

HÜRNER



HÜRNER
SCHWEISSTECHNIK

Bedienungsanleitung • User's Manual • Manuel utilisateur

SPG 2.0



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The success of the jointing operation depends on the proper pressures, times, and temperatures used in the process. The correct pressure value depends on the section of the cylinder of the welding machine. Prior to welding, verify carefully that correct machine is set/selected in the data logger.

1 Introduction

Dear Customer:

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

The development, manufacture, and check of the data logger for recording welding processes **HÜRNER SPG 2.0** has been performed with a view to superior operation safety and user-friendliness. The product was manufactured and checked according to state-of-the-art technology and widely recognized safety provisions.

To ensure maximum operation safety, please conform to the appropriate messages in this booklet and the rules for the prevention of accidents.

Thank you.

2 Safety Messages

This User's Manual contains important instructions for the intended and safe operation of the product. Every person who operates the product has to conform to the instructions of this manual.

2.1 The User's Manual

The User's Manual is presented according to sections which explain the different functions of the product.

All rights, in particular the right to copy or reproduce (in print or electronic form) and distribute as well as to translate, are reserved and subject to prior written consent.

2.2 Explaining Icons

The following expressions and icons are used in this User's Manual to refer to safety-related issues:



Caution

This icon indicates that non-compliance may result in a hazardous situation that possibly causes bodily injury or material damage.



Important

This icon indicates important messages related to the correct use of the product. Non-compliance may cause problems of operation and damage to the product.



Info

This icon indicates tips and useful information for using the product more efficiently and more economically.

2.3 Operating the Product Safely

For your own safety, comply with the following instructions

- Protect the power supply cord and sensor cables from cutting edges. Have an authorized service shop replace damaged cables immediately.
- The product may be operated and serviced exclusively by authorized staff who were briefed on it.
- The product may be operated only when observed.
- Before operating the product, always check for damaged parts

and have them repaired or replaced by an authorized service shop as needed.

- The dust cap of the interface port has to be closed during welding in order to prevent contaminants and humidity from entering the enclosure.
- Mains suppliers' wiring regulations, VDE provisions, DIN/CE regulations, and applicable national legislation have to be respected.
- Without prior authorization by the manufacturer, modifications to the product are unacceptable.



Caution

Parts Under Power

After opening the enclosure or removing the cover, parts of it are accessible that may be under power. It may be opened exclusively by an authorized service shop.



Info

User's Manual

The User's Manual has to be available at any time on the site where the product is used. If the User's Manual becomes incomplete or unreadable, replace it without delay. Feel free to contact us for assistance.

2.4 Owner and Operator Obligations

- The system may be operated only when observed. Welders must have been briefed properly on the operation of the system or must have participated in a dedicated training. The operating/owning organization engages to check at reasonable intervals if the system is operated by the welders as intended and under proper guidelines of occupational safety.
- The system must be operated only when in proper state of repair and for one of the intended uses. Before welding, the welder is required to make sure that the state of the system is in order.



Important

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

2.5 Intended Use

The data logger is intended exclusively controlling and recording butt-welding processes with heating element performed with machines that are compatible with it and can be connected to it.

The notion of intended use also includes:

- Compliance with the instructions in the User's Manual
- Observation of all service and maintenance intervals



Important

All uses other than those mentioned above are not allowed and will cancel any and all liability or warranty by the manufacturer. Unintended use may cause considerable hazards and material damage.

2.6 Warranty

Warranty claims may be raised only if the conditions for warranty given in the General Terms and Conditions of Sale and Delivery obtain.

2.7 Transport and Storage

The product ships in a transport case. Store it dry and protected from humidity in this case.

2.8 Identifying the Product

Every product is identified by a name plate. It shows the model ("Typ"), the serial number ("Seriennr."), and the manufacturer. The first two digits of the serial number represent the year of manufacture.

