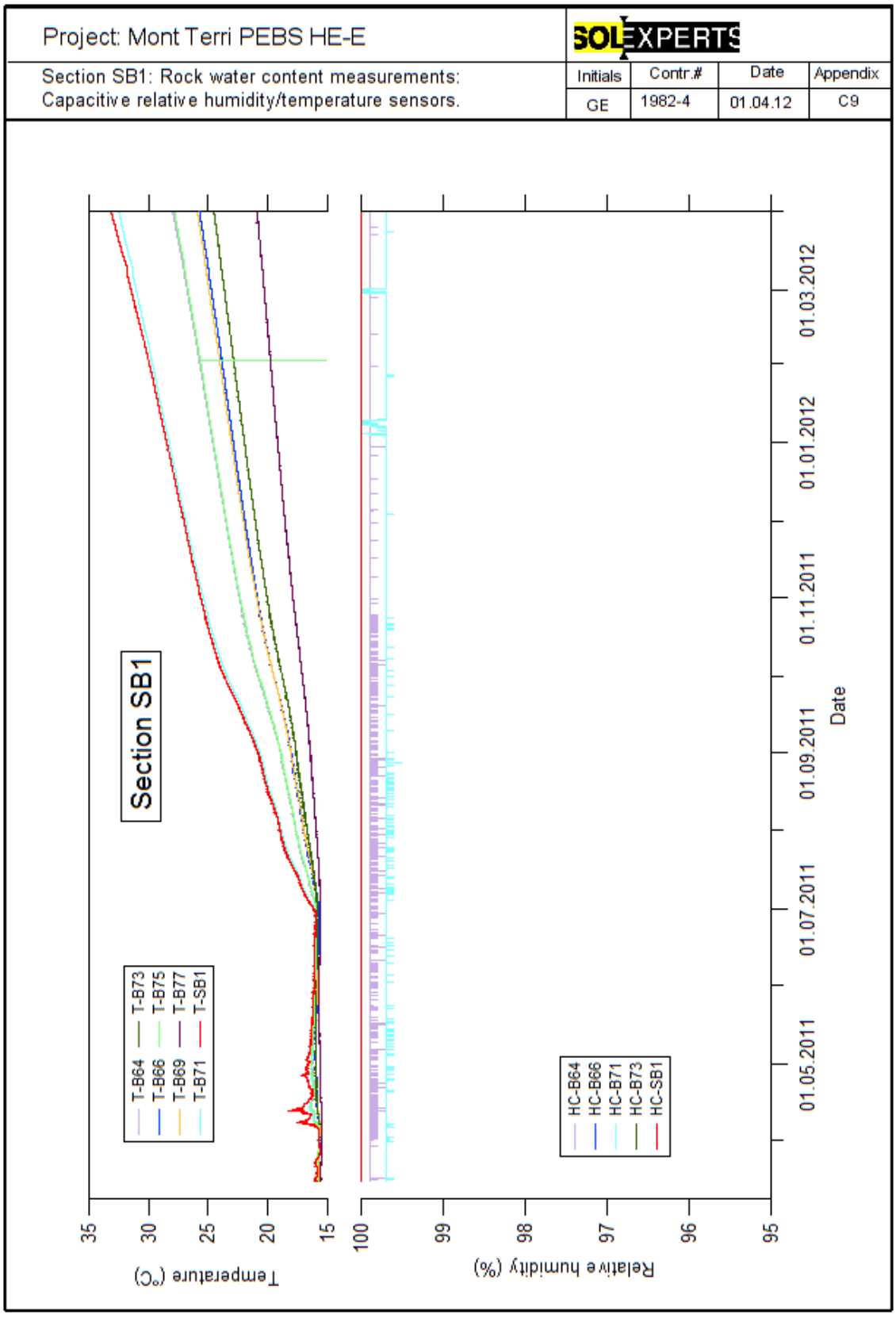

Project: Mont Terri PEBS HE-E
Section SA4: Overview Pore Pressure Sensors.
Initials
Contr.#
Date
Appendix
GE
1982-4
01.04.12
C4
Section SA4
Section SA4:
P-B2
P-B3
P-B4
P-B5
P-B6
P-B7
P-B8
P-B9
Pressure (KPa)
440
400
360
320
280
240
200
160
120
80
40
0
01.05.2011
01.07.2011
01.09.2011
01.11.2011
01.01.2012
01.03.2012
Date

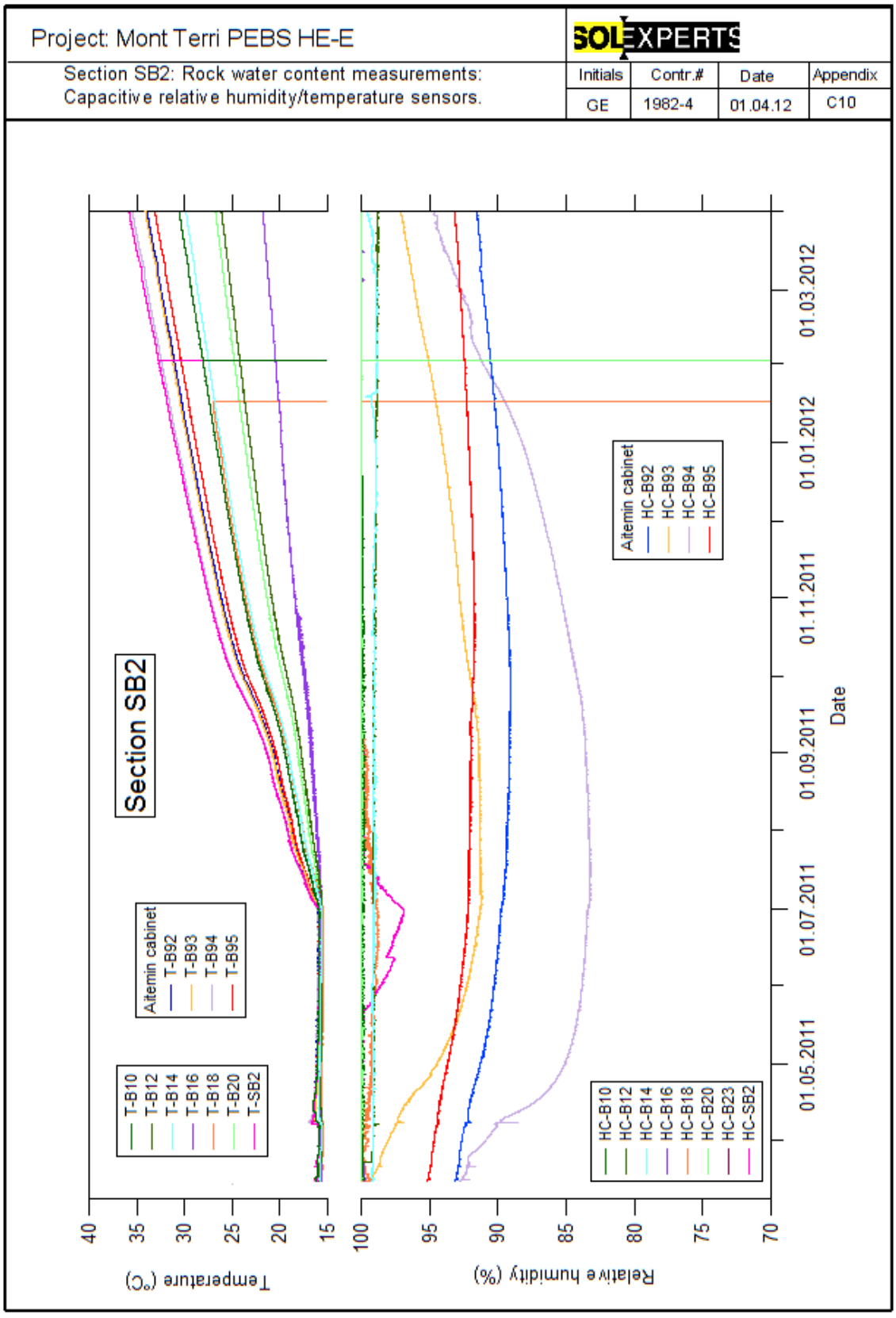

Project: Mont Terri PEBS HE-E
Section SA20: Overview Pore Pressure and Temperature Sensors.
Initials
Contr.#
Date
Appendix
GE
1982-4
01.04.12
C5
Section SA20
T-BESA21
T-BESA22
T-BESA23
T-BESA24
T-BESA25
P-BESA21
P-BESA22
P-BESA23
P-BESA24
P-BESA25
Temperature (°C)
Pressure (KPa)
Date
01.05.2011
01.07.2011
01.09.2011
01.11.2011
01.01.2012
01.03.2012

