Stationary tool for installing strap clamps
OETIKER FAST 3000

Operating Instructions

Translation of the original Operating Instructions
Issued 03.2019

Item no. 08903979
Oetiker Schweiz AG, Horgen, Switzerland
# Contents

1  **Information about this manual** ................................................................. 1-8  
   1.1 Symbols and means of representation used ........................................ 1-8  
   1.2 Scope .................................................................................................... 1-9  
       1.2.1 FAST 3000 .................................................................................. 1-9  
       1.2.2 Rating plates ............................................................................... 1-10  
   1.3 Abbreviations ...................................................................................... 1-10  
   1.4 Stickers on the FAST 3000 ................................................................. 1-11  
   1.5 Associated documents ....................................................................... 1-12  

2  **Basic safety instructions** ..................................................................... 2-13  
   2.1 Using the Operating Instructions ..................................................... 2-13  
   2.2 Use for the intended purpose ............................................................ 2-13  
   2.3 General safety instructions ............................................................... 2-14  
   2.4 Covers .................................................................................................. 2-16  
   2.5 Special safety instructions .................................................................. 2-16  
   2.6 Safe methods of working .................................................................... 2-17  
   2.7 Using the FAST 3000 via an external control system ...................... 2-17  
   2.8 Conversions, modifications ............................................................... 2-17  
   2.9 Qualified personnel ........................................................................... 2-18  
   2.10 Maintenance work ............................................................................ 2-20  
   2.11 Overload protection of the crimping cut-off head ......................... 2-21  
   2.12 Noise level ...................................................................................... 2-21  

3  **Scope of supply of the FAST 3000 tool** ............................................. 3-22  
   3.1 Overview of the main components of the FAST 3000 ...................... 3-22  
   3.2 Available main configurations .......................................................... 3-23  
   3.3 Optional extras .................................................................................. 3-25  

4  **Brief description of the FAST 3000** .................................................... 4-27  
   4.1 Design of the tool mechanism ......................................................... 4-28  
   4.2 Design of the FAST 3000 crimping cut-off head ............................. 4-30  
   4.3 Two-hand control desk ..................................................................... 4-32  

5  **Description of the process monitoring of the FAST 3000** .................. 5-33  
   5.1 Control of the closing force, description the of process parameters .... 5-33
5.1.1 Functional description of control of the closing force.........................................................5-34
5.1.2 Closing Force ..................................................................................................................5-35
5.1.3 Closing force tolerance .................................................................................................5-35
5.1.4 Switch point reduction ....................................................................................................5-35
5.1.5 Speed phase 1 .................................................................................................................5-35
5.1.6 Speed phase 2 .................................................................................................................5-35
5.1.7 Closing force holding time .............................................................................................5-35
5.1.8 Sample curves with different closing force parameters .................................................5-36
5.1.9 Plausibility test of the closing force sensor ..................................................................5-38

5.2 Crimping monitoring.........................................................................................................5-38
5.2.1 General information on the crimping force monitoring (CFM) .......................................5-38
5.2.2 Mechanical design ........................................................................................................5-39
5.2.3 CFM: Typical OK force curve .......................................................................................5-41
5.2.4 CFM: Wear detection ....................................................................................................5-42
5.2.5 CFM: Sample curves of crimping operations ................................................................5-43

5.3 Cut-off monitoring.............................................................................................................5-56

6 Working with the FAST 3000..............................................................................................6-57
6.1 Commissioning..................................................................................................................6-57
6.2 Connections to the control cabinet ..................................................................................6-59
6.3 Cable connections to the crimping force monitoring .......................................................6-60
6.4 Switching on the FAST 3000 ............................................................................................6-61
6.5 Correctly positioning the FAST 3000 .............................................................................6-63
6.5.2 Positioning of the FAST 3000 installation tool with the alignment aid .......................6-67
6.5.3 Dimensions for correctly positioning the FAST 3000 ................................................6-69
6.6 Normal operation (production) .......................................................................................6-71
6.7 Laboratory mode (password-protected) .........................................................................6-74
6.7.1 One-hand operation .......................................................................................................6-76
6.7.2 Foot pedal .....................................................................................................................6-78
6.8 Special operating modes (password-protected) ...............................................................6-80
6.8.1 Unlocking .....................................................................................................................6-81
6.8.2 Manual mode operation of drives ...............................................................................6-82
6.8.3 Setting the force offset to zero ......................................................................................6-83
6.8.4 Verifying the closing force ..........................................................................................6-84
6.8.5 Crimping force monitoring verification........................................................................6-85
6.8.6 Adjusting the crimping force monitoring ..................................................................6-87
6.8.7 Loading new settings/measurement programs to the CFM units ...............................6-93

7 GUI..............................................................................................................................................7-95
  7.1 Touch Panel..........................................................................................................................7-95
  7.2 Computer..................................................................................................................................7-95
  7.3 GUI Layout ..........................................................................................................................7-96
  7.4 Menu structure ....................................................................................................................7-97
    7.4.1 Welcome screen ............................................................................................................7-97
    7.4.2 Closure data (a password is necessary to change the values)......................................7-98
    7.4.3 Operating mode.............................................................................................................7-99
    7.4.4 Friction test....................................................................................................................7-104
    7.4.5 IO Test............................................................................................................................7-105
    7.4.6 Logbook........................................................................................................................7-108
    7.4.7 Setting ...........................................................................................................................7-114
    7.4.8 Information.....................................................................................................................7-119
    7.4.9 Error list (version V2.09).............................................................................................7-120
    7.4.10 Access rights ................................................................................................................7-123

8 Assigning the IP address ...........................................................................................................8-124
  8.1 Setting the date and time ....................................................................................................8-125

9 Maintenance and replacement of parts ..................................................................................9-128
  9.1 General safety instructions for maintenance and repair work .........................................9-128
  9.2 Maintenance ........................................................................................................................9-129
    9.2.1 Before maintenance work ..........................................................................................9-129
    9.2.2 After maintenance work ...........................................................................................9-129
    9.2.3 Regular checking of the status ....................................................................................9-131
    9.2.4 Regular maintenance work / maintenance schedule ................................................9-132
    9.2.5 A-service - to be performed every 100,000 cycles .....................................................9-133
    9.2.6 B-service - to be performed every 200,000 cycles .....................................................9-134
  9.3 Replacing parts ....................................................................................................................9-135
    9.3.1 Removing the crimping cut-off head ........................................................................9-136
    9.3.2 Installing the crimping cut-off head ..........................................................................9-138
9.3.3 Replacing the crimping jaws and/or the cut-off die ............................................................. 9-138
9.3.4 Replacing the crimping wedge ............................................................................................. 9-142
9.3.5 Replacing the crimping jaws pivot pin ................................................................................. 9-142
9.3.6 Replacing the clamping lever ............................................................................................... 9-144
9.4 Checking and adjusting the position of the strap detection sensor ........................................... 9-147
9.5 Setting the closing force sensor ............................................................................................... 9-149
  9.5.1 Adjusting the load cell .......................................................................................................... 9-149
9.6 Replacing the control cabinet or tool mechanism ........................................................................ 9-150
9.7 Tools and consumable materials for maintenance ........................................................................ 9-151

10 Controlling the FAST 3000 via an external PLC ................................................................. 10-158
  10.1 Control via a field bus (Ethernet/IP or Profinet) ................................................................. 10-158
    10.1.1 Settings for the Ethernet/IP communication protocol .................................................. 10-158
    10.1.2 Settings for the Profinet HW configuration ........................................................................ 10-159
    10.1.3 Field bus mapping (software version V2.09) ..................................................................... 10-159
  10.2 Control via 24-V I/O signals .................................................................................................... 10-163

11 Decommissioning, transport, storage, recommissioning ......................................................... 11-164
  11.1 Decommissioning ............................................................................................................................. 11-164
  11.2 Transport ........................................................................................................................................ 11-164
  11.3 Storage .......................................................................................................................................... 11-166
  11.4 Recommissioning ............................................................................................................................. 11-166
  11.5 Disposal ......................................................................................................................................... 11-166

12 Technical data .............................................................................................................................. 12-167

13 Troubleshooting and error messages ....................................................................................... 13-168
  13.1 General instructions in the event of errors ................................................................................. 13-168
  13.2 What should I do, if …? ................................................................................................................. 13-168
  13.3 Error messages and their resolution ............................................................................................... 13-172
    13.3.1 ToErr_1: (W) strap present -> remove & acknowledge .................................................. 13-172
    13.3.2 ToErr_2: Clamping unit not in the home position STO -> Initialize ................................ 13-173
    13.3.3 PrErr_1: Maximum tensioning travel exceeded ............................................................. 13-174
    13.3.4 PrErr_11: General error at crimping .................................................................................. 13-175
    13.3.5 PrErr_12: Error at cutting off ............................................................................................. 13-176
    13.3.6 ToErr_4: Position sensor defective ...................................................................................... 13-176
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.3.7</td>
<td>PrErr_15: Closing force outside tolerance</td>
<td>13-177</td>
</tr>
<tr>
<td>13.3.8</td>
<td>War_2: Button contact error</td>
<td>13-177</td>
</tr>
<tr>
<td>13.3.9</td>
<td>ToErr_5: Drive error active</td>
<td>13-178</td>
</tr>
<tr>
<td>13.3.10</td>
<td>ToErr_6: Emergency stop circuit open / ToErr_14: Emergency Stop</td>
<td>13-178</td>
</tr>
<tr>
<td>13.3.11</td>
<td>PrErr_3: Crimping error CFM1 envelope curve 1</td>
<td>13-179</td>
</tr>
<tr>
<td>13.3.12</td>
<td>PrErr_4: Crimping error CFM1 envelope curve 2</td>
<td>13-179</td>
</tr>
<tr>
<td>13.3.13</td>
<td>PrErr_5: Crimping error CFM1 NoPass</td>
<td>13-179</td>
</tr>
<tr>
<td>13.3.14</td>
<td>PrErr_6: Crimping error CFM1 wear</td>
<td>13-179</td>
</tr>
<tr>
<td>13.3.15</td>
<td>PrErr_7: Crimping error CFM2 envelope curve 1</td>
<td>13-179</td>
</tr>
<tr>
<td>13.3.16</td>
<td>PrErr_8: Crimping error CFM2 envelope curve 2</td>
<td>13-180</td>
</tr>
<tr>
<td>13.3.17</td>
<td>PrErr_9: Crimping error CFM2 NoPass</td>
<td>13-180</td>
</tr>
<tr>
<td>13.3.18</td>
<td>PrErr_10: Crimping error CFM2 wear</td>
<td>13-180</td>
</tr>
<tr>
<td>13.3.19</td>
<td>PrErr_13: Force overshoot</td>
<td>13-180</td>
</tr>
<tr>
<td>13.3.20</td>
<td>PrErr_16: Max force when the light curtain breached</td>
<td>13-181</td>
</tr>
<tr>
<td>13.3.21</td>
<td>PrErr_17: Max force travel in ejection position</td>
<td>13-182</td>
</tr>
<tr>
<td>13.3.22</td>
<td>PrErr_18: Process aborted</td>
<td>13-182</td>
</tr>
<tr>
<td>13.3.23</td>
<td>PrErr_19: Max force reached on interruption by bus stop</td>
<td>13-182</td>
</tr>
<tr>
<td>13.3.24</td>
<td>ToErr_7: Light curtain active during the initialization routine</td>
<td>13-182</td>
</tr>
<tr>
<td>13.3.25</td>
<td>ToErr_8: Verifying the crimping force (phase 1)</td>
<td>13-183</td>
</tr>
<tr>
<td>13.3.26</td>
<td>ToErr_9: Verifying the crimping force (phase 2)</td>
<td>13-183</td>
</tr>
<tr>
<td>13.3.27</td>
<td>ToErr_10: Verifying the crimping force: No force increase</td>
<td>13-184</td>
</tr>
<tr>
<td>13.3.28</td>
<td>ToErr_11: Checking the strap waste</td>
<td>13-184</td>
</tr>
<tr>
<td>13.3.29</td>
<td>ToErr_12: CFM general warning / error</td>
<td>13-184</td>
</tr>
<tr>
<td>13.3.30</td>
<td>ToErr_13: Check tensioning force sensor</td>
<td>13-185</td>
</tr>
<tr>
<td>13.3.31</td>
<td>ToErr_16: No power to tool during operation</td>
<td>13-186</td>
</tr>
<tr>
<td>13.3.32</td>
<td>War_1: Error acknowledged</td>
<td>13-186</td>
</tr>
<tr>
<td>13.3.33</td>
<td>War_3: No power supply – press Start -&gt; Init</td>
<td>13-186</td>
</tr>
<tr>
<td>13.3.34</td>
<td>War_4: CFM units warning / error</td>
<td>13-186</td>
</tr>
<tr>
<td>13.3.35</td>
<td>War_5: Service due soon</td>
<td>13-187</td>
</tr>
<tr>
<td>13.3.36</td>
<td>War_6: Service due</td>
<td>13-187</td>
</tr>
<tr>
<td>13.3.37</td>
<td>War_7: Stop triggered by the light curtain</td>
<td>13-187</td>
</tr>
<tr>
<td>13.3.38</td>
<td>War_8: CFM mode teach-in active</td>
<td>13-187</td>
</tr>
<tr>
<td>13.3.39</td>
<td>War_9: No power to tool</td>
<td>13-188</td>
</tr>
</tbody>
</table>
13.3.40 War_10 No power supply – external enable, press Start .................................................. 13-188
13.3.41 War_11 Remove strap ........................................................................................................ 13-189

14 Appendix .................................................................................................................................................. 14-190
15 Help and Support .................................................................................................................................... 15-191
1  Information about this manual

1.1  Symbols and means of representation used

Safety notices are used in this manual to warn of the risk of personal injury or property damage.
- Always read and observe these safety notices.
- Observe all notices that are flagged with a safety alert symbol and text.

The following symbols are used in these Operating Instructions:

**DANGER**

Hazardous situation.  
Failure to observe this notice will lead to death or serious injury.

**WARNING**

Hazardous situation.  
Failure to observe this instruction may lead to death or serious injury.

**CAUTION**

Hazardous situation.  
Failure to observe this notice may lead to minor injury.

**NOTE**

Information relating to the understanding or optimization of working practices.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>One-step instruction</td>
</tr>
</tbody>
</table>
| 1.     | Multi-step instruction  
| 2.     | Carry out the steps in the order shown.  
| 3.     | Requirement  
| ✓      | Necessary or labor-saving steps for the successful execution of an action.  

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1.2 Scope

These Operating Instructions apply to all Oetiker FAST 3000 (stationary tool for installing strap clamps) and describe the method of operation together with the correct procedures for commissioning, operation, maintenance, decommissioning, recommissioning, storage and transport. They contain important instructions for safe working procedures.

For the version FAST 3000 with Light curtain the corresponding leaflet “Manual FAST 3000 Light Curtain” has to be considered.

1.2.1 FAST 3000

- Control cabinet
- Two-hand control desk (optional)
- Installation tool
- Connecting cable
- Touch panel (optional)
- Foot pedal (optional)
- Closing force verification unit (optional)
- Crimping force monitoring devices
- Emergency stop dongle
1.2.2 Rating plates

![Rating plates image]

Fig. 2  Rating plates

1.3 Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Newton</td>
</tr>
<tr>
<td>mm</td>
<td>millimeters</td>
</tr>
<tr>
<td>kg</td>
<td>kilogram</td>
</tr>
<tr>
<td>s</td>
<td>seconds</td>
</tr>
<tr>
<td>ms</td>
<td>milliseconds</td>
</tr>
<tr>
<td>CFM</td>
<td>Crimping Force Monitoring</td>
</tr>
</tbody>
</table>
1.4 Stickers on the FAST 3000

**CAUTION**

- Comply with all safety stickers and always exercise great care when using the FAST 3000.

---

Fig. 3  *Stickers (1, 2, 3) on the FAST 3000*

1. Wear safety glasses!
2. Crush hazard!
3. Crush hazard!
Fig. 4  *Stickers (1, 2) on the crimping cut-off head and alignment aid*

1. General warning signs: Never use a FAST 3000 without force sensors.
2. Warning sign: Magnetic field
3. Permanent magnet

### 1.5 Associated documents
- EC Declaration of Conformity, see Appendix (Section 14)
- Other associated documents, see Appendix (Section 14)
2 Basic safety instructions

2.1 Using the Operating Instructions

- Make sure that these Operating Instructions are always kept close at hand ready for use.
- Pass these Operating Instructions on to the next owner or user.
- Please read these Operating Instructions carefully before commissioning the FAST 3000 tool.
  - Familiarize yourself with all settings and their functions.
  - Anyone involved in setting up, commissioning, maintaining or repairing the unit must have read and understood the Operating Instructions and in particular the safety instructions.

2.2 Use for the intended purpose

**CAUTION**

The FAST 3000 with its associated parts is intended solely for the controlled closure of OETIKER PG270 WingGuard® strap clamps. It may not be used to close clamps other than Oetiker WingGuard® strap clamps 270.

- The unit may be used only for the intended purpose and under technically safe and fault-free conditions.
- Correct usage also covers observance of these Operating Instructions and compliance with the technical data.
- Any use not in accordance with the prescribed usage shall be regarded as incorrect usage.
- The use of the FAST 3000 in areas subject a risk of explosions is not permitted.
- The FAST 3000 can be used as a stand-alone tool or be integrated into an assembly cell.
- If the FAST 3000 is integrated into an assembly cell it can be used without the optional two-hand control desk and without the optional touch panel. In such cases the integrator is responsible for the safe integration of the FAST 3000 into the assembly cell.
  - For further information on the integration of the FAST 3000 see Section 10.

Use other than for the intended purpose

The FAST 3000 is built to current technology and is safe in operation. Residual hazards remain if it used incorrectly or by untrained personnel. The manufacturer bears no responsibility for injuries to personnel and damage to property arising from improper use of the FAST 3000. In such cases the operating company is solely responsible.
Implemented safety concept for safe operation

The FAST 3000 is intended for operation by a single operator. It is prohibited for a third person to start the clamping cycle.

To exclude the risk that parts of limbs may be crushed between the WingGuard® clamp and the goods being strapped, the two-hand control requires the use of two hands to start the clamping cycle, which corresponds to a Performance Level PL d to EN ISO 13849-1.

The clamping cycle is started by depressing the two start buttons simultaneously.

Since after 300 milliseconds the WingGuard® clamp is sufficiently closed that no parts of limbs can be inserted, the start buttons can be released again once they have been depressed. This excludes the possibility of incorrect clamping that might be caused by premature release of the start buttons.

In the event of the clamping drive starting up unexpectedly during the insertion phase, an additional sensor ensures that the pulling unit is immediately disabled.

The safety concept considers the hazards that might arise from the FAST 3000. Other hazards in the surrounding working area must be considered by the operating company and countered as necessary by measures for personal safety.

If the FAST 3000 is not controlled via the Oetiker two-hand control, the operating company must ensure safe integration of the FAST 3000.

2.3 General safety instructions

**CAUTION**

**Hazard due to an unsuitable workplace.**

- Ensure sufficient space and sufficient lighting.

- Comply with all operating instructions and maintenance instructions.

- Maintenance and repair work should be carried out only by qualified specialists.

- The FAST 3000 tool may be used only by persons who are familiar with its use and have been informed of the risks.

- All relevant accident prevention regulations and other generally recognized health and safety rules must be complied with. The manufacturer shall not be held liable for damage resulting from unauthorized modifications to the FAST 3000.

- Use the FAST 3000 only in a clean and dry working environment.

- Use the FAST 3000 only in an area provided with sufficient lighting.

- Provide sufficient space for safe handling and operation.
Spare parts
In order to ensure the fast and accurate delivery of spare parts, a clear purchase order is essential. It must include the following information:

- Product name, software version
- Type designation
- Serial number
- Name of the spare part and quantity required
- Spare part number
- Shipping method
- Full address

Details can be found in the OETIKER tools catalog.

Improvements to the machine
In our endeavor to continuously improve the quality of our products, we reserve the right to make improvements without changing the Operating Instructions. Details of dimensions, weights, materials, performance ratings and names may therefore be subject to necessary changes. Regarding electrical diagrams, the diagram supplied with the machine takes precedence in all cases.
2.4 Covers

⚠️ CAUTION
Use the FAST 3000 only when all covers are correctly fitted.

![Diagram of FAST 3000 with protective covers](image)

Fig. 5  Protective covers on the FAST 3000
- Make sure that identification marks and warning instructions on the machine are always present and legible.

2.5 Special safety instructions

Only specially trained personnel are authorized to carry out maintenance and repair work on electrical equipment.
- Before starting maintenance and repair work, switch off all units and disconnect the entire tool from the power supply.
- Check the crimping jaws and cut-off die as part of the preventive maintenance routine and replace them if necessary.
2.6 Safe methods of working

- Check the FAST 3000 for visible damage on each occasion before starting production, and make sure it is used only when in good condition. Make particularly sure to thoroughly check the crimping jaws and emergency stop!
- Any defects must be reported to a supervisor immediately.
  - Do not continue to use the FAST 3000 if defects have been identified.
- During operation of the machine and when performing maintenance, wear safety glasses.
- The FAST 3000 is intended for operation by only a single operator. The closing cycle may not be initiated by a second person.
- Keep sufficient free space around the product. Users must not be hampered by third persons.
- Arrange the working area of the FAST 3000 for good ergonomics.
- Pressing the emergency stop button on the two-hand control desk disconnects both positioning drives from the power supply and brings their movement to an immediate halt.
  - If the FAST 3000 is controlled via an external PLC, see section 10.

2.7 Using the FAST 3000 via an external control system

- The integrator is responsible for the safe integration of the FAST 3000.
- The integrator must perform a risk evaluation and implement the system in accordance with the risk evaluation.
- The integration may be performed only by qualified personnel.
- If no two-hand control desk is used, an external emergency stop must be wired in.
- For more information on this subject, see section 10.
- If you have questions about how to perform integration contact Oetiker.

2.8 Conversions, modifications

- The FAST 3000 may not be modified either in respect of its design or in respect of its safety features without express permission from OETIKER. OETIKER shall not be held liable for any damages resulting from any unauthorized modifications.
- Use only original spare parts and accessories.
- Do not dismantle any safety equipment or features.
2.9 Qualified personnel

![WARNING]

Hazards due to operation by unauthorized or unqualified personnel.

