



ACO 08

Crimp Force Monitor

Operating manual

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Schleuniger GmbH

Raiffeisenstrasse 14
42477 Radevormwald
Germany
P +49 21 959 29 0
F +49 21 959 29 105
info@schleuniger.net
www.schleuniger.com

Schleuniger AG

Bierigutstrasse 9
3608 Thun
Switzerland
P +41 33 334 03 33
F +41 33 334 03 34
info@schleuniger.ch
www.schleuniger.com

Schleuniger AG

Business Unit Solutions
Gewerbestrasse 14
6314 Unteraegeri
Switzerland
P +41 41 754 53 53
F +41 41 754 53 50
solutions@schleuniger.ch
www.schleuniger.ch

Schleuniger, Inc.

87 Colin Drive
Manchester, NH 03103
USA
P +1 603 668 81 17
F +1 603 668 81 19
sales@schleuniger.com
www.schleuniger-na.com

Schleuniger Japan Co., Ltd.

4-5-8, Tokai, Ota-ku
Tokyo 143-0001
Japan
P +81 3 57 55 80 41
F +81 3 57 55 80 45
sales@schleuniger.co.jp
www.schleuniger.co.jp

Schleuniger Trading (Shanghai) Co., Ltd.

315, Yixiang Building
1599, West Yan'an Road
Shanghai, 200050, China
P +86 21 62 52 66 77
F +86 21 62 40 86 55
sales@schleuniger.com.cn
www.schleuniger.cn

TABLE OF CONTENTS

| | | |
|----------|---|-----------|
| 1 | General..... | 6 |
| 1.1 | Dealer..... | 6 |
| 1.2 | Year of manufacture / device type..... | 6 |
| 1.3 | Information about the operating manual..... | 6 |
| 1.3.1 | Content of the manual..... | 6 |
| 1.3.2 | Storage location..... | 7 |
| 1.3.3 | Responsibilities..... | 7 |
| 1.4 | General symbols and keys..... | 7 |
| 1.4.1 | Recommendations and tips..... | 7 |
| 1.4.2 | Key..... | 8 |
| 1.5 | Declaration of conformity..... | 8 |
| 1.6 | Limitation of liability..... | 8 |
| 1.7 | Warranty conditions..... | 8 |
| 1.8 | Copyright protection..... | 8 |
| 1.9 | Privacy protection..... | 9 |
| 1.10 | Spare Parts..... | 9 |
| 2 | Safety..... | 10 |
| 2.1 | Warnings..... | 10 |
| 2.2 | General safety advice..... | 10 |
| 2.3 | Sources of danger / residual dangers..... | 10 |
| 2.4 | Proper and intended use..... | 11 |
| 2.5 | Safety symbols used..... | 11 |
| 2.5.1 | Safety symbols used in the manual..... | 11 |
| 2.6 | Modification and conversion to the product..... | 12 |
| 2.7 | Personnel qualifications..... | 12 |
| 2.7.1 | Personnel groups..... | 12 |
| 2.8 | Personal protective equipment..... | 13 |
| 2.8.1 | Goggles..... | 13 |
| 2.8.2 | Protective work clothing..... | 13 |
| 2.9 | Safety equipment..... | 13 |
| 3 | Transport / Packaging / Storage..... | 14 |
| 3.1 | Transportation inspection..... | 14 |

| | | |
|----------|--|-----------|
| 3.2 | Unpacking / unloading..... | 14 |
| 3.3 | Packaging..... | 14 |
| 3.3.1 | About the packaging..... | 14 |
| 3.3.2 | Handling the packaging materials | 14 |
| 3.4 | Shipping..... | 14 |
| 4 | Product Specifications | 15 |
| 4.1 | Dimensions and weight..... | 15 |
| 4.2 | Technical key data..... | 15 |
| 4.3 | Setup location..... | 16 |
| 4.4 | Rating plate | 16 |
| 5 | Product Description | 17 |
| 5.1 | Concept..... | 17 |
| 5.2 | Front view | 18 |
| 5.3 | Rear view | 19 |
| 5.4 | Control elements and interfaces..... | 19 |
| 5.5 | Scope of delivery | 20 |
| 5.6 | Accessories | 20 |
| 6 | Installation..... | 21 |
| 6.1 | Installation | 21 |
| 6.1.1 | Remove the ACO 08 and the accessories from the packaging..... | 21 |
| 6.1.2 | Place the device at its final location | 21 |
| 6.1.3 | Install the crimping machine-specific cable kit and connect it with the ACO 08.... | 21 |
| 6.2 | Commissioning | 21 |
| 7 | General Handling / Operation | 22 |
| 7.1 | General operating information | 22 |
| 7.2 | User interface..... | 22 |
| 7.2.1 | Main menu | 22 |
| 7.2.2 | Monitoring mode..... | 23 |
| 7.2.3 | Teaching..... | 26 |
| 7.2.4 | Setup | 27 |
| 7.2.5 | User levels..... | 31 |
| 7.2.6 | Job management..... | 33 |
| 7.2.7 | Information dialog..... | 36 |
| 7.2.8 | Automatic parametrization | 37 |

| | | |
|-----------|---|-----------|
| 7.2.9 | Headroom test | 38 |
| 7.2.10 | Machine profiles | 40 |
| 8 | Diagnosis / Troubleshooting | 41 |
| 8.1 | What to do in the event of problems | 41 |
| 8.2 | Possible machine faults | 41 |
| 9 | Maintenance | 43 |
| 10 | Disposal | 44 |
| 10.1 | Decommissioning | 44 |
| 10.2 | Disassembly / disposal | 44 |
| 11 | Parts Catalog | 45 |
| 11.1 | Spare parts | 45 |
| 12 | Exploded Drawings | 46 |
| 13 | Block Diagram | 47 |
| 14 | PLC Interface | 48 |
| 15 | Notes | 50 |
| 16 | Index | 51 |

1 GENERAL

Thank you for choosing Schleuniger technology. You have purchased a high-performance Schleuniger product that has been developed with care and manufactured in cooperation with our partner, KMF Messtechnik. Carefully read this operating manual. It contains important tips and safety instructions to ensure efficient, precise and reliable production of cables.

1.1 DEALER

In this Operating Manual Schleuniger GmbH, Deutschland, is designated as dealer and abbreviated to "*Schleuniger*".

| | |
|-------------------------|--|
| Schleuniger GmbH | Phone: +49 (0)2195 929 0 |
| Raiffeisenstrasse 14 | Fax: +49 (0)2195 929 105 |
| 42477 Radevormwald | Email: info@schleuniger.de |
| Germany | Web: http://www.schleuniger.de |

1.2 YEAR OF MANUFACTURE / DEVICE TYPE

Refer to the "*EC declaration of conformity (register 2)*" of the folder.

1.3 INFORMATION ABOUT THE OPERATING MANUAL

- The operating manual is a part of the product and contains all relevant information for using the product efficiently and safely in accordance with its intended use.
- The safety advice and other instructions given must be adhered to, in addition to the applicable local accident prevention regulations and general safety regulations for the area of application.
- If the product changes ownership, the operating manual must also be passed on to the new owner.
- It is important to ensure that any available safety-related changes or corrections can be included in the operating manual. For more information, contact your local *Schleuniger* representative

1.3.1 Content of the manual

Each person who works with the product must be sufficiently trained and, before starting work, must have read and understood the operating manual. This is also applicable if the respective person has already worked with the product or a similar one or has been trained by the manufacturer.

The operating manual becomes invalid if contents are removed (excluding the quick reference, if present), or contents on the data carrier are altered.

We are committed to making it as simple as possible to use our products, to reference information and to instruct new employees, which is why we divide our operating manuals into four clearly structured chapters:

- Operating
- Maintenance
- Repairs
- Parts catalog

1.3.2 Storage location

The operating manual must be accessible to the operating personnel at the workplace at all times. Select a storage location where the operating manual cannot be damaged, so that the manual remains clearly legible over the expected service life of the product.









1.3.3 Responsibilities

- This operating manual must be stored in the immediate vicinity of the product. It must be kept accessible to personnel who work on or with the product at all times.
- Completely and unreservedly observe the information given in the operating manual.

1.4 GENERAL SYMBOLS AND KEYS

1.4.1 Recommendations and tips

The meanings of the following symbols in the operating manual are as follows:

| | | | |
|---|--|---|---|
|  | <p>Tip: Recommendations and tips for easier operation of the product in accordance with the intended use.</p> |  | <p>Info: Important information for efficient, trouble-free operation.</p> |
|  | <p>Magnifying glass: Important chart, introductory chapter.</p> |  | <p>Menu level: Sub-screen with menu level (starting from main menu).</p> |
|  | <p>Procedure: Important instruction, programming sample.</p> |  | <p>Figure reference: Text reference to elements in a preceding figure.</p> |
|  | <p>Content reference (topic): Important safety-related content reference.</p> |  | <p>Disposal: Waste material that must be recycled and not disposed of in domestic waste.</p> |

1.4.2 Key

Markups with the following meaning are used in the text.

| Markup | Meaning | Description |
|---------------------------|---------------------------|---|
| [SWITCH] | Switch / Button | Key commands and buttons from screen presentations are depicted in square brackets, italics and orange. |
| "Configuration" | Screen titles / menus | Screen titles and menus are depicted in quotation marks. |
| <i>Schleuniger</i> | Product names and company | Product and company names are depicted in italics. |
| <i>"1.5 Key (Page 9)"</i> | Cross reference | Cross references are depicted in blue and italics. |
| 1.» | Instruction | Instructions are enumerations with arrow. |
| ➔ | Results of an instruction | Explanations and actions initiated in instructions are indicated by an arrow. |

The following abbreviations are used.

| Abbreviation | Meaning | Description |
|--------------|-------------|---|
| Fig. | Figure | Images are referred to in the captions as Figure. |
| mm | Millimeters | All dimensions in this manual are given in millimeters. |

1.5 DECLARATION OF CONFORMITY

See appendix.

1.6 LIMITATION OF LIABILITY

This manual was compiled while taking into account the applicable norms and guidelines, state-of-the-art technology and our many years of experience.

The manufacturer accepts no liability for any damages or accidents resulting from:

- Disregard of the manual
- Disregard of the safety signs
- Improper use

1.7 WARRANTY CONDITIONS

See the *Schleuniger* document, *"General Terms of Sale and Delivery"*.

