

DRILL-PILOT

HANDLING

- Züblin standard computer software (picture 2)
- Real-time information about borehole deviation (picture 3)
- Quick and easy reporting of each measurement (picture 4)

PRECISE BOREHOLES

The Drill-Pilot is:

- precise – due to the use of newest FOG and MEMS technology
- quick – because of the measurement-while-drilling concept
- flexible – due to the use of in-house mechatronics know-how

The Drill-Pilot is installed directly behind the drill bit and allows exact measurement during the drilling process as well as short reaction times while performing steering maneuvers.

The sophisticated design with newest inertial measuring technology allows exact measurement during the drilling process. Furthermore the Drill-Pilot is not affected by magnetic fields, for which reason there is no need for extensive reference measurements.

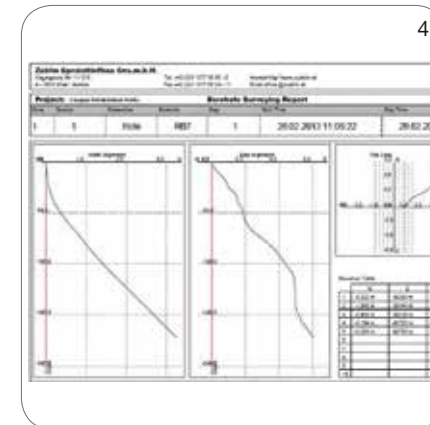
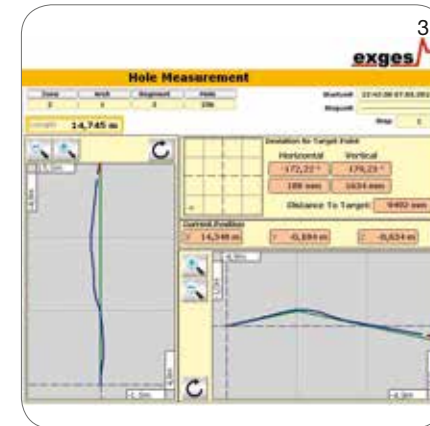
For exact measurements during the drilling process, only three components are needed:

- inertial sensor unit
- distance measurement unit
- operators display

Due to the complete in-house solution an adaption of our system to your requirements can be done quickly and easily.

Applications:

- high accuracy drilling through installation behind drill bit
- precise borehole surveying
- accurate measurement of boreholes by either pushing or flushing in borehole



TECHNICAL KEY DATA:

- outer diameter: 76 mm (surveying starting with 80 mm internal diameter)
- external length: 75 cm
- total weight: 25 kg
- minimum accuracy (under normal conditions): basically $\leq 0,5\%$ of the measurement length up to 300 m.

REFERENCES:

- Compensation grouting York University, Toronto (Canada): surveying of 83 horizontal boreholes with up to 50 m depth
- Kramertunnel, Garmisch (Germany): surveying of upward drilled boreholes with up to 45 m depth
- SEC "South East Collector" York, Toronto (Canada): Surveying of 200 vertical boreholes with up to 50 m depth
- Brenner Basistunnel - Ahrental, Innsbruck (Austria): surveying of upward drilled boreholes with up to 50 m depth
- Hydropower plant Visegrad (Bosnia-Herzegovina): surveying of 9 vertical boreholes with up to 240 m depth
- Raiseboring, Voitsberg (Austria): surveying of inclined boreholes with depth up to 150 m
- Geomagnetic observatory, Muggendorf (Austria): Surveying of vertical boreholes with depth up to 240 m
- Spreetal - RL Nordrandschlauch (Germany): Horizontal directional drilling of 50 boreholes with depth of 330 m
- HydroOne Metrolinx Gardiner Expressway, Toronto (Canada): Horizontal directional drilling of 8 boreholes with multiple horizontal- and vertical curves and depth of 240 m

Cover: Drill-Pilot in action

- 1 Drill-Pilot
- 2 Operator display
- 3 Real time measurement
- 4 Evaluation
- 5 Drill-Pilot

- 1 Cable winch
- 2 High precision fibre optic gyros and accelerators
- 3 Drill-Pilot



DRILL-PILOT

In 2011 Züblin Spezialtiefbau Ges.m.b.H. Vienna and Northrop Grumman LITEF GmbH formed a cooperation to develop and manufacture an innovative solution for challenging drilling tasks.

NG LITEF has more than 50 years experience in inertial navigation. Its highly accurate systems are used to navigate aircrafts, ships and other vehicles.

The Drill-Pilot components are based on highly reliable FOG and MEMS technology fulfilling aircraft quality requirements.

Züblin is internationally well known for civil and ground engineering with highest competence in drilling technology.

The combination of Züblin's vast experience and the newest technology from NG LITEF opens a new dimension of accurate drilling.

The Drill-Pilot: Ground Engineering Excellence



1 Drill rig



Züblin Spezialtiefbau Ges.m.b.H.
Donau-City-Str. 9
1220 Vienna /Austria
Tel. +43 1 22422-2605
Fax +43 1 22422-2604
office@zueblin.at



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DRILL-PILOT
GUIDED DRILLING AND BOREHOLE MEASURING
ZÜBLIN SPEZIALTIEFBAU GES.M.B.H.

