tirak

Electrically powered endless hoist for man-riding

Original Operating Instructions

TIRAK® series
X 2050 P

TIRAK® series
X 300 P
X 400 P
X 500 P
X 720 P
X 820 P
X 1030 P

TIRAK® series
T 1020 P

This instruction manual must be available for the user at all times.
Additional copies may be obtained on request.

www.tractel.com
## Contents

<table>
<thead>
<tr>
<th>Information for this manual</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notes for manufacturers of suspended suspended access equipment</td>
<td>3</td>
</tr>
<tr>
<td>Explanation of symbols used</td>
<td>3</td>
</tr>
<tr>
<td>1. Safety Advice</td>
<td>4</td>
</tr>
<tr>
<td>2. Exclusion of non-intended use</td>
<td>5</td>
</tr>
<tr>
<td>3. Machine Description</td>
<td>5</td>
</tr>
<tr>
<td>3.1 Purpose</td>
<td>5</td>
</tr>
<tr>
<td>3.2 Working principle</td>
<td>5</td>
</tr>
<tr>
<td>3.3 Allowed TIRAK® wire rope for man-riding</td>
<td>5</td>
</tr>
<tr>
<td>3.4 Noise emission</td>
<td>5</td>
</tr>
<tr>
<td>3.5 Main components and operating controls</td>
<td>6</td>
</tr>
<tr>
<td>3.6 Technical data</td>
<td>7</td>
</tr>
<tr>
<td>3.6.1 TIRAK® hoists</td>
<td>7</td>
</tr>
<tr>
<td>3.6.2 BLOCSTOP® Fall arrest device</td>
<td>7</td>
</tr>
<tr>
<td>3.7 Typical examples</td>
<td>8</td>
</tr>
<tr>
<td>3.8 Safety devices</td>
<td>9</td>
</tr>
<tr>
<td>3.8.1 Primary brake</td>
<td>9</td>
</tr>
<tr>
<td>3.8.2 Emergency STOP</td>
<td>9</td>
</tr>
<tr>
<td>3.8.3 Phase control relay</td>
<td>9</td>
</tr>
<tr>
<td>3.8.4 Load limiting device</td>
<td>10</td>
</tr>
<tr>
<td>3.8.5 Manual operation</td>
<td>10</td>
</tr>
<tr>
<td>3.8.6 Fall arrest devices</td>
<td>11</td>
</tr>
<tr>
<td>3.8.7 Upper limit switch</td>
<td>11</td>
</tr>
<tr>
<td>3.9 Residual risks</td>
<td>11</td>
</tr>
<tr>
<td>4. Setting up</td>
<td>12</td>
</tr>
<tr>
<td>4.1 General</td>
<td>12</td>
</tr>
<tr>
<td>4.2 Required equipment</td>
<td>12</td>
</tr>
<tr>
<td>4.3 Anchoring the TIRAK® hoist</td>
<td>12</td>
</tr>
<tr>
<td>4.3.1 Anchoring devices and dimensions</td>
<td>13</td>
</tr>
<tr>
<td>4.3.2 Anchoring the TIRAK® hoist</td>
<td>14</td>
</tr>
<tr>
<td>4.4 Installation of the fall arrest device</td>
<td>15</td>
</tr>
<tr>
<td>4.4.1 Evidence of carrying capacity</td>
<td>15</td>
</tr>
<tr>
<td>4.4.2 Dimensions of BSA devices</td>
<td>15</td>
</tr>
<tr>
<td>4.4.3 Anchoring the fall arrest device</td>
<td>16</td>
</tr>
<tr>
<td>4.4.4 Connection to the TIRAK® control system</td>
<td>17</td>
</tr>
<tr>
<td>4.4.5 Dimensions of BSO Devices</td>
<td>18</td>
</tr>
<tr>
<td>4.5 Slack wire rope</td>
<td>18</td>
</tr>
<tr>
<td>4.5.1 Slack wire ropes</td>
<td>18</td>
</tr>
<tr>
<td>4.5.2 Use of rope winders</td>
<td>18</td>
</tr>
<tr>
<td>4.6 Electric connections</td>
<td>19</td>
</tr>
<tr>
<td>4.7 Electric controls</td>
<td>20</td>
</tr>
<tr>
<td>4.7.1 Push button control UP/DOWN</td>
<td>20</td>
</tr>
<tr>
<td>4.7.2 Examples for central control</td>
<td>20</td>
</tr>
<tr>
<td>4.8 Wire rope installation</td>
<td>20</td>
</tr>
<tr>
<td>4.8.1 Preparing the rope</td>
<td>20</td>
</tr>
<tr>
<td>4.8.2 Lifting rope installation</td>
<td>21</td>
</tr>
<tr>
<td>4.8.3 Safety rope installation</td>
<td>22</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. Operation</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1 Checks before starting</td>
<td>22</td>
</tr>
<tr>
<td>5.2 Daily checks</td>
<td>23</td>
</tr>
<tr>
<td>5.3 Weekly checks of wire rope and cable</td>
<td>24</td>
</tr>
<tr>
<td>5.4 Operation</td>
<td>24</td>
</tr>
<tr>
<td>5.4.1 Stop / EMERGENCY-STOP</td>
<td>24</td>
</tr>
<tr>
<td>5.4.2 Service operation</td>
<td>24</td>
</tr>
<tr>
<td>5.5 Manual operation</td>
<td>25</td>
</tr>
<tr>
<td>5.5.1 Emergency descent</td>
<td>25</td>
</tr>
<tr>
<td>5.5.2 Manual lifting</td>
<td>25</td>
</tr>
<tr>
<td>5.6 Action in the event of operation of the fall arrest device</td>
<td>25</td>
</tr>
</tbody>
</table>

| 6. Troubleshooting | 26-28 |
| 7. Out of operation | 28 |
| 8. Maintenance | 29 |
| 8.1 Maintenance | 29 |
| 8.1.1 Hoist | 29 |
| 8.1.2 Wire rope | 29 |
| 8.1.3 Motor, brake, and gear box | 29 |
| 8.1.4 BLOCSTOP® fall arrest device | 29 |
| 8.2 Checks | 30 |
| 8.2.1 Essential checks | 30 |
| 8.2.2 Safety inspection | 31 |
| 8.3 Repair | 31 |

| 9. Spare parts | 32 |
| 9.1 Hoist | 32 |
| 9.2 Motor and brake | 32 |
| 9.3 Elektric control | 32 |
| 9.4 BLOCSTOP® fall arrest device | 32 |
| 9.5 Nameplates and labels | 32-33 |

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**Date of edition**

2nd Edition: February 2004

**Copyright**

The copyright of these assembly and operating instructions shall remain with the manufacturer.

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Address of the manufacturer:

GREIFZUG Hebezeugbau GmbH
Scheidtbachstraße 19-21
51469 Bergisch Gladbach
Germany

Phone: +49 / 22 02 / 10 04-0
Fax: +49 / 22 02 / 10 04-50 or -70
e-Mail: info@greifzug.de

For addresses of other TRACTEL Group Companies see page 36.
Notes for manufacturers of suspended access equipment

Important!

The manufacturer of “Suspended access equipment (SAE)” (working platforms, baskets, seats or similar) into which a TIRAK® device with corresponding BLOCSTOP® fall arrest device is installed, must indicate all notes of these operating instructions required for safe use at the appropriate point of the instructions which the manufacturer must prepare for the SAE.

Merely enclosing these instructions does not satisfy the requirements of the EC Machinery Directive or of the applicable standards!

Users of “Suspended access equipment” from GREIFZUG GmbH or from another company of the TRACTEL Group shall receive the complete instructions for the corresponding installation.

Explanation of symbols used

<table>
<thead>
<tr>
<th>Safety advice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbol</td>
</tr>
<tr>
<td>STOP</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Other advice

<table>
<thead>
<tr>
<th>Other advice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbol</td>
</tr>
<tr>
<td>Attention</td>
</tr>
<tr>
<td>Important</td>
</tr>
</tbody>
</table>

Directions (without code word)

<table>
<thead>
<tr>
<th>Directions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbol</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
1. Safety advice

Follow all instructions and safety regulations contained in this manual to avoid injuries.

a) TIRAK® hoists for man-riding with BLOCSTOP® fall arrest devices are designed for installation in “Suspended access equipment (SAE)”.

b) TIRAK® hoists with standard electric equipment must not be used in a potentially explosive atmosphere.

c) Anchoring, maintenance, and/or the operation of a TIRAK® hoist must only be done by persons, who are familiar with it. Employees must have received the instruction to anchor, maintain, and/or operate the hoist by their employer.

d) They must be familiar with the relevant accident prevention regulations e.g. “Hoists, lifting and pulling devices”, “load carrying devices in hoist operation”, “safety requirements on suspended access equipment (EN 1808)” etc. and have been instructed accordingly. They must have read and understood the assembly and operating instructions prepared by the manufacturer of the SAE.

e) If more than one person is entrusted with one of the above mentioned activities, the manufacturer of the SAE must designate a supervisor who is authorised to give instructions.

f) Only TIRAK® hoists, BLOCSTOP® fall arrest devices, ropes, anchoring devices as well as leads and control cables in good condition must be used.

g) The safety equipment supplied with the TIRAK® hoist (e.g. the BLOCSTOP® fall arrest device) must be assembled on the SAE.

