GLÖTZL Baumeßtechnik

BORE HOLE LENGTH MEASURING PROBE

- Easily to handle and use
- Only one operating person required - also for transport to measuring site
- Quick measuring sequence
- Economical measuring system
- Combined length measurement possible with inclination measurements vertical and horizontal
- No guide rods
- Accessories of Glötzl standard inclination measuring probe can be used.
- Digital data transfer

Type: BES–E32/1
E32/1A+B
E32/1H
E32/1A+B+H

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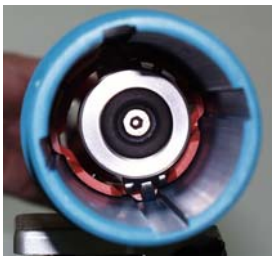


The bore hole length **measuring probe** is a measuring device which takes account of the requirements of a site-adjusted application.

The new development has the advantage – compared with the conventional probes - that the measuring expenditure is minimized as far as possible. By this, the measurement can be carried out without rods – similar to an inclination measurement -, but in the vertical area.

The measuring tubes are installed in single lengths of 1 m and have measuring connections of metal or plastic material for orientation of the length measuring probe, dependent on the required measuring accuracy. For installation, the measuring tubes are connected with each other in such a way that they can record settlements and deformations in the construction by the case friction and thus make them measurable for the probe.

The essential novelty of the measuring probe is based on the arrangement of guide rods with a balancer system, which enables the step-by-step measurement of the single guide couplings at the measuring connections by fine-tuned elastic forces. The balancer at the bottom of the probe is kept by the measuring mark. The upper balancer is drawn up till the upper measuring connection by overdraw of the elastic force at the lower balancer part which is connected with the displacement transducer for length measurement. The appearing measured value is accepted as length dimension. For placing the probe at next tube coupling, with a distance of approx. 1 m, the probe is slightly dropped and drawn over the measured measuring mark with slow speed. At the same time, the incli-nation measuring values are also recorded at pick-up of meas. values, dependent on probe model. Recording of inclinations measurements in connection with the length measurement enables the determination of exact deformation lines of an instrumented measuring distance for each meter of measuring length.

Measuring probes:

4 probe models are availabe for the different measuring tasks. The probe assemblage is constructed in such a way that it is possible to upgrade the basic equipment for length measurement with additional sensors for vertical inclination measurement, and, if required, also for horizontal measurement. An installed controller is digitalizing the measured values and is transferring them for data recording via a RS 485 interface.

Measurement:

Basically, this is exactly done like a vertical or horizontal inclination measurement with the same measuring equipment. Readout units VMG 14 and evaluation software GLNP are already equipped for length measurement.

If the Glötzl inclination measuring equipment with corresponding readout unit and software are already existing, only the supply of the bore hole length measuring probe is required for the solution of the measuring tasks.

Figure: Bore hole length measuring probe, basis 1 m

Vertical length- and inclination measurements:

The measurement is done like a vertical inclination measurement. Additionally, a scanning of the measuring marks has to be done with the probe and their distance to each other be measured. In case of an equipment of probe with inclination sensors, **type E32/1 A+B,** the inclination angles are also recorded with the length measurement.

Horizontal length- /inclination measurements:

The procedure is the same as a horizontal inclination measurement with rods. By recording of measuring mark distances, it is similar to the measurement of horizontal settlement plates, however with high accuracy – also known as expanding level measurement. With the probe type **E32/1 H**, also the vertical settlements are recorded by the inclination angles.

Probes:

Type E32/1	Model only as length measuring probe
Type E32/1 A+B	Length measuring probe with vertical inclination sensors A and B (X/Y)
Type E32/1 H	Length measuring probe with sensor for horizontal inclination measurement H
Type E32/1 A+B+H	Length measuring probe with vertically and horizontally measuring inclination sensors

Measuring tubes:

ABS 50, Ø 49/55 mm with plastic measuring marks (2“-tubes), type ABS BES-RK 50

ALU 50, Ø 49/53 mm with metal measuring marks (2“-tubes), type ALU BES-RA 50

PVC 60, Ø 60/70 mm with metal- or plastic measuring marks (2,75“-tubes), type PVC BES-RM 60