Schweißprotokollier-Gerät	
SPG 2.0	
Seriennr.	14432901
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D - 35325 Mücke	
Tel. +49 6401 9127 0	
CE	

3 Understanding the Machine

3.1 Product Description

The SPG 2.0 is a data logger to generate reports for butt-welding machines for plastics, which has basically three functions:

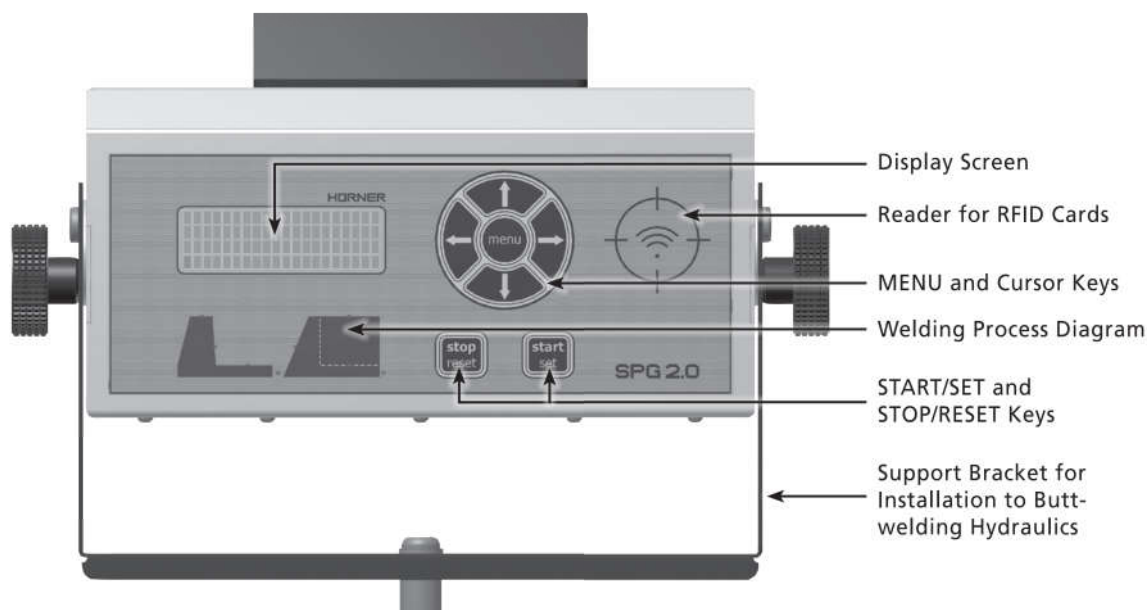
- Guiding the operator through the welding process;
- Monitoring all the relevant parameters during the welding process;
- Generating a protocol to report the welding process.

The product can be used both with on-site and with in-shop machines and it can in principle be connected to any welding machine. Upon entering the type of plastic, the pipe diameter, and the wall thickness, the unit calculates all the parameters that are critical for the welding process, taking into account the selected welding machine. The entire welding process is automatically saved to a report and can be exported in different ways for purposes of analysis and further processing.

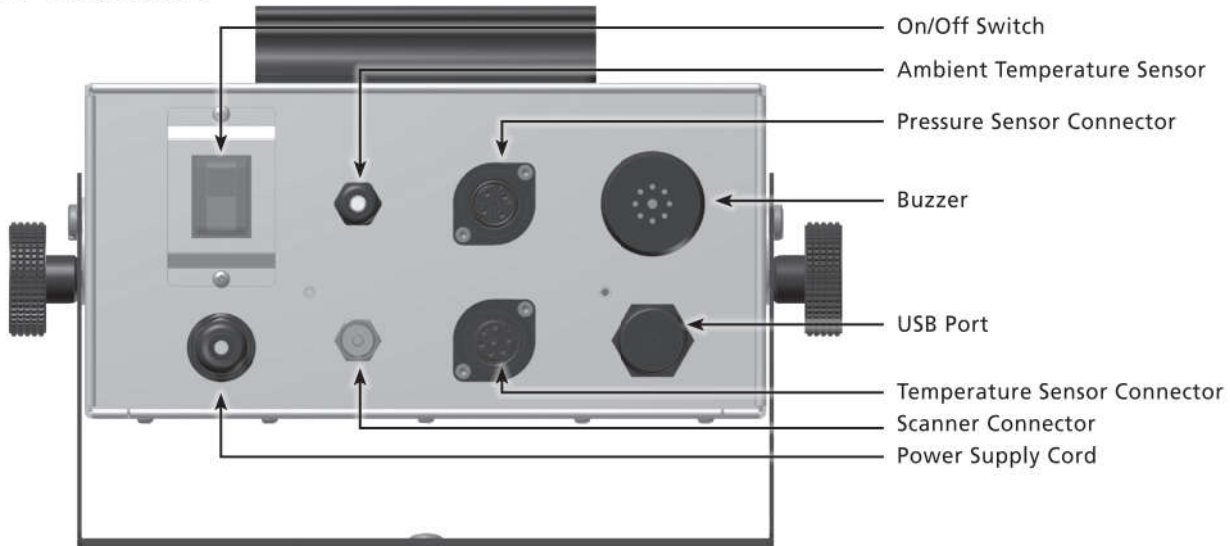
The required pipe jointing and traceability data can be entered using the cursor keys (see first Info in Sect. 4.1), a RFID chip card or a bar code scanner.

