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SCHWEISSTECHNIK

Bedienungsanleitung • User's Manual • Manuel utilisateur

# HST 300 Print+ 2.0<sup>(1)</sup>

*Inliegende deutsche Fassung der Anleitung ist der Urtext, welchen inliegende Übersetzungen wiedergeben.  
The German version of the manual enclosed herein is the original copy, reflected in both translations herein.  
La version allemande ci-après représente le texte original du manuel, rendu par les deux traductions ci-joint.*



<sup>(1)</sup> Boost System

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SCHWEISSTECHNIK

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# 1 Introduction

Dear Customer:

Thank you very much for purchasing our product. We are confident that it will meet your expectations.

The HST 300 Print+ 2.0 Welding Unit is designed exclusively for welding plastic pipe fittings according to the electrofusion process. It represents the next generation of the tried and tested HST 300 series, featuring a broader range of functions. It is available with or without a GPS module for automatic recording of the geo-data of every joint.

The product was manufactured and checked according to state-of-the-art technology and widely recognized safety regulations and is equipped with the appropriate safety features.

Before shipment, it was checked for operation reliability and safety. In the event of errors of handling or misuse, however, the following may be exposed to hazards:

- the operator's health,
- the product and other hardware of the operator,
- the efficient work of the product.

All persons involved in the installation, operation, maintenance, and service of the product have to

- be properly qualified,
- operate the product only when observed,
- read carefully and conform to the User's Manual before working with the product.

Thank you.

## 2 Safety Messages

### 2.1 Using the Correct Connection Terminal

Use the appropriate connection terminal that is compatible with the fitting type used. Be sure the contact is firmly established and do not use connection terminals or terminal adapters that are burnt or not designed for the intended use.

## 2.2 Improper Use of the Welding and Power Supply Cables

Do not carry the product by its cables and do not pull the power cord to unplug the unit from the socket. Protect the cables against heat, oil, and cutting edges.

## 2.3 Securing the Fitting and the Joint

Use positioner clamps or a vice to secure the fitting and the joint to be made before welding. The fitting manufacturer's installation instructions, local and national regulations have to be respected in all cases.

A welding process must never be repeated with the same fitting, since this may cause parts under power to be accessible to the touch.

## 2.4 Cleaning the Product

The product must not be sprayed with or immersed in water.

## 2.5 Opening the Unit



The cover of the product may be removed only by specialized staff of the manufacturer or of a service shop properly trained and approved by it.

## 2.6 Extension Cables on the Worksite

To extend power cord length, use exclusively properly approved extension cables that are labeled as such and have the following conductor sections:

up to 20 m: 1.5 mm<sup>2</sup> (2.5 mm<sup>2</sup> recommended);

Type H07RN-F

over 20 m: 2.5 mm<sup>2</sup> (4.0 mm<sup>2</sup> recommended); Type H07RN-F



When using the extension cable, it has always to be rolled off completely and lie fully extended.

## 2.7 Checking the Product for Damage

Before every use of the product, check safety features and possibly existing parts with minor damage for proper function. Make sure that the push-on connection terminals work properly, that contact is fully established, and that the contact surfaces are clean. All parts have to be installed correctly and properly conform to all conditions in order for the product to function as intended. Damaged safety features or functional parts should be properly repaired or replaced by an approved service shop.

## 2.8 Data Interface Cover Cap

The dust cap for the interface has to cover the port during operation, in order to keep humidity and contaminations away.

## 2.9 Power Supply Specifications

### 2.9.1 Mains Power Supply

Utility suppliers' wiring requirements, occupational safety rules, applicable standards, and national codes have to be respected.



Caution

When using power distributions on the worksite, rules for the installation of earth-leakage circuit breakers (RCD) have to be respected, and operation requires an installed breaker.

Generator or mains power fuse protection should be 16 A (slow blow). The product has to be protected against rain and humidity.

### 2.9.2 Generator Power Supply

The required nominal generator capacity as determined by the power supply requirement of the largest fitting to be welded depends on the power supply specifications, the environment conditions, and the generator type itself including its control/regulation characteristics.

Nominal output power of a generator 1-phase, 220 - 240 V, 50/60 Hz:

d 20.....d 160	3.2	kW
d 160....d 450	4	kW mechanically regulated
	5	kW electronically regulated

Start the generator first, then connect the welding unit. The idle voltage should be set to approx. 240 volts. When turning the generator off, disconnect the welding unit first.



Important

The working output power of the generator decreases by about 10% per 1,000 m of altitude. During the welding process no other device connected to the same generator should be operated.

## 3 Service and Repair

### 3.1 General

As the product is used in applications that are sensitive to

safety considerations, it may be serviced and repaired only by the manufacturer or its duly authorized and trained partners. Thus, constantly high standards of operation quality and safety are maintained.

**Failure to comply with this provision will dispense the manufacturer from any warranty and liability claims for the product, including any consequential damage.**

When serviced, the unit is upgraded automatically to the technical specifications of the product at the moment it is serviced, and we grant a three-month functional warranty on the serviced unit.

We recommend having the product serviced at least every twelve months.

Any provisions in the law pertaining to an electrical safety inspection have to be complied with.