1.8 COPYRIGHT PROTECTION

This operating manual must be treated confidentially. It is only intended for persons who are involved in work with the product. The operating manual must not be made available to third parties without the express written consent of the manufacturer.

The manufacturer holds the copyright to the contents of the operating manual (text, figures, illustrations, drawings, diagrams and other representations).

1.9 PRIVACY PROTECTION

Schleuniger processes personal data in compliance with the *Schleuniger* privacy protection declaration. This declaration is available in the following languages and addresses.

| Language | Address |
|----------|---|
| German | schleuniger.com/de/rechtsmittel-und-datenschutzerklärung |
| English | schleuniger.com/en/legal-information-and-privacy-statement |
| Spanish | schleuniger.com/na/es/información-legal-y-aviso-de-privacidad |
| Japanese | schleuniger.com/jp/jp/法的情報およびプライバシー宣言 |
| Chinese | schleuniger.com/cn/cn/法律和隐私条款 |

1.10 SPARE PARTS

Original spare parts must always be purchased from your local *Schleuniger* representative.

We reserve the right to change the appearance or function of spare parts as part of product improvement without prior notice.



Caution

Use of incorrect spare parts

Incorrect or faulty spare parts can lead to damage, malfunction or total failure of the product as well as affecting the safety of the operating personnel. Therefore, use only original spare parts from *Schleuniger*.

2 SAFETY

2.1 WARNINGS

Throughout the operating manual, warnings are indicated by the following symbols. They are introduced by danger signs and key words which indicate the extent of danger. The warnings must be adhered to in order to prevent accidents, personal injury and tangible damage.



Danger

“Danger”

This indicates an imminent hazardous situation, that will result in death or serious injuries if it is not avoided.



Warning

“Warning”

This indicates a potential hazardous situation, that can result in death or serious injuries if it is not prevented.



Caution

“Caution”

This indicates a potential hazardous situation, that can result in moderate or light injuries if it is not avoided.



Notice

“Tangible damage”

This indicates a potential hazardous situation, that can result in material damage if it is not avoided.

2.2 GENERAL SAFETY ADVICE

- The product must only be operated in a fully serviceable and safe operating condition. Before starting the product, check that it is serviceable.
- Never operate the product in environments where there is a risk of fire or explosion.
- Only operate the product in dry, dust-free surroundings.
- Disconnect the product from the electrical power supply and/or the compressed air supply before performing any maintenance or repair work.
- Only use original *Schleuniger* accessories, especially interface cables (electromagnetic compatibility).

2.3 SOURCES OF DANGER / RESIDUAL DANGERS

There are hazards involved when using technical products.

Any hazards that cannot be eliminated by design measures or protective devices are considered to be residual hazards. The safety information in this operating manual indicate known residual hazards. If other dangers become apparent during operation, then the operating company must inform *Schleuniger* of these immediately.

Under some circumstances, the following residual hazards can occur:

- Injuries and faults on the product can occur due to inadequate maintenance of the product.
- Danger of tripping, falling and slipping caused by connection cables, compressed air hoses and wire residues on the floor.
- Injuries may happen when working at the workplace without adequate lighting.

2.4 PROPER AND INTENDED USE



Notice

Use the product only as intended!

Each use of the product which contradicts the intended use is considered as improper. *Schleuniger* accepts no liability for damages as a result of improper use.



Caution

Intended use

The product has been designed and built exclusively for the intended use specified below:

The ACO 08 is used for monitoring and analyzing the crimping process within the range according to the technical data.

Nonadherence can lead to injury to the operating personnel and material damage.



Caution

Reasonably expected misuse

Do not use the product for the following tasks:



- Monitoring/analyzing force values on machines not intended for this task

Non-adherence can lead to injury to the operating personnel and material damage.

2.5 SAFETY SYMBOLS USED

2.5.1 Safety symbols used in the manual

Safety symbols are used in this manual to warn the operator of possible dangers. These are described in detail below.

| | | |
|---|-----------------------------------|---|
|  | <p>General danger!</p> | <p>Hints and instructions marked with this symbol must be strictly followed. Disregard can lead to injuries and material damage.</p> |
|  | <p>Electrical current!</p> | <p>There is a danger of electric shock at the power connector and inside the machine. This means that you must always switch off the machine at the main switch and disconnect it from the mains power supply before opening. Users may injure themselves if they come in contact with live components.</p> |

2.6 MODIFICATION TO AND CONVERSION OF THE PRODUCT

In order to avoid possible dangers and guarantee optimal performance, modifications, additions and conversions on the product are not permitted without the express written consent of the manufacturer or the *Schleuniger* representative. This does not include official equipment options and accessories offered by *Schleuniger*.

2.7 PERSONNEL QUALIFICATIONS

The various tasks may only be carried out by the personnel specified in the corresponding chapters.

The product has been designed for use by persons over the age of 14. Allowing access to younger persons is strictly forbidden.



Caution

Potential risk due to inadequate qualification!

Users may become injured when handling the product improperly.

There are hazard areas that require special caution. The product may only be operated by the groups of persons mentioned in the respective chapter.

2.7.1 Personnel groups

The following qualifications are specified in the manual for the various tasks.

2.7.1.1 Operating company

As a supervisory legal authority, the operating company is responsible for using the product as intended as well as for the training and employment of the authorized persons. The operating company specifies the binding competencies and authorities of the authorized personnel.

2.7.1.2 Technical specialists

Based on their product-specific training as well as their initial mechanical and electrical training and their experience, they are able to carry out the maintenance and repair work on the product as commissioned.

2.7.1.3 Technical personnel

Based on their technical skills, professional experience and product-specific training, they are able to install the product, to commission it and to instruct the operating personnel.

2.7.1.4 Operating personnel

Persons who have been instructed and authorized by the operating company to operate the product in a safe manner in accordance with the regulations. They are able to detect and avoid possible hazards. This also includes knowledge of accident prevention regulations and first aid.

2.7.1.5 Third parties

External personnel solicited the operating company, service technicians and employees from *Schleuniger*.

2.8 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment in accordance with the local regulations is required when working on the product to minimize possible health risks.

- Always wear the necessary protective equipment for the corresponding task.
- Observe the signs in the working area relating to personal protective equipment.

2.8.1 Goggles



For protecting the eyes against small parts generated when processing the product to be cut.

2.8.2 Protective work clothing



Wear close-fitting work clothing with low tear resistance and no protruding parts. Protects against being caught by movable machine parts.

2.9 SAFETY EQUIPMENT

The safety equipment on the product (used for safety, protection and monitoring) must not be removed, bridged, modified or bypassed. The safety equipment must be inspected on a regular basis. Defective safety equipment must be repaired immediately. Only then can the product be put back into operation.

- Never operate the product with the safety cover open.

3 TRANSPORT / PACKAGING / STORAGE

The following instructions must be followed exactly when unpacking, transporting and storing the product. They contain important information for preventing personal injury and damage to the product. The weight of the product must be taken into account during transportation and loading. See chapter [4.1 Dimensions and weight](#).



Notice

Personnel qualifications

The instructions listed in this chapter must be carried out by the **technical personnel!**

3.1 TRANSPORTATION INSPECTION

Check the delivery immediately for completeness and transport damages.

In the event of externally visible transport damages, proceed as follows:

- Do not accept the delivery, or only accept it conditionally.
- Define the extent of the damages.
- Report damages to the product immediately.

3.2 UNPACKING / UNLOADING



Caution

Transportation lock!

The product may be damaged if transportation locks are not removed prior to operation.

Remove marked transportation locks before possibly planned commissioning of the product (store transportation locks for future transport).

3.3 PACKAGING

3.3.1 About the packaging

Keep the packaging materials in weatherproof storage for later transportation.

3.3.2 Handling the packaging materials

Recycle any packaging no longer needed.

See chapter [10 Disposal](#).

3.4 SHIPPING

Use the associated packaging before shipping the device. Disconnect all connected cables from the device.

4 PRODUCT SPECIFICATIONS

Among others, this chapter gives an overview of the technical data of the product. The technical data corresponds to the theoretical values that can be achieved under normal conditions. We reserve the right to change the technical data and design as part of product improvement without prior notice.

4.1 DIMENSIONS AND WEIGHT

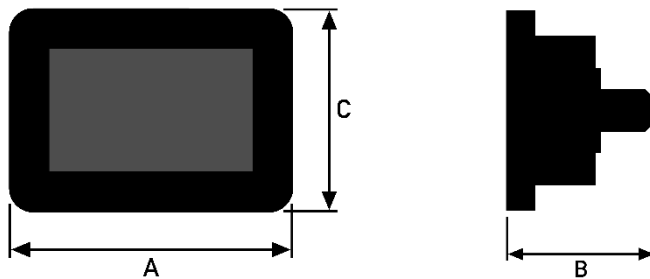


Fig. 1: Dimensions

| Description | | Value | Swivel in the unit |
|-------------|------------|-------|--------------------|
| Weight | | 0.5 | kg |
| Dimensions | Width (A) | 134 | mm |
| | Depth (B) | 41 | mm |
| | Height (C) | 96 | mm |

4.2 TECHNICAL KEY DATA

| Description | | Value | Swivel in the unit |
|---------------------|-------------------------------|----------------|--------------------|
| Ambient conditions | Temperature range (operation) | +0 to +50 | °C |
| | Temperature range (storage) | +0 to +50 | °C |
| | Relative humidity at 20 °C | 90 | % |
| | Relative humidity at 40 °C | 50 | % |
| | Protection class | IP 20 | |
| Limit values, incl. | measuring range | 0 – 20000 | N |
| | Units | N, lb, without | |
| | Channels | 2 | |
| | Data capacity | 8 GB (μSD) | |
| | Sensor type | Piezo and DMS | |
| | Interfaces | Ethernet, USB, | |

| Description | | Value | Swivel in the unit |
|-----------------|--------------------------|--------------------|--------------------|
| | | Digital IO | |
| | Trigger | external, internal | |
| Feed connection | Operating voltage | 12 – 24 | VDC |
| | Power consumption (max.) | 10 | W |

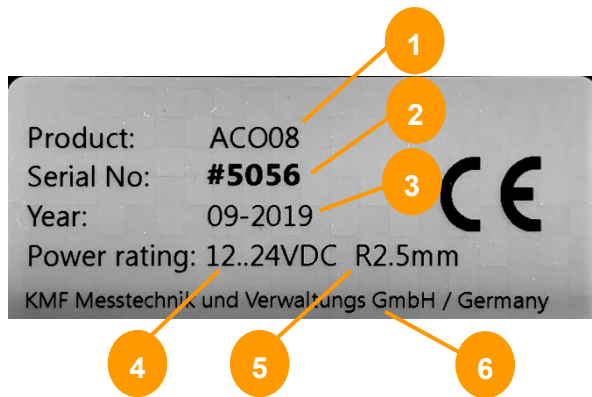
4.3 SETUP LOCATION

Set up on hard nonfragile surface or mount to the crimping machine.