For various applications, the SPG 2.0 can be specifically configured in the Configuration Menu (see section 4.2).

3.2 Control Panel



3.3 Connectors



3.4 Technical Specifications

Dimensions (L x W x H)	approx. 240 x 120 x 185 mm
Weight	3.0 kg
Power	22 watts
Input Voltage	230 V, 110 V - 240 V
Input Frequency	50 Hz / 60 Hz
Ingress Protection	IP 54
Welding Report Memory	10 000 joints
Interface	USB A

4 Operation



Make sure all connectors are tight in their sockets and note that operation of butt-welding machines on a worksite is only acceptable if the power supply has earth-leakage circuit breakers.

Important

After connecting the power supply cord to the mains power supply or a generator, turn the unit on at the On/Off switch.



Caution

It has to be ensured that the voltage of the power source the machine is connected to corresponds to the rated voltage of the machine. Also the following has to be respected when using extension cables:

- wire section 1.5 mm² = max. 20 m long
- wire section 2.5 mm² = max. 75 m long
- wire section 4.0 mm² = max. 100 m long

4.1 Switching the Data Logger on and Setting its Basic Parameters

After the machine was switched on, Display 1 shows on the screen.

The machine will then automatically start the auto-test process to check the sensors and the system clock and to determine the number of free welding reports. This test can be bypassed by holding down the STOP/RESET key when Display 1 is showing.

```
*****
*      HUERNER      *
*WeldControl EF 2.0*
*****
```

Display 1



Caution

If during the auto-test an error is detected, a "System Error" message shows on the display. When this happens, the report generator has to be disconnected from the power supply and the welding machine and has to be returned to the manufacturer for repair.

During the auto-test several screens resembling Display 2 appear. They inform the welder of the currently selected pressure and temperature sensor, the current outside temperature, power supply voltage, time, and date as well as of the kind of machine and welding standard selected at that point. By pressing the MENU key, you can access the Configuration Menu to change all parameters to be applied to the imminent welding which are not currently selected as they should be.

Then Display 3 appears with the parameters that will be used for the next welding (the joint number will show only if this function has been enabled in the Configuration Menu). From this screen it is possible to access the Configuration Menu in which the default behavior of the data logger can be configured. To access it, press the MENU key and then, on the following enter code screen, enter the access code using the cursor keys or hold the transponder card with the menu access code in front of the RFID reader.



Info

To enter information using the cursor keys, proceed as follows: The ← and → cursor keys position the cursor at the desired digit/character on the display screen. The ↑ and ↓ cursor keys are used to select the value (letter, number) that should appear at this place. In general, the START/SET must then be pressed to confirm that input.

Pressing the ↑ and ↓ cursor keys in the menu that appears (Display 4), you can select a menu option, then access the selected sub-menu by pressing the MENU key again.

In the Machine Data sub-menu, the type of machine (its designation and its cylinder section) to which the hydraulic, control, and data logging/report generation unit is connected, has to be defined (see the arrow symbol in Display 5). To change the selected machine, select the desired machine type by pressing the ↑ or ↓ cursor keys and confirm by pressing the START/SET key. For added safety, the section of the selected machine's cylinder is once more displayed and has to be confirmed again by START/SET.

An access code is required to open the Machine Data sub-menu. This code will be disclosed only to authorized personnel with the operating company.



Important

If the wrong machine is selected in this menu, all pressure computations that the unit makes, will be wrong! Changing to another machine requires consultation with the manufacturer or an authorized service shop, as a sensor calibration is then also recommended. This step requires proper authorization.

As an addition to the preinstalled machines, user-defined types can be set as needed at the unused menu entries (a designation for the machine and its cylinder section have to be entered). Enter the required data using the cursor keys and confirm by START/SET.