The manufacturer of the SAE is responsible for the installation of the limit switches for LIFTING and if applicable LOWERING.

h) Before starting with the assembly, please check that all parts are complete and defect-free.

i) Anchor TIRAK® hoist and BLOCSTOP® fall arrest device so that the lifting or safety ropes are vertical.

k) Only anchor TIRAK® hoist and BLOCSTOP® fall arrest device at the points provided for this purpose (connection rods, anchor points, or load pins).

l) When using self-locking nuts please observe the following:

– the screw must protrude from the nut with at least half of its thread diameter;

– do not re-use nuts if they can be unscrewed by hand!

m) DO NOT overload the TIRAK® hoist.

n) Use only the prescribed TIRAK® rope in perfect condition. Use only normally commercially available multi-purpose greases for the required lubrication of the rope. Do not use any lubricants containing disulphide (e.g. Molycote®).

o) When using a rope other than the prescribed TIRAK® rope, the warranty entitlement given by GREIFZUG Hebezeugbau GmbH or other company of the TRACTEL Group shall not apply.

p) The electrical connection of the TIRAK® hoists as well as of electrical accessories must be carried out in accordance with EN 60204-1.

q) Checks and repairs to the electrical system must only be performed by qualified electricians.

r) Other checks and repairs must only be performed by GREIFZUG Hebezeugbau GmbH, other company of the TRACTEL Group or a hoist workshop.

s) GREIFZUG Hebezeugbau GmbH or an other company of TRACTEL Group shall assume no liability for damage as a result of conversions and alterations to the devices supplied by itself or as a result of the use of non-original parts.

1) TIRAK® hoists can be supplied for these applications on request.
2. Exclusion of non-intended use

Use of standard TIRAK® hoists and other equipment for man-riding under the following conditions is prohibited:

- at temperatures below -10 °C or above +50 °C, for X 1030 to 2050 P series below -15 °C or above +80 °C (for advice regarding gearbox oils for lower/higher temperatures see chapter 8.3);
- in potentially explosive atmosphere.

Machines for these conditions can be supplied on request.

3. Machine description

3.1 Purpose

TIRAK® hoists of the series X 300 P, X 400 P, X 500 P, X 720 P, X 820 P, X 1030 P, T 1020 P und X 2050 P are portable, electric driven hoists for Lifting and Lowering of “Suspended access equipment” by means of a TIRAK® wire rope prescribed by the manufacturer. This wire rope is mandatory for the safe and troublefree working with TIRAK® hoists.

3.2 Working principle

A TIRAK® hoist is installed on suspended access equipment with which it moves up and down on wire ropes.

For either lifting or lowering there is one corresponding push button.

The wire rope is driven through the winch with constantly equal safety, and the length of wire rope i. e. the possible pulling length, is practically unlimited.

All TIRAK® hoists referred to in 3.1 have an integrated load limiting device.

3.3 Allowed TIRAK® wire rope for man-riding

<table>
<thead>
<tr>
<th>for TIRAK®-Series</th>
<th>Wire-rope-Ø</th>
</tr>
</thead>
<tbody>
<tr>
<td>X 300 P</td>
<td>8 mm</td>
</tr>
<tr>
<td>X 400 P</td>
<td></td>
</tr>
<tr>
<td>X 500 P</td>
<td></td>
</tr>
<tr>
<td>X 720 P</td>
<td>9 mm</td>
</tr>
<tr>
<td>X 820 P</td>
<td></td>
</tr>
<tr>
<td>T 1020 P</td>
<td></td>
</tr>
<tr>
<td>X 1030 P</td>
<td>10 mm</td>
</tr>
<tr>
<td>X 2050 P</td>
<td>14 mm</td>
</tr>
</tbody>
</table>

Table 1

Identification:
one red strand.
Diameter indication on the ferrule:

3.4 Noise emission

<table>
<thead>
<tr>
<th>TIRAK®-Series</th>
<th>(Distance 1 m)</th>
<th>max. 72 dB(A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X 300/400 P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X 500/720/820/1030 P, T 1020 P</td>
<td>...</td>
<td>70 dB(A)</td>
</tr>
<tr>
<td>X 2050 P</td>
<td></td>
<td>max. 78,5 dB(A)</td>
</tr>
</tbody>
</table>
3.5 Main components and operating controls

1. Wire rope drive mechanism
2. Motor
3. Gearbox
4. Controls
   a. with central control box
   b. at the terminal box
   c. with pendant control, mounted on the terminal box
   d. with pendant control, with connector
5. Where applicable: connector to the central control box
6. Always: connector to the upper limit switch (at the TIRAK® terminal box)
7. Brake release lever
8. Lifting rope
3.6 Technical Data

3.6.1 TIRAK® Hoists

<table>
<thead>
<tr>
<th>Hoist</th>
<th>Capacity</th>
<th>Rope speed</th>
<th>Type of drive</th>
<th>Output</th>
<th>Rated-Current</th>
<th>TIRAK® rope Ø</th>
<th>Dead- weight approx.</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>TI1</td>
<td>kg</td>
<td>m/min</td>
<td></td>
<td>A</td>
<td>kg/mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>X 300 P</td>
<td>300</td>
<td>9 D</td>
<td>0,5</td>
<td>1,6</td>
<td>8</td>
<td>28</td>
<td>437 272 285</td>
<td></td>
</tr>
<tr>
<td>X 302 P</td>
<td>300</td>
<td>18 D</td>
<td>0,9</td>
<td>2,6</td>
<td>8</td>
<td>28</td>
<td>437 272 285</td>
<td></td>
</tr>
<tr>
<td>X 301 P</td>
<td>300</td>
<td>9 W</td>
<td>0,5</td>
<td>4,5</td>
<td>8</td>
<td>29</td>
<td>476 272 285</td>
<td></td>
</tr>
<tr>
<td>X 400 P</td>
<td>400</td>
<td>9 D</td>
<td>0,7</td>
<td>1,6</td>
<td>8</td>
<td>29</td>
<td>437 272 285</td>
<td></td>
</tr>
<tr>
<td>X 402 P</td>
<td>400</td>
<td>18 D</td>
<td>1,4</td>
<td>2,5</td>
<td>8</td>
<td>30</td>
<td>485 272 285</td>
<td></td>
</tr>
<tr>
<td>X 401 P</td>
<td>400</td>
<td>9 W</td>
<td>0,7</td>
<td>5,5</td>
<td>8</td>
<td>32</td>
<td>485 250 220</td>
<td></td>
</tr>
<tr>
<td>X 500 P</td>
<td>500</td>
<td>9 D</td>
<td>0,9</td>
<td>2,8</td>
<td>8</td>
<td>39</td>
<td>485 297 250</td>
<td></td>
</tr>
<tr>
<td>X 502 P</td>
<td>500</td>
<td>18 D</td>
<td>1,8</td>
<td>5,0</td>
<td>8</td>
<td>39</td>
<td>495 297 250</td>
<td></td>
</tr>
<tr>
<td>X 503 P</td>
<td>500</td>
<td>9 D</td>
<td>0,9/1,8</td>
<td>2,8/5,1</td>
<td>8</td>
<td>41</td>
<td>495 297 250</td>
<td></td>
</tr>
<tr>
<td>X 501 P</td>
<td>500</td>
<td>9 W</td>
<td>0,9</td>
<td>6,5</td>
<td>8</td>
<td>43</td>
<td>546 297 256</td>
<td></td>
</tr>
<tr>
<td>X 720 P</td>
<td>700</td>
<td>9 D</td>
<td>1,5</td>
<td>3,9</td>
<td>9</td>
<td>43</td>
<td>546 297 256</td>
<td></td>
</tr>
<tr>
<td>X 820 P</td>
<td>800</td>
<td>9 D</td>
<td>1,25</td>
<td>4,0</td>
<td>9</td>
<td>48</td>
<td>525 297 250</td>
<td></td>
</tr>
<tr>
<td>X 822 P</td>
<td>800</td>
<td>18 D</td>
<td>3,5</td>
<td>7,0</td>
<td>9</td>
<td>60</td>
<td>563 307 285</td>
<td></td>
</tr>
<tr>
<td>X 823 P</td>
<td>800</td>
<td>9/18 D</td>
<td>1,75/3,5</td>
<td>4,5/9,0</td>
<td>9</td>
<td>61</td>
<td>563 307 315</td>
<td></td>
</tr>
<tr>
<td>X 1020 P</td>
<td>1000</td>
<td>9 D</td>
<td>1,9</td>
<td>4,6</td>
<td>9</td>
<td>74</td>
<td>577 320 315</td>
<td></td>
</tr>
<tr>
<td>X 1023 P</td>
<td>1000</td>
<td>9/18 D</td>
<td>1,9/3,6</td>
<td>5,5/9,5</td>
<td>9</td>
<td>84</td>
<td>645 320 315</td>
<td></td>
</tr>
<tr>
<td>X 1030 P</td>
<td>1000</td>
<td>9 D</td>
<td>1,9</td>
<td>4,6</td>
<td>10</td>
<td>48</td>
<td>525 297 250</td>
<td></td>
</tr>
<tr>
<td>X 1032 P</td>
<td>1000</td>
<td>18 D</td>
<td>3,6</td>
<td>9,5</td>
<td>10</td>
<td>60</td>
<td>563 307 285</td>
<td></td>
</tr>
<tr>
<td>X 1033 P</td>
<td>1000</td>
<td>9/18 D</td>
<td>1,9/3,6</td>
<td>5,5/9,5</td>
<td>10</td>
<td>61</td>
<td>563 307 315</td>
<td></td>
</tr>
<tr>
<td>X 2050 P</td>
<td>2000</td>
<td>6 D</td>
<td>2,2</td>
<td>6</td>
<td>14</td>
<td>85</td>
<td>650 400 340</td>
<td></td>
</tr>
<tr>
<td>X 2052 P</td>
<td>2000</td>
<td>12 D</td>
<td>5,5</td>
<td>12</td>
<td>14</td>
<td>110</td>
<td>660 400 350</td>
<td></td>
</tr>
</tbody>
</table>