### **3.2 Transport, Storage, Shipment**

The product ships in a transport box. The product should be stored in this box, protects the product from humidity and environmental agents.

When sending the product, it should be placed into the transport box at all times.

## **4 Principles of Operation**

The HST 300 Print+ 2.0 allows welding electrofusion fittings that feature a bar code. Every fitting is provided with a tag with one or two bar codes on it. The structure of this code is internationally standardized. The first code, encoding the data on proper welding, complies with ISO 13950, the second code, if present, encoding the component traceability data, complies with ISO 12176-4. The model version with GPS module can additionally be used to record the geographic coordinates of the place where the welding operation is performed, which will then be added to the relevant welding report.

The welding control program supports the extended data encoding specifications under the ISO 12176-4 standard, e.g., pipe and fitting traceability codes. To use this feature, the desired data have to be enabled in the configuration menu, at "Recording" (see Sect. 10.2).

The welding parameters can also be entered manually.



The microprocessor-controlled HST 300 Print+ 2.0 Welding Unit

- controls and monitors the welding process in a fully automated fashion,
- determines welding duration depending on ambient temperature,
- shows all information on the display in plain text.

All data that are relevant for the weld or for traceability are saved to the internal memory and can be sent to a USB stick.

Welding data transfer is enabled through an interface of the USB A type, which is compatible with a USB stick.

#### Further Optional Accessories

- **PC software** for downloading and archiving data on PC (for all common Windows operating systems)
- **Label tag printer** for printing an identifier label for the new joint right after the welding operation
- **USB stick** for data transfer from the welding unit on the worksite to the printer or PC in your office (see details at the end of this booklet)

## 5 Check-out and Operation

- To operate the welding unit, be sure that it is set on a proper, level surface.
- Be sure that power supply/generator protection is 16 A (slow blow).
- Plug the power supply cord into the mains power supply or the generator.
- Read and comply with the User's Manual of the generator, if applicable.

### 5.1 Turning the Welding Unit on

After connecting the power supply cable to mains power or a generator, turn the welding unit on using the On/Off switch. This causes Display 1 to show.

```
*****  
HUERNER  
HST 300 Print+ 2.0  
*****
```

Display 1

Then the screen changes to Display 2.



Caution

#### CAUTION in case of System Errors!

If during the auto-test that the unit performs at start-up, an error is detected, a "System Error" message shows on the display. When this happens, the welding unit has to be disconnected immediately from the power supply and the fitting, and it has to be shipped to the manufacturer for repair.

```
Enter Fitting Code  
14:32:11 21.10.12  
Inp.Volt. 230V 50Hz  
No Contact
```

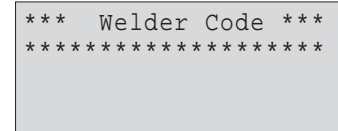
Display 2



## 5.2 Entering the Welder ID Code



The alphanumeric keypad is designed and works like the keypad of a common mobile phone without touch screen display. All characters found on a key can be “browsed” by pressing that key repeatedly at short intervals. As soon as “browsing” generates the desired character on the screen, wait a little longer until you press the next key to use the displayed character. The first character always is the number on the respective key, then the letters or marks in the order on the key, i. e., for instance, with the key “2 | a | b | c” the 1<sup>st</sup> keypress brings up “2,” the 2<sup>nd</sup> “a,” the 3<sup>rd</sup> “b,” and the 4<sup>th</sup> brings up “c.” By default, lower-case letters appear on the screen. To enter upper-case letters, hold down the  $\uparrow$  key while selecting the appropriate letter by one or several keypresses.



Display 3

The welding unit can be configured to ask for the welder identification code before the fitting code is entered. The display screen then shows the message “Enter Welder Code.” (Later this screen can be accessed by a quick access routine; see Sect. 6.1.) The numeric code can be entered either by reading it from a tag with the scanner or by using the alphanumeric keypad. Whether the welder identification code has to be entered and if so, when or how often, is determined in the “Settings” sub-menu of the configuration menu (see Sect. 10.1).

When the welder code is read from a bar code using the scanner, an audible signal confirms this and the screen shows the read code and switches to the next input display. When the code is entered manually, it is saved by pressing the START/SET key. If the code entered is not correct, a “Code Error” message appears; check the sequence of numbers and correct as needed. If the code entered is correct, it is saved to system memory and inserted into the welding reports to be printed.

Only an ISO standard-compliant welder identification code is accepted by the unit. If the welder code feature is disabled, the input screen for the welder code will not show.

## 5.3 Connecting the Fitting

Connect the connection terminals to the fitting and check for proper contact. Use terminal adapters if needed. The contact surfaces of the cable connection terminals or adapters and the fitting have to be clean. Dirty terminals may lead to improper welding and also to overheated and fused

connection terminals. Protect the cable connectors against getting dirty at all times. Terminals and push-on adapters should be considered consumables and, therefore, have to be checked before every welding operation and replaced if damaged or dirty.

When the fitting is connected, instead of the "No Contact" message (see Display 2) the number of the next welding report appears, e.g., "Prot. No.: 0015."