This device may be used only by authorized and qualified personnel. Use other than in accordance with the Operating Instructions is prohibited. The levels of authorization for use are as follows:

<table>
<thead>
<tr>
<th>Use/operation</th>
<th>Personnel</th>
<th>Operator</th>
<th>Maintenance mechanic</th>
<th>Electrician</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation/decommissioning</td>
<td>x</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Transport/storage</td>
<td>x</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Commissioning without the optional two-hand control desk / without the optional touch panel</td>
<td>x</td>
<td>x</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Normal operation</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Removal/installation of the crimping cut-off head</td>
<td>x</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Maintenance of the crimping cut-off head</td>
<td>x</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>&quot;Manual mode&quot; operation</td>
<td>x</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Error correction</td>
<td>x</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Removal of the covers</td>
<td>x</td>
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<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Opening the control cabinet</td>
<td>x</td>
<td>x</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Replacing parts</td>
<td>x</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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**Explanation:** ✓ = permitted  x = not permitted

"Operator":
- is familiar with the specified safety instructions and regulations
- knows the applicable procedures described in this document
- is appropriately trained
- is authorized by the competent office

The operating company must ensure that the employee has received the safety instructions and regulations in the relevant language.
**“Maintenance mechanic”:**
- has the knowledge described for the “Operator”
- is familiar with the mechanical techniques required for working on the machines and tools (fastening, cleaning, lubricating)
- knows the applicable procedures described in this document
- does not use the tool under improper conditions (when maintenance intervals have been exceeded or when partially disassembled)

**“Electrician”:**
- has the knowledge described for the “Maintenance mechanic”
- has sound knowledge of mechanical and electrical matters
- has been trained and authorized to work on equipment at potentially fatal voltages (110/230 V AC)
- is aware that bad workmanship can lead to serious injuries to personnel and damage to equipment
- is aware that bad workmanship can lead to the failure of electrical and mechanical components
- is aware that the tool must be in good condition when handed over to another user
- knows the applicable procedures described in this document

The **“Maintenance mechanic”** is authorized to perform the following activities:
- Use of the tool in normal operation
- Cleaning the working area

The **“Service mechanic”** is authorized to perform the following activities:
- The activities performed by the “Operator”
- Working in the "Manual operation" operating mode. This allows the tool to be operated manually.
- Make changes to the closure data
- Removal/installation of the crimping cut-off head and cleaning the associated parts
- Maintenance of the crimping cut-off head by replacing the spare parts, cleaning and lubricating
- Investigation of the crimping cut-off head and the associated parts for wear and damage
- Installation, transport and storage
- Removal of the covers for access to the components
The “Electrician” is authorized to perform the following activities:

- The activities performed by the “Maintenance mechanic”
- Repair of the tool if it is in a defective condition
- Removal of the covers and opening the control cabinet for access to the components
- Replacement of the parts and maintenance of the electrical wiring

2.10 Maintenance work

The inspection and maintenance intervals specified in the Operating Instructions must be complied with. Maintenance and repair instructions must be followed accordingly.
2.11 Overload protection of the crimping cut-off head

⚠️ CAUTION

Do not remove the overload protection of the crimping cut-off head. Using the tool without overload protection and CFM force load cells can lead to mechanical damage.

Fig. 6  Overload protection (1) of the crimping cut-off head

2.12 Noise level

In normal operation a maximum noise level of 75 dBA can be expected.
3  Scope of supply of the FAST 3000 tool

3.1  Overview of the main components of the FAST 3000

Fig. 7  Design of the FAST 3000 tool
1. Connecting cable
2. Control cabinet
3. Two-hand dongle, thin
4. Two-hand dongle (emergency stop two-hand control desk, used if the two-hand control desk is not connected)
5. Touch panel / optional
6. Foot pedal / optional
7. Two-hand control desk / optional
8. Jaws checking mirror
9. Closing force verification unit can CAL 01 calibrator (not shown) / optional
10. Alignment aid
11. Installation tool with crimping force monitoring devices

### 3.2 Available main configurations

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Scope of supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>OETIKER FAST 3000 + CFM - EtherNet/IP</td>
<td></td>
</tr>
<tr>
<td>Part number 13500209</td>
<td></td>
</tr>
<tr>
<td>Oetiker FAST 3000 with CFM and EtherNet/IP</td>
<td></td>
</tr>
<tr>
<td>The tool is supplied with a tool carrier</td>
<td></td>
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</table>
### Configuration

<table>
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<tr>
<th>Configuration</th>
<th>Scope of supply</th>
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<tr>
<td><strong>OETIKER FAST 3000 + CFM - PROFINET</strong></td>
<td></td>
</tr>
<tr>
<td>Part number 13500210</td>
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</table>

Oetiker FAST 3000 with CFM and PROFINET
The tool is supplied with a tool carrier

---

*Issued 03.19 08903979 3-24*
### 3.3 Optional extras

<table>
<thead>
<tr>
<th>Option</th>
<th>Scope of supply</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Two-hand control desk</strong></td>
<td>Two-hand control desk for autonomous operation of the FAST 3000.</td>
</tr>
<tr>
<td>Part number 13500002</td>
<td></td>
</tr>
<tr>
<td><strong>Touch panel, complete</strong></td>
<td>Touch panel for controlling the FAST 3000 if no laptop or supervisory controller is used.</td>
</tr>
<tr>
<td>Part number 13500278</td>
<td></td>
</tr>
<tr>
<td><strong>Foot pedal</strong></td>
<td>Foot pedal to allow hands-free use of the FAST 3000 during tests or in the laboratory.</td>
</tr>
<tr>
<td>Part number 13500105</td>
<td></td>
</tr>
<tr>
<td><strong>Test Equipment CAL01 CAL01 qualified UK / engl-de / SKS01-1500mm</strong></td>
<td>Test equipment for verification of the closure force and crimping force</td>
</tr>
<tr>
<td>Part number 13600384</td>
<td>–</td>
</tr>
<tr>
<td><strong>Test Equipment CAL01 CAL01 qualified USA / engl-es / SKS01-1500mm</strong></td>
<td>Test equipment for verification of the closure force and crimping force</td>
</tr>
<tr>
<td>Part number 13600385</td>
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</tr>
<tr>
<td><strong>Test Equipment CAL01 CAL01 qualified CN / engl-de / SKS01-1500mm</strong></td>
<td>Test equipment for verification of the closure force and crimping force</td>
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<td>Part number 13600386</td>
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### Option

<table>
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<th>Option</th>
<th>Scope of supply</th>
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</thead>
<tbody>
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<td></td>
</tr>
<tr>
<td>Part number 13600387</td>
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<tr>
<td>Test equipment for verification of the closure force and crimping force</td>
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<tr>
<td><strong>Verification unit PG135</strong></td>
<td></td>
</tr>
<tr>
<td>Part number 13500232</td>
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</tr>
<tr>
<td>Adapter jaws for verification of the closing force. The CAL 01 must be ordered separately.</td>
<td></td>
</tr>
<tr>
<td><strong>Jaws kit for CFM verification on the FAST 3000</strong></td>
<td></td>
</tr>
<tr>
<td>Part number 13500237</td>
<td></td>
</tr>
<tr>
<td>For CFM verification</td>
<td></td>
</tr>
<tr>
<td>The CAL 01 must be ordered separately.</td>
<td></td>
</tr>
</tbody>
</table>

*For spare parts and auxiliary tools, see section 9.7.*
4  Brief description of the FAST 3000

The Oetiker FAST 3000 was developed to perform closure of the OETIKER WingGuard® strap clamps.

A production cycle consists of the following steps:

• The operator positions the OETIKER WingGuard® strap clamps on the application.
• The FAST 3000 is pulled in the direction of the application and the strap end of the OETIKER WingGuard® strap clamp is inserted into in the crimping cut-off head.
• Pressing the clamping button secures the strap end.
• After the start of the closing cycle the strap end is drawn in by the FAST 3000 until a certain closing force is achieved.
  Precise control of the force is ensured by the force load cell and the high-performance electro-mechanical drive.
• After the closing force is achieved, the strap is crimped by the FAST 3000 to create the wings that secure the clamp against opening. The clamping procedure is monitored by two force load cells. The signal from the force load cells is evaluated by two force monitoring devices. OK/not OK signals are sent by the monitoring devices to the PLC of the FAST 3000.
• After crimping procedure has been performed, the strap ends are cut off.
• They are transported to the ejection position, where they fall out of the tool.
• The FAST 3000 returns to the home position.
4.1 Design of the tool mechanism

![Tool mechanism of the FAST 3000](image)

1 Crimping cut-off head
   The crimping cut-off head crimps the WingGuard® clamp and cuts off the projecting strap end.

2 Strap end detection LED
   Indicates the presence of the strap:
   - Continually dark: No strap present
   - Flashing slowly: Strap present but not clamped
   - Flashing quickly: Strap present and clamped but not inserted sufficiently far. The strap must be inserted further
   - Continually lit: Strap present and clamped. Ready for the clamping cycle

3 M8 3-pin port for connecting the customer's clamping pushbutton
   When a second handle is used, a second clamping pushbutton can also be connected.

4 Handle
   The tool can be positioned using the handle.

5 Clamping pushbutton
   To trigger the securing of the WingGuard® strap end.
### Brief description of the FAST 3000

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Spirit level</td>
<td>Using the spirit level it can be checked that the tool is correctly positioned vertically (see Section 6.5).</td>
</tr>
<tr>
<td>7</td>
<td>Sleeve for the sensor signal cable for crimping monitoring</td>
<td>Sleeve that contains the sensor signal cables for crimping monitoring. The cables are directly connected to the crimping force monitoring device.</td>
</tr>
<tr>
<td>8</td>
<td>Connecting cable between the tool and control cabinet</td>
<td>Connecting cable between the tool mechanism and control cabinet</td>
</tr>
<tr>
<td>9</td>
<td>Tapped hole for attachments</td>
<td>This is available for customer applications such as installation of sensors or of a second handle</td>
</tr>
<tr>
<td>10</td>
<td>Pivot point for the tilting motion</td>
<td>This permits easy insertion of the WingGuard® clamp into the strap end slot.</td>
</tr>
<tr>
<td>11</td>
<td>Tapped hole (concealed)</td>
<td>This can be used for instance to mount the customer’s positioning cylinder.</td>
</tr>
<tr>
<td>12</td>
<td>Linear guide</td>
<td>This permits each insertion of the WingGuard® clamp into the strap end slot. Achievement of the correct setting position must always be guaranteed.</td>
</tr>
<tr>
<td>13</td>
<td>Transport restraint</td>
<td>This must be installed for transporting the mechanism. For normal operation the transport restraint must be removed.</td>
</tr>
<tr>
<td>14</td>
<td>Positioning stop</td>
<td>The purpose of the stop is to ensure the correct horizontal positioning of the tool mechanism in the setting position.</td>
</tr>
<tr>
<td>15</td>
<td>Strap end discharge duct</td>
<td>The strap ends of the WingGuard® clamps are ejected here. Make sure that the strap ends are correctly discharged and do not remain on the linear guide.</td>
</tr>
</tbody>
</table>
4.2 Design of the FAST 3000 crimping cut-off head

**CAUTION**

- Risk of damage to the crimping jaws and the cut-off die.
- Make sure that only the intended OETIKER PG270 WingGuard® strap clamps are used. Otherwise the crimping jaws and the cut-off die may be damaged.

---

**Fig. 9 Crimping cut-off head**

1. Head housing
2. Crimping jaws
3. Crimping wedge
4. Crimping slide
5. Spacer plate
6. Cut-off die
7. Cut-off slide
8. Cut-off die guide
9. Clamping unit slide
10  Head housing cover

Fig. 10  *Particulars of the crimping cut-off head: CFM force load cell and its brackets*

11  Force sensor bracket

12  Crimping force sensor
4.3 Two-hand control desk

⚠️ DANGER
The two-hand control desk must be positioned at least 210 mm from the crimping tool mechanism and must be bolted in position.

![Two-hand control desk diagram](attachment:image)

---

1. Emergency stop button
2. 2-hand start buttons (must be depressed simultaneously to start a closing cycle)
3. Initialization button (for initializing the FAST 3000).
   - Flashes when the tool requires initialization.
   - The button is lit continually whilst initialization is in progress.
4. Acknowledgement button (“Acknowledge”; to display and acknowledge closures that are not OK, and error messages)
5. Green indicator light (“Ready”; indicates that the FAST 3000 is ready for operation)
6. Buzzer (active in laboratory mode, indicates the closing cycle is about to start)
5  Description of the process monitoring of the FAST 3000

5.1  Control of the closing force, description the of process parameters

The purpose of the FAST 3000 is to close OETIKER WingGuard® strap clamps.

**NOTE**

For the recommended values for the process parameters please refer to the technical data sheet of the OETIKER PG270 WingGuard® strap clamp.

---

Fig. 12  Closure data table
5.1.1 Functional description of control of the closing force
The development of the closing force is divided into four phases. These three phases allow simple adjustment of the force control parameters, which are required for a constant and repeatable tensioning operation.

Phase 1 Rapid pre-closing of the clamp.
- The clamp is closed at speed phase 1 until the closing force minus the switch point reduction has been reached.

Phase 2 A slower closing speed until the required closing force has been reached.
- The speed at which the clamp is closed is specified by the speed phase 2. Once the closing force has been reached, the force control switches to phase 3.

Phase 3 In phase 3, the FAST 3000 force control mode is active.
- As soon as the closing force has remained within the closing force tolerance for a period specified by the closing force holding time, the crimping of WingGuard® clamp tail starts. Force Control is active during crimping.

Phase 4 After the end of the crimping process, the WingGuard® strap clamp is relieved by a drive stroke of 1 mm. Then the strap end is cut, which causes an increase in force.

![Fig. 13 Force control phases (Example, shows a target of closing force of 1850 N)](image)

1 Closing force  
2 Closing force tolerance (±100 N around 1850 N)  
3 Force threshold at which the engine is starts to decelerate  
4 Switch point reduction  
5 Force increase after reaching the closing force, due to the drive stroke during deceleration  
6 Start crimp process  
7 Closing force holding time  
8 Strain relief on the clamp band  
9 Force increase while cutting the band
5.1.2 Closing Force
OETIKER PG270 WingGuard® strap clamps must be closed with a recommended and uniform closing force (force priority). This results in a consistent, reproducible and permitted tensioning stress on the strap material and avoids overloading the individual components, the parts being clamped and the clamps.

5.1.3 Closing force tolerance
Specifies the tolerance range within which the closing force must lie for clamp locking to be activated.
Adjustable Tolerance Range: ±50 N to 200 N

5.1.4 Switch point reduction
Sets the force to a value less than the set closing force. At that point the tensioning speed changes from the fast speed phase 1 to a slower speed phase 2.

5.1.5 Speed phase 1
Speed during phase 1 (fast closure of the clamp).

5.1.6 Speed phase 2
Speed during phase 2 (slow closure of the clamp before activation of force control).

5.1.7 Closing force holding time
Some applications require a specific applied force and a specific period of time, so that the components are ideally connected. With the FAST 3000, the user can adjust this period of time. In general, soft materials require a longer holding time than harder ones.
### 5.1.8 Sample curves with different closing force parameters

The preset closing force parameters function on all applications, including very hard ones. It is therefore recommended the settings are not changed unnecessarily.

<table>
<thead>
<tr>
<th>Diagram/Setting</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Closing with standard settings on a hard mandrel" /></td>
<td>Closing with standard settings on a hard mandrel</td>
</tr>
<tr>
<td><img src="image" alt="Closing force set to 800 N" /></td>
<td>Closing force set to 800 N</td>
</tr>
<tr>
<td><img src="image" alt="Reduced holding duration" /></td>
<td>- Reduced holding duration</td>
</tr>
<tr>
<td><img src="image" alt="This results in a shorter cycle time" /></td>
<td>- This results in a shorter cycle time</td>
</tr>
</tbody>
</table>
### Diagram/Setting

<table>
<thead>
<tr>
<th>Diagram/Setting</th>
<th>Comment</th>
</tr>
</thead>
</table>
| ![Diagram 1](image1.png) | • Switch point reduction set to a higher value  
                             • The FAST 3000 switches earlier to phase 2.  
                             • The drive begins to reduce speed at 1250 N (600 N before reaching the closing force) |
| ![Diagram 2](image2.png) | • Phase 1 speed is lower  
                             • This results in a slightly longer cycle time  
                             • Due to the lower speed setting, the FAST 3000 switches to phase 2 at 1550 N. (Less time required to reduce the drive speed) |
| ![Diagram 3](image3.png) | • Phase 2 speed is higher  
                             • This results in a slightly shorter cycle time  
                             • The risk of a force overshoot is higher |
5.1.9 Plausibility test of the closing force sensor
During each closing cycle, the FAST 3000 performs a plausibility test of the closing force sensor. In the unloaded state, a test is carried out as to whether the measured force is approx. 0 N. In addition, the system tests in a lightly loaded state whether the measured force is within the expected range.

5.2 Crimping monitoring
The crimping operation is monitored during measurement of the forces occurring during crimping.

5.2.1 General information on the crimping force monitoring (CFM)

- Two monitoring devices evaluate the force signals from the two load cells. A sensor and a monitoring device is used for each wing; one on the left, one on the right.
- The independent monitoring of the two wings ensures that as many irregularities as possible are recorded.
- The evaluation is based on a time-force curve.
- The units send OK/not OK signals to the PLC. The PLC uses these and other signals to determine whether the overall closing operation was OK or not OK.
- The monitoring devices must be positioned separately from the control cabinet. They can be mounted within the user’s field of view.
- New measurement programs can be transmitted using the “Kistler maXYmos” software from a laptop to the monitoring devices via an Ethernet connection (see Section 6.8.7).
- The results of the individual closing operations, including the force curve and current evaluation settings of the monitoring device, can be saved automatically to a central server. For more detailed information on this, please refer to the Operating Instructions of the monitoring device.

Fig. 14 Crimping force monitoring devices
5.2.2 Mechanical design
The following figure shows the action of the forces applied to the crimping jaw. Viewed from the crimping jaw side.

Fig. 15  Application of force to on the crimping jaws

1  Movement of the crimping wedge
2  Force acting on the jaw due to the closing action of the crimping wedge
3  Shearing and deformation force during the crimping of the WingGuard® strap clamp (wing formation)
4  Resulting force accepted by the crimping jaws pivot pin
The force is transmitted via the crimping jaw pivot pins to the force transmission lever of the crimping head transmit.

**NOTE**

Due to the principle of leverage the force is divided between the transmission lever and the spacer plate.

---

**Fig. 16  Force transmission level, lateral sectional view through the crimping head**

1. Force transmission lever
2. Spacer plate
3. Crimping jaw pivot pins
4. Crimping jaw

**Fig. 17  Front view of the crimping cut-off head with force transmission levers**

5. The force on the crimping jaw pivot pins is transmitted to the force transmission lever of the head housing
6. Fixed body hinge
7. Force transmission lever
8. Force measured by the crimping force sensor (leverage principle)
5.2.3 CFM: Typical OK force curve

Fig. 18 OK force curve

1. EO 3: No-Pass curve: The force curve may not intersect this curve. If the force curve intersects the No-Pass curve:
   - The crimping procedure will be evaluated as not OK.
   - In addition, the closing operation will be terminated immediately and the strap of the WingGuard® clamp will be cut off without formation of the closing wings. This function protects the components of the FAST 3000, particularly the crimping jaws, against overloading.

2. The crimping jaw touches the strap of the WingGuard® strap clamp, the force increases

3. EO 1: First envelope curve: If the actual force curve infringes the upper or lower envelope curve limit, the crimping operation will be evaluated as not OK.

4. First peak: The strap begins to shear/formation of the wings

5. EO 2: Second envelope curve: If the actual force curve infringes the upper or lower envelope curve limit, the crimping operation will be evaluated as not OK.

6. EO 4: Uni-Box: Transmits the force values on entry and exit to the FAST 3000 PLC. See next section.

7. Second peak: The crimping jaw reaches its end position

8. Relaxation effects. As there is no process-relevant information, this is not a part of the envelope curve

9. Switching signal: If the force curve intersects the switching signal, then the crimping operation is terminated immediately and strap of the WingGuard® clamp is cut off without forming the closing wings. This function protects the components of the FAST 3000, particularly the crimping jaws, against overloading.

NOTE

As soon as an EO (Evaluation Object) does not meet the test condition, it is displayed in red.
5.2.4 CFM: Wear detection

1. New crimping cut-off head
2. Worn crimping cut-off head

If the second peak is missing, this means either that parts of the crimping cut-off head (crimping jaws, crimping wedge, crimping pivot pin) are worn or that the crimping jaw has broken off (Example pictures on page 5-50 to page 5-53). For this reason, the FAST 3000 PLC will perform an additional check: The monitoring devices measure the force levels at entry into the green rectangular box and exit from the box. These force values are transmitted to the FAST 3000 PLC, which calculates the difference between the entry force and exit force. If the difference is less than a specific value, an error message is generated (Zero N is the standard setting, adjustable range –100 to +100 N).

Formula:

\[ \text{If Exit Force} - \text{Entry Force} > \text{Threshold value}, \text{then closure is OK} \]

The condition of the Crimping cut-off head can be determined by:

- checking the condition of the crimping jaws visually. See picture of good jaws below:

- measuring the closing gap of the Crimping cut-off head in mounted condition (Refer to chapter 9.2.5 for information about how to measure the closing gap).

In addition to the condition of the crimping cut-off head, the band thickness of the WingGuard® clamp and side-acting forces on the WingGuard® clamp also affect the force differential.
5.2.5 CFM: Sample curves of crimping operations

<table>
<thead>
<tr>
<th>CFM curve</th>
<th>Image of the closed clamp</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Left</strong></td>
<td>Wings unusually thin and not closed to a sufficient height.</td>
</tr>
<tr>
<td><img src="image1.png" alt="CFM curve image" /></td>
<td><img src="image2.png" alt="Image of the closed clamp" /></td>
</tr>
<tr>
<td><strong>Right</strong></td>
<td></td>
</tr>
<tr>
<td><img src="image3.png" alt="CFM curve image" /></td>
<td><img src="image4.png" alt="Image of the closed clamp" /></td>
</tr>
</tbody>
</table>

**Description**

During wing closure the clamp housing was not parallel to the crimping cut-off head.

The following criteria have led to the not OK evaluation:

- Second envelope curve (EO 2) right (Troubleshooting see chapter 13.3.16)
- Wear detection right (Troubleshooting see chapter 13.3.18)
CFM curve | Image of the closed clamp
---|---
**Left**

![CFM curve image](image1)

**Right**

![CFM curve image](image2)

**Description**

During wing closure the clamp housing was not parallel to the crimping cut-off head.

The following criteria have led to the not OK evaluation:

- First envelope curve (EO 1) right (Troubleshooting see chapter 13.3.15)
- Second envelope curve (EO 2) left (Troubleshooting see chapter 13.3.12)
- Second envelope curve (EO 2) right (Troubleshooting see chapter 13.3.16)
Description

During wing closure the clamp housing was not parallel to the crimping cut-off head.

Crimping jaw struck the edge of the strap instead of reaching underneath the strap.

The closure process is aborted in order to protect the crimping jaws of the FAST 3000 against damage.

Cancellation triggered by maximum force of the left crimping jaw.