Table 2
1) Hoist to 9 m/min = Driving group 1B. Hoists over 9 m/min = Driving group 1C.
2) If the capacity is not sufficient in direct pull, multiply it by reeving the rope according to the block and tackle principle.
3) D = 415 V three phase current; W =110/220 V single phase current.
4) Weight without wire rope.

3.6.2 BLOCSTOP® Fall arrest device

Fig. 3

Table 3

<table>
<thead>
<tr>
<th>Fall arrest device</th>
<th>Capacity</th>
<th>for max. wire rope speed</th>
<th>TIRAK® Rope Ø</th>
<th>Dead weight approx.</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLOCSTOP® Model</td>
<td>kg</td>
<td>m/min</td>
<td>mm</td>
<td>kg</td>
<td>mm</td>
</tr>
<tr>
<td>BSA 15-301</td>
<td>500</td>
<td>–</td>
<td>8</td>
<td>4</td>
<td>286 191 76</td>
</tr>
<tr>
<td>BSA 20-303</td>
<td>800</td>
<td>–</td>
<td>9</td>
<td>6</td>
<td>350 222 76</td>
</tr>
<tr>
<td>BSA 20-330</td>
<td>1000</td>
<td>–</td>
<td>10</td>
<td>6</td>
<td>350 222 76</td>
</tr>
<tr>
<td>BSA 35-305</td>
<td>2000</td>
<td>–</td>
<td>14</td>
<td>10,5</td>
<td>395 313 90</td>
</tr>
<tr>
<td>BSO 500</td>
<td>500</td>
<td>18</td>
<td>8</td>
<td>4,7</td>
<td>214 121 131</td>
</tr>
<tr>
<td>BSO 1020</td>
<td>800</td>
<td>18</td>
<td>9</td>
<td>6</td>
<td>251 140 131</td>
</tr>
<tr>
<td>BSO 1030</td>
<td>1000</td>
<td>18</td>
<td>10</td>
<td>6</td>
<td>251 140 131</td>
</tr>
<tr>
<td>BSO 2050</td>
<td>2000</td>
<td>18</td>
<td>14</td>
<td>14</td>
<td>408 150 183</td>
</tr>
</tbody>
</table>

The BLOCSTOP®-Models BSO... can if desired be equipped with a limit switch which stops the downward travel of the assigned hoist in the event of the BLOCSTOP® being closed.
3.7 Typical Examples

Platform with end suspension

Platform with rear suspension

Working cage

Working seat

Fig. 4a

Fig. 4b

Fig. 4c

Fig. 4d

1 TIRAK®
2a BLOCSTOP® BSA
   Fall arrest device
2b BLOCSTOP® BSO
   Fall arrest device
3 Lifting rope
4 Safety rope
5 Tensioning weight on safety rope
6 Upper limit switch
7 Buffer plate for upper limit switch
3.8 Safety devices

3.8.1 Primary brake

Electromagnetic brake which closes automatically
- if the UP/DOWN-button is released
- in case of power supply failure.

3.8.2 Emergency Stop

Pushing the red EMERGENCY STOP button in case of emergency completely switches off the hoist control. To start after clearing the problem, turn the EMERGENCY-STOP button clockwise until it releases.

3.8.3 Phase control relay

On hoists with 3-phase motors, the integrated phase control relay stops the operation, if the phases are reversed. This prevents wrong coordination of the UP/DOWN-buttons, which would prevent operation of the load limiting device as well as the upper limit switch.

Correction: turn the phase inverter of the plug by 180° (Fig. 6).

3.8.4 Load limiting device

3.8.4.1 Electronic load limiting device

The load limiting device is set by the manufacturer in such a manner that it switches off the lifting movement at the latest when the load has reached 1.25 times the rated capacity of the hoist. A warning signal (lamp or buzzer) must be provided for on the control box which notifies the operator of the overload.

Possible causes for switching off:
- overloading of the suspended access equipment, possibly as a result of unfavourable load distribution, or
- the suspended access equipment being blocked by an obstacle during upward travel.

Action following switching off:
Press DOWN button,
- until the suspended access equipment is once again on the ground and reduce the load to such an extent that, or redistribute it until there is no longer any overload
  or
- until the suspended access equipment is free from the obstacle which must be removed before travel is continued.

Function of the load limiting device

The electronic load limiting device reacts to the current consumption of the motor. The overload is detected during lifting.

Reducing the switch-off threshold value

Setting to a lower threshold value e.g. as a result of a lower carrying capacity of the suspended access equipment, can only be carried out by a qualified electrician or a hoist workshop (fig. 7):

A Pre-setting

A.1 Nominal current

Turn upper regulator to the right as far as the stop.

A.2 Start-bridging

Turn lower regulator to the right as far as the stop.

B. Setting

(Example for Tirak X 500 P)

B.1 Setting the overload

Attach overload = rated load + 25 %
(e. g. 625 kg)

During the lifting of the overload turn the upper regulator to the left until the hoist stops.
Lower overload until the rope is slack.
Again lift overload – the hoist must stop as soon as it comes under load.
B.2 Setting the rated load

Attach rated load (e.g. 500 kg) and lift the nominal load from ground.

Turn lower regulator to the left as far as the stop.

Press UP button – the hoist must stop immediately.

Following each stopping of the hoist during this setting procedure, press the DOWN button shortly so that the upward travel is again possible.

Step by step
– turn the lower regulator slightly to the right,
– then press UP button, until lifting of the suspended nominal load is possible.

Important note for TIRAK® with 2 speeds
(pole changing motor):
The control system contains 2 load limiting devices, the setting must be carried out for both speeds.

3.8.4.2 Mechanical load limiting device

The load limiting device is installed in the rope drive and switches off the UPWARD travel in the event of overload.

A warning signal (lamp/buzzer) is triggered which does not go off until the cause of the overload has been removed.

Possible causes for the switching off:
– overload of the suspended access equipment, possibly as a result of unfavourable load distribution
  or
– the suspended access equipment being blocked by an obstacle during upward travel

Action following switching off:
– reduce load to such an extent that, or redistribute it until there is no longer any overload,
  or
– move downwards until the suspended access equipment is free from the obstacle which must be removed before travel is continued.

3.8.5 Manual operation

Details in chapter 5.5 on page 25.

3.8.5.1 Emergency Descent

In case of power failure you can manually open the brake with lever (1) (Fig. 8).

3.8.5.2 Manual lifting

With the brake opened the suspended access equipment can be lifted with the hand wheel (2) placed on the motor shaft. (Fig. 8).

3.8.6 Fall arrest devices

Suspended access equipment must be equipped with a fall arrest device which secures the load against falling using a safety rope.

The two systems available from the manufacturer of the TIRAK® hoists are described below.

3.8.6.1 BLOCSTOP® Model BSA

The fall arrest device model BLOCSTOP® BSA is opened by the loaded lifting rope (fig. 9) and secures the suspended access equipment against:

a) rupture of the lifting rope,

b) failure of the hoist,

c) interlocking/becoming caught during downward travel with the result that the lifting rope is no longer under tension,

d) inclined position of more than the maximum admissible 14° (on suspended platforms with the two hoists attached at the ends).

3.8.6.2 BLOCSTOP® model BSO

The fall arrest device model BLOCSTOP® BSO is released manually (fig. 10).

The speed of the safety rope is constantly monitored and the clamping mechanism closed automatically in the event of a sudden occurrence of excessive speed. As a result, the suspended access equipment is secured against

a) rupture of the lifting rope and

b) failure of the hoist

By pressing the EMERGENCY STOP button the fall arrest device can also be closed manually in an emergency. This offers the advantage that a defective hoist can be replaced on the hanging man-riding device.

The viewing window serves to enable to check the operation of the centrifugal weights during service.

See section 5.6 on page 25 for action in the event of operation of the fall arrest device.
3.8.7 Upper limit switch

For each TIRAK® hoist a limit switch must be assembled at the upper end of the support frame/support stirrup of the suspended access equipment which stops operation of upward travel when pressed (fig. 11).

