

Stationary tool for installing strap clamps
OETIKER FAST 3000

Operating Instructions

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Item no. 08903979 Oetiker Schweiz AG, Horgen, Switzerland



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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.

Symbol	Meaning
>	One-step instruction
1 2 3	Multi-step instruction Carry out the steps in the order shown.
✓	RequirementNecessary or labor-saving steps for the successful execution of an action.



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
- Jaws kit for CFM verification on the FAST 3000 (optional)

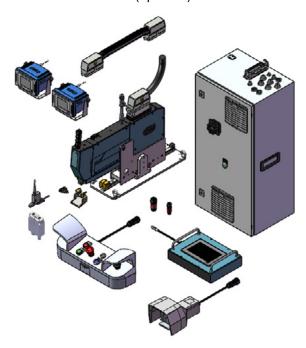


Fig. 1 FAST 3000



1.2.2 Rating plates



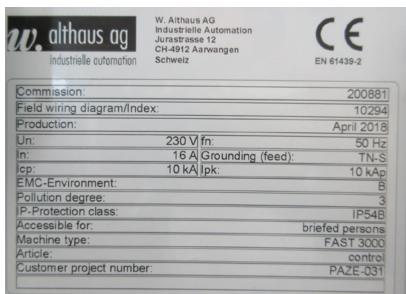


Fig. 2 Rating plates

1.3 Abbreviations

N	Newton	S	seconds
mm	millimeters	ms	milliseconds
ka	kilogram	CFM	Crimpina Force Monitorina

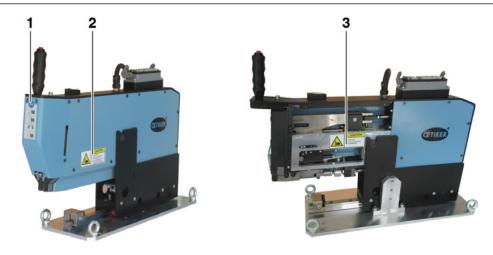


Stickers on the FAST 3000 1.4



▲ CAUTION

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



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

- Wear safety glasses! 1
- 2 Crush hazard!
- 3 Crush hazard!





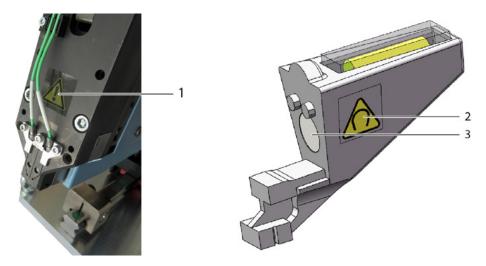


Fig. 4 Stickers (1, 2) on the crimping cut-off head and alignment aid

- 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.

OETIKER FAST 3000 Basic safety instructions

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 my 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.

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



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.



OETIKER FAST 3000

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.

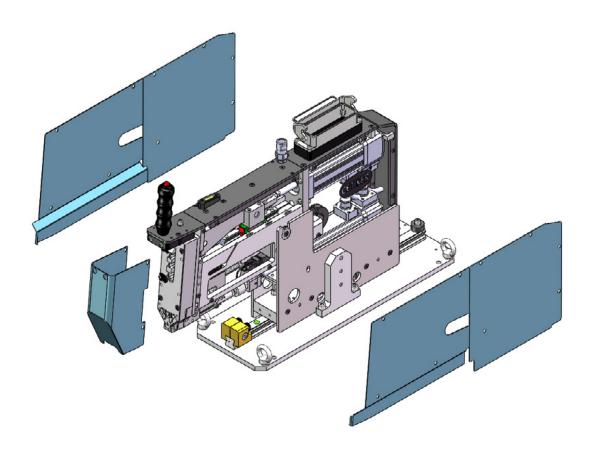


2.4 Covers



CAUTION

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



Protective covers on the FAST 3000 Fig. 5

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 my 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:

Personnel Use/operation	Operator	Maintenance mechanic	Electrician
Installation/decommissioning	×	✓	✓
Transport/storage	×	✓	✓
Commissioning without the optional two-hand control desk / without the optional touch panel	×	×	√
Commissioning with the optional two-hand control desk / with the optional touch panel	×	✓	×
Normal operation	✓	✓	✓
Removal/installation of the crimping cut-off head	×	✓	✓
Maintenance of the crimping cut-off head	×	✓	✓
"Manual mode" operation	×	✓	✓
Error correction	×	✓	✓
Removal of the covers	×	✓	✓
Opening the control cabinet	×	×	✓
Replacing parts	×	✓	✓

Explanation: \checkmark = permitted \times = 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.

Basic safety instructions



OETIKER FAST 3000

"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 "Operator" 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

OETIKER FAST 3000 Basic safety instructions

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.

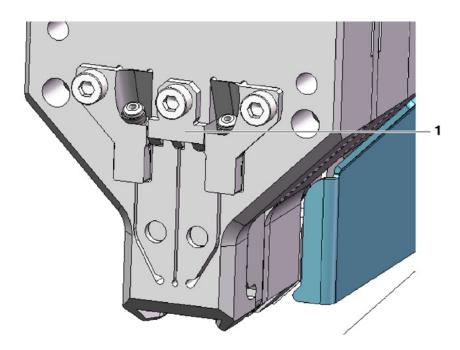


Fig. 6 Overload protection (1) of the crimping cut-off head

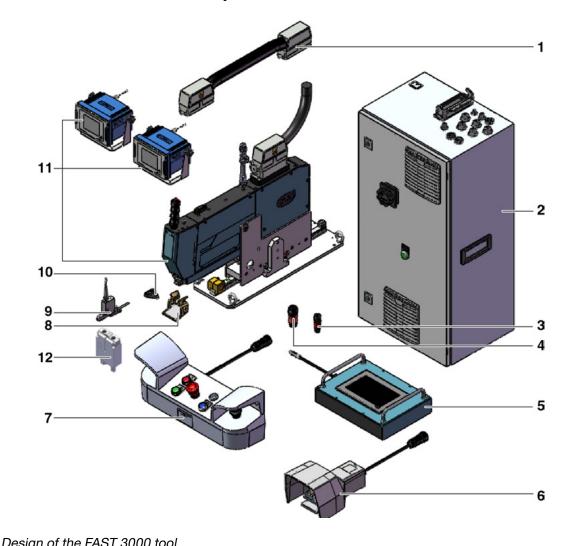
2.12 Noise level

In normal operation a maximum noise level of 75 dBA can be expected.



Scope of supply of the FAST 3000 tool 3

Overview of the main components of the FAST 3000 3.1



rig. 1	Design of the PAST 3000 tool		
1	Connecting cable	7	Two-hand control desk / optional
2	Control cabinet	8	Jaws checking mirror
3	Two-hand dongle, thin	9	Closing force verification unit can
4	Two-hand dongle (emergency stop two-hand		calibrator (not shown) / optional
	control desk, used if the two-hand control desk	10	Alignment aid
	is not connected)	11	Installation tool with crimping force
5	Touch panel / optional		devices
6	Foot pedal / optional	12	Jaws kit for CFM verification on the

- mirror erification unit can CAL 01 shown) / optional
- ol with crimping force monitoring
- M verification on the FAST 3000 / optional



3.2 Available main configurations

Configuration	Scope of supply
OETIKER FAST 3000 + CFM - EtherNet/IP Part number 13500209	
Oetiker FAST 3000 with CFM and EtherNet/IP The tool is supplied with a tool carrier	
OETIKER FAST 3000 + CFM - PROFINET Part number 13500210	
Oetiker FAST 3000 with CFM and PROFINET The tool is supplied with a tool carrier	



3.3 Optional extras

Option	Scope of supply
Two-hand control desk Part number 13500002 Two-hand control desk for autonomous operation of the FAST 3000.	808
Touch panel, complete Part number 13500278 Touch panel for controlling the FAST 3000 if no laptop or supervisory controller is used.	
Foot pedal Part number 13500105 Foot pedal to allow hands-free use of the FAST 3000 during tests or in the laboratory.	
Test Equipment CAL01 CAL01 qualified UK / engl-de / SKS01-1500mm Part number 13600384 Test equipment for verification of the closure force and crimping force	
Test Equipment CAL01 CAL01 qualified USA / engl-es / SKS01-1500mm Part number 13600385 Test equipment for verification of the closure force and crimping force	
Test Equipment CAL01 CAL01 qualified CN / engl-de / SKS01-1500mm Part number 13600386 Test equipment for verification of the closure force and crimping force	



OETIKER FAST 3000

Option	Scope of supply
Test Equipment CAL01 CAL01 qualified EURO / de-engl / SKS01-1500mm Part number 13600387 Test equipment for verification of the closure force and crimping force	
Verification unit PG135 Part number 13500232	()
Adapter jaws for verification of the closing force. The CAL 01 must be ordered separately.	
Jaws kit for CFM verification on the FAST 3000	A
Part number 13500237 For CFM verification The CAL 01 must be ordered separately.	
Connecting cable cpl. 1m 2x180° Part number 13500277	
Connecting cable cpl. 1.5m 2x180° Part number 13500291	

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.

NOTE

More information on the different steps is provided in Section 6.6.



4.1 Design of the tool mechanism

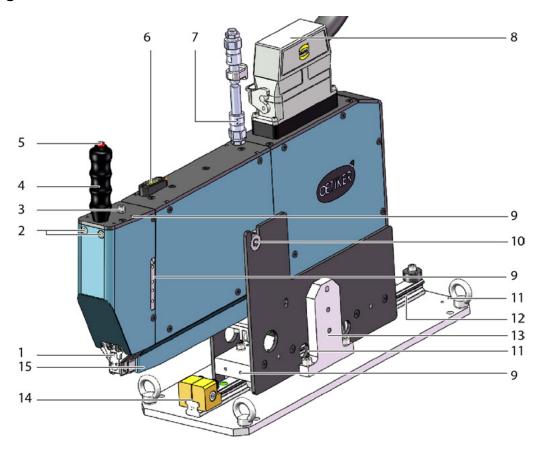


Fig. 8 Tool mechanism of the FAST 3000

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.



OETIKER FAST 3000

6	Spirit level	Using the spirit level it can be checked that the tool is correctly positioned vertically (see Section <i>6.5</i>).
7	Sleeve for the sensor signal cable for crimping monitoring	Sleeve that contains the sensor signal cables for crimping monitoring. The cables are directly connected to the crimping force monitoring device.
8	Connecting cable between the tool and control cabinet	Connecting cable between the tool mechanism and control cabinet
9	Tapped hole for attachments	This is available for customer applications such as installation of sensors or of a second handle
10	Pivot point for the tilting motion	This permits easy insertion of the WingGuard® clamp into the strap end slot.
11	Tapped hole (concealed)	This can be used for instance to mount the customer's positioning cylinder.
12	Linear guide	This permits each insertion of the WingGuard® clamp into the strap end slot. Achievement of the correct setting position must always be guaranteed.
13	Transport restraint	This must be installed for transporting the mechanism. For normal operation the transport restraint must be removed.
14	Positioning stop	The purpose of the stop is to ensure the correct horizontal positioning of the tool mechanism in the setting position.
15	Strap end discharge duct	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.



Design of the FAST 3000 crimping cut-off head 4.2



A 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.

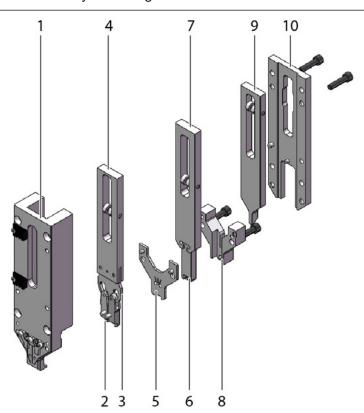


Fig. 9 Crimping cut-off head

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





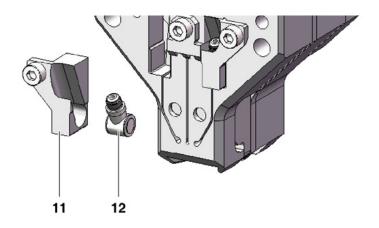


Fig. 10 Particulars of the crimping cut-off head: CFM force load cell and its brackets

- 11 Force sensor bracket
- 12 Crimping force sensor

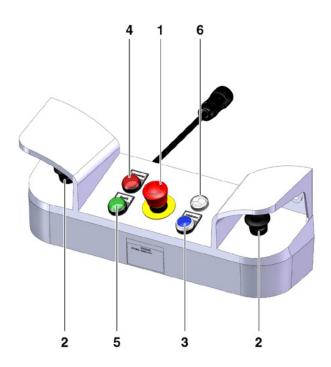


Two-hand control desk (option) 4.3



▲ 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 Fig. 11

- 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 while initialization is in progress.
- Acknowledgement button ("Acknowledge"; to display and acknowledge closures that are not OK, and 4 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.

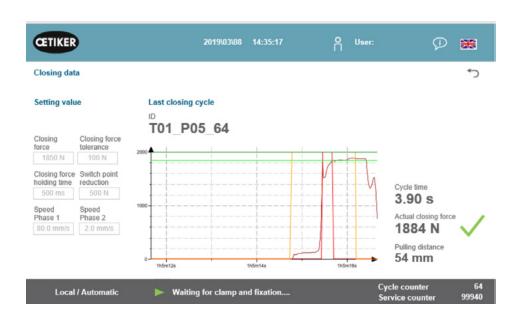


Fig. 12 Closure data table



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 pulling 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.

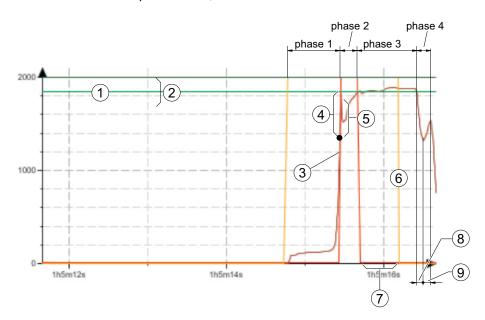


Fig. 13 Force control phases (Example, shows a target of closing force of 1850 N)

- 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 pulling 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 ± 150 N

5.1.4 Switch point reduction

Sets the force to a value less than the set closing force. At that point the pulling 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

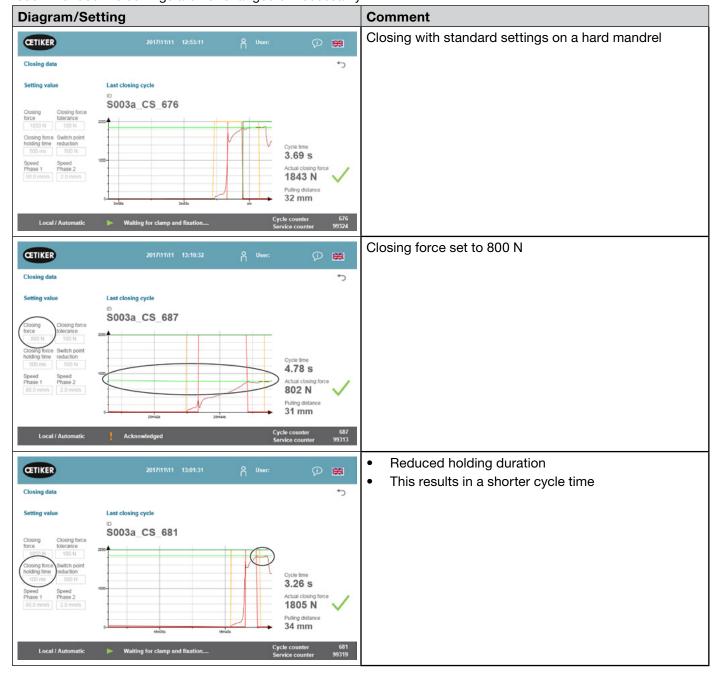
Some applications require a specific applied force and a specific period of time, so that the components are ideally connected. With the FAST 3000, the user can adjust this period of time.

In general, soft materials require a longer holding time than harder ones.

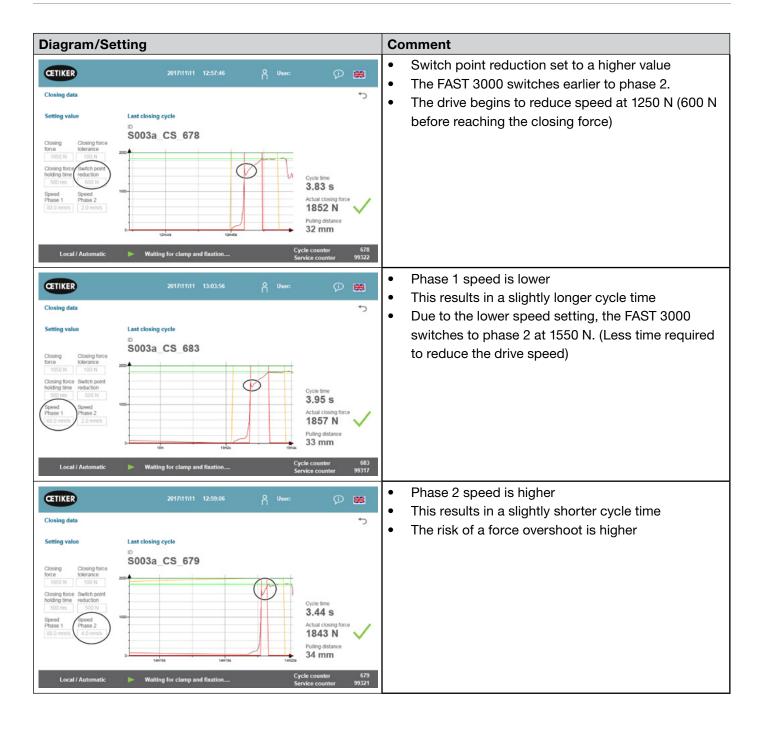


5.1.8 Sample curves with different closing force parameters

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



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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)

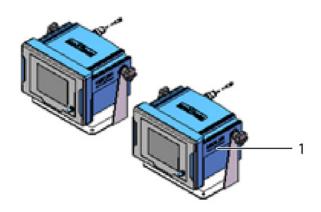


Fig. 14 Crimping force monitoring devices

- 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 FAST 3000 PLC. The FAST 3000 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.