The following criteria have led to the not OK evaluation:

- Second envelope curve (EO 2) left (Troubleshooting see chapter 13.3.12)
- Second envelope curve (EO 2) right (Troubleshooting see chapter 13.3.16)
- Uni-Box (EO 4) left (Troubleshooting see chapter 13.3.12)
- Uni-Box (EO 4) right (Troubleshooting see chapter 13.3.16)
Description of the process monitoring of the FAST 3000

<table>
<thead>
<tr>
<th>CFM curve</th>
<th>Image of the closed clamp</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Left</strong></td>
<td>Chip formation under the wing.</td>
</tr>
<tr>
<td><img src="image" alt="CFM curve diagram left" /></td>
<td></td>
</tr>
<tr>
<td><strong>Right</strong></td>
<td><img src="image" alt="CFM curve diagram right" /></td>
</tr>
<tr>
<td>Description</td>
<td></td>
</tr>
</tbody>
</table>

Slanting application; the right side is lower than the left side. Closure of the clamp on an oblique solid surface.

The following criteria have led to the not OK evaluation:

Second envelope curve (EO 2) right (Troubleshooting *see chapter 13.3.16*)
### CFM curve

<table>
<thead>
<tr>
<th>CFM curve</th>
<th>Image of the closed clamp</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Left</strong></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="CFM curve graph" /></td>
<td><img src="image" alt="Image of the closed clamp" /></td>
</tr>
<tr>
<td><strong>Right</strong></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="CFM curve graph" /></td>
<td><img src="image" alt="Image of the closed clamp" /></td>
</tr>
</tbody>
</table>

No wing formation.
Description

- Slanting application; the right side is lower than the left side. Closure of the clamp on an oblique solid surface.
- Foreign Object leads to a gap between cut off punch and WingGuard® housing, therefore there is a collision between the FAST 3000 crimp jaw and the WingGuard® housing.

The crimping process is terminated due to the premature increase in force, in order to prevent damage to the crimping jaws.

The following criteria have led to the not OK evaluation:

- No-Pass (EO 3) left (Troubleshooting see chapter 13.3.13)
- First envelope curve (EO 1) left (Troubleshooting see chapter 13.3.11)
- First envelope curve (EO 1) right (Troubleshooting see chapter 13.3.15)
- Second envelope curve (EO 2) left (Troubleshooting see chapter 13.3.12)
- Second envelope curve (EO 2) right (Troubleshooting see chapter 13.3.16)
- Uni-Box (EO 4) left (Troubleshooting see chapter 13.3.12)
- Uni-Box (EO 4) right (Troubleshooting see chapter 13.3.16)
### Description of the process monitoring of the FAST 3000

<table>
<thead>
<tr>
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<th>Image of the closed clamp</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Left</strong></td>
<td>Closing width larger, wing less high.</td>
</tr>
</tbody>
</table>

![CFM curve Image of the closed clamp](image)

**Right**

![CFM curve Image of the closed clamp](image)

**Description**

Closing with simulated wear (closing gap 3.4 mm. Refer to chapter 9.2.5 for information about how to measure the closing gap.)

![Description](image)

The FAST 3000 PLC checks if the following condition is fulfilled: Exit Force – Entry Force < Threshold value. If yes, the FAST 3000 PLC outputs an error message and the closure operation is evaluated as not OK.

For more information about wear detection, see chapter 5.2.4.

The following criteria have led to the not OK evaluation:

- Wear detection left (Troubleshooting see chapter 13.3.14)
- Wear detection right (Troubleshooting see chapter 13.3.18)
### Description

<table>
<thead>
<tr>
<th>CFM curve</th>
<th>Image of the closed clamp</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Left</strong></td>
<td>Right wing not formed, left wing badly formed.</td>
</tr>
</tbody>
</table>

![CFM curve Image of the closed clamp](image)

<table>
<thead>
<tr>
<th><strong>Right</strong></th>
</tr>
</thead>
</table>

![CFM curve Image of the closed clamp](image)

**Description**

Right crimping jaw completely broken off. In comparison to good jaws:

(Example image)

The following criteria have led to the not OK evaluation:

- First envelope curve (EO 1) right (Troubleshooting see chapter 13.3.15)
- Second envelope curve (EO 2) left (Troubleshooting see chapter 13.3.12)
- Second envelope curve (EO 2) right (Troubleshooting see chapter 13.3.16)
- Uni-Box (EO 4) right (Troubleshooting see chapter 13.3.16)
- Wear detection left (Troubleshooting see chapter 13.3.14)
- Wear detection right (Troubleshooting see chapter 13.3.18)
<table>
<thead>
<tr>
<th>CFM curve</th>
<th>Image of the closed clamp</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Left</strong></td>
<td><img src="image1.png" alt="Image of the closed clamp" /></td>
</tr>
<tr>
<td><img src="image2.png" alt="CFM curve of the left side" /></td>
<td></td>
</tr>
<tr>
<td><strong>Right</strong></td>
<td><img src="image3.png" alt="Image of the closed clamp" /></td>
</tr>
<tr>
<td><img src="image4.png" alt="CFM curve of the right side" /></td>
<td></td>
</tr>
</tbody>
</table>

**Description**

Right crimping jaw partially broken off:

The following criteria have led to the not OK evaluation:

- Second envelope curve (EO 2) left (Troubleshooting see chapter 13.3.12)
- Second envelope curve (EO 2) right (Troubleshooting see chapter 13.3.16)
- Wear detection right (Troubleshooting see chapter 13.3.18)
### Description of the process monitoring of the FAST 3000

<table>
<thead>
<tr>
<th>CFM curve</th>
<th>Image of the closed clamp</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Left</strong></td>
<td><img src="image1" alt="Image of the closed clamp left" /></td>
</tr>
<tr>
<td><img src="image2" alt="CFM curve left" /></td>
<td><img src="image3" alt="Image of the closed clamp left" /></td>
</tr>
<tr>
<td><strong>Right</strong></td>
<td><img src="image4" alt="Image of the closed clamp right" /></td>
</tr>
<tr>
<td><img src="image5" alt="CFM curve right" /></td>
<td><img src="image6" alt="Image of the closed clamp right" /></td>
</tr>
</tbody>
</table>

#### Description

<table>
<thead>
<tr>
<th>Both jaws partially broken off</th>
<th>In comparison to good jaws</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image7" alt="Image of both jaws partially broken off" /></td>
<td><img src="image8" alt="Image of good jaws" /></td>
</tr>
</tbody>
</table>

The following criteria have led to the not OK evaluation:

- Second envelope curve (EO 2) right (Troubleshooting see chapter 13.3.16)
## Description of the process monitoring of the FAST 3000

<table>
<thead>
<tr>
<th>CFM curve</th>
<th>Image of the closed clamp</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Left</strong></td>
<td><img src="image" alt="Image of the closed clamp" /></td>
</tr>
<tr>
<td><img src="chart" alt="CFM curve chart" /></td>
<td><img src="image" alt="Image of the closed clamp" /></td>
</tr>
<tr>
<td><strong>Right</strong></td>
<td><img src="image" alt="Image of the closed clamp" /></td>
</tr>
<tr>
<td><img src="chart" alt="CFM curve chart" /></td>
<td><img src="image" alt="Image of the closed clamp" /></td>
</tr>
</tbody>
</table>

### Description

Right jaw partially broken off:

- The following criteria have led to the not OK evaluation:
- Second envelope curve (EO 2) right (Troubleshooting see chapter 13.3.16)
## Description

Fastening screws of the head housing cover are not sufficiently tight.

Lock is still OK!

Refer to chapters 9.3.2 and 9.3.3 for information about the correct tightening torque.
### Description

Closing force set to 800 N instead of the standard setting of 1850 N. CFM force level greater than at 1850 N, due to the in general lower stress level in the clamp band.

Conclusion: The closing force has an influence on the CFM curves

As a comparison, check the pictures on the next page

<table>
<thead>
<tr>
<th>CFM curve</th>
<th>Image of the closed clamp</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Left</strong></td>
<td><img src="image1" alt="Image of the closed clamp (Left)" /></td>
</tr>
<tr>
<td><strong>Right</strong></td>
<td><img src="image2" alt="Image of the closed clamp (Right)" /></td>
</tr>
</tbody>
</table>
Description of the process monitoring of the FAST 3000

<table>
<thead>
<tr>
<th>CFM curve</th>
<th>Image of the closed clamp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left</td>
<td><img src="image1" alt="Image of the closed clamp left" /></td>
</tr>
<tr>
<td>Right</td>
<td><img src="image2" alt="Image of the closed clamp right" /></td>
</tr>
</tbody>
</table>

**Description**

Closing force set to 2500 N instead of the standard setting of 1850 N. CFM force level less than at 1850 N, due to the in general higher stress level in the clamp band.

Conclusion: The closing force has an influence on the CFM curves

As a comparison, check the pictures on the page before

### 5.3 Cut-off monitoring

The PLC checks the force acting on the load measuring cells, whilst the strap end of the WingGuard® clamp is ejected. If the force measured is higher than expected, this may mean that the strap of the WingGuard® strap clamp has not been fully cut off and the cutting die is defective. An error message appears and the assembly operation is evaluated as not OK.
6 Working with the FAST 3000

⚠️ WARNING

Hazardous situation due to improper installation.
- Read and understand the safety advice, Section 2.
- Make sure that the FAST 3000 has enough space around it to ensure the operator is not hampered or bumped into by other persons.
- Attach the FAST 3000 installation tool and its control cabinet to the attachment points provided.
- Ensure that the necessary plugs are inserted (the tool, two-hand control desk, ...) before the FAST 3000 is connected to the power supply.
- A touch panel/ two-hand control desk and/or a connection to a PLC must be provided.

6.1 Commissioning

⚠️ CAUTION

Hazard due to the machine being incorrectly installed.
The installation of the FAST 3000 may be performed only by qualified personnel who have read and understood the Operating Instructions.

⚠️ CAUTION

Hazard due to incorrect inspection.
Ensure during and after each installation that
- all parts are in good condition,
- all parts are installed so that they cannot fall down,
- all safety-relevant parts are installed and working correctly.
- the cramping cut-off head is correctly installed. Use only cramping jaws that are in good condition and use only an intact cut-off die.

⚠️ CAUTION

Hazard due to defective devices due to improper handling and positioning.
- Connect all cables and installation tools to the control cabinet and disconnect them from it only when in the de-energized state.
- Plug connector contacts may be touched only by persons who are grounded to prevent ESD.
- The control cabinet may be installed only in an upright position.
The commissioning procedure of the FAST 3000 includes the following steps:

1. Install the components of the FAST 3000 so that they cannot fall off, so they recognize ergonomic factors and so that clamps can be correctly closed.

2. Connect the installation tool an the control cabinet.

3. Connect the CFM unit to the control cabinet (see Section 6.3).

4. Optional: Connect the touch panel, the two-hand control desk, the foot pedal and the external PLC to the control cabinet (see Section 6.2).

5. Connect the control cabinet to the power supply.

6. Switch the FAST 3000 on (see Section 6.4).
   The first closures on a loose mandrel can now be performed.

7. Position the installation tool (see Section 6.5).
   The tool is now ready for operation.

8. Close a few test clamps to determine the functionality of the tool.
6.2 Connections to the control cabinet

Fig. 20  Connections to the control cabinet

1  Power supply
2  Connecting cable between the tool mechanism and control cabinet
3  Touch panel
4  Hard wire I/O
5  Power supply CFM 24 V
6  EtherCat CFM
7  Hardwire I/O power supply
8  Foot pedal
9  ProfiNet (active only on Oetiker FAST 3000 + CFM-Profinet)
10  EtherNet (TCP / Ethernet IP)
11  External emergency stop (if this port is not connected to an external emergency stop the thin two-hand dongle must be plugged in.)
12  Two-hand control desk (if no two-hand control desk is connected the two-hand dongle must be plugged in.)
13  M16 cable gland, external light curtain, external power management
6.3 Cable connections to the crimping force monitoring

**NOTE**

Use the cable strain relief strip supplied to provide strain relief to the connecting cables.

---

**Fig. 21  Control unit, connections**

1. Cables for connecting the crimping force-monitoring devices to the FAST 3000 control cabinet
2. 24-V power supply for the crimping force monitoring devices
3. Cable conduit and bracket for the force signal cables (use an M5 bolt for strain relief of the cables and attach the bracket to a secure surface).
4. Port for the left hand CFM force load cell (when the port is not occupied, cover it with the closure cap supplied. Do not allow dirt to enter the plug connector socket).
5. Port for the right hand CFM force load cell (when the port is not occupied, cover it with the closure cap supplied. Do not allow dirt to enter the plug connector socket).
6. EtherCAD connection (use the “Fieldbus In” port of the left hand CFM device)
7. RJ-45 cable connecting the “Fieldbus Out” socket of the left hand crimping force monitoring device to the “Fieldbus In” socket of the right hand CFM unit
6.4 Switching on the FAST 3000

**NOTE**

For further information on controlling the FAST 3000 without the two-hand control desk (see Section 10).

**NOTE**

The FAST 3000 may not be initialized when a clamp or other part is inserted in the crimping cut-off head. Disregard of this rule can lead to breakage of the crimping jaws.

1. Switch the FAST 3000 on using the On/Off switch (1) on the control cabinet.
2. Wait until the PLC has booted up. After the blue illuminated button on the two-hand control desk has started to flash, press the green button (2) on the control cabinet door. This indicates that the power stages of the drives are supplied with power. CAUTION! As long as no enable flag from the supervisory system is present and the bypass switch is not active, the power cannot be switched on (see Section 7.4.7, “Tool parameters”).

3. Make sure that no clamp is present in the crimping cut-off head and the crimping jaws and the cut-off die can move freely.

4. To initialize the FAST 3000, press the blue flashing button (3) on the two-hand control desk.

The FAST 3000 is ready for operation when the green indicator lamp on the two-hand control desk is lit.
6.5 Correctly positioning the FAST 3000

6.5.1 General instructions, positioning the FAST 3000 and WingGuard® clamp housing

⚠️ CAUTION

Hazard due to incorrect tool positioning.
The positioning of the FAST 3000 may be performed only by qualified personnel who have read and understood the Operating Instructions.
The following procedure is applicable only if after the installation the housing of the WingGuard® strap clamp must be in the horizontal position. In all other cases the FAST 3000 must be set up manually.

► There are many different installation options available. Therefore you must check the correct alignment of the WingGuard® strap clamp. In addition you must install it after the first set-up to the trial clamps.

► The horizontal and tilting movement of the FAST 3000 must not be obstructed by contact with external objects.

► During the closure procedure, the crimping cut-off head of the FAST 3000 must not touch any parts other than the WingGuard® clamp that is being closed. Disregard of this rule can lead to mechanical damage and poor connection quality of the WingGuard® strap clamp.

► In order to obtain the full benefit of the WingGuard® strap clamp, the WingGuard®-housing must be supported by the application.

► The WingGuard® strap clamp must not be mounted on a conical surface.

► Before positioning the FAST 3000, always remove the transport restraint. The transport restraint must not be mounted during the productions operation.

► We emphatically recommend that a suitable jig is employed for the entire application. Free-hand closure can result in the clamps not being properly closed.

► The base plate of the FAST 3000 must be securely attached to the support frame. This is applicable also to the validation phase of the application.

► Incorrect alignment of the machine can lead to a reduced residual force in the WingGuard® strap clamp.

► The control cabinet may be installed only in an upright position.

Example of correct installation of the WingGuard® housing and the crimping cut-off head (both are parallel)
Fig. 22  *Example of an incorrect non-parallel alignment of the WingGuard®-housing and of the crimping cut-off head*

Fig. 23  *Impermissible positioning of the WingGuard® housing on an application*

Fig. 24  *Impermissible application of the WingGuard® strap clamp on a conical surface*
Fig. 25 The crimping cut-off head must be at a sufficient distance from the application

Fig. 26 Here the crimping cut-off head is at an insufficient distance from the application
Impermissible application. The same is true if two WingGuard® strap clamps are fitted too close to each other.
Fig. 27  Do not mount the WingGuard® strap clamp on a stepped application

Fig. 28  Avoid contact between the end face of the strap and the goods being strapped (example: goods being strapped (1))
6.5.2 Positioning of the FAST 3000 installation tool with the alignment aid

**WARNING**

**Hazard due to a magnetic field.**
The alignment aid is held against the crimping cut-off head by a strong magnet. Personnel fitted with a heart pacemaker must maintain a suitable distance from the alignment aid.

1. Fix the customer application in the bracket provided by the purpose by the customer.
2. Remove the transport restraint (2).
3. Attach the alignment aid (1) to the crimping cut-off head and satisfy yourself that both pins are correctly positioned.

4. Displace the FAST 3000 horizontally so that the indicated dummy housing (3) of the alignment aid (1) is correctly positioned relative to the intended position of the WingGuard® housing. In most applications this is the 12 o'clock position.
5. Make sure that the FAST 3000 has sufficient space (~ 50 mm) for attaching the positioning stop (3) to the guide rail.

6. Adjust the height of the tool so that the bubble of the spirit level is exactly central between the two vertical lines (horizontal alignment). The correct horizontal position must be maintained at all times.

7. Mount the positioning stop on the tool so that both the vibration-absorbing rubber pads rest lightly against the tool.

8. Tighten the attachment screw (4) on the positioning stop (3) to a torque of 5 Nm.
9. Check the horizontal alignment yet again. The tool must rest lightly against an the positioning stop and against the alignment aid on the application.

10. Remove the alignment aid.

11. Check the alignment of the FAST 3000. To do this, install several WingGuard® clamps on your application. If the WingGuard® strap clamp is not in 12 o'clock position, manually correct the horizontal alignment of the FAST 3000.

You can check the correct vertical positioning of the FAST 3000 by reference to the spirit level which is mounted at the top of the tool. To do this, position the crimping cut-off head on the clamp housing of the WingGuard® clamp. The spirit level must now be correctly aligned.

The FAST 3000 is now correctly positioned.

6.5.3 Dimensions for correctly positioning the FAST 3000

⚠️ CAUTION

Hazard due to the machine being incorrectly installed.

The following drawing relates to installation situations where the surrounding surfaces of the WingGuard® strap clamp housing are symmetrical (cylindrical surfaces)

▶ If the surfaces on which WingGuard® strap clamp housing is installed are asymmetrical (elliptical or the like), the correct position of the WingGuard® strap clamp housing and the FAST 3000 must be determined by means of tests.
▶ The horizontal and tilting movement of the FAST 3000 must not be obstructed by contact with external objects.
▶ The crimping cut-off head of the FAST 3000 must not touch any parts other than the WingGuard® clamp that is being closed. Disregard of this rule can lead to mechanical damage and poor connection quality of the WingGuard® strap clamp.
▶ Always remove the transport restraint before positioning the FAST 3000.
▶ We emphatically recommend that a suitable jig is employed for the entire application. Free-hand closure can result in the clamps not being properly closed.
Comment: On request, Oetiker will provide a 3D-CAD model of the FAST 3000.
6.6 Normal operation (production)

⚠️ WARNING

Crush hazard at the WingGuard® strap clamp.
Fingers can be crushed when the two-hand start buttons are pressed or when a start is initiated by an external control.

- When starting the clamping cycle, keep your fingers away from the clamp.

⚠️ WARNING

Crush hazard at moving parts.
The FAST 3000 may be used only when all covers are correctly fitted and bolted in place!
**WARNING**

Crush hazard due to positioning the hands under the installation tool.

Never reach under the installation tool whilst it is in operation.

---

**CAUTION**

Danger due to parts being flung from the machine.

If parts become defective whilst the machine is in during operation, parts may become loose and be flung from the machine.

During operation and maintenance of the machine, always wear safety glasses.

---

1. Check that the process parameters are set to the correct values for your application (see Section 5.1).
2. Place the clamp around the parts to be connected and secure the customer application in the bracket provided by the purpose by the customer.
3. Hold the machine by the handle and pull it in the direction of the clamp or of the assembly to be fastened. When doing so, guide the strap of the OETIKER PG270 WingGuard® strap clamp into the bottom slot on the crimping cut-off head.
4. Push the OETIKER PG270 WingGuard® strap clamp into the tool as far as possible. A sensor detects the correct positioning and confirms this with two LED lamps on the front cover (slowly flashing green light). Now the clamp can be locked by pressing the button on the top of the handle. Pressing the button a second time releases the lock.

Once the strap is locked (as shown by the two LEDs on the front cover) lighting up continuously, the installation of the OETIKER PG270 WingGuard® strap clamp can start. If the clamping strap was inserted insufficiently far, the LEDs will flash at rapid intervals. In this case the button must be pressed again to release the clamp, the strap must be pushed in further and locked again.

5. Start the installation by pressing both the left and right buttons (1) on the two-hand control desk simultaneously. This initiates closure of the clamp. At the end of the closure procedure the clamp is released and the tool can be pushed back into the output position.

6. Remove the installed assembly and start another cycle.

NOTE
After a defective clamp closure, always check the crimping jaws for damage.
NOTE
If the strap sensor detects no strap, the strap sensor is deactivated.

NOTE
You must depress both start buttons quickly and simultaneously. Otherwise the warning “Failure to achieve 2-button contact” is output.

6.7 Laboratory mode (password-protected)
You can switch into the password-protected laboratory mode and choose between 1-hand control or foot pedal control. Laboratory mode can be used only for a limited number of connections and activated for only a limited period of time (see Section 7.4.3).

⚠️ WARNING
Hazard due to unqualified personnel.
Laboratory mode can be used only under laboratory or test conditions where there is no alternative. The personnel must have been trained to use of the FAST 3000 with an increased level of care.

⚠️ WARNING
Crush hazard at the WingGuard® strap clamp.
Fingers can be crushed when the START button is pressed or when a start is initiated by an external control.
► When starting the clamping cycle, keep your fingers away from the clamp.
**WARNING**

Crush hazard at moving parts.
The FAST 3000 may be used only when all covers are correctly fitted and bolted in place.

**WARNING**

Crush hazard due to positioning the hands under the installation tool.
- Never reach under the installation tool whilst it is in operation.

**CAUTION**

Danger due to parts being flung from the machine.
If parts become defective whilst the machine is in operation, parts may become loose and be flung from the machine.
- During operation and maintenance of the machine, always wear safety glasses.

**NOTE**

Only one laboratory mode can ever be activated at a time. Depending on the setting you can then initiate a cycle by pressing a start button or pressing the foot pedal.
6.7.1 One-hand operation

1. Check that the process parameters are set to the correct values for your application.

2. Activate the one-hand operation:
   - Switch to “operating mode”, activate “laboratory mode” and “one-hand operation”.
   - In order to access laboratory mode you must be logged in.