A buffer plate must be assembled underneath the rope anchor on the lifting rope which triggers the limit switch. If possible the interval (a) to the rope anchor should be 1.5 metres or more.

With projecting components attach the buffer plate sufficiently well below the rope anchor that the suspended access equipment stops in good time.

Attention! If the limit switch has been triggered, press the DOWN button until the limit switch is again switched free.

Fig. 11

3.9 Residual risks

CAUTION!

The following risks are not constructively covered for the TIRAK® hoist and the BLOCSTOP® fall arrest devices:

a) The load limiting device is set to the maximum rated capacity of the respective hoist; the manufacturer of the suspended access equipment must check whether the admissible overall weight of his installation (own weight + working load) corresponds to this value.

Should a lower value be necessary,

- have electronic load limiting device set by qualified personnel;
  (see section 3.8.4 load limiting device)
- have mechanical load limiting device set by the manufacturer.

b) The electronic load limiting device only detects an overload during lifting/upward travel.

Therefore special care must be given to the distribution of the loads.

c) The BLOCSTOP® fall arrest devices only fulfil their safety function if the safety rope between rope anchor and BLOCSTOP® is tensioned (no slack rope!).

Therefore on safety ropes hanging down loosely, a counterweight must always be secured 20 cm above the ground (see 4.8.3).
4. Setting up

4.1 General
The manufacturer of the suspended access equipment is responsible for ensuring that the device, including the suspension construction, conforms to the applicable standards.

Required equipment
a) TIRAK® hoist(s) of correct capacity, speed and voltage with load limiting device.
b) Fall arrest device(s), e.g. BLOCSTOP® machine(s) with at least the same capacity as the TIRAK® hoist(s) in use.
c) TIRAK® wire rope with correct diameter and of sufficient length. Also multi-purpose grease to lubricate the rope.

d) Electric supply cable of correct type and required length, with correct number of wires and cross sectional area.
e) Pulleys for diverting or reeving the wire rope of sufficient strength and diameter.

Check condition of all components.

4.3 Anchoring the TIRAK® hoist

4.3.1 Anchoring devices and dimensiones

Anchoring devices

<table>
<thead>
<tr>
<th>Dimension</th>
<th>TIRAK® Series</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X 300/400 P</td>
</tr>
<tr>
<td>a</td>
<td>255</td>
</tr>
<tr>
<td>b</td>
<td>220</td>
</tr>
<tr>
<td>c</td>
<td>60</td>
</tr>
<tr>
<td>Ø d</td>
<td>10.5</td>
</tr>
<tr>
<td>e</td>
<td>-</td>
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<td>f</td>
<td>-</td>
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<td>g</td>
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<td>h</td>
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<tr>
<td>Ø i</td>
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<td>k</td>
<td>112</td>
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<tr>
<td>l</td>
<td>40</td>
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<td>m</td>
<td>12</td>
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<tr>
<td>n</td>
<td>98</td>
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<tr>
<td>o</td>
<td>32</td>
</tr>
<tr>
<td>p</td>
<td>26</td>
</tr>
<tr>
<td>Ø q</td>
<td>13</td>
</tr>
</tbody>
</table>

Instead of the screws, bolts or similar with at least the same strength can be used.
Fig. 12
Series X 300/400 P

Fig. 13
Series X 500/720/820/1030 P

Fig. 14
Adapter (optional) for Series X 300/400/500/720/820/1030 P

Fig. 15
Series T 1020 P

Fig. 16
Series X 2050 P
4.3.2 Anchoring the TIRAK® hoist

Attention:
ALWAYS anchor the TIRAK® hoist in such way that the wire rope enters the hoist perpendicularly, when under load (Fig. 17 to 19).

A) TIRAK®-Series X 300 / 400 / 7500 / 720 / 820 / 1030 P (Fig. 17)

- Anchor TIRAK® hoist with bolt or shackle at point (B), or
- anchor the TIRAK® hoist at least at two of the four anchoring points (A);
  allowed: A₁<-->A₂, A₂<-->A₃, A₃<-->A₄

Attention!
NOT allowed: anchoring only at points A₁<-->A₃ or A₁<-->A₄ or A₂<-->A₄.

B) TIRAK®-Series X 2050 P (Fig. 18)

- Anchor TIRAK® hoist with bolt or shackle at point (B).

Attention:
Support TIRAK® hoist with additional adapters in the direction of pull.

- Or anchor the TIRAK® hoist at least at two of the four anchoring points (A₁ to A₄);
  allowed: A₁<-->A₂, A₂<-->A₃, A₃<-->A₄

Attention!
NOT allowed: anchoring only at points A₁<-->A₃ or A₁<-->A₄ or A₂<-->A₄.

Attention:
It must be ensured by means of the mounting (C) that the force is distributed evenly over both anchoring points.

Important:
When planning the anchoring we recommend consultation with the manufacturer.

C) TIRAK®-Series T 1020 P (Fig. 19)

- Anchor the TIRAK® hoist at the two points (C and D).
  In this respect the anchoring point at (C) must be sufficient for the full carrying capacity of the hoist whilst the anchoring at (D) merely serves to stabilise the hoist.
4.4 Installation of the fall arrest device

4.4.1 Evidence of carrying capacity

The construction for hanging the safety rope as well as the component to which the BLOCSTOP® fall arrest device is anchored must have at least four times the carrying capacity (against rupture) of the BLOCSTOP®.

This is necessary in order to cope with the dynamic load in the event of fall arresting.

4.4.2 Dimensions for BSA-Devices

<table>
<thead>
<tr>
<th>Dim.</th>
<th>Dimensions in mm for BLOCSTOP® BSA BSA 15-301</th>
<th>BSA 20-303/330</th>
<th>BSA 35-305</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>286</td>
<td>350</td>
<td>395</td>
</tr>
<tr>
<td>b_1</td>
<td>191</td>
<td>222</td>
<td>313</td>
</tr>
<tr>
<td>b_2</td>
<td>269</td>
<td>324</td>
<td>370</td>
</tr>
<tr>
<td>c_1</td>
<td>34</td>
<td>37</td>
<td>53</td>
</tr>
<tr>
<td>c_2</td>
<td>75</td>
<td>75</td>
<td>90</td>
</tr>
<tr>
<td>d</td>
<td>91</td>
<td>121</td>
<td>140</td>
</tr>
<tr>
<td>e</td>
<td>42.5</td>
<td>55</td>
<td>60</td>
</tr>
<tr>
<td>f</td>
<td>14</td>
<td>25</td>
<td>28</td>
</tr>
<tr>
<td>g</td>
<td>20</td>
<td>19.5</td>
<td>22</td>
</tr>
<tr>
<td>Ø h</td>
<td>12.1</td>
<td>12.1</td>
<td>22.2</td>
</tr>
<tr>
<td>S</td>
<td>100</td>
<td>100</td>
<td>200</td>
</tr>
</tbody>
</table>

Table 5  
C_1 = Casing breadth; C_2 = Breadth over all
4.4.3 Anchoring the fall arrest device

A) BLOCSTOP® BSA ...

- Anchor the BLOCSTOP® Device to both anchor points (A) in such a manner (fig. 24) that there is

  10 cm interval (S) BSA 15/20...or
  20 cm interval (S) BSA 35-305
  between safety rope and lifting rope

  (fig. 21 to 23).

- The component to which the BLOCSTOP® type BSA... is anchored must be connected rigidly to the suspended access equipment. Otherwise the BLOCSTOP® cannot function as an inclination limiting device (fig. 25).

**Attention!**

Protect BLOCSTOP® devices against dirt!

(Details see page 17).

**Anchoring devices**

BSA 15-301 / 20-303 / 20-330:

- M12x... screws, at least grade 8.8 with self-locking nuts;

BSA 35-305:

- M22x... screws, at least grade 8.8 with self-locking nuts;

or bolts or similar with at least the same strength.

B) BLOCSTOP® BSO 500 und BSO 1020/1030

(Installation dimensions on page 18)

a) The interval between safety and lifting rope is not laid down; however it should be kept as small as possible.

b) Anchor the BLOCSTOP® device to the anchoring point (A) in such a manner that the safety rope runs vertically into the opening of the BLOCSTOP® (fig. 25). If necessary guide the safety rope over deflection pulleys.

**Attention:** Do not fully tighten screw; the BLOCSTOP® models BSO 500 and BSO 1020/1030 must be capable of swivelling around the anchoring point (A).

**Anchoring devices**

M12x... screws, at least grade 8.8 with self-locking nuts;

or bolts or similar with at least the same strength.
C) BLOCSTOP® BSO 2050

(Installation dimensions on page 18)

a) The interval between safety and lifting rope is not laid down; however it should be kept as small as possible.

b) The anchoring component must be provided for at an appropriate interval to the hoist on the suspended access equipment and indeed in such a manner that the safety rope runs vertically into the opening of the BLOCSTOP® (fig. 27).

Attention!
The anchoring component (a) must consist of two brackets so that the BLOCSTOP® is linked to this on both sides (fig.28).

c) Connect both anchor points of the BLOCSTOP® to the anchor component (a) of the working platform with bolts (b).