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.

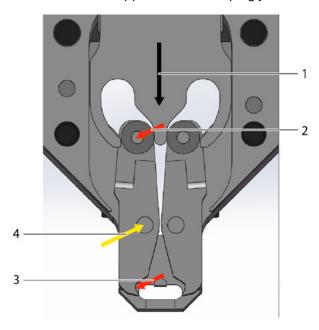


Fig. 15 Application of force to on the crimping jaws

- 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.

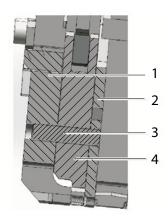


Fig. 16 Force transmission level, lateral sectional view through the crimping head

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

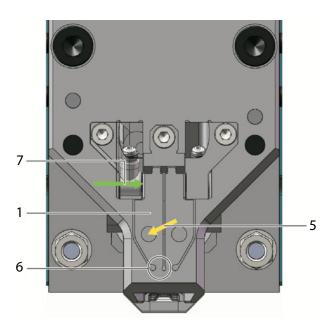


Fig. 17 Front view of the crimping cut-off head with force transmission levers

- 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 measured by the crimping force sensor (leverage principle)



5.2.3 CFM: Typical OK force curve

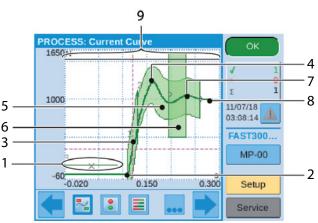


Fig. 18 OK force curve

- 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

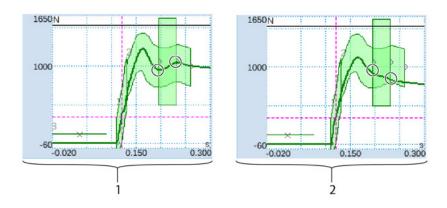


Fig. 19 Wear detection

- 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 5-48 to page 5-51). 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 (-40 N is the standard setting, adjustable range –100 to +100 N). Information on how to adjust the tol. wear value, see Section 7.4.7.

Formula:

If Exit Force – Entry Force > Threshold value, 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:

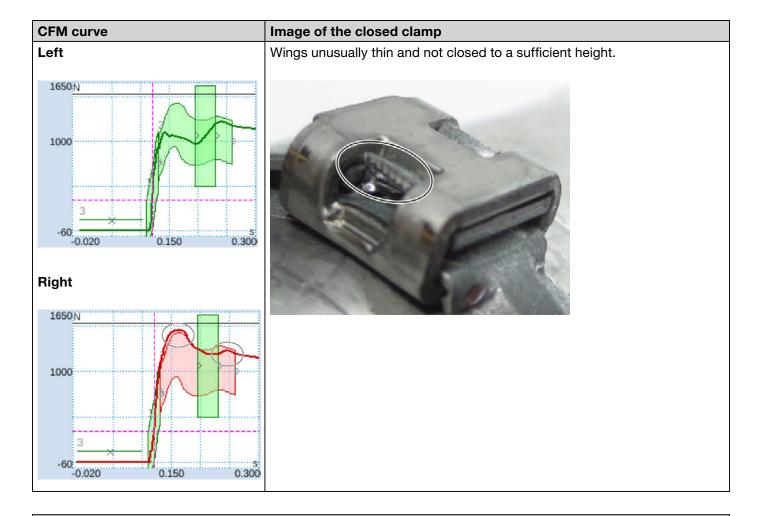


• measuring the closing gap of the Crimping cut-off head in mounted condition (Refer to maintenance manual for information about how to measure the closing gap).

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



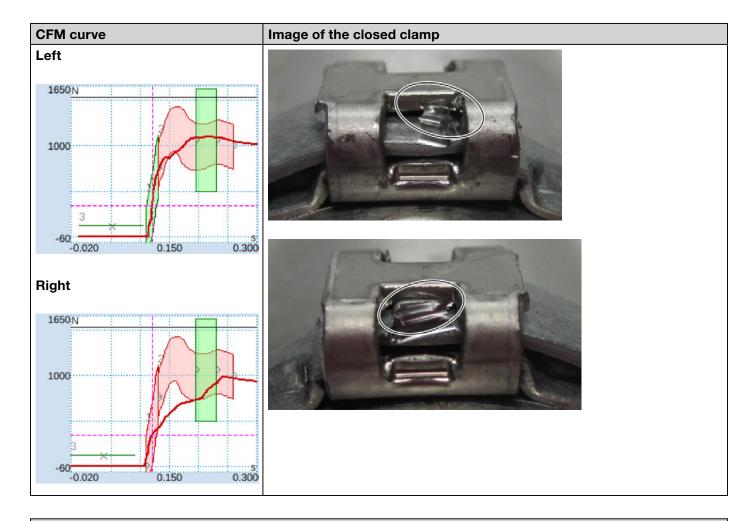
Description

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

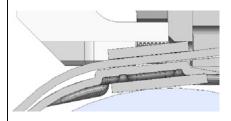


- Second envelope curve (EO 2) right (Troubleshooting "PrErr_308: Crimping error CFM2 envelope curve 2")
- Wear detection right (Troubleshooting "PrErr_310: Crimping error CFM2 wear")



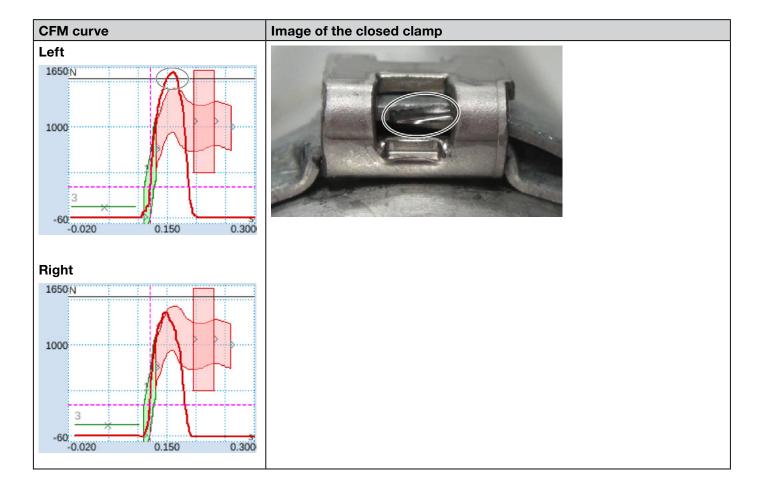


During wing closure the clamp housing was not parallel to the crimping cut-off head.

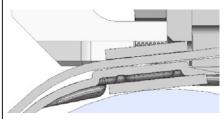


- First envelope curve (EO 1) right (Troubleshooting "PrErr_307: Crimping error CFM2 envelope curve 1")
- Second envelope curve (EO 2) left (Troubleshooting "PrErr_304: Crimping error CFM1 envelope curve 2")
- Second envelope curve (EO 2) right (Troubleshooting "PrErr_308: Crimping error CFM2 envelope curve 2")





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.

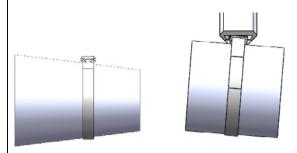
- Second envelope curve (EO 2) left (Troubleshooting "PrErr_304: Crimping error CFM1 envelope curve 2")
- Second envelope curve (EO 2) right (Troubleshooting "PrErr_308: Crimping error CFM2 envelope curve 2")
- Uni-Box (EO 4) left (Troubleshooting "PrErr_304: Crimping error CFM1 envelope curve 2")
- Uni-Box (EO 4) right (Troubleshooting "PrErr_308: Crimping error CFM2 envelope curve 2")







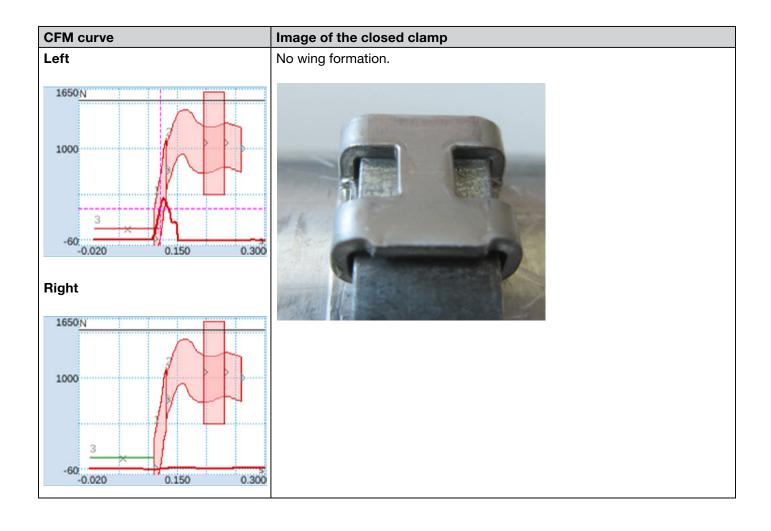
Slanting application; the right side is lower than the left side. Closure of the clamp on an oblique solid surface.



The following criteria have led to the not OK evaluation:

Second envelope curve (EO 2) right (Troubleshooting "PrErr_308: Crimping error CFM2 envelope curve 2")

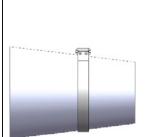


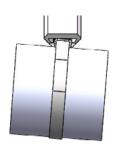


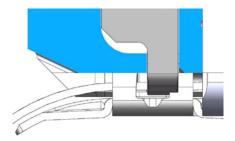




- Slanting application; the right side is lower than the left side. Closure of the clamp on an oblique solid surface.
- Foreign Object leads to a gap between cut off punch and WingGuard® housing, therefore there is a collision between the FAST 3000 crimp jaw and the WingGuard® housing.



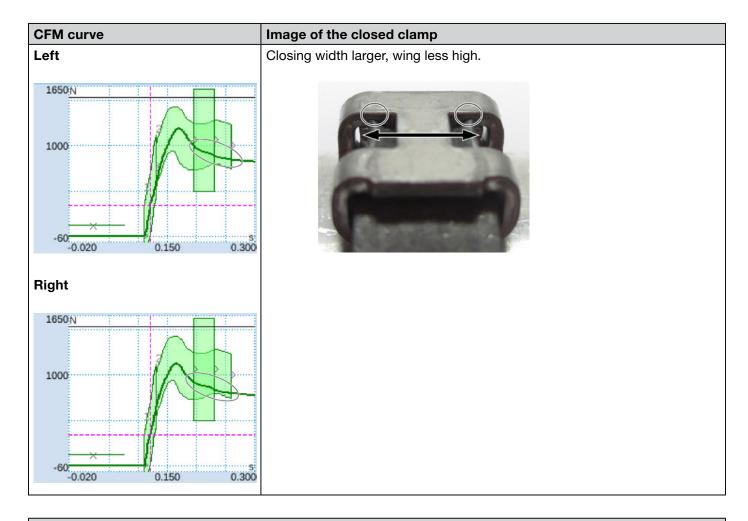




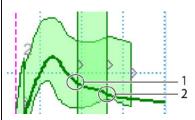
The crimping process is terminated due to the premature increase in force, in order to prevent damage to the crimping jaws.

- No-Pass (EO 3) left (Troubleshooting "PrErr_305: Crimping error CFM1 NoPass")
- First envelope curve (EO 1) left (Troubleshooting "PrErr_303: Crimping error CFM1 envelope curve 1")
- First envelope curve (EO 1) right (Troubleshooting "PrErr_307: Crimping error CFM2 envelope curve 1")
- Second envelope curve (EO 2) left (Troubleshooting "PrErr_304: Crimping error CFM1 envelope curve 2")
- Second envelope curve (EO 2) right (Troubleshooting "PrErr_308: Crimping error CFM2 envelope curve 2")
- Uni-Box (EO 4) left (Troubleshooting "PrErr_304: Crimping error CFM1 envelope curve 2")
- Uni-Box (EO 4) right (Troubleshooting "PrErr_308: Crimping error CFM2 envelope curve 2"





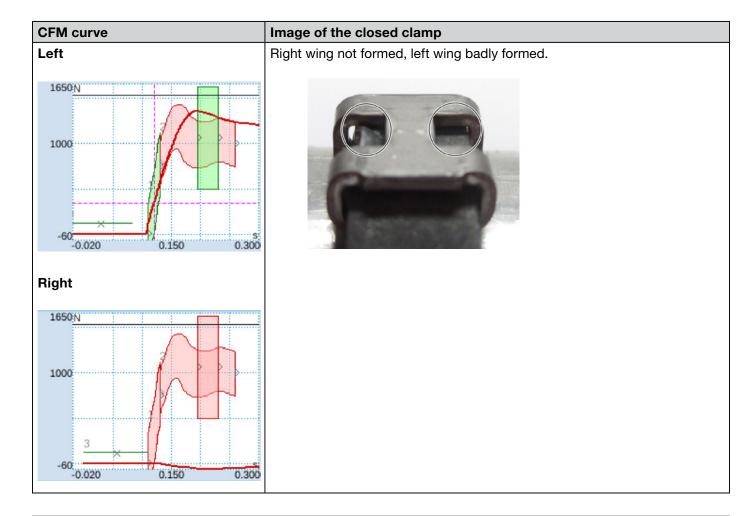
Closing with simulated wear (closing gap 3.4 mm. Refer to maintenance manual for information about how to measure the closing gap.)



The FAST 3000 PLC checks if 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 Section 5.2.4*.

- Wear detection left (Troubleshooting "PrErr_306: Crimping error CFM1 wear")
- Wear detection right (Troubleshooting "PrErr_310: Crimping error CFM2 wear")





Right crimping jaw completely broken off.



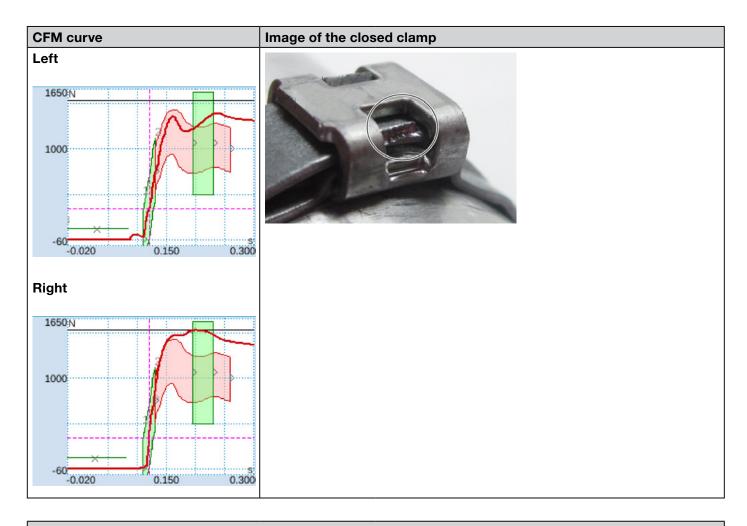
In comparison to good jaws:



(Example image)

- First envelope curve (EO 1) right (Troubleshooting "PrErr_307: Crimping error CFM2 envelope curve 1")
- Second envelope curve (EO 2) left (Troubleshooting "PrErr_304: Crimping error CFM1 envelope curve 2")
- Second envelope curve (EO 2) right (Troubleshooting "PrErr_308: Crimping error CFM2 envelope curve 2")
- Uni-Box (EO 4) right (Troubleshooting "PrErr_308: Crimping error CFM2 envelope curve 2")
- Wear detection left (Troubleshooting "PrErr_306: Crimping error CFM1 wear")
- Wear detection right (Troubleshooting "PrErr_310: Crimping error CFM2 wear")





Right crimping jaw partially broken off:

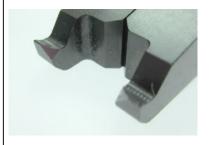


- Second envelope curve (EO 2) left (Troubleshooting "PrErr_304: Crimping error CFM1 envelope curve 2")
- Second envelope curve (EO 2) right (Troubleshooting "PrErr_308: Crimping error CFM2 envelope curve 2")
- Wear detection right (Troubleshooting "PrErr_310: Crimping error CFM2 wear")





Both jaws partially broken off:



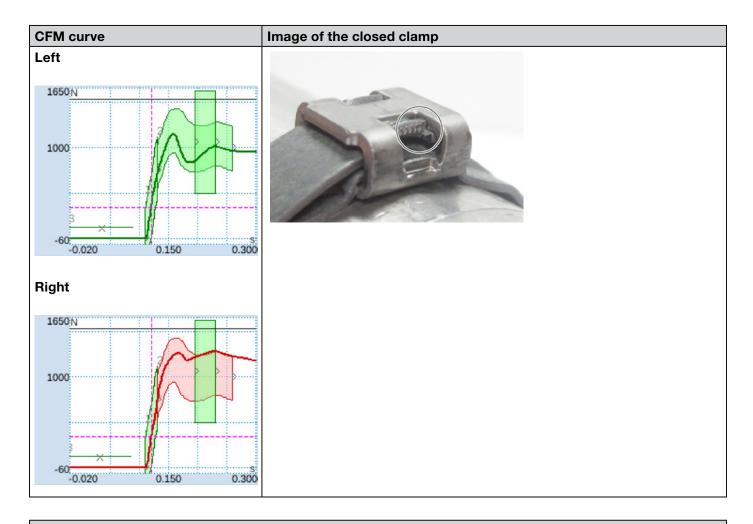
In comparison to good jaws:



The follow "PrErr_308: Crimping error CFM2 envelope curve 2"ng criteria have led to the not OK evaluation:

• Second envelope curve (EO 2) right (Troubleshooting "PrErr_308: Crimping error CFM2 envelope curve 2")



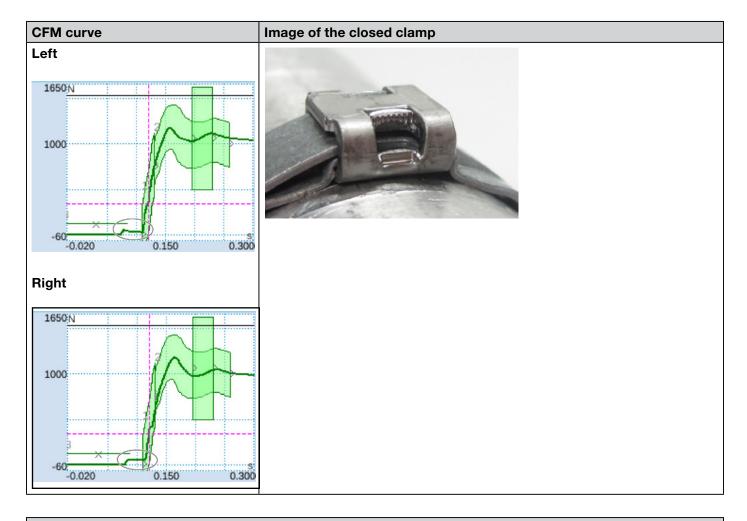


Right jaw partially broken off:



The followi "PrErr_308: Crimping error CFM2 envelope curve 2"g criteria have led to the not OK evaluation: Second envelope curve (EO 2) right (Troubleshooting "PrErr_308: Crimping error CFM2 envelope curve 2")

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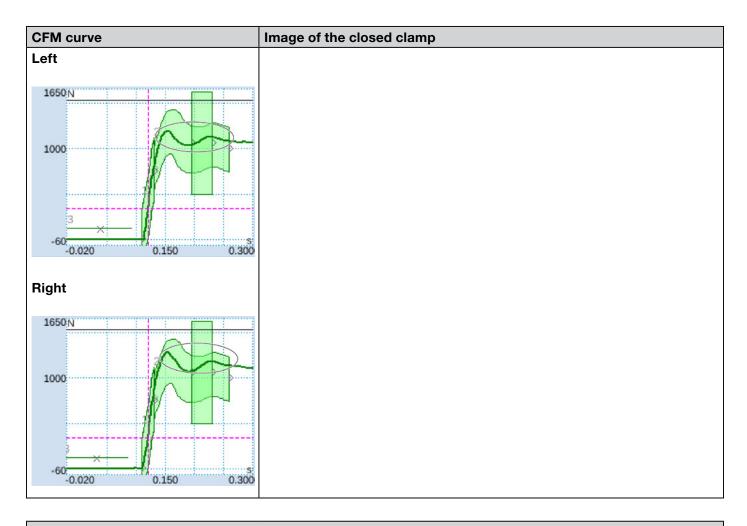
Description

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

Lock is still OK!

For information about the correct tightening torque refer to Section 9.3.3.



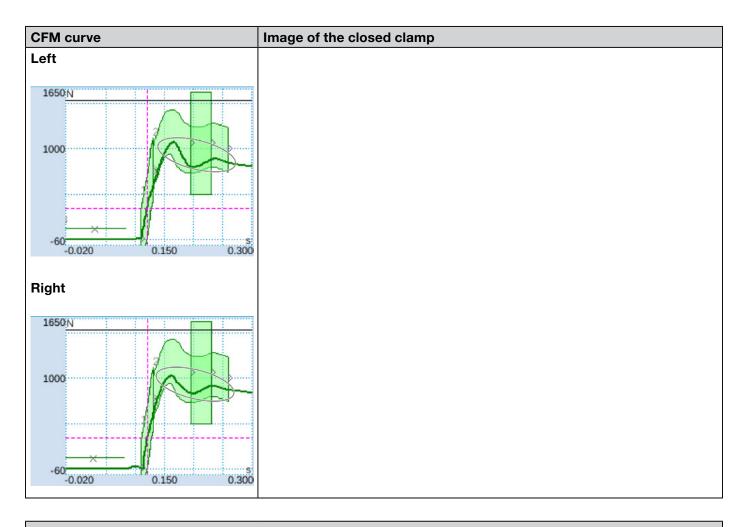


Closing force set to 800 N instead of the standard setting of 1850 N. CFM force level greater than at 1850 N, due to the in general lower stress level in the clamp band.

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

As a comparson, check the pictures on the next page





Closing force set to 2500 N instead of the standard setting of 1850 N. Due to the generally higher stress level in the clamp band, the CFM force level is lower than with the standard 1850-N setting.

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

As a comparson, check the pictures on the page before

5.3 Cut-off monitoring

The FAST 3000 PLC checks the force acting on the load measuring cell, while 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.



Working with the FAST 3000 6



▲ 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 crimping cut-off head is correctly installed. Use only crimping 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.



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CAUTION

Risk of insufficient closure quality due to incorrect routing of the connecting cable

When closing a WingGuard® clamp the WingGuard® strap clamp housing of the tool head must be pressed gently against the parts to be connected.

Lay the connecting cable so that the crimping cut-off head tilts downwards.

The commissioning procedure of the FAST 3000 includes the following steps:

- 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 to 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.

Close a few test clamps to determine the functionality of the tool.



6.2 Connections to the control cabinet

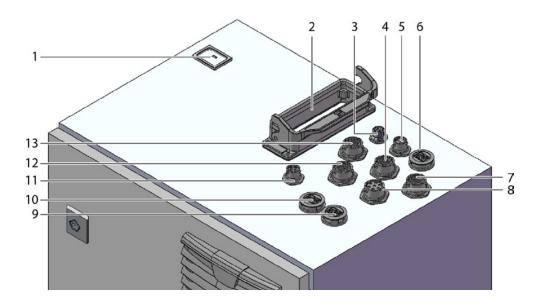


Fig. 20 Connections to the control cabinet

- 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)
- External emergency stop (if this port is not connected to an external emergency stop the thin two-hand dongle must be plugged in.)
- Two-hand control desk (if no two-hand control desk is connected the two-hand dongle must be plugged in, see Section *3.3*)
- 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.

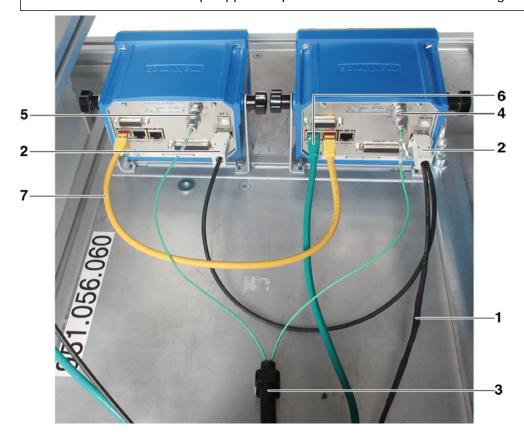


Fig. 21 Control unit, connections

- 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).
- 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 EtherCAT connection (use the "Fieldbus In" port of the left hand CFM device)
- RJ-45 cable connecting the "Fieldbus Out" socket od 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

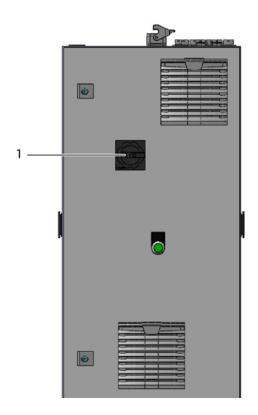
NOTE

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.

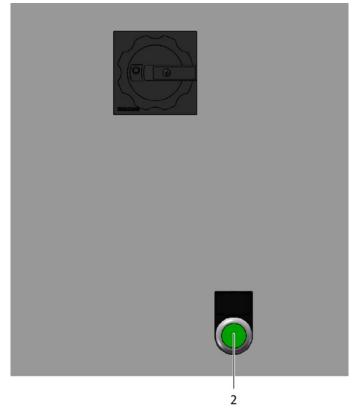




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 Wait until the FAST 3000 PLC has booted up. After the blue illuminated button on the two-hand control desk has started to flash, press the green button (2) on the control cabinet door.

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 is not active, the power cannot be switched on (see Sections 7.4.7 and 10.1.3).



- 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



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.

- Many different mounting conditions are possible. Therefore, you must check the correct alignment of the WingGuard® strap clamp. For this purpose, you must install test clamps after the initial setup.
- ► 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 (see *Fig. 27*).
- In order to obtain the full benefit of the WingGuard® strap clamp, the WingGuard®-housing must be supported by the application (see *Fig. 22* and *Fig. 24*).
- ► The WingGuard® strap clamp must not be mounted on a conical surface (see Fig. 25).
- ▶ 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 must be installed in an upright position.

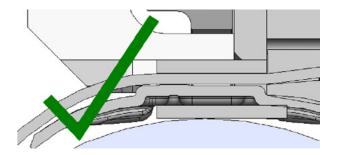


Fig. 22 Example of correct installation of the WingGuard® housing and the crimping cut-off head (both are parallel)



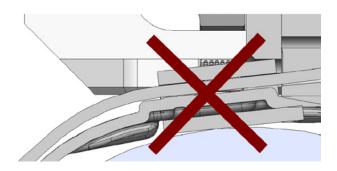


Fig. 23 Example of an incorrect non-parallel alignment of the WingGuard®-housing and of the crimping cut-off head

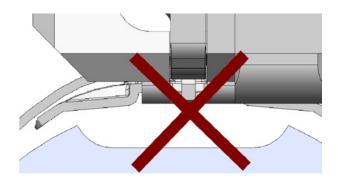


Fig. 24 Impermissible positioning of the WingGuard® housing on an application

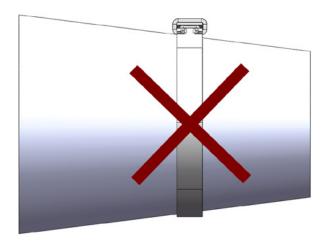
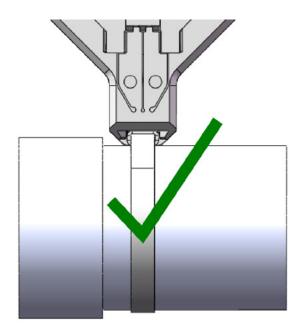


Fig. 25 Impermissible application of the WingGuard® strap clamp on a conical surface





Kein

Fig. 26 The crimping cut-off head must be at a sufficient distance from the application. No collision with the application.

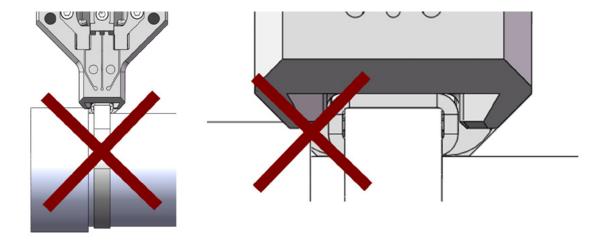


Fig. 27 The crimping cut-off head collides with the application Impermissible application. The same is true if two WingGuard® strap clamps are fitted too close to each other.



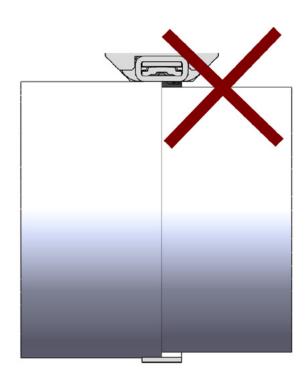


Fig. 28 Do not mount the WingGuard® strap clamp on a stepped application

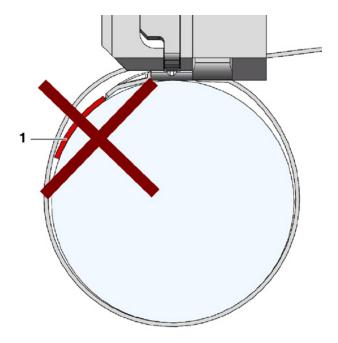


Fig. 29 Avoid contact between the end face of the strap and the goods being strapped (example: goods being strapped (1))





6.5.2 Positioning of the FAST 3000 installation tool with the alignment aid

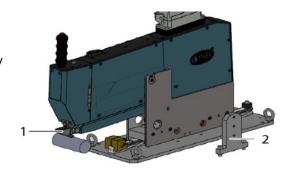


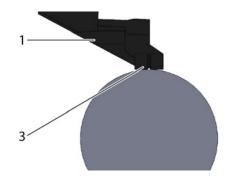
⚠ WARNING

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.

- Ensure that the base plate of the FAST 3000 is aligned horizontally.
- 2. Fix the customer application in the nest provided by the customer. 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.

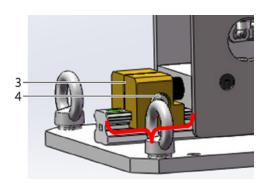


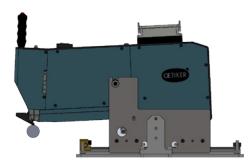




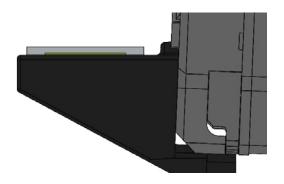


 Make sure that the FAST 3000 has sufficient space (~ 50 mm) for attaching the positioning stop (3) to the guide rail.





- 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 the 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.





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- 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

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

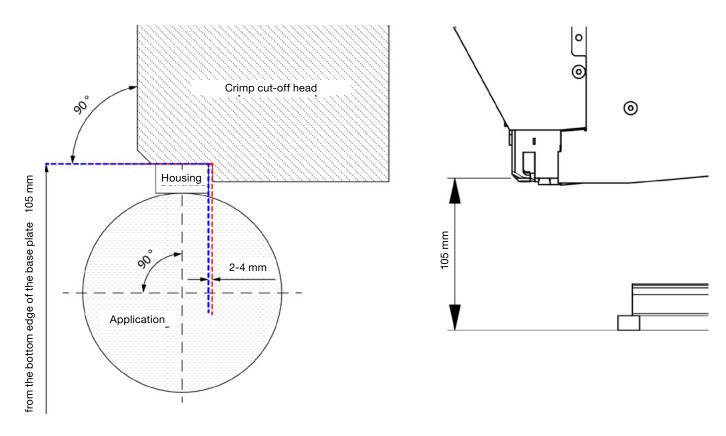
CAUTION

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
- The crimping cut-off head and the clamping unit 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.
- Ensure suitable design of the customer-provided waste channel.
- 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.



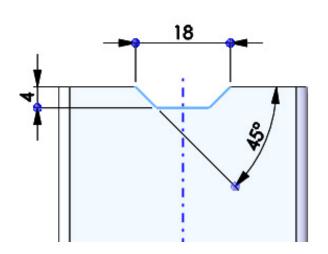


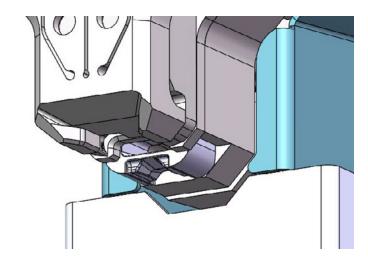
Comment: On request, Oetiker will provide a 3D-CAD model of the FAST 3000.

Waste channel design

It must be ensured that no foreign parts touch the clamping unit and distort the measured closing force. Among other things, this concerns the customer-provided waste channel. The below illustrations show the recommended design of the waste channel.







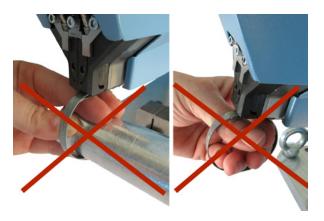
6.6 **Normal operation (production)**

⚠ 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

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 while it is in operation.





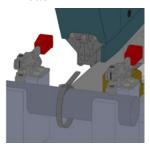
▲ CAUTION

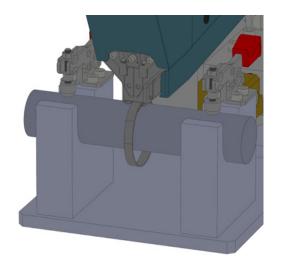
Danger due to parts being flung from the machine.

If parts become defective while 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 nest provided by the customer.
- 3. Hold the machine by the handle and pull it in the direction of the clamp. When doing so, guide the tail of the OETIKER PG270 WingGuard® strap clamp into the bottom slot on the crimping cut-off head.



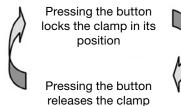


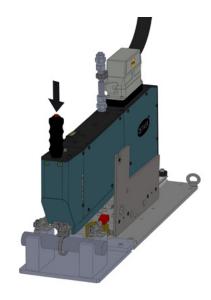




4. Push the OETIKER PG270 WingGuard® strap clamp into the tool as far as possible.

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 clamp tail 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 tail must be pushed in further and locked again.

NOTE

Risk of an increased error rate.