## 5.4 Reading the Fitting Code with a Handheld Scanner

Only the bar code on the tag sticking on the fitting to be welded may be used. It is not acceptable to read the fitting code tag of a fitting of a different kind if the intended one is damaged or unreadable.

Start ?		
Temp.:	20°C	
HST	315mm	58s
SAT	40.00V	0.80Ω

Display 4

Read the fitting code by holding the scanner in front of the bar code at a distance of 5 to 10 cm (2 to 4 inches), where the red line indicates the reading area. Then push the reading button. If the data are correctly read, the welding unit confirms this by an audible signal and displays the decoded data on the screen (see Display 4).



The displayed values are the nominal welding parameters contained in the fitting bar code or computed based on these data. They are displayed before the actual resistance of the electrofusion fitting is measured. This means that even when the showing ohm value is o.k., a resistance error may still be detected (see Sect. 9.2). Only when the welding process starts, the display shows the actual, measured welding parameters.

The "Start ?" message means that the unit is ready to start the welding process. Check the read data and if you see that they are erroneous, delete them by pressing the STOP/RESET key. The read data are also deleted if the welding unit is disconnected from the fitting.

## 5.5 Direct Welding with the AutoWeld Feature

If two welding operations with electrofusion fittings with the exact same welding parameters succeed each other, it is not necessary to read a fitting bar code or enter welding parameters manually. To start a welding operation that is fully identical to the preceding one, it is sufficient to use the AutoWeld feature, provided it was enabled in the configuration menu (see Sect. 10.1). It is accessible from the quick selection screen opened from the "Enter Fitting

Code" screen with the ⇐ arrow key (see Sect. 6.1). In this screen, the selection cursor can be moved using the ↑ and ↓; the selection is made with the START/SET key.



Important

It is under the user's responsibility to rely on the AutoWeld feature only when the preceding and the planned welding operation and electrofusion fitting are really fully identical to each other. An erroneous or negligent use of the feature will result in a poor, unstable joint.

## 5.6 Starting the Welding Process



After the fitting bar code was read or the AutoWeld feature was called, the input of all traceability data that were enabled in the configuration menu (see Sect. 10.2), is requested by the system.

After reading or entering the fitting code, the welding process can be started using the START/SET key, when the "Start ?" message is displayed and there is no indication of a problem.

Pressing the START/SET key will trigger a confirmation message "Pipe treated?," which in turn requires a confirmation with the START/SET key to start the welding proper.

## 5.7 Welding Process

The welding process is monitored for its entire duration applying the welding parameters contained in the fitting code. The welding voltage, the resistance, and the welding current are displayed in the lower line of the screen.

Act. Time: 56sec
Nom. Time: 90sec
35.00V 1.57Ω 22.29A

Display 5

## 5.8 End of Welding

The welding process ends successfully if the actual welding time corresponds to the nominal welding time and the buzzer can be heard twice.

## 5.9 Aborted Welding Process

The welding process has failed if a plain-text error is displayed on the screen and the audible signal buzzes continuously. An error has to be acknowledged by pressing the STOP/RESET key.

## 5.10 Cooling Time

The cooling time as given in the fitting manufacturer's instructions has to be respected. If the bar code provided by the fitting manufacturer contains cooling time data, it will be displayed at the end of the welding process and

will be counted down to zero. This countdown can be acknowledged and canceled at any time by the STOP/RESET key. However, note that for that time the pipe fitting joint which is still warm must not be subjected to an external force. No cooling time is displayed if the fitting code does not contain any such information.

## 5.11 Returning to the Start of Parameter Input

After welding is finished, disconnecting the welded fitting from the unit or pressing the STOP/RESET key will reset the unit back to the start of entering the welding parameters.

## 5.12 Using ViewWeld to Manage Logged Welding Reports, Print Tags, and Assign Geo-data

The ViewWeld feature offers viewing an abstracted version of the welding reports recorded during the welding processes and printing it as a label tag to be affixed to the joint on the optionally available tag printer. The ViewWeld abstract shows the report number, the date and time of the welding and the welding parameters along with an evaluation of the quality of the joint/welding operation (see Display 6), where the first displayed abstract is that of the last performed welding operation.

0015	24.02.13	09:33
M/B	MON HST	315
0058s	025.0V	1.57Ω
Welding OK		

*Display 6*

To call the ViewWeld abstract of a welding report, press the  $\hat{\uparrow}$  key in the bar code input screen (see Display 2). Browsing through the saved welding reports is then possible by pressing the  $\leftarrow$  or  $\rightarrow$  cursor keys. To print a tag of the welding operation of which the abstract is currently displayed, the label tag printer has to be connected to the welder. Then press the START/SET key in the ViewWeld screen.

ViewWeld also enables assigning the geo-data of a joint after it was made, in case they were not recorded with enabled geo-data logging at the welding operation (see Sect. 6.7). To do this, call the ViewWeld screen and, if needed, browse to the welding abstract of the joint that needs to have its geo-data assigned. Then press the  $\hat{\uparrow}$  cursor key in the ViewWeld screen displaying the desired welding operation. This causes a screen asking you if you want to record geo-data to appear (see Display 12). Confirm by pressing the START/SET key and log the geo-data according to the procedure described in Sect. 6.7.