- Bolt diameter: 22 mm
- Minimum quality: Grade 8.8 (800 N/mm² = 800 MPa)

d) The bolts must be secured against loss by forelocks (c) or equal value securing elements.

Attention!
Protect BLOCSTOP® devices against dirt!
Take appropriate action for ensuring that no debris is carried into the BLOCSTOP® by the rope.

This applies in particular during work with air-placed concrete or with synthetic resin coatings or similar!
Deposits of this nature can lead to malfunction which endanger work safety!

Applies only for BSO models with built-in limit switch:

4.4.4 Connection to the TIRAK® control system

4.4.4.1 Function
If the BLOCSTOP® fall arrest device is closed, the control current for the downward travel of the assigned hoist will be interrupted.

4.4.4.2 Connection (fig. 29)

A) Plug connection
Connect limit switch cable (a) to the control box of the assigned hoist with plug connection.

B) Fixed wired connection
Have limit switch cable (a) connected in the control box of the assigned hoist by a qualified electrician in accordance with the wiring diagram provided.

(Principle sketch)
4.5 Slack wire rope

4.5.1 Free-hanging wire ropes

Always ensure that the wire rope exit is not obstructed! Use a diverter pulley or other wire rope guiding systems for the slack wire rope to prevent damage from rubbing over sharp edges. Make sure that the slack wire rope

- is freely hanging down and able to untwist itself
- or
- is properly reeled to prevent the formation of loops.

4.5.2 Use of rope winders

The loose, unloaded end of the rope can also be stored on suitable rope winders (e.g. motor or spring rope drums).

When planning, we recommend consulting the manufacturer of the TIRAK® hoists regarding design and arrangement of the rope winders.

### Table 6

<table>
<thead>
<tr>
<th>Dimension</th>
<th>BLOCSTOP® BSO 500</th>
<th>BLOCSTOP® BSO 1020/1030</th>
<th>BLOCSTOP® BSO 2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>214</td>
<td>251</td>
<td>408</td>
</tr>
<tr>
<td>a₁</td>
<td>-</td>
<td>-</td>
<td>70</td>
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<tr>
<td>b</td>
<td>121</td>
<td>140</td>
<td>150</td>
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<td>c₁</td>
<td>131</td>
<td>131</td>
<td>183</td>
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<tr>
<td>c₂</td>
<td>37</td>
<td>37</td>
<td>110</td>
</tr>
<tr>
<td>c₃</td>
<td>-</td>
<td>-</td>
<td>55</td>
</tr>
<tr>
<td>d₁</td>
<td>64</td>
<td>65</td>
<td>60</td>
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<td>e</td>
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<td>36</td>
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<tr>
<td>Ø h</td>
<td>12.2</td>
<td>12.2</td>
<td>22.2</td>
</tr>
</tbody>
</table>
4.6 Electrical Connections

The manufacturer of the suspended access equipment is responsible for the connection of the TIRAK® hoists taking into consideration the wiring diagrams provided.

**DANGER!**

The electrical connection for TIRAK® winches must conform to EN 60204-1.

The lead must be protected by fuse by the customer.

Always pull the plug out before opening a central control!

a) Ensure that the mains voltage is adequate for the motor of the TIRAK®:
   - **Three phase:**
     400 V (3P + E + 0), 50 Hz,
     16 amp rated plug and socket
   - **Single phase:**
     230 V (2P + E), 50 Hz,
     16 amp rated plug and socket

   If in doubt ask.

b) To avoid power loss between power source and the TIRAK® always use power cables with adequate cross sectional area.

   See tables 6a and 6b.

Table 7a indicates the reference letter of the TIRAK® model and the mains supply voltage.

Maximum speed must be used for TIRAK® with two speeds.

Table 7b gives the minimum cable cross section based on the reference letter.

c) Use only heavy duty cables with incorporated strain relief.

d) Hanging cables longer than 30 m should be fixed by means of a cable sleeve or cable clamp. (Fig. 33).

e) When using a generator its output must be at least 2.5 times greater than the TIRAK® power consumption.

<table>
<thead>
<tr>
<th>TIRAK® Series</th>
<th>Max. wire rope speed m/min</th>
<th>1 TIRAK</th>
<th>2 TIRAK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3 phase</td>
<td>1 Ph</td>
</tr>
<tr>
<td>X 300 P</td>
<td>9</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>A</td>
<td>C</td>
</tr>
<tr>
<td>X 500 P</td>
<td>9</td>
<td>A</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>B</td>
<td>E</td>
</tr>
<tr>
<td>X 720 P</td>
<td>9</td>
<td>A</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>B</td>
<td>E</td>
</tr>
<tr>
<td>X 820 P</td>
<td>9</td>
<td>A</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>B</td>
<td>D</td>
</tr>
<tr>
<td>T 1020 P</td>
<td>9</td>
<td>A</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>B</td>
<td>D</td>
</tr>
<tr>
<td>X 1030 P</td>
<td>9</td>
<td>A</td>
<td>C</td>
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<td></td>
<td>18</td>
<td>B</td>
<td>D</td>
</tr>
<tr>
<td>X 2050 P</td>
<td>6</td>
<td>C</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>D</td>
<td>F</td>
</tr>
</tbody>
</table>

Table 7a

<table>
<thead>
<tr>
<th>Reference letter of table 7a</th>
<th>Cross section (mm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1.5</td>
</tr>
<tr>
<td>B</td>
<td>1.5</td>
</tr>
<tr>
<td>C</td>
<td>1.5</td>
</tr>
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<td>D</td>
<td>1.5</td>
</tr>
<tr>
<td>E</td>
<td>1.5</td>
</tr>
<tr>
<td>F</td>
<td>1.5</td>
</tr>
<tr>
<td>G</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Important!

Connect limit switch for the upward travel limitation to the plug connection of the TIRAK® terminal box.

For this see fig. 35 on page 20.

Wiring diagrams for the electrical connection are in the TIRAK® terminal box, as well as in the central control cabinet, if provided.
4.7 Electrical Controls

4.7.1 Function / Starting the hoist
Push button control for UP/DOWN.

On TIRAK® with two speed motor:

<table>
<thead>
<tr>
<th>Half depressed</th>
<th>Fully depressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>= low speed</td>
<td>= high speed</td>
</tr>
</tbody>
</table>

**EMERGENCY-STOP button:**

| Button depressed | = mains supply interrupted |

To START, turn the EMERGENCY-STOP button clockwise until it releases.

4.7.2 Example of a central control:

![Fig. 35](image)

4.8 Wire rope installation

4.8.1 Preparing the wire ropes

**CAUTION!** Use gloves, when handling wire ropes.

a) Use only TIRAK® wire ropes specified by the TIRAK® manufacturer.

b) Check correct diameter (Fig. 36) and sufficient length of the wire rope.

c) Always unreel the wire rope in a straight line (Fig. 37), to prevent it from becoming unusable because of loops.

d) Check the rope condition for damage:

- proper connections (thimble, ferrule); on wire ropes with hook: hook is not bent, safety catch is in place (Fig. 38);
- the wire rope has no visible damage along its total length; the fused and tapered end is according to Fig. 39.

![Fig. 36](image)

![Fig. 37](image)
4.8.2 Lifting rope installation

Attention!
When using a fall arrest device of the models BLOCSTOP® BSA... first insert the lifting rope between roll and rope guide of the sensor arm from above (fig. 40)!

a) Feed the wire rope as far as possible into the wire rope entry (fig. 41).

b) Press UP-button, and push in the wire rope, until it starts to reeve itself automatically and exits at the opposite side.

Attention!
Never use DOWN button to install the wire rope, the load limiting device will not function!

On three-phase motors: Turn the phase inverter of the plug for 180° (Fig. 41).
Ensure a clear rope exit (fig. 42)!

c) If the wire rope does not reeve, check:
   - Is the wire rope tip in good condition?
   - Did you press the correct button?

Important!
If the anchoring point for the rope is above the TIRAK® hoist, first anchor the rope and then insert into the TIRAK® device.

Never use the TIRAK® wire rope for fixing a load!

Never let the wire rope rub over sharp edges!
Always ensure a clear rope exit!

Always keep it lightly lubricated!
Use normally commercially available multi-purpose grease; do not use lubricants containing disulphide (e.g. Molycote®).
4.8.3 Safety rope installation

a) The safety rope must hang free alongside the lifting rope.

b) Open BLOCSTOP® (Abb. 43 + 44):

- **BLOCSTOP® BSA ...**
  - Push sensor arm (A) upwards by hand if it is not already raised by the tensioned lifting rope.

- **BLOCSTOP® BSO ...**
  - Press lever (B) down until it locks into position.

c) Place safety rope through the fall arrest device from above and pull taught by hand.

On the BLOCSTOP® BSO 2050 the forward protruding control pin (C) indicates that the rope has been introduced correctly. Otherwise remove the rope and push through again.