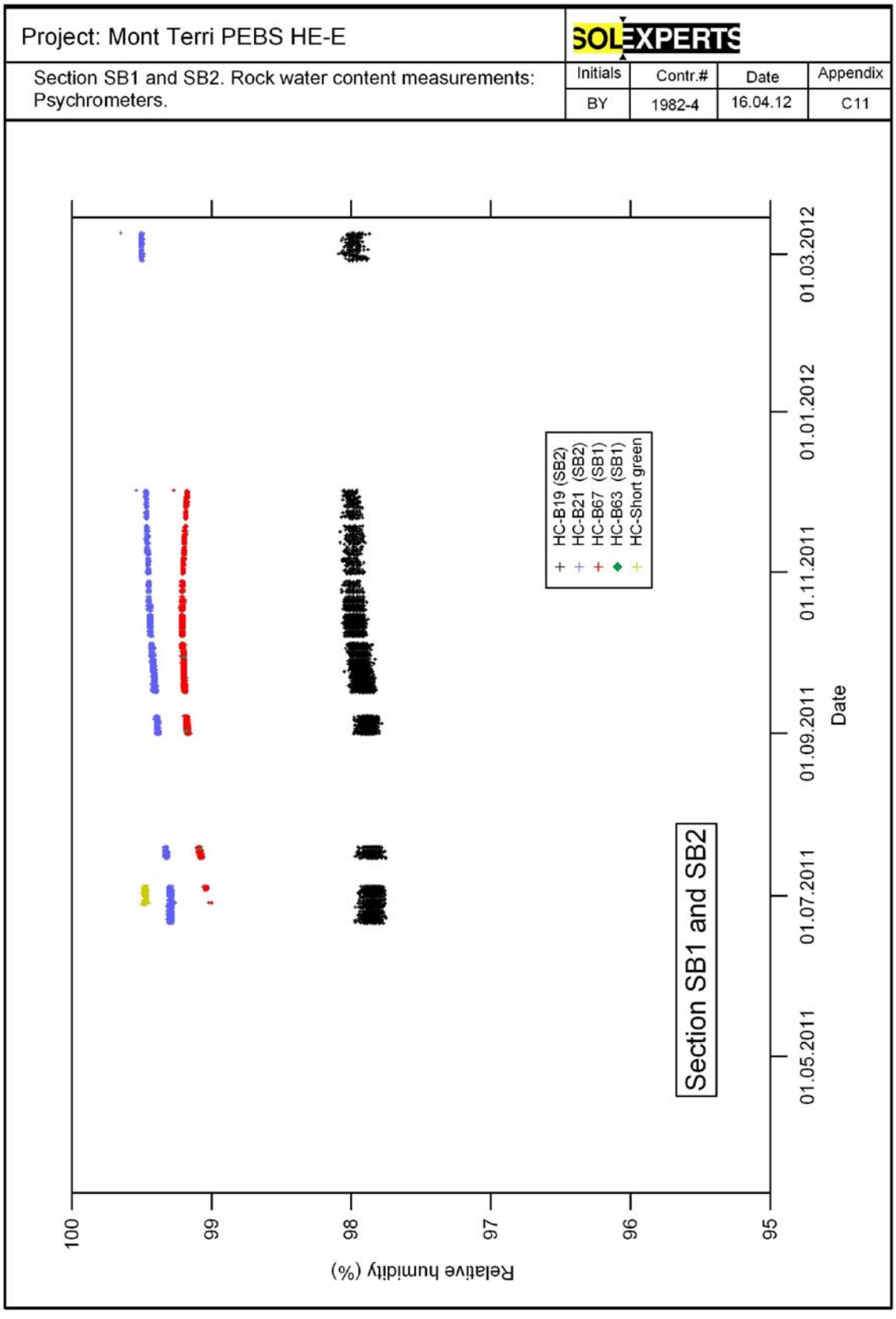

Project: Mont Terri PEBS HE-E
Section SD20: Overview Pore Pressure and Temperature Sensors.
Initials
Contr.#
Date
Appendix
GE
1982-4
26.03.12
C6
Section SD20
T-BESD21
T-BESD22
T-BESD23
T-BESD24
T-BESD25
P-BESD21
P-BESD22
P-BESD23
P-BESD24
P-BESD25
Temperature (°C)
Pressure (KPa)
Date
01.05.2011
01.07.2011
01.09.2011
01.11.2011
01.01.2012
01.03.2012


Project: Mont Terri PEBS HE-E
SOLEXPERTS
Section SD1: Rock displacement sensors:
Extensometer measurements including temperatures.
Initials
Contr.#
Date
Appendix
BY
1982-4
16.04.12
C7
T-B47
T-B48
T-B49
RD-B46
RD-B47
RD-B49
Section SD1
Temperature (°C)
Displacement (mm)
Date
01.05.2011
01.07.2011
01.09.2011
01.11.2011
01.01.2012
01.03.2012


Project: Mont Terri PEBS HE-E
SOLEXPERTS
Section SD2: Rock displacement sensors:
Extensometer measurements including temperatures.
Initials
Contr.#
Date
Appendix
BY
1982-4
16.04.12
C8
T-B25
T-B27
T-B28
RD-B25
RD-B26
RD-B28
Section SD2
Temperature (°C)
Displacement (mm)
Date
01.05.2011
01.07.2011
01.09.2011
01.11.2011
01.01.2012
01.03.2012

