ASSEMBLY AND OPERATING MANUAL

DEGERtracker 3000NT
DEGERtracker 3000HD
DEGERtracker 5000NT
DEGERtracker 5000HD
DEGERtracker 6000NT
DEGERtracker 7000NT
DEGERtracker 9000NT
Copyright

All information contained in this technical documentation, as well as the drawings and technical descriptions provided by DEGER remain our property and must not be copied without the prior written consent of DEGER.

We reserve the right for technical changes.

Version status: 2014-03-24
Original version in German
Table of Contents

1 General ............................................................................................................................ 4
  1.1 Security advices ......................................................................................................... 5
  1.2 Short assembly instruction ....................................................................................... 6
  1.3 Scope of delivery ....................................................................................................... 7
2 Foundation and mast ...................................................................................................... 9
  2.1 Assembly foundation ............................................................................................... 9
  2.2 Creating foundation .................................................................................................. 9
  2.3 Assembly of the mast .............................................................................................. 11
  2.4 Dimensions ............................................................................................................. 12
3 Structure ....................................................................................................................... 13
  3.1 Assembly integrated motor east-west and boomerang ........................................... 13
  3.2 Assembly boomerang and limit switch .................................................................... 14
  3.3 Assembly base frame .............................................................................................. 15
  3.4 Assembly Elevation-Motor (EMO) .......................................................................... 18
4 Module carry system ..................................................................................................... 20
  4.1 DEGERtracker 3000NT / 3000HD .......................................................................... 20
  4.2 DEGERtracker 5000NT / 5000HD .......................................................................... 21
  4.3 DEGERtracker 6000NT ......................................................................................... 22
  4.4 DEGERtracker 7000NT ......................................................................................... 23
  4.5 DEGERtracker 9000NT ......................................................................................... 24
  4.6 Assembly of aluminium profiles and the modules .................................................. 25
  4.7 Assembly inverter holding plate (optional) .............................................................. 27
5 Control unit ................................................................................................................... 28
  5.1 Assembly control unit ............................................................................................. 28
  5.2 Connection diagram ............................................................................................... 29
  5.3 Overview ................................................................................................................ 30
6 Commissioning ............................................................................................................ 31
7 Inspection for free movement ...................................................................................... 31
  7.1 Initiate the inspection for free movement ............................................................... 31
  7.2 Scope of the inspection for free movement ............................................................. 31
8 Notes .............................................................................................................................. 32
9 Trouble shooting / Maintenance .................................................................................. 33
  9.1 Maintenance .......................................................................................................... 33
  9.2 Trouble Shooting ...................................................................................................... 34
  9.3 Fault report ............................................................................................................. 35
  9.4 Spare parts ............................................................................................................. 36
10 Certificates .................................................................................................................. 37
  10.1 Declaration of conformity ....................................................................................... 37
  10.2 Declaration of obligation on liability for material defects ....................................... 38
  10.3 TÜV Certificate ...................................................................................................... 39
11 Publisher Information .................................................................................................. 40
1 General

Congratulations for acquiring a DEGERtracker.
You decided on a high quality dual-axis solar tracking system which is suitable for all current photovoltaic solar modules.

**Maximum solar yield:**

The maximum solar yield can be achieved with the DEGERtracker tracking system. By using the DEGERtracker tracking system, you are truly acknowledging the power of nature: you are not only protecting our environment and nature but you are increasing your yield and thus achieving ROI sooner. During the day, the DEGERtracker aligns itself like a sunflower following the sun or the brightest source of light.

**Maintenance-free. Long-life. Recyclable.**

The systems designed to these exacting parameters are mass-produced in an ISO 9001-certified factory under environmentally sound conditions. DEGERtracker systems are truly 99.9% recyclable. Compared with rigid systems, the amount of electronic scrap after useful life is 40% lower!

**Quick installation.**

Pre-assembled components with detailed instructions allow an installation within less than four hours (after the mast has been erected).

**A technology to rely on.**

The fact that the patent-protected control system and the utility model-protected mechanical system were awarded the inventor's prize of the federal state of Baden-Württemberg in South-Germany in 2000 shows that the DEGERtracker meets the demands of both experts and investors. Since this award the control unit and the mechanical system have been improved continuously. The design of the DEGERtrackers is done according to DIN 1055-4 (3/2005) with independent certification.

**Scope of delivery.**

Complete dual-axis tracking system: mast, rotating head, supporting frame, aluminium solar module carrier system - to fit the respective module type. Control electronics: MLD-Sensor with energy converter for extremely economical operation, wind monitor and optional sunlight sensor and security sensor. Foundation plan and this assembly instructions.

**ATTENTION!**

Read all of the instructions prior to working with the equipment and save these Assembly Instructions!

The installation of the DEGERtracker may only be conducted by suitable specialists! We recommend that the system be inspected by a master electrician, or at least a person with equivalent qualification, after completion.

A fault report (Chapter 9.3) must be submitted in order to process complaints. Complaints cannot be processed if fault reports have not been filled out correctly!! (the serial number of the defect system must be included in the report)
1.1 Security advices

The installed DEGERtracker tracking system has to be protected against trespassing in its whole sphere of action by adapted measures, for example by erecting a fence.

While assemblage of the DEGERtracker or parts of the system and while the system is put into operation some risks of injury exist caused by moveable parts of the tracking system. To protect injuries caused by possibly existing burrs or sharp angles we imperatively recommend to wear gloves when mounting the steel parts of the system.

In case of checks or changes at the DEGERtracker all parts of the system have to be free of potential through a Customer-supplied electrical power switch. Zero-potential and mechanical protection have to be proven and guaranteed due to the “General rules for accident prevention”. When voltage supply is indispensable for checking the system injuries of persons have to be ruled out by adapted actions.

Lightning protection and grounding should be installed/designed in accordance with state specific requirements and national standards for photovoltaic systems.

The whole sphere of action has to be free of any objects.

Elevation-axle and azimuth-axle of the DEGERtracker can be moved manually by the enclosed Central Control Box (CCB). Therefore please pay attention to to the assembly instructions “MLD Control EK6 with CCB”.

To move the tracker safely in the horizontal position in case of power failure we recommend to use an uninterruptible power supply. When all electrical components fail the systems can be moved into the horizontal position by using standard tools. (see chapter 3.4)

The development of the DEGERtrackers is based on the DIN 1055-4. Reducing the module surface the system will be able to resist higher demands than the values given in the norm. The maximum mountable module surface depends on regional conditions and regulations. To calculate the maximum mountable module surface a dimensioning-tool is available on our website. The download of the dimensioning-tool is free.

DEGERtrackers can also be set up in earthquake endangered zones without reservation in respect of module area or foundations geometry.

In case of accumulation of snow on the module surface with more than 35kg/m² (equivalent to about 8 cm wet snow and about 15 cm powder snow) it is necessary to broach the module surface. It is possible to do this by activating manually the CCB as described above.
For 6000NT and 9000NT the snow sensor is mandatory. Upon failure of the snow sensor, it is necessary to tilt the module surface at a load of more than 10kg/m².