- Do not touch the FAST 3000 until the closure procedure is completed.
- 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.





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NOTE

After a defective clamp closure, always check the crimping jaws for damage.

NOTE

If the tail sensor detects no tail, the clamping push button is deactivated.

NOTE

You must depress both start buttons quickly and simultaneously. Otherwise the warning "War_2 Check button contacts occurs" 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.



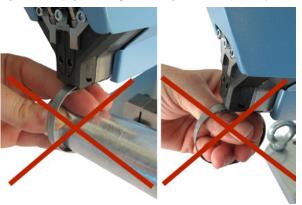


⚠ WARNING

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 while it is in operation.







CAUTION

Danger due to parts being flung from the machine.

If parts fracture while the machine is in operation, parts may become loose and be flung from the machine.

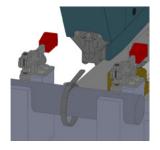
During operation and maintenance of the machine, always wear safety glasses.

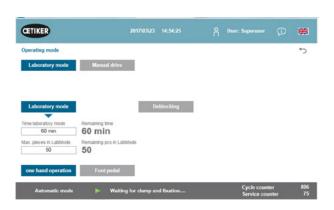
NOTE

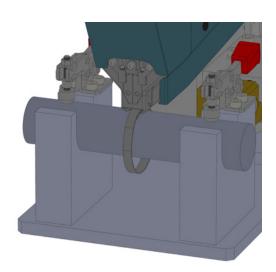
Only one laboratory mode can ever be activated at a time. Depending on the setting you can then initiate a cycle by pressing a start button or pressing the foot pedal.

6.7.1 One-hand operation

- 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 as Superuser.
- Place the clamp around the parts to be connected.
- Hold the machine by the handle and pull it in the direction of the clamp. When doing so, guide the tail of the OETIKER PG270 WingGuard® strap clamp into the bottom slot on the crimping cut-off head.





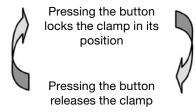


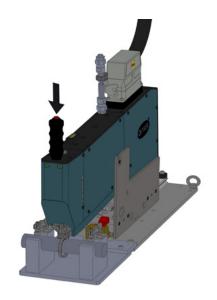




5. Push the OETIKER PG270 WingGuard® strap clamp into the tool as far as possible.

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 tail, 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 clamp tail 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 tail must be pushed in further and locked again.

NOTE

Risk of an increased error rate.

- Do not touch the FAST 3000 until the closure procedure is completed.
- Start the installation. Press either the left-hand or right-hand button on the two-hand control desk for at least 2.5 seconds.

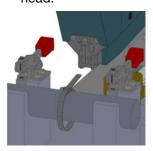
After the buzzer has sounded 3 times the clamp will start to close. Once the closure procedure is complete, the clamp is released again.

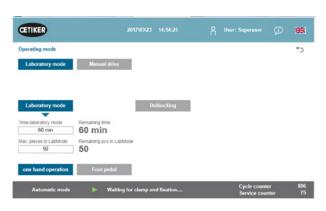


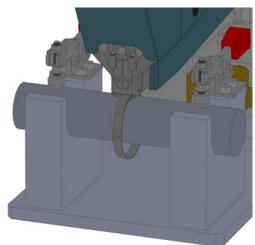


6.7.2 Foot pedal

- 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 as Superuser.
- 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 tail of the OETIKER PG270 WingGuard® strap clamp into the bottom slot on the crimping cut-off head.





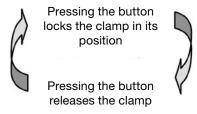


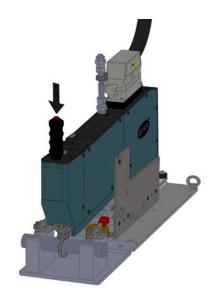




5. Push the OETIKER PG270 WingGuard® strap clamp into the tool as far as possible.

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 tail, the locking button will not work.

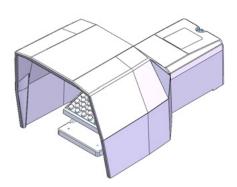
Once the strap is locked (as shown by the two LEDs on the front cover lighting up continuously) the installation of the OETIKER PG270 WingGuard® strap clamp can start.

If the clamp tail 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 tail must be pushed in further and locked again.

NOTE

Risk of an increased error rate.

- ▶ Do not touch the FAST 3000 until the closure procedure is completed.
- 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.





Special operating modes (password-protected) 6.8

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.

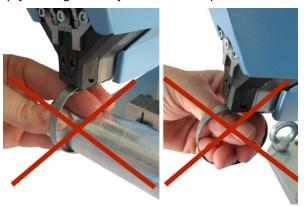


▲ WARNING

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 while it is in operation.







CAUTION

Danger due to parts being flung from the machine.

If parts fracture while 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

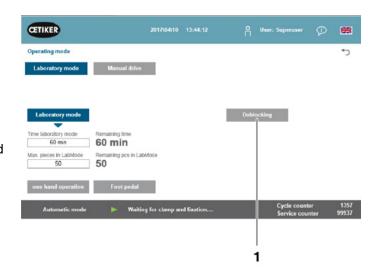
NOTE

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.

- Switch to the "operating mode" tab. 1.
- 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

NOTE

Possible damage to the FAST 3000

In this mode, the jaw overload protection feature is not active.

- 1. Activating operating mode.
 - Switch to "operating mode" and activate "manual drive".
 - In order to access manual drive mode you must be logged in as Superuser.
- Control the drives by pressing one of the pre-defined positions (1, 2).
 For further Information see Section 7.4.3.





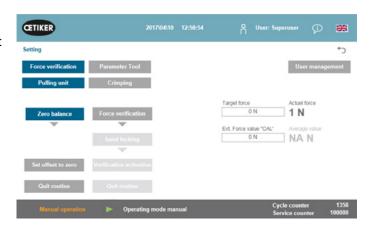


6.8.3 Setting the force offset to zero

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 at least be logged in as Operator.
- 2. Select "Force verification" and "Pulling unit"
- Start the procedure by pressing "Zero balance".
 - 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

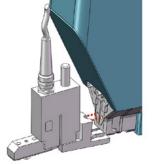
To check the correct operation of the force load cell, verify the measured force at least once a week, using an Oetiker CAL 01.

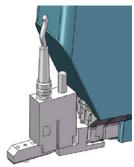
If the force is set to 1850 N, the force measured by the CAL 01 must be within a tolerance of \pm 60 N of that value. The pulling strap should be replaced after about 50 verifications.

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 at least logged in as Operator.
- 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.





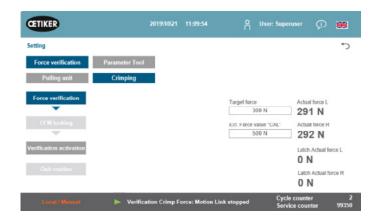




6. Press the button at the top of the handle.



- 7. Press on "Target force" to change the verification force to the desired value.
- 8. Press on "Verification activation".
- 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.
- 12. If the force measured by the CAL 01 is outside the tolerance, see Section 9.5 for further procedure.





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 \pm 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 at least be logged in as Operator.
- 2. Press the "Force verification" button.
- 3. Press the "Crimping" button.
- 4. Press the "Force verification" button.
- Set the "force target value" to the desired value, e.g. 800 N.
- 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 SKS01 in this position.
- 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.
- 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.
- Press "Quit routine".
 The values are written to the relevant log file.







6.8.6 Adjusting 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.

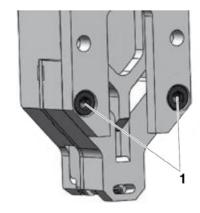
NOTE

Before making any adjustments, make sure that there is no problem other than the clamp batch. This is done by the following tests:

- Visual inspection of the crimping jaws. No chips or visible wear.
- Check the tightening torque of the two marked screws (1): Target 7–9 Nm.
- Remove the crimping force sensors; check to see that the area where they are mounted is free from particles. Reinstall the sensors.
- Measure the distance between the crimping jaws:
 Target 3 ±0.1 mm (see Section 9.2.5).
- Check the CFM correlation factor:
 On both CFM devices perform Setup / Global / Channel-Y /
 Channel-Y / Right arrow. The sensitivity should be about
 -1.2 pC/N.
- Check the crimping force (see Section 5.2.1).
- Set the closing force in Newtons: 1850 N
- Use the closing force verification unit to check the closing force (see Section 6.8.4).
- Check th positioning of the FAST 3000 installation tool (12 o'clock position) (see Section 6.5).

It is strongly recommended to use for EO 2, the second envelope curve, a smaller value for DY, for example 180. It is likely, that these adapted curves will lead in production after a while to an increased rate of NOK closures again, due to variations of the WingGuard® strap clamp. In this case, check first if the standard settings work well. A backup of the standard settings can be found on the monitoring devices under MP15, measurement program 15.

Use the copy and paste function on the CFM devices.





NOTE

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

Teaching the crimping force monitoring

be logged in as Superuser.

Each monitoring device must be set separately.

 Select "Settings" and "Parameter Tool" on the FAST 3000 touch panel.
 Select "CFM Teaching mode".
 In order to access CFM Teaching mode you must



Separately on each of the two crimping force monitoring devices:

- 2. Select "Setup" on the welcome screen.
- 3. Log in as Superuser (password-protected).
- 4. Select "MP Setup".
- 5. Select MP-00.





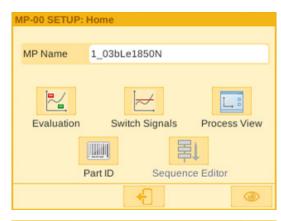


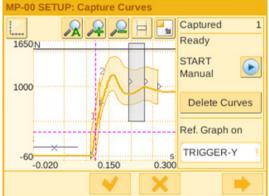
6. Select "Evaluation".

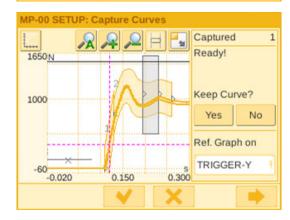
 If the message "Retain the curve" appears on the screen, select "No".
 Select "Delete the curve".

8. Close a WingGuard® strap clamp.

- 9. If the WingGuard® strap clamp closes correctly, press "Yes", otherwise press "No".
- 10. Repeat steps 11 and 12 four times, in order to record at least five OK reference curves.
- 11. Select the button "Forwards"





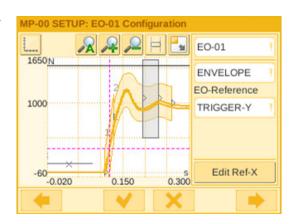


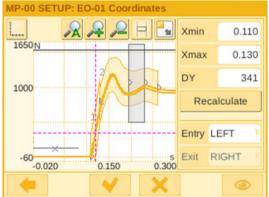


- 12. Select the EO that you wish to change (01 or 02 for the envelope curves).
- 13. Select the button "Forwards"
- 14. If necessary, adjust the evaluation tolerance by editing DY.
- 15. Select "Recalculate".



- 17. Confirm the new settings by pressing the check
- 18. Press the button twice to return to the welcome screen.
- After the teaching process, deactivate the mode again. If this is not done, the relevant pop-pup window will appear periodically.
- 20. On the touch panel of the FAST 3000: Be sure to set "CFM Production mode" to "On".
- Log out of the FAST 3000 and also log out of the FAST 3000 as Superuser.









Adjusting the crimping force monitoring tolerance

Each monitoring device must be set separately.

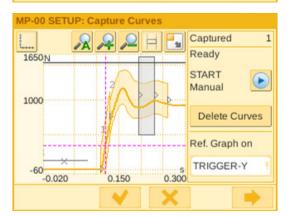
- 1. Select "Setup" on the welcome screen.
- 2. Log in as Superuser (password-protected).

- 3. Select "MP Setup".
- 4. Select MP-00.
- 5. Select "Evaluation".



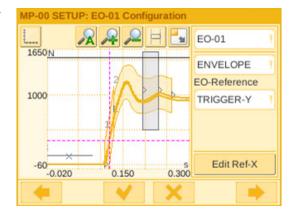






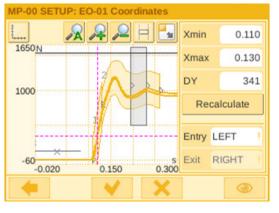


- 7. Select the EO that you wish to change (01 or 02 for the envelope curves).
- 8. Select the button "Forwards"



- 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.





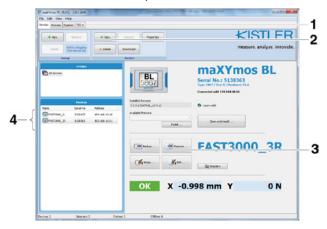
6.8.7 Loading new settings/measurement programs to the CFM units

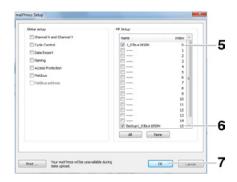
NOTE

If Oetiker recommends an optimized setting of the CFM devices, this setting can be transferred to the CFM devices according to the following procedure.

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 is available. The software is part of the FAST 3000 scope of delivery.
- √ The CFM settings file must be available in zip format. The file is provided by Oetiker.
- ✓ An Ethernet cable must be available.
- Connect the laptop to the CFM device, using a LAN cable. Use the Ethernet port of the CFM device.
- 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.
- 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.
- Select the settings to be loaded on the CFM device and deselect all others. The measuring programs
 (5) and 15 (6) are activated by default.
- 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.





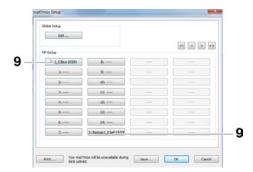


Only on the CFM device for the right-hand side:

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.

Touch Panel 7.1

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

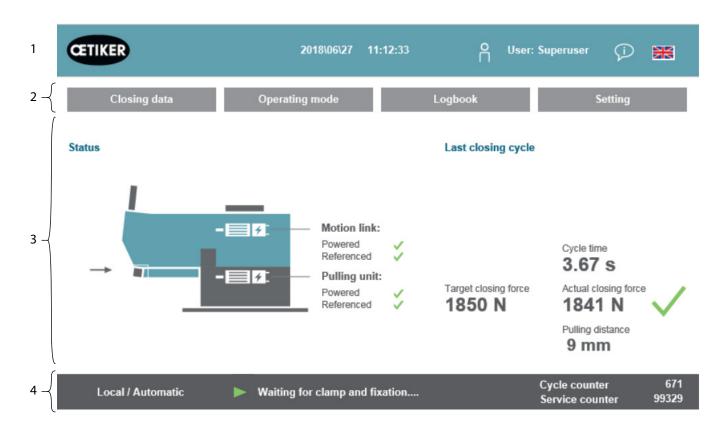
You can connect the FAST 3000 to any standard computer or laptop with a RJ45 network port and a web browser.

- 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.
- 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

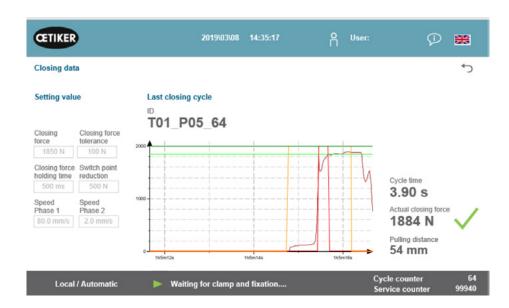


1	- Arrow	- No WingGuard® strap clamp present in the FAST 3000	
	- Symbol for the	- WingGuard® strap clamp present in the FAST 3000	
	WingGuard® strap clamp		
2	Status	Shows the status of the two electrical drives of the FAST 3000	
3	Operating mode	Automatic mode or manual operation of drives; local or PLC	
4 Messages Error messages etc.		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	Pulling 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.



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	Pulling 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.

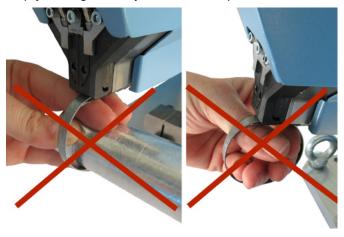


⚠ WARNING

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 while it is in operation.





△ CAUTION

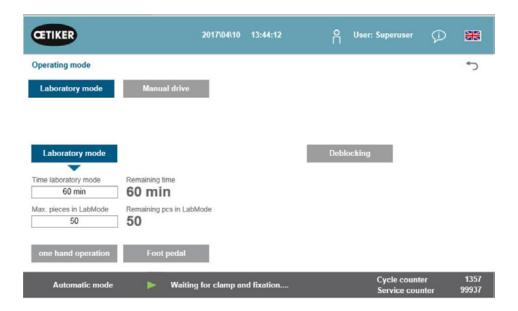
Danger due to parts being flung from the machine.

If parts become defective while 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.



Laboratory mode (password-protected)



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



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.

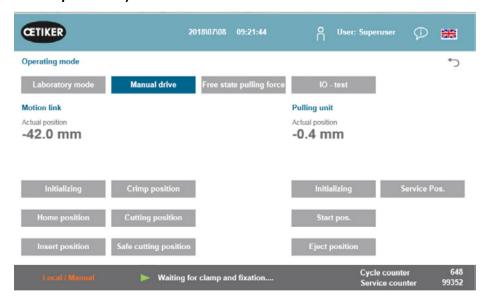
▲ CAUTION

Damage to the device due to improper use of the manual mode.

Before each use of the commands "Crimp position" or "Cutting position" make sure that nothing is between the jaws.