4.4 RATING PLATE

To ensure our efficient support, we request the customer to always submit the exact content of the rating plate when contacting us with requests.

The rating plate is located on the side wall and contains the following specifications.



1 Product

2 Serial number

3 Year of manufacture

4 Permissible operating voltages

5 Internal fuses

6 Manufacturer

5 PRODUCT DESCRIPTION

The product description chapter gives the performance description, information on the product limits and the scope of delivery. The individual operating elements on the product are indicated and described using photos. Additionally, the product description also contains information on operating modes and functionality.

5.1 CONCEPT

The ACO 08 crimp force monitoring monitors and analyzes the crimping process. The device can be used to evaluate and optimize the crimping processes in the sector of further development of crimping technology, as well as for monitoring, control, and checking the production process. A series of adjustable parameters for the device, as well as the simple operation of the device, permit adaptation to different crimping uses.

A piezoelectric force sensor generates a load (proportional to the crimp force) and supplies measuring signals. The sensor is located within the crimping press and converts crimp force coefficients into load coefficients which can then be evaluated by the measuring device. The process-controlled measuring device conducts an analog-to-digital data conversion and saves these coefficients in the internal log memories.

To control the crimping process, a reference force coefficient is calculated by recording and averaging a certain number of crimp force coefficients. Based on this force curve, an envelope is generated which can be modified by the user according to the specific requirements of the crimping process. In addition, the area under the curve (work) is calculated as a reference value. The crimping process itself is monitored to prevent exceeding the tolerance limits or deviation from work within a certain part of the tolerance range. The comparison of the reference and actual values generates a digital control signal that allows the crimp machine to be directly connected. This allows the machine to be blocked and the crimped parts to be sorted out. Event counters (crimp good/bad/total/Cpk) are continuously updated on the screen. The actual process parameters can be displayed at any time.

The measured force parameters can be transmitted via TCP/IP to a connected PC, where a software package generates a graphical representation. The PC software enables the storage of all generated data as well as various statistical and conversion functions. All independent data (e.g. for printouts) can be downloaded to the PC. The measuring instruments can be networked.

5.2 FRONT VIEW



Fig. 2: Control elements

1 Touch display with graphical user Interface

5.3 REAR VIEW

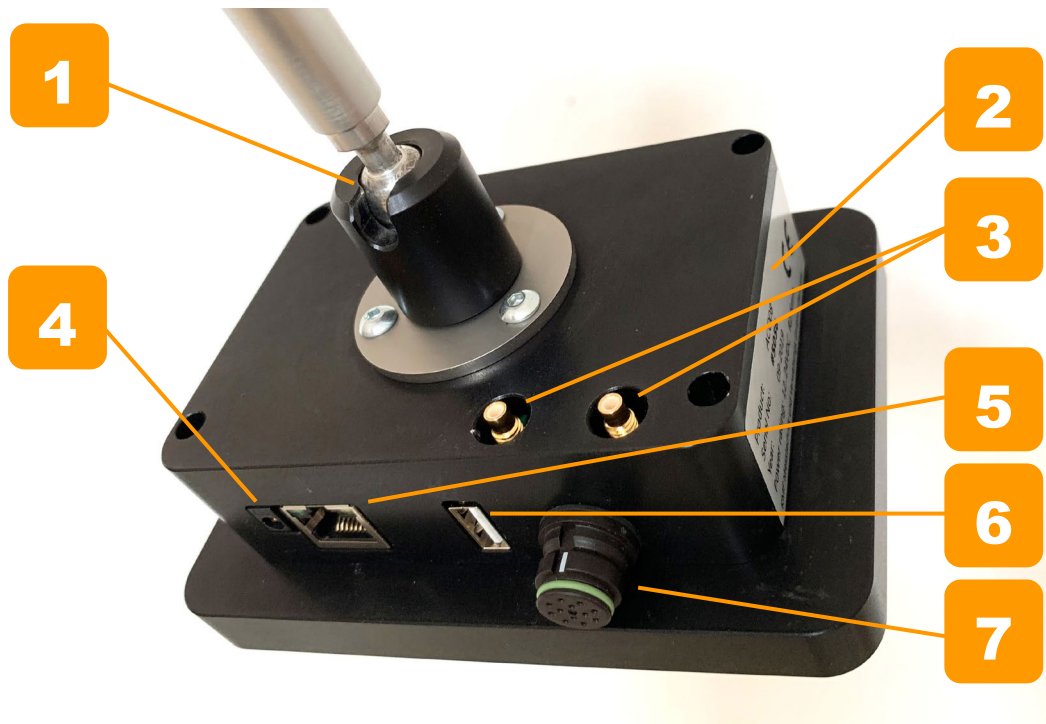


Fig. 3: Rear view

- | | |
|---|------------------------|
| 1 Mounting device with ball head | 5 TCP/IP interface |
| 2 Rating plate | 6 USB interface |
| 3 Sensor cable connections (channels 1 and 2) | 7 Digital IO interface |
| 4 Mains socket for external mains supply | |

5.4 CONTROL ELEMENTS AND INTERFACES

Touch display

The ACO 08 does not have any physical switches. All inputs are made via gestures or digital buttons on the graphical user interface.

Sensor cable connections (channels 1 and 2)

Input sockets for the signal of the force sensors. The right socket is to be used if only one channel is used.

Mains socket for external mains supply

An external power supply can be connected if the ACO 08 cannot be supplied with power via the crimping machine.

TCP/IP interface

Allows integration of the device into a network and transmission of data to a PC.

USB Interface

Enables service functions such as firmware updates or reading data

Digital IO interface

Enables the output and receipt of control signals between ACO 08 and crimping machine

5.5 SCOPE OF DELIVERY

See goods data sheet.

5.6 ACCESSORIES

Please use only original manufacturer accessories.

6 INSTALLATION

This chapter describes the steps of assembly and initial commissioning of the product.



Notice

Personnel qualifications

The instructions listed in this chapter must be carried out by a **technical specialist!**

6.1 INSTALLATION

6.1.1 Remove the ACO 08 and the accessories from the packaging.

6.1.2 Place the device at its final location.

6.1.3 Install the crimping machine-specific cable kit and connect it with the ACO 08.

6.2 COMMISSIONING

Following the proper installation, the levels of the digital IOs must be adapted to the crimping machine. Common crimping machines are listed in the "Machine profile" menu and can be simply selected. All required settings are made.

If the crimping machine type is not listed, the information on the settings will be supplied with the cable kit.

7 GENERAL HANDLING / OPERATION

7.1 GENERAL OPERATING INFORMATION



Notice

Personnel qualifications

The instructions listed in this chapter must be carried out by the **operating personnel!**

- Before daily commissioning, a visual inspection of the device must be carried out.
- The safety cover of the machine must be closed during processing.
- The internal process instructions must be followed in the machining process.

7.2 USER INTERFACE

The ACO 08 does not have any physical pushbuttons or switches. It is only operated via the graphic user interface. The following principal inputs can be made:

- Selection by tapping tiles or buttons
- Return to the main menu or switching to page 2 of the main menu by swiping from the right across the right edge of the display
- Scrolling up/down by vertical swiping in the center of the display
- Tab/category change by horizontal swiping in the center of the display

7.2.1 Main menu

The main menu has two pages. To change the page, swipe from the right across the right edge of the display (requires user level 2 or 3).



Fig. 4: Setup p. 1

1 Monitoring mode

2 Teaching mode

3 Setup

4 User selection

5 Jobs

6 Device information



Fig. 5: Setup p. 2

1 Automatic parametrization

3 Machine profiles

2 Headroom test

7.2.2 Monitoring mode

In monitoring mode, your production is monitored and documented. If thus defined in setup, the machine is stopped in the event of an error and the error must be acknowledged.

1. To access the monitoring mode, select the "monitoring mode" tile in the main menu.



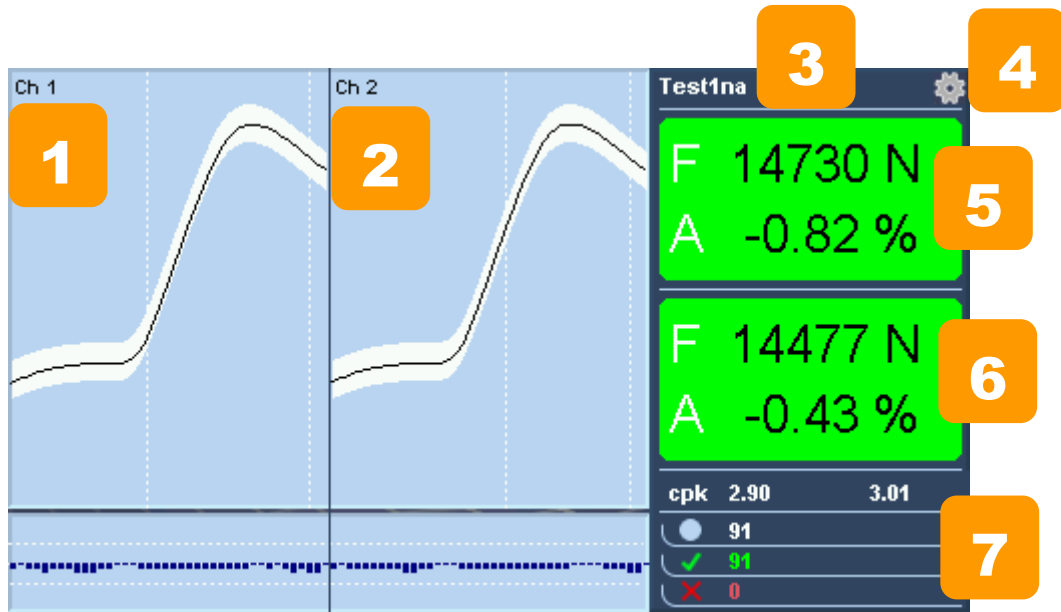


Fig. 6: Monitoring mode

- 1 Curve/envelope channel 1
- 2 Curve/envelope channel 2
- 3 Active job
- 4 Active user level

- 5 Measured value (peak) / area deviation channel 1
- 6 Measured value (peak) / area deviation channel 2
- 7 Infos: Cpk value, number of total/good/bad

Zoom

In case of two active channels, both curves/envelopes are displayed side by side. A graphic image can be shown enlarged by pressing on it.