3. Place the clamp around the parts to be connected.

4. Hold the machine by the handle and pull it in the direction of the clamp. When doing so, guide the strap of the OETIKER PG270 WingGuard® strap clamp into the bottom slot on the crimping cut-off head.
5. Push the OETIKER PG270 WingGuard® strap clamp into the tool as far as possible. A sensor detects the correct positioning and confirms this with two LED lamps on the front cover (slowly flashing green light). Now the clamp can be locked by pressing the button on the top of the handle. Pressing the button a second time releases the lock.

If the sensor does not detect a strap, the locking button will not work.

Once the strap is locked (as shown by the two LEDs on the front cover lighting up continuously) the installation of the OETIKER PG270 WingGuard® strap clamp can start.

If the clamping strap was inserted insufficiently far, the LEDs will flash at rapid intervals. In this case the button must be pressed again to release the clamp, the strap must be pushed in further and locked again.

6. Start the installation. Press either the left-hand or right-hand button on the two-hand control desk for at least 2.5 seconds.

After the buzzer has sounded 3 times the clamp will start to close. Once the closure procedure is complete, the clamp is released again.
6.7.2 Foot pedal

1. Check that the process parameters are set to the correct values for your application.

2. Activating foot pedal mode
   - Switch to “operating mode”, activate “laboratory mode” and “foot pedal”.
   - In order to access laboratory mode you must be logged in.

3. Place the clamp around the parts to be connected.

4. Hold the machine by the handle and pull it in the direction of the clamp. When doing so, guide the strap of the OETIKER PG270 WingGuard® strap clamp into the bottom slot on the crimping cut-off head.
5. Push the OETIKER PG270 WingGuard® strap clamp into the tool as far as possible. A sensor detects the correct positioning and confirms this with two LED lamps on the front cover (slowly flashing green light). Now the clamp can be locked by pressing the button on the top of the handle. Pressing the button a second time releases the lock.

If the sensor does not detect a strap, the locking button will not work.

Once the strap is locked (as shown by the two LEDs on the front cover lighting up continuously) the installation of the OETIKER PG270 WingGuard® strap clamp can start.

If the clamping strap was inserted insufficiently far, the LEDs will flash at rapid intervals. In this case the button must be pressed again to release the clamp, the strap must be pushed in further and locked again.

6. Start the installation. Depress the foot pedal down to the middle position for at least 2.5 seconds. After the buzzer has sounded 3 times the clamp will start to close. Once the closure procedure is complete, the clamp is released again.
6.8 Special operating modes (password-protected)

These operating modes are not intended for closing clamps, instead they are only for testing the positions and forces during maintenance and repair work, and for quality assurance.

**WARNING**

Crush hazard at the WingGuard® strap clamp.

When triggering the functions described below, fingers may be crushed by the WingGuard® strap clamp.

- When starting functions, keep your fingers away from the clamp.

**WARNING**

Crush hazard at moving parts.

- Use the FAST 3000 only when all covers are correctly fitted and bolted into place.

**WARNING**

Hazard due to positioning the hands under the installation tool.

- Never reach under the installation tool whilst it is in operation.
**CAUTION**

Danger due to parts being flung from the machine.
If parts fracture whilst the machine is in during operation, parts may become loose and be flung from the machine.
▸ During operation and maintenance of the machine, always wear safety glasses.

### 6.8.1 Unlocking

**NOTE**

In certain situations, tool initialization cannot be performed since it might lead to mechanical damage.
▸ Use the unlocking function of the FAST 3000 only when tool initialization cannot be performed.

1. Switch to the “operating mode” tab.
2. If the emergency stop-button is set, unlatch it.
3. Press the “Deblocking” button (1).
   The strap of the WingGuard® strap clamp will not be cut off from the FAST 3000, but not crimped.
   The residual piece of strap is discarded.
4. Press the blue “initializing” button on the two-hand control desk.
   The tool is now ready for operation.
6.8.2 Manual mode operation of drives

1. Activating operating mode.
   - Switch to “operating mode” and activate “manual drive”.
   - In order to access manual drive mode you must be logged in.

2. Control the drives by pressing one of the pre-defined positions (1, 2).
   For further information see Section 7.4.3.
6.8.3 Setting the force offset to zero

**NOTE**

Under various conditions the force measured by the force load cell in the clamping unit can vary due to changes in temperature. To compensate for this you can set the measured to zero when there is no force measured by the unloaded force load cell. If the value is found to deviate from zero by more than 20 N, we recommend that the force offset is set to zero. We recommend that the force offset is checked every week.

1. Switch to the “Settings” tab.
   - In order to access the zero offset tab you must be logged in.

2. Select “Force verification” and “Pulling unit”
   - Start the procedure by pressing “Zero offset”.
   - The tool will move so that the force load cell is unloaded.

The “Actual force average value” indicates the force actually measured. If you wish compensate an existing offset, press “Set offset to zero”.

   - Press “Quit routine”
     - The tool returns to the home position.

For further information see Section 7.4.7.
6.8.4 Verifying the closing force

**NOTE**

To check the correct operation of the force load cell, verify the measured force at least once a week, using an Oetiker CAL 01.

If the force is set to 1850 N, the force measured by the CAL 01 must be within a tolerance of ± 100N of that value.

The tensioning strap should be replaced after about 50 verifications.

**Setting with CAL 01:** SKS mode: hold-ME-EL / average (see section 7.4.7)

1. Activate the verification.
   - Switch to the “Settings” tab.
   - In order to access force verification mode you must be logged in.
2. Press the “Force verification” button.
3. Press the “Pulling unit” button.
4. Press the “Force verification” button.
5. Adjusting the closing force verification unit.
6. Press the button at the top of the handle.

7. Press on “Target force” to change the verification force to the desired value.

8. Press on “Activate verification”.

9. Input the force measured by the CAL 01 into the “Ext. Force value “CAL”” field. The value that is input will be saved in the verification log.

10. Press “Quit routine”
    The values are written to the relevant log file.

11. Remove verification unit from the tool.

6.8.5 Crimping force monitoring verification

**NOTE**

To check the correct operation of the CFM force load cell, we recommend that the measured force is verified at least once a week, using an Oetiker CAL 01.

If the force is set to 800 N, the force measured by the CAL 01 must be within a tolerance of ± 150 N of that value.

**Setting the CAL 01:** SKS mode: hold-ME-EL / average (see section 7.4.7)
NOTE

During the verification, do not hold the SKS firmly in the hand, since this can corrupt the measured result.

1. Activate the force verification.
   ▶ Switch to the “Settings” tab.
   ▶ In order to access CFM force verification mode you must be logged in.

2. Press the “Force verification” button.

3. Press the “Crimping” button.

4. Press the “Force verification” button.
5. Set the “force target value” to the desired value, e.g. 800 N.

6. Position the SKS 01 with the correctly installed CFM verification jaws under the crimping cut-off head, as shown in the photo on the right.

7. Press the strap locking button on the handle, keeping the SKS 01 in this position.

8. Keep the SKS 01 in this position until the CFM measured force achieves the force target value. After a few seconds, the SKS 01 will be released.

9. Input the force measured by the CAL 01 into the “Ext. Force value (“CAL”)” field. The value that is input will be saved in the verification log.

10. Press “Quit routine”. The values are written to the relevant log file.

### 6.8.6 Adjusting the crimping force monitoring

#### Teaching the crimping force monitoring

**NOTE**

The definition of the envelope curves for the crimping force monitoring devices is based on the force curve of the Wing-Guard® strap clamps for various different clamps, clamp straps and batches of steel. It is therefore recommended to use the factory settings for as long as possible so as to avoid faults in material due to differing melt batches.
NOTE
If the closing force deviates from the factory setting of 1850 Nm you may have to teach new reference curves.

Each monitoring device must be set separately.

1. Select “Settings” and “Tool Parameters” on the FAST 3000 touch panel.

2. Select “CFM Teaching mode”.
   In order to access CFM Teaching mode you must be logged in.

Separately on each of the two crimping force monitoring devices:


4. Log in as Superuser (password-protected).

5. Select “MP Setup”.

6. Select MP-00.
7. Select “Evaluation”.

8. If the message “Retain the curve” appears on the screen, select “No”. Select “Delete the curve”.

9. Close a WingGuard® strap clamp.

10. If the WingGuard® strap clamp closes correctly, press “Yes”, otherwise press “No”.

11. Repeat steps 11 and 12 four times, in order to record at least five OK reference curves.

12. Select the button “Forwards” 🔄.
13. Select the EO that you wish to change (01 or 02 for the envelope curves).

14. Select the button “Forwards”.

15. If necessary, adjust the evaluation tolerance by editing DY.

16. Select “Recalculate”.

17. If necessary, repeat steps 14 to 17 for further Eos (use the “Back” button to select a different EO).

18. Confirm the new settings by pressing the check.

19. Press the button twice to return to the welcome screen.

20. After the teaching process, deactivate the mode again. If this is not done, the relevant pop-up window will appear periodically.

21. On the touch panel of the FAST 3000: Be sure to set “CFM Production mode” to “On”.

22. Log out of the FAST 3000 and also log out of the FAST 3000 as Superuser.

Adjusting the crimping force monitoring tolerance

NOTE

The definition of the envelope curves for the crimping force monitoring devices is based on the force curve of the Wing-Guard® strap clamps for various different clamps, clamp straps and batches of steel. It is therefore recommended to use the factory settings for as long as possible so as to avoid faults in material due to differing melt batches.
NOTE

If the closing force deviates from the factory setting of 1850 Nm you may have to teach new reference curves.

Each monitoring device must be set separately.

1. Select “Setup” on the welcome screen.
2. Log in as Superuser (password-protected).

3. Select “MP Setup”.
4. Select MP-00.
5. Select “Evaluation”.

6. Select the button “Forwards”.

![Setup Screen](image)

![MP-00 Setup: Hauptmenü](image)

![MP-00 Setup: Kurven erfassen](image)
7. Select the EO that you wish to change (01 or 02 for the envelope curves).
8. Select the button “Forwards” 
9. Adjust the evaluation tolerance by editing DY.
10. Select “Recalculate”.
11. If necessary, repeat steps 7 to 10 for further EOs (use the “Back” button to select a different EO).
12. Confirm the new settings by pressing the check 

Press the button twice to return to the welcome screen.
6.8.7 Loading new settings/measurement programs to the CFM units

For communication with the CFM units both participants (PC and device) must be within the same network.

✓ A PC must be available for loading settings and programs.
✓ The maXYmos software must be available.
✓ The CFM settings file must be available in zip format.
✓ An Ethernet cable must be available.

1. Connect the laptop to the CFM device, using a LAN cable. Use the Ethernet port of the CFM device.
2. Start the maXYmos software.
   The currently connected device is displayed in the list of units (4) on the left, and is identified with a green dot.
3. If necessary, use the “Languages” tab (1) to change the language settings.
4. Double click on the device and acknowledge to login message.
5. If the connection is not established automatically, proceed as follows:
   – Go to “New device” (2).
   – Enter the network address.
   – Confirm with “OK”.
6. Select “Restore” (3), to load new settings to the device.
7. Select the file with the new CFM settings.
8. Remove the check from the settings that are not to be loaded to the CFM device. In the following example, only the measurement programs 0 (5) and 15 (6) are loaded to the CFM device.
9. Confirm the selection with “OK” (7).
   A message acknowledging the input will appear.
10. Confirm the message with OK in order to load the new settings on to the device.
Only on the CFM device for the right-hand side:

11. Select “Setup” (8).

12. Select the measurement programs for which the name are to be changed (9).

13. Switch to the “General” tab (10).

14. Rename the measurement program by replacing “Le” with “Ri” (11).

15. Confirm with OK (12).
   A message acknowledging the input will appear.

16. Confirm the message with OK in order to load the new settings on to the device.

**NOTE**

The purpose of the measurement program 0 is to evaluate the closing force curves. A backup is saved under measurement program 15.
7 GUI

Control and monitoring of the FAST 3000 can be performed either by means of the optional touch panel, a laptop or computer.

⚠️ WARNING

Danger of starting up unexpectedly
Only one operator control unit may be used for the FAST 3000. For reasons of safety, simultaneous control by the optional touch panel and a computer is not permitted.

7.1 Touch Panel

The available touch panel has software pre-installed. Using this software, all the main functions of the FAST 3000 closure procedures can be controlled and monitored. The output of images and data is the same as for a computer with a web browser.

7.2 Computer

You can connect the FAST 3000 to any standard computer or laptop with a RJ45 network port and a web browser.

1. Go to the settings for your LAN connection and open the TCP/IPv4 settings.
2. Set the IP of your devices to the value 192.168.10.xx, however do not use the following last two digits: 50, 51, 40, 60, 61.
3. Set the subnet mask to the value 255.255.255.0.
4. Then you can input http://192.168.10.50:8080/webvisu.htm into your web browser and access the control of the FAST 3000. For more information see Section 10.
7.3 GUI Layout

The main view of the FAST 3000 visualization is as follows:

1. User management / Language selection / Date & Time
2. Tabs
3. Content of the tabs
4. Status bar
7.4 Menu structure

7.4.1 Welcome screen

1 - Arrow
- Symbol for the WingGuard® strap clamp

2 Status
- No WingGuard® strap clamp present in the FAST 3000
- WingGuard® strap clamp present in the FAST 3000

3 Operating mode
- Automatic mode or manual operation of drives; local or PLC

4 Messages
- Error messages etc.

Target closing force
- Set closing force in Newtons

Cycle time
- Duration in seconds of the last clamp closure from start to readiness for the next start

Actual closing force
- Force in Newtons applied during the last clamp closure

Pulling distance
- Tensioning travel in mm when closing the WingGuard® strap clamp

5 User
- Select the user level

6 Oetiker Symbol
- Press the symbol to log out from a higher user level
7.4.2 Closure data (a password is necessary to change the values)

All the settings for the installation of an OETIKER PG270 WingGuard® strap clamp are displayed under the “Closure data” tab. This tab can be accessed without using a password. Provided you are logged in you can change the values.

<table>
<thead>
<tr>
<th>Setting value</th>
<th>Last closing cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closing force</td>
<td>Closing force tolerance</td>
</tr>
<tr>
<td>Closing force holding time</td>
<td>Switch point reduction</td>
</tr>
<tr>
<td>Speed Phase 1</td>
<td>Speed during the first closing phase in mm/s</td>
</tr>
<tr>
<td>Speed phase 2</td>
<td>Speed during the second closing phase in mm/s</td>
</tr>
<tr>
<td>Closing force holding time</td>
<td>Holding time in milliseconds during which the closing force is held within the closing force tolerance.</td>
</tr>
<tr>
<td>ID</td>
<td>Name of the data record that is displayed</td>
</tr>
<tr>
<td>Cycle time</td>
<td>Duration in seconds of the last clamp closure from start to readiness for the next start</td>
</tr>
<tr>
<td>Actual closing force</td>
<td>Force in Newtons applied during the last clamp closure</td>
</tr>
<tr>
<td>Pulling distance</td>
<td>Tensioning travel in mm when closing the WingGuard® strap clamp</td>
</tr>
<tr>
<td>Diagram</td>
<td>Shows how the force is/was achieved during closure</td>
</tr>
</tbody>
</table>

Closing Force
Set the closing force in Newtons

Closing force tolerance
Set the closing force tolerance in Newtons

Switch point reduction
The force in Newtons below the set closing force at which the speed is reduced

Speed Phase 1
Speed during the first closing phase in mm/s

Speed phase 2
Speed during the second closing phase in mm/s

Closing force holding time
Holding time in milliseconds during which the closing force is held within the closing force tolerance.

ID
Name of the data record that is displayed

Cycle time
Duration in seconds of the last clamp closure from start to readiness for the next start

Actual closing force
Force in Newtons applied during the last clamp closure

Pulling distance
Tensioning travel in mm when closing the WingGuard® strap clamp

Diagram
Shows how the force is/was achieved during closure
7.4.3 Operating mode
The operating mode can be selected using the “Operating mode” tab. The modes available are: Normal operation, Laboratory mode, Manual operation and Deblocking function.

Laboratory mode (password-protected)

⚠️ WARNING

Hazard due to unqualified personnel.
Laboratory mode can be used only under laboratory or test conditions where there is no alternative. The personnel must have been trained to use of the FAST 3000 with an increased level of care.

⚠️ WARNING

Crush hazard at the WingGuard® strap clamp.
When triggering the functions described below, fingers may be crushed by the WingGuard® strap clamp.

➤ When starting functions, keep your fingers away from the clamp.
**WARNING**

Crush hazard at moving parts.
The FAST 3000 may be used only when all covers are correctly fitted and bolted in place.

**CAUTION**

Crush hazard due to positioning the hands under the installation tool.
Never reach under the installation tool whilst it is in operation.

**CAUTION**

Danger due to parts being flung from the machine.
If parts become defective whilst the machine is in operation, parts may become loose and be flung from the machine.

> During operation and maintenance of the machine, always wear safety glasses.
### Laboratory mode (password-protected)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Laboratory mode</strong></td>
<td>Activating and deactivating laboratory mode</td>
</tr>
<tr>
<td><strong>Time laboratory mode</strong></td>
<td>Specify the duration in minutes, after which laboratory mode is deactivated automatically</td>
</tr>
<tr>
<td><strong>Remaining time [min]</strong></td>
<td>Time remaining until automatic deactivation of laboratory mode</td>
</tr>
<tr>
<td><strong>Max. pieces in LabMode</strong></td>
<td>Set the counter to the maximum number of pieces to be closed, after which laboratory mode is deactivated automatically</td>
</tr>
<tr>
<td><strong>Remaining pcs in LabMode</strong></td>
<td>Displays the remaining number of closures in laboratory mode</td>
</tr>
<tr>
<td><strong>one hand operation</strong></td>
<td>Activate this in order to use one-hand operation in laboratory mode</td>
</tr>
<tr>
<td><strong>Foot pedal</strong></td>
<td>Activate this in order to use the foot pedal in laboratory mode</td>
</tr>
</tbody>
</table>

![Image of the laboratory mode interface](image-url)
Manual mode (password-protected)

**WARNING**

Crush hazard at moving parts.
For maintenance work it may be necessary to operate the tool in the operating mode “Manual operation” and without covers. Do this only if you have no alternative, and take the utmost care when doing so.

- On completion, immediately refit the covers.

**CAUTION**

Hazard due to incorrectly closed clamps.
The “Manual operation” function must not be used for closure of clamps. This function may be used only for the rectification of faults.
Manual mode (password-protected)

![Image of GUI interface]

**Lever (left-hand side)**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initializing</td>
<td>Initializing the lever: Setting the zero</td>
</tr>
<tr>
<td>Home position</td>
<td>Link in the home position (if there is a WingGuard® strap clamp in the clamping unit, this is secured.)</td>
</tr>
<tr>
<td>Insert position</td>
<td>Lever in the position that allows the clamp to be inserted</td>
</tr>
<tr>
<td>Crimp position</td>
<td>Lever in the crimping position</td>
</tr>
<tr>
<td>Cutting position</td>
<td>Lever in the cutting position</td>
</tr>
<tr>
<td>Safe cutting position</td>
<td>Lever moves directly into the cutting position, skips the crimping position</td>
</tr>
<tr>
<td>Actual position</td>
<td>Position of the lever in millimeters</td>
</tr>
</tbody>
</table>

**Pulling unit (right-hand side)**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initializing</td>
<td>Initializing the pulling unit: Setting the zero point</td>
</tr>
<tr>
<td>Start pos.</td>
<td>Pulling unit in the start position</td>
</tr>
<tr>
<td>Eject position</td>
<td>Pulling unit in the position that allows the remaining strap to be ejected</td>
</tr>
<tr>
<td>Actual position</td>
<td>Position of the pulling unit in millimeters</td>
</tr>
<tr>
<td>Service pos.</td>
<td>Pulling unit in the position that allows the strap sensor to be set</td>
</tr>
</tbody>
</table>
7.4.4 Friction test

NOTE
The operating mode “Friction test” is available for testing the internal friction of the WingGuard® clamp. To do this, the WingGuard® clamp is closed without any strapping present, and the maximum no-load closing force is determined.

<table>
<thead>
<tr>
<th>Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starte freestate p.f.</td>
<td>Start of the friction test</td>
</tr>
<tr>
<td>Target position</td>
<td>End position of the tensioning motor during the friction test</td>
</tr>
<tr>
<td>Speed</td>
<td>Speed of the pulling unit during the friction test</td>
</tr>
<tr>
<td>Maximum force</td>
<td>Maximum force applied during the friction test</td>
</tr>
<tr>
<td>Pulling unit actual posi.</td>
<td>Pulling unit actual position</td>
</tr>
</tbody>
</table>
**Sequence of the friction test**

1. Activate the function by pressing the “Start friction test” button.
2. Insert the clamp.
3. Fix the clamp.
4. Start the test by pressing the start buttons on the two-hand control desk.
   The pulling unit moves at the defined speed towards the end position. The maximum tensioning force applied during this time is determined. At the end, the strap is cut off.

**7.4.5 IO Test**

The purpose of the “I/O Test” menu is to test the basic functions of the inputs to the FAST 3000. The depiction of the individual inputs are distributed across three pages. When the “I/O Test” menu is open, the individual buttons have no further functions.