Manual mode (password-protected)



Motion link (left-hand side)

Initializing	Initializing the motion link: Setting the zero
Home position	Motion link in the home position (if there is a WingGuard® strap clamp in the clamping unit, this is secured.)
Insert position	Motion link in the position that allows the clamp to be inserted
Crimp position	Motion link in the crimping position
Cutting position	Motion link in the cutting position
Safe cutting position	Motion link moves directly into the cutting position, skips the crimping position
Actual position	Position of the motion link in millimeters

Pulling unit (right-hand side)

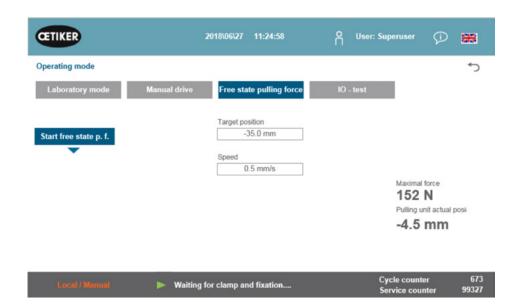
	·
Initializing	Initializing the pulling unit: Setting the zero point
Start pos.	Pulling unit in the start position
Eject position	Pulling unit in the position that allows the remaining strap to be ejected
Actual position	Position of the pulling unit in millimeters
Service pos.	Pulling unit in the position that allows the strap sensor to be set



7.4.4 Free state pull force test

NOTE

The operating mode "Free state pull force 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.



Start freestate p.f.	Start of the free state pull force test
Target position	End position of the pulling motor during the free state pull force test
Speed	Speed of the pulling unit during the free state pull force test
Maximum force	Maximum force applied during the free state pull force test
Pulling unit actual posi.	Pulling unit actual position



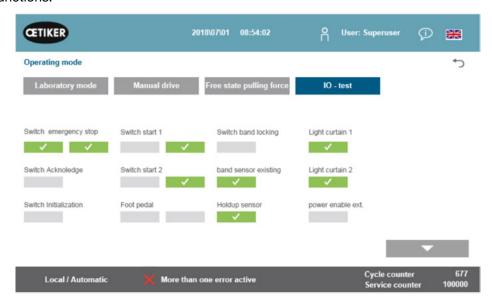
Sequence of the free state pull force test

- ✓ The FAST 3000 must be referenced.
- 1. Activate the function by pressing the "Start free state pull force test" button.
- 2. Insert the clamp.
- 3. Fix the clamp by pressing the button on the handle of the tool.
- 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 pulling force applied during this time is determined. At the end, the strap is cut off.



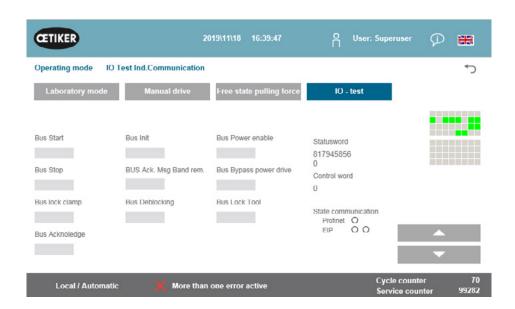
7.4.5 IO Test

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.



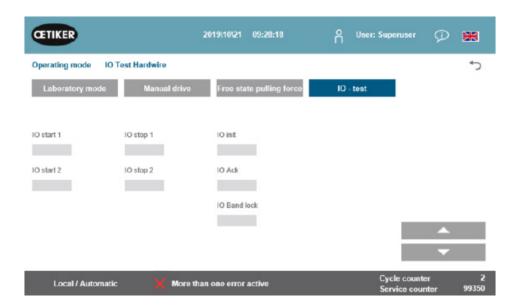
Switch emergency stop	Status of the 2-channel emergency stop circuit; two-hand control desk and external emergency stop switch
Switch Acknowledge	Red acknowledgement button on the two-hand control desk
Switch Initialization	Blue initialization switch on the two-hand control desk
Switch start 1	2-channel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





Bus Start	Start command v	ria Profinet or Ethernet/IP
Bus Stop Stop command v		ia Profinet or Ethernet/IP
Bus lock clamp Locking the clam		ps via Profinet or Ethernet/IP
Bus Acknowledge	Acknowledgment	t of error messages via Profinet or Ethernet/IP
Bus Init	Initializing via Profinet or Ethernet/IP	
Bus Ack. Msg Band rem.	Acknowledgment	of the message "Remove strap" via Profinet or Ethernet/IP
Bus Power enable	Enable connection of the power supply to the motors from the supervisory system via Profinet or Ethernet/IP	
Bus Bypass power drive	Connection of the power supply to the motors from the supervisory system via Profinet or Ethernet/IP	
Bus Deblocking	Deblocking of the tool via Profinet or Ethernet/IP	
Statusword	Status words (status word 1 and status word 2) generated by the tool (32-bit integer value)	
Control word	Control word sent by the external control unit to the FAST 3000.	
State communication	Status of	Green: The controls are connected to a supervisory control unit
	the Profinet communication	White: The controls are not connected to any other control unit
	Status of the	Green (1): The controls are connected to a supervisory control
	Ethernet/IP	unit
	communication	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 start 1	Hardwire I/O start channel 1
I/O start 2	Hardwire I/O start channel 2
I/O stop 1	Hardwire I/O stop channel 1
I/O stop 2	Hardwire I/O stop channel 2
I/O init	Hardwire I/O initializing
I/O Ack	Hardwire I/O acknowledgement
I/O Band lock	Hardwire I/O strap clamp





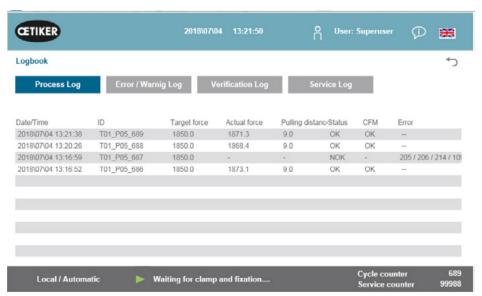
EtherCAT running	Green: Bus EtherCAT is running
	Red: Bus EtherCAT is not running
PACIO_01	Green: IO module1 OK
	Red: IO module1 fault
PACIO_02	Green: IO module2 OK
	Red: IO module2 fault
ClipX	Green: ClipX amplifier OK
	Red: ClipX amplifier fault
L7NH	Green: Servo drive motion link OK
Motion link	Red: servo drive motion link fault
L7NH	Green: Servo drive pulling unit OK
Pulling unit	Red: servo drive pulling unit fault
CFM1	Green: CFM1 (1st Kistler device) OK
	Red: CFM1 (1st Kistler device) fault
CFM2	Green: CFM2 (2nd Kistler device) OK
	Red: CFM2 (2nd Kistler device) fault



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.



Date/Time	Data and time of the installation
ID	Identification ID of the closure
Target force	Target force value in Newtons
Actual force	Pulling force actual value in Newtons
Pulling distance	Pulling travel in mm when closing the WingGuard® strap clamp
Status	Closing status as viewed by the tool, evaluated by control of the installation tool (OK or not OK) based on pre-defined values
СҒМ	OK or not OK from the crimping force monitoring. "-", if the CFM is not in production mode
Error	Error number if the closure was not OK; the error are listed, e.g. 205 / 206 / 214 /



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.

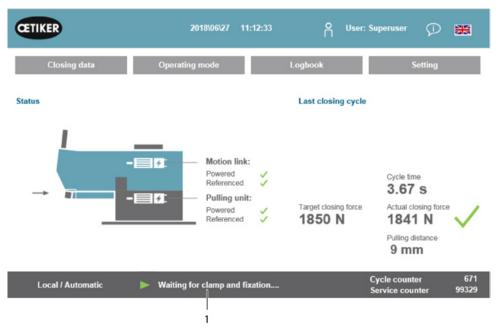


See Sections 7.4.9 and 13.3 for detailed information about the individual error messages.

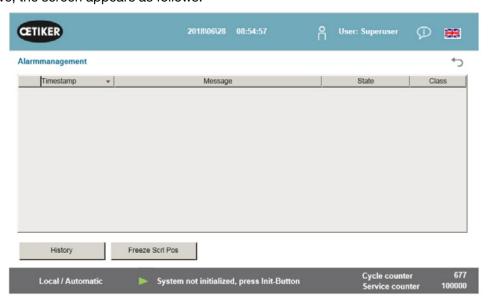


Alarm management

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.

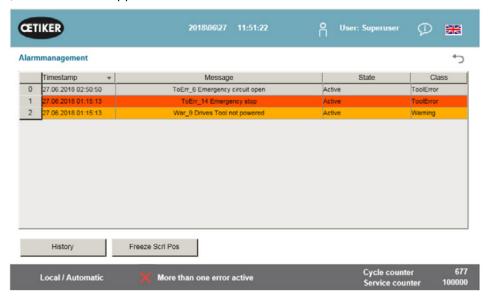


If no alarm is active, the screen appears as follows:





If alarms are active, the screen can appear as follows:



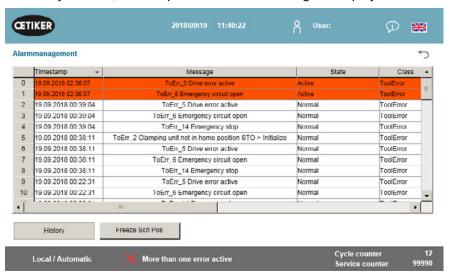
If only one alarm is active, the error is shown as a message in the status bar. If several alarms are active, the message "Several errors active" is shown.

Colored: There are alarms that are active and not acknowledged been acknowledged.

Not colored: There are alarms outstanding which have been acknowledged.

To acknowledge the alarms, press the Acknowledge button or the Initialization 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:





Verification log

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



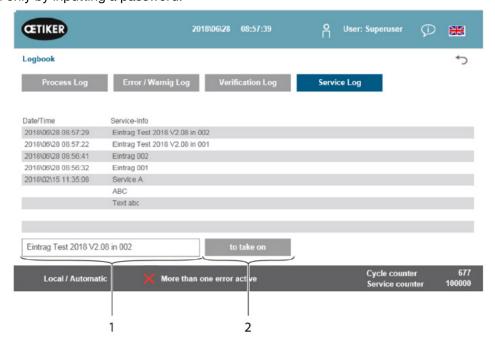
If a value is listed only for force 1, this is a tensioning force verification. The scaling factor is listed for the correlation factor to convert the PLC force sensor input signal into the closing force (see Section 9.5.2).

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.

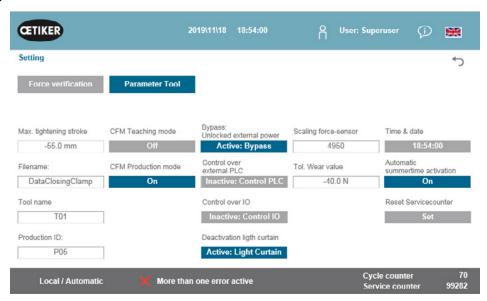


To create a new Service log entry, write the text in the field (1) in the bottom left corner and press "enter" (2).



7.4.7 Setting

Tool parameters



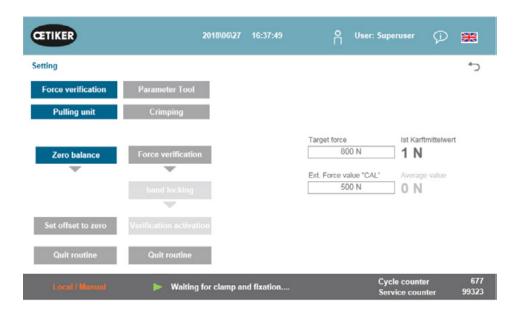
Max. tightening stroke	Maximum pulling travel of the clamping unit. The maximum pulling travel limits the	
	maximum diameter reduction of the WingGuard® clamp.	
Filename	Name of the data file stored on the USB stick	
Tool name	Name of the tool (part of the data record ID)	
Production ID	Name of the production batch (part of the data record ID)	
CFM Teaching mode	Production mode (the FAST 3000 PLC does not evaluate the output of the CFM monitoring devices)	
CFM Production mode	Production mode (the FAST 3000 PLC evaluates the output of the CFM monitoring devices)	
Bypass	Bypass the external power unlock signal.	
Deactivate light curtain	Select "Light curtain inactive" if no light curtain is present.	
Control over external PLC	Select this button in order to control the FAST 3000 via an external PLC	
Control over I/O	Select this button in order to control the FAST 3000 via I/O	
Time & Date	Setting the date and time	
Automatic summertime activation	Select "On" to switch to daylight saving time automatically	
Reset Servicecounter	Resets the Service counter to zero after a Service	
Scaling force-sensor	Scaling of the pulling force sensor (the factor should lie between 4750 and 5200)	
Tol. Wear value	Limit for the error message of the wear value. See Section 5.2.4	



Force verification / Zero offset

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.

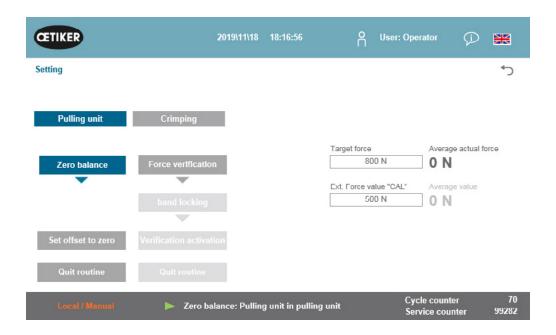
Force verification	Changes to the verifier force tab	
Pulling unit	Changes to the pulling unit verification force tab	
Zero balance	Activates the zero offset function	
Set offset to zero	Press the button to change the current setting to zero	
Quit routine	Quit the zero offset routine	
Actual force	Displays the actual force measured by the force load cell, in Newtons	



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 at least be logged in as Operator.

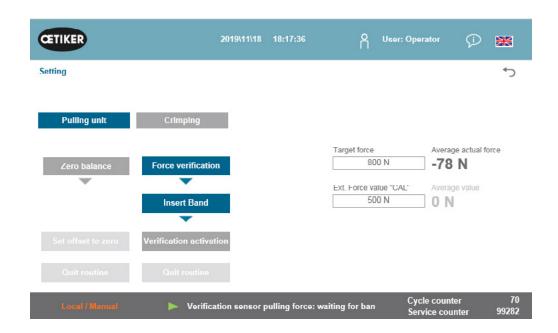
Force verification	Changes to the verifier force tab	
Pulling unit	Changes to the pulling unit verification force tab	
Force verification	This activates the force verification routine	
band locking	Indicates that the pulling strap is locked (the locking must be performed using the button on the handle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



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.)



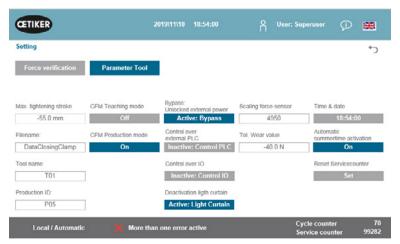
For crimping force monitoring verification you must at least be logged in as operator.

Force verification	Changes to the verifier force tab	
Crimping	Changes to the crimping force verification tab	
Force verification	This activates the force verification routine	
CFM locking	This activates the force verification	
Target force	Set the verification force in Newtons; FAST 3000 stops the force increase as soon as the first force sensor detects this force	
Force L/R	Currently measured force, in Newton	
Testing active	Indicates that the force verification is being performed	
(Latch Actual force L/R)	Displays the force measured by the force load cells, in Newton. The force value determined during the measurement phase of the verification is displayed	
Ext. force value "CAL"	The force value that is input is read by the CAL 01 and is logged in the verification record	
Quit routine	Quits the force verification routine	



Setting the date and time

To set the date and time using the GUI, select "Settings" and "Parameter tool" on the FAST 3000 touch panel. In the "Parameter Tool" menu,, click on the "Date & Time" button.



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



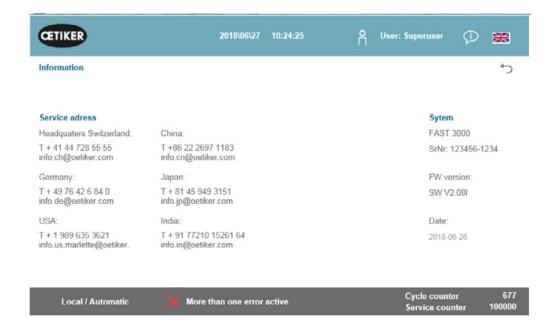
Input the current date and time.

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.

NOTE

The errors are grouped as follow:

100-199: Warnings. These are not affecting wheter a closure is evaluated as OK. 200-299: Tool error. These are not affecting wheter a closure is evaluated as OK. 300-399: Process error. All process errors cause the closure to be evaluated as NOK.