1. Select a channel in the 2-channel presentation by tapping the corresponding graphic image.
 - ↳ Curve and envelope of the channel are displayed enlarged.
2. Tap the graphic image to return to the 2-channel display.



Presentation of errors

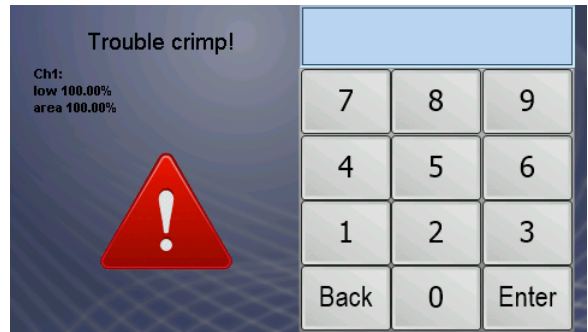
Errors may occur through a value that lies within the evaluation limits

- ↳ that lies outside the envelope.
- ↳ that is located outside the specified area tolerance.
- ↳ that exceeds the specified fault limit.

The errors are displayed as follows:

| Error | Presentation |
|---|--------------|
| Area value in channel 1 outside of the tolerance | |
| Curves outside of the tolerance | |
| Area values and curves outside of the tolerances in both channels | |
| <p>If configured in the setup, the error must be acknowledged on user level 1 by entering the password. Acknowledgment without password is possible on user level 2 or 3.</p> | |

Specified fault limit exceeded. If configured in the setup, the error must be acknowledged on user level 1 by entering the password. Acknowledgment without password is possible on user level 2 or 3.



7.2.3 Teaching

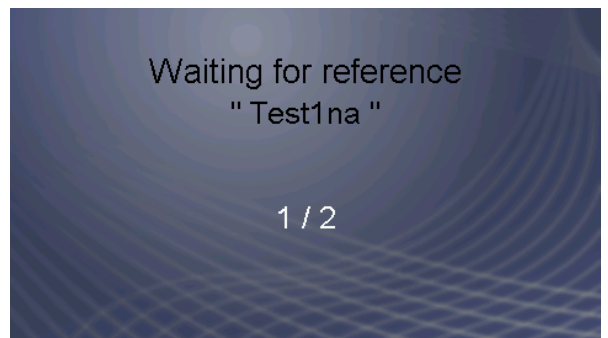
Before the monitoring status can be started, a reference curve must be formed from one or several good crimps. The number of reference crimps is defined in setup.

1. To access the teaching mode, select the "teaching" tile on the main menu (possibly requires user level 2 or 3 if configured in setup).

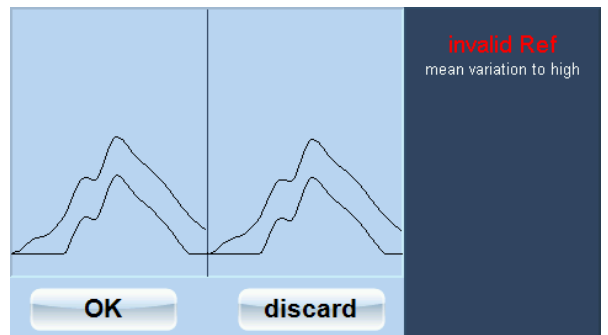


2. Produce a reference crimp on the crimping machine and use it to verify the quality criteria (e.g. crimp height, pull-off strength/cross section) and confirm with "OK" if prompted.

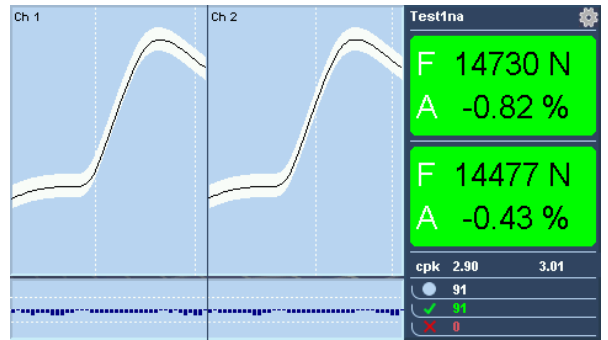
If the crimp does not meet the quality criteria, use "discard" to reject it.



3. If a curve deviates too much from the previous curves, the message "invalid Ref" appears automatically. Select "OK" to generate the last curve again or "discard" to start over with teaching.



4. Repeat step 2 until all reference crimps are done.
 - ↳ The reference curve is generated, and the ACO 08 switches to monitoring mode.



7.2.4 Setup

In setup all setting parameters concerning the ACO 08 can be set. At least user level 2 is required to access setup.

1. To access the setup mode, select the "setup" tile on the main menu (possibly requires user level 2 or 3).



Graphic user interface

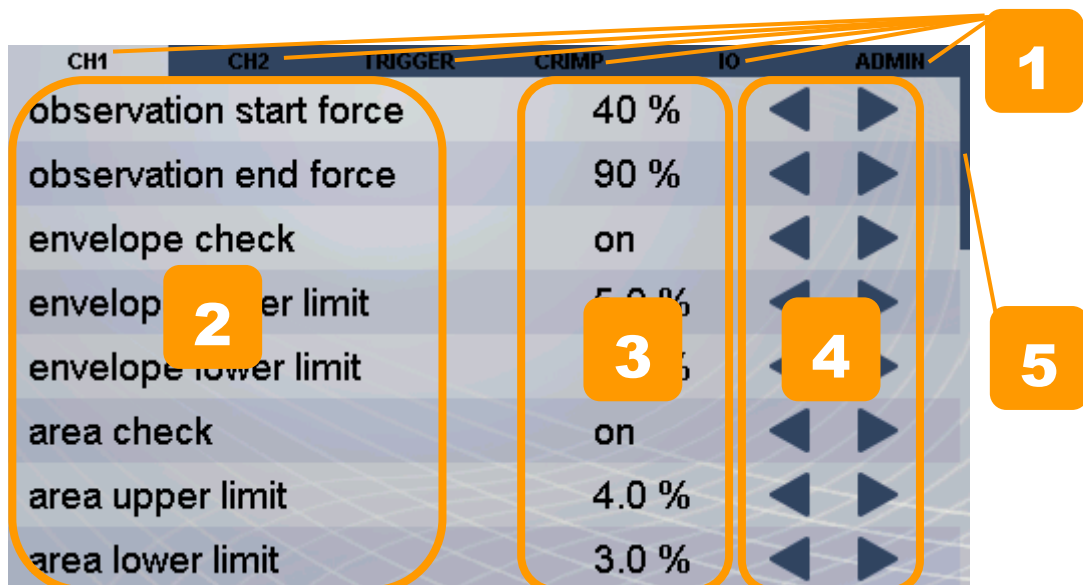


Fig. 7: Setup

- | | |
|-----------------------|--------------------|
| 1 Categories | 4 Control elements |
| 2 Option designations | 5 Scroll indicator |
| 3 Option values | |

Categories

You may switch between categories by horizontal swiping in the center of the display or by directly tapping the tab. Some categories require user level 3.

| Category | Description | Required user level |
|----------|---|---------------------|
| CH1 | Monitoring parameters for channel 1 | 2/3 |
| CH2 | Monitoring parameters for channel 2 (if used) | 2/3 |
| Trigger | Settings for the start encoder | 2/3 |
| Crimp | Settings for the crimp | 2/3 |
| IO | Settings for the signals | 3 |
| Admin | Device settings | 3 |

Options

You may scroll up/down within a category by vertical swiping in the center of the display. The option values can be modified by tapping the control elements. Some options required user level 3. They are hidden when opening setup in user level 2.

Category CH1/CH2

| Option | Description | Value |
|-------------------------|---|-----------------|
| Observation start force | Starting value of the crimp process evaluation | 10-100 % |
| Observation end force | End value of the crimp process evaluation | 10-100 % |
| Envelope check | Evaluation according to envelope | on/off |
| Envelope upper limit | Upper limit of the envelope (if active) | 0-30 % |
| Envelope lower limit | Lower limit of the envelope (if active) | 0-30 % |
| Area check | Evaluation according to area (work) | on/off |
| Area upper limit | Upper limit of the area tolerance (if active) | 0-50 % |
| Area lower limit | Lower limit of the area tolerance (if active) | 0-50 % |
| Trouble check | Additional fault limit to stop production in the event of major errors | on/off |
| Trouble upper limit | Upper fault limit (if active) | 1-100 % |
| Trouble lower limit | Lower fault limit (if active) | 1-100 % |
| Drift compensation | Compensation of gradual changes of the crimping process (e.g. by fluctuations of the terminal material or the room temperature) | on/off |
| Max drift | Limit value of drift compensation. An error is signaled if this value is exceeded. | 1-100 % |
| Gain | Boosting of the sensor signal | 1/2/4/8/16/32 x |

| | | |
|--------------------|---|----------------|
| Signal inverse | Mode of the PLC/stop signal | Normal/inverse |
| Filter | Noise filter | on/off |
| Calibration factor | Calibration factor for comparison of calibration values | 0.01 - 100 |