<table>
<thead>
<tr>
<th>Switch emergency stop</th>
<th>Status of the 2-channel emergency stop circuit; two-hand control desk and external emergency stop switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch Acknowledge</td>
<td>Red acknowledgement button on the two-hand control desk</td>
</tr>
<tr>
<td>Switch Initialization</td>
<td>Blue initialization switch on the two-hand control desk</td>
</tr>
<tr>
<td>Switch start 1</td>
<td>2-channel start button on the two-hand control desk</td>
</tr>
<tr>
<td>Switch start 2</td>
<td>2-channel start button on the two-hand control desk</td>
</tr>
<tr>
<td>Foot pedal</td>
<td>2-channel foot pedal</td>
</tr>
<tr>
<td>Switch band locking</td>
<td>Clamp locking</td>
</tr>
<tr>
<td>band sensor existing</td>
<td>Clamp present sensor</td>
</tr>
</tbody>
</table>
Holdup sensor | Holdup sensor for monitoring the tensioning motor
---|---
Light curtain 1 | Light curtain
Light curtain 2 | Light curtain
power enable ext. | External power available for the servo amplifier

<table>
<thead>
<tr>
<th>Bus Start</th>
<th>Start command via Profinet or Ethernet/IP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus Stop</td>
<td>Stop command via Profinet or Ethernet/IP</td>
</tr>
<tr>
<td>Bus lock clamp</td>
<td>Locking the clamps via Profinet or Ethernet/IP</td>
</tr>
<tr>
<td>Bus Acknowledge</td>
<td>Acknowledgment of error messages via Profinet or Ethernet/IP</td>
</tr>
<tr>
<td>Bus Init</td>
<td>Initializing via Profinet or Ethernet/IP</td>
</tr>
<tr>
<td>Bus Ack. Msg Band rem.</td>
<td>Acknowledgment of the message “Remove strap” via Profinet or Ethernet/IP</td>
</tr>
<tr>
<td>Bus Power enable</td>
<td>Enable connection of the power supply to the motors from the supervisory system via Profinet or Ethernet/IP</td>
</tr>
<tr>
<td>Bus Bypass power drive</td>
<td>Connection of the power supply to the motors from the supervisory system via Profinet or Ethernet/IP</td>
</tr>
<tr>
<td>Bus Deblocking</td>
<td>Deblocking of the tool via Profinet or Ethernet/IP</td>
</tr>
<tr>
<td>Statusword</td>
<td>Status words (status word 1 and status word 2) generated by the tool (32-bit integer value)</td>
</tr>
<tr>
<td>Control word</td>
<td>Control word sent by the external control unit to the FAST 3000.</td>
</tr>
</tbody>
</table>
### State communication

| Status of the Profinet communication | **Green**: The controls are connected to a supervisory control unit  
**White**: The controls are not connected to any other control unit |
|--------------------------------------|-------------------------------------------------|

| Status of the Ethernet/IP communication | **Green (1)**: The controls are connected to a supervisory control unit  
**White (1)**: The controls are not connected to any other control unit  
**Red (2)**: There is communication error  
**White (2)**: Communications are operating correctly |
|------------------------------------------|-------------------------------------------------|

### I/O settings

<table>
<thead>
<tr>
<th>I/O start 1</th>
<th>Hardwire I/O start channel 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>I/O start 2</td>
<td>Hardwire I/O start channel 2</td>
</tr>
<tr>
<td>I/O stop 1</td>
<td>Hardwire I/O stop channel 1</td>
</tr>
<tr>
<td>I/O stop 2</td>
<td>Hardwire I/O stop channel 2</td>
</tr>
<tr>
<td>I/O init</td>
<td>Hardwire I/O initializing</td>
</tr>
<tr>
<td>I/O Ack</td>
<td>Hardwire I/O acknowledgement</td>
</tr>
<tr>
<td>I/O Band lock</td>
<td>Hardwire I/O strap clamp</td>
</tr>
</tbody>
</table>
### 7.4.6 Logbook

**Process log**
The data on the most recent clamp closures are shown in the “Data log” tab. This menu can be accessed without using a password.

![Logbook](image)

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Data and time of the installation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
<td>Identification ID of the closure</td>
</tr>
<tr>
<td><strong>Target force</strong></td>
<td>Target force value in Newtons</td>
</tr>
<tr>
<td><strong>Actual force</strong></td>
<td>Tensioning force actual value in Newtons</td>
</tr>
<tr>
<td><strong>Pulling distance</strong></td>
<td>Tensioning travel in mm when closing the WingGuard® strap clamp</td>
</tr>
<tr>
<td><strong>Status</strong></td>
<td>Closing status as viewed by the tool, evaluated by control of the installation tool (OK or not OK) based on pre-defined values</td>
</tr>
<tr>
<td><strong>CFM</strong></td>
<td>OK or not OK from the crimping force monitoring. “-”, if the CFM is not in production mode</td>
</tr>
<tr>
<td><strong>Error</strong></td>
<td>Error number if the closure was not OK; the error are listed, e.g. 205 / 206 / 214 /...</td>
</tr>
</tbody>
</table>
Error log / Warning log
The most recent errors of the tool are displayed in the “Error log” tab. This menu can be accessed without using a password.
Alarm management
The alarm management is a list of the errors and warnings. To open the alarm management, click on the information (1) shown in the status bar.

If no alarm is active, the screen appears as follows:
If alarms are active, the screen can appear as follows:

![Alarm management screen]

If only one alarm is active, the error is shown as a message in the status bar. If several alarms are active, the message “Several errors active” is shown.

**Colored:** There are alarms that are active and not acknowledged.  
**Not colored:** There are alarms outstanding which have been acknowledged.

- To acknowledge the alarms, press the ACK button or the Init button on the two-hand control desk (if PLC mode is active, the relevant bit must be set).

If you press on the “History” button, a list of past errors and warnings is displayed:

![Alarm history]

<table>
<thead>
<tr>
<th>Timestamp</th>
<th>Message Description</th>
<th>State</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 19.09.2018 02:30:07</td>
<td>TaEr_5 Drive error active</td>
<td>Active</td>
<td>ToolErr</td>
</tr>
<tr>
<td>1 19.09.2018 02:30:07</td>
<td>TaEr_4 Emergency circuit open</td>
<td>Active</td>
<td>ToolErr</td>
</tr>
<tr>
<td>2 19.09.2018 00:39:04</td>
<td>TaEr_5 Drive error active</td>
<td>Normal</td>
<td>ToolErr</td>
</tr>
<tr>
<td>3 19.09.2018 00:39:04</td>
<td>TaEr_6 Emergency circuit open</td>
<td>Normal</td>
<td>ToolErr</td>
</tr>
<tr>
<td>4 19.09.2018 00:39:04</td>
<td>ToEr_14 Emergency stop</td>
<td>Normal</td>
<td>ToolErr</td>
</tr>
<tr>
<td>5 19.09.2018 00:39:11</td>
<td>ToEr_2 Clamping unit not in home position</td>
<td>Normal</td>
<td>ToolErr</td>
</tr>
<tr>
<td>6 19.09.2018 00:39:11</td>
<td>ToEr_5 Drive error active</td>
<td>Normal</td>
<td>ToolErr</td>
</tr>
<tr>
<td>7 19.09.2018 00:39:11</td>
<td>ToEr_8 Emergency circuit open</td>
<td>Normal</td>
<td>ToolErr</td>
</tr>
<tr>
<td>8 19.09.2018 00:39:11</td>
<td>ToEr_14 Emergency stop</td>
<td>Normal</td>
<td>ToolErr</td>
</tr>
<tr>
<td>9 19.09.2018 00:22:31</td>
<td>ToEr_5 Drive error active</td>
<td>Normal</td>
<td>ToolErr</td>
</tr>
<tr>
<td>10 19.09.2018 00:22:31</td>
<td>ToEr_8 Emergency circuit open</td>
<td>Normal</td>
<td>ToolErr</td>
</tr>
</tbody>
</table>
Verification log

The most recent verification forces are displayed in the “Verification log” tab. This menu can be accessed only by inputting a password.

If a value is listed only for force 1, this is a tensioning force verification. The scaling factor is listed for the correlation factor.

For the crimping force verification, both forces are listed. The value 0 is shown for the correlation factor, since no correlation exists for the crimping force.
**Servicelogbook**

In the “Service logbook” the most recently performed Service work / Maintenance work are displayed. This menu can be accessed only by inputting a password.

To create a new Service log entry, write the text in the field (1) in the bottom left corner and press “enter” (2).
### 7.4.7 Setting

#### Tool parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. tightening stroke</td>
<td>Maximum tensioning travel of the clamping unit</td>
</tr>
<tr>
<td>Filename</td>
<td>Name of the data file held on the USB stick</td>
</tr>
<tr>
<td>Tool name</td>
<td>Name of the tool (part of the data record ID)</td>
</tr>
<tr>
<td>Production ID</td>
<td>Name of the production batch (part of the data record IDD)</td>
</tr>
<tr>
<td>CFM Teaching mode</td>
<td>Production mode (the PLC does not evaluate the output of the CFM monitoring devices)</td>
</tr>
<tr>
<td>CFM Production mode</td>
<td>Production mode (the PLC evaluates the output of the CFM monitoring devices)</td>
</tr>
<tr>
<td>Bypass</td>
<td>Bypassing the requirement for enabling connection of the power supply output stage to the motor drive</td>
</tr>
<tr>
<td>Deactivate light curtain</td>
<td>Select “Light curtain inactive” if no light curtain is present.</td>
</tr>
<tr>
<td>Control over external PLC</td>
<td>Select this button in order to control the FAST 3000 via an external PLC</td>
</tr>
<tr>
<td>Control over I/O</td>
<td>Select this button in order to control the FAST 3000 via I/O</td>
</tr>
<tr>
<td>Time &amp; Date</td>
<td>Setting the date and time</td>
</tr>
<tr>
<td>Automatic summertime</td>
<td>Select “On” to switch to summer time automatically</td>
</tr>
<tr>
<td>activation</td>
<td></td>
</tr>
<tr>
<td>Reset Servicecounter</td>
<td>Resets the Service counter to zero after a Service</td>
</tr>
<tr>
<td>Scaling force-sensor</td>
<td>Scaling of the tensioning force sensor (the factor should lie between 4500 and 6500)</td>
</tr>
</tbody>
</table>
NOTE

Under various conditions the force measured by the force load cell in the clamping unit can vary due to changes in temperature. To compensate for this you can set the measured to zero when there is no force measured by the unloaded force load cell. If the value is found to deviate from zero by more than 20 N, we recommend that the force offset is set to zero. We recommend that the force offset is checked every week (see Section 6.8.3)

To zero the offset of the force load cell you must be logged in.

<table>
<thead>
<tr>
<th>Force verification</th>
<th>Changes to the verifier force tab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulling unit</td>
<td>Changes to the pulling unit verification force tab</td>
</tr>
<tr>
<td>Zero balance</td>
<td>Activates the zero offset function</td>
</tr>
<tr>
<td>Set offset to zero</td>
<td>Press the button to change the current setting to zero</td>
</tr>
<tr>
<td>Quit routine</td>
<td>Quit the zero offset routine</td>
</tr>
<tr>
<td>Actual force</td>
<td>Displays the actual force measured by the force load cell, in Newtons</td>
</tr>
</tbody>
</table>
Force verification / verification of the closing force when the force is configurable

**NOTE**

For verification of correct operation of the force load cell which measures the tensioning force, the measured force must be measured at least once a week. For further Information see Section 6.8.4.

For checking the closing force you must be logged in.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Force verification</td>
<td>Changes to the verifier force tab</td>
</tr>
<tr>
<td>Pulling unit</td>
<td>Changes to the pulling unit verification force tab</td>
</tr>
<tr>
<td>Force verification</td>
<td>This activates the force verification routine</td>
</tr>
<tr>
<td>band locking</td>
<td>Indicates that the tensioning strap is locked (the locking must be performed using the button on the handle of the FAST 3000)</td>
</tr>
<tr>
<td>Target force</td>
<td>Set the force in Newtons that the FAST 3000 will use to tension the clamps</td>
</tr>
<tr>
<td>Verification activation</td>
<td>Start the tensioning at the set force</td>
</tr>
<tr>
<td>Actual force</td>
<td>Displays the actual force measured by the force load cell, in Newtons</td>
</tr>
<tr>
<td>Ext. force value “CAL”</td>
<td>The force value that is input is read by the CAL 01 and is logged in the verification record</td>
</tr>
<tr>
<td>Quit routine</td>
<td>Stop tensioning and quit the force verification routine. In normal operation, the tensioning force sensor stops automatically. When the force has been achieved, a defined time elapses after which the pulling unit / lever revert to their home position.</td>
</tr>
</tbody>
</table>
Crimping force monitoring verification

NOTE

For verification of the correct operation of the crimping force sensors which measure the crimping forces we recommend that the measured force is verified once a month using an Oetiker CAL 01. (For further Information see Section 6.8.5.)

For crimping force monitoring verification you must be logged in.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Force verification</td>
<td>Changes to the verifier force tab</td>
</tr>
<tr>
<td>Crimping</td>
<td>Changes to the crimping force verification tab</td>
</tr>
<tr>
<td>Force verification</td>
<td>This activates the force verification routine</td>
</tr>
<tr>
<td>CFM locking</td>
<td>This activates the force verification</td>
</tr>
<tr>
<td>Target force</td>
<td>Set the verification force in Newtons; FAST 3000 stops the force increase as soon as the first force sensor detects this force</td>
</tr>
<tr>
<td>Testing active</td>
<td>Indicates that the force verification is being performed</td>
</tr>
<tr>
<td>Last force actual value (R/L)</td>
<td>Displays the force measured by the force load cells, in Newtons</td>
</tr>
<tr>
<td>Ext. force value “CAL”</td>
<td>The force value that is input is read by the CAL 01 and is logged in the verification record</td>
</tr>
<tr>
<td>Quit routine</td>
<td>Quits the force verification routine</td>
</tr>
</tbody>
</table>
Setting the date and time
To set the date and time using the GUI, select “Settings” and “Tool parameters” on the FAST 3000 touch panel. In the “Tool parameters” menu, click on the “Date & Time” button.

A popup window appears, in which the date and time can be set.

Input the current date and time.
To load the setting, press the “Set time and date” button.
7.4.8 Information
The currently installed software version and the publication date are shown in the “Information” tab. It also contains a list of the Oetiker service addresses.
### 7.4.9 Error list (version V2.09)

For further information on error correction see Section 13. The following error list is valid for the software version V2.09. Error lists for later software versions can be obtained from OETIKER.

<table>
<thead>
<tr>
<th>Error number</th>
<th>Description</th>
<th>Class/Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>War_1 Error acknowledged</td>
<td>Warning</td>
</tr>
<tr>
<td>102</td>
<td>War_2 Check button contacts</td>
<td>Warning</td>
</tr>
<tr>
<td>103</td>
<td>War_3 No output voltage -&gt; Press Start / Init</td>
<td>Warning</td>
</tr>
<tr>
<td>104</td>
<td>War_4 Kistler devices warning error</td>
<td>Warning</td>
</tr>
<tr>
<td>105</td>
<td>War_5 Service due soon</td>
<td>Warning</td>
</tr>
<tr>
<td>106</td>
<td>War_6 Service due</td>
<td>Warning</td>
</tr>
<tr>
<td>108</td>
<td>War_8 Modus CFM teach-in active</td>
<td>Warning</td>
</tr>
<tr>
<td>109</td>
<td>War_9 Drive tool not powered</td>
<td>Warning</td>
</tr>
<tr>
<td>110</td>
<td>Press Start</td>
<td>Warning</td>
</tr>
<tr>
<td>111</td>
<td>War_11 Remove strap</td>
<td>Warning</td>
</tr>
<tr>
<td>201</td>
<td>ToErr_1 Strap present -&gt; Rectify &amp; Ack</td>
<td>Tool error</td>
</tr>
<tr>
<td>202</td>
<td>ToErr_2 Clamping unit not in STO home position STO-&gt; New Init</td>
<td>Tool error</td>
</tr>
<tr>
<td>204</td>
<td>ToErr_4 Position sensor defective</td>
<td>Tool error</td>
</tr>
<tr>
<td>205</td>
<td>ToErr_5 Drive error active</td>
<td>Tool error</td>
</tr>
<tr>
<td>206</td>
<td>ToErr_6 Emergency Stop circuit open</td>
<td>Tool error</td>
</tr>
<tr>
<td>207</td>
<td>ToErr_7 Light curtain active during the initialization routine</td>
<td>Tool error</td>
</tr>
<tr>
<td>208</td>
<td>ToErr_8 Verify crimping force error in phase 1</td>
<td>Tool error</td>
</tr>
<tr>
<td>209</td>
<td>ToErr_9 Verify crimping force error in phase 2</td>
<td>Tool error</td>
</tr>
<tr>
<td>210</td>
<td>ToErr_10 Verify crimping force: No force increase</td>
<td>Tool error</td>
</tr>
<tr>
<td>211</td>
<td>ToErr_11 Check strap end disposal</td>
<td>Tool error</td>
</tr>
<tr>
<td>212</td>
<td>ToErr_12 CFM general warning / error</td>
<td>Tool error</td>
</tr>
<tr>
<td>213</td>
<td>ToErr_13 Check tensioning force sensor</td>
<td>Tool error</td>
</tr>
<tr>
<td>214</td>
<td>ToErr_14 Emergency stop</td>
<td>Tool error</td>
</tr>
<tr>
<td>216</td>
<td>ToErr_16 Drive tool tensioning force loss during operation</td>
<td>Tool error</td>
</tr>
<tr>
<td>301</td>
<td>PrErr_1 Maximum tensioning travel exceeded</td>
<td>Process error</td>
</tr>
<tr>
<td>302</td>
<td>PrErr_2 Maximum tensioning time exceeded</td>
<td>Process error</td>
</tr>
<tr>
<td>303</td>
<td>PrErr_3 Crimping CFM1 envelope curve 1</td>
<td>Process error</td>
</tr>
<tr>
<td>304</td>
<td>PrErr_4 Crimping CFM1 envelope curve 2</td>
<td>Process error</td>
</tr>
<tr>
<td>305</td>
<td>PrErr_5 Crimping CFM1 NoPass</td>
<td>Process error</td>
</tr>
<tr>
<td>306</td>
<td>PrErr_6 Crimping CFM1 wear</td>
<td>Process error</td>
</tr>
<tr>
<td>307</td>
<td>PrErr_7 Crimping CFM2 envelope curve 1</td>
<td>Process error</td>
</tr>
<tr>
<td>308</td>
<td>PrErr_8 Crimping CFM2 envelope curve 2</td>
<td>Process error</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
<td>Type</td>
</tr>
<tr>
<td>-------</td>
<td>--------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>309</td>
<td>PrErr_9 Crimping CFM2 NoPass</td>
<td>Process</td>
</tr>
<tr>
<td>310</td>
<td>PrErr_10 Crimping CFM2 wear</td>
<td>Process</td>
</tr>
<tr>
<td>311</td>
<td>PrErr_11 General error at crimping</td>
<td>Process</td>
</tr>
<tr>
<td>312</td>
<td>PrErr_12 Error at cutting off</td>
<td>Process</td>
</tr>
<tr>
<td>313</td>
<td>PrErr_13 Force overshoot</td>
<td>Process</td>
</tr>
<tr>
<td>315</td>
<td>PrErr_15 Closing force outside tolerance</td>
<td>Process</td>
</tr>
<tr>
<td>316</td>
<td>PrErr_16 Max force when the light curtain breached</td>
<td>Process</td>
</tr>
<tr>
<td>317</td>
<td>PrErr_17 Max force movement in ejection position exceeded</td>
<td>Process</td>
</tr>
<tr>
<td>318</td>
<td>PrErr_18 Process cancellation</td>
<td>Process</td>
</tr>
<tr>
<td>319</td>
<td>PrErr_19 Max force reach on stop through bus</td>
<td>Process</td>
</tr>
<tr>
<td>11016</td>
<td>Servo pulling unit: IPM error</td>
<td>Drive</td>
</tr>
<tr>
<td>11017</td>
<td>Servo pulling unit: IPM temperature</td>
<td>Drive</td>
</tr>
<tr>
<td>11020</td>
<td>Servo pulling unit: Overcurrent</td>
<td>Drive</td>
</tr>
<tr>
<td>11021</td>
<td>Servo pulling unit: Current offset</td>
<td>Drive</td>
</tr>
<tr>
<td>11022</td>
<td>Servo pulling unit: Current limit exceeded</td>
<td>Drive</td>
</tr>
<tr>
<td>11033</td>
<td>Servo pulling unit: continually overloaded</td>
<td>Drive</td>
</tr>
<tr>
<td>11034</td>
<td>Servo pulling unit: Drive temperature 1</td>
<td>Drive</td>
</tr>
<tr>
<td>11035</td>
<td>Servo pulling unit: Overload on regeneration</td>
<td>Drive</td>
</tr>
<tr>
<td>11036</td>
<td>Servo pulling unit: Motor cable not connected</td>
<td>Drive</td>
</tr>
<tr>
<td>11037</td>
<td>Servo pulling unit: Temperature 2</td>
<td>Drive</td>
</tr>
<tr>
<td>11038</td>
<td>Servo pulling unit: Encoder temperature</td>
<td>Drive</td>
</tr>
<tr>
<td>11048</td>
<td>Servo pulling unit: Encoder communication error</td>
<td>Drive</td>
</tr>
<tr>
<td>11049</td>
<td>Servo pulling unit: Encoder cable not connected</td>
<td>Drive</td>
</tr>
<tr>
<td>11050</td>
<td>Servo pulling unit: Encoder data error</td>
<td>Drive</td>
</tr>
<tr>
<td>11051</td>
<td>Servo pulling unit: Motor settings</td>
<td>Drive</td>
</tr>
<tr>
<td>11052</td>
<td>Servo pulling unit: Z phase not connected</td>
<td>Drive</td>
</tr>
<tr>
<td>11053</td>
<td>Servo pulling unit: Low battery level</td>
<td>Drive</td>
</tr>
<tr>
<td>11054</td>
<td>Servo pulling unit: Sine ENC</td>
<td>Drive</td>
</tr>
<tr>
<td>11055</td>
<td>Servo pulling unit: Sine frequency</td>
<td>Drive</td>
</tr>
<tr>
<td>11056</td>
<td>Servo pulling unit: Encoder setting error</td>
<td>Drive</td>
</tr>
<tr>
<td>11064</td>
<td>Servo pulling unit: Undervoltage</td>
<td>Drive</td>
</tr>
<tr>
<td>11065</td>
<td>Servo pulling unit: Overvoltage</td>
<td>Drive</td>
</tr>
<tr>
<td>11066</td>
<td>Servo pulling unit: Interruption in power supply</td>
<td>Drive</td>
</tr>
<tr>
<td>11067</td>
<td>Servo pulling unit: Interruption in control voltage</td>
<td>Drive</td>
</tr>
<tr>
<td>11080</td>
<td>Servo pulling unit: Speed overshoot</td>
<td>Drive</td>
</tr>
<tr>
<td>11081</td>
<td>Servo pulling unit: POS following</td>
<td>Drive</td>
</tr>
<tr>
<td>11083</td>
<td>Servo pulling unit: Large SPD deviations</td>
<td>Drive</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
<td>Error Type</td>
</tr>
<tr>
<td>--------</td>
<td>----------------------------------------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>11099</td>
<td>Servo pulling unit: Checksum error</td>
<td>Drive error</td>
</tr>
<tr>
<td>11113</td>
<td>Servo pulling unit: Error in the factory settings</td>
<td>Drive error</td>
</tr>
<tr>
<td>12016</td>
<td>Servo lever: IPM error</td>
<td>Drive error</td>
</tr>
<tr>
<td>12017</td>
<td>Servo lever: IPM temperature</td>
<td>Drive error</td>
</tr>
<tr>
<td>12020</td>
<td>Servo lever: Overcurrent</td>
<td>Drive error</td>
</tr>
<tr>
<td>12021</td>
<td>Servo lever: Current offset</td>
<td>Drive error</td>
</tr>
<tr>
<td>12022</td>
<td>Servo lever: Current limit exceeded</td>
<td>Drive error</td>
</tr>
<tr>
<td>12033</td>
<td>Servo lever: Continuously overloaded</td>
<td>Drive error</td>
</tr>
<tr>
<td>12034</td>
<td>Servo lever: Drive temperature 1</td>
<td>Drive error</td>
</tr>
<tr>
<td>12035</td>
<td>Servo lever: Overload on regeneration</td>
<td>Drive error</td>
</tr>
<tr>
<td>12036</td>
<td>Servo lever: Motor cable not connected</td>
<td>Drive error</td>
</tr>
<tr>
<td>12037</td>
<td>Servo lever: Temperature 2</td>
<td>Drive error</td>
</tr>
<tr>
<td>12038</td>
<td>Servo lever: Encoder temperature</td>
<td>Drive error</td>
</tr>
<tr>
<td>12048</td>
<td>Servo lever: Encoder communication error</td>
<td>Drive error</td>
</tr>
<tr>
<td>12049</td>
<td>Servo lever: Encoder cable not connected</td>
<td>Drive error</td>
</tr>
<tr>
<td>12050</td>
<td>Servo lever: Encoder data error</td>
<td>Drive error</td>
</tr>
<tr>
<td>12051</td>
<td>Servo lever: Motor settings</td>
<td>Drive error</td>
</tr>
<tr>
<td>12052</td>
<td>Servo lever: Z phase not connected</td>
<td>Drive error</td>
</tr>
<tr>
<td>12053</td>
<td>Servo lever: Low battery level</td>
<td>Drive error</td>
</tr>
<tr>
<td>12054</td>
<td>Servo lever: Sine ENC</td>
<td>Drive error</td>
</tr>
<tr>
<td>12055</td>
<td>Servo lever: Sine frequency</td>
<td>Drive error</td>
</tr>
<tr>
<td>12056</td>
<td>Servo lever: Encoder setting error</td>
<td>Drive error</td>
</tr>
<tr>
<td>12064</td>
<td>Servo lever: Undervoltage</td>
<td>Drive error</td>
</tr>
<tr>
<td>12065</td>
<td>Servo lever: Overvoltage</td>
<td>Drive error</td>
</tr>
<tr>
<td>12066</td>
<td>Servo lever: Interruption in power supply</td>
<td>Drive error</td>
</tr>
<tr>
<td>12067</td>
<td>Servo lever: Interruption in control voltage</td>
<td>Drive error</td>
</tr>
<tr>
<td>12080</td>
<td>Servo lever: Speed overshoot</td>
<td>Drive error</td>
</tr>
<tr>
<td>12081</td>
<td>Servo lever: POS following</td>
<td>Drive error</td>
</tr>
<tr>
<td>12083</td>
<td>Servo lever: Large SPD deviations</td>
<td>Drive error</td>
</tr>
<tr>
<td>12099</td>
<td>Servo lever: Checksum error</td>
<td>Drive error</td>
</tr>
<tr>
<td>12113</td>
<td>Servo lever: Error in the factory settings</td>
<td>Drive error</td>
</tr>
</tbody>
</table>
### 7.4.10 Access rights