Error	Description	Class/Severity	See Section
number			
101	War_101 Error acknowledged	Warning	13.3.1
102	War_102 Check button contacts	Warning	
103	War_103 No output voltage .> Press Start / Init	Warning	
104	War_104 Kistler devices warning error	Warning	
105	War_105 Service due soon	Warning	
106	War_106 Service due	Warning	
108	War_108 Modus CFM teach-in active	Warning	
109	War_109 Drive tool not powered	Warning	
110	War_110 Press Start	Warning	
111	War_111 Remove strap	Warning	
201	ToErr_201 Strap present -> Rectify & Ack	Tool error	13.3.2
202	ToErr_202 Clamping unit not in STO home position STO-> New Init	Tool error	
204	ToErr_204 Position sensor defective	Tool error	
205	ToErr_205 Drive error active	Tool error	
206	ToErr_206 Emergency Stop circuit open	Tool error	
207	ToErr_207 Light curtain active during the initialization routine	Tool error	
208	ToErr_208 Verify crimping force error in phase 1	Tool error	
209	ToErr_209 Verify crimping force error in phase 2	Tool error	
210	ToErr_210 Verify crimping force: No force increase	Tool error	
211	ToErr_211 Check strap end disposal	Tool error	
212	ToErr_212 CFM general warning / error	Tool error	
213	ToErr_213 Check pulling force sensor	Tool error	
214	ToErr_214 Emergency stop	Tool error	
216	ToErr_216 Drive tool pulling force loss during operation	Tool error	



Error number	Description	Class/Severity	See Section
301	PrErr_301 Maximum pulling travel exceeded	Process error	13.3.3
302	PrErr_302 Maximum pulling time exceeded	Process error	
303	PrErr_303 Crimping CFM1 envelope curve 1	Process error	
304	PrErr_304 Crimping CFM1 envelope curve 2	Process error	
305	PrErr_305 Crimping CFM1 NoPass	Process error	
306	PrErr_306 Crimping CFM1 wear	Process error	
307	PrErr_307 Crimping CFM2 envelope curve 1	Process error	
308	PrErr_308 Crimping CFM2 envelope curve 2	Process error	
309	PrErr_309 Crimping CFM2 NoPass	Process error	
310	PrErr_310 Crimping CFM2 wear	Process error	
311	PrErr_311 General error at crimping	Process error	
312	PrErr_312 Error at cutting off	Process error	
313	PrErr_313 Force overshoot	Process error	
315	PrErr_315 Closing force outside tolerance	Process error	
316	PrErr_316 Max force when the light curtain breached	Process error	
317	PrErr_317 Max force movement in ejection position exceeded	Process error	
318	PrErr_318 Process cancellation	Process error	
319	PrErr_319 Max force reach on stop through bus	Process error	
11016	Servo pulling unit: IPM error	Drive error	
11017	Servo pulling unit: IPM temperature	Drive error	
11020	Servo pulling unit: Overcurrent	Drive error	
11021	Servo pulling unit: Current offset	Drive error	
11022	Servo pulling unit: Current limit exceeded	Drive error	
11033	Servo pulling unit: continually overloaded	Drive error	
11034	Servo pulling unit: Drive temperature 1	Drive error	
11035	Servo pulling unit: Overload on regeneration	Drive error	
11036	Servo pulling unit: Motor cable not connected	Drive error	
11037	Servo pulling unit: Temperature 2	Drive error	
11038	Servo pulling unit: Encoder temperature	Drive error	
11048	Servo pulling unit: Encoder communication error	Drive error	
11049	Servo pulling unit: Encoder cable not connected	Drive error	
11050	Servo pulling unit: Encoder data error	Drive error	
11051	Servo pulling unit: Motor settings	Drive error	
11052	Servo pulling unit: Z phase not connected	Drive error	
11053	Servo pulling unit: Low battery level	Drive error	



Error number	Description	Class/Severity	See Section
11054	Servo pulling unit: Sine ENC	Drive error	
11055	Servo pulling unit: Sine frequency	Drive error	
11056	Servo pulling unit: Encoder setting error	Drive error	
11064	Servo pulling unit: Undervoltage	Drive error	
11065	Servo pulling unit: Overvoltage	Drive error	
11066	Servo pulling unit: Interruption in power supply	Drive error	
11067	Servo pulling unit: Interruption in control voltage	Drive error	
11080	Servo pulling unit: Speed overshoot	Drive error	
11081	Servo pulling unit: POS following	Drive error	
11083	Servo pulling unit: Large SPD deviations	Drive error	
11099	Servo pulling unit: Checksum error	Drive error	
11113	Servo pulling unit: Error in the factory settings	Drive error	
12016	Servo lever: IPM error	Drive error	
12017	Servo lever: IPM temperature	Drive error	
12020	Servo lever: Overcurrent	Drive error	
12021	Servo lever: Current offset	Drive error	
12022	Servo lever: Current limit exceeded	Drive error	
12033	Servo lever: Continuously overloaded	Drive error	
12034	Servo lever: Drive temperature 1	Drive error	
12035	Servo lever: Overload on regeneration	Drive error	
12036	Servo lever: Motor cable not connected	Drive error	
12037	Servo lever: Temperature 2	Drive error	
12038	Servo lever: Encoder temperature	Drive error	
12048	Servo lever: Encoder communication error	Drive error	
12049	Servo lever: Encoder cable not connected	Drive error	
12050	Servo lever: Encoder data error	Drive error	
12051	Servo lever: Motor settings	Drive error	
12052	Servo lever: Z phase not connected	Drive error	
12053	Servo lever: Low battery level	Drive error	
12054	Servo lever: Sine ENC	Drive error	
12055	Servo lever: Sine frequency	Drive error	
12056	Servo lever: Encoder setting error	Drive error	
12064	Servo lever: Undervoltage	Drive error	
12065	Servo lever: Overvoltage	Drive error	
12066	Servo lever: Interruption in power supply	Drive error	



Error	Description	Class/Severity	See Section
number			
12067	Servo lever: Interruption in control voltage	Drive error	
12080	Servo lever: Speed overshoot	Drive error	
12081	Servo lever: POS following	Drive error	
12083	Servo lever: Large SPD deviations	Drive error	
12099	Servo lever: Checksum error	Drive error	
12113	Servo lever: Error in the factory settings	Drive error	

7.4.10 Access rights

	User		
Rights	"none" = status at switch-on	Operator	Superuser
Closing force parameter	×	×	✓
Parameter Tool	×	×	✓
Process protocol	✓	✓	✓
Error / warning protocol	✓	✓	✓
Verification protocol	×	×	✓
Service logbook	×	×	✓
Unlocking function	×	✓	✓
Laboratory mode	×	×	✓
Manual operation (manual operation)	×	×	✓
Friction test	×	×	✓
I/O test	×	×	✓
Force verification	×	✓	✓

Explanation: \checkmark = access \times = 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.

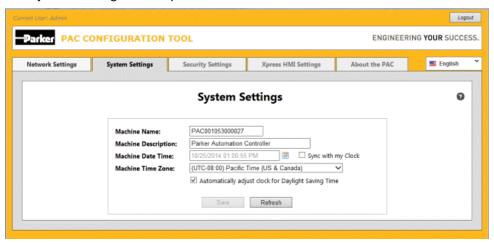


The IP address that is set is used both for the Ethernet TCP/IP and also for the Ethernet/IP (industrial communication).



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.



Maintenance and replacement of parts 9

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 while 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.
- 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.



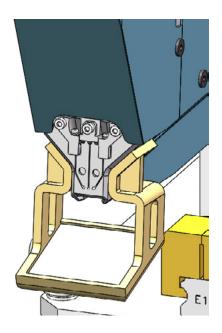
9.2.3 Regular checking of the status



▲ 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.



Use the mounted jaws checking mirror to check the crimping jaws Fig. 30

- The closing force must be verified every week (see Section 6.8.4).
- We recommend that the force offset is verified every week (see Section 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

Service	Service interval / Performed by	Parts to be replaced	Maintenance activities	Time required
A	100,000 cycles CUSTOMER or Oetiker	Crimping jaws kit (part number 13500112)	 Replace the crimping jaws Rotate the cut-off die through 180° Clean and lubricate the tool head 	10 minutes
В	200,000 cycles CUSTOMER or Oetiker	 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) 	 A-service Replacing parts Clean and lubricate the clamping unit 	40 minutes
С	2,000,000 cycles Exclusively by Oetiker: Please contact your OETIKER representative.	Parts involved in the 200,000 cycles service	 B-service Replacing parts Grease the drives Check the condition of the tool Clean the dust filter of the control cabinet 	2 hours

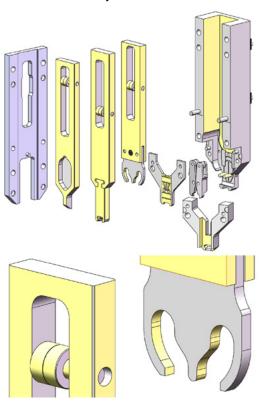
Recommended lubricant

Description	Туре	Manufacturer
Grease	MICROLUBE GBU-Y 131 Klüber Lubrication AG (Switzerland)	
		Thurgauerstrasse 39
		8050 Zürich
		Tel.: +41 44 308 69 69
		Fax: +41 44 308 69 44
		www.klueber.com



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.

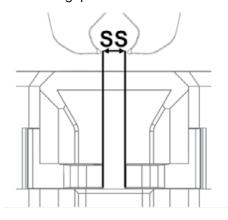
This service must be performed every 100,000 cycles.

- Dismantle the crimping cut-off head (see Section 9.1). 1.
- 2. Clean and grease the crimping cut-off head.
- Perform a visual inspection of the crimping wedge and crimping jaw pivot pins: No excessive wear. 3.
- 4. Replace the crimping jaws (see Section 9.3.3).
- Rotate the cut-off die through 180° (see Section 9.3.3). 5.
- Reassemble the crimping cut-off head (see Section 9.3.3). 6.





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



CAUTION

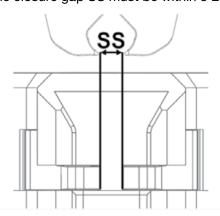
Replace wear parts (crimping jaws) after 100,000 closures.

Replace the wear parts (cut-off die, crimping wedge, crimping jaws pivot pin, clamping lever) after 200,000 closures.

When doing this, clean and grease the entire crimping cut-off head and clamping unit.

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).
- Replace the crimping wedge (see Section 9.3.4). 3.
- Replace the crimping jaws pivot pin (see Section 9.3.5). 4.
- 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).
- Clean and grease the clamping unit. 8.
- Replace the clamping lever (see Section 9.3.6).
- 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 verification at 1850 N. The closing force must lie within
- 13. Perform ten WingGuard® clamp closures. These ten closures must all be evaluated as OK pieces.



9.3 Replacing parts



WARNING

Risk of injury when the crimping cut-off head is not mounted.

Never operate the FAST 3000 without a correctly fitted crimping cut-off head.



⚠ CAUTION

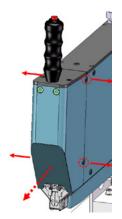
When the CFM force load cells are not fitted there is a risk of mechanical damage.

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.

9.3.1 Removing the crimping cut-off head

- To facilitate installation, move the clamping unit to the ejection position (see Section 6.8.2).
- Switch off the FAST 3000.
- 3. Unscrew the 4 screws at the side and remove the cover from the head.

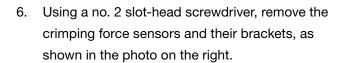


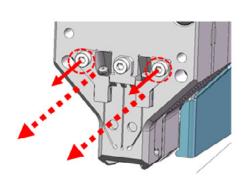




OETIKER FAST 3000

- 4. Release the force sensor cable from the cable clips.
- 5. Unscrew the screws from the force sensor brackets.





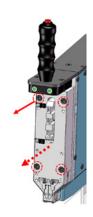


 Before removing the crimping cut-off head, lay the force sensor cables (1) over the FAST 3000. This reduces the risk of inadvertently crushing the force sensor cables.





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.

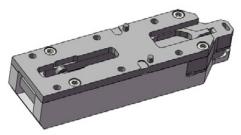


Fig. 31 Removed crimping cut-off head

9.3.2 Installing the crimping cut-off head

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

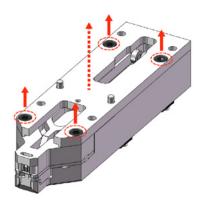
Use no impact tools when disassembling or reassembling the crimping cut-off head. The assembly is part of a measurement system which can be damaged by improper handling.

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

For information on naming the components of the crimping cut-off, see Section 4.2.

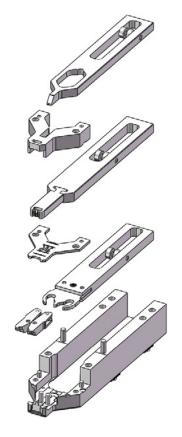
Dismantling the crimping cut-off head

- 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.









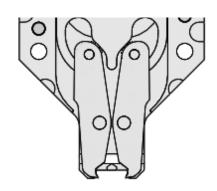
Reassembling the crimping cut-off head

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.

NOTE

When the FAST 3000 is delivered, the cut-off die is inserted so that the side marked "1" is the cutting side. Accordingly, a new cut-off die should be inserted so that the side marked "1" cuts.



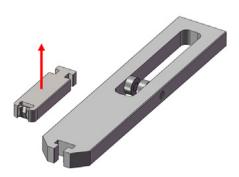


 Comply with the disassembly instructions when dismantling the crimping cut-off head.

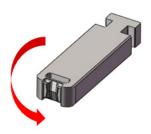


Fig. 32 Dismantled cut-off die and slide

2. Push the cut-off die out of the slide.



 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 this has 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 few closing cycles.

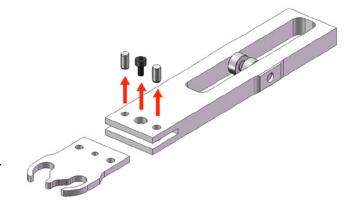
If this is the case, do not install the WingGuard® clamps on production pieces until the crimping jaws have been broken in (approx. 50 cycles).

- Comply with the disassembly instructions when dismantling the crimping cut-off head (see "Dismantling the crimping cut-off 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.
- 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.
- Assemble the crimping head again, as described in the Section "Assembling the crimping cut-off head".



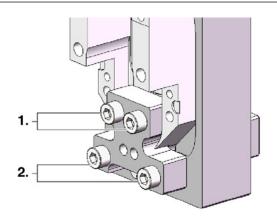


9.3.5 Replacing the crimping jaws pivot pin

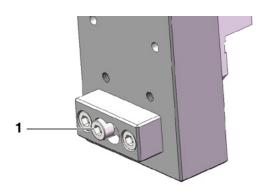
NOTE

Only the press-out and press-in 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.

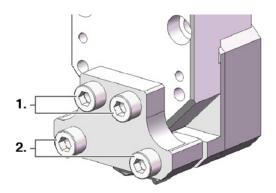
 Mount the pivot pin press-out tool on the crimping cut-off head as shown in the picture on the right.
 Comply with the sequence of tightening operations.



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.



 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.

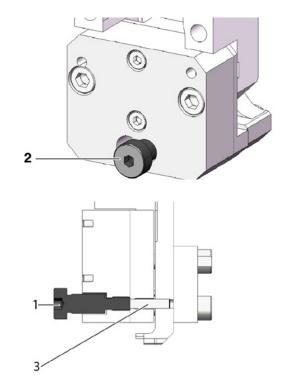




- 4. Insert the new crimping jaw pivot pin (3) and insert the marked screw (2). Now tighten the screw, to press the crimping jaw pivot pin in. Stop tightening as soon as resistance is clearly sensed. Do the
- Remove the press-in tool and assemble the crimping head again, as described in the Section "Assembling the crimping cut-off head".

same for the second new pivot pin.

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 that the number of cycles specified in the Maintenance section.

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

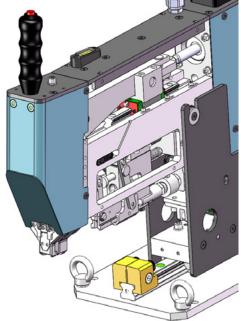
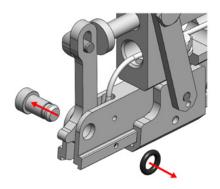


Fig. 33 Tool with front covers removed

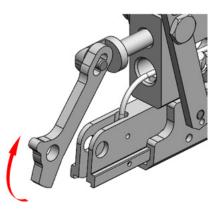




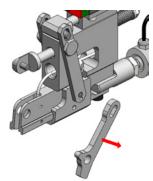
4. Pull the clamping lever pivot pin out (no tool necessary).



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

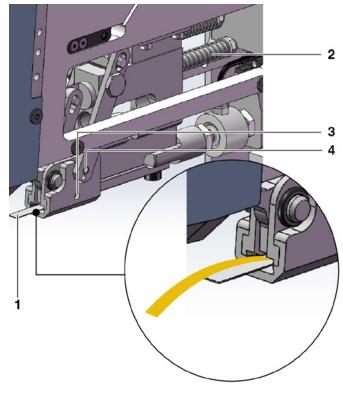
NOTE

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

NOTE

For information about the part numbers of the two strap strips, see Section 9.7.

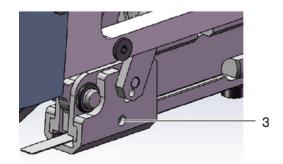
- Move the lower drive into the service position (Operating mode -> Manual operation -> Service position).
- 2. Press the Emergency Stop button.
- 3. Remove both the side covers.
- 4. Insert the strap section (1) bearing the "LED on" legend into the slot in the pulling unit. Press the pulling lever rod (2) of the crimping cut-off head, to open the pulling unit. Once the strap section has been inserted, release the pulling lever rod. (Note: If the strap section is curved, insert it as shown by the yellow line. This ensures that once the pulling lever has been released the strap section will lie flat.
 - If the sensor is correctly set, the LED (4) will light up.
- 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.
- 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 set screw (3) about one turn.
- 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 set screw.

Tightening torque: 5 Ncm.



NOTE

Excessive tightening of the set screw may damage the sensor

- 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

NOTE

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.

NOTE

▶ Before adjusting the force sensor scaling, check the tool mechanics, in particular the smooth running of the linear guide of the clamping unit and the correct alignment of the clamping unit to the crimping head.Adjusting the scaling of a tool with a mechanical problem masks the mechanical problem, which can lead to incorrectly installed WingGuard® clamps and incorrectly mounted products.