From the Configuration Menu's Sensor Parameters option, the tem-

```
****Machine Data****
      HST-355
Cylinder : 06.60
Pres.Sens.: 160bar
```

Display 2

```
Next welding
15:44:52      29.05.12
235V          135C/220C
Rep. No. 00072/00002
```

Display 3

CODE : 415311

```
Settings      -M-
>Reporting    -M-
Sensor Parameter-M-
Machine Data  -M-
```

Display 4

```
**Machine Chassis**
>HST 250      05.10
HST 315      05.89
HST 355      06.60
```

Display 5

```
SENSOR PARAMETERS
>Calib. Heat.El. -M-
Calib. Press.S. -M-
```

Display 6

perature sensor (PT100, PT1000) and the pressure sensor (160 bar, 250 bar, 600 bar) can be selected/calibrated (see Display 6).

Use the \uparrow or \downarrow cursor keys to select the desired item and press the MENU key to confirm your selection. Under Calibrate Pressure Sensor, you can calibrate for connected the machine, i.e. determine the zero pressure point for the sensor. To do so, move the carriage to the farthest point and then press the START/SET key. The display screen then shows the reference pressure, e.g. 80.0 bar if the 160 bar pressure sensor is currently selected (see Display 7). The displayed reference pressure, which is not the same for all available pressure sensors, has to be set on the machine using its pressure gauge, and the display value, to be adjusted accordingly using the \uparrow or \downarrow cursor keys. By pressing the START/SET key, the data are saved to the system.

```
Calib. Press. Values
[SET]
Act. Pres. : 80.0bar
Nom. Pres. : 00.0bar
```

Display 7

The heating element can be calibrated under the Calibrate Heating Element option. Use the \uparrow or \downarrow cursor keys and the START/SET key in the same manner.



When matching the displayed value to the reference using the \uparrow and \downarrow keys, holding the respective key down will make the values change faster.

4.2 Setting the Default Configuration of Machine Operation

In the sub-menus of the Configuration Menu, 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.



Important

On both menu levels (Configuration Menu and its respective sub-menus), press the START/SET key to save the settings to memory or press the STOP/RESET key to return to the previous menu level without saving possible changes.

```
*** SETTINGS ***
Check Code Exp. Off
Memory Control On
>Manual Input On
```

Display 8

4.2.1 Understanding the "Settings" Sub-menu

"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 or computed parameters is possible, "off," that the manual input is not allowed.

"Check Ambient Temperature on" means that the outside temperature is measured before welding, "off," that it not; if the temperature is below 0°C (32°F), welding should be performed only after taking appropriate steps (heating, tent, for instance).

"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 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. 4.1.3).

"Date/Time – M – " means that by pressing the MENU key, the user can access a sub-menu for setting the clock (see Sect. 4.1.4).

"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. 4.1.5).

"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.

"Pressure Unit – M – " means that by pressing the MENU key, the user can access a sub-menu for selecting bars or pounds per square inch (psi) as the unit for the pressure.

"Length Unit – M – " means that by pressing the MENU key, the user can access a sub-menu for selecting metric or U.S./Imperial units for the length.

"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.

"Standard – M – " means that by pressing the MENU key, the user can access a sub-menu for selecting the standard (guideline, normative scheme) applicable to the welding operation.

4.2.2 Selecting the Display Language

When the "Select Language" sub-menu was selected, the screen changes and the display reproduced in Display 7 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 9

4.2.3 Setting the Clock

When the "Set Clock" sub-menu was selected, the screen changes and the display reproduced in Display 8 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 10

4.2.4 Setting the Buzzer Volume

When the "Set Volume" sub-menu was selected, the screen changes and the display reproduced in Display 9 appears. The buzzer can also be heard. Turn the buzzer volume up or down to the desired value using the \leftarrow , \rightarrow arrow keys (from 0 to 100) and confirm your setting by pressing the START/SET key.

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

Display 11

4.2.5 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.

```
** CONFIGURATION **
>Welder Code      On
Commission No.    On
Joint No.         Off
```

Display 12

- “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.
- “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.
- “Angle – M – ” means that by pressing the MENU key, the user can access a sub-menu for entering the angle, in degrees, between the two components that are going to be welded.



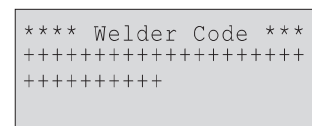
All data that are available in the chip of a transponder card can be entered by placing the card in front of the card reader. If they are encoded in a bar code, they can be read using the handheld scanner.