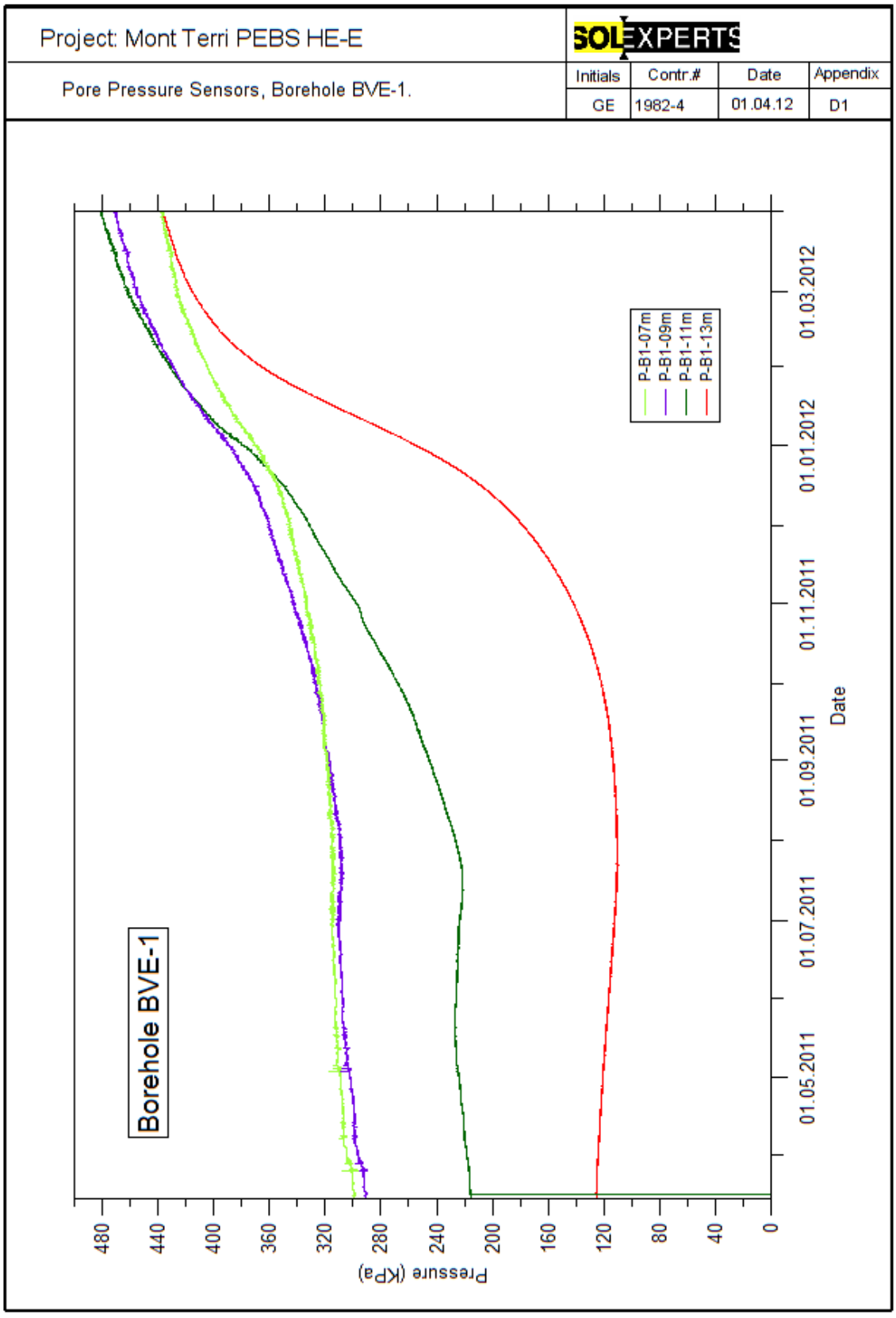

Project: Mont Terri PEBS HE-E
Section SB1: Rock water content measurements:
Capacitive relative humidity/temperature sensors.
Initials
Contr.#
Date
Appendix
GE
1982-4
01.04.12
C9
Section SB1
T-B64
T-B66
T-B69
T-B71
T-B73
T-B75
T-B77
T-SB1
HC-B64
HC-B66
HC-B71
HC-B73
HC-SB1
Temperature (°C)
Relative humidity (%)
Date
01.05.2011
01.07.2011
01.09.2011
01.11.2011
01.01.2012
01.03.2012

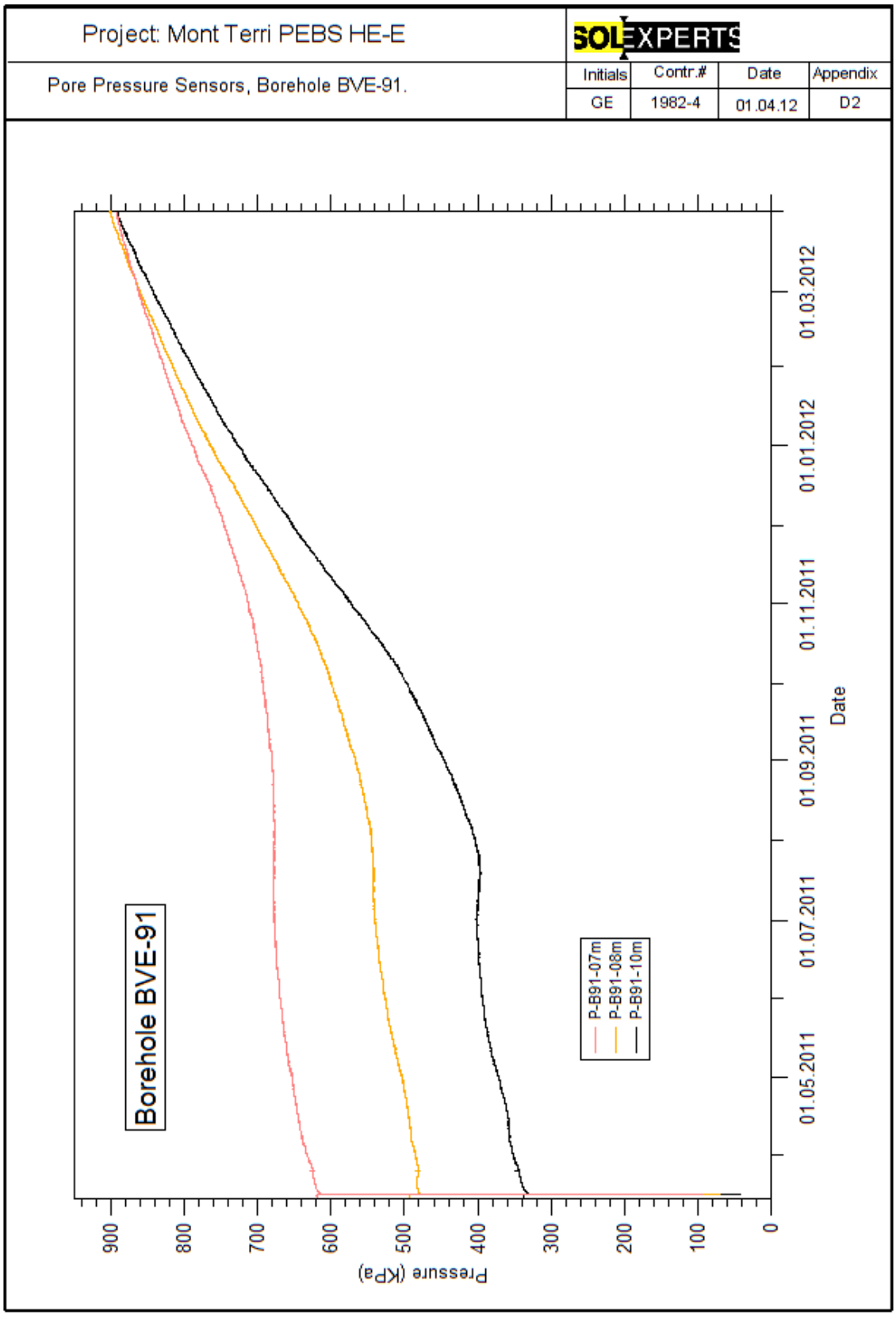

Project: Mont Terri PEBS HE-E
Section SB2: Rock water content measurements:
Capacitive relative humidity/temperature sensors.
Initials
Contr.#
Date
Appendix
GE
1982-4
01.04.12
C10
Section SB2
Aitemin cabinet
T-B92
T-B93
T-B94
T-B95
T-B10
T-B12
T-B14
T-B16
T-B18
T-B20
T-SB2
HC-B10
HC-B12
HC-B14
HC-B16
HC-B18
HC-B20
HC-B23
HC-SB2
Temperature (°C)
Relative humidity (%)
Date
01.05.2011
01.07.2011
01.09.2011
01.11.2011
01.01.2012
01.03.2012