For adjustment you will need a CAL 01 and a PG135 verification unit. For information about part numbers see Section 3.3.

See Section 6.8.4 (Verifying the closing force) for information on how to verify the closing force sensor.

9.5.1 Checking the ease of movement of the clamping unit

- Move the motion link to the home position and the pulling unit to the service position.
- 2. Press the emergency stop.
- 3. Remove the screw red marked.
- Move the pulling unit by hand, it must be possible to move it smoothly and easily over the entire available stroke.
- 5. Reassemble the screw removed in step 3.
- Release the emergency stop and initialize the FAST 3000.

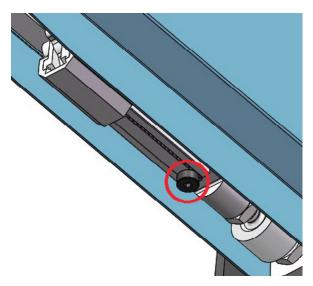
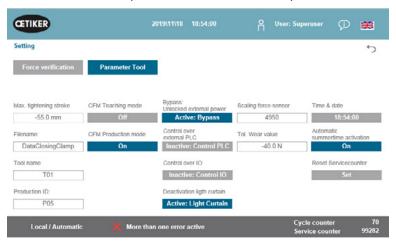


Fig. 34 Checking the ease of movement of the clamping unit



9.5.2 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.
- 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:

$$NKS = D_{CAL01} / F_7 \bullet AKS$$

NKS: New Force Sensor scaling

 D_{CAL01} : 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.



Replacing the control cabinet or tool mechanism 9.6



⚠ 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.

- Remove the defective components (from the tool mechanism or control cabinet). 1.
- If you have to send the defective component back to Oetiker for repair, make sure you send back all the 2. 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).
- 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

Tool error / Consumable materials	Part number	Applications
Spare parts kit for the crimping jaws (Service pack A)	13500112	A-service
Service pack B	13500157	B-service
Service pack C	13500228	C-service
Crimping wedge	13500060	Spare part



Tool error / Consumable materials		Part number	Applications
Spare parts kit for clamping lever		13500113	Spare part
Crimping cut-off head for CFM		13500215	Crimping cut-off head for quick maintenance
Crimping cut-off tool + CFM		13500269	Spare part
Ethernet IP control cabinet	_	13500281	Spare part
Profinet control cabinet	-	13500280	Spare part
Press-in tool		13500205	Press in the crimping jaws



Tool error /		Part	Applications
Consumable materials		number	
Press-out tool		13500204	Press out the crimping jaws
Pulling strap	0000	13500233	Closing force verification
Installation aid for the crimping cut-off head		13500288	Facilitates the installation of the crimping head
CAL01 and SKS01		*	Closing force verification
Sensor setting strip "LED on"		13500151	Setting the strap detection sensor
Sensor setting strip "LED off"		13500152	Setting the strap detection sensor

^{*} Various different article numbers (see Section 3.3)



Tool error / Consumable materials	Part number	Applications
Force measurement jaws set	13500264	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.
Proximity switch IFRM 03P3501/KS35L (Clamping unit strap sensor)	06001786	Spare part
Damper, complete	13500024	Spare part
Sensor clamping bushing	13500219	Spare part



Tool error / Consumable materials		Part number	Applications
Clamping unit rail		13500218	Spare part
Contact module NO	.3 NO	06001813	Spare part
Contact module NC	.1 NC	06001814	Spare part
Servo amplifier L7NHA004U		06001892	Spare part



Tool error / Consumable materials		Part number	Applications
Measurement amplifier 1-BM40IE	CIDX O D D SEE	06002147	Spare part
Digital input / output card		06001891	Spare part
PLC PAC320 PROFINET	Parker	06002146	Spare part
PLC PAC320 Ethernet/IP	-Parker	06001870	Spare part



Tool error / Consumable materials	Part number	Applications
Drive GSM20 complete (complete with connection plugs)	13500271	Spare part
Force monitoring device	06001877	Spare part
Miniature force sensor 2.5kN (crimping force sensor)	06001864	Spare part
Alignment aid	13500214	Positioning of the FAST 3000
Cable for the force monitoring device 2 m	06001878	Cable for connecting the crimping force sensor to the crimping force monitoring devices



Tool error / Consumable materials	Part number	Applications
Jaws checking mirror	13500266	Spare part
Safety sticker set for the FAST 3000	08904156	Spare part
Hexagon key wrench 1.5 mm		Strap sensor
Hexagon key wrench 2 mm		Safety proximity sensor,
Hexagon key wrench 2.5 mm		Power supply chain
Hexagon key wrench 3 mm		Covers,
Hexagon key wrench 4 mm		-
Hexagon key wrench 5 mm		Various different
Hexagon key wrench 6 mm		Transport restraint,
Hexagon key wrench 8 mm		Jointed pin, female
Tweezers		Setting the strap sensor
MICROLUBE GBU-Y 131 grease		Greasing the crimping cut-off head, Clamping unit and strap
Brush		Applying grease
Feeler gauge 0-150 mm		Closure gap verification



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 my 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

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

Name: Parker

IP address: 192.168.10.50 Communication format: Data - Dint

Inhibit module: true Use a Unicast connection via EtherNet/IP: false

	Assembly example	Size
Input	101	46
Output	100	1
Configuration	102	2



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

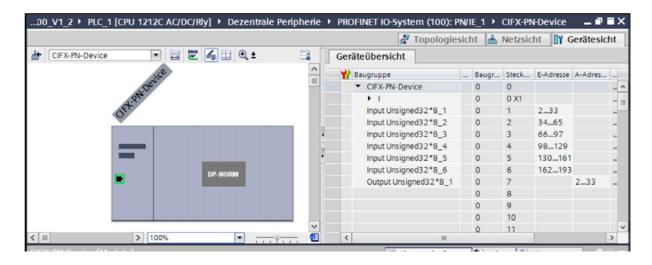


Fig. 35 Examples of HW configuration of the Profinet module on the FAST 3000 in a Siemens S7 1212C

10.1.3 Field bus mapping (software version V2.10)

		Description		Data type	Recom- mendation
R-DW0	Bit0	Part OK	Normally Mode	R Bool	х
R-DW0	Bit1	Part not OK	Normally Mode	R Bool	х
R-DW0	Bit2	Pulling force: Routine active	Force adjustment	R Bool	
R-DW0	Bit3	Pulling force: Ready for band	Force adjustment	R Bool	
R-DW0	Bit4	Pulling force: Controller active	Force adjustment	R Bool	
R-DW0	Bit5	Zero balance: Routine active	Adjust to zero	R Bool	
R-DW0	Bit6	Zero balance: Ready for set Zero	Adjust to zero	R Bool	
R-DW0	Bit7	Motion link: Powerd	Tool	R Bool	
R-DW0	Bit8	Motion link: Referenced	Tool	R Bool	
R-DW0	Bit9	Pulling unit: Powerd	Tool	R Bool	
R-DW0	Bit10	Pulling unit: Referenced	Tool	R Bool	



		Description		Data type	Recom- mendation
R-DW0	Bit11	Light curtain (Input channel1 and channel2)	Tool	R Bool	
R-DW0	Bit12	PLC ready and EtherCAT running	Tool	R Bool	
R-DW0	Bit13	Feedback external Enable power	Tool	R Bool	
R-DW0	Bit14	Ready for external Enable power	Tool	R Bool	
R-DW0	Bit15	Ready for initialization	Normally mode	R Bool	
R-DW0	Bit16	Ready for locking the clamp	Normally mode	R Bool	
R-DW0	Bit17	Ready for start the cycle closing clamp	Normally mode	R Bool	
R-DW0	Bit18	Busy (Cycle closing clamp active)	Normally mode	R Bool	
R-DW0	Bit19	Error from the drives	Normally mode	R Bool	
R-DW0	Bit20	Laboratory Mode active	Laboratory-mode	R Bool	
R-DW0	Bit21	Status Restart Light curtain	Safety Information	R Bool	
R-DW0	Bit22	Status Emergency Stop Ch.1	Safety Information	R Bool	
R-DW0	Bit23	Status Emergency Stop Ch.2	Safety Information	R Bool	
R-DW0	Bit24	Request Deblocking	Deblocking	R Bool	
R-DW0	Bit25	Deblocking Routine aktiv	Deblocking	R Bool	
R-DW0	Bit26	HMI-message "Band remove" (Kont.)	Init Routine	R Bool	
R-DW0	Bit27	Routine Closing clamp active	Normally Mode	R Bool	
R-DW0	Bit28	Sensor: Clamp present	Tool	R Bool	
R-DW0	Bit29	Sensor: Holdup Sensor	Tool	R Bool	
R-DW0	Bit30	Alive Bit	Tool	R Bool	
R-DW0	Bit31	Release clamp requierd	Normally Mode	R Bool	
R-DW1	Bit0			R Bool	
R-DW1	Bit1			R Bool	
R-DW1	Bit2			R Bool	
R-DW1	Bit3			R Bool	
R-DW1	Bit4			R Bool	
R-DW1	Bit5			R Bool	
R-DW1	Bit6			R Bool	
R-DW1	Bit7			R Bool	
R-DW1	Bit8			R Bool	
R-DW1	Bit9			R Bool	
R-DW1	Bit10			R Bool	
R-DW1	Bit11			R Bool	
R-DW1	Bit12			R Bool	
R-DW1	Bit13			R Bool	



		Description		Data type	Recom- mendation
R-DW1	Bit14			R Bool	mendation
R-DW1	Bit15			R Bool	
R-DW1	Bit16			R Bool	
R-DW1	Bit17			R Bool	
R-DW1	Bit18			R Bool	
R-DW1	Bit19			R Bool	
R-DW1	Bit20			R Bool	
R-DW1	Bit21			R Bool	
R-DW1	Bit22			R Bool	
R-DW1	Bit23			R Bool	
R-DW1	Bit24			R Bool	
R-DW1	Bit25			R Bool	
R-DW1	Bit26			R Bool	
R-DW1	Bit27			R Bool	
R-DW1	Bit28			R Bool	
R-DW1	Bit29			R Bool	
R-DW1	Bit30			R Bool	
R-DW1	Bit31			R Bool	
R-DW2		Oparating Mode &Master for handling	Normally mode	R Int	
R-DW3		Closing force	Normally Mode	R Real	х
R-DW4		Cycle time	Normally Mode	R Real	у
R-DW5		Total cycle counter	Service	R Int	y (x)
R-DW6		Service Cycle counter	Service	R Int	
R-DW7		Actual position motion link	Tool	R Real	
R-DW8		Actual position pulling unit	Tool	R Real	
R-DW9		PID Pulliung force: Gain force cotrol	Tool PID Controller	R Real	
R-DW10		PID Pulliung force: Reset time force control	Tool PID Controller	R Real	
R-DW11		PID Pulliung force: Ratetime force control	Tool PID Controller	R Real	
R-DW12		-			
R-DW13		Status message	Error Handling	R Int	
R-DW14		Force holding Time (Closing clamp)	Tool	R Int	
R-DW15		Time laboratory mode	Laboratory-mode	R Real	
R-DW16		Remaining time laboratory mode	Laboratory-mode	R Real	
R-DW17		Max. pieces in laboratory mode	Laboratory-mode	R Int	



	Description		Data type	Recom- mendation
R-DW18	Remaining pieces in laboratory mode	Laboratory-mode	R Int	
R-DW19	Home position motion link	Parameter motion link	R Real	
R-DW20	Insert position motion link	Parameter motion link	R Real	
R-DW21	Crimping position motion link	Parameter motion link	R Real	
R-DW22	Cutting position motion link	Parameter motion link	R Real	
R-DW23	Setting minimal crimping current	Parameter motion link	R Int	
R-DW24	Setting maximum crimping current	Parameter motion link	R Int	
R-DW25	Setting minimal cutting current	Parameter motion link	R Int	
R-DW26	Setting maximum cutting current	Parameter motion link	R Int	
R-DW27	Home position pulling unit	Parameter pulling unit	R Real	
R-DW28	Eject position pulling unit	Parameter pulling unit	R Real	
R-DW29	Max. tightening stroke	Parameter pulling unit	R Real	
R-DW30	Switch Phase 1 => Phase 2	Parameter pulling unit	R Int	
R-DW31	Tolerance Force	Parameter pulling unit	R Real	
R-DW32	PullDistance	Parameter pulling unit	R Real	у
R-DW33	Pulling force Home position	Parameter pulling unit	R Real	
R-DW34	Pulling force insert position	Parameter pulling unit	R Real	
R-DW35	CFM1: Force entry EO4	CFM EO4	R Real	у
R-DW36	CFM1: Force exit EO4	CFM EO4	R Real	у
R-DW37	CFM2: Force entry EO4	CFM EO4	R Real	у
R-DW38	CFM2: Force exit EO4	CFM EO4	R Real	у
R-DW39	CFM1: Force max value	CFM	R Real	у
R-DW40	-			
R-DW41	CFM2: Force max value	CFM	R Real	у
R-DW42	-			
R-DW43	Warning	Error Handling	R Int	(y)
R-DW44	Tool Error	Error Handling	R Int	(y)
R-DW45	Process Error	Error Handling	R Int	(y)

R Real	3 decimal fraction
R Real	2 decimal fraction

x:	Values for process documentation
у	Values for build of experience



		Description		Data type
W-DW0	Bit0	Start cycle	Normally mode	W Bool
W-DW0	Bit1	Stop cycle	Normally mode	W Bool
W-DW0	Bit2	Start locking the clamp	Normally mode	W Bool
W-DW0	Bit3	Acknoledge error	Normally mode	W Bool
W-DW0	Bit4	Initialization	Normally mode	W Bool
W-DW0	Bit5			
W-DW0	Bit6			
W-DW0	Bit7			
W-DW0	Bit8			
W-DW0	Bit9			
W-DW0	Bit10	Power enable	Start mode	W Bool
W-DW0	Bit11	Bypass start power for drives	Start mode	W Bool
W-DW0	Bit12	Start deblocking	Deblocking	W Bool
W-DW0	Bit13	Ack.message "Band remove"	Normally mode	W Bool
W-DW0	Bit14	Locking Tool	Normally mode	W Bool

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



10.1.4 Addition to industrial communication

R-DW43 Warning

Hereby the messages from Section 7.4.9 (error list) are transmitted. It is the messages (warnings) 100 to 199. In these cases, 100 is subtracted from the error number, and then the number is bitwise added to the sum.

Error	Weight	Value		
x01	2^1	2	0	War_101 Error acknowledged
x02	2^2	4	0	War_102 Check start button contacts
x03	2^3	8	0	War_103 No power -> press start / and init
x04	2^4	16	0	War_104 CFM box warning / error
x05	2^5	32	0	War_105 Soon service necessary
x06	2^6	64	0	War_106 Service necessary
x07	2^7	128	0	War_107 Stop about light curtain
x08	2^8	256	0	War_108 Mode CFM teaching activ
x09	2^9	512	0	War_109 Drives Tool not powered
x10	2^10	1024	0	War_110 No Power - activate extern enable signal, then press Start , then
				press Init
x11	2^11	2048	0	War_111 Band remove
x12	2^12	4096	0	War_112 Abort verification pulling force
x13	2^13	8192	0	War_113 Abort verification crimp force
x14	2^14	16384	0	War_114 Stop about external stop command
x15	2^15	32768	0	War_115 External Signal band lock is on
x16	2^16	65536	0	War_116 EtherCAT - bus not running
x17	2^17	131072	0	War_117 Init command is pending
x18	2^18	262144	0	War_118 Please check function light curtain



R_DW44 Tool Error

Hereby the messages from Section 7.4.9 (error list) are transmitted. It is the messages (tool errors) 200 to 299. In these cases, 200 is subtracted from the error number, and then the number is added bitwise to the sum.

Error	Weight	Value		
x01	2^1	2	0	ToErr_201 Band present -> remove & acknowledge
x02	2^2	4	0	ToErr_202 Clamping unit not in home position STO-> Initialize
x03	2^3	8	0	ToErr_203 Check pulling and cutting units
x04	2^4	16	0	ToErr_204 Position sensor pulling unit fault
x05	2^5	32	0	ToErr_205 Drive error active
x06	2^6	64	0	ToErr_206 Emergency circuit open
x07	2^7	128	0	ToErr_207 Light curtain during init sequence
x08	2^8	256	0	ToErr_208 Verification CFM error phase 1
x09	2^9	512	0	ToErr_209 Verification CFM error phase 2
x10	2^10	1024	0	ToErr_210 Verification CFM: No force built up
x11	2^11	2048	0	ToErr_211 Check band scrap
x12	2^12	4096	0	ToErr_212 CFM general warning/error
x13	2^13	8192	0	ToErr_213 Check pulling force sensor
x14	2^14	16384	0	ToErr_214 Emergency stop
x15	2^15	32768	0	ToErr_215 Pulling unit not in home position
x16	2^16	65536	0	ToErr_216 During cyle, Drives Tool lost power
x17	2^17	131072	0	ToErr_217 Verification pulling force; Target force not reached
x18	2^18	262144	0	ToErr_218 Tool locked from external bus-signal

R_DW45 Process Error

Hereby the messages from Section 7.4.9 (error list) are transmitted. It is the messages (process errors) 300 to 399. In these cases, 300 is subtracted from the error number, and then the number is added bitwise to the sum

Error	Weight	Value		
x01	2^1	2	0	PrErr_301 Max. pulling stroke exceeded
x02	2^2	4	0	PrErr_302 Max. pulling time exceeded
x03	2^3	8	0	PrErr_303 Crimping CFM1 envelope 1
x04	2^4	16	0	PrErr_304 Crimping CFM1 envelope 2
x05	2^5	32	0	PrErr_305 Crimping CFM1 NoPass
x06	2^6	64	0	PrErr_306 Crimping CFM1 wear
x07	2^7	128	0	PrErr_307 Crimping CFM2 envelope 1
x08	2^8	256	0	PrErr_308 Crimping CFM2 envelope 2
x09	2^9	512	0	PrErr_309 Crimping CFM2 NoPass



Error	Weight	Value		
x10	2^10	1024	0	PrErr_310 Crimping CFM2 wear
x11	2^11	2048	0	PrErr_311 General error crimping
x12	2^12	4096	0	PrErr_312 Cutting error
x13	2^13	8192	0	PrErr_313 Force limit exceeded
x14	2^14	16384	0	PrErr_314 Max. pulling stroke exceeded
x15	2^15	32768	0	PrErr_315 Closing force out of tolerance
x16	2^16	65536	0	PrErr_316 Max. force at stop from light curtain
x17	2^17	131072	0	PrErr_317 Max. force during move to throw-off position
x18	2^18	262144	0	PrErr_318 Process interrupt
x19	2^19	524288	0	PrErr_319 Max. force at stop from Bus

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.