**Attention!** Should it still not protrude forward, send the device to the supplier for checking.

d) Anchor **counterweight** to the safety rope approx. 20 cm above the ground (fig. 45):

9.5 kg for BSA 15-301 / 20-303 / 20-330 and BSO 500 / 1020 / 1030;

2 x 9.5 kg for BSA 35-305 and BSO 2050

5. Operation

5.1 Checks before starting

A qualified person must

a) carry out the checks as per sections 5.2 and 5.3.

b) make a trial journey with the working load limit of the suspended access equipment and when so doing

c) press the EMERGENCY STOP button, the suspended access equipment must come to a standstill.

To switch back on, turn EMERGENCY STOP button to the right. Carry on travelling and

d) check the **upper limit switches**: when travelling upwards press down individually by hand, the corresponding hoist must stop immediately.

Make a written note of the result of this check and keep the report.
5.2 Daily checks

a) Check correct anchoring of TIRAK® hoist and BLOCSTOP® fall arrest device to the suspended access equipment.

b) Check function of UP and DOWN button as well as of EMERGENCY STOP button (fig. 46).

c) Check the function of the upper limit switch: when travelling upwards press the tripping devices down individually by hand, the corresponding hoist must stop immediately.

d) Pay attention to ensuring that nobody stands underneath the suspended access equipment.

e) Check BLOCSTOP® fall arrest device.

DANGER!

It must not be possible to pull the safety rope upwards when the BLOCSTOP® fall arrest device is closed.

BLOCSTOP® models BSA...

- The fall arrest device closes automatically if the lifting rope is not tensioned e.g. when the suspended access equipment is set on the ground (fig. 47).

If the safety rope can however still be pulled upwards, replace BLOCSTOP® and send to the supplier for checking.

BLOCSTOP® models BSO...

- Close fall arrest device by pressing the EMERGENCY STOP button – the lever must jump to the “CLOSED” position (fig. 48).

If the safety rope can however still be pulled upwards, replace BLOCSTOP® and send to the supplier for checking.

- Re-open the fall arrest device by pressing down the lever and sharply pull the safety rope upwards – the BLOCSTOP® must close automatically; if this is not the case replace and send to the supplier for checking.

During operation check the rotation of the centrifugal weights regularly through the viewing window.

CAUTION!

If the centrifugal weights do not rotate:

i) Check BLOCSTOP® function (see above).

If the safety rope is not blocked by the closed BLOCSTOP®:

- take measures for evacuating the platform crew;
- anchor the platform suitably so that the defective BLOCSTOP® can be replaced on the suspended platform.

ii) If the closed BLOCSTOP® is blocking the rope:

- Open BLOCSTOP® by pressing down the lever.
- move platform downward carefully – at all times be prepared to catch the platform on the safety rope by pressing the EMERGENCY STOP button.
- After setting down the platform replace BLOCSTOP® and send to the supplier for checking.
5.3 Weekly checks of wire rope and cable

**DANGER!**
Damaged wire ropes endanger operational safety!

Therefore examine lifting and safety ropes in accordance with section 8.2.1 on page 30 for damage which requires replacement.

**Attention!**

Lubrication: Keep the wire rope lightly lubricated. This will not affect the gripping power but will prolong the life of wire rope to a maximum.

Check all power supply and control cables and if necessary replace.

5.4 Operation

5.4.1 Stop / Emergency Stop (Fig. 49)

a) **To STOP movement release UP or DOWN button** – the suspended access equipment stops.

   **If not:**

b) **Press EMERGENCY STOP-Button**, the control must stop completely.

   **if that does not function:**

c) **Pull out the plug!**

   **CAUTION! in cases b) and c):**

   **STOP working!**

   Have the TIRAK checked/repaired by a qualified electrician.

d) **When using fall arrest devices of the type BSO... press EMERGENCY STOP button (A) to catch the suspended access equipment on the safety rope (fig. 50).**

5.4.2 Service operation (Fig. 49)

a) **To START**, turn the EMERGENCY-STOP button clockwise until it releases – it comes out, the control is on function.

b) **To Climb**: press UP-button.

   **To Descend**: press DOWN-button.

   **To STOP**, release button (see also chapter 5.4.1).

**Important:** If the hoist will not start, it might be possible that two phases of power supply are reversed so that the integrated phase control relay blocks the control.

**Correction:** turn the phase inverter of the plug by 180°.

   **c) When stopping the hoist the load is securely held at any position by the primary brake.**

d) **In the event of inclined position:**

   – **Move lower TIRAK® upwards** with the UP button until the platform again hangs horizontally.

   With central control, follow instructions for individual control of the hoists.

**CAUTION!**
Do not move the hoist UP with closed BLOCSTOP® fall arrest device!

The safety rope would be pushed up and would no longer be taught between suspension and BLOCSTOP®, which would dangerously extend the fall distance in the event of a fall arresting.

**CAUTION!**
On BLOCSTOP® models BSO ...:

In normal travelling operation the EMERGENCY STOP button must not be used for stopping the suspended access equipment.
5.5 Manual operation

5.5.1 Emergency Descent

In case of power failure you can manually open the brake:

– Take the control lever (1) from the carrying handle, insert it through the motor cover into the brake release point, and raise it (fig. 51).

Important:

On working platforms with more than one TIRAK®, if possible open brakes simultaneously on all hoists – if only one operator is on the platform, open brakes alternately so that no inadmissible inclined position occurs.

– Move the suspended access equipment down the rope(s). The centrifugal brake ensures a limited descent speed.

To STOP: release the control lever (1).

After use: put back the control lever (1) in the carrying handle.

**CAUTION!** Emergency descent in case of overload is prohibited!

5.5.2 Manual lifting

– Take off rubber cap (3).

– Put the hand wheel (2) on the motor shaft and with the brake opened (see above) turn to the right (TIRAK® T…) or to the left (TIRAK® X…) to let the TIRAK® climb the wire rope together with the suspended access device.

– After use: put brake release lever (1), hand wheel (2) and rubber cap (3) back to their original positions.

5.6 Action in the event of operation of the fall arrest device

A) **DANGER!**

In the event of rupture of the lifting rope or failure of the hoist, evacuate the crew of the man-riding equipment.

In the event of operation of the fall arrest device the suspension of the safety rope and the connection between BLOCSTOP® and suspended access equipment are submitted to dynamic loads.

Before resuming normal operation carry out checks as per section 5.1!

B) In the event of interlocking/becoming caught during downward travel so that the lifting rope is no longer under tension (only on BLOCSTOP® models BSA…),

in the event of inclined position of more than 14° (only on BLOCSTOP® models BSA… on platforms with two hoists attached to the ends),

on BLOCSTOP® models BSO… which are closed by pressing the EMERGENCY STOP button:

– release the safety rope by moving the suspended access equipment upwards – in the event of inclined position, only the lower end.

– In the event of a power failure move upwards in manual operation as per section 5.5.2.

– The fall arrest device BLOCSTOP® BSA… is automatically re-opened by the tensioned lifting rope (fig. 52).

– Open BLOCSTOP® models BSO… manually: Press down lever (A) until it locks into position (fig. 52).

**Attention!** When the suspended access equipment is on the ground again, check the fall arrest device operation as per section 5.2 on page 23.

**CAUTION!** Replace defective BLOCSTOP® devices and send for repair by the manufacturer or by a hoist workshop.
6. Troubleshooting

**WARNING!** Avoid injuries:

1. Checks and repairs of the electrical equipment must only be carried out by qualified electricians! Wiring diagrams are shown in the control box of the motor.

2. Any other repairs should only be carried out by the manufacturer (or Group company) or by a qualified person, and only original spare parts shall be used.

<table>
<thead>
<tr>
<th>Breakdown</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>The platform moves neither up nor down although the motor starts when the UP/DOWN buttons are pressed.</td>
<td><strong>WARNING! IMMEDIATELY STOP WORKING!</strong> Any attempt to continue operating the TIRAK® hoist jeopardizes the operational safety!</td>
<td>Stop working immediately! Request assistance from the supplier or the manufacturer.</td>
</tr>
<tr>
<td>Rope jam in the TIRAK® hoist. Defective or incorrect wire rope or obstructed rope exit.</td>
<td>A1</td>
<td></td>
</tr>
<tr>
<td>The platform has become caught on an obstacle or the platform is held tight.</td>
<td>A2</td>
<td>Release platform carefully from the obstacle or until platform. Check affected platform parts for their operational safety. Inform supervisor.</td>
</tr>
<tr>
<td>Power failure</td>
<td>A3</td>
<td></td>
</tr>
<tr>
<td>a) Control switched off.</td>
<td>a) Turn the EMERGENCY-STOP button clockwise until it releases.</td>
<td></td>
</tr>
<tr>
<td>b) Interrupted power supply.</td>
<td>b) Check reason and wait, until power returns.</td>
<td></td>
</tr>
<tr>
<td>c) On 3-phase motors: two phases changed in the supply, the built-in phase control relay blocks the hoist control.</td>
<td>c) Turn phase inverter of the central control plug by 180°.</td>
<td></td>
</tr>
<tr>
<td>d) Defect connection between power supply and hoist control.</td>
<td>d) Check lead and control cable, fuses and connections or wiring of central control and terminal boxes and repair if necessary.</td>
<td></td>
</tr>
<tr>
<td>Wrong connection, e. g. no neutral conductor</td>
<td>A4</td>
<td>Compare connection with wiring diagram. If necessary conversion by the manufacturer.</td>
</tr>
<tr>
<td>Protective switching off due to overheating:</td>
<td>A5</td>
<td></td>
</tr>
<tr>
<td>a) One phase is missing</td>
<td>a) Check/repair fuses, leads and connections.</td>
<td></td>
</tr>
<tr>
<td>b) Insufficient cooling</td>
<td>b) Clean air inlet at the motor cover.</td>
<td></td>
</tr>
<tr>
<td>c) Voltage too high/too low</td>
<td>c) Check voltage and current consumption on the motor under load. If necessary increase lead cross section.</td>
<td></td>
</tr>
<tr>
<td>Brake does not open (no “click” noise, when switching on/off)</td>
<td>A6</td>
<td></td>
</tr>
<tr>
<td>a) Defective supply conductor, brake coil, or rectifier.</td>
<td>a) Have supply conductor, brake coil and rectifier checked by an electrician and repaired/replaced.</td>
<td></td>
</tr>
<tr>
<td>b) Worn brake rotor.</td>
<td>b) Send the TIRAK® for repairs.</td>
<td></td>
</tr>
</tbody>
</table>