Intended Use

A DEGERtracker is designed and dimensioned to be applied with standard-photovoltaic modules and is therefore not adapted to be applied with concentrator modules, mirrors, solar thermal collectors etc. The maximum mountable module surface calculated by the dimensioning-tool must not be exceeded in any case. As soon as the modules are mounted an operating wind monitor has to be assembled or the module surface has to stay in the horizontal position.

Permissible ambient temperature: -20°C to +55°C
Sound level
Distance 20m: no difference to the sound level of the surrounding measurable
Distance 10m: 40 dB(A) Reference value: 40 dB(A) corresponds to:
- tweet of a bird
- usual background sound level in a house
1.2 Short assembly instruction

1st step
Assembly of foundation and mast

2nd step
Assembly of integrated motor east west

3rd step
Assembly of base frame

4th step
Assembly of Elevation motor

5th step
Assembly of modules and control unit
### 1.3 Scope of delivery

#### 130001 DEGERtraker 3000NT

<table>
<thead>
<tr>
<th>A-Nr.</th>
<th>Name of item</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mast</td>
<td>1</td>
</tr>
<tr>
<td>8100041</td>
<td>Rotating head 3000NT</td>
<td>1</td>
</tr>
<tr>
<td>8100017</td>
<td>Base frame 3000NT</td>
<td>1</td>
</tr>
<tr>
<td>4100438</td>
<td>Elevation-motor EMO V</td>
<td>1</td>
</tr>
<tr>
<td>8100036</td>
<td>Boltpack rotating head</td>
<td>1</td>
</tr>
<tr>
<td>6800003</td>
<td>Tread locking fluid 5x</td>
<td>1</td>
</tr>
<tr>
<td>8100034</td>
<td>Boomerang II 5000NT</td>
<td>1</td>
</tr>
<tr>
<td>8910</td>
<td>Assembly instruction</td>
<td>1</td>
</tr>
<tr>
<td>8101041</td>
<td>Energy converter 6</td>
<td>1</td>
</tr>
</tbody>
</table>

#### 150001 DEGERtraker 5000NT

<table>
<thead>
<tr>
<th>A-Nr.</th>
<th>Name of item</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mast</td>
<td>1</td>
</tr>
<tr>
<td>8100005</td>
<td>Rotating head 5000NT</td>
<td>1</td>
</tr>
<tr>
<td>8100003</td>
<td>Base frame 5000NT</td>
<td>1</td>
</tr>
<tr>
<td>4100038</td>
<td>Elevation-motor EMO V</td>
<td>1</td>
</tr>
<tr>
<td>8100036</td>
<td>Boltpack rotating head</td>
<td>1</td>
</tr>
<tr>
<td>6800003</td>
<td>Tread locking fluid 5x</td>
<td>1</td>
</tr>
<tr>
<td>8100034</td>
<td>Boomerang II 5000NT</td>
<td>1</td>
</tr>
<tr>
<td>8910</td>
<td>Assembly instruction</td>
<td>1</td>
</tr>
<tr>
<td>8101041</td>
<td>Energy converter 6</td>
<td>1</td>
</tr>
</tbody>
</table>

#### 160001 DEGERtraker 6000NT

<table>
<thead>
<tr>
<th>A-Nr.</th>
<th>Name of item</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mast</td>
<td>1</td>
</tr>
<tr>
<td>8100003</td>
<td>Rotating head 6000NT</td>
<td>1</td>
</tr>
<tr>
<td>8100081</td>
<td>Base frame 6000NT</td>
<td>1</td>
</tr>
<tr>
<td>4100055</td>
<td>Elevation-motor EMO V</td>
<td>1</td>
</tr>
<tr>
<td>8100019</td>
<td>Boltpack rotating head</td>
<td>1</td>
</tr>
<tr>
<td>6800003</td>
<td>Tread locking fluid 5x</td>
<td>1</td>
</tr>
<tr>
<td>8100032</td>
<td>Boomerang II 6000NT</td>
<td>1</td>
</tr>
<tr>
<td>8910</td>
<td>Assembly instruction</td>
<td>1</td>
</tr>
<tr>
<td>8101041</td>
<td>Energy converter 6</td>
<td>1</td>
</tr>
</tbody>
</table>

#### 190001 DEGERtraker 9000NT

<table>
<thead>
<tr>
<th>A-Nr.</th>
<th>Name of item</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mast</td>
<td>1</td>
</tr>
<tr>
<td>8100077</td>
<td>Rotating head 9000NT</td>
<td>1</td>
</tr>
<tr>
<td>8100074</td>
<td>Base frame 9000NT</td>
<td>1</td>
</tr>
<tr>
<td>4100055</td>
<td>Elevation-motor EMO V</td>
<td>1</td>
</tr>
<tr>
<td>8100199</td>
<td>Boltpack rotating head</td>
<td>1</td>
</tr>
<tr>
<td>6800003</td>
<td>Tread locking fluid 5x</td>
<td>1</td>
</tr>
<tr>
<td>8100032</td>
<td>Boomerang II 9000NT</td>
<td>1</td>
</tr>
<tr>
<td>8910</td>
<td>Assembly instruction</td>
<td>1</td>
</tr>
<tr>
<td>8101015</td>
<td>Energy converter 6</td>
<td>1</td>
</tr>
</tbody>
</table>

### 170001 DEGERtraker 7000NT

<table>
<thead>
<tr>
<th>A-Nr.</th>
<th>Name of item</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mast</td>
<td>1</td>
</tr>
<tr>
<td>8100006</td>
<td>Rotating head 7000NT</td>
<td>1</td>
</tr>
<tr>
<td>8100004</td>
<td>Base frame 7000NT</td>
<td>1</td>
</tr>
<tr>
<td>4100038</td>
<td>Elevation-motor EMO V</td>
<td>1</td>
</tr>
<tr>
<td>8100199</td>
<td>Boltpack rotating head</td>
<td>1</td>
</tr>
<tr>
<td>6800003</td>
<td>Tread locking fluid 5x</td>
<td>1</td>
</tr>
<tr>
<td>8100031</td>
<td>Boomerang II 7000NT</td>
<td>1</td>
</tr>
<tr>
<td>8910</td>
<td>Assembly instruction</td>
<td>1</td>
</tr>
<tr>
<td>8101041</td>
<td>Energy converter 7</td>
<td>1</td>
</tr>
</tbody>
</table>

#### Optional:

- 1900003 Inverter holding plate 1200 mm
- 1900005 Inverter holding plate 600 mm
- 1900011 Inverter holding plate 900 mm with support bracket
- 1900012 Inverter holding plate 600 mm with support bracket
- 1900007 Snow sensor
- 1900032 Sunlight sensor
- 1900001 CentralControlBox BASIC
- 1900004 CentralControlBox STANDARD
- 1900003 CentralControlBox ADVANCED
- 1900008 Pendulum kit for wind guard

* depending on amount and size of modules

The exact number and dimensions refer to the enclosed packing list.