4.3 Entering Preformatted and User-defined Traceability Data

All traceability data enabled in the configuration menu at “Recording” (see Sect. 4.1.5) have to be entered before the welding process. The welding unit prompts the user to enter them before the welding process proper. Depending on what data is entered, either its repeated input is mandatory (e. g., the welder ID code; see Sect. 4.3.2) or previously entered data can be changed and confirmed or confirmed without changes (e. g. the commission number; see Sect. 4.3.2).

4.3.1 Entering the Welder ID Code

When the welding is started by pressing the START/SET key while Display 3 is showing, first the input of the welder identification code is requested, if it is enabled in the Configuration Menu (see Display 13). The code has to be an ISO-compliant code. It can be entered either using the cursor keys (see the first info in Sect. 4.1) and confirming the input by pressing the START/SET key, or by reading a RFID transponder card or scanning it from a bar code with the optional handheld scanner.

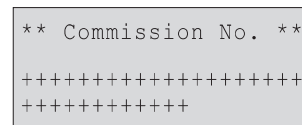


Display 13

When the code was properly scanned or entered, this is confirmed by an audible signal.

4.3.2 Entering or Changing the Commission Number

From Display 3 or after the welder identification code was entered, the machine requests the input of the job number, or commission number, of a maximum 32 characters if it was enabled in the Configuration Menu. If a commission number exists already in memory, this one is proposed. You can either confirm it by pressing START/SET or change it using the cursor keys (see the first info in Sect. 4.1) or reading it with the scanner or from a RFID card and then confirm the new number by pressing the START/SET key.



Display 14

It is possible to select a previously saved commission number instead of the one shown on the screen by pressing the ⇐ and ⇒ cursor keys simultaneously. This causes a commission number selection screen to be displayed, and you can scroll through the commission numbers in memory using the ⇐ and ⇒ keys, to select a number and then confirm it by the START/SET key. This number will be used for the next welding. To quit the scroll mode without selecting a commission, press the STOP/RESET key.

4.3.3 Entering or Changing the Joint Number

From Display 3 or after the commission number was entered, the machine requests the input of the welding number, or joint number, if it was enabled in the Configuration Menu.

The joint number, or welding number, is based on the job/commission number. This means that it increments by 1 for every welding operation performed in the scope of the current commission (identified previously by entering the appropriate job number). In the example in Display 3, the next welding operation will be saved to welding report number 72 while the joint itself is joint number 2 of the current job/commission.



The first joint of a commission for which no joint has been saved to memory so far, always receives no. 1. If the memory already holds joints for a commission, the machine finds the highest number of the joints existing for that commission and uses this number plus 1. The user is shown the number thus found on the screen and can apply or change it. If the user changes the joint number, it is his responsibility to make sure that no number is assigned twice in one commission. If a joint number appears twice in a commission, this will not affect the welding process and the logging of its data in any way. However, in that commission two joints will not be distinguished by a unique number.

If user inputs leave some joint numbers unused (for instance, for a given commission no. 1, 2, 3, 5, 6, 9), the gaps do not get filled, and the automatically found number proposed for the next welding operation will still be the highest existing number plus 1 (that is, 10 in this example).

The joint number can also be entered after simultaneously pressing the cursor keys ⇐ and ⇒ when Display 3 is showing on the screen.

4.3.4 Entering oder Changing Further Data on Component Traceability

In the same way as welder identification code, commission and welding number, other data relating to the components can be entered if they were enabled in the Configuration Menu.

All data can be entered by using the cursor keys and confirming them by pressing the START/SET key or can be scanned from a bar code or

an RFID card, if available, with the scanner or transponder reader. One exception is the weather (see Display 15). This option is presented as a list in which the applicable conditions can be selected by pressing \uparrow or \downarrow and confirmed by pressing the START/SET key.

```
Weather
>sunny
clear
rain
```

Display 15

4.4 Performing the Butt Welding

After all traceability data enabled in the configuration menu were entered, Display 3 shows on the screen. From this screen, the welding process proper is started by pressing the START/SET key.

First, the parameters of the pipes to be welded have to be entered. If pipe parameters of an earlier welding are available and no code error was detected, all welding parameters of the previous welding are proposed and can be confirmed in one go (see Display 18).