**DANGER!** Always pull the plug out before opening a terminal box or a pendant or central control!
<table>
<thead>
<tr>
<th>Breakdown</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platform moves down but not up.</td>
<td><strong>DANGER!</strong> Thoughtless behaviour endangers the safety of the installation!</td>
<td>Move the platform carefully downwards and remove the obstacle. Check platform parts affected for their operational safety. Inform the supervisor.</td>
</tr>
<tr>
<td></td>
<td><strong>B1</strong> The platform has become caught on an obstacle.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>B2</strong> Overload, the load limiting device has switched off the hoist.</td>
<td>Check load and if necessary reduce or distribute more evenly.</td>
</tr>
<tr>
<td></td>
<td><strong>B3</strong> Lifting rope run out with platform set down.</td>
<td>Install lifting rope again. Check why it had run out, avoid repetition, e.g. by installing longer lifting rope(s).</td>
</tr>
<tr>
<td></td>
<td><strong>B4</strong> Upper limit switch: a) Limit switch defective or not connected. b) Limit switch activated.</td>
<td>a) Check switch connection/function; if necessary replace. b) Move down until the limit switch is free.</td>
</tr>
<tr>
<td></td>
<td><strong>B5</strong> One phase is missing.</td>
<td>Check fuses and leads.</td>
</tr>
<tr>
<td></td>
<td><strong>B6</strong> Error in the UP control circuit of the central control or the TIRAK® hoist.</td>
<td>Check connections, wiring, contactors and replace if necessary.</td>
</tr>
<tr>
<td></td>
<td><strong>B7</strong> lack of motor power a) Defective starting capacitor b) Defective centrifugal switch (starting capacitor overloaded)</td>
<td>a) Have starting capacitor checked/replaced by an electrician. b) Check the current at the auxiliary winding in the terminal box. Repair by the manufacturer or a hoist workshop.</td>
</tr>
<tr>
<td></td>
<td><strong>C1</strong> Overheating</td>
<td>Individual causes as well as their correction see page 26 point A5.</td>
</tr>
<tr>
<td></td>
<td><strong>C2</strong> Dirt in the rope drive</td>
<td>Replace the TIRAK® as urgently as possible and have checked/repaired by the manufacturer or a hoist workshop.</td>
</tr>
</tbody>
</table>

**Attention!** Continuing travel can lead to damage on the rope and the rope drive.

**DANGER!** Always pull the plug out before opening a terminal box or a pendant or central control!

---

Excessive motor noise or hoist is crunching, although UP and DOWN travel are possible.
<table>
<thead>
<tr>
<th>Breakdown</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| Platform moves up but not down | **DANGER!** Thoughtless behaviour endangers the safety of the installation!  

D1 The platform has hit an obstacle or has become caught on an obstacle.  
Move platform carefully upwards, and remove the obstacle.  
Check platform parts affected for their operational safety.  
Inform the supervisor. |
|                           | **DANGER!** Defective BLOCSTOP® fall arrest devices endanger the operational safety of the installation! They must be replaced as a matter of urgency! |
|                           | **DANGER!** Always pull the plug out before opening a terminal box or a pendant or central control! |
|                           | **DANGER!** Evacuate platform and follow the instructions in section 5.6, page 25. |
|                           | **DANGER!** Move upwards until the loaded lifting rope opens the BLOCSTOP®. |
|                           | **DANGER!** Move lower platform end upwards until the loaded lifting rope opens the BLOCSTOP®. |
|                           | **DANGER!** Check hoist. |
|                           | **DANGER!** Replace BLOCSTOP® and send for checking. |
|                           | **DANGER!** Inform the supervisor. |
|                           | **DANGER!** Check connections, wiring, contactors etc. and replace if necessary. |
|                           | If necessary **Emergency descent** (details in section 5.5) |
|                           | Should these steps not explain the cause and provide a remedy please contact GREIFZUG Hebezeugbau GmbH, other TRACTEL Group company, or a hoist workshop. |
|                           | **7. Out of operation** |
|                           | **a) Amchoring the platform:**  
- Lower working platform to the ground with slightly tensioned ropes  
or  
- anchor working platform to the building in order to secure it against swinging motion. |
|                           | **b) Disconnect the power supply** to prevent any unauthorised operation:**  
- Disconnect power supply cable from site distributor  
or, if available  
- turn and lock the main switch to “0”. |
8. Maintenance

8.1 Maintenance

8.1.1 Hoist

The mechanism does not require any special maintenance.

Lubrication: Keep the wire ropes lightly lubricated. This will not affect the gripping power but will prolong the life of wire rope to a maximum.

**TIRAK® series X 2050 P**

Lubrication of the drive disks - outer toothing:

Replenish the reservoir behind the lubricating nipple every 50 operating hours with a grease gun (fig. 53).

Specification: Water-insoluble and thermoduric adhesive gear box grease, e.g. VARILUB

- Quantity: two times approx. 5 cm³
- Prepare grease gun and press in first portion with 3 to 5 shots;
- Allow TIRAK® to run for approx. two seconds;
- Press in second portion.

8.1.2 Wire ropes

a) Always unreel and reel the wire rope.

b) Do not use the wire rope for fixing a load and do not pull it over sharp edges.

c) Always keep the wire rope clean and lightly lubricated. Use normally commercially available multi-purpose grease; do not use lubricants containing disulphide (e.g. Molycote®).

8.1.3 Motor, brake, and gear box

a) The motor does not require any special maintenance. If it is very dirty, it should be cleaned to ensure an effective air flow.

b) The brake does not require any special maintenance. If it is very dirty, it should be cleaned. Keep it free of oil or grease!

c) The gear box is maintenance-free.

8.1.4 BLOCSTOP® fall arrest device

The BLOCSTOP® fall arrest device does not require any special maintenance.

Always keep the mechanism clean and lightly lubricated, e.g. with GREIFZUG® oil or motor oil. Too much oil is never bad – this will not affect the gripping power.


8.2 Checks

8.2.1 Essential checks

a) General

Prior to every operation and during operation make sure, that
– the TIRAK® hoist,
– and all other used equipment (anchoring devices, pulleys etc.)

are properly installed and without visible damage

Attention!

If during operation damage appears:
– STOP operating,
– if necessary: cordon off the danger zone, and
– have the damage removed by a qualified person!

b) Nameplates and labels

Make sure that all nameplates and labels are in place and not obscured (see section 9.5, pages 32 to 33).
Replace missing labels and those which are not legible!

c) Wire ropes

Attention!

Replace wire ropes, if one of the following defects is determined during the prescribed weekly check:
– 8 or more wire breaks (fig. 54) on a length which corresponds to 30 times the rope diameter.
– Heavy rust formation on the surface or inside.
– Heat damage, recognisable through discoloured wires.
– Reduction of the diameter by 5% or more compared with the nominal diameter (fig. 56).
– External damage to the rope – fig. 55 shows the most frequent forms of damage.

These examples do not however replace the ISO 4309 reference for wire rope checks!

d) Electric cables

Replace lead and control cables if damage to the insulation or to cable connections is determined during the prescribed weekly check.
8.2.2 Safety inspection

Checking the TIRAK® hoists and the BLOCSTOP® fall arrest device by a qualified person:

1. The TIRAK® should be thoroughly examined every twelve months or more regularly (see 2 below) depending on the working practice and current safety regulations in force.

2. The TIRAK® should be thoroughly examined at the latest after 500 running hours but for hoists with 18 m/min. and hoists of the series X 2050 P with 12 m/min. speed after 250 running hours.

3. Extraordinary check

Attention!
Following a fall arrest, a qualified person must check the operational safety of the BLOCSTOP® fall arrest device including anchor points, as well as the safety rope and the rope anchoring.

It is the responsibility of the employer that a written register is kept showing the dates, period of use, and inspection record.

8.3 Repair

Repair of TIRAK® hoists must only be carried out by the manufacturer (or Group company), or by a qualified person and only original spare parts shall be used.

If a gearbox oil change is necessary, take one of the oils specified below according to the temperature range that the hoist will be usually used in.