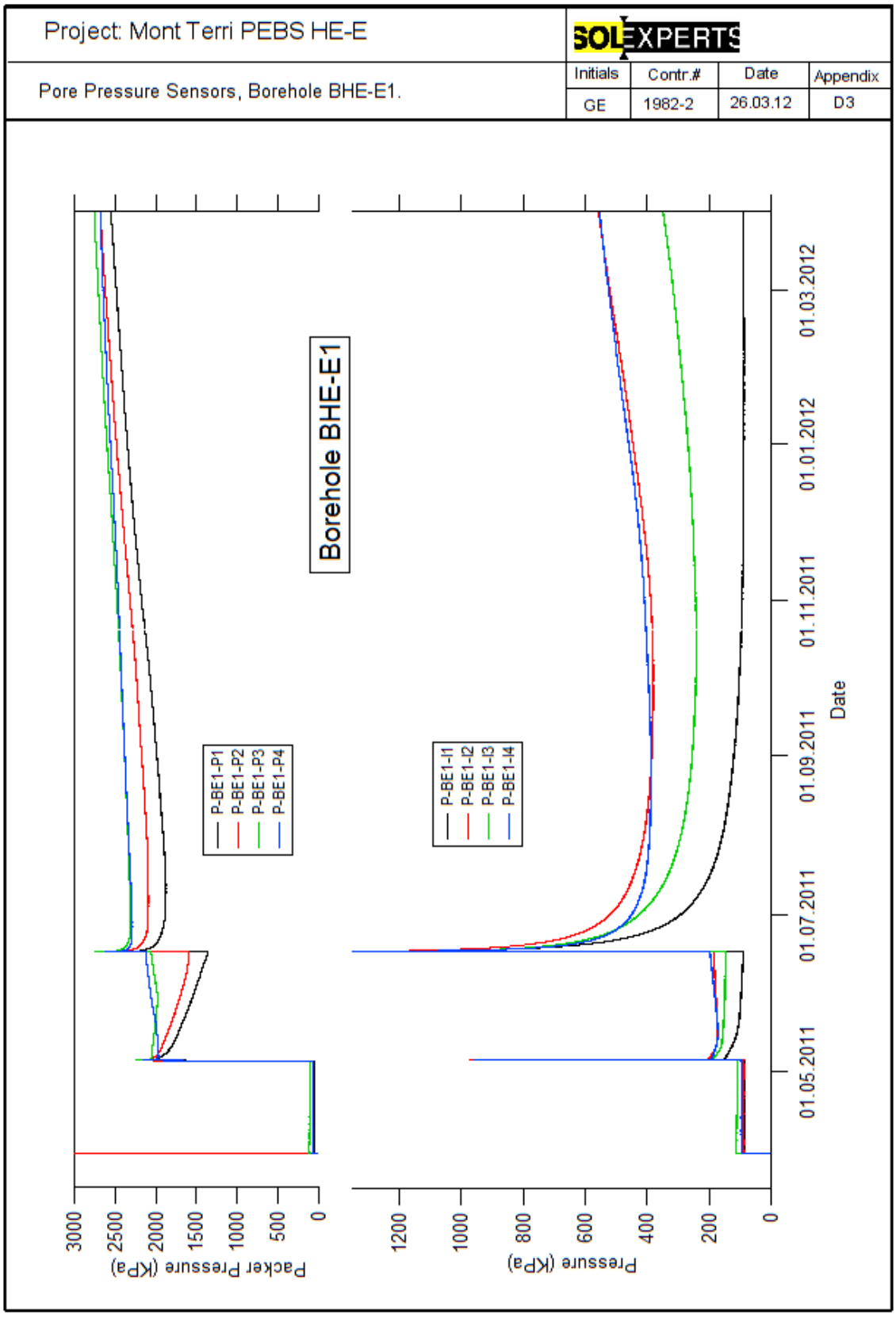

Project: Mont Terri PEBS HE-E
SOLEXPERTS
Section SB1 and SB2. Rock water content measurements: Psychrometers.
Initials
Contr.#
Date
Appendix
BY
1982-4
16.04.12
C11
HC-B19 (SB2)
HC-B21 (SB2)
HC-B67 (SB1)
HC-B63 (SB1)
HC-Short green
Section SB1 and SB2
Relative humidity (%)
100
99
98
97
96
95
01.05.2011
01.07.2011
01.09.2011
01.11.2011
01.01.2012
01.03.2012
Date

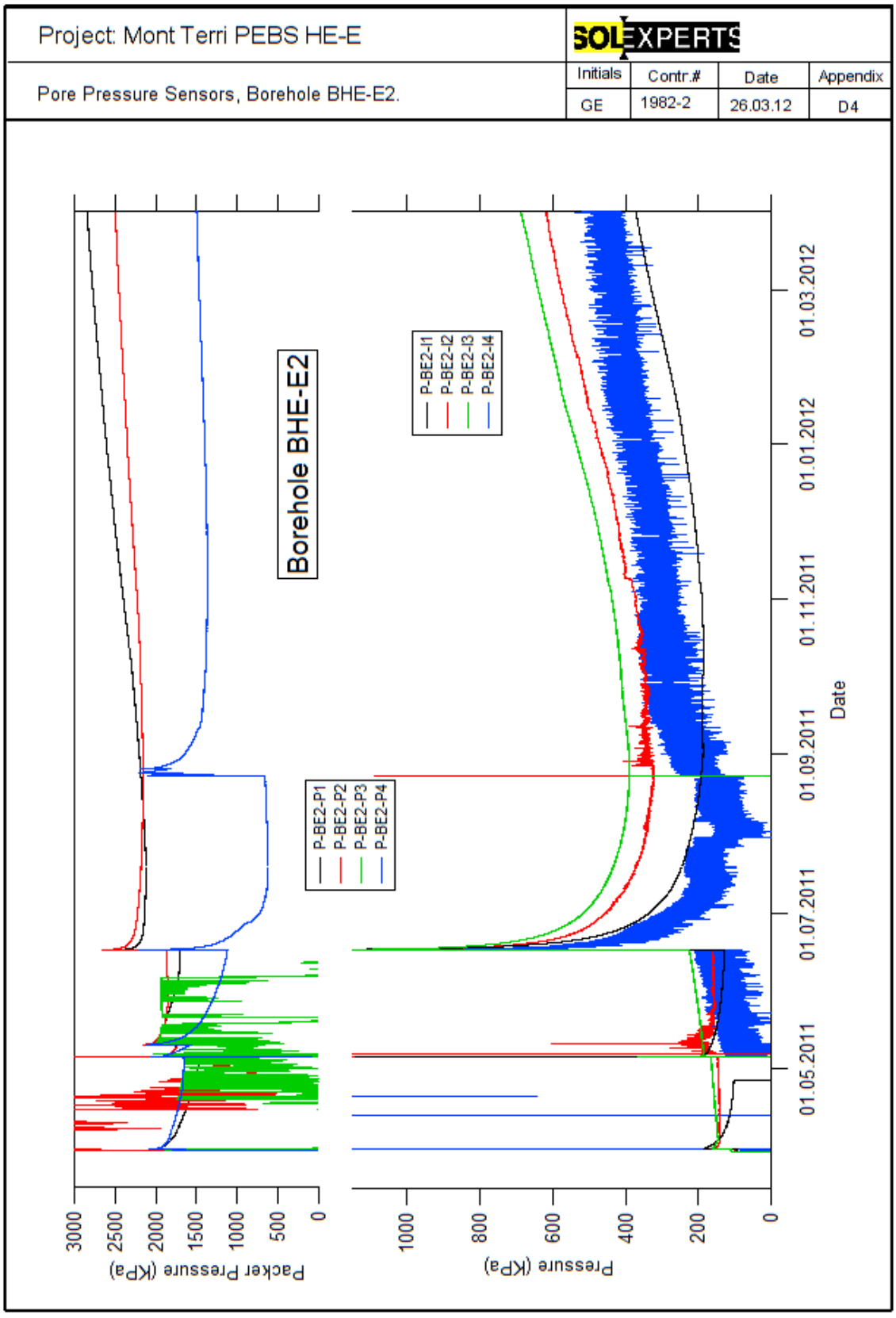
# ***Appendix D:***

- *Data plots of the sensors in the boreholes from Gallery 98*


Project: Mont Terri PEBS HE-E
Pore Pressure Sensors, Borehole BVE-1.
SOLEXPERTS
Initials
Contr.#
Date
Appendix
GE
1982-4
01.04.12
D1
P-B1-07m
P-B1-09m
P-B1-11m
P-B1-13m
Borehole BVE-1
Pressure (KPa)
480
440
400
360
320
280
240
200
160
120
80
40
0
01.05.2011
01.07.2011
01.09.2011
01.11.2011
01.01.2012
01.03.2012
Date