Risk the machine may be dropped during transport!

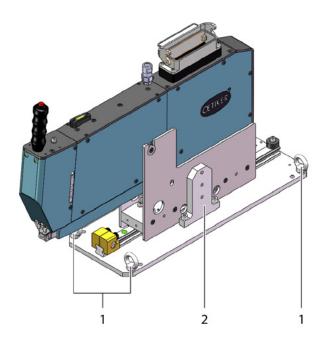
- Do not remain underneath the machine.
- Wear safety equipment (particularly safety shoes).

▲ 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.

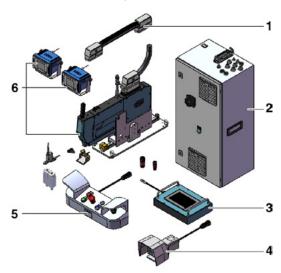


OETIKER FAST 3000 Technical data

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
- Machine capability $C_{mk} > 1.33$ at $1850 \pm 100 \text{ N}$
- Closing force 800 to 2500 N

Dimensions and weight



Pos.	Component	Approximate dimensions [mm]	Approximate weight [kg]
1	Connecting cable	_	2.5
2	Control cabinet	300 x 400 x 800	40
3	Touch panel	340 x 220 x 120	2
4	Foot pedal	260 x 150 x 140	1.5
5	Two-hand control desk	465 x 190 x 120	2.5
6	Installation tool	610 x 71 x 470 (without base plate)	30
	Crimping force monitoring device	190 x 195 x 125	1



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 ...?

Type of error	Reason for fault	Actions to rectify fault
Closure operation will not	Tool not switched on	Switch tool on.
start	Emergency Stop button activated	Deactivate the Emergency Stop button.
	Tool not initialized	Initialize tool.
	Clamp not inserted correctly (check	Insert the clamp correctly.
	the strap detection signal)	
	Not all the required connectors have	Insert all the connectors required for the
	been inserted	tool.
	Incorrect operating mode	Change the operating mode settings.
	Light curtain activated and light	Repair the light curtain.
	curtain damaged	
	The FAST 3000 is in manual mode	Switch to Automatic mode and initialize the
		tool.
	Power to the drives not switched on	Press the green button on the control
		cabinet to switch on the power to the drive.



Type of error	Reason for fault	Actions to rectify fault
Initialization of FAST 3000 does not function	Insert a WingGuard® strap clamp strap into the clamping unit	Remove the strap. To release the clamping lever, it may be necessary to remove a front cover and the strap pulled out of the crimping cut-off head.
	Strap sensor soiled	Clean the strap sensor.
	Two-hand control panel not connected to the control cabinet	Connect the two-hand control panel to the control cabinet.
	Control cabinet defective	Send the unit back to OETIKER.
	Emergency Stop activated	Press and release the Emergency Stop button. Initialize the FAST 3000.
	Power to the drives not switched on	Press the green button on the control cabinet to switch on the power to the drive.
	One of the fuses in the control cabinet has responded	Check the control cabinet and the device. If test OK, switch on the fuse again.
	Incorrect operating mode	Change the operating mode settings.
	Light curtain activated and light curtain damaged	Repair the light curtain.
	No values stored for the parameters	Use Oetiker Service Center to reset the parameters of the PLC to the factory settings.
	Initialization cannot be performed due to the current operating state	Activate the emergency stop then deactivate it again.
Tool switched on, no display	Touch panel not connected to the control cabinet	Connect the touch panel to the control cabinet.
	Control cabinet defective	Send the unit back to OETIKER.
	Incorrect network address set on the display or on the controller	Set the network address correctly.
	Incorrect settings on the display	Have the display settings performed by the Oetiker Service Center.
	One of the fuses in the control	Check the control cabinet and the device.
	cabinet has responded	If test OK, switch on the fuse again.
Clamp is crimped on only	Crimping jaw broken	Replace the crimping jaws as a set.
one side	Crimping jaw pivot pin broken	Replace the pivot pin
Strap is not cut off	Cut-off die broken	Replacing the cut-off die
	Cut-off die guide not installed correctly	Perform the installation of the cut-off die guide (see Section 9.3.3).



Type of error	Reason for fault	Actions to rectify fault			
The crimping jaws cut into	Cut-off die guide not installed	Perform the installation of the cut-off die			
the clamp housing	correctly	guide (see Section 9.3.3).			
	Incorrect horizontal positioning of the	Check the correct positioning of the			
	FAST 3000	horizontal stop, in order to ensure the			
		correct position of the clamp housing.			
	When the WingGuard® clamp is	Check whether a part is blocking the path			
	closed, the tool head is not in the	of the tool head to its correct position as			
	right position	the clamp closes.			
An inserted clamp cannot	The WingGuard® clamp is blocked by	Use the deblocking function			
be removed from the FAST 3000 during the	the pushed-in clamping lever. Initialization cannot be performed	(see Section 6.8.1). If the unblocking function does not perform			
production	due to an inserted clamp	correctly, continue with the following steps:			
production	duo to an moortou olamp	Switch the FAST 3000 off securely.			
		Remove one of the front side covers			
		and the cover of the crimping cut-off			
		head.			
		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.			
Crimping force level too	Crimping jaws not broken in	Close some WingGuard® clamps. The			
high		crimping jaws will broke in and the			
		crimping force will take on the usual			
		values.			



Type of error	Reason for fault	Actions to rectify fault
Inserted clamp cannot	Drives cannot be initialized as the tool	Switch off the FAST 3000.
be removed after	is detecting a clamp in the clamping	Remove a front cover and push the
the FAST 3000 was	unit.	clamping lever rod in the direction of the
switched on		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.
No response of the	The FAST 3000 is in "Control via	Deactivate "Control via external PLC" or
FAST 3000 to the inputs	external PLC" or "Control via I/O"	"Control via I/O".
(such as the strap locking	mode	
button)	The I/O module is not correctly	Attach the connector correctly.
	plugged in to the PLC (connector or	Connect the module correctly.
	module)	
	EtherCAT-Bus not ready for operation	Check whether all the devices are
		connected correctly, particularly the
		connections for the measurement amplifier
		of the pulling forces and the connections of
		the crimping force monitoring devices.
Tool error	Servo drive error	Refer to the manual for the drive "LH7N".



13.3 Error messages and their resolution

13.3.1 Warnings

War_101 Error acknowledge

Errors and warnings have been acknowledged. No action necessary.

War_102: 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 War_102.

- ▶ 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.

War_103 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.



War_104 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.

War_105 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.

War_106 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.

War_107 Stop triggered by the light curtain

Prevent the light curtain tripping.





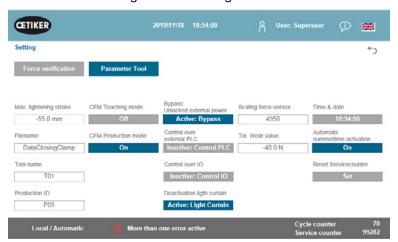
War_108 CFM mode teach-in active

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.



War_109 No power to tool

NOTE

The power supply to the motion link or to the pulling 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.



War_110 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").

War_111 Remove strap

NOTE

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.

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).



13.3.2 Tool errors

ToErr_201: (W) strap present -> remove & acknowledge

NOTE

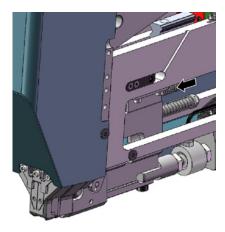
At each closure cycle a check is performed to determine whether the strap end has fallen from the clamping unit: The strap sensor checks whether the strap end is still present in the ejection position of the clamping unit. If it is, the warning War_111 is output.

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:

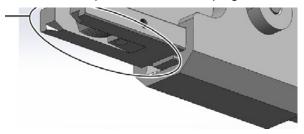
If a strap end is present in the clamping unit:

- Remove one of the front covers.
- Press the ejector pulling 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.





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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 FAST 3000 PLC.

ToErr_202: 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).

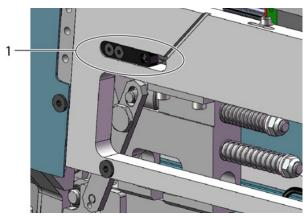
Remedy:

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 FAST 3000 PLC.

If the clamping unit position sensor is dirty:

Clean the sensor.



ToErr 204: Position sensor defective

The clamping unit position sensors failed the plausibility test.

Remedy:

See Section "ToErr_202: Clamping unit not in the home position STO -> Initialize"

If the clamping unit position sensor is dirty:

- Clean the sensor.
- Check the function of the sensor.
- ▶ Check the connection of the sensor cable to the tool socket.
- Check the fastening distances of the force load cell according to the service instructions.
- Check the I/O module in the FAST 3000 PLC.

ToErr_205: 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.

ToErr_206: 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.





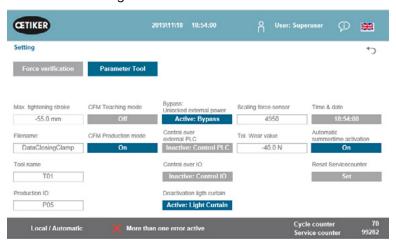
ToErr_207: Light curtain active during the initialization routine

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 "Parameter Tool" sub-menu.



ToErr_208: Verifying the crimping force (phase 1)

NOTE

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

- 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.





ToErr_209: Verifying the crimping force (phase 2)

NOTE

The error occurs if the end force is not achieved during the second phase (the motion link 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.

ToErr_210: 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.

ToErr_211: Checking the strap waste

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





ToErr_212: 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 in respect of their settings, damage and error messages.
- Restart the crimping force monitoring devices.
- For further information see the crimping force monitoring devices manual.

ToErr_213 Check pulling force sensor

NOTE

During the clamping cycle the pulling force sensor checks that the value satisfies certain criteria when the motion link 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 approximately 0 N.

- Check that the crimping cut-off head is installed correctly.
- Make sure that no unauthorized parts come into contact with the clamping unit of the FAST 3000 during the closing cycle (see Section 6.5.3).
- Check the tool mechanism, in particular that the linear guide of the clamping unit runs easily without jerking, and check the correct alignment of the clamping unit to the crimping head (see Section 9.5.1).



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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).

This command will then determine the new value for the home position.



- Check the scaling factor and correct it if necessary (see Section 9.5).
- 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).

ToErr_216 No power to tool during operation

NOTE

The power supply to the motion link or to the pulling 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).

ToErr_218 Tool blocked by an external signal

The tool is blocked by the signal:

W-DW0: Control Word Bit14 Locking Tool

The cycle cannot be restarted as long as the signal is present.

Remedy:

Cancel the signal.





13.3.3 Process errors

PrErr_301: Maximum pulling travel exceeded

NOTE

The pulling 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 pulling 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 as Superuser.

If the closure parameters are wrongly set:

Adjust the closure parameters (see Section 5.1.1-5.1.7).





PrErr_302: 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).

PrErr_303: 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.
- Check the FAST 3000 for correct positioning (see Section 6.5).
- Check the correct routing of the connecting cable: during closure the crimping cut-off head must push down against the housing of the WingGuard® clamp.

PrErr_304: 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.
- Check the FAST 3000 for correct positioning (see Section 6.5).
- ▶ Check the correct routing of the connecting cable:

During closure the crimping cut-off head must push down against the housing of the WingGuard® clamp.

If the WingGuard® clamp batch exhibits an unusual crimping force curve.

▶ Re-teach the force curve 2 (see Section 6.8.6).





PrErr_305: 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.
- Check that the fastening screws of the crimping cut-off head are tightened to the correct tightening torque (see Section 9.3.3).
- Check the correct routing of the connecting cable:
 During closure the crimping cut-off head must push down against the housing of the WingGuard® clamp.

PrErr_306: Crimping error CFM1 wear

Remedy:

- Check the crimping jaws for wear.
- Check the setting of the crimping force monitoring device 1.
- Check the positioning of the FAST 3000.
- ► Check the correct routing of the connecting cable:
 - During closure the crimping cut-off head must push down against the housing of the WingGuard® clamp.
- If the WingGuard® clamp is subjected to guidance by parts other than the crimping cut-off head, make sure that this additional guidance is correctly centered relative to the crimping cut-off head.
 - In addition, we recommend that the additional guidance is not too precise, instead it must allow approx. 0.7 mm clearance on each side of the clamp strap.
- If necessary, adjust the parameter "Tool wear value", see Sections 5.2.4 and 7.4.7.

PrErr_307: Crimping error CFM2 envelope curve 1

- Check the crimping jaws for damage and wear.
- Check the curve settings in the crimping force monitoring device 2.
- Check the positioning of the FAST 3000 (see Section 6.5).
- Check the correct routing of the connecting cable:
 - During closure the crimping cut-off head must push down against the housing of the WingGuard® clamp.



PrErr_308: 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.

Check the positioning of the FAST 3000 (see Section 6.5).

Check the correct routing of the connecting cable:

During closure the crimping cut-off head must push down against the housing of the WingGuard® clamp.

If the WingGuard® clamp batch exhibits an unusual crimping force curve.

▶ Re-teach the force curve 2 (see Section 6.8.6).

PrErr_309: 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.
- Check that the fastening screws of the crimping cut-off head are tightened to the correct tightening torque (see Section 9.3.3).
- Check the correct routing of the connecting cable:
 During closure the crimping cut-off head must push down against the housing of the WingGuard® clamp.

PrErr_310: Crimping error CFM2 wear

- Check the crimping jaws for wear.
- Check the setting of the crimping force monitoring device 2.
- Check the positioning of the FAST 3000.
- Check the correct routing of the connecting cable: during closure the crimping cut-off head must push down against the housing of the WingGuard® clamp.
- ▶ If the WingGuard® clamp is subjected to guidance by parts other than the crimping cut-off head, make sure that this additional guidance is correctly centered relative to the crimping cut-off head. In addition, we recommend that the additional guidance is not too precise, instead it must allow approx. 0.7 mm clearance on each side of the clamp strap.
- If necessary, adjust the parameter "Tool wear value", see Sections 5.2.4 and 7.4.7.



GETTKER

PrErr_311: 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.

If the current of the drive link is not within the predefined limits during the crimping process:

- Have the limit values for the current of the motion link (crimping) adjusted by the Oetiker service team.
- Replace or repair the drive if it has an excessive current consumption.
- Check whether the crimping head and the motion link are intact and easy to move.

PrErr_312: 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.

If the current of the drive link is not within the predefined limits during the cutting process.

- ► Have the limit values for the current of the motion link (cutting) adjusted by the Oetiker service team.
- Replace or repair the drive if it has an excessive current consumption.
- Check whether the crimping head and the motion link are intact and easy to move.





PrErrPrErr_313 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.

PrErr_315: Closing force outside tolerance

Remedy:

If the closure parameters are not correctly set:

- ► Check the curve profile (see Section 5.1).
- Adjust the closure parameters (see Section 5.1.1–5.1.7).
- Check that no external influences are preventing the correct control of the closing force.
- Check the tool mechanism, in particular that the linear guide of the clamping unit runs easily without jerking, and check the correct alignment of the clamping unit to the crimping head (see Section 9.5.1).



PrErr_316 Max force when the light curtain breached

- Prevent the light curtain being breached during the cycle.
- Check that the light curtain system is correctly installed and operational.





PrErr_317: Max force travel in ejection position

NOTE

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

Remedy:

- Check the cut-off die.
- Check the pulling force sensor.
- Check that no external influences are preventing the correct control of the closing force.
- Check the tool mechanism, in particular that the linear guide of the clamping unit runs easily without jerking, and check the correct alignment of the clamping unit to the crimping head (see Section 9.5.1).
- Check the cut edge of the end of the strap at the WingGuard® clamp.
- If the cut edge is not square, the cut-off die may be defective.

PrErr_318: 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.

PrErr_319: 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.



OETIKER FAST 3000 Appendix

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



OETIKER FAST 3000 Help and Support

15 Help and Support

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

Headquarters Switzerland

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Germany

T +49 76 42 6 84 0 info.de@oetiker.com

USA

T +1 989 635 3621 info.us.marlette@oetiker.com

China

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Japan

T +81 45 949 3151 info.jp@oetiker.com

India

T +91 77210 15261 64 info.in@oetiker.com