## 6 Additional Information in the Welding Report

Every welding report saved to system memory, which can be downloaded as a PDF report file or in the DataWork

format, contains a number of welding and traceability data that the operator can decide to enter or not to enter in the set-up menu.

## 6.1 Entering Preformatted and User-defined Traceability Data

All traceability data enabled in the configuration menu at "Data Recording" (see Sect. 10) have to be entered before the welding process. The welding unit prompts the user to enter them either before or after entering the fitting bar code (see Display 2). Depending on what data is entered, either its repeated input is mandatory (e. g., the welder ID code; see Sect. 5.2) or previously entered data can be changed and confirmed or confirmed without changes (e. g. the commission number; see Sect. 6.2).

```
*** Recording ***
AutoWeld
>Welder ID Code
Enter Job No.
```

Display 7

Certain traceability data can also be accessed quickly, via a selection screen, by pressing the ⇐ cursor key (see Display 7), either for viewing or for entering or changing/confirming them (for the AutoWeld feature mentioned along with them on this screen, see Sect. 5.5).

## 6.2 Entering or Changing the Job Number and Joint Number

The commission number input screen is shown by the unit before welding or accessed by the user in the quick access screen (Display 7). It can be entered using the alphanumeric keypad (see Info in Sect. 5.2) or by reading it from a bar code using the scanner. The maximum length is 32 characters. Confirm your input by pressing the START/SET key. The job number will be saved to memory and will appear in the printed welding report.

```
Enter Job No.
*****
*****
```

Display 8

Provided is was enabled in the configuration menu (see Sect. 10.2), a commission number-related joint number is also recorded and shown along with the report number (see Sect. 5.3). To say that the joint number is related to the job, or commission, number means that the system checks, when a commission number was entered, whether it exists already in the internal memory. If so, it takes the highest existing joint number for that commission, increments it by 1, and applies this new joint number to the next welding operation in that commission.

## 6.3 Entering or Changing Additional Data

The additional data input screen is shown by the unit before welding, first the screen that allows entering the first additional data, then the one for the second additional

data. This input can be entered either using the alphanumeric keypad (see Info in Sect. 5.2) or by reading from a bar code using the scanner.

For the first additional data input, the maximum length is 20 characters. For the second data input, the maximum length is 15 characters. Confirm your input by pressing START/SET. The additional data will be saved to memory and appear in the welding report. By pressing STOP/RESET, you skip this screen without any input.



You are free to define any additional data you see fit. For instance, you can put into these fields information on pipe length, ditch depth, or comments that help with welded joint traceability.

```
** Addit'l Data 1 **  
*****
```

Display 9

## 6.4 Entering the Fitting Traceability Code

If this feature is enabled in the configuration menu, after the fitting code was entered, another input "Fitting Code" is required. This is the so-called "traceability code" or "second fitting code" of the fitting.

```
*** Fitting Code ***  
*****  
*****
```

Display 10

This input is entered either from a bar code using the scanner or manually using the alphanumeric keypad (see Info in Sect. 5.2). Press the START/SET key to confirm your input. If the code entered is not correct, a "Code Error" message appears; check the string of numbers and correct as needed. If the code entered is correct, it is saved to system memory and inserted into the welding reports to be printed. By pressing the STOP/RESET key, you skip this input.

## 6.5 Entering Weather Conditions

If the weather conditions feature is enabled in the system set-up, this input is required before the fitting code can be entered.

```
**** WEATHER ****  
>sunny  
dry  
rain
```

Display 11

Use the arrow keys  $\uparrow$ ,  $\downarrow$  to select from "sunny," "dry," "rain," "wind," "tent," and "heating." Press the START/SET key to confirm your selection. The selection is saved to memory and will appear in the printed welding report.

## 6.6 Entering Data on the Jointed Components

According to the same procedure as used for entering the fitting traceability code (see Sect. 6.4), prior to the welding proper the ISO-compliant codes of the pipes to be welded, their length as well as the installing company can be entered for inclusion in the welding reports. For this to be possible, they have to have been enabled in the



configuration menu.

## 6.7 Recording the Geo-data of the Planned Joint

*This section applies only to the product version with GPS module.*

Provided that geo-data recording is enabled in the configuration menu (see Sect. 10.2), the geographic coordinates can be recorded, if the GPS module is on, as soon as Display 12 shows on the screen.

```
Record Geo-Data
>Yes
No
```

Display 12



Wait at least 1 minute from switching the GPS module on to the actual recording of the geo-data, or the GPS module will throw a not-ready error.

Important

During the first minute after switching the GPS module on the following messages may appear on the screen: "No signal," "GPS module failed," "GPS Error, Restarting," and "GPS Module not Ready." These are no errors during the starting minute of initialization right after switching on. If they appear after this time, they have to be considered actual error messages. In this case, the restart after a GPS (signal processing) error will be performed by the module itself, without any user action. The Not Ready message disappears automatically, too, as soon as the module is ready for recording.