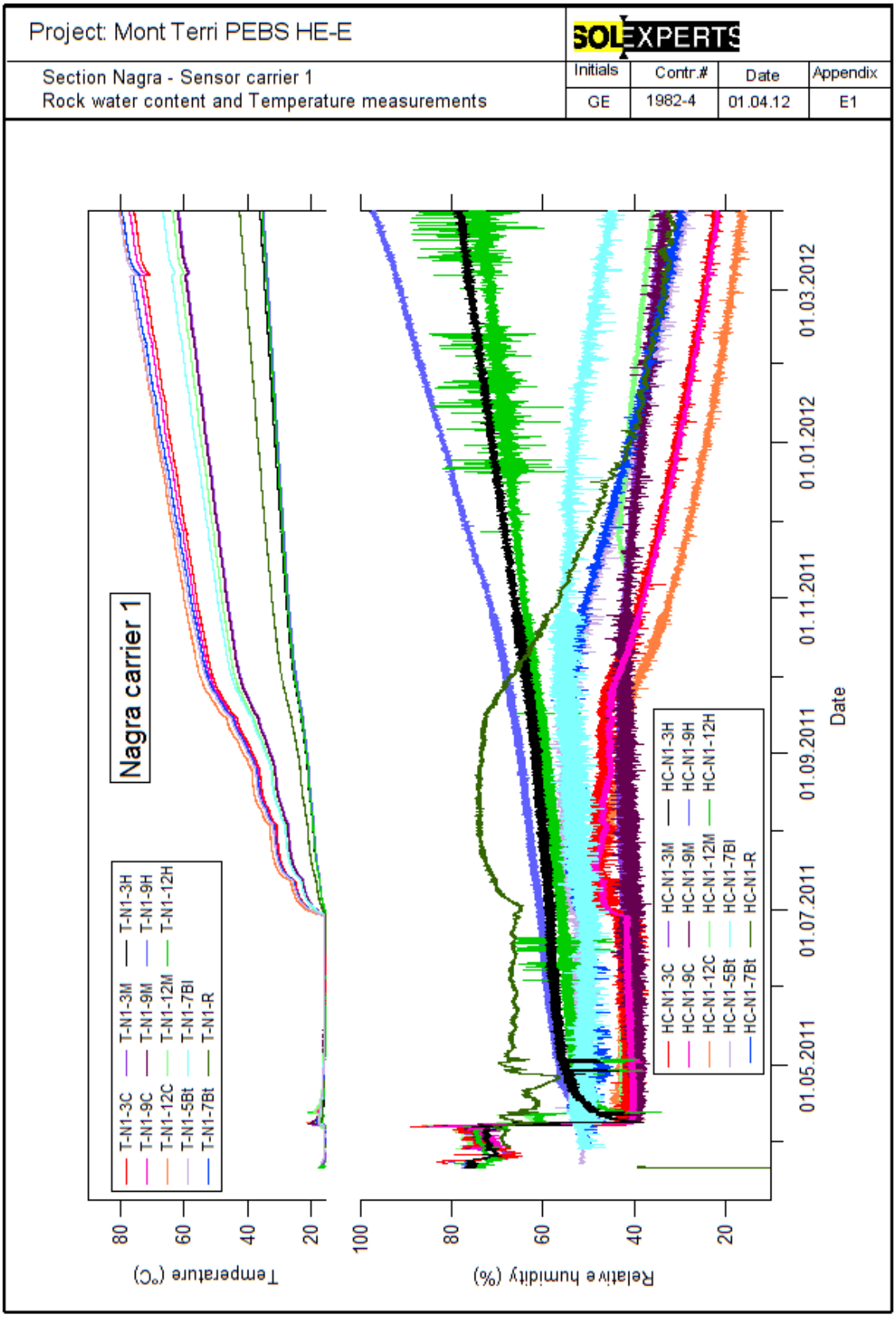

Project: Mont Terri PEBS HE-E
Pore Pressure Sensors, Borehole BVE-91.
SOLEXPERTS
Initials
Contr.#
Date
Appendix
GE
1982-4
01.04.12
D2
Borehole BVE-91
P-B91-07m
P-B91-08m
P-B91-10m
Pressure (KPa)
0
100
200
300
400
500
600
700
800
900
Date
01.05.2011
01.07.2011
01.09.2011
01.11.2011
01.01.2012
01.03.2012