Trigger category

| Option | Description | Value |
|----------------|---|-----------------------------|
| Trigger mode | Mode of the start encoder: <ul style="list-style-type: none"> ■ External: External start encoder ■ Internal 1: Start encoder through generated sensor force on channel 1 ■ Internal 2: Start encoder through generated sensor force on channel 2 | Ext/Int1/Int2 |
| Trigger level | Force value for internal start encoder (if active) | 1-99 % |
| Trigger offset | Time shift of the starting time to the start encoder | -2000-2000 measuring points |

Crimp category

| Option | Description | Value |
|--------------------------|---|---------------|
| Reference amount | Number of crimps to form the reference curve | 1 - 100 |
| Sample Factor | Enlarging the measuring window for longer crimping processes by skipping n-1 measurements | 1-20 |
| Aktive channels | Determines which channels are activated. | Ch1/ch2/ch1+2 |
| Shift curve peak | Shifts the crimping curves to the X axis (time) and superimposes them at the maximum value to compensate for irregular times. | on/off |
| Always acknowledge error | On: Requires acknowledgment in case of error Off: No acknowledgment, machine continues running Secure: Acknowledgment by password entry | on/off/secure |
| Auto reference check | Evaluates the deviation of curves automatically in reference mode. Each reference must be confirmed manually if disabled. | on/off |

IO category

| Option | Description | Value |
|---------------------|---|---|
| Ready signal | Switches ready signal between normal and inverse. | normal/ inverse |
| Error signal | Switches error signal between normal and inverse. | normal/ inverse |
| Cable clamp impulse | Enables signal for cable clamp. | on/off |
| GPI 1 function | GPI (input) functions channel 1 | MRF0/MRF1/ setW/FPin/ none/setR/ reset |
| GPI 2 function | GPI (input) functions channel 2 | MRF0/MRF1/ setW/FPin/ none/setR/ reset |
| GPO 1 function | GPO (output) functions channel 1 | None/Rstate/ Wstate/FPout |
| GPO 2 function | GPO (output) functions channel 2 | None/Rstate/ Wstate/FPout |

Admin category

| Option | Description | Value |
|-------------------|---|-----------|
| IP address byte 1 | First byte of the IP address that is assigned to the network integration | 0-255 |
| IP address byte 2 | Second byte of the IP address that is assigned to the network integration | 0-255 |
| IP address byte 3 | Third byte of the IP address that is assigned to the network integration | 0-255 |
| IP address byte 4 | Fourth byte of the IP address that is assigned to the network integration | 0-255 |
| DHCP | DHCP for obtaining an IP address automatically | on/off |
| User 2 password | Password for user level 2 | String |
| User 3 password | Password for user level 3 | String |
| Language | Language of the user interface | DE/EN |
| Ref permission | Permit to form reference curve for user level 1 | on/off |
| Unit | Unit of the measuring results | N/lb/none |

7.2.5 User levels

The ACO 08 is controlled via 3 user levels where each of them has different access rights.

1. To access the user level selection, select the "user selection" tile in the main menu.



Fig. 8: User selection

1 User level 1: Default user

3 User level 3: Device administrator

2 User level 2: Setter



Notice

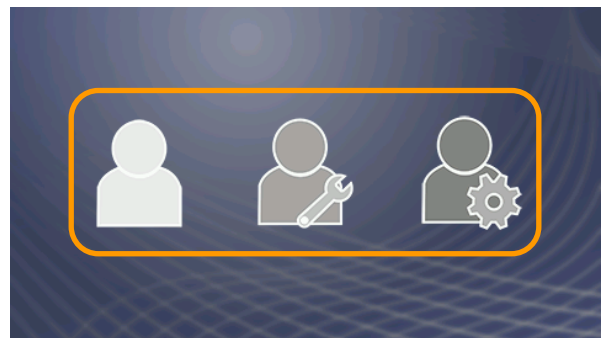
After switching on the device, user level 1 is first always active.

Access rights

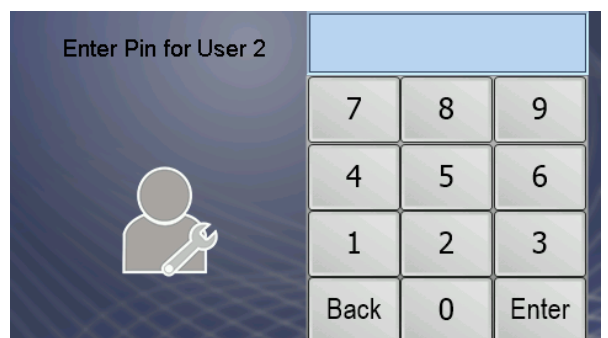
| Access right | User level 1 | User level 2 | User level 3 |
|----------------------------------|--------------|--------------|--------------|
| Monitoring mode access | ✓ | ✓ | ✓ |
| Teaching mode access | optional | ✓ | ✓ |
| Settings access | | restricted | ✓ |
| User level selection access | ✓ | ✓ | ✓ |
| Job management access | | ✓ | ✓ |
| Information dialog access | ✓ | ✓ | ✓ |
| Automatic parametrization access | | ✓ | ✓ |
| Headroom mode access | | ✓ | ✓ |
| Machine presets access | | | ✓ |

Switching user levels

1. Select the desired user level.



2. Enter the appropriate password, if applicable.



Notice

Use only user level 1 in default operation!

Make sure to switch again to user level 1 after you have made corresponding settings on a higher user level.

Passwords

The following passwords are used when the device is delivered:

| User level | Password |
|--------------|----------|
| User level 2 | 1234 |
| User level 3 | 5678 |



Notice

Changing passwords!

We recommend changing passwords at commissioning to rule out changes made to the settings by unauthorized persons.

7.2.6 Job management

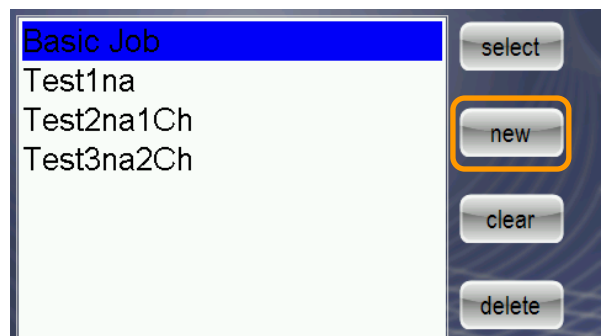
The ACO 08 provides the option of working with jobs. Settings, parameters and measuring results are stored in a job.

1. To access job management, select the "job management" tile on the main menu (requires user level 2 or 3).

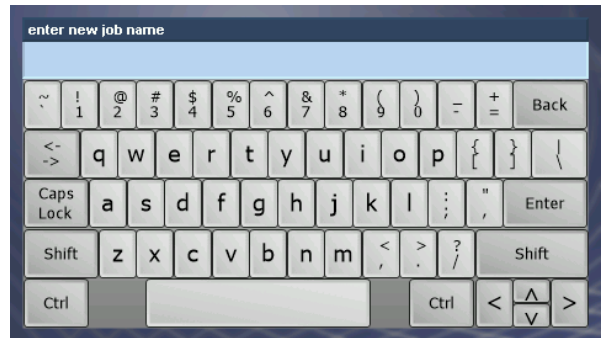


Create job

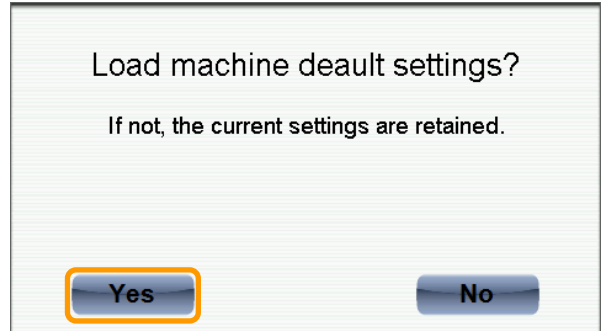
1. Select "new".



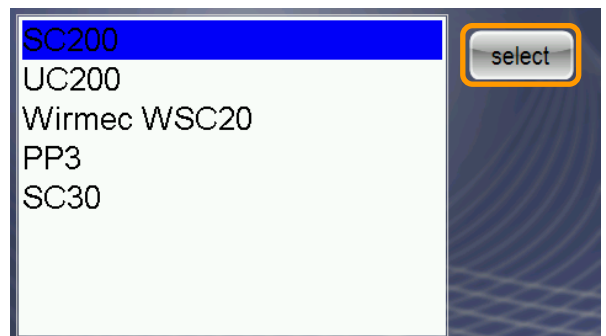
2. Assign a unique name by entry via the on-screen keyboard and confirm with "Enter".



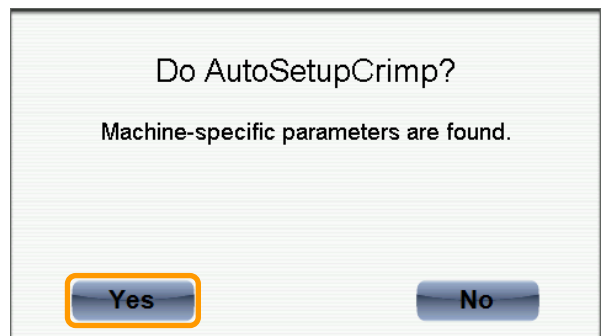
3. Select "Yes" to load the default machine settings. If you want to retain the existing settings and possibly make changes to the settings manually, then select "No".



4. Mark the desired machine and confirm with "select".



5. Select "Yes" to automatically set the corresponding parameters. Proceed as described in the chapter [7.2.8 Automatic parametrization](#).

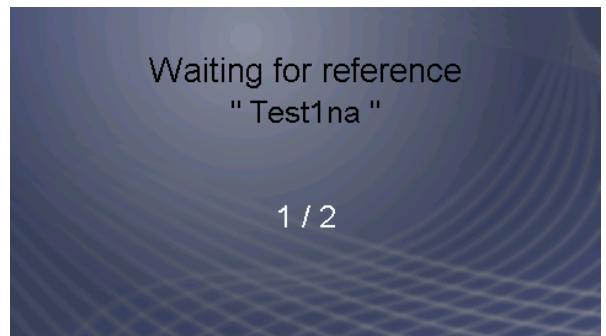


6. Generate a reference curve (see chapter [7.2.3 Teaching](#)).

- ↳ The ACO 08 switches to the monitoring mode

If you do not yet want to generate a reference curve at this time, swipe from the right edge of the display onto the display.