From this display, it is possible to change the pipe parameters by pressing the STOP/RESET key. Then the first thing is to select the pipe material in a list; use the \uparrow and \downarrow cursor keys and confirm by pressing the START/SET key (see Display 16). Then the cursor keys (see the first info in Sect. 4.1) allow entering the diameter and the wall thickness, both confirmed by the START/SET key (see Display 17). Instead of the wall thickness, you may want to enter the Standard Dimension Ratio (SDR); then display this input line instead of the wall thickness line by pressing the \leftarrow and \rightarrow simultaneously and enter the SDR value. The machine then displays the whole set of parameters as an overview. In case there are errors, it is possible either to enter all data once more by pressing the STOP/RESET key, or to return to the previous step by pressing \uparrow and correct the data one at a time.

```
*Select Pipe Mater.*
>PE100
PE-HD
PP
```

Display 16

```
** Enter Pipe Size**
Pipe Diameter:0250mm
Wallthickness:22.7mm
```

Display 17

If pipe codes were entered previously in the traceability data for the joint, the machine automatically presents the welding parameters contained in the pipe codes for confirmation.

```
PE100
Pipe Diameter:0250mm
Wallthickness:22.7mm
RESET SDR11.0 SET
```

Display 18

4.4.1 Facing the Pipe Butts

To ensure that the pipe butts are level, insert the pipe facing tool between the machine carriages and turn it on. Then have the pipes close in on the facing tool and work them until a continuous shaving blade is cut that rolls twice or three times around the pipe ends, so the butts are level. Facing is stopped by moving the carriage apart.

Now press the START/SET key as a confirmation that facing is properly finished, to make the report generator go on to the next process step (see Display 20). By pressing STOP/RESET you return to the beginning of the welding process. It is thus possible, too, if the butts are still not level, to start over and repeat the facing process. When facing is properly done, pipe alignment has to be checked.

```
Face Pipe Ends
230°C ACT. 0.5bar
```

Display 19

4.4.2 Checking Pipe Alignment and Determining Drag Pressure

When the pipes are properly faced, close in the movable carriage completely to check whether a potential vertical and horizontal pipe misalignment is within the tolerance allowed by the applicable welding standard. The maximum acceptable gap between them is displayed (see Display 20). If pipe alignment is in order, confirm this by pressing the START/SET key. If the misalignment is out of tolerance, the pipes may have to be readjusted in the clamps and facing may have to be repeated.

```
Check Pipe Alignment
Max. Al. Gap :2.5mm
230°C ACT. 3.5bar
```

Display 20

When pipe alignment is appropriate, move the movable carriage apart in order to determine the drag pressure, i. e. the minimum pressure needed to "drag" the movable carriage on. When there is zero pres-

sure in the hydraulic circuit, slowly increase the pressure and watch closely to observe at which pressure level the carriage is "dragged" to start moving.

The drag pressure for moving the pipes has to be higher than 2.0 bar.

The START/SET key has to be pressed when the carriage starts moving, in order to save the drag pressure applicable to this welding to memory.



Important

The exact drag pressure depends on various conditions (pipe size and material, position of the machine, etc.) and has to be determined for every welding individually.

4.4.3 Possibility to Change Welding Parameters

Subsequent to setting the drag pressure, Display 23 shows on the screen, provided that manual data input is enabled in the Reporting sub-menu of the Configuration Menu.

The two screens enabling manual input of welding parameters (Displays 22 and 23) allow value changes using the ↑, ↓, ⇐, ⇒ cursor keys (see first Info in Sect. 4.1). The START/SET key serves to confirm the inputs. By pressing the START/SET key, you also make the control unit go on to the next screen.



Info

The parameters set manually are kept in memory when the machine is turned off. Only the pressure values are computed individually for every welding process. If the pipe parameters change, **all** parameters have to be set once again. The machine recognizes the change of pipe parameters and brings the operator directly to the menu that allows changing them.

4.4.4 Setting the Maximum Pressure and Starting the Bead Build-up Stage

After butt facing, pipe alignment check, and confirmation of the welding parameters are done, the welding process proper starts by setting the maximum pressure that will be reached during the process, in the bead build-up stage and at the end of the joining stage. While the welder is setting the maximum pressure displayed as the nominal value on the screen, the actual pressure also shows (see Display 24), and the control software moves on to the next step as soon as the actual pressure is within tolerance.

At the start of the bead build-up stage, place the heating element between the pipe butts. The display tells you so (Display 25). If the heating element does not have the nominal temperature yet at this point, an information message on the screen tells you so. For the heating element temperature is continuously monitored by the data logger. The Insert Heating Element screen is displayed only when the heating element exhibits the required temperature.