The geo-data are recorded after you selected "Yes" in Display 12 using the  $\uparrow$  and  $\downarrow$  arrow keys and confirmed this selection by pressing the START/SET key. A message confirms that the data have been recorded. The recorded data then show on the screen (see Display 13). A second screen is used to display additional information on the precision at the time of recording. To switch back and forth between both geo-data screens, press the  $\Rightarrow$  key.

```
Current Position
050.38,4873'N
008.59,4141'E
Sat:7
```

Display 13

If it is likely that no satisfactorily precise position will be recorded because of relatively poor signal strength, a warning message tells you, after you pressed the START/SET key in Display 12, "Poor GPS signal; record data?". When this message is showing, you can still start recording the position by pressing the START/SET key or go on without recording by pressing the STOP/RESET key.



Info

The recorded position is the one the GPS module is at at the moment of recording. This means that in situations where the welding unit cannot be set next to the joint that is being welded, it is possible to start by placing the welder/the GPS module next to the future joint, then to record the geo-data, and finally to move the welder to the place where it will be during the welding process.



## 7 Entering Welding Parameters Manually

To be able to enter the welding parameters manually, you have first to connect the fitting to the welding unit with the welding cable. The manual input of the parameters can then be accessed by pressing the ↓ arrow key. The screen will show a menu as reproduced in Display 14, provided manual input is enabled in the configuration menu (see Sect. 10.1). In other words, the manual parameter input replaces reading the bar code of the fitting with a scanner.

```
** MANUAL INPUT **  
>Enter Voltage/Time  
Enter Fitting Code
```

Display 14

Using the arrow keys ↑ and ↓ you can select “Enter Voltage/Time” or “Enter Fitting Code” (i.e., the numbers that represents the code of the fitting to be used). Confirm your selection by pressing the START/SET key.

### 7.1 Manually Entering Welding Voltage and Time

If this option was chosen in the manual parameter input menu, a display like the one to the right appears on the screen. Use the alphanumeric keypad (see Info in Sect. 5.2) to set the welding voltage and the welding time, according to the fitting manufacturer’s instructions, then press the START/SET key to confirm your input. The “Start ?” message displayed after the confirmation by START/SET indicates that the unit is ready for welding.

```
Voltage/Time  
U= 40 V t= 1000 s
```

Display 15

### 7.2 Entering the String of Numbers

If this option was chosen in the manual parameter input menu, the “Enter Fitting Code” display shows. The 24 characters of the fitting code to be entered display as asterisks ( \* ). Use the alphanumeric keypad (see Info in Sect. 5.2) to enter the code and press START/SET to confirm your input and have it decoded. If the code entered is not correct, a “Code Error” message appears; check the string of numbers and correct as needed. If the code is correct, the decoded data is displayed, and the “Start ?” message indicates that the unit is ready to start welding.

## 8 Downloading the Reports

Interface

### USB A Interface Port

for connecting USB mass storage media (such as a memory stick)

The interface port complies with the USB version 2.0 specification (i.e., maximum data rate of 480 megabits per second).



Important

Before transferring data, it is highly recommended to switch the welding unit off and on again. If this fails to happen, there is a risk of data transfer failure, or reports in the welding unit may be corrupted.



Important

When transferring welding reports to a USB stick, always be sure to wait until the display shows the "Download finished" message before you disconnect the USB stick from the product. If you disconnect it too early, the unit may ask you whether you want to delete the reports in memory, although they were not properly transferred. In this case, if you delete the contents of the report memory, the welding reports would be irrevocably lost and would not be available elsewhere either.

## 8.1 Selecting the File Format

Connecting the storage media causes the the screen to appear in which the format of the output file with the welding reports can be selected: a PDF file with an abstracted or extended version of the report, the format of the welding data management application DataWork or a CSV file. Using the  $\uparrow$  and  $\downarrow$  arrow keys, select the file type you need and confirm your selection by pressing the START/SET key.

```
* Select File Type *
DataWork File
>PDF Abstract
PDF Ext'd Report
```

*Display 16*

The CSV format enables import of the report data into a database or spreadsheet application, provided this application can read the format; this is the case, e.g., with Microsoft Excel.

The Service Report option is not important for normal operation. In the scope of computer-assisted unit service, this report lists the events related to the maintenance of the welding unit.

## 8.2 Downloading All Reports

After the file type was selected, the next screen offers a "Print All Reports" option. Selecting it will download all welding reports currently in system memory in the previously selected file format.

## 8.3 Downloading by Commission Number, Date or Report Range

After the file type was selected, the next screen offers a "By Commission Number," a "By Date Range," and a "By Report Range" options. Depending on the selection, the  $\uparrow$

and ↕ arrow keys can be used to select from the commissions currently in system memory the desired one, of which the reports should be downloaded, or the alphanumeric keypad can be used (see Info in Sect. 5.2) to enter a start date and an end date, or the first and the last report, that define a range of dates or a range of reports of which the reports should be downloaded. When you press the START/SET key, you cause the selected reports to be transferred to the storage media.

## 8.4 Understanding the Report Download Process

The download starts automatically after a selection was made among the options. Wait for all the selected reports to transfer and the "Download completed" message to appear on the screen.

If a problem occurs while the download is in progress, a "Not ready" message shows. After the problem condition is cleared, the download resumes automatically.