<table>
<thead>
<tr>
<th>Rights</th>
<th>User</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&quot;none&quot; = status at switch-on</td>
</tr>
<tr>
<td>Closing force parameter</td>
<td>×</td>
</tr>
<tr>
<td>Transport/storage</td>
<td>×</td>
</tr>
<tr>
<td>Commissioning without the optional two-hand control desk /</td>
<td>×</td>
</tr>
<tr>
<td>without the optional touch panel</td>
<td>Tool parameters</td>
</tr>
<tr>
<td>Process protocol</td>
<td>✓</td>
</tr>
<tr>
<td>Error / warning protocol</td>
<td>✓</td>
</tr>
<tr>
<td>Verification protocol</td>
<td>×</td>
</tr>
<tr>
<td>Service logbook</td>
<td>×</td>
</tr>
<tr>
<td>Unlocking function</td>
<td>×</td>
</tr>
<tr>
<td>Laboratory mode</td>
<td>×</td>
</tr>
<tr>
<td>Manual operation (manual operation)</td>
<td>×</td>
</tr>
<tr>
<td>Friction test</td>
<td>×</td>
</tr>
<tr>
<td>I/O test</td>
<td>×</td>
</tr>
</tbody>
</table>

**Explanation:** ✓ = access  × = no access

The user “Superuser” will be logged out automatically on expiry of a certain time.
8 Assigning the IP address

If the tool is to be integrated into a network, make sure that the IP address that is assigned will not generate any conflicts. The factory setting of the IP address is 192.168.10.50. You can use a web browser to access the controller in order to change the IP address. To do this, enter http://192.168.10.50:81/ into the address bar of the browser.

After logging in to the home page, input the desired IP address, subnet mask and standard gateway.

The IP address that is set is used both for the Ethernet TCP/IP and also for the Ethernet/IP (industrial communication).
8.1 Setting the date and time

Select the menu tab “System settings” and input the date and time.

The date and time can also be set via the GUI.
9 Maintenance and replacement of parts

9.1 General safety instructions for maintenance and repair work

**WARNING**

Danger of death from electric shock. Touching live parts can result in death.

- Withdraw the mains plug from the electrical socket and secure the FAST 3000 to prevent it being plugged in again accidentally.
- Wait 15 minutes after switching off the power, to allow the intermediate circuit voltage in the servo amplifier to dissipate.
- Ensure that only qualified and authorized electricians work on the electrical equipment.
- Ensure that operators rectify only those faults that are clearly attributable to operating or maintenance errors.

**WARNING**

Never immerse the FAST 3000 in water or other liquids.

**CAUTION**

Risk of damage to the force load cell.
The FAST 3000 is equipped with a force load cell. This is a precision measuring device. So as not to damage the force load cell, apply only the intended forces to it (do not apply hammer impacts and the like).

- Cleaning, lubrication and maintenance work should only be carried out by authorized technical personnel in accordance with the enclosed maintenance instructions and local safety regulations. Failure to observe these instructions and regulations may lead to personal injury and property damage.
- For maintenance and repair work use only the tools and original equipment recommended by OETIKER.
- Use only original-spare parts from OETIKER.
- Maintenance work may be performed on the FAST 3000 only when it is disconnected from the electrical supply.
- Following initial commissioning, the FAST 3000 tool should be cleaned daily or weekly, depending on the degree of soiling.
- Never immerse the FAST 3000 in water or other liquids.
9.2 Maintenance

9.2.1 Before maintenance work

⚠️ WARNING
Danger of death from electric shock.
Touching live parts can result in death.
- Withdraw the mains plug from the electrical socket and secure the FAST 3000 to prevent it being plugged in again accidentally.
- Wait 15 minutes after switching off the power, to allow the intermediate circuit voltage in the servo amplifier to dissipate.
- Ensure that only qualified and authorized electricians work on the electrical equipment.
- Ensure that operators rectify only those faults that are clearly attributable to operating or maintenance errors.

⚠️ CAUTION
Crush hazard at moving parts.
- Maintenance work may be performed on the FAST 3000 only when it is disconnected from the electrical supply.
- The covers may be removed only by authorized, trained and qualified personnel.

9.2.2 After maintenance work

⚠️ CAUTION
Crush hazard at moving parts.
- After maintenance work, ensure that all safety devices have been replaced and securely bolted in place.
CAUTION

Danger due to parts being flung from the machine.
If parts fracture whilst the machine is in use during operation, parts may become loose and be flung from the machine.

- During operation and maintenance of the machine, always wear safety glasses.

- Ensure that the electrical plug connectors which were withdrawn are plugged in again following the maintenance and inspection work.
- Check all screw connections.
- Reattach all safety devices immediately.
- Check all operating functions of the FAST 3000 and the initialize the tool.
9.2.3 Regular checking of the status

**CAUTION**

Any defects must be reported to a supervisor immediately.

- Do not continue to use the FAST 3000 if defects have been identified.

- Check the FAST 3000 for visible damage daily or at the start of each shift, and make sure it is used only when in good condition. This applies particularly to the crimping jaws and operation of the emergency stop.

Fig. 29  *Use the mounted jaws checking mirror to check the crimping jaws*

- The closing force must be verified every week (see Section 6.8.4).
- We recommend that the force offset is verified every week (see Sections 6.8.3).
- We recommend that the crimping force sensors are verified once every month (see Section 6.8.5).
- We recommend that the tool positioning is checked weekly.
## 9.2.4 Regular maintenance work / maintenance schedule

<table>
<thead>
<tr>
<th>Service</th>
<th>Service interval / Performed by</th>
<th>Parts to be replaced</th>
<th>Maintenance activities</th>
<th>Time required</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>100,000 cycles CUSTOMER or Oetiker</td>
<td>Crimping jaws kit (part number 13500112)</td>
<td>Replace the crimping jaws, Rotate the cut-off die through 180°, Clean and lubricate the tool head</td>
<td>10 minutes</td>
</tr>
<tr>
<td>B</td>
<td>200,000 cycles CUSTOMER or Oetiker</td>
<td>Parts involved in the 100,000 cycles service activities, Cut-off die, Clamping lever, Crimping wedge, Crimping jaw pivot pins (Select all the parts contained in part number 13500157)</td>
<td>A-service, Replacing parts, Clean and lubricate the clamping unit</td>
<td>40 minutes</td>
</tr>
<tr>
<td>C</td>
<td>Exclusively by Oetiker: Please contact your OETIKER representative. 2,000,000 cycles</td>
<td>Parts involved in the 200,000 cycles service activities, Clamping lever kit, Clamping unit slide (depending on the extent of wear) (Select all the parts contained in part number 13500228)</td>
<td>B-service, Replacing parts, Grease the drives, Check the condition of the tool, Clean the dust filter of the control cabinet</td>
<td>2 hours</td>
</tr>
</tbody>
</table>

### Recommended lubricant

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grease</td>
<td>MICROLUBE GBU-Y 131</td>
<td>Klüber Lubrication AG (Switzerland) Thurgauerstrasse 39 8050 Zürich Tel.: +41 44 308 69 69 Fax: +41 44 308 69 44 <a href="http://www.klueber.com">www.klueber.com</a></td>
</tr>
</tbody>
</table>
Greasing points

- Apply a thin film of grease to all the areas marked yellow.

9.2.5 A-service - to be performed every 100,000 cycles

⚠️ CAUTION

Replace wear parts (crimping jaws) after 100,000 closures.
When doing this, clean and grease the entire head.

This service must be performed every 100,000 cycles.
1. Dismantle the crimping cut-off head (see Section 9.1).
2. Clean and grease the crimping cut-off head.
3. Perform a visual inspection of the crimping wedge and crimping jaw pivot pins: No excessive wear.
4. Replace the crimping jaws (see Section 9.3.3).
5. Rotate the cut-off die through 180° (see Section 9.3.3).
6. Reassemble the crimping cut-off head (see Section 9.3.3).
7. The closure gap SS must be within 3±0.1 mm (measure it in the closed condition).
8. After installing and securing the head housing cover, all three slides must be free to move with very little resistance.

9. After assembling the FAST 3000, perform a closing force verification at 1850 N (see Section 6.8.4). The closing force must lie within ±100 N.

10. Perform ten WingGuard® clamp closures. These ten closures must all be evaluated as OK pieces.

9.2.6 B-service - to be performed every 200,000 cycles

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replace wear parts (crimping jaws) after 100,000 closures.</td>
</tr>
<tr>
<td>Replace the wear parts (cut-off die, crimping wedge, crimping jaws pivot pin, clamping lever) after 200,000 closures.</td>
</tr>
<tr>
<td>When doing this, clean and grease the entire crimping cut-off head and clamping unit.</td>
</tr>
</tbody>
</table>

An extended/major service must be performed every 200,000 cycles.

1. Dismantle the crimping cut-off head (see Section 9.3).
2. Clean and lubricate the tool head (see Section 9.2.4).
3. Replace the crimping wedge (see Section 9.3.4).
4. Replace the crimping jaws pivot pin (see Section 9.3.5).
5. Replace the crimping jaws (see Section 9.3.3).
6. Replace the cut-off die (see Section 9.3.3).
7. Reassemble the crimping cut-off head (see Section 9.3).
8. Clean and grease the clamping unit.
9. Replace the clamping lever (see Section 9.3.4).
10. The closure gap SS must be within 3 ±0.1 mm (measure it in the closed condition).
11. After installing and securing the head housing cover, all three slides must be free to move with very little resistance.

12. After assembling the FAST 3000, perform a closing force at 1850 N. The closing force must lie within ±100 N.

13. Perform ten WingGuard® clamp closures. These ten closures must all be evaluated as OK pieces.

### 9.3 Replacing parts

ifdef WARNING

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk of injury when the crimping cut-off head is not mounted.</td>
</tr>
<tr>
<td>▶ Never operate the FAST 3000 without a correctly fitted crimping cut-off head.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>When the CFM force load cells are not fitted there is a risk of mechanical damage.</td>
</tr>
<tr>
<td>▶ If the force load cells are not installed in their normal position, never operate the FAST 3000 with a crimping cut-off head that is equipped for CFM. Failure to comply with this instruction risks mechanical damage to the crimping cut-off head.</td>
</tr>
</tbody>
</table>
9.3.1 Removing the crimping cut-off head

1. To facilitate installation, move the clamping unit to the ejection position (see Section 6.8.2).

2. Switch off the FAST 3000.

3. Unscrew the 4 screws at the side and remove the cover from the head.

4. Release the force sensor cable from the cable clips.

5. Unscrew the screws from the force sensor brackets.

6. Using a no. 2 slot-head screwdriver, remove the crimping force sensors and their brackets, as shown in the photo on the right.
7. Before removing the crimping cut-off head, lay the force sensor cables (1) over the FAST 3000. This reduces the risk of inadvertently crushing the force sensor cables.

8. Unscrew the 4 screws on the front face, and pull the crimping cut-off head off.

9. Place the crimping cut-off head face-down on the maintenance worktop.
9.3.2 Installing the crimping cut-off head

1. Make sure that the FAST 3000 is switched off.

2. To install the crimping cut-off head, perform steps 3 to 7 of Section 9.3.1 in the reverse order.
   Tightening torque of the M6 screws: 7–9 Nm (62–80 lbf in)

9.3.3 Replacing the crimping jaws and/or the cut-off die

⚠️ CAUTION

Damage to the tool due to the use of unauthorized parts or improper handling.
Use only original OETIKER spare parts. Crimping jaws other than those designated may not be installed in the crimping cut-off head.
Use no impact tools when disassembling or reassembling the crimping cut-off head. The assembly is part of a measurement system which can be damaged by improper handling.

For further information on the part numbers of spare parts, see Section 9.5.

Dismantling the crimping cut-off head

1. Make sure that the workplace is free of chips and dust.

2. Place the crimping cut-off head face-down on the worktop.

3. Release the 4 screws and take off the head housing cover.
4. Dismantle the parts.

5. To remove the spacer plate, lift the spacer plate by inserting a no. 2 slot-head screwdriver into the recesses provided.
   After lifting at one recess, always switch to the opposite recess.

Reassembling the crimping cut-off head
To install the crimping cut-off head, perform the steps for disassembly in the reverse order.
Comply with the following instructions:
  > When assembling the crimping cut-off head and installing it on the FAST 3000 mechanism, make sure that the crimping jaw rollers are located in the crimping wedge guides as shown in the left-hand photo. Failure to comply with this instructions can lead to mechanical damage to the crimping cut-off head.
Push down the spacer plate by hand alternately at the points indicated. Tightening torque the M6 screws: 7-9 Nm (62-80 lbf in)

Replacing the cut-off die

**NOTE**

Do not use the respective side of the cut-off die any longer that the number of cycles specified in the Maintenance section.

1. Comply with the disassembly instructions when dismantling the crimping cut-off head.

![Dismantled cut-off die and slide](image)
2. Push the cut-off die out of the slide.

3. When for the first time the cut-off die is due for replacement it can simply be turned over and the other side used. If that had already been done, replace the cut-off die with a new one.

Replacing the crimping jaws

**NOTE**

Always replace the right-hand and left-hand crimping jaws together.

**NOTE**

Do not use the crimping jaws any longer that the recommended number of cycles (see Section 9.2.4).

**NOTE**

During the first closing cycles, the crimping force monitoring may measure an elevated level of force. The cause of this behavior is the higher level of friction between the crimping jaws and the strap being clamped during the first closing cycles. If this is the case, do not perform the WingGuard® clamps on productive pieces until the crimping jaws have been run in.
1. Comply with the disassembly instructions when dismantling the crimping cut-off head (see “Dismantling the crimping head”)
2. Replace the crimping jaws.
3. Reassemble the crimping cut-off head.

9.3.4 Replacing the crimping wedge
For details of dismantling the crimping cut-off head see Sections 9.3.1 and 9.3.3.

1. Release the attachment screw and remove it.
2. Remove the pins.
3. Pull the crimping wedge out of the crimping slide and replace the crimping wedge with a new one.
4. Insert the pins again into their recesses.
5. Tighten the attachment screw.
6. Assemble the crimping head again, as described in the Section “Assembling the crimping cut-off head”.

9.3.5 Replacing the crimping jaws pivot pin

**NOTE**

Only the tools provided for the purpose (see Section 9.7) may be used to replace crimping jaw pivot pins. Do not use any hammers or punches, since these increase the risk of mechanical damage. The pivot pin press-in tool ensures that each crimping jaw pivot pin is pressed in to the correct depth. The pivot pin must not project beyond the spacer plate and must not be pressed in too deeply.
1. Mount the pivot pin press-out tool on the crimping cut-off head as shown in the picture on the right. Comply with the sequence of tightening operations.

2. Tighten the marked screw (1) and press the first pivot pin out. Then screw the screw in the other tapped hole and press the second pivot pin out. Remove the press-out tool.

3. Mount the pivot pin press-in tool on the crimping cut-off head as shown in the picture on the right. Comply with the sequence of tightening operations.
4. Insert the new crimping jaw pivot pin (3) and insert the marked screw (2). Now tighten the screw, to press the crimping jaw pivot pin in. Stop tightening as soon as resistance is clearly sensed. Do the same for the second new pivot pin.

5. Remove the press-in tool and assemble the crimping head again, as described in the Section “Assembling the crimping cut-off head”.

The pivot pin press-in tool ensures that each crimping jaw pivot pin is pressed in to the correct depth (3).

---

9.3.6 Replacing the clamping lever

⚠️ CAUTION

Damage to the tool due to the use of unauthorized parts.
Use only original OETIKER spare parts.

For further information on the part numbers of spare parts see Section 9.7.

⚠️ CAUTION

Damage to the tool due to incorrect closure of clamps.
Install the clamping lever in the correct position with the nose facing forwards.
**NOTE**

Do not use the clamping lever any longer than the number of cycles specified in the Maintenance section.

1. Move the lower drive into the ejection position.
2. Press the emergency stop button.
3. Remove the front covers.

4. Pull the clamping lever pivot pin out (no tool necessary).

---

Fig. 32  *tool with front covers removed*
5. Move the clamping lever forwards.

6. Push the clamping lever to one side, take it off and replace it with a new one.

7. Reassemble everything. To do this, perform the above steps in the reverse order.
9.4 Checking and adjusting the position of the strap detection sensor

**NOTE**
To check whether the strap sensor is set correctly, perform steps 1 to 6.

1. Move the lower drive into the service position (Operating mode -> Manual operation -> Service position).

2. Press the Emergency Stop button.

3. Remove both the side covers.

4. Insert the strap section bearing the “LED on” legend into the slot in the pulling unit. Press the tensioning lever rod (1) of the crimping cut-off head, to open the pulling unit. Once the strap section has been inserted, release the tensioning lever rod.
   (Note: If the strap section is curved, insert it as shown by the yellow line. This ensures that once the tensioning lever has been released the strap section will lie flat. If the sensor is correctly set, the LED (3) will light up.

5. Remove the strap section bearing the “LED on” legend again and insert the strap section bearing the “LED off” legend.
   If the sensor is correctly set, the LED will not light up.

6. If at steps 4 or 5 the LED status is incorrect, continue with the next step. Otherwise the setting of the sensor is correct; continue with step 14.
7. Once again insert the strap section bearing the “LED on” legend into the slot in the pulling unit.

8. Using a 1.5 mm hexagon drive key, undo the threaded pin (2) about one turn.

9. Press the strap sensor down until it rests on the strap section. You can do this more easily if you hold the sensor by gripping its cable with a pair of tweezers.

10. Slowly raise the sensor off the strap section until the LED lights up.

11. If necessary, rotate the sensor so that the LED is visible.

12. Hold the LED securely in position and tighten the threaded pin.

13. Perform steps 4 and 5 to check the sensor position once again.

14. Reinstall both the side covers.

15. Deactivate the Emergency Stop and initialize the FAST 3000.
9.5 Setting the closing force sensor

**WARNING**
If the factor “Force sensor scaling” is set incorrectly this will cause the WingGuard® strap clamps to be closed with a closing force that is either too high or too low.

Make adjustments carefully, use a calibrated CAL 01.

For adjustment you will need a CAL 01 and a PG135 verification unit.
See Section 6.8.4 (Verifying the closing force) for information on how to verify the closing force sensor.

9.5.1 Adjusting the load cell
1. Log in as “Superuser”.
2. Set the CAL 01 to Hold-ME-EL Average mode.
3. Wait five minutes until the CAL 01 has warmed up.
4. Check whether there is any force deviation (zero point offset). If there is, zero the device (see Section 6.8.3 (Setting the force offset to zero)).
5. Perform five force verifications with a target force of 1850 N and make a note of the values.
6. Calculate the average of these five values. (for instance 1950 N)
7. Select “Settings” on the FAST 3000 touch panel and select the “Tool parameters” sub-menu:
8. Use the following formula to calculate the new value for the force sensor scaling:

\[ NKS = \frac{DCAL01}{F_Z \cdot AKS} \]

- **NKS**: New Force Sensor scaling
- **DCAL01**: Average value of the CAL01 force measurement
- **F_Z**: Target force
- **AKS**: Old force sensor scaling

9. Input this value into the field “Force sensor scaling”).

10. Check whether there is any force deviation (zero point offset). If there is, zero the device.

11. Perform force verification to check the correct setting once again.

### 9.6 Replacing the control cabinet or tool mechanism

**WARNING**

Failure to comply with the procedure described below will cause the WingGuard® strap clamps 270 to be closed with a closing force different from the set value. It is absolutely essential that the closing force is verified and the force sensor scaling factor is adjusted if necessary.

1. Remove the defective components (from the tool mechanism or control cabinet).

2. If you have to send the defective component back to Oetiker for repair, make sure you send back all the necessary components.
   
   The scope of the components sent back must be the same as the scope of spare components supplied.
   
   Caution: The scope of supply of the tool mechanism includes both the crimping force monitoring devices.