When the heating element is ready in place, press the START/SET key and set the machine to maximum pressure, so it pushes the pipes against the heating element. Wait for the weld bead to reach the required height or width, depending on the used welding standard. When the nominal bead height, which is also indicated on the display, is reached, the operator has to press the START/SET key to terminate the build-up stage.

Drag Pressure		
230°C	ACT.	3.5bar

Display 21

Bead B. Pr.:	030.5bar
Heating Pr.:	010.5bar
Heating Tm :	0120 s
Change Tm :	0005 s

Display 22

Cooling t5 :	0727 s
Cooling t6 :	0000 s
Cool Pr t6 :	002.0bar
Pres. Ramp :	012 s

Display 23

Max. Pressure		
230°C	NOM.	16.5bar
229°C	ACT.	3.5bar

Display 24

Insert Heating Elem.		
222°C	NOM.	16.5bar
221°C	ACT.	0.5bar

Display 25

Bead Height	:2.0mm
Bead B. Time	:68 s
230°C	NOM. 16.5bar
229°C	ACT. 12.5bar

Display 26

4.4.5 Heating Stage

After the bead build-up stage (1st LED in the welding diagram) was completed, pressure must be decreased (2nd LED in the diagram). The decreased pressure will then be applied for the entire duration of the heat-soaking stage (3rd LED in the diagram), in which the pipe butts continue to soak heat from the plate.



If decreasing the pressure to heating pressure takes longer than 10 sec, the welding process aborts and throws an **Important** error.

The pressure decrease has to be observed on the display. It is under the operator's responsibility to respond to possible pressure fluctuations.

The machine also moves on to the heating stage if the welder decreases the pressure to a level below the heat-soaking maximum before the countdown of the bead build-up stage is completely over – which may happen if the bead is o.k. earlier than expected. However, such a pressure decrease has to be quick. In these cases, the bead build-up time shortened by the early decrease is saved to memory as the build-up time for this welding and will be used as a reference for possible automode-managed build-up stages at a later time.



Full contact has to be continuously established between the heating plate and the bead, even with lower pressure. While **Important** heating, if contact between them is lost somewhere along the circumference, welding has to be aborted and repeated. If the control unit detects an error (such as insufficient pressure not readjusted by the welder or excessive heating time), it also aborts welding and displays an error message.

4.4.6 Change-over Stage



An audible signal indicates the imminent change-over during the last 10 seconds of the heat-soaking stage.

At the end of the heating stage, move the carriage apart. Then remove the heating plate from in-between the pipes. The count-down of the heating time has to be complete. It is prohibited to remove the pipe butts away from the heating element early. Only when Display 28 shows on the screen, it is acceptable to end the heating stage.

The change-over has to be followed immediately by the joining stage. The change-over time given on the display must not be exceeded. If it is, the welding is aborted automatically and an error is displayed.

4.4.7 Joining and Cooling Stage

Build the joining pressure while watching the value on the screen. Building the joining pressure must correspond to a linear increase, as predicted by the nominal values on the screen. The 5th LED of the diagram on the hydraulic unit flashes. In the joining and cooling stage it is particularly important to keep the pressure at the nominal level.



Right after the end of the linear pressure ramp, at the very **Important** beginning of the cooling, pressure may drop slightly for technical reasons. The welder has to compensate for this drop immediately. In this case, the first line of Display 30 reads, "Keep the pressure."

HEAT SOAK PHASE		
Heating Time	:	148s
230°C	MAX	5.0bar
229°C	ACT.	3.5bar

Display 27

Remove plate		
Change-over	:	8 s
230°C	MAX	5.0bar
229°C	ACT.	3.5bar

Display 28

Build Joining Press.		
230°C	NOM.	16.5bar
229°C	ACT.	14.5bar

Display 29

COOLING PHASE		
Cooling time	:	1234s
230°C	NOM.	16.5bar
229°C	ACT.	16.5bar

Display 30

Depending on the welding standard used or on information provided by the pipe or fitting manufacturer, a cool-on time may be required during which the new joint must not be exposed to external forces. This, however, is not monitored by the hydraulic, control, and data logging unit, for which the welding has to be considered finished when the 7th LED is lit.

4.4.8 End of Welding

The welding is finished at the end of the successful joining and cooling stage. The welder can then release the pressure.

```

COOLING PHASE
Cooling time over

229°C ACT. 0.0bar
  
```

Display 31

4.5 Aborted Welding Process

If an error condition