If the welding unit recognizes a problem that cannot be cleared while the data transfer is in progress, it does not resume the process and displays a "Download cancelled" error message. To acknowledge this error, press the START/SET key.

## 8.5 Deleting Data from Memory

The report data in memory can be deleted only after all welding reports were transferred, which is indicated by the "Download completed" message. When the storage media is unplugged, a "Delete Memory" message appears. If the START/SET key is pressed at this point, a further confirmation message "Delete Memory, sure?" is shown, which has to be confirmed by pressing the START/SET key once again. Then, the report data in memory are deleted.

## 8.6 Keeping Data in Memory

When the cable or storage media is unplugged, a "Delete Memory" message is displayed. Press the STOP/RESET key to keep the current report data in memory. They can then be printed off once again.



**Important** Make a habit of handling the internal storage as described at the beginning of Sect. 8, to maintain data integrity and avoid any inadvertent deletion of the reports in memory.

## **9 Dedicated Welding Unit Information**

### **9.1 Displaying Characteristics of the Welding Unit**

The key technical information on the welding unit itself is displayed by pressing the ⇨ key at the "Enter Fitting Code" screen. They are the software version, the serial number of the unit, the date of the next scheduled maintenance, and the number of currently available, unused reports. To quit this screen, press the STOP/RESET key.

If the scheduled service is overdue, a service due message appears on the screen as soon as the unit is plugged into the mains or generator power supply. This message has to be acknowledged by pressing START/SET.

### **9.2 Measuring Resistance**

When the START/SET key was pressed to initiate a welding process, the resistance value of the fitting is measured and compared to the value entered as part of the read fitting code. If the gap between the two values is smaller than the acceptable tolerance given in the code, the welding process starts. If the gap is greater than the preset tolerance, the welding unit aborts welding and displays a "Resistance Error" message. Furthermore, it displays the actual resistance value measured for the connected fitting.

The reason for a resistance error may be poorly contacting and/or worn connection terminals. Therefore, if this error occurs, check them for proper fit and, if worn, replace them with new ones.

### **9.3 Overheating Switch**

The welding process aborts if the temperature of the transformer in the welding unit is too high. The overheating circuit breaker for the transformer stops the welding if the temperature reading is too high and the remaining welding time is longer than 800 seconds. The display and the welding report will show an "Overheated" message.

### **9.4 Indication of Power Supply Failure at the Last Welding**

The message "Power Supply Failure Last Welding" indicates that the previous welding aborted because of a power supply failure. The reason may be too weak a generator or too long or too thin an extension cable, or a tripped cut-out in the mounting box. The next welding operation

is still possible after acknowledging the message by pressing the STOP/RESET key.

## 10 Configuring the Welding Unit

With the operator identity card, the welding unit can be reconfigured. When the MENU key is pressed, the "Enter Menu Code" message appears on the screen. After the code was read from the operator card, the selection menu in Display 17 shows.

```
>Settings      -M-  
Recording      -M-
```

Display 17

At "Settings," the parameters related to the welding unit itself and its operation can be set. At "Recording," the traceability data that have to or need not be recorded and written into the reports can be enabled or disabled. The desired sub-menu is selected using the  $\uparrow$  and  $\downarrow$  arrow keys. Then to access that sub-menu, press the MENU key.

In both parts of the configuration menu, use the  $\uparrow$  and  $\downarrow$  arrow keys to select the desired set-up option. Use the  $\Rightarrow$  arrow key to toggle between "on" and "off" for that set-up option.

If a "M" is shown next to a set-up option, this indicates that a sub-menu is accessible here by pressing the MENU key.

Press the START/SET key to confirm the set-up and save it to memory.

### 10.1 Understanding the "Settings" Sub-menu

"AutoWeld on" means that the AutoWeld feature for the easy definition of welding parameters (see Sect. 5.5) can be used, "off," that the feature is not available.

"Check Code Expiry on" means that the welder identification code has to be current and not expired (default period of validity 2 years from code issuance), or the welding operation cannot be started, "off," that the validity of the code is not checked at all.

"Memory Control on" means that when the system memory is full of reports, the unit will be blocked until the reports are printed or downloaded, "off," that it works but that the oldest report will be overwritten.

"Manual Input on" means that the manual input of welding parameters (see Sect. 7) is possible, "off," that the manual input is not allowed.

"Welder Code Options – M – " means that by pressing the MENU key, the user can access a sub-menu that allows determining when the welder code, if it is enabled at "Recording," has to be entered: always, i. e. before every

```
*** SET-UP MENU ***  
>AutoWeld      on  
Check Cd Expiry off  
Memory Control on
```

Display 18

single welding operation, only before the first welding operation after switching the unit on or only after the first welding operation of a new day/date.

“Language – M – ” means that by pressing the MENU key, the user can access a sub-menu for selecting the display and report language (see Sect. 10.1.1).

“Date/Time – M – ” means that by pressing the MENU key, the user can access a sub-menu for setting the clock (see Sect. 10.1.2).

“Buzzer Volume – M – ” means that by pressing the MENU key, the user can access a sub-menu for setting the volume of the status buzzer (see Sect. 10.1.3).