In the packing list you also can find the corresponding item number.
Pos.1 : Mast

Pos.2 : Rotating head
optional: Inverter holding plate
Snow Sensor
Sunlight Sensor
CentralControlBox
Wind guard
BASIC
STANDARD
ADVANCED
Pendulum for Wind guard

Pos.3 : Base frame
for 9000NT
additional:
2x Thread rod

Pos.4 : Elevation motor EMO
Pos.4a: Bolt pack EMO

Pos.5 : Bolt pack rotating head
Pos.7 Boomerang II
Pos.9 : Energy converter 6

Pos.6 : Boomerang I

Pos.10 : Aluminum profiles

Pos.11: Clamp MTH M10
Pos.12: Sliding nut M10
Pos.13: Bolt M10x35
Pos.14: Bolt M10x140

Pos.15: End Clamp
Pos.16: Sliding nut M8
Pos.17: Bolt M8
Pos.18: Clamp plate
Pos.19: Bolt M6
Pos.20: Sliding nut M6
2 Foundation and mast

2.1 Assembly foundation

A qualified professional must be commissioned with creating the foundation.

We recommend having the foundation reinforcement approved by a qualified engineer or technician before concreting.

The necessary bearing capacity of the subsoil is 200 kN/m². This value must be checked for correctness and documented by the site manager in charge. A substratum expert is to be called in if there is any uncertainty.

In regions and with soils at risk of frost, further measures must be taken to ensure frost protection, e.g. frost-proof sub-base or lean-mixed concrete fill down to the frost line.

A formwork and reinforcement diagram for the particular foundation, as shown below, can be obtained for each DEGERtracker on request – you must observe the instructions given in the diagrams! This diagram will be sent with the order confirmation. The diagram shown is only intended as a sample drawing.

2.2 Creating foundation

1st Step:

- Excavate top soil
- Insert conduit for cable (not in picture)
- Install formwork (Foundation dimensions, see chapter 2.4)
- Lay bottom layer of wire-mesh steel Q257A Item1 into the formwork (cut into the formwork)
- Insert a spacer to ensure minimum concrete coverage (5 cm).
2nd Step:
- Insert mast mount centrally (height approx. 10 cm).
- Install bent bar-steel into the center of the foundation.

ATTENTION: Conduit must be inside the mast
- Install bent bar-steel.
- Install top layer of wire-mesh steel Q257A (cut into the formwork).

3th Step:
- Create formwork for the receiving part.
- Attach foundation formwork.
- Affix foundation formwork in such a way that the formwork pressure generated by filling can be absorbed.
- Pour out and compact the foundation (without receiving part) using C20/30 concrete.

4th Step:
- Affix mast with 2 reinforcement against rotation.
- Insert mast into the foundation receiving part. You do not have to take account of the location of the bores in the flange.
  ATTENTION: Conduit must be inside the mast until min. 10 cm above foundation top edge
- Align mast vertically.
- Fill up receiving part and mast base up to the top edge of the foundation using grout concrete C25/30 (flowable) and compact the concrete.

The concrete should be allowed to harden for at least 2 days before any further installation work is done!

ATTENTION! Cable guide
We recommend you attach a junction box to the side of the foundations, as shown in the adjacent drawing. The cables from the junction box to the rotating head must be designed as flexible rubber cables.
2.3 Assembly of the mast

Example for mounting on concrete wall C20/25:

ATTENTION!

It is necessary to dimension the mounting for every system separately according to the conditions on site. The calculations are to be assigned to a local structural engineer who is responsible for the present building!

Dimensions:

Free standing tracker:

Tracker building integrated:
## 2.4 Dimensions

### DEGERtracker 3000

<table>
<thead>
<tr>
<th>Modul area m²</th>
<th>Total length m</th>
<th>Free length m</th>
<th>Length of restraint m</th>
<th>Mast cross section Ø / wall thickness mm</th>
<th>Mast weight kg</th>
<th>Foundation dimensions mm</th>
<th>Foundation weight kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>3.3</td>
<td>2.6</td>
<td>0.7</td>
<td>tube 219.1 x 7.1</td>
<td>113</td>
<td>Ø205x85</td>
<td>180x180x85</td>
</tr>
<tr>
<td>25</td>
<td>4.0</td>
<td>3.3</td>
<td>0.7</td>
<td>tube 219.1 x 8.0</td>
<td>160</td>
<td>Ø210x85</td>
<td>185x185x85</td>
</tr>
<tr>
<td>25</td>
<td>4.5</td>
<td>3.8</td>
<td>0.7</td>
<td>tube 219.1 x 8.8</td>
<td>198</td>
<td>Ø215x85</td>
<td>190x190x85</td>
</tr>
<tr>
<td>25</td>
<td>5.0</td>
<td>4.3</td>
<td>0.7</td>
<td>tube 219.1 x 10.0</td>
<td>251</td>
<td>Ø225x85</td>
<td>200x200x85</td>
</tr>
<tr>
<td>25</td>
<td>5.5</td>
<td>4.8</td>
<td>0.7</td>
<td>tube 219.1 x 11.0</td>
<td>303</td>
<td>Ø235x85</td>
<td>205x205x85</td>
</tr>
</tbody>
</table>

### DEGERtracker 5000

<table>
<thead>
<tr>
<th>Modul area m²</th>
<th>Total length m</th>
<th>Free length m</th>
<th>Length of restraint m</th>
<th>Mast cross section Ø / wall thickness mm</th>
<th>Mast weight kg</th>
<th>Foundation dimensions mm</th>
<th>Foundation weight kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>3.3</td>
<td>2.6</td>
<td>0.7</td>
<td>tube 219.1 x 7.1</td>
<td>113</td>
<td>Ø230x85</td>
<td>200x200x85</td>
</tr>
<tr>
<td>40</td>
<td>4.0</td>
<td>3.3</td>
<td>0.7</td>
<td>tube 219.1 x 8.0</td>
<td>160</td>
<td>Ø250x85</td>
<td>220x220x85</td>
</tr>
<tr>
<td>40</td>
<td>4.5</td>
<td>3.8</td>
<td>0.7</td>
<td>tube 219.1 x 8.8</td>
<td>198</td>
<td>Ø280x85</td>
<td>240x240x85</td>
</tr>
<tr>
<td>40</td>
<td>5.0</td>
<td>4.3</td>
<td>0.7</td>
<td>tube 219.1 x 10.0</td>
<td>251</td>
<td>Ø300x85</td>
<td>260x260x85</td>
</tr>
<tr>
<td>40</td>
<td>5.5</td>
<td>4.8</td>
<td>0.7</td>
<td>tube 219.1 x 11.0</td>
<td>303</td>
<td>Ø310x85</td>
<td>270x270x85</td>
</tr>
<tr>
<td>40</td>
<td>6.0</td>
<td>5.3</td>
<td>0.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>8.0</td>
<td>7.3</td>
<td>0.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### DEGERtracker 6000