3. Install all the components within the scope of supply of the spare components.

4. Perform a closing force verification (see Section 6.8.4).

5. If the measured closing force deviates by more than 25 N from the set value, perform readjustment of the closing force sensor (see Section 9.5).
9.7 Tools and consumable materials for maintenance

<table>
<thead>
<tr>
<th>Tool error / Consumable materials</th>
<th>Part number</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spare parts kit for the crimping jaws (Service pack A)</td>
<td>13500112</td>
<td>A-service</td>
</tr>
<tr>
<td>Service pack B</td>
<td>13500157</td>
<td>B-service</td>
</tr>
<tr>
<td>Service pack C</td>
<td>13500228</td>
<td>C-service</td>
</tr>
<tr>
<td>Crimping wedge</td>
<td>13500060</td>
<td>Spare part</td>
</tr>
<tr>
<td>Tool error / Consumable materials</td>
<td>Part number</td>
<td>Applications</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>-------------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td>Spare parts kit for clamping lever</td>
<td>13500113</td>
<td>Spare part</td>
</tr>
<tr>
<td>Crimping cut-off head for CFM</td>
<td>13500215</td>
<td>Crimping cut-off head for quick maintenance</td>
</tr>
<tr>
<td>Crimping cut-off tool + CFM</td>
<td>13500269</td>
<td>Spare part</td>
</tr>
<tr>
<td>Ethernet IP control cabinet</td>
<td>13500281</td>
<td>Spare part</td>
</tr>
<tr>
<td>Profinet control cabinet</td>
<td>13500280</td>
<td>Spare part</td>
</tr>
<tr>
<td>Press-in tool</td>
<td>13500205</td>
<td>Press in the crimping jaws</td>
</tr>
<tr>
<td>Tool error / Consumable materials</td>
<td>Part number</td>
<td>Applications</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Press-out tool</td>
<td>13500204</td>
<td>Press out the crimping jaws</td>
</tr>
<tr>
<td>Tensioning strap</td>
<td>13500233</td>
<td>Closing force verification</td>
</tr>
<tr>
<td>Installation aid for the crimping cut-off head</td>
<td>13500288</td>
<td>Facilitates the installation of the crimping head</td>
</tr>
<tr>
<td>CAL01 and SKS01</td>
<td>Various different article numbers</td>
<td>Closing force verification</td>
</tr>
<tr>
<td>Sensor setting strip “LED on”</td>
<td>13500151</td>
<td>Setting the strap detection sensor</td>
</tr>
<tr>
<td>Sensor setting strip “LED off”</td>
<td>13500152</td>
<td>Setting the strap detection sensor</td>
</tr>
<tr>
<td>Tool error / Consumable materials</td>
<td>Part number</td>
<td>Applications</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Force measurement jaws set</td>
<td>13500264</td>
<td>The force measurement jaws set is used to determine the remaining radial force on the set WingGuard® strap clamps. The set must be used in conjunction with a CAL01 and a SKS01.</td>
</tr>
<tr>
<td>Proximity switch IFRM 03P3501/KS35L (Clamping unit strap sensor)</td>
<td>06001786</td>
<td>Spare part</td>
</tr>
<tr>
<td>Damper, complete</td>
<td>13500024</td>
<td>Spare part</td>
</tr>
<tr>
<td>Sensor clamping bush</td>
<td>13500219</td>
<td>Spare part</td>
</tr>
<tr>
<td>Tool error / Consumable materials</td>
<td>Part number</td>
<td>Applications</td>
</tr>
<tr>
<td>---------------------------------------------------------</td>
<td>-------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Clamping unit rail</td>
<td>13500218</td>
<td>Spare part</td>
</tr>
<tr>
<td>Contact module NO</td>
<td>06001813</td>
<td>Spare part</td>
</tr>
<tr>
<td>Contact module NC</td>
<td>06001814</td>
<td>Spare part</td>
</tr>
<tr>
<td>Servo amplifier L7NHA004U</td>
<td>06001892</td>
<td>Spare part</td>
</tr>
<tr>
<td>Measurement amplifier 1-BM40IE</td>
<td>06002147</td>
<td>Spare part</td>
</tr>
<tr>
<td>Digital input / output card</td>
<td>06001891</td>
<td>Spare part</td>
</tr>
<tr>
<td>PLC PAC320 PROFINET</td>
<td>06002146</td>
<td>Spare part</td>
</tr>
<tr>
<td>PLC PAC320 Ethernet/IP</td>
<td>06001870</td>
<td>Spare part</td>
</tr>
<tr>
<td>Drive GSM20 complete (complete with connection plugs)</td>
<td>13500271</td>
<td>Spare part</td>
</tr>
<tr>
<td>Tool error / Consumable materials</td>
<td>Part number</td>
<td>Applications</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------------</td>
<td>---------------------------------------------------</td>
</tr>
<tr>
<td>Force monitoring device</td>
<td>06001877</td>
<td>Spare part</td>
</tr>
<tr>
<td>Miniature force sensor 2.5kN (crimping force sensor)</td>
<td>06001864</td>
<td>Spare part</td>
</tr>
<tr>
<td>Alignment aid</td>
<td>13500214</td>
<td>Positioning of the FAST 3000</td>
</tr>
<tr>
<td>Cable for the force monitoring device 2 m</td>
<td>06001878</td>
<td>Cable for connecting the crimping force sensor to the crimping force monitoring devices</td>
</tr>
</tbody>
</table>
### Tool Error / Consumable Materials

<table>
<thead>
<tr>
<th>Part number</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>13500266</td>
<td>Spare part</td>
</tr>
<tr>
<td>08904156</td>
<td>Spare part</td>
</tr>
<tr>
<td>1.5 mm</td>
<td>Strap sensor</td>
</tr>
<tr>
<td>2 mm</td>
<td>Safety proximity sensor, …</td>
</tr>
<tr>
<td>2.5 mm</td>
<td>Power supply chain</td>
</tr>
<tr>
<td>3 mm</td>
<td>Covers, …</td>
</tr>
<tr>
<td>4 mm</td>
<td>-</td>
</tr>
<tr>
<td>5 mm</td>
<td>Various different</td>
</tr>
<tr>
<td>6 mm</td>
<td>Transport restraint, …</td>
</tr>
<tr>
<td>8 mm</td>
<td>Jointed pin, female</td>
</tr>
<tr>
<td>Tweezers</td>
<td>Setting the strap sensor</td>
</tr>
<tr>
<td>MICROLUBE GBU-Y 131 grease</td>
<td>Greasing the crimping cut-off head, Clamping unit and strap</td>
</tr>
<tr>
<td>Brush</td>
<td>Applying grease</td>
</tr>
<tr>
<td>Feeler gauge 0-150 mm</td>
<td>Closure gap verification</td>
</tr>
</tbody>
</table>
10 Controlling the FAST 3000 via an external PLC

**WARNING**

Never operate the FAST 3000 via an external PLC, without providing the necessary safety precautions. Failure to observe this instruction may lead to death or serious injury.

- The system integrator is responsible for the safe integration of the FAST 3000 into the assembly cell.
- The system integrator must perform a risk analysis and configure the tool in accordance with this analysis.
- If particular, if the two-hand control desk is not used, the two-hand dongle must be plugged in. An external emergency stop must be connected.
- The integration may be performed only by qualified personnel.
- If you have questions about how to perform integration contact Oetiker.

See also the following pages of the circuit diagram (version V1_0):

- 40, 42, 43: Connecting the emergency stop
- 350, 351, 352: Control via I/O signals, light curtain and power-on readiness

### 10.1 Control via a field bus (Ethernet/IP or Profinet)

The FAST 3000 can be controlled via an external control system based on the Ethernet/IP or Profinet field bus. Connect the supervisory control system to the respective LAN port of the FAST 3000 control cabinet. For further information see Section 6.2 and 7.4.5.

The following data are valid for the software version V2.09.

#### 10.1.1 Settings for the Ethernet/IP communication protocol

<table>
<thead>
<tr>
<th>Name</th>
<th>Parker</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP address</td>
<td>192.168.10.50</td>
</tr>
<tr>
<td>Communication format</td>
<td>Data – Dint</td>
</tr>
<tr>
<td>Requested Packet Interval (RPI):</td>
<td>20 ms</td>
</tr>
<tr>
<td>Inhibit module:</td>
<td>true</td>
</tr>
<tr>
<td>Use a Unicast connection via EtherNet/IP:</td>
<td>false</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assembly example</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input</td>
<td>101</td>
</tr>
<tr>
<td>Output</td>
<td>100</td>
</tr>
<tr>
<td>Configuration</td>
<td>102</td>
</tr>
</tbody>
</table>

Assembly example	Size
10.1.2 Settings for the Profinet HW configuration

The GDSML file for configuration of the supervisory control system can be found on the USB stick supplied. The following settings must be performed in the configuration of the supervisory control system:

- 6 x Input unsigned32
- 1 x Output unsigned32

![Fig. 33 Examples of HW configuration of the Profinet module on the FAST 3000 in a Siemens S7 1212C](image)

10.1.3 Field bus mapping (software version V2.09)

<table>
<thead>
<tr>
<th>R-DW0</th>
<th>Bit0</th>
<th>Bit1</th>
<th>Description</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Part OK</td>
<td>Normal mode</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit1</td>
<td>Bit2</td>
<td>Part not OK</td>
<td>Normal mode</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit2</td>
<td>Bit3</td>
<td>Sequence active force control</td>
<td>Force adjustment</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit3</td>
<td>Bit4</td>
<td>Force controller active</td>
<td>Force adjustment</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit4</td>
<td>Bit5</td>
<td>Ready for locking the strap</td>
<td>Force adjustment</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit5</td>
<td>Bit6</td>
<td>Sequence active adjust to zero</td>
<td>Adjust to zero</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit6</td>
<td>Bit7</td>
<td>Ready for adjust to zero</td>
<td>Adjust to zero</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit7</td>
<td>Bit8</td>
<td>Motion lever: Power on</td>
<td>Tool</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit8</td>
<td>Bit9</td>
<td>Motion lever: Referenced</td>
<td>Tool</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit9</td>
<td>Bit10</td>
<td>Pulling unit: Power on</td>
<td>Tool</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit10</td>
<td>Bit11</td>
<td>Pulling unit: Referenced</td>
<td>Tool</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit11</td>
<td>Bit12</td>
<td>Light curtain</td>
<td>Tool</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit12</td>
<td>Bit13</td>
<td>Description</td>
<td>Data type</td>
</tr>
<tr>
<td>---------</td>
<td>--------</td>
<td>--------</td>
<td>----------------------------------------------------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PLC: PCL and EtherCAT ready</td>
<td>Tool R Bool</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit13</td>
<td>Bit14</td>
<td>PLC: Feedback external PLC: Enable power</td>
<td>Tool R Bool</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit14</td>
<td>Bit15</td>
<td>PLC: Servo drive power on voltage source inverter</td>
<td>Tool R Bool</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit15</td>
<td>Bit16</td>
<td>Ready for initialization</td>
<td>Normal mode R Bool</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit16</td>
<td>Bit17</td>
<td>Ready for locking the clamp</td>
<td>Normal mode R Bool</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit17</td>
<td>Bit18</td>
<td>Ready for start</td>
<td>Normal mode R Bool</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit18</td>
<td>Bit19</td>
<td>Busy</td>
<td>Normal mode R Bool</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit19</td>
<td>Bit20</td>
<td>Error</td>
<td>Normal mode R Bool</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit20</td>
<td>Bit21</td>
<td>Laboratory Mode active</td>
<td>Laboratory mode R Bool</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit21</td>
<td>Bit22</td>
<td>Status Restart Light curtain</td>
<td>Safety Information R Bool</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit22</td>
<td>Bit23</td>
<td>Status Emergency Stop Ch.1</td>
<td>Safety Information R Bool</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit23</td>
<td>Bit24</td>
<td>Status Emergency Stop Ch.2</td>
<td>Safety Information R Bool</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit24</td>
<td>Bit25</td>
<td>Request deblocking</td>
<td>Deblocking R Bool</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit25</td>
<td>Bit26</td>
<td>Deblocking routine active</td>
<td>Deblocking R Bool</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit26</td>
<td>Bit27</td>
<td>HMI message “Remove strap” (cont.)</td>
<td>Init Routine R Bool</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit27</td>
<td>Bit28</td>
<td>Routine main cycle active</td>
<td>Normal mode R Bool</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit28</td>
<td>Bit29</td>
<td>Sensor: Clamp present</td>
<td>Tool R Bool</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit29</td>
<td>Bit30</td>
<td>Sensor: Holdup sensor</td>
<td>Tool R Bool</td>
</tr>
<tr>
<td>R-DW0</td>
<td>Bit30</td>
<td>Bit31</td>
<td>Alive bit</td>
<td>Tool R Bool</td>
</tr>
<tr>
<td>R-DW1</td>
<td>Bit31</td>
<td>Bit32</td>
<td>Spare</td>
<td>Spare for status bits</td>
</tr>
<tr>
<td>R-DW2</td>
<td></td>
<td></td>
<td>Operating mode &amp; master for handling</td>
<td>Normal mode R Int</td>
</tr>
<tr>
<td>R-DW3</td>
<td></td>
<td></td>
<td>Closing force</td>
<td>Normal mode R Real</td>
</tr>
<tr>
<td>R-DW4</td>
<td></td>
<td></td>
<td>Cycle time</td>
<td>Normal mode R Real</td>
</tr>
<tr>
<td>R-DW5</td>
<td></td>
<td></td>
<td>Total cycle counter</td>
<td>Service R Int</td>
</tr>
<tr>
<td>R-DW6</td>
<td></td>
<td></td>
<td>Service cycle counter</td>
<td>Service R Int</td>
</tr>
<tr>
<td>R-DW7</td>
<td></td>
<td></td>
<td>Actual position motion lever</td>
<td>Tool R Real</td>
</tr>
<tr>
<td>R-DW8</td>
<td></td>
<td></td>
<td>Actual position pulling unit</td>
<td>Tool R Real</td>
</tr>
<tr>
<td>R-DW9</td>
<td></td>
<td></td>
<td>Gain force control</td>
<td>Tool PID controller R Real</td>
</tr>
<tr>
<td>R-DW10</td>
<td></td>
<td></td>
<td>Reset time force control</td>
<td>Tool PID controller R Real</td>
</tr>
<tr>
<td>R-DW11</td>
<td></td>
<td></td>
<td>Rate time force control</td>
<td>Tool PID controller R Real</td>
</tr>
<tr>
<td>R-DW12</td>
<td></td>
<td></td>
<td>Spare</td>
<td>R Real</td>
</tr>
<tr>
<td>R-DW13</td>
<td></td>
<td></td>
<td>Status message</td>
<td>Error handling R Int</td>
</tr>
<tr>
<td>R-DW14</td>
<td></td>
<td></td>
<td>Force holding time</td>
<td>Tool R Int</td>
</tr>
<tr>
<td>R-DW15</td>
<td></td>
<td></td>
<td>Time laboratory mode</td>
<td>Laboratory mode R Real</td>
</tr>
<tr>
<td>R-DW16</td>
<td></td>
<td></td>
<td>Remaining time laboratory mode</td>
<td>Laboratory mode R Real</td>
</tr>
</tbody>
</table>
## Controlling the FAST 3000 via an external PLC

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-DW17</td>
<td>Max. pieces in laboratory mode</td>
<td>Laboratory mode R Int</td>
</tr>
<tr>
<td>R-DW18</td>
<td>Remaining pieces in laboratory mode</td>
<td>Laboratory mode R Int</td>
</tr>
<tr>
<td>R-DW19</td>
<td>Home position motion lever</td>
<td>Parameter motion lever R Real</td>
</tr>
<tr>
<td>R-DW20</td>
<td>Insert position motion lever</td>
<td>Parameter motion lever R Real</td>
</tr>
<tr>
<td>R-DW21</td>
<td>Crimping position motion lever</td>
<td>Parameter motion lever R Real</td>
</tr>
<tr>
<td>R-DW22</td>
<td>Cutting position motion lever</td>
<td>Parameter motion lever R Real</td>
</tr>
<tr>
<td>R-DW23</td>
<td>Setting minimum crimping current</td>
<td>Parameter motion lever R Int</td>
</tr>
<tr>
<td>R-DW24</td>
<td>Setting maximum crimping current</td>
<td>Parameter motion lever R Int</td>
</tr>
<tr>
<td>R-DW25</td>
<td>Setting minimum cutting current</td>
<td>Parameter motion lever R Int</td>
</tr>
<tr>
<td>R-DW26</td>
<td>Setting maximum cutting current</td>
<td>Parameter motion lever R Int</td>
</tr>
<tr>
<td>R-DW27</td>
<td>Home position pulling unit</td>
<td>Pulling unit parameter R Real</td>
</tr>
<tr>
<td>R-DW28</td>
<td>Pulling unit ejection position</td>
<td>Pulling unit parameter R Real</td>
</tr>
<tr>
<td>R-DW29</td>
<td>Max. tensioning travel</td>
<td>Pulling unit parameter R Real</td>
</tr>
<tr>
<td>R-DW30</td>
<td>Switch Phase 1 =&gt; Phase 2</td>
<td>Pulling unit parameter R Int</td>
</tr>
<tr>
<td>R-DW31</td>
<td>Force tolerance</td>
<td>Pulling unit parameter R Real</td>
</tr>
<tr>
<td>R-DW32</td>
<td>Pull distance</td>
<td>Pulling unit parameter R Real</td>
</tr>
<tr>
<td>R-DW33</td>
<td>Tensioning force unit home position</td>
<td>Pulling unit parameter R Real</td>
</tr>
<tr>
<td>R-DW34</td>
<td>Tensioning force unit insert position</td>
<td>Pulling unit parameter R Real</td>
</tr>
<tr>
<td>R-DW35</td>
<td>CFM1: Force entry EO4</td>
<td>CFM EO4 R Real</td>
</tr>
<tr>
<td>R-DW36</td>
<td>CFM1: Force exit EO4</td>
<td>CFM EO4 R Real</td>
</tr>
<tr>
<td>R-DW37</td>
<td>CFM1: Force entry EO4</td>
<td>CFM EO4 R Real</td>
</tr>
<tr>
<td>R-DW38</td>
<td>CFM1: Force exit EO4</td>
<td>CFM EO4 R Real</td>
</tr>
<tr>
<td>R-DW39</td>
<td>CFM1: Force max value</td>
<td>CFM R Real</td>
</tr>
<tr>
<td>R-DW40</td>
<td>CFM1: Force max value</td>
<td>CFM R Real</td>
</tr>
<tr>
<td>R-DW41</td>
<td>CFM1: Force max value</td>
<td>CFM R Real</td>
</tr>
<tr>
<td>R-DW42</td>
<td>CFM1: Force max value</td>
<td>CFM R Real</td>
</tr>
<tr>
<td>R-DW43</td>
<td>Warning</td>
<td>Error handling R Int</td>
</tr>
<tr>
<td>R-DW44</td>
<td>Tool error</td>
<td>Error handling R Int</td>
</tr>
<tr>
<td>R-DW45</td>
<td>Process error</td>
<td>Error handling R Int</td>
</tr>
</tbody>
</table>

R Real 4 places of decimals
### Controlling the FAST 3000 via an external PLC

#### Description of Data Types

<table>
<thead>
<tr>
<th>Description</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start cycle</td>
<td>Normal mode W Bool</td>
</tr>
<tr>
<td>Stop cycle</td>
<td>Normal mode W Bool</td>
</tr>
<tr>
<td>Start locking the clamp</td>
<td>Normal mode W Bool</td>
</tr>
<tr>
<td>Acknowledge error</td>
<td>Normal mode W Bool</td>
</tr>
<tr>
<td>Initialization</td>
<td>Normal mode W Bool</td>
</tr>
<tr>
<td>Power enable</td>
<td>Start mode</td>
</tr>
<tr>
<td>Bypass start power for drives</td>
<td>Start mode</td>
</tr>
<tr>
<td>Start deblocking</td>
<td>Deblocking</td>
</tr>
<tr>
<td>Acknowledge .message “Remove strap”</td>
<td>Normal mode</td>
</tr>
</tbody>
</table>

#### R-DW2, Comments

- **0..7:**
  1 = Manual
  2 = Automatic
  3 = Laboratory mode & 2-hand_control
  4 = Laboratory mode & foot pedal

- **8..32:**
  8 = Command 2-hand safety_control
  16 = Command I/O hardwire
  24 = Command over industrial communication

#### R-DW12, Comments

Not used; in older version this was the number of the error
10.2 Control via 24-V I/O signals

As an alternative to the bus the FAST 3000 can be controlled via 24-V signals. Details of the connection for external control at the control cabinet of the FAST 3000 can be found in the circuit diagram on pages 350, 351, 352. For further information about activating control via I/O see Sections 7.4.5 and 7.4.7 (Settings, Tool Parameters).
11  Decommissioning, transport, storage, recommissioning

11.1  Decommissioning

If the FAST 3000 is to remain out of service for an extended period, it must be decommissioned.

- Withdraw the electrical plug.
- Clean the FAST 3000 before putting it into storage.
- Replace any defective parts.
- Store the FAST 3000 in a clean dry place and protect it from dust.

11.2  Transport

The parts of the FAST 3000 are heavy. Always use appropriate means of transport. Always use two persons when lifting the tool.

Use the transport restraint to prevent linear and rotational movement of the tool mechanism during transport.

Remove the transport restraint before recommissioning.

![CAUTION]

Risk the machine may be dropped during transport!

- Do not remain underneath the machine.
- Wear safety equipment (particularly safety shoes).

![CAUTION]

Risk of dropping the control cabinet during transport!

- Do not remain underneath the machine.
- Wear protective equipment (especially safety shoes).
1. Transport eyes
2. Transport restraint
3. Handle
11.3 Storage

If the FAST 3000 is to remain out of service for an extended period, it must be decommissioned.

- Withdraw the electrical plug.
- Clean the FAST 3000 before putting it into storage.
- Replace any defective parts.
- Smear the mechanical parts with rust inhibitor.
- Store the FAST 3000 in a clean dry place and protect it from dust.

11.4 Recommissioning

If the FAST 3000 is to be returned into service for an extended period, it must be recommissioned.

- Check the FAST 3000 for defective parts or rust and perform any necessary repairs or maintenance.
- Perform setting up, see Section 6.1.

11.5 Disposal

The tool, all replacement parts and in particular used operating fluids or other environmentally polluting substances must be disposed of by specialist firms in accordance with applicable statutory regulations.
12 Technical data

• For use only indoors
• Temperature range 5 °C to 40 °C
• Max. relative atmospheric humidity 80 % at temperatures up to 31 °C
• 110 V or 220/230 V 50-60 Hz AC, grounded
• Closing force tolerance: ±100 N
• Max. noise level: 75 dBA

Dimensions and weight

<table>
<thead>
<tr>
<th>Approximate dimensions [mm]</th>
<th>Approximate weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control cabinet</td>
<td>300 x 400 x 800</td>
</tr>
<tr>
<td>Connecting cable</td>
<td>–</td>
</tr>
<tr>
<td>Installation tool</td>
<td>610 x 71 x 470 (without base plate)</td>
</tr>
<tr>
<td>Two-hand control desk</td>
<td>465 x 190 x 120</td>
</tr>
<tr>
<td>Touch panel</td>
<td>340 x 220 x 120</td>
</tr>
<tr>
<td>Foot pedal</td>
<td>260 x 150 x 140</td>
</tr>
<tr>
<td>Crimping force monitoring device</td>
<td>190 x 195 x 125</td>
</tr>
</tbody>
</table>
13 Troubleshooting and error messages

13.1 General instructions in the event of errors

- If the closing operation cannot be started or if functional faults occur during operation, then the technical personnel responsible for maintenance of the FAST 3000 should be contacted.
- Errors may only be corrected in a technically correct manner. If in doubt contact Oetiker (www.oetiker.com).