- ↳ The ACO 08 switches to the main menu.





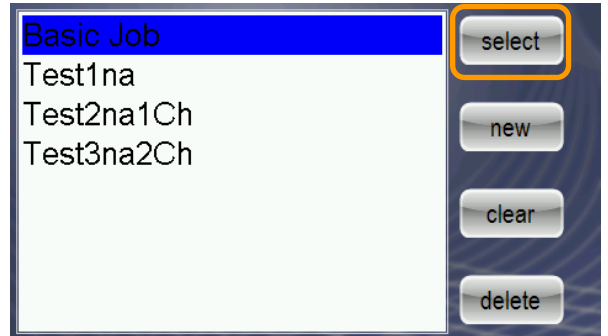
Notice

No measurement without reference curve!

The monitoring mode cannot be accessed if no reference curve was generated.

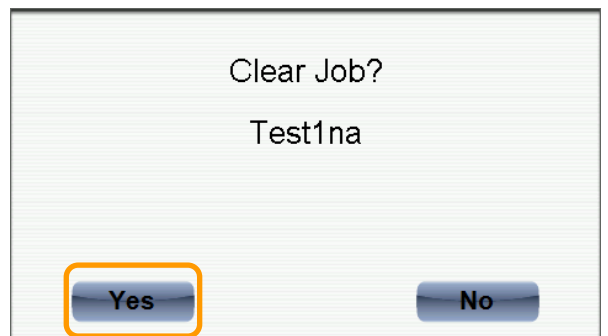
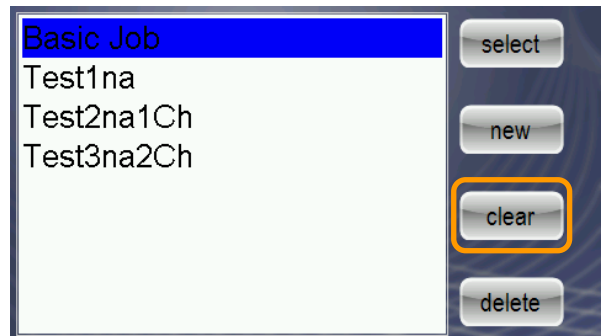
Select job

1. Highlight an existing job and choose "select".
 - ↳ The ACO 08 switches to the settings corresponding to the monitoring mode. All measurements performed so far are displayed.



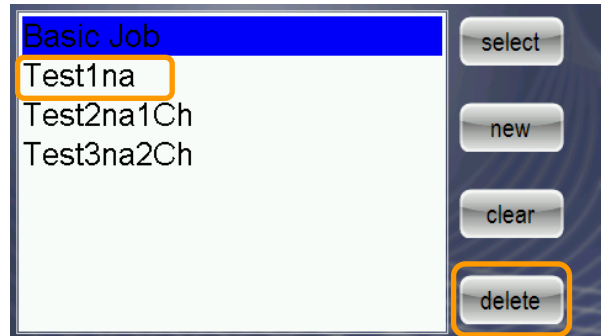
Clear job

1. Highlight an existing job and choose "clear".
2. Answer the verification prompt with "Yes".
 - ↳ All measuring results within the selected job are cleared.

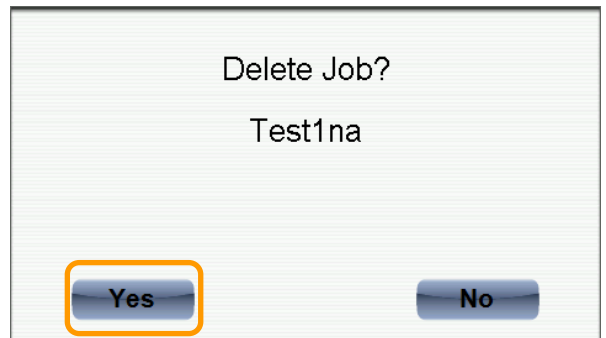


Delete job

1. Highlight an existing job and choose "delete".



2. Answer the verification prompt with "Yes".
 - ↳ The job is deleted from the list.



Notice

Basic Job!

The job "Basic Job" cannot be deleted.

7.2.7 Information dialog

Information on the device is provided here.

1. To access the information dialog, select the "info" tile in the main menu.



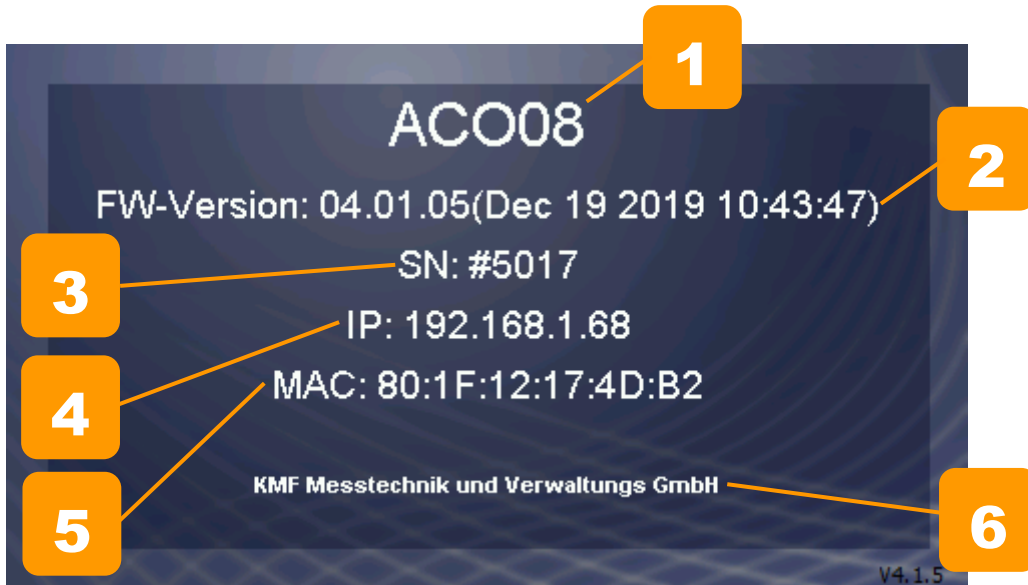


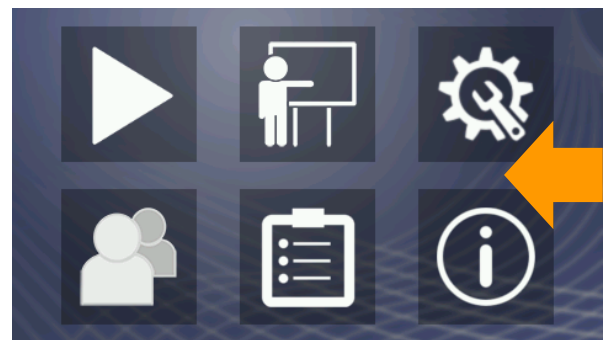
Fig. 9: Information dialog

- | | |
|--------------------|----------------|
| 1 Device type | 4 IP address |
| 2 Firmware version | 5 MAC address |
| 3 Serial number | 6 Manufacturer |

7.2.8 Automatic parametrization

Automatic parametrization allows you to calculate the optimal start time as well as the optimal signal gain.

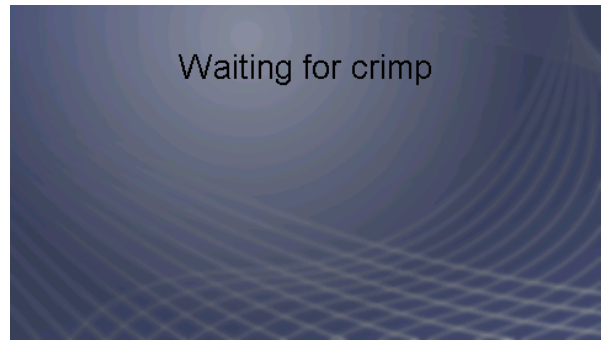
1. To access automatic parametrization, swipe in the main menu from the right across the right edge of the display (requires user level 2 or 3).



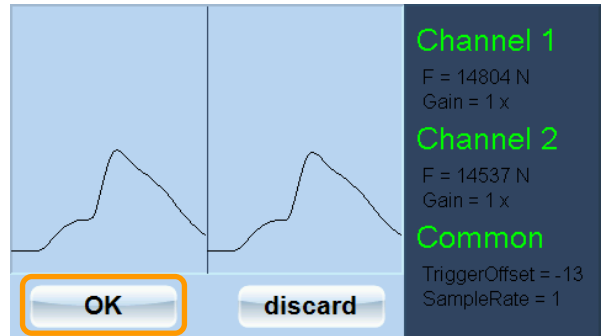
2. Select the tile "automatic parametrization".



3. Generate a crimp with the configured machine.



4. Accept the recommended settings with "OK".



7.2.9 Headroom test

The headroom test lets you determine how much force you have available to determine errors.

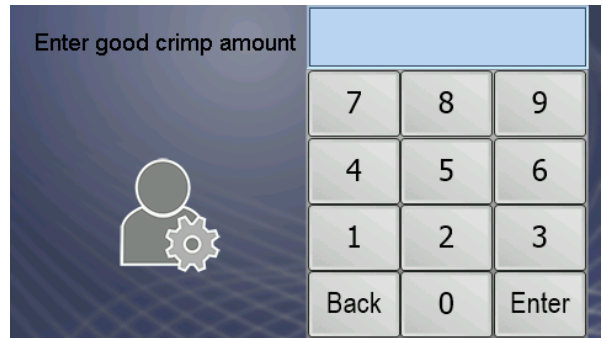
1. To access the headroom test, swipe in the main menu from the right across the right edge of the display (requires user level 2 or 3).



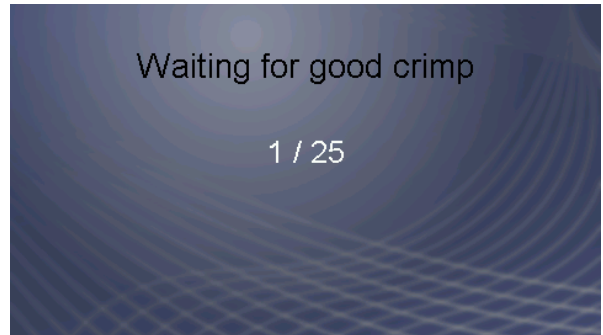
2. Select the "Headroom test" tile.