<table>
<thead>
<tr>
<th>Modul area m²</th>
<th>Total length m</th>
<th>Free length m</th>
<th>Length of restraint m</th>
<th>Mast cross section Ø / wall thickness mm</th>
<th>Mast weight kg</th>
<th>Foundation dimensions mm</th>
<th>Foundation weight kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>53</td>
<td>4.0</td>
<td>3.3</td>
<td>0.7</td>
<td>tube 323.9 x 7.1</td>
<td>205</td>
<td>Ø255x85</td>
<td>225x225x85</td>
</tr>
<tr>
<td>53</td>
<td>4.5</td>
<td>3.8</td>
<td>0.7</td>
<td>tube 323.9 x 7.1</td>
<td>233</td>
<td>Ø260x85</td>
<td>230x230x85</td>
</tr>
<tr>
<td>53</td>
<td>5.0</td>
<td>4.3</td>
<td>0.7</td>
<td>tube 323.9 x 8.0</td>
<td>292</td>
<td>Ø265x85</td>
<td>235x235x85</td>
</tr>
<tr>
<td>53</td>
<td>5.5</td>
<td>4.8</td>
<td>0.7</td>
<td>tube 323.9 x 8.8</td>
<td>356</td>
<td>Ø270x85</td>
<td>240x240x85</td>
</tr>
<tr>
<td>53</td>
<td>6.0</td>
<td>5.3</td>
<td>0.7</td>
<td>tube 323.9 x 8.8</td>
<td>387</td>
<td>Ø280x85</td>
<td>250x250x85</td>
</tr>
<tr>
<td>53</td>
<td>8.0</td>
<td>7.3</td>
<td>0.7</td>
<td>tube 323.9 x 14.2</td>
<td>817</td>
<td>Ø310x85</td>
<td>270x270x85</td>
</tr>
</tbody>
</table>

### DEGERtracker 7000

<table>
<thead>
<tr>
<th>Modul area m²</th>
<th>Total length m</th>
<th>Free length m</th>
<th>Length of restraint m</th>
<th>Mast cross section Ø / wall thickness mm</th>
<th>Mast weight kg</th>
<th>Foundation dimensions mm</th>
<th>Foundation weight kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>3.3</td>
<td>2.6</td>
<td>0.7</td>
<td>tube 323.9 x 7.1</td>
<td>166</td>
<td>Ø280x85</td>
<td>280x280x85</td>
</tr>
<tr>
<td>60</td>
<td>4.0</td>
<td>3.3</td>
<td>0.7</td>
<td>tube 323.9 x 7.1</td>
<td>205</td>
<td>Ø290x85</td>
<td>290x290x85</td>
</tr>
<tr>
<td>60</td>
<td>4.5</td>
<td>3.8</td>
<td>0.7</td>
<td>tube 323.9 x 8.0</td>
<td>259</td>
<td>Ø300x85</td>
<td>300x300x85</td>
</tr>
<tr>
<td>60</td>
<td>5.0</td>
<td>4.3</td>
<td>0.7</td>
<td>tube 323.9 x 8.8</td>
<td>356</td>
<td>Ø340x85</td>
<td>320x320x85</td>
</tr>
<tr>
<td>60</td>
<td>5.5</td>
<td>4.8</td>
<td>0.7</td>
<td>tube 323.9 x 10.0</td>
<td>430</td>
<td>Ø330x85</td>
<td>330x330x85</td>
</tr>
</tbody>
</table>

### DEGERtracker 9000

<table>
<thead>
<tr>
<th>Modul area m²</th>
<th>Total length m</th>
<th>Free length m</th>
<th>Length of restraint m</th>
<th>Mast cross section Ø / wall thickness mm</th>
<th>Mast weight kg</th>
<th>Foundation dimensions mm</th>
<th>Foundation weight kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>4.0</td>
<td>3.3</td>
<td>0.7</td>
<td>tube 323.9 x 7.1</td>
<td>205</td>
<td>Ø320x85</td>
<td>290x290x85</td>
</tr>
<tr>
<td>70</td>
<td>4.5</td>
<td>3.8</td>
<td>0.7</td>
<td>tube 323.9 x 8.0</td>
<td>259</td>
<td>Ø330x85</td>
<td>300x300x85</td>
</tr>
<tr>
<td>70</td>
<td>5.0</td>
<td>4.3</td>
<td>0.7</td>
<td>tube 323.9 x 8.8</td>
<td>356</td>
<td>Ø340x85</td>
<td>320x320x85</td>
</tr>
<tr>
<td>70</td>
<td>6.0</td>
<td>5.3</td>
<td>0.7</td>
<td>tube 323.9 x 10.0</td>
<td>672</td>
<td>Ø380x85</td>
<td>330x330x85</td>
</tr>
<tr>
<td>70</td>
<td>8.0</td>
<td>7.3</td>
<td>0.7</td>
<td>tube 323.9 x 20.0</td>
<td>1121</td>
<td>Ø420x85</td>
<td>365x365x85</td>
</tr>
</tbody>
</table>

---

**ATTENTION!**

The measurements and dimensions listed have been calculated according to DIN norms and should be understood as a guide values. National norms, directives and materials must also be taken into consideration. Special foundation plans (also for Canada and USA) can be made available on request!!

The total length of the mast 6.0m and 8.0m are only available in Europe!
3 Structure

3.1 Assembly integrated motor east-west and boomerang

1st step:
Set rotating head carefully onto the flange on the top of the mast. The gearbox should not get hard knocks.

The drive unit should roughly point south (+/- 30°) while being screwed tight.

2nd step:
Screw rotating head with the flange by using bolts M16x75 and washers M16.

torque 200Nm

3rd step:
Mounting boomerang at the mast flange.

The tip of the “boomerang” must point in a southward direction (+/- 3°). Use a GPS device or refer to the surveyor’s plan of the property to determine the south position. A compass is not precise enough. As the boomerang is operating the end-limit-switch and with this the final position of the east-west-axis is set, an exact arrangement is necessary.

<table>
<thead>
<tr>
<th>Weight of rotation head</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DEGERtracker 3000NT, 5000NT</td>
<td>160kg</td>
</tr>
<tr>
<td>DEGERtracker 3000HD, 7000NT</td>
<td>240kg</td>
</tr>
<tr>
<td>DEGERtracker 5000HD, 6000NT, 9000NT</td>
<td>260kg</td>
</tr>
</tbody>
</table>

The position of the bore holes is irrelevant.
3.2 Assembly boomerang and limit switch

Push the boomerang as shown at the mast flange and fix it with the screws M5x18.

torque 6.5Nm

4th Step:
Attach the limit switch setting azimuth in the free bore on the rotating head.

Make sure that the switch flag terminals make contact upon operation of the boomerang and that the rotation movement is stopped.
3.3 Assembly base frame

Only required for the DEGERtrackers 9000NT supporting frames:

The tension rods supplied must be installed before assembling the DEGERtrackers 9000NT base frame onto the rotating head. To do this, push the tension rods through the longitudinal holes of the upper and lower cross member and secure each with an Washer M12, an M12 nut and an M12 self-locking nut. 

**torque 15Nm**

Detailed view from above: 
(sectional view)

Tension rod with M12 thread on both sides

Detailed view from below: 
(sectional view)
Before installing the base frame, it is advisable to mark the positions of the aluminium profiles on the side of the top cross brace and the bottom cross brace – according to the description Part IV. Labelling must always be from the centre of the cross brace to the outside.