13.2 What should I do, if …?

<table>
<thead>
<tr>
<th>Type of error</th>
<th>Reason for fault</th>
<th>Actions to rectify fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closure operation will not start</td>
<td>Tool not switched on</td>
<td>Switch tool on.</td>
</tr>
<tr>
<td></td>
<td>Emergency Stop button activated</td>
<td>Deactivate the Emergency Stop button.</td>
</tr>
<tr>
<td></td>
<td>Tool not initialized</td>
<td>Initialize tool.</td>
</tr>
<tr>
<td></td>
<td>Clamp not inserted correctly (check the strap detection signal)</td>
<td>Insert the clamp correctly.</td>
</tr>
<tr>
<td></td>
<td>Not all the required connectors have been inserted</td>
<td>Insert all the connectors required for the tool.</td>
</tr>
<tr>
<td></td>
<td>Incorrect operating mode</td>
<td>Change the operating mode settings.</td>
</tr>
<tr>
<td></td>
<td>Light curtain activated and light curtain damaged</td>
<td>Repair the light curtain.</td>
</tr>
<tr>
<td>The FAST 3000 is in manual mode</td>
<td>Switch to Automatic mode and initialize the tool.</td>
<td></td>
</tr>
<tr>
<td>Power to the drives not switched on</td>
<td>Press the green button on the control cabinet to switch on the power to the drive.</td>
<td></td>
</tr>
<tr>
<td>Type of error</td>
<td>Reason for fault</td>
<td>Actions to rectify fault</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>Initialization of FAST 3000 does not function</td>
<td>Insert a WingGuard® strap clamp strap into the clamping unit</td>
<td>Remove the strap. To release the clamping lever, it may be necessary to remove a front cover and the strap tensioned out of the crimping cut-off head.</td>
</tr>
<tr>
<td></td>
<td>Strap sensor soiled</td>
<td>Clean the strap sensor.</td>
</tr>
<tr>
<td></td>
<td>Two-hand control panel not connected to the control cabinet</td>
<td>Connect the two-hand control panel to the control cabinet.</td>
</tr>
<tr>
<td></td>
<td>Control cabinet defective</td>
<td>Send the unit back to OETIKER.</td>
</tr>
<tr>
<td></td>
<td>Emergency Stop activated</td>
<td>Press and release the Emergency Stop button. Initialize the FAST 3000.</td>
</tr>
<tr>
<td></td>
<td>Power to the drives not switched on</td>
<td>Press the green button on the control cabinet to switch on the power to the drive.</td>
</tr>
<tr>
<td></td>
<td>Incorrect operating mode</td>
<td>Change the operating mode settings.</td>
</tr>
<tr>
<td></td>
<td>Light curtain activated and light curtain damaged</td>
<td>Repair the light curtain.</td>
</tr>
<tr>
<td></td>
<td>No values stored for the parameters</td>
<td>Use PTC to reset the parameters of the PLC to the factory settings.</td>
</tr>
<tr>
<td></td>
<td>Initialization cannot be performed due to the current operating state</td>
<td>Activate the emergency stop then deactivate it again.</td>
</tr>
<tr>
<td>Tool switched on, no display</td>
<td>Touch panel not connected to the control cabinet</td>
<td>Connect the touch panel to the control cabinet.</td>
</tr>
<tr>
<td></td>
<td>Control cabinet defective</td>
<td>Send the unit back to OETIKER.</td>
</tr>
<tr>
<td></td>
<td>Incorrect network address set on the display or on the controller</td>
<td>Set the network address correctly.</td>
</tr>
<tr>
<td></td>
<td>Incorrect settings on the display</td>
<td>Have the display settings performed by the PTC.</td>
</tr>
<tr>
<td>Clamp is crimped on only one side</td>
<td>Crimping jaw broken</td>
<td>Replace the crimping jaw.</td>
</tr>
<tr>
<td></td>
<td>Crimping jaw pivot pin broken</td>
<td>Replace the pivot pin</td>
</tr>
<tr>
<td>Strap is not cut off</td>
<td>Cut-off die broken</td>
<td>Replacing the cut-off die</td>
</tr>
<tr>
<td></td>
<td>Cut-off die guide not installed correctly</td>
<td>Perform the installation of the cut-off die guide according to the description in 9.3.3 “Replacing the crimping jaws and/or cut-off die”.</td>
</tr>
</tbody>
</table>
## Troubleshooting and error messages

<table>
<thead>
<tr>
<th>Type of error</th>
<th>Reason for fault</th>
<th>Actions to rectify fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>The crimping jaws cut into the clamp housing</td>
<td>Cut-off die guide not installed correctly</td>
<td>Perform the installation of the cut-off die guide according to the description in 7.3.1 “Replacing the crimping jaws and/or cut-off die”.</td>
</tr>
<tr>
<td></td>
<td>Incorrect horizontal positioning of the FAST 3000</td>
<td>Check the correct positioning of the horizontal stop, in order to ensure the correct position of the clamp housing.</td>
</tr>
<tr>
<td></td>
<td>When the WingGuard® clamp is closed, the tool head is not in the right position</td>
<td>Check whether a part is blocking the path of the tool head to its correct position as the clamp closes.</td>
</tr>
<tr>
<td>An inserted clamp cannot be removed from the FAST 3000 during the production</td>
<td>The WingGuard® clamp is blocked by the pushed-in clamping lever. Initialization cannot be performed due to an inserted clamp</td>
<td>Use the unblocking function (see Section 6.8.1). If the unblocking function does not perform correctly, continue with the following steps: 1. Switch the FAST 3000 off securely. 2. Remove one of the front side covers and the cover of the crimping cut-off head. 3. Slacken the fastening screws of the crimping cut-off head by a few revolutions and pull the head back slightly. 4. The push rod of the clamping lever can now be loosened, so that the strap end of the WingGuard® clamp can be removed from the clamping unit and the head. 5. Assemble the FAST 3000. 6. Switch the device on and initialize it.</td>
</tr>
<tr>
<td>Crimping force level too high</td>
<td>Crimping jaws not run in</td>
<td>Undo some WingGuard® clamps. The crimping jaws will run in and the crimping force will take on the usual values.</td>
</tr>
<tr>
<td>Type of error</td>
<td>Reason for fault</td>
<td>Actions to rectify fault</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Inserted clamp cannot be removed after the FAST 3000 was switched on</td>
<td>Drives cannot be initialized as the tool is detecting a clamp in the clamping unit.</td>
<td>Switch off the FAST 3000. Remove a front cover and push the clamping lever rod in the direction of the crimping cut-off head. Remove the clamp strap from the crimping cut-off head. The FAST 3000 is now ready for initialization. Mount the front cover and switch on the FAST 3000. Initialize the FAST 3000.</td>
</tr>
<tr>
<td>No response of the FAST 3000 to the inputs (such as the strap locking button)</td>
<td>The FAST 3000 is in “Control via external PLC” or “Control via I/O” mode</td>
<td>Deactivate “Control via external PLC” or “Control via I/O”.</td>
</tr>
<tr>
<td></td>
<td>The I/O module is not correctly plugged in to the PLC (connector or module)</td>
<td>Attach the connector correctly. Connect the module correctly.</td>
</tr>
<tr>
<td></td>
<td>EtherCAT-Bus not ready for operation</td>
<td>Check whether all the devices are connected correctly, particularly the connections for the measurement amplifier of the tensioning forces and the connections of the crimping force monitoring devices.</td>
</tr>
<tr>
<td>Tool error</td>
<td>Servo drive error</td>
<td>Refer to the manual for the drive “LH7N”.</td>
</tr>
</tbody>
</table>
13.3 Error messages and their resolution

13.3.1 ToErr_1: (W) strap present -> remove & acknowledge

NOTE

At each closure cycle a check is performed to determine whether the strap end has fallen from the clamping unit: The strap sensor checks whether the strap end is still present in the ejection position of the clamping unit. If it is, the warning War_11 is output.
During initialization the tool checks whether a strap is present or not. The check is performed before the tool seeks to position the drives in the home position. If a clamp is present in the tool and the housing is not correctly positioned, this can lead to incorrect home positions of the drives.

Remedy:

If a strap end is present in the clamping unit:
>>> Remove one of the front covers.
>>> Press the ejector tensioning rod in the direction of the crimping cut-off head and remove the strap end.
If the strap sensor is covered with particles of metal:

- Clean the area around the strap detection sensor. To clean the sensor it may be necessary to remove a front cover and push back the clamping unit slide.

If the strap sensor fails the I/O test:

- Check the function of the sensor.
- Check the connection of the strap sensor plug.
- Check the connection of the extension cable in the tool socket.
- Check the I/O module in the PLC.

13.3.2 ToErr_2: Clamping unit not in the home position STO -> Initialize

**NOTE**

Before starting the closure cycle the tool performs a safety check to determine whether the clamping unit is in its home position. (If for instance the clamping unit is set in motion inadvertently when a finger is present between the clamp and the parts to be connected, this can lead to injuries.) If the position sensor detects that the clamping unit is not in its home position, both the electrical drives are switched off. A plausibility check is performed during every closing cycle (to check whether the signal has changed its status).

Remedy:

If the tool performs initialization successfully:

The errors have been resolved.
If the clamping unit position sensor fails the I/O test:

- Check the function of the sensor.
- Check the connection of the sensor cable in the tool socket.
- Check the attachment condition of the force load cell as described in the Service Instructions.
- Check the I/O module in the PLC.

If the clamping unit position sensor is dirty:

- Clean the sensor.

13.3.3 PrErr_1: Maximum tensioning travel exceeded

**NOTE**

The tensioning travel can be limited. This can provide a check on whether the correct clamp diameter was used. (There are limitations to this function, since the WingGuard® strap end is detected even before it is fully inserted into the clamping unit.) Therefore the closure travel varies slightly.

Remedy:

The wrong clamp size was used:

- Use a clamp of the correct diameter.

Wrong parts to be connected were used:

- Use the correct parts.

Is the strap end broken?

- Check that the closing force is correctly set (see Section 7.4.7)
- Perform a closing force test (see the Operating Instructions).
The strap has slipped out of the clamping unit:
- Check the clamping lever, particularly its teeth, and replace it if necessary.
- Check the clamping unit slide. If it is worn, replace it.
- Check the clamping lever pivot pin. If it is worn, replace it.
- Check the clamping unit rail. If it is worn, replace it.

If the maximum tensioning travel does not correspond to the required reduction in the clamp diameter:
- Adjust the max. tensioning travel setting in the pulling unit parameters. For changing this setting you must be logged in.

If the closure parameters are wrongly set:
- Adjust the closure parameters (see Section 5.1.1–5.1.7).

PrErr_1: Maximum tensioning time exceeded

Remedy:

If the closure parameters are wrongly set:
- Adjust the closure parameters (see Section 5.1.1–5.1.7).

If the holding time setting is too long:
- Reduce the holding time (see Section 5.1.7).

13.3.4 PrErr_11: General error at crimping

Remedy:
Subject the WingGuard® clamps closed during this cycle to visual inspection for defects especially in the wing formation area..

If a crimping jaw is broken:
- Replace both crimping jaws.

If the crimping wedge is exhibiting wear:
- Replace the crimping wedge.

If the crimping jaw pivot pins are exhibiting wear:
- Replace the crimping pivot pins.
If the FAST 3000 is not correctly positioned:
- Move the FAST 3000 into the correct position (see Section 6.1).

If the crimping cut-off head is being pulled upwards by the connecting cable:
- Arrange for the connecting cable (see Section 6.1) to be better secured.

If adjoining parts are obstructing the free movement of the FAST 3000:
- Ensure that the FAST 3000 can move freely and not accidentally come into contact with other parts.

13.3.5 PrErr_12: Error at cutting off
Remedy:
Subject the cut-off die to a visual inspection for defects.

If the cut-off die is broken:
- Replace the cut-off die.

13.3.6 ToErr_4: Position sensor defective
The clamping unit position sensors failed the plausibility test.

Remedy:
see Section 13.3.2

If the clamping unit position sensor is dirty:
- Clean the sensor.
13.3.7 PrErr_15: Closing force outside tolerance

Remedy:

If the closure parameters are not correctly set:

- Check the curve profile.
- Correct the settings.

13.3.8 War_2: Button contact error

**NOTE**

For reasons of safety, the two start buttons on the manual control each have two channels. Every time a button is pressed, a plausibility check is performed. If the button is pressed too slowly this results in an error 20.

- Use the deblocking function *(see Section 6.8.1)* to move the tool into a status where initialization can be performed.

- Use the deblocking function *(see Section 6.8.1)*

If at the next cycle the FAST 3000 operates correctly:

- Depress the start buttons quickly.
If at the next cycle despite the buttons being quickly the FAST 3000 once again exhibits the same error:

- Replace the start button contacts.
- Check the wiring of the buttons.

13.3.9 ToErr_5: Drive error active

If the green power enable button on the control cabinet door fails to light up:
- Press the green power enable button.

If one of the miniature circuit breakers in the control cabinet has tripped:
- Switch the miniature circuit breaker back on.

If the EtherCAD interfaces are not correctly connected:
- Make sure that the Ethernet cables correct are correctly connected at the control cabinet and to the force monitoring devices.
- Check the Ethernet cables for damage.

If the servo drive is not correctly installed:
- Make sure that the Ethernet cables correct are correctly connected to the servo drive amplifier in the control cabinet.

13.3.10 ToErr_6: Emergency stop circuit open / ToErr_14: Emergency Stop

If the emergency stop-button is pressed:
- Unlatch the emergency stop button.

If the emergency stop-button is not pressed:
- Check the cabling between the emergency stop-button and the two-hand control desk.
- Check that the two-hand dongle is plugged in correctly.
- Check that the external emergency stop is connected correctly or that the thin two-hand dongle is plugged in correctly.
13.3.11 PrErr_3: Crimping error CFM1 envelope curve 1

Remedy:
- Check the crimping jaws for damage and wear.
- Check the curve settings in the crimping force monitoring device 1.

13.3.12 PrErr_4: Crimping error CFM1 envelope curve 2

Remedy:
- Check the crimping jaws for damage and wear.
- Check the curve settings in the crimping force monitoring device 1.

13.3.13 PrErr_5: Crimping error CFM1 NoPass

NOTE
This error occurs when during crimping the force at the crimping jaws increases too early.

Remedy:
- Check the setting of the crimping force monitoring device 1.
- Check the positioning of the FAST 3000.

13.3.14 PrErr_6: Crimping error CFM1 wear

Remedy:
- Check the crimping jaws for wear.
- Check the setting of the crimping force monitoring device 1.

13.3.15 PrErr_7: Crimping error CFM2 envelope curve 1

Remedy:
- Check the crimping jaws for damage and wear.
- Check the curve settings in the crimping force monitoring device 2.
13.3.16  **PrErr_8: Crimping error CFM2 envelope curve 2**

**Remedy:**
- Check the crimping jaws for damage and wear.
- Check the curve settings in the crimping force monitoring device 2.

13.3.17  **PrErr_9: Crimping error CFM2 NoPass**

**NOTE**
This error occurs when during crimping the force at the crimping jaws increases too early.

**Remedy:**
- Check the setting of the crimping force monitoring device 2.
- Check the positioning of the FAST 3000.

13.3.18  **PrErr_10: Crimping error CFM2 wear**

**Remedy:**
- Check the crimping jaws for wear.
- Check the setting of the crimping force monitoring device 2.

13.3.19  **PrErr_13 Force overshoot**

**Remedy:**
- Check that the closure parameters are correctly set.
- Increase the switch point reduction or reduce the speed phase 1 and speed phase 2.
13.3.20  PrErr_16 Max force when the light curtain breached

Remedy:
- Prevent the light curtain being breached during the cycle.
- Deactivate the light curtain in the “Settings” menu “Tool Parameters” sub-menu.
13.3.21  PrErr_17: Max force travel in ejection position

**NOTE**

After the strap has been cut off the tensioning force is monitored during the journey to the ejection position. During this time the force should be effectively 0 N, otherwise the strap has not been correctly cut off.

Remedy:

- Check the cut-off die.
- Check the tensioning force sensor.

13.3.22  PrErr_18: Process aborted

**NOTE**

These message appears when the process has been aborted. As a rule it appears as a second or later message after the first message has been acknowledged.

Remedy:

- Acknowledge the message.

13.3.23  PrErr_19: Max force reached on interruption by bus stop

**NOTE**

This error occurs if during the clamping cycle a stop command is send via the communication system.

Remedy:

- Check the operation of the supervisory system.

13.3.24  ToErr_7: Light curtain active during the initialization routine

**NOTE**

The light curtain trips during initialization. The drives are stopped and the process is aborted.
Remedy:

- Prevent the light curtain tripping during the initialization procedure.
- Deactivate the light curtain in the “Settings” menu “Tool Parameters” sub-menu.

13.3.25 ToErr_8: Verifying the crimping force (phase 1)

**NOTE**

The error occurs if an excessive force is present during the first phase (the lever moves at a pre-defined speed into position 1). The lever then moves back into the home position and the verification is aborted.

Remedy

- Check for foreign bodies in the area of the crimping jaws which deform the WingGuard® clamp strap.
- Check that the correct SKS is fitted with the correct jaws.

13.3.26 ToErr_9: Verifying the crimping force (phase 2)

**NOTE**

The error occurs if the end force is not achieved during the second phase (the lever moves at a pre-defined speed into position 2). The lever then moves back into the home position and the verification is aborted.

Remedy

- Check that the crimping force monitoring devices are correctly set.
- Check that the crimping force monitoring devices are activated.
- Check that the target value the crimping force is not too great.
13.3.27  ToErr_10: Verifying the crimping force: No force increase

**NOTE**
The error occurs if for a period of 5 seconds during the second phase the crimping force fails to increase.

**Remedy:**
- Check that the crimping force monitoring devices are switched on.
- Check that the crimping force monitoring devices are correctly set.
- Check that the crimping force monitoring devices are activated.

13.3.28  ToErr_11: Checking the strap waste

**Remedy:**
- Move manually into the ejection position and check the respective sensor for damage.
- Check that the strap waste has been ejected.

13.3.29  ToErr_12: CFM general warning / error

**NOTE**
An error or a warning is present in relation to the crimping force monitoring devices.

**Remedy:**
- Check the crimping force monitoring devices is respect of their settings, damage and error messages.
- Restart the crimping force monitoring devices.
- For further information see the crimping force monitoring devices manual.
13.3.30  **ToErr_13 Check tensioning force sensor**

**NOTE**
During the clamping cycle the tensioning force sensor checks that the value satisfies certain criteria when the lever is in the home position and when it is in the insertion position.
In the home position the value should be about 80 N and in the insertion position it should be 0 N.

**Remedy:**
- In the “Settings” menu and the “Force verification” sub-menu, perform a zero offset of the force sensor.
  Caution! During this procedure, it is essential that the “Set offset to zero” button is pressed (see Section 6.8.3 “Setting the force offset to zero”). This command will then determine the new value for the home position.

- Check the scaling factor and correct it if necessary.
- After the scaling factor has been corrected, perform a zero offset and a force verification.
- Check the measurement amplifier (connections, signaling display on the measurement amplifier).
13.3.31  ToErr_16 No power to tool during operation

**NOTE**
The power supply to the lever or to the tensioning drive has been interrupted.

**Remedy:**
- Restore power supply to the tool. Switch on at the green button on the control cabinet door and initialize the tool.
  - Make sure that the supervisory system enable flag for activating the servo drives is set, or that the bypass is activated is (“Settings” menu, “Tool parameters” sub-menu).

13.3.32  War_1 Error acknowledged
Errors and warnings have been acknowledged. No action necessary.

13.3.33  War_3 No power supply – press Start -> Init

**NOTE**
The power supply of the drive is not activated.

**Remedy:**
- Press the start button on the control cabinet door.
  - The start button will light up green.
- Initialize the device.

13.3.34  War_4 CFM units warning / error

**NOTE**
General CFM error. An error or a warning is present in relation to the crimping force monitoring devices.

**Remedy:**
- Perform an error analysis for both crimping force monitoring devices.
### 13.3.35  War_5 Service due soon

**NOTE**

When the service counter falls below a pre-defined limit, the message appears periodically every ten closures.

**Remedy:**

- Perform the service and reset the service counter.

### 13.3.36  War_6 Service due

**NOTE**

When the service counter falls below a pre-defined limit, the message appears periodically every two closures.

**Remedy:**

- Perform the service and reset the service counter.

### 13.3.37  War_7 Stop triggered by the light curtain

- Prevent the light curtain tripping.

### 13.3.38  War_8 CFM mode teach-in active

**NOTE**

The message appears when the “CFM teach” mode is active. As long as this mode remains active, the results of the CFM will be ignored. The message appears after five closures.
Remedy:

- Activate the “CFM Production Mode setting” in the “Settings” menu “Tool Parameters” sub-menu.

13.3.39  **War_9 No power to tool**

**NOTE**

The power supply to the lever or to the tensioning drive is not activated.

Remedy:

- Restore power supply to the tool. Switch on at the green button on the control cabinet door and initialize the tool.

13.3.40  **War_10 No power supply – external enable, press Start**

**NOTE**

The power supply of the drive is not activated.

Remedy:

- Press the start button on the control cabinet door.
- The start button will light up green.
- No response to the start switch: Check that the supervisory system enable flag is present (DI or BUS “Power enable”).
13.3.41 War_11 Remove strap

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>This warning appears during initialization. For safety reasons it may happen that during initialization the pulling unit moves to the ejection position and then the message appears that surplus pieces of the clamping strap must be removed.</td>
</tr>
</tbody>
</table>

Remedy:

- Check that there is no strap material present in the pulling unit and that the crimping cut-off head is free of foreign bodies (such as the WingGuard® clamp housing).
14 Appendix

- Circuit diagram
- Industrial communication
- EU Declaration of Conformity
- Oetiker production checklist
- FAST 3000 capability measurements
- Control cabinet test certificate
- HBM force sensor test certificate
- Kistler test certificates
- Operating Instructions for crimping force monitoring devices
## 15 Help and Support

If you need help, contact the appropriate Oetiker service center. Further information can be found at www.oetiker.de.

<table>
<thead>
<tr>
<th>Country</th>
<th>Telephone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headquarters Switzerland</td>
<td>+41 44 728 55 55</td>
<td><a href="mailto:info.ch@oetiker.com">info.ch@oetiker.com</a></td>
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</tr>
</tbody>
</table>