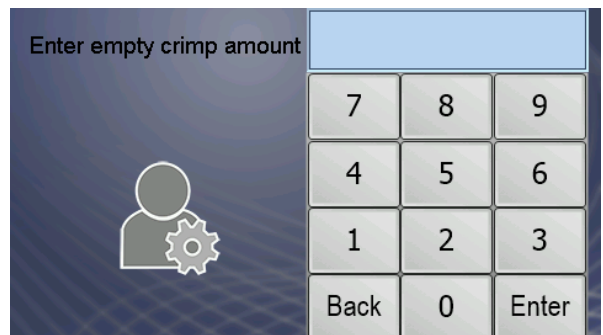
3. Enter the desired number of "good" crimps, the more accurate the result.



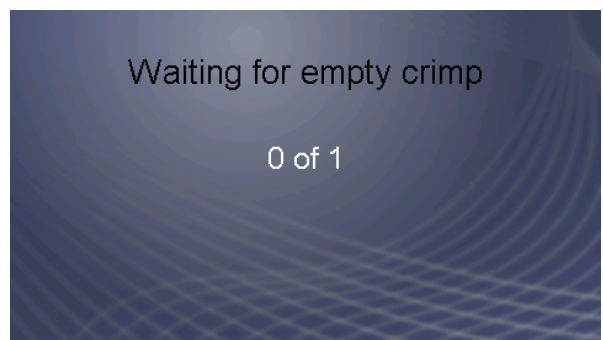
4. Carry out the corresponding number of crimping operations.



5. Enter the desired number of empty crimps for the test and select "Enter". The more crimps, the more accurate the result.



6. Carry out the corresponding number of empty crimping operations, i.e. crimp empty terminal sleeves without conductor.



↳ The results will be displayed.

| Headroom results | | | |
|------------------|---------|-----------|---------|
| Channel 1 | | Channel 2 | |
| good | 20705 N | good | 20232 N |
| deviation | 2.1 % | deviation | 3.9 % |
| empty | 17249 N | empty | 16860 N |
| deviation | 0.0 % | deviation | 3.3 % |
| headroom | 16.7 % | headroom | 16.7 % |

7.2.10 Machine profiles

Machine profiles are default settings that can be accessed for certain machines.

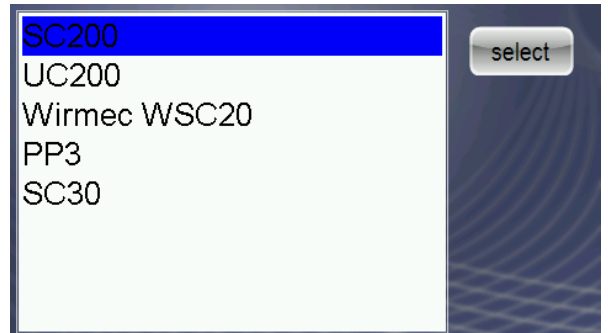
1. To access the machine profiles, swipe in the main menu from the right across the right edge of the display (requires user level 2 or 3).



2. Select the "Machine profile" tile.



3. Mark the desired machine and confirm with "select".



8 DIAGNOSIS / TROUBLESHOOTING

Faults may occur, among others, when major physical stresses or soiling affect the components. Regular inspection and maintenance of the product reduce the potential of unexpected faults and increase operational reliability and service life. Maintenance work must be carried out in accordance with instructions and at the specified intervals.

See chapter [9 Maintenance](#).



Notice

Personnel qualifications

The instructions listed in this chapter must be carried out by a **technical specialist!**

8.1 WHAT TO DO IN THE EVENT OF PROBLEMS

Our customer service team is available if problems occur that cannot be rectified using the operating manual. It is essential to have a precise description of the problem immediately available in such situations:

- Exact product designation
- Serial number of the product (rating plate)
- Machine type used
- Exact description of the fault (fault number and text on the operating panel if available)
- Under which conditions did the fault occur?

8.2 POSSIBLE MACHINE FAULTS

| Error pattern | Cause | Possible measures |
|---|--|--|
| Measurement not carried out | External trigger Start encoder defective / not connected | Check plug connection; replace start encoder |
| | Internal trigger Force sensor not connected / defective | Check force sensor connection, replace force sensor |
| | Force too low to reach threshold | Adapt threshold; check whether tool, terminal, cable are correct |
| | Force bypass | Check or clean the tool/base plate area |
| Measurement is carried out, no force signal | External trigger Force sensor not connected / defective | Check force sensor connection, replace force sensor |

| Error pattern | Cause | Possible measures |
|---|--|--|
| | Wrong trigger time | Perform automatic parametrization |
| | Force bypass | Check or clean the tool/base plate area |
| | Internal trigger Wrong trigger time | Perform automatic parametrization |
| Machine is not released | Wrong machine setup | Load correct machine profile or make appropriate settings manually |
| Device does not start | No voltage on the device | Check connecting cable/power supply, replace if necessary |
| Device signal error with each measurement | Tolerances no longer current; wrong references | Check tool/machine for changes or contamination; generate new references |

9 MAINTENANCE

Regular inspection and maintenance reduce the potential of unexpected faults and increase operational reliability.

This chapter describes simple maintenance work on the product which can be carried out by trained technical personnel at the production site.

All maintenance and cleaning recommendations are based on single-shift operation. When working in multiple shifts, the specified intervals are reduced in the same proportion.

| Maintenance task | Page | Duration | Interval | Personnel qualifications |
|------------------|--------------------|----------|----------|---|
| Cleaning | 12 | 1 min. | weekly | 2.7.1.4 Operating personnel |



Caution

Mains supply!

Switch off the device before any maintenance task and disconnect it from the power supply system!

Cleaning

Duration 1 min

Interval Weekly

Personnel qualifications [2.7.1.4 Operating personnel](#)

Auxiliary equipment  Soft cloth

Basic prerequisites Device switched off and disconnected from power supply system



Notice

Cleaning!

-  Do not use aggressive solvents for cleaning.

Display and plastic parts will be damaged.

Clean housing and display with a damp cloth.

10 DISPOSAL



Notice

Personnel qualifications

The instructions listed in this chapter must be carried out by a **technical specialist!**

10.1 DECOMMISSIONING

Switch off the device and disconnect it from the power supply system.

10.2 DISASSEMBLY / DISPOSAL



Disassemble the product properly. Recycle the disassembled components in accordance with local and statutory regulations.

Schleuniger products mainly consist of the following materials:

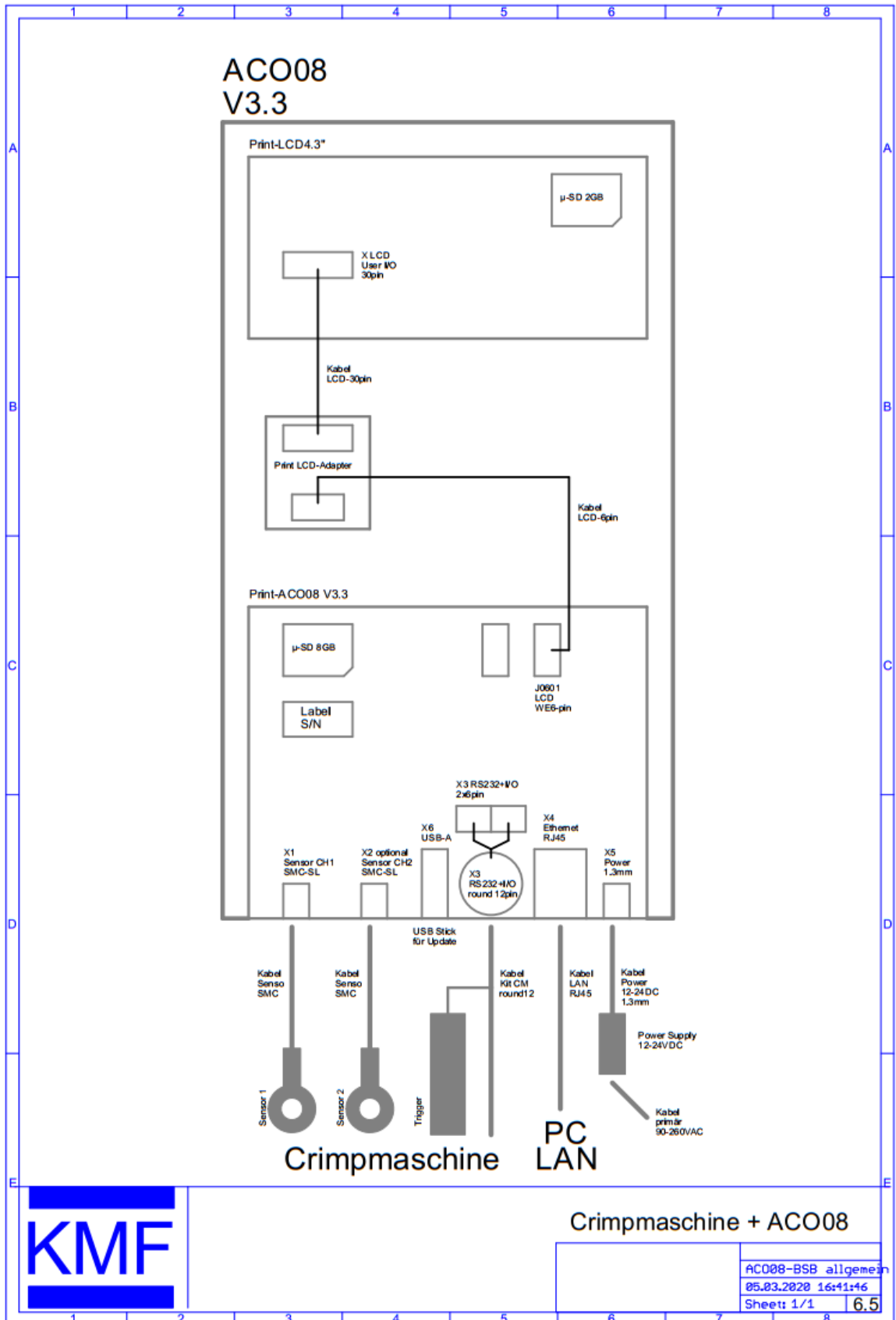
| Material | Disposal |
|----------------------|------------------|
| Aluminum | Metal waste |
| Steel | Metal waste |
| Other metals | Metal waste |
| Electronic materials | Electronic waste |
| Plastic | Recycling |