**1st step:**

Suspend the base frame by using a crane in such a way that the bore holes at the tip of rotation of the base frame are at the top and the connection for the Elevation motor (EMO) is on the left.

### 5000NT / 5000HD / 6000NT / 7000NT / 9000NT:

![Diagram of base frame with markings](image)

### 3000NT / 3000HD:

![Diagram of base frame with markings](image)

### Weight of base frame

- DEGERtracker 3000NT: 217 kg
- DEGERtracker 3000HD: 328 kg
- DEGERtracker 5000NT: 383 kg
- DEGERtracker 5000HD: 600 kg
- DEGERtracker 6000NT: 650 kg
- DEGERtracker 7000NT: 665 kg
- DEGERtracker 9000NT: 675 kg
2nd step:
Built in bolt M24x180 with washer M24 and self-looking nut M24. Do not screw the bolts with the nut too tightly, to ensure that the shackles at the rotating head are not pressed together.

ATTENTION!
Slide bearing bushings are installed at the rotation point of the base frame – these must be slightly lubricated in the initial installation. Later on lubrication is possible at any time through a lubricating nipple in the bolt M24x180. A list of suitable lubricants you find on chapter 0.

Mounting the modules on the base frame beforehand is not permitted!!
3.4 Assembly Elevation-Motor (EMO)

1st step:

The EMO is delivered with preset limit switches so no set up work has to be done at all.

Fix Elevation motor at the rotation head by using the special screws EMO. Therefore the enclosed thread locking fluid has to be used. Tighten the special screws. **Torque:**

- **35 Nm**, EMO
- **50Nm**, EMO HD

2nd step:

Fix Elevation motor (EMO) at the base frame by using bolt M14x80 and self-locking nut M14. The bolt should not turn during operation.

Fix Elevation motor (EMO-HD) at the base frame by using bolt M20x80 and self-locking nut M20. The bolt should not turn during operation.

---

**ATTENTION!**

- Do not use any other screws except those included in the delivery!
- Apply max. one drop of the thread locking fluid to the internal thread of the EMO. Ensure that **no** locking fluid enters into the sliding bearing connector!
- The cable connections for the elevation motor must be at the bottom!
- In both holding fixture points the Elevation motor must be movable.
ATTENTION!
Disconnect the Elevation-Motor from the Energy-Converter by loosen clamp 1 and 2 before beginning with this work.

Manual operation:
When electrical components fail the systems can be moved into the horizontal position by using a 12V or 24V batterie.

When all electrical components fail the systems can be moved into the horizontal position by using standard tools. For this the Aluminium-Cover at the lower side of the elevation motor has to be removed. After this apply a spanner wrench (size 17mm) at the hexagonal nut at the end of the elevation motor and turn slowly (max. 30°/sec ==> 5 Upm) clockwise.

ATTENTION! IMPORTANT OPERATING INSTRUCTIONS!
The expansion bellows may not be pinched, blocked or compressed, since this can lead to damage to the internal parts.

A mechanical blockage of the movement of the piston rods is to be avoided since this can lead to damage to the drive system.

The linear actuator must come to a complete stop before changing the movement direction.

A fast reversal of the travel direction of the actuator (for example with the aid of the CCB) is not permitted.

CHECKING OF THE MECHANICS
Extend and retract the complete way of the drive, to guarantee that the mechanics moves freely, does not knock against anything and that the cables are long enough. Use a 12V or 24V batterie (for ex. suitable for a batterie-driven drill) for the head of the drive.
4 Module carry system

4.1 DEGERtracker 3000NT / 3000HD

Module arrangement:

The following dimensions have to be abode and have to be reduced according to regional conditions if necessary:

- Module surface: max. 25m²
- length of Module surface: max. 5.00m
- height of Module surface: max. 5.00m

The total module area is to be determined relative to the site with the aid of the DEGERenergie dimensioning tool and may in no case be greater than 25m².

![Diagram of module arrangement]

1st step: Arrangement of aluminium profiles:

Following points have to be attended:

- in both axis modules have to be arranged symmetrically to the center of gravity
- 2 aluminium profiles for each row of modules
- attend the connecting socket on the backside of the modules

Overhang of the aluminium profile: \[ y = \frac{\text{length of aluminium profile} - 1.942m}{2} \]

2nd Step: Installation of aluminium profile F-SET-HD:
(only for DEGERtracker 3000NT and 3000HD)

Insert screw M10x140 through existing bores; slide, align and fix Alu profile F-SET-X via the sliding nuts. The two screws are to be tightened with a **torque of 40NM**.
4.2 DEGERtracker 5000NT / 5000HD

Module arrangement:

The following dimensions have to be abode and have to be reduced according to regional conditions if necessary:

- Module surface: max. 40m²
- length of Module surface: max. 8.30m
- height of Module surface: max. 5.30m

The total module area is to be determined relative to the site with the aid of the DEGERenergie dimensioning tool and may in no case be greater than 40m².

1st step: Arrangement of aluminium profiles:

Distance between 2 aluminium profiles: \( x = \) width of module / 2
(attend the point of fastening from the modul manufacturer)

Overhang of the aluminium profile: \( y = (\text{length of aluminium profile } - 2.60m) / 2 \)

Following points have to be attended:
- assemble aluminium profile from the middle to the outside
- in both axis modules have to be arranged symmetrically to the center of gravity
- 2 aluminium profiles for each row of modules
- attend the connecting socket on the backside of the modules

2nd step: Assembly of aluminium profiles see chapter Fehler! Verweisquelle konnte nicht gefunden werden.
4.3 DEGERtracker 6000NT

Module arrangement:

The following dimensions have to be abode and have to be reduced according to regional conditions if necessary:

- Module surface: \( \text{max. } 53 \text{m}^2 \)
- length of Module surface: \( \text{max. } 10.05 \text{m} \)
- height of Module surface: \( \text{max. } 5.60 \text{m} \)

The total module area is to be determined relative to the site with the aid of the DEGERenergie dimensioning tool and may in no case be greater than \( 53 \text{m}^2 \).

1st step: Arrangement of aluminium profiles:

Distance between 2 aluminium profiles: \( x = \text{width of module} / 2 \)
(attend the point of fastening from the modul manufacturer)

Overhang of the aluminium profile: \( y = (\text{length of aluminium profile} - 2.60 \text{m}) / 2 \)

Following points have to be attended:
- assemble aluminium profile from the middle to the outside
- in both axis modules have to be arranged symmetrically to the center of gravity
- 2 aluminium profiles for each row of modules
- attend the connecting socket on the backside of the modules

2nd step: Assembly of aluminium profiles see chapter Fehler! Verweisquelle konnte nicht gefunden werden.!
4.4 DEGERtracker 7000NT

Module arrangement:

The following dimensions have to be abode and have to be reduced according to regional conditions if necessary:

- Module surface: max. 60m²
- length of Module surface: max. 11.40m
- height of Module surface: max. 5.30m

The total module area is to be determined relative to the site with the aid of the DEGERenergie dimensioning tool and may in no case be greater than 60m².