“Temperature Unit – M – ” means that by pressing the MENU key, the user can access a sub-menu for selecting centigrade or Fahrenheit as the unit for the temperature.

“Inventory Number – M – ” means that by pressing the MENU key, the user can access a sub-menu for entering the number under which the unit is inventorized with the operating company.

“Number of Tags – M – ” means that by pressing the MENU key, the user can access a sub-menu for entering the number of tags that are printed automatically after welding with the optional label tag printer if such a printer is connected.

```
*** SET-UP MENU ***
Manual Input      -M-
Wldr Code Option -M-
>Language         -M-
```

Display 19

```
*** SET-UP MENU ***
Date/Time        -M-
Buzzer Volume    -M-
>Temp. Unit      -M-
```

Display 20

```
*** SET-UP MENU ***
>Temp. Unit      -M-
Inventory No.    -M-
Number of Tags   -M-
```

Display 21

## 10.1.1 Selecting the Display Language

When the “Select Language” sub-menu was selected, the screen changes and the display reproduced in Display 22 appears.

Use the arrow keys  $\uparrow$  and  $\downarrow$  to select one of the options, “Deutsch,” “English,” and “Français” and confirm by pressing the START/SET key.

```
***** LANGUAGE *****
>Deutsch
English
Français
```

Display 22

## 10.1.2 Setting the Clock

When the “Set Clock” sub-menu was selected, the screen changes and the display reproduced in Display 23 appears.

The time of day and the date can be set using the keypad. The portions “Hour,” “Minute,” “Day,” “Month,” and “Year” are set separately. Press the START/SET key to confirm your settings.

```
Date/Time
21.06.13      14:28
```

Display 23

## 10.1.3 Setting the Buzzer Volume

When the “Set Volume” sub-menu was selected, the screen changes and the display reproduced in Display 24 appears. The buzzer can also be heard. Turn the buzzer volume up or down to the desired value using the  $\leftarrow$ ,  $\rightarrow$  arrow keys

```
Buzzer Volume
< -----20----- >
```

Display 24



(from 0 to 100) and confirm your setting by pressing the START/SET key.

## 10.2 Understanding the "Recording" Sub-menu

"Welder Code on" means that the welder identification code has to be entered as set with "Welder Code Options," "off," that this is impossible.

"Commission Number on" means that the commission number (job number) will have to be entered or confirmed before every new welding, "off" that the user is not prompted to enter it.

"Joint Number on" means that the unit assigns an automatically incremented joint number to every welding operation belonging to a commission already known, and displays this number on the screen next to the report number, "off" that no joint numbers will be assigned at all.

"Additional Data on" means that the additional data will have to be entered or confirmed before every new welding, "off" that the user is not prompted to enter them.

"Fitting Code on" means that the second, so-called traceability code of the electrofusion fitting has to be entered before every welding, "off," that this is not possible.

"Pipe Codes on" means that the codes of both pipes/components (ISO-compliant welding and traceability codes) have to be entered before every welding, "off," that this is not possible.

"Pipe Length on" means that the length of both pipes/components has to be entered before every welding, "off," that this is not possible.

"Weather Conditions on" means that the weather has to be selected in a list before every welding, "off," that this is not possible.

"Geo-data on" (only if GPS module) means that the geographic coordinates have to be recorded after every welding (see Sect. 6.7 for details), "off," that this is not possible.

"Installing Company on" means that the company that performs the installation work has to be entered before every welding, "off," that this is not possible.

"Print Tags – M –" means that by pressing the MENU key, the user can access a sub-menu for starting to print (a) label(s) with reference to a given welding operation, with the optional label tag printer.

Data Recording	
Welder Code	on
>Commission No.	on
Joint No.	off

Display 25

Data Recording	
Additional Data	on
>Fitting Code	on
Pipe Codes	on

Display 26

Data Recording	
Pipe Length	on
>Weather Cond.	on
Geo-data	off

Display 27

Data Recording	
>Geo-data	off
Installing Comp.	on
Print Tags	-M-

Display 28



All data can also be read from a bar code with the scanner, provided such a bar code is available.



## **11 Self-Monitoring Functions Overview**

### **11.1 Errors During Data Input**

#### **11.1.1 Code Error**

An erroneous input has occurred, a code tag is poor or has an error in code symbology or code reading was improper.

#### **11.1.2 No Contact**

There is no properly established electric contact between the welding unit and the fitting (check push-on terminal on fitting), or the heater coil is defective.

#### **11.1.3 Low Voltage**

The input voltage is below 175 volts. Adjust generator output voltage.

#### **11.1.4 Overvoltage**

The input voltage is over 290 volts. Decrease generator output voltage.

#### **11.1.5 Overheated**

The transformer temperature is too hot. Let the welding unit cool down for about 1 hour.

#### **11.1.6 System Error**

##### **CAUTION!**

The welding unit has to be disconnected immediately from both the power supply and the fitting. The auto-test has detected an error in the system. The unit must no longer be operated and has to be sent to an approved shop for check and repair.

#### **11.1.7 Temperature Error**

The ambient temperature measured is outside the operating range of the welding unit, i.e., below  $-20^{\circ}\text{C}$  ( $-4^{\circ}\text{F}$ ) or over  $+60^{\circ}\text{C}$  ( $+140^{\circ}\text{F}$ ).