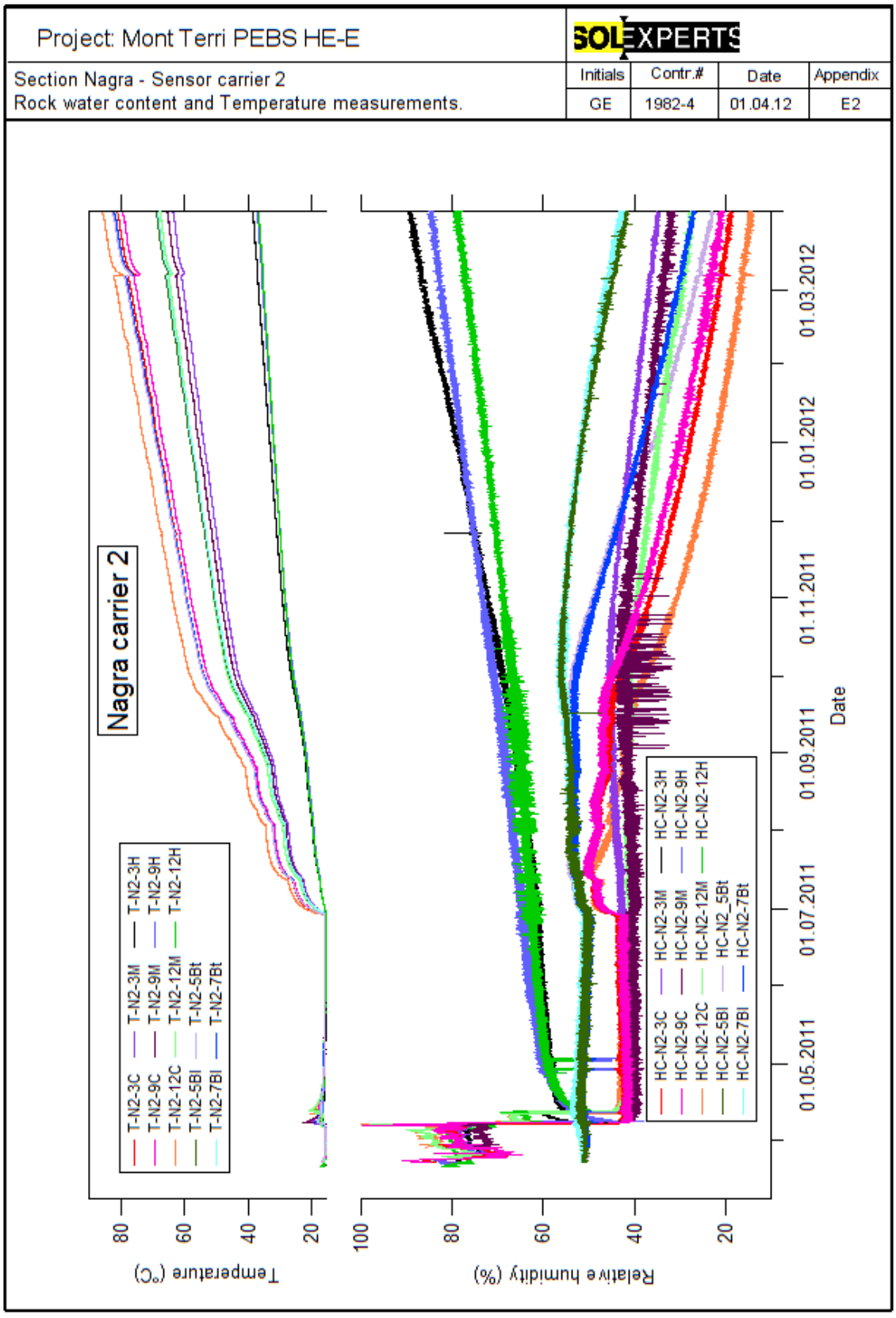

Project: Mont Terri PEBS HE-E
Pore Pressure Sensors, Borehole BHE-E1.
SOLEXPERTS
Initials
Contr.#
Date
Appendix
GE
1982-2
26.03.12
D3
Borehole BHE-E1
P-BE1-P1
P-BE1-P2
P-BE1-P3
P-BE1-P4
P-BE1-I1
P-BE1-I2
P-BE1-I3
P-BE1-I4
Packer Pressure (kPa)
Pressure (kPa)
Date
01.05.2011
01.07.2011
01.09.2011
01.11.2011
01.01.2012
01.03.2012

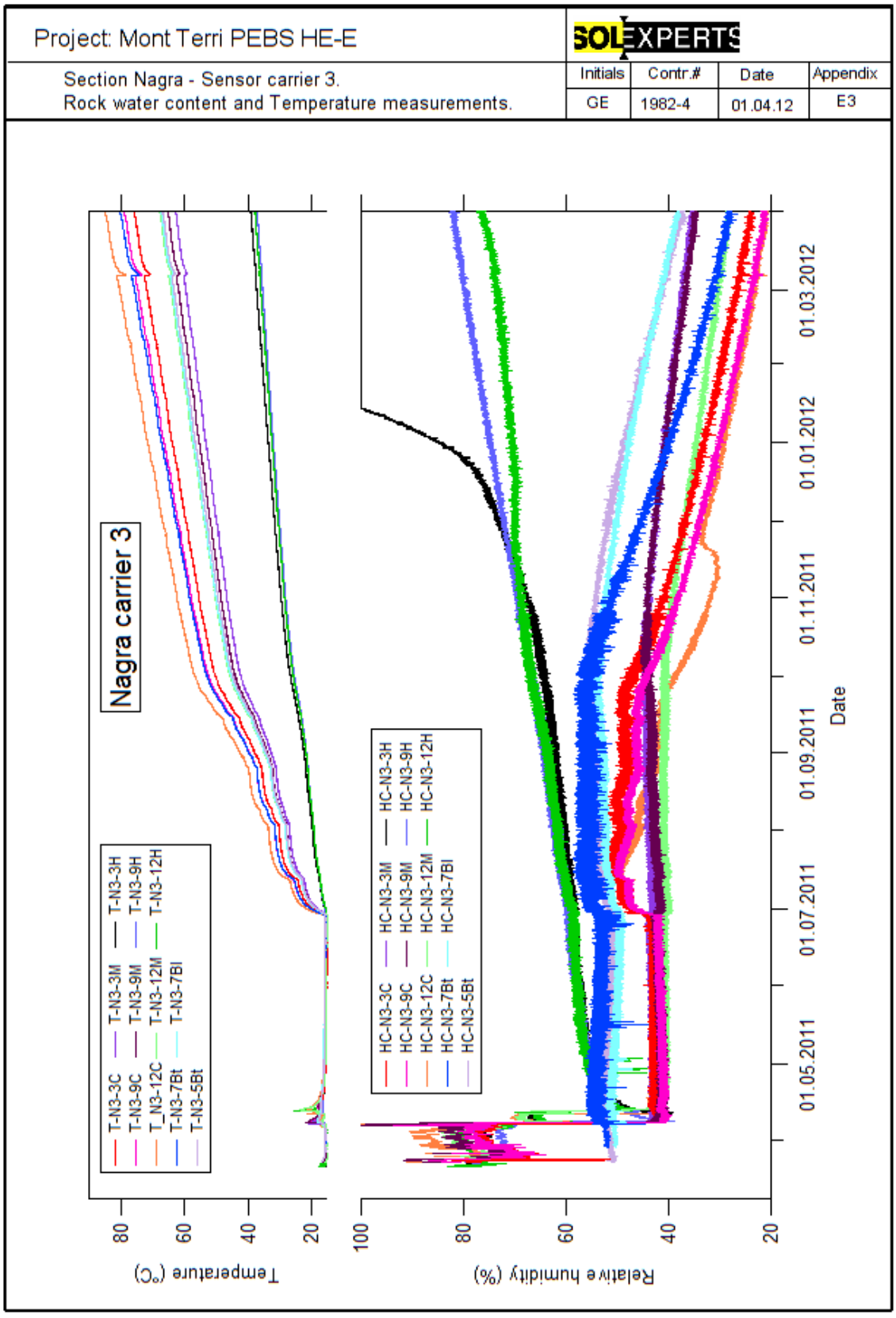

Project: Mont Terri PEBS HE-E
Pore Pressure Sensors, Borehole BHE-E2.
Initials
Contr.#
Date
Appendix
GE
1982-2
26.03.12
D4
Borehole BHE-E2
P-BE2-I1
P-BE2-I2
P-BE2-I3
P-BE2-I4
P-BE2-P1
P-BE2-P2
P-BE2-P3
P-BE2-P4
Packer Pressure (KPa)
Pressure (KPa)
Date
01.03.2012
01.01.2012
01.11.2011
01.09.2011
01.07.2011
01.05.2011