1st step: Arrangement of aluminium profiles:

Distance between 2 aluminium profiles: \( x = \text{width of module} / 2 \)  
(attend the point of fastening from the modul manufacturer)

Overhang of the aluminium profile: \( y = (\text{length of aluminium profile} - 2.60) / 2 \)

Following points have to be attended:
- assemble aluminium profile from the middle to the outside
- in both axis modules have to be arranged symmetrically to the center of gravity
- 2 aluminium profiles for each row of modules
- attend the connecting socket on the backside of the modules

2nd step: Assembly of aluminium profiles see chapter Fehler! Verweisquelle konnte nicht gefunden werden.
4.5 DEGERtracker 9000NT

Module arrangement:

The following dimensions have to be abode and have to be reduced according to regional conditions if necessary:

- Module surface: \( \text{max. } 70 \text{m}^2 \)
- length of Module surface: \( \text{max. } 11.80 \text{m} \)
- height of Module surface: \( \text{max. } 6.00 \text{m} \)

The total module area is to be determined relative to the site with the aid of the DEGERenergie dimensioning tool and may in no case be greater than 70m².

1st step: Arrangement of aluminium profiles:

Distance between 2 aluminium profiles: \( x = \text{width of module} / 2 \)  
(attend the point of fastening from the modul manufacturer)

Overhang of the aluminium profile: \( y = (\text{length of aluminium profile} - 2.60 \text{m}) / 2 \)

Following points have to be attended:
- assemble aluminium profile from the middle to the outsite
- in both axis modules have to be arranged symmetrically to the center of gravity. **Recommendation:** Move the modulesurface 3 cm towards the top to reduce the self consumption of the system and to exceed the lifetime durability of the system.
- 2 aluminium profiles for each row of modules
- attend the connecting socket on the backside of the modules

2nd step: Assembly of aluminium profiles see Chapter Fehler! Verweisquelle konnte nicht gefunden werden.
4.6 Assembly of aluminium profiles and the modules

2nd step: Assembly of aluminium profiles
(DEGERtracker 5000NT, 5000HD, 6000NT, 7000NT and 9000NT)

Assemble aluminum profile on both sides at the outside of the base frame by using clamp MTH, bolt M 10 x 35 and sliding nut M10. The clamp MTH has to slide along inside the aluminum profile towards the base frame until the bolt contacts the base frame.

In the range of the suspension for the elevation motor it is not possible to assemble the MTH-clamps at the outside of the base frame. Here the MTH-clamps have to be assembled at the inside of the base frame.

torque: 35NM

Tip: Bring the DEGERtracker in a horizontal position – then it will be easier to mount the moduls

3rd step: Assembly of the modules

ATTENTION!
The total module area is to be determined relative to the site with the aid of the DEGERenergie dimensioning tool and may in no case exceed the maximum allowable total module surface.

Maximum total module surface
- DEGERtracker 3000NT / 3000HD: 25m²
- DEGERtracker 5000NT / 5000HD: 40m²
- DEGERtracker 6000NT: 53m²
- DEGERtracker 7000NT: 60m²
- DEGERtracker 9000NT: 70m²

Defects resulting from a too large module surface are not covered by the warranty. As soon as the solar modules are installed you have to install a functioning windguard or the module surface has to stay in a horizontal position. Because the elevation motor is not completely self-locking, it is possible that the module surface can move to a steeper position in strong winds. In order to avoid this situation, the motor connections should be kept short. It is recommended that the module surface position be inspected on a daily basis until commissioning is finalized!

Note the module mounting:

DEGERenergie supplies the tracking system, incl. aluminum rails and standard mounting hardware to fasten the modules. The scope of delivery from DEGERenergie does not include module specific mounting hardware.

Assembly of the modules is permitted only on the already-assembled base frame.
Module assembly beforehand is not permitted.
Between the modules

In order to achieve the most precise symmetry, it is advisable to install the modules from the centre outwards. Assemble modules on the aluminum profiles by using bolt M6, clamp plate and sliding nut M6. The distance between the modules must not be more than the thickness of the bolt.

torque: 8NM

ATTENTION!

We strongly recommend that a gap of approximately 2 mm be left between the individual module column.

At the end of the module-surface

Mount the modules onto the aluminum profiles using end clamp, bolt M8 and sliding nut M8.

torque: 20NM

ATTENTION!

Extend and retract the complete way of the drive, to guarantee that the mechanics move freely, don’t knock against anything and that the cables are long enough.

AFFIX WARNING NOTICE

The delivered warning notice has to be affixed to the mast of every system well observable.
4.7 Assembly inverter holding plate (optional)

Assembly inverter holding plate

3000NT / 3000HD / 5000NT / 7000NT:

Hang up the inverter holding plate directly at the traverse of the rotating head. Save the plate against lift-off by using bolts M8x30 and nut M8.

5000HD / 6000NT / 9000NT:

Hang up the inverter holding plate directly at the traverse of the rotating head. Save the plate against lift-off by using the framing square, bolts M8x20 and nut M8 and washer.
5 Control unit

5.1 Assembly control unit

1st step: Fixing energy converter

Fix the energy converter at the cover of gear casing of the rotating head by using the provided screws M3.9 x 13. Therefore prefabricated holes are in the cover.

**ATTENTION!**

It must be no cable between the rotating head and the base frame.

2nd step: Controlling the east-west axis

Mount the MLD-Sensor with the inscription ‘Ost-West’ pointing **UPWARDS** above the solar module surface. If the MLD-Sensor is mounted out of centre, it should be placed on the eastern side of the module surface.

Connect the cable of the azimuth-actuator (drive motor east-west)
- blue cable connection 3
- brown cable connection 4

**Function test:**
Check if the drive rotates the module surface towards the brightest spot in the sky. If you are not sure, you can cover a sensor cell at the MLD-Sensor with your hand – now the module surface should rotate in the direction of the non-covered sensor cell. Otherwise change connection 3 / 4

3rd step: Controlling the elevation axis

Mount the MLD-Sensor with the inscription ‘elevation’ **LATERALLY** at the solar module surface. (left side; seen from the front side)

Connect the cable of the elevation-actuator (drive motor for elevation)
- blue cable connection 1
- brown cable connection 2

**Function test:**
Check if the drive rotates the module surface towards the brightest spot in the sky. When the sky is cloudy the control will move the module surface into the horizontal. In this case, too, if you are not sure, you can cover a sensor cell at the MLD-Sensor – then the module surface should rotate in the direction of the non-covered sensor cell. Otherwise change connection 1 / 2
5.2 Connection diagram

ATTENTION!
Please note the operating manual “MLD control EK6 with CCB”

Pin 1, 2, 3, 4
Pin 16, 17, 18, 19

CCB with joystick
EC 6 with MLD sensors

Pin 20
Pin 21

Wind guard
standard and advanced

Optional:
sunlight sensor

Optional:
security sensor

ATTENTION!
Please note the operating manual “MLD control EK6 with CCB”
5.3 Overview

Wind monitor evaluation unit

EC 6 Energy converter

MLD sensor East-West (AZ)
MLD sensor Elevation (EL)

Anemometer (can also be mounted on the building)

Drive Azimuth
Drive Elevation

Cable routing planned inside the mast

Cable connection

Connecting socket on the mast

Signal lines

Mains connection

Building

Electric power supply for EK6
Cable can also be used for inverters, if designed accordingly.
6 Commissioning

**DANGER!**
Danger to life caused by electric current!

Danger to life caused by electric shock when contacting live components.