11 PARTS CATALOG

11.1 SPARE PARTS

| Item number | Description |
|-------------|--|
| 10100092 | Display for ACO08 4.3" Touch |
| 10100093 | Housing cover for ACO08 |
| 10100094 | Spare PCB board ACO08 - 1CH (S/N required) |
| 10100095 | Spare PCB board ACO08 - 2CH (S/N required) |
| 10100096 | Housing base for ACO08 (S/N required) |
| 10100097 | Screw DIN 912 M3 x 25 (1 piece) |
| 10100098 | Screw ISO 7380 M4 x 8 (1 piece) |
| 10100099 | Ball joint incl. flange for ACO08 |
| 10100100 | Connecting rod machine to ACO08 (M12 / M4) |
| 10100009 | Sensor with 1.1 m cable and BNC plug |
| 10100018 | Start/Stop Kit ACO07 SC/UC 200 |

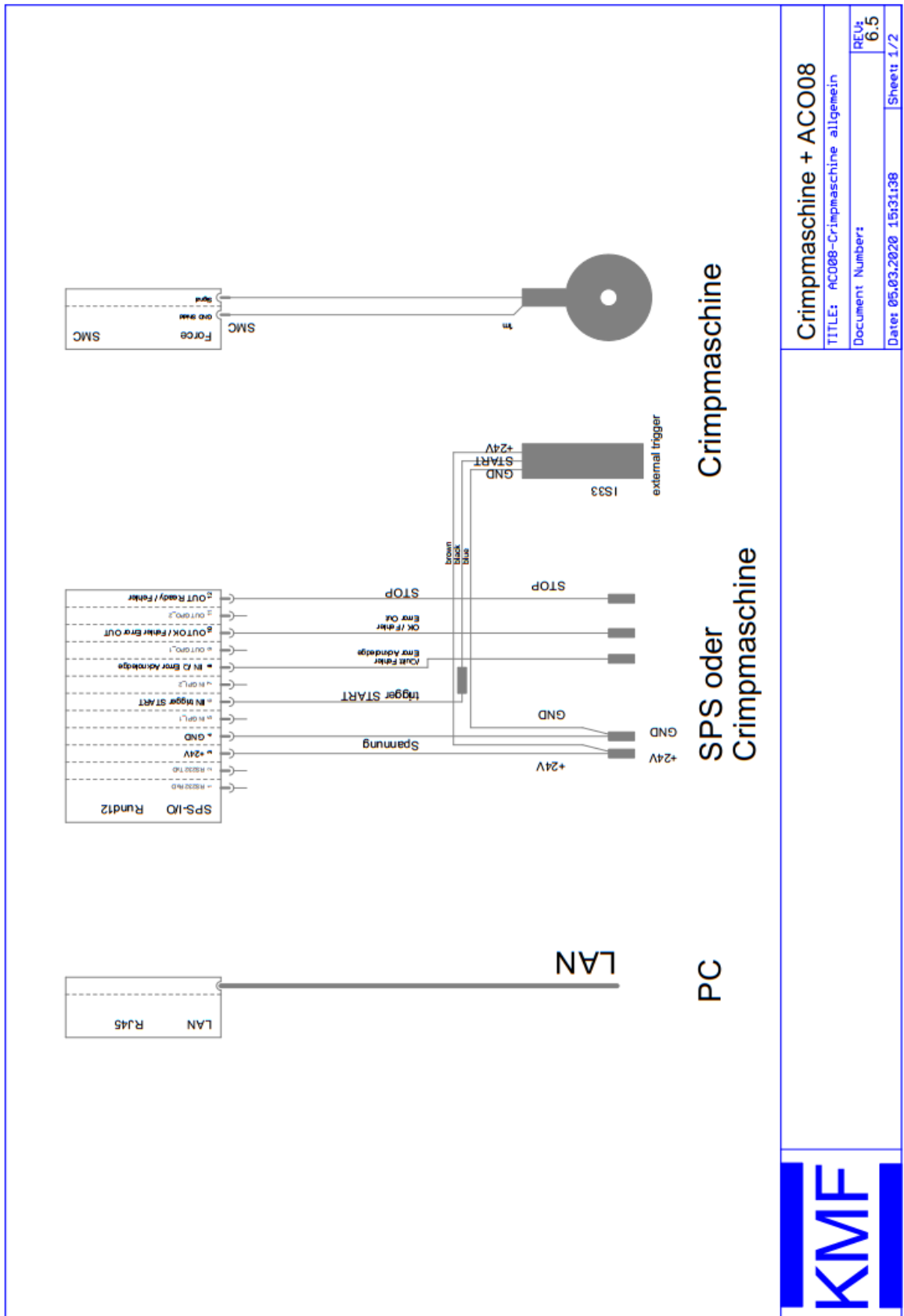
13 BLOCK DIAGRAM



Crimpmaschine + ACO08

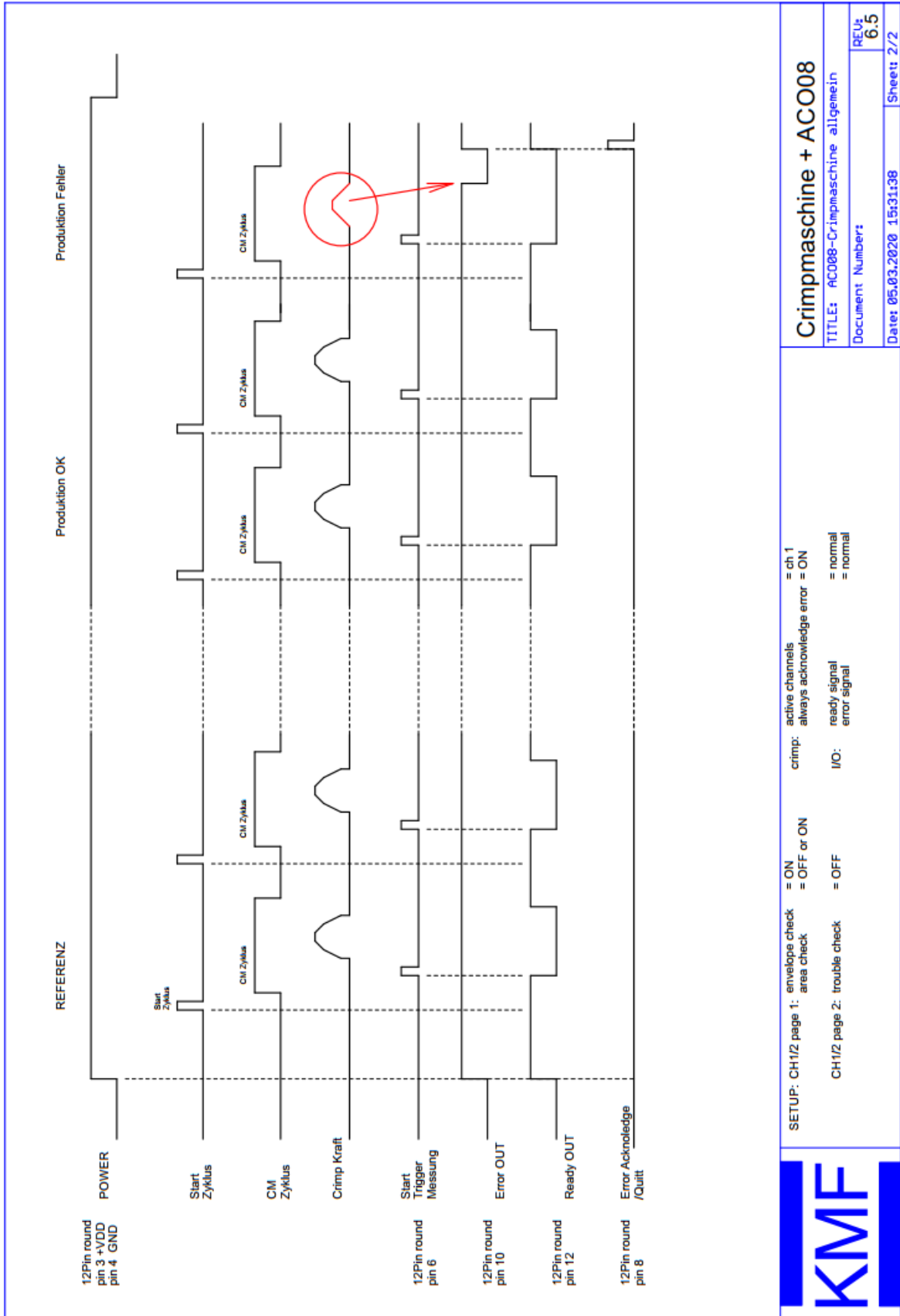
| | |
|---------------------|----------|
| ACO08-BSB allgemein | |
| 05.03.2020 | 16:41:46 |
| Sheet: 1/1 | 6.5 |

14 PLC INTERFACE



| | |
|--------------------------------------|------------|
| Crimpmaschine + ACO08 | |
| TITLE: ACO08-Crimpmaschine allgemein | |
| Document Number: | REF: 6.5 |
| Date: 05.03.2020 15:31:38 | Sheet: 1/2 |





| | | |
|---------------------------|--------------------------------------|------------|
| | Crimpmaschine + ACO08 | |
| | TITLE: ACO08-Crimpmaschine allgemein | |
| | Document Number: | REV: 6.5 |
| Date: 05.03.2020 15:31:38 | | Sheet: 2/2 |

15 NOTES

16 INDEX

C

Content of the manual **6**

Copyright protection **9**

D

Dealer **6**

Declaration of conformity **8**

G

General safety advice **10**

K

Key **8**

L

Limitation of liability **8**

P

Personal protective equipment **13**

Personnel groups **13**

Personnel qualifications **13**

Proper and intended use **12**

R

Residual dangers **10**

S

Safety equipment **14**

Safety symbols used **12**

Symbols **7**

T

Transportation **15**

W

Warnings **10**

Warranty conditions **9**