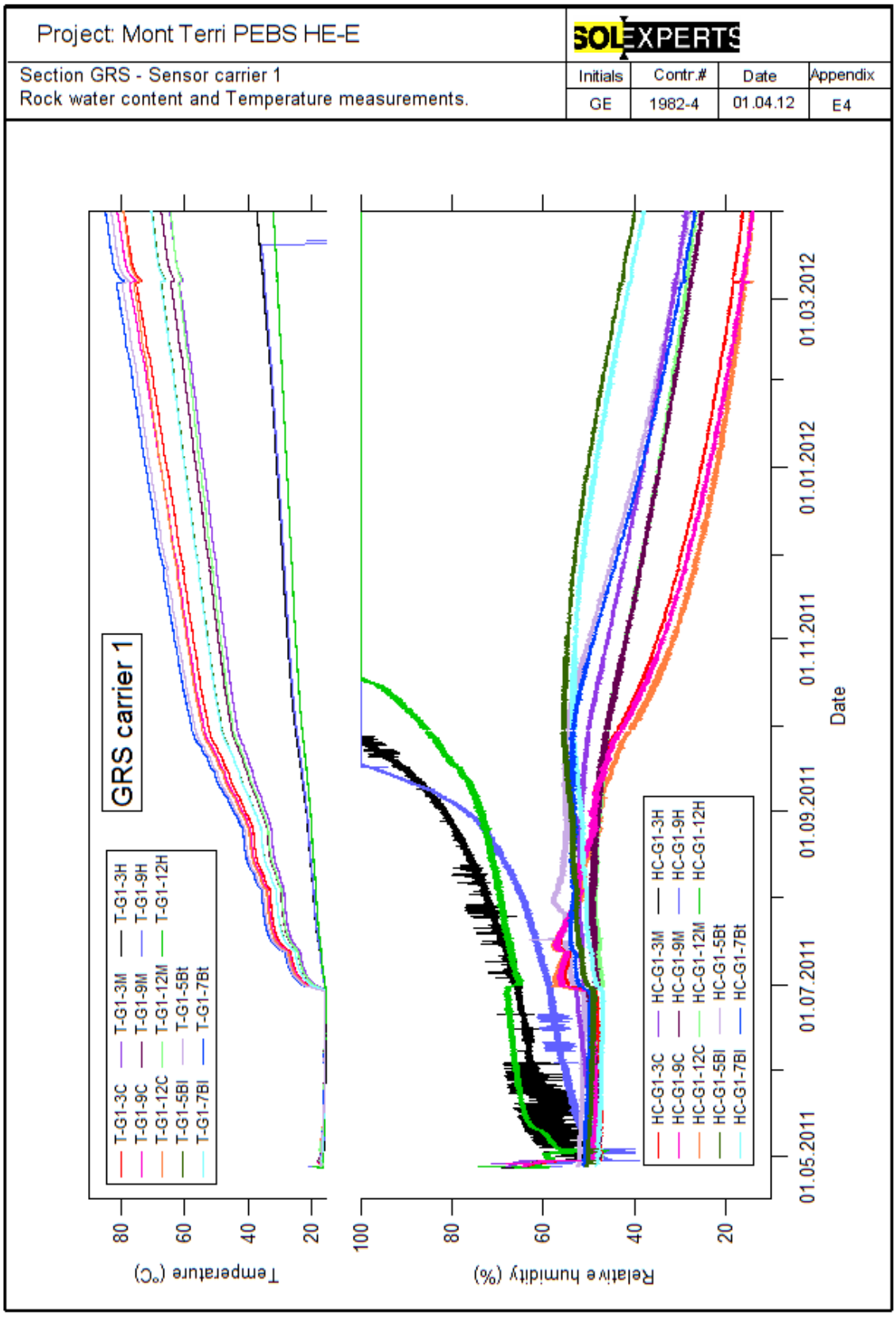
# ***Appendix E:***

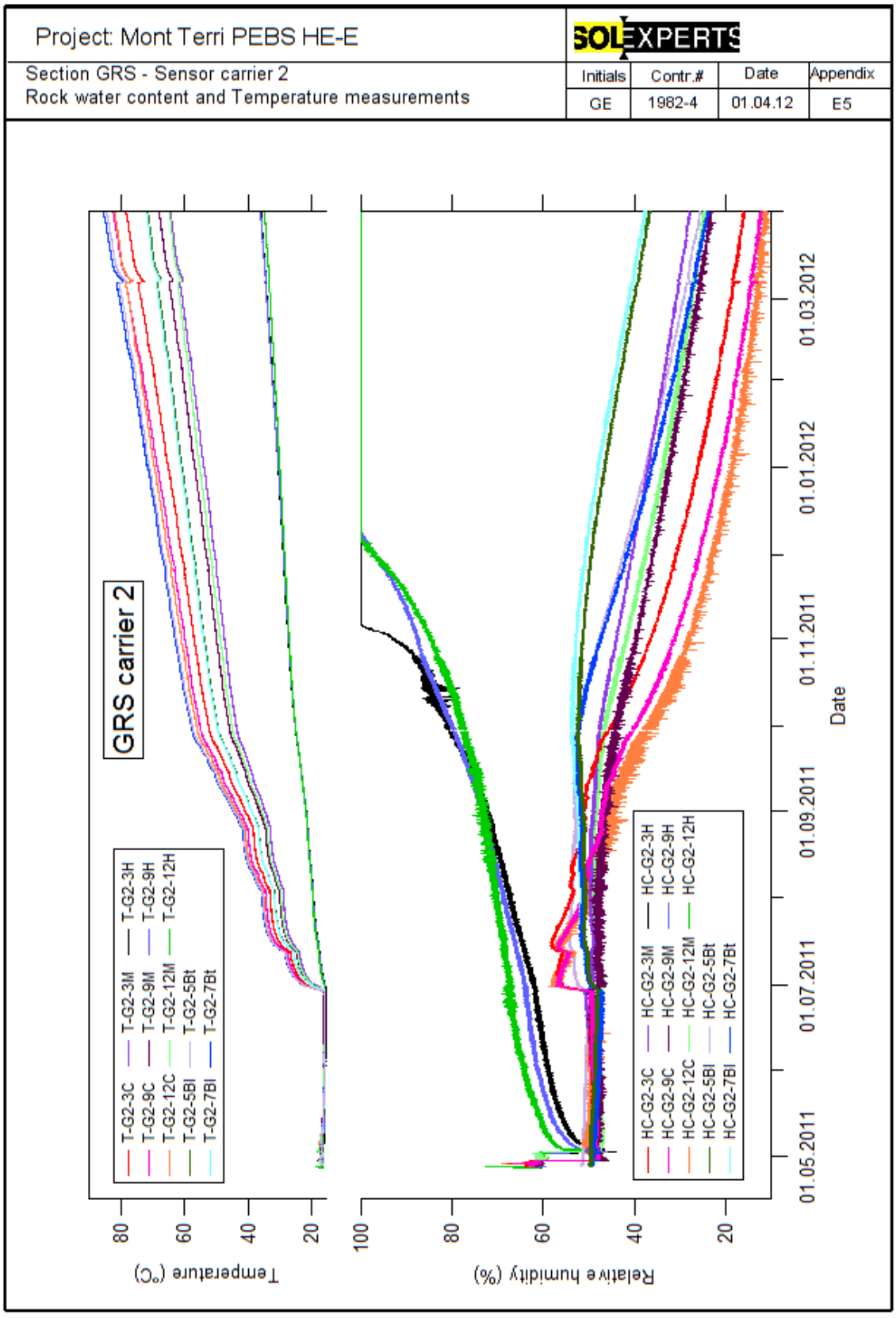
- *Data plots for the sensors installed in the EBS and at the EBS-host rock interface*