- The external power supply must be set up according to the local regulations.
- A line protection breaker 10 A B or 6 A C should be installed, so that the energy converter can be isolated from the mains voltage.
- The line protection breaker must be freely accessible.

**WARNING!**
Danger caused by non-apparent movement of the machine!

When commissioning the DEGERtracker, moving parts can cause serious injuries.

- Do not stay in the rotating and slewing range of the DEGERtracker.
- Remove any objects from the rotating and slewing range of the DEGERtracker.

7 Inspection for free movement

7.1 Initiate the inspection for free movement

In order to make sure, that the mechanics of the DEGERtracker is freely moveable and that all cables are long enough and the limit switches switch off the motors, one must move through the complete distance of the elevation and azimuth drives.

**ATTENTION!**
If several DEGERtrackers are connected to one CCB, the inspection for the freedom of movement must be performed for each individual system. This way possible faults can already be localized before damage occurs.

7.2 Scope of the inspection for free movement

- Cables must not be mechanically strained
- Limit switches switch off the corresponding drive in due time
- The full rotation and slewing range is reached
- No unusual noises

1. The simplest way to execute the freedom of movement test is with the joystick of the CCB.

2. Alternatively you may also supply the drives for EL and AZ from a 12...26 V battery pack. Change the sense of rotation in the EC6 as per wiring diagram
9 Trouble shooting / Maintenance

9.1 Maintenance

The DEGERtracker is designed for as less as possible service- and maintenance work to do. For a safe and long-life running of the system it is necessary to do the following jobs periodically once a year:

- control all screws and tighten them up to the torque given in the assembly instruction.

<table>
<thead>
<tr>
<th>Mounting screw Dimensions</th>
<th>Tightening torque $M_A$ in Nm of screw strength class</th>
</tr>
</thead>
<tbody>
<tr>
<td>M6</td>
<td>7.8</td>
</tr>
<tr>
<td>M8</td>
<td>19.1</td>
</tr>
<tr>
<td>M10</td>
<td>38.0</td>
</tr>
<tr>
<td>M12</td>
<td>66.5</td>
</tr>
<tr>
<td>M14</td>
<td>107.0</td>
</tr>
<tr>
<td>M16</td>
<td>168.0</td>
</tr>
</tbody>
</table>

1) $M_A$ according to VDI-guideline 2230 (Feb. 2003) for $\mu_A=0.08$ and $\mu_B=0.12$

- Control all moving parts and lubricate them again if necessary. Pay special attention to the IMO.
- For this you can find some lubricate nipples at the IMO and at the bolt M24 (Fixation base frame).
- You find recommended lubricants in the list below.

ATTENTION!
The elevation motor is free of maintenance and does not need to be lubricated.

Adapted Lubricants for DEGERtracker:

<table>
<thead>
<tr>
<th>Supplier</th>
<th>Product name</th>
<th>Art.-Nr.</th>
<th>Applicable temperature range</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEGERenergie</td>
<td>Grease in cartridge KG-2-3-B</td>
<td>6800022</td>
<td>-40 °C until +140 °C</td>
</tr>
</tbody>
</table>

ATTENTION!
The systems are filled up ex works with a specially grease, which is not mixable with other greases.

That Grease in cartridge KG-2-3-B can be obtained by DEGERenergie.
9.2 Trouble Shooting

ATTENTION!
In the case of inspections or modifications to the DEGERtracker all electrical parts need to be disconnected from line-power by an electrical separator or breaker. It is important to ensure the technical security and the absence of voltage has been verified. When voltage supply is imperative for checking the system, injuries of persons have to be prevented by appropriate actions.

The application of the troubleshooting plan presented above enables a target-oriented troubleshooting.

To exchange defective parts, please contact us with the fault report located in these instructions. We will promptly ship you the necessary replacement parts including detailed exchange instructions.
9.3 Fault report

To assist in case of problems with our systems it is necessary to have this fault report on hand. Without a completely filled out fault report there can not be any support provided!!

Please send this report to the following fax number: +49 7451 5391410

or scan and email to: service@degerenergie.com

Please provide a phone number to contact you.

RECALL-NUMBER: ___________________________ (required)

Fault report from ___._____._____.

1. Information about the system

- TOPTramer 6.1 (since 2001)
- TOPTramer 6.5 (since 2005)
- TOPTramer 25HD (since 2009)
- TOPTramer 40NT (since 2005)

- TOPsolar EL (1999 to 2002)
- 1000/1200EL (1999 to 2002)
- 1600EL (2002 to 2003)
- 2500EL (2003 to 2006)
- 4000EL (2006)
- 6000NT (since 2009)

- 5000NT (since 2005)
- 7000NT (since 2006)
- 9000NT (since 2010)
- 3000HD (since 2009)
- 5000HD (since 2009)
- 3000CT (since 2010)
- 5000CT (since 2010)

- Individual DEGERtracker
- Plant with trackers

- Serial number EC 6

- Energy-converter-type:
  - ELERO
  - ELTAKO
  - CCB 1
  - CCB II BASIC
  - CCB III STANDARD
  - CCB III ADVANCED

- Windward/counter-type:
  - I
  - II
  - III
  - IV
  - V

- Date of delivery:
  - 204-

- Serial number:
  - 6

- Power supply:
  - AC
  - DC

- Voltage:
  - V

- Total height (top edge of module surface over ground):
  - m

2. Measurement

- Function control:
  - East-West drive rotates to the brightest spot (cover one sensor cell) [ ]
  - Elevation drive moves to the brightest spot (cover one sensor cell) [ ]
  - by activating windward the DEGERtracker moves into horizontal position [ ]

- Measured data at the energy-converter:
  - Power supply:
    - Clamp A-B/L-N
    - Clamp 5-6
  - Power supply to DEGERconnector:
    - Clamp 1-2
    - Clamp 3-4
  - Power supply to motor east-west:
    - Clamp 11-12
    - Clamp 17-14

3. Data

- Contact:
  - Distributor
  - Installer
  - Operator

- Company/Location:

- Address:

- ZIP Code/Location:

- Contact person:

4. Formulation of problem

5. Spare-part(s) with number
9.4 Spare parts

Spare parts catalogue

- Spare parts lists are available from DEGERenergie or can be downloaded from www.DEGER.biz in the dealer area.

Contact data Horb Parent Plant

DEGERenergie GmbH
Industriestr. 70
D-72160 Horb am Neckar
Germany
Tel: +49 (0) 7451-53914-0
Fax: +49 (0) 7451-53914-10
E-mail: service@DEGERenergie.com

Addresses of Service Stations

Greece

technical-greece@DEGERenergie.com
T: +30 210 876 4811

Portugal

service.pt@DEGERiberica.com
T: +351 934 845 929

Spain

service@DEGERiberica.com
T: +34 93 480 84 66

Canada

service.ca@DEGERenergie.com
T: +1 519 925 5427

USA

service.us@DEGERenergie.com
T: +1 519 925 5427
10 Certificates

10.1 Declaration of conformity

Declaration of Conformity
in accordance with EC machine directive 2006/42/EG, addendum II A

for solar tracking systems

We,

DEGERenergie GmbH, 72160 Horb, Germany

herewith declare that the listed products in the way we put them in circulation destined for EC member countries are fitted with CE plates in accordance with EC machine directive.