Quantities required:

<table>
<thead>
<tr>
<th>Type</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>X 300/400 P series</td>
<td>1.4 l</td>
</tr>
<tr>
<td>X 500-1030 P series</td>
<td>2.0 l</td>
</tr>
<tr>
<td>T 1020 P series</td>
<td>2.0 l</td>
</tr>
<tr>
<td>X 2050 P series</td>
<td>5.0 l</td>
</tr>
</tbody>
</table>

Table 8

<table>
<thead>
<tr>
<th>Temperature range</th>
<th>-10 to +50 °C</th>
<th>-35 to +40 °C</th>
<th>-15 to +80 °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>API Specification</td>
<td>Mineral oils 1) SAE85W-140 GL5 2)</td>
<td>CLPPG or PGLP ISO VG 100</td>
<td>CLPPG or PGLP ISO VG 460</td>
</tr>
<tr>
<td>Sample oils (other oils on request)</td>
<td>BP Hypogear EP 90</td>
<td>Klübersynth GH6 100</td>
<td>Klübersynth GH6 460</td>
</tr>
<tr>
<td></td>
<td>SHELL Spirax HD 90</td>
<td>Applying other synthetic oils is not allowed without official agreement by the manufacturer!</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TEXACO Multigear EP6 S80 W90</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1) Standard charge on series X 300 P, X 500 to 820 P and T 1020 P; also see foot note 3)
2) Standard charge on series X 400 P and X 1030 to 2050 P
3) Important: Changing between mineral and synthetic oils requires the complete cleaning of the gearbox parts.
9. Spare Parts

9.1 Hoist
As well as the spare part number and description please always quote
- TIRAK® model
- wire rope diameter, and
- serial number.

9.2 Motor and brake
As well as the spare part number and description please always quote
- Motor type
  or
- Type and supply voltage of the brake.

9.3 Electric controls
In case of enquiries or spare parts order please always quote the wiring diagram number.
The wiring diagram is situated in the control box of the motor.

9.4 BLOCSTOP® fall arrest device
As well as the spare part number and description please always quote
- BLOCSTOP® model
- wire rope diameter and
- serial number.

9.5 Nameplates and labels
Make sure that all nameplates and labels are in place and not obscured (see figs. 57 and 58).
Replace missing labels and those which are not legible!

Spare parts lists are available from your supplier or from the manufacturer.
1. SET-UP INSTRUCTIONS
Anchor the machine. Connect to electric/air supply (see motor name plate). Feed in the wire rope. Start the motor. Push wire rope inside until it reeves itself automatically.
Do not obstruct the wire rope outlet!
For details consult Operating Manual.
IMPORTANT: Use only special TIRAK wire rope in good condition with short fused and tapered end.
Lightly lubricate the wire rope.
Only TIRAK P models may be used for man-riding. Use a BLOCSTOP® fall arrest device.

2. TECHNICAL DATA

<table>
<thead>
<tr>
<th>Model</th>
<th>Capacity (daN/kg):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admissible load for man-riding (kg):</td>
<td></td>
</tr>
<tr>
<td>Working speed (meters/min):</td>
<td></td>
</tr>
<tr>
<td>Wire rope diameter (mm):</td>
<td>Breaking strength (kg):</td>
</tr>
<tr>
<td>Year of manufacture: 200</td>
<td>Serial-No.:</td>
</tr>
</tbody>
</table>

In case of inquiry or spare parts order, please mention type, wire rope diameter, and serial number.

---

**CHECKING**
1) Daily check as follows:
- Push down the control lever in its "OPEN" position and press the EMERGENCY STOP button. The BLOCSTOP should close automatically, and the control lever has to return to its "CLOSED" position.
- Open the BLOCSTOP again, and quickly pull the wire rope upwards. The BLOCSTOP should close automatically, and the control lever has to return to its "CLOSED" position.
2) During operation the centrifugal weights must rotate. Check regularly through the window.
If during the above checks the BLOCSTOP malfunctions, replace it and return to the supplier for inspection. Address see TIRAK nameplate.
3) Yearly inspection by the supplier.

**Wire rope exchange:** To pull the wire rope through push and hold the control lever in its OPEN position!
**TIRAK® hoist for silo inspection**

Series XS 300 P

These devices conform to the special safety requirements applicable for inspecting silos:
- Hand operation,
- hanging limit switch for manual operation when passing through the silo opening.

The device illustrated is equipped with an automatic rope reeler for a 40 m rope.

Details on request

---

**TIRAK® hoists for material handling**

**Compact & versatile**

- Unlimited rope travel.
- Small dimensions, portable.
- Working position: horizontal, inclined, vertical.
- Also moves with load on the rope
- T 1020 series pulls in both directions.

**Capacity**

<table>
<thead>
<tr>
<th>Capacity</th>
<th>0.3 to 3 t</th>
</tr>
</thead>
</table>

**TIRAK® wire ropes in any length required on hand or drum reel.**

- 300 kg hoist
- 3 t hoist

**TIRAK® with rope storage as “Mobile Winch” for rope lengths from 60 to 500 m**

- The ideal hoist for frequently changing places of use.
- Quick, simple, versatile:
  - Assembly on construction site.
  - Repair and maintenance work in finished buildings.
  - Drive for internal transport systems.

**Saves space, weight and costs**

compared to a crane or drum winch of the same carrying capacity and range!

- 300 kg hoist with 60 m rope reeler
- 3 t hoist with 500 m rope winder

Details on request
Access solutions from the TRACTEL Group

**Suspended platforms, working cage & seat**

![Diagram of suspended platform]

Aluminum platforms + strong TIRAK® = high capacity

Platforms up to 18 m in length can be made up using 2 and 3 m long sections.

These new, mobile platforms and seats with unlimited travel height for assembly, inspection and repairs offer you the comfort of a lift combined with a working platform.

Whether you have to work at height as facade designer or window cleaner, as insulation specialist, as chimney, boiler and tank setter or as painter and corrosion protection personnel:

Make use of this sensible replacement for standing scaffolding! **Travel to height, and indeed to precisely that height which gets you to the most productive working position. Because that helps to save time and money!**

Increase your **competitiveness by reducing operating costs.**

That improves the bottom line!

Details on request

Whether purchased or rented – the economic alternative to scaffolding!

**Building maintenance and inspection installations**

Modern, daring building constructions demand creative solutions.

The earlier you involve our team in your planning the easier and cheaper the installation will be!

![Diagram of building maintenance and inspection installation]

Move to any position of the facade “at the push of a button” – with platform and roof car, the standard solution.

For inspecting building constructions outside and inside – with platforms which traverse on rail systems.

**Moveable stairs and work gantries**

![Diagram of moveable stairs and work gantries]

For cleaning, inspecting and repairing windows, facades and glass roofs, inside and outside.

Let your buildings always shine!

Details on request
The TRAVSAFE® – horizontal travelling lifeline system

TRAVSAFE® is a patented horizontal running protection system for working at heights in which there is a risk of falling.

Areas of use: buildings and roofs, aircraft hangars, shopping centres, bridges and viaducts, industrial installations, overhead cranes, oil and gas containers, telecommunication towers ...

The TRAVSAFE® system consists of two wire ropes along which a traveller (1) slides. These lifelines are held by brackets (2) anchored to the building. The user anchors the connection devices (3) of his personal protective equipment (4) to the holding ring of the traveller.

The TRAVSAFE® travelling lifeline enables free and unhindered movement and work.

TRAVSAFE® systems require thorough planning and professional installation – challenge us to provide extensive advice.

Fall arrest equipment for personal protection

For all work in which there is a risk of falling “Safety first” is the overriding objective.

The appropriate equipment must be put together depending on the location and work to be performed.

The product range of our safety program offers the following, amongst other things:

- Harnesses and working belts, also as a practical combination (1)
- retractable lifelines (2)
- rope grabs (3)
- climbing protection devices
- retaining ropes
- lanyards (4)
- shock absorber (5)
- various connectors

For common applications we offer a series of complete sets in a practical carrying case (6).

All components are approved under the strict European Standards.

Challenge us to provide extensive advice – we shall assist you in putting together your equipment.

Your life could be hanging on this!

GREIFZUG Hebezeugbau GmbH
Scheidbachstr: 19-21
51469 Bergisch Gladbach - Germany
Tel.: +49 / 22 02 10 04-0
Fax: +49 / 22 02 10 04-70
e-mail: info@greifzug.de

SECALT S. A.
B. P. 11 13
L-1011 Luxembourg
Tel.: +352 / 43042042-1
Fax: +352 / 43042042-200
e-mail: info@secalt.lu

TRACTEL S. A. S.
RN 19, Saint-Hilaire-sous-Romilly
B. P. 36 - F-10102 Romilly-sur-Seine Cedex
Tel.: +33 / 3.25.21.07.00
Fax: +33 / 3.25.21.07.21
e-mail: info@tractel.com

TRACTEL UK Ltd.
Old Lane, Halfway
Sheffield  S20  3GA
Tel.: +44 / 114 248 22 66
Fax: +44 / 114 247 33 50
e-mail: info@tractel.com