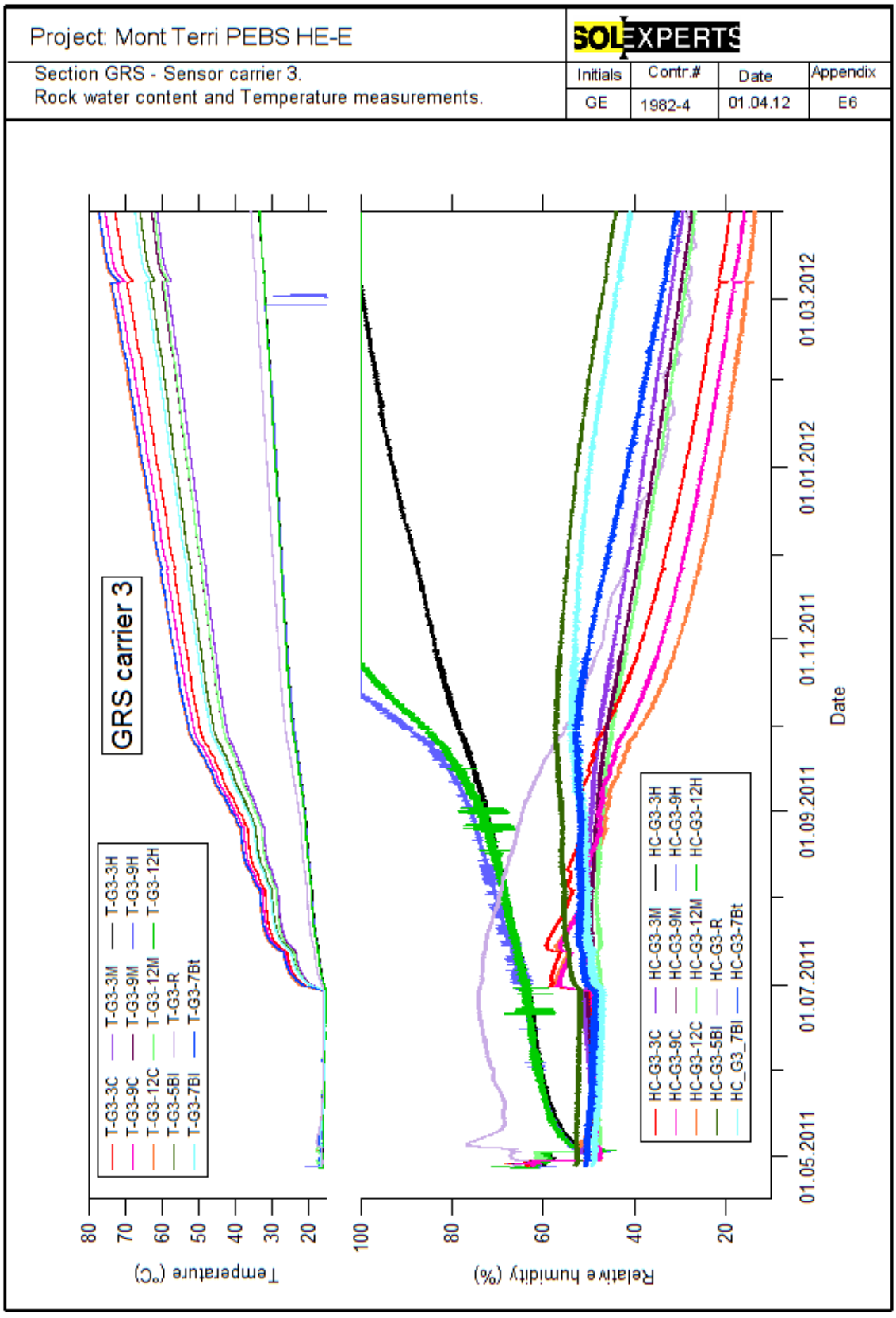

Project: Mont Terri PEBS HE-E
Section Nagra - Sensor carrier 1
Rock water content and Temperature measurements
Initials
Contr.#
Date
Appendix
GE
1982-4
01.04.12
E1
Nagra carrier 1
T-N1-3C
T-N1-9C
T-N1-12C
T-N1-5Bt
T-N1-7Bt
T-N1-3M
T-N1-9M
T-N1-12M
T-N1-7Bl
T-N1-R
T-N1-3H
T-N1-9H
T-N1-12H
HC-N1-3C
HC-N1-9C
HC-N1-12C
HC-N1-5Bt
HC-N1-7Bt
HC-N1-3M
HC-N1-9M
HC-N1-12M
HC-N1-7Bl
HC-N1-R
HC-N1-3H
HC-N1-9H
HC-N1-12H
Temperature (°C)
Relative humidity (%)
Date
01.05.2011
01.07.2011
01.09.2011
01.11.2011
01.01.2012
01.03.2012


Project: Mont Terri PEBS HE-E
SOLEXPERTS
Section Nagra - Sensor carrier 2
Rock water content and Temperature measurements.
Initials
Contr.#
Date
Appendix
GE
1982-4
01.04.12
E2
Nagra carrier 2
T-N2-3C
T-N2-9C
T-N2-12C
T-N2-5BI
T-N2-7BI
T-N2-3M
T-N2-9M
T-N2-12M
T-N2-5Bt
T-N2-7Bt
T-N2-3H
T-N2-9H
T-N2-12H
HC-N2-3C
HC-N2-9C
HC-N2-12C
HC-N2-5BI
HC-N2-7BI
HC-N2-3M
HC-N2-9M
HC-N2-12M
HC-N2_5Bt
HC-N2-7Bt
HC-N2-3H
HC-N2-9H
HC-N2-12H
Temperature (°C)
Relative humidity (%)
Date
01.05.2011
01.07.2011
01.09.2011
01.11.2011
01.01.2012
01.03.2012


Project: Mont Terri PEBS HE-E
Section Nagra - Sensor carrier 3.
Rock water content and Temperature measurements.
Initials
Contr.#
Date
Appendix
GE
1982-4
01.04.12
E3
Nagra carrier 3
T-N3-3C
T-N3-3M
T-N3-3H
T-N3-9C
T-N3-9M
T-N3-9H
T_N3-12C
T-N3-12M
T-N3-12H
T-N3-7Bt
T-N3-7Bl
T-N3-5Bt
HC-N3-3C
HC-N3-3M
HC-N3-3H
HC-N3-9C
HC-N3-9M
HC-N3-9H
HC-N3-12C
HC-N3-12M
HC-N3-12H
HC-N3-7Bt
HC-N3-7Bl
HC-N3-5Bt
Temperature (°C)
Relative humidity (%)
Date
01.05.2011
01.07.2011
01.09.2011
01.11.2011
01.01.2012
01.03.2012


Project: Mont Terri PEBS HE-E
SOLEXPERTS
Section GRS - Sensor carrier 1
Rock water content and Temperature measurements.
Initials
Contr.#
Date
Appendix
GE
1982-4
01.04.12
E4
GRS carrier 1
T-G1-3C
T-G1-9C
T-G1-12C
T-G1-5BI
T-G1-7BI
T-G1-3M
T-G1-9M
T-G1-12M
T-G1-5Bt
T-G1-7Bt
T-G1-3H
T-G1-9H
T-G1-12H
HC-G1-3C
HC-G1-9C
HC-G1-12C
HC-G1-5BI
HC-G1-7BI
HC-G1-3M
HC-G1-9M
HC-G1-12M
HC-G1-5Bt
HC-G1-7Bt
HC-G1-3H
HC-G1-9H
HC-G1-12H
Temperature (°C)
Relative humidity (%)
Date
01.05.2011
01.07.2011
01.09.2011
01.11.2011
01.01.2012
01.03.2012


Project: Mont Terri PEBS HE-E
Section GRS - Sensor carrier 2
Rock water content and Temperature measurements
Initials
Contr.#
Date
Appendix
GE
1982-4
01.04.12
E5
GRS carrier 2
T-G2-3C
T-G2-3M
T-G2-3H
T-G2-9C
T-G2-9M
T-G2-9H
T-G2-12C
T-G2-12M
T-G2-12H
T-G2-5BI
T-G2-5Bt
T-G2-7BI
T-G2-7Bt
HC-G2-3C
HC-G2-3M
HC-G2-3H
HC-G2-9C
HC-G2-9M
HC-G2-9H
HC-G2-12C
HC-G2-12M
HC-G2-12H
HC-G2-5BI
HC-G2-5Bt
HC-G2-7BI
HC-G2-7Bt
Temperature (°C)
Relative humidity (%)
Date
01.05.2011
01.07.2011
01.09.2011
01.11.2011
01.01.2012
01.03.2012


Project: Mont Terri PEBS HE-E
Section GRS - Sensor carrier 3.
Rock water content and Temperature measurements.
Initials
Contr.#
Date
Appendix
GE
1982-4
01.04.12
E6
GRS carrier 3
T-G3-3C
T-G3-3M
T-G3-3H
T-G3-9C
T-G3-9M
T-G3-9H
T-G3-12C
T-G3-12M
T-G3-12H
T-G3-5BI
T-G3-R
T-G3-7BI
T-G3-7Bt
HC-G3-3C
HC-G3-3M
HC-G3-3H
HC-G3-9C
HC-G3-9M
HC-G3-9H
HC-G3-12C
HC-G3-12M
HC-G3-12H
HC-G3-5BI
HC-G3-R
HC_G3_7BI
HC-G3-7Bt
Temperature (°C)
Relative humidity (%)
Date
01.05.2011
01.07.2011
01.09.2011
01.11.2011
01.01.2012
01.03.2012