#### **11.1.8 Temperatur Sensor Defective**

The ambient temperature sensor on the welding cable is damaged or defective.

### **11.1.9 Clock Error**

The internal system clock works improperly or is defective. Reset it, or send the welding unit to the manufacturer for check and service.

### **11.1.10 Unit to Service**

The recommended next service date for the welding unit is overdue. The service due message has to be acknowledged by pressing the START/SET key. Send the welding unit to the manufacturer or an approved service point for service and check-up.

### **11.1.11 Input Error**

A code that was entered is incorrect. At manual welding parameter input, no welding time was entered. An incorrect value was selected in the date setting.

### **11.1.12 Memory Full**

The system memory is full of welding reports. Print or download the reports in memory or switch memory control off. Without memory control, a new report overwrites the oldest existing one.

### **11.1.13 Download Cancelled**

During data transfer or printing, an error condition occurred which could not be cleared.

### **11.1.14 GPS Module Not Ready (only in model version with GPS module)**

The minute that you have to wait from switching the GPS module on to the actual recording of the geo-data is not over yet.

### **11.1.15 No GPS Signal (only in model version with GPS module)**

There is no reliable signal from the relevant satellites to the GPS antenna of the module.

### **11.1.16 Poor GPS Signal (only in model version with GPS module)**

The signal strength is so weak that no precise position can be recorded. Repeating the recording is recommended.

## **11.2 Errors During Welding**

All errors that occur while welding is in progress are also indicated by an audible alarm.

### **11.2.1 Low Voltage**

The input voltage is below 175 volts. If the error condition persists for longer than 15 seconds, the welding process will be aborted. If the voltage goes down below 170 volts, the welding process will abort immediately.

### **11.2.2 Overvoltage**

The input voltage is over 290 volts. If the error condition persists for longer than 15 seconds, the welding process will be aborted.

### **11.2.3 Resistance Error**

The resistance value of the connected fitting is out of the read tolerance.

### **11.2.4 Frequency Error**

The frequency of the input voltage is out of tolerance (42 Hz - 69 Hz).

### **11.2.5 Voltage Error**

Check generator voltage and current. The output voltage does not correspond to the value previously read; the welding unit has to be sent to the manufacturer for check-up.

### **11.2.6 Low Current**

The message is displayed if there is a momentary current failure or if the current decreases by more than 15% per second for 3 seconds.

### **11.2.7 Excess Current**

The output current value is in excess; possible causes: short-circuit in the heater coil or the welding cable. During the start stage the upper abort threshold equals 1.18 times the value at start, in any other case the upper limit depends on the load value and is calculated as the current at start plus 15%.

### **11.2.8 Emergency Off**

The welding process has been interrupted by pressing the STOP/RESET key.

### **11.2.9 Heater Coil Error**

The dynamic current value during welding differs by more than 15% from the required value, indicating a short-circuit in the heater coil.

## 11.2.10 Power Supply Failure at Last Welding

The last welding is incomplete. The welding unit was disconnected from the power supply voltage while it was in progress. To go on using the unit, this error has to be acknowledged by pressing the STOP/RESET key (see also Sect. 9.4).

## 12 Technical Specifications

Nominal Voltage	230 V
Frequency	50 Hz / 60 Hz
Power	3295 VA / 2800 VA, 80% duty cy.
Power	3680 VA / 3312 VA, 80% duty cy. <sup>(1)</sup>
Ingress Protection	IP 54
Primary Current	max. 16 A
Ambient Temperature	-20°C to +60 °C (-4°F to +140°F)
Output Voltage	8 V - 48 V
Max. Output Current	110 A
Memory for Welding Reports	10,000 reports
Data Interface Port	USB v 2.0 (480 mbit/s)
(see also the information on the data ports in Sect. 6)	

Tolerances:

Temperature	± 5 %
Voltage	± 2 %
Current	± 2 %
Resistance	± 5 %

Operating Range	20 through 1200 mm
Operating Range	20 through 1600 mm <sup>(1)</sup>

## 13 Service and Repair Contact

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We reserve the right to change technical specs of the product without prior notice.

<sup>(1)</sup> Boost System

## 14 Accessories/Parts for the Product

Connection Terminal 4.7 threaded (fitting connector of welding cable), compatible with Uponor, DURA-Pipe, Simona, Strengheld, Plasson	216 - 023 - 430
Push-on Adapter FF flat compatible with Friatec	216 - 010 - 070
Push-on Adapter FF round 4.0 compat. w/ Friatec, GF, agru, Wavin, Euro Standard	216 - 010 - 080
Push-on Adapter FF pin compatible with Friatec Friafit (waste water)	216 - 010 - 400
Push-on Adapter GF compatible w/ GF, agru, Wavin, with free wires	216 - 010 - 090
Push-on Elbow Adapter 4.7 - 4.7 90°	216 - 010 - 580
Adapter Bag	216 - 030 - 310
Welder/Operator ID Card	216 - 080 - 031
Software DataWork for Windows	216 - 080 - 505
USB Stick	300 - 010 - 154