Figure: Probe in measuring tube

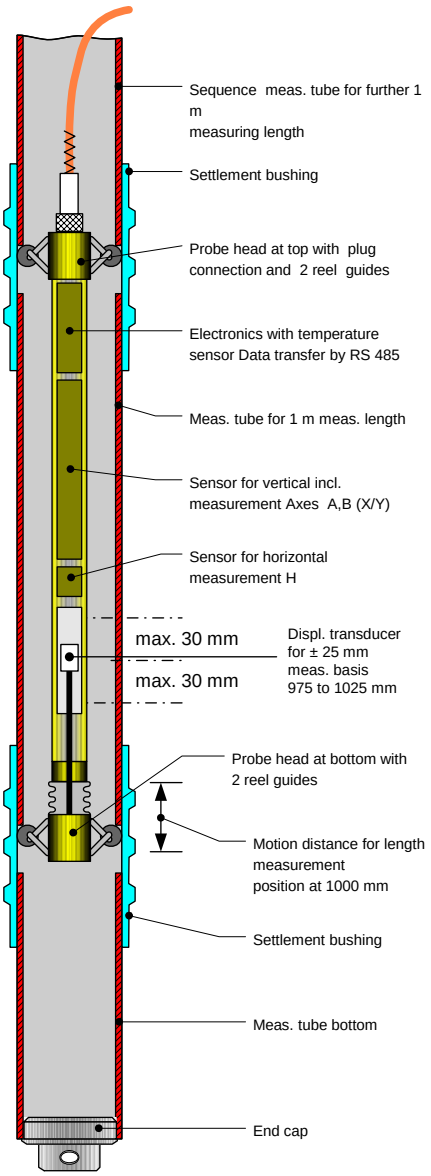
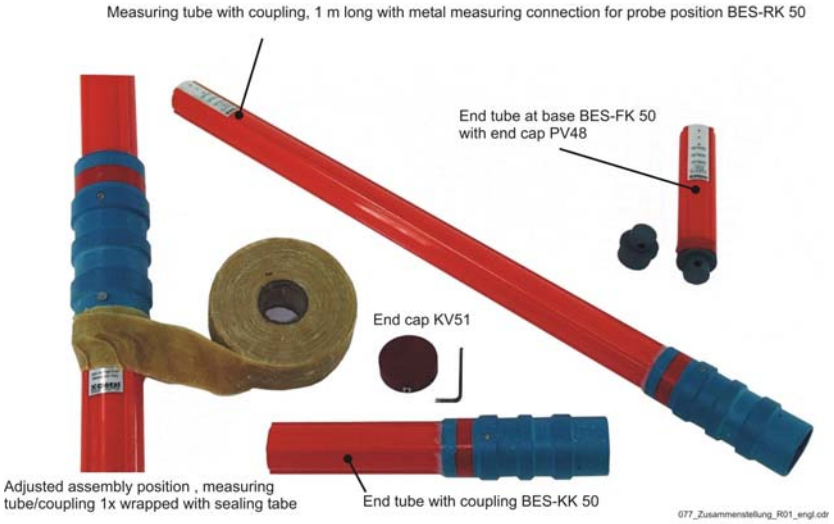


Figure: Meas. tubes and accessories



Technical data general:

Probe length, basic length	1000 mm
Measuring length	975 up to 1025 mm
Probe diameter	32/40 mm
Data transfer digital	RS 485
Probe temperature	± 0.1 °C
Temperature range	-5 up to +60 °C
Material	Stainless steel

Length measurement E:

Probe accuracy	± 0.02 mm
Measuring range	50 mm
Meas. value resolut. max.	0.001mm
Standard	0.01 mm

Operation accuracy:

Vertical*)

Metal meas. marks	± 0.05 mm
Plastic meas. marks	± 0.1 mm

Horizontal*)

Metal meas. marks	± 0.1 mm
Plastic meas. marks	± 0.1 mm

Inclination measurement A+B vertical with 2 measuring axes:

Measuring range
Maximum 90°, normal ± 30°

Measured value resolution

Maximum up to 5,7°	sine 0.00001
Standard	sine 0.0001
Accuracy	± 0.1 mm/m

Inclination measurement H horizontal with 1 measuring axis:

Measuring range
Maximum 90°, normal ± 30°

Measured value resolution

Maximum up to 5,7°	sine 0.00001
Standard	sine 0.0001
Accuracy	± 0.1 mm/m

*) depending on the conditions caused by installation and measurements

Configuration with max. resolution only as option available

Subject to technical alterations

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