The configuration consists of:
- Premium hardware GRP 3000
- Application specific software Tamping Plus
- Robust and guaranteed precision thanks to GRP Fidelity
- First-class application support

Technical data GRP 3000

<table>
<thead>
<tr>
<th>System configuration</th>
<th>Cont. system accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauge (mm)</td>
<td>+/- 0.3 mm</td>
</tr>
<tr>
<td>Super elevation</td>
<td>+/- 0.5 mm</td>
</tr>
<tr>
<td>Control point accuracy</td>
<td>+/- 1.0 mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TGS FX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauge - for nominal gauge</td>
</tr>
<tr>
<td>Super elevation (Cant)</td>
</tr>
<tr>
<td>Control point distance</td>
</tr>
</tbody>
</table>

Sensor performance

Track geometry measurement (Position, Gauge, Super elevation)

<table>
<thead>
<tr>
<th>Measurement stop&amp;go - Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>TPS 5 s</td>
</tr>
<tr>
<td>GPS 1 s</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measurement kinematic - Data Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>TPS 7 Hz</td>
</tr>
<tr>
<td>GPS 10 Hz</td>
</tr>
</tbody>
</table>

System accuracy

Determination of track position and height(*)

<table>
<thead>
<tr>
<th>GRP with total station (TPS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position/Height</td>
</tr>
<tr>
<td>GRP with GPS</td>
</tr>
<tr>
<td>Position:</td>
</tr>
<tr>
<td>Height:</td>
</tr>
</tbody>
</table>

(*) Typical project accuracy depending on e.g. atmospheric conditions, control point quality, positioning sensor and project conditions.

System use and typical system performance

Tamping applications

Typical track work applications
- New construction
- Rehabilitation
- Renewal
- Maintenance
- Tamping only

Typical project performance

<table>
<thead>
<tr>
<th>Track survey with total station</th>
<th>800 – 1200 m/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Track survey with GPS</td>
<td>3000 m/h</td>
</tr>
</tbody>
</table>

Control point survey
- track offset report
- average control point interval 40 m

Tamping data (lift and slue values)

- TPS: 5 s
- GPS: 1 s

Power supply

Leica total stations: T515/16, T530, T550/60, M550/60

Leica GPS: GPS1200, GS10/14/15/16/18

Panasonic control computer: Battery life(*)

Battery life: Li-Ion battery rechargeable > 4 h

(*) Depending on conditions.

Environmental specifications

Working temperature range: -10°C to +50°C

Humidity: < 80 %

System weight

GRP 3000: 30 kg

System approval

CE Conformity:
- EN 61326-1:2013
- EN 61000-4-2:2005
- EN 61000-6-2:2005/A1:2011
- EN 60825-1:2014
- EN 13848-4
- Directives 2014/30/EU
- Directives 2014/35/EU
- Directives 2011/65/EU

GRP System FX approvals from:
- Network Rail / London Underground (UK), Deutsche Bahn (DE), SBB (CH), SNCF (FR), ORR (AT), RFI (IT), Add (ES), ProRail (NL), Infrabel (BE)

Extract of references

Amberg’s railway surveying solutions have proven their high performance all over the world. Demanding projects have been successfully realised in e.g. Germany, Austria, Belgium, the Netherlands, Denmark, France, Italy, Spain, Greece, Turkey, Australia, United Kingdom, Saudi Arabia, UAE, Korea, USA, PR China.
Amberg Tamping

The perfect track with Amberg Tamping. High-performance system solution for track design based or control point based tamping survey.

**Amberg Tamping GRP 3000**

**System performance and technical data**

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**Project data management**

- Central database for input, visualisation and management of all track project data including route data chronology, control points and survey and construction progress.

- User-defined project definition either as manual input of the (relative) track axis data from a track layout plan or as (absolute) coordinate referenced track axis data directly from the database or design software.

- Prior definition of geometrical tamping parameters (e.g. max. lift, max. slue per run).

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**Surveying**

- Automatic surveying of current track position including inner track geometry as basis for calculation of lift and slue values.

- All relevant track information available on track in real-time.

- Data logging in static or kinematic surveying mode, depending on project requirements – with surveying performance up to 3 km/h.

- Use of the Profiler 110 FX for control point surveying after completion of track work.

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**Evaluation and reporting**

- Automatic survey data processing and evaluation – including automatic linking of subsequently surveyed sections.

- User friendly tamping data editor for interactive graphical data analysis and processing.

- Direct export of correction data for Plasser, Framafer and Matisa tamping machine control computers.

- Comprehensive reports of inner and outer track geometry analyses, including control point record.

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