Note:
This declaration will become invalid if the product is
- modified, supplemented or changed in any kind
- and/or accessories not from DEGERenergy are used
- and in case of inappropriate assembling or installation or not intended use/improper use without our express permission

marking of the systems: DEGERtracker 3000NT, 3000HD, 5000NT, 5000HD, 6000NT, 7000NT, 9000NT

EC-directives: EC machine directive (2006/42/EC)
EC Low Voltage Directive 73/23/EEC
EC EMV directive (89/336/EWG) i.d.F. 93/31/EWG

Applied harmonised standards:
EN 60730-1:2000
EN 60730-1/A14:2005
EN 55011:1998
EN 61000-3-2:2000
EN 61000-6-2:2005
EN 50102

Applied national standards and technical specification:
VDE 0470-100,VDE 0875,E VDE 0530,DIN VDE 0470-1
DIN 42025
DIN 40050-2
DIN 1055-1
DIN 1055-4
DIN 18800
DIN 4149 (04/2005)

Manufacturer
DEGERenergie GmbH
Industriestraße 70
D-72160 Horb

Horb, 01.07.2012
**10.2 Declaration of obligation on liability for material defects**

**DEGERtracker 3000NT, 5000NT, 6000NT, 7000NT, 9000NT, 3000HD, 5000HD, D60H, D80, D100 TOPTracker 8.5, TOPTracker 40NT**

You have purchased a product that was subject to meticulous examination before it was delivered. Nevertheless, in the event that the DEGERtracker supplied by us does display any defects then the scope of our liability for defects shall be as follows (valid from 1st December 2013): **Liability for defects**

DEGERenergie GmbH grants a 2-year period for any claims for defects to be asserted. This period starts with the delivery from the factory. DEGERenergie GmbH offers to replace the defective parts free of charge where any justified claims are received in this period.

In addition, DEGERenergie GmbH offers a lump sum as compensation for outlays for transportation and labor where defective parts are replaced. An up-to-date list of these one-off lump sums is available upon request. Actual costs may vary through the location and design of the systems and cannot therefore be taken into account. In all other respects the General Terms and Conditions for deliveries and services shall additionally apply in this regard: version: December 2013

For the entire steel construction DEGERenergie GmbH offers extended liability for defects of 20 years against rust-through starting with the delivery from the factory. Where a defect arises the contract partner of DEGERenergie GmbH is obligated to inform DEGERenergie GmbH immediately by sending a fault report (part of the assembly instructions) by fax to: +49 (0)7451 539 1410 or by e-mail to: service@DEGERenergie.com, stating the system serial number.

**Proof**

A fault report completed in full and stating the system serial number is considered as proof with any claim for defects (see Liability for defects). The defective assembly part must be sent to DEGERenergie GmbH for examination with a copy of the fault report. The type plate on the equipment must be completely legible. There must be no changes present or made to the original delivery condition and no mechanical damage (cut cables, damaged terminals, etc.). An invoice must be submitted with a copy of the fault report in order to claim the lump-sum payment. DEGERenergie GmbH will decide on its liability for defects as well as the lump-sum payment following an examination of the assembly part sent.

**Terms and conditions**

Once the spare part is received, the damaged part must be returned to DEGERenergie GmbH in its original packaging or at least in equivalent transport packaging. A return slip will be enclosed with the spare part.

Where there is a defect in the contractual item and DEGERenergie GmbH is responsible for this, then DEGERenergie GmbH shall be under an obligation to repair the damaged part or replace it with a spare part, unless DEGERenergie GmbH is entitled to refuse the supplementary performance on account of statutory regulations. Any replacement of individual parts within the defect period does not give rise to an extension to the validity period neither for the liability for defects in the system nor for the replaced spare part.

The contract partner of DEGERenergie GmbH must grant the latter a reasonable period for the supplementary performance. DEGERTracker that are standardized with a wind guard are only allowed to be operated in association with a suitable wind guard which brings the solar module area into the horizontal position in the event of a storm. This must be assembled in accordance with the specifications in the assembly instructions. It must be ensured that this wind guard is available and fully functional at all times.

**Liability Disclaimer**

DEGERenergie GmbH is not liable for any damage that arises as a consequence of improper operation by the contract partner, in particular if the module area is dimensioned too generously. The maximum module area that can be installed can be seen in the module layout plan sent with the order confirmation from DEGERenergie GmbH. Where permissible under the law then DEGERenergie GmbH shall not be liable for material damage and financial loss (e.g. lost buyback price) which result from a defect in the tracking system.

**Open area systems:** Under the provision under "Liability for defects", DEGERenergie GmbH is not liable for any extra costs (e.g. use of crane, skylift, etc.) that arise from using higher masts than the standard version.

**Building integration:** Under the provision under "Liability for defects", DEGERenergie GmbH is not liable in particular for any extra costs (e.g. use of crane, skylift, etc.) that arise from erecting masts on buildings.

In addition DEGERenergie GmbH is not liable for:

- defects that arise from unintended use
- defects that arise from the use of third-party components, e.g. the mounting profile
- defects that arise through changes to the mechanics and/or electronics
- defects that arise on account of a force majeure event (lightning strikes, surges, severe storm, fire, etc.)
- defects that arise through interventions, changes or repair attempts that have been made
- defects that arise through a failure to follow the information in the assembly and operating manual.

In all other respects our General Terms and Conditions for deliveries and services shall additionally apply, version: December 2013

*The German version of this declaration is legally binding. Translations into other languages serve only for a better comprehension.*
10.3 TÜV Certificate

Production facility inspection on the basis of the agreement in the testing and certification rules performed on 24.01.2014

Licence holder:
DEGERennergie GmbH
Industriestr. 70
72160 Horb

This facility manufactures products certified by TÜV SUD PRODUCT SERVICE. The requirements to a faultless and homogenous fabrication as stated in the test and certification rules are met. The applied and documented quality assurance procedures were found suitable.

Production facility:
DEGERennergie GmbH
Industriestr. 70
72160 Horb

Equipment tested:
Solarmachführsysteme mit Steuerung / solar tracker

The next inspection will be conducted latest in 6 months, starting with the date of inspection.

Filderstadt, 24.01.2014

i.A. [Signature]
Achim Schmalacker
Stuttgart Branch - IND
11 Publisher Information

DEGERenergie GmbH
Industriestr. 70
D-72160 Horb am Neckar
Germany
Tel: +49 (0) 7451-53914-0
Fax: +49 (0) 7451-53914-10

www.DEGER.biz
info@DEGERenergie.com

CEO: Artur Deger, Hünkar Korkmaz
Registered Head Office: Horb a.N.
Registrar of Companies: Stuttgart county court
HRB 440745
Vat No.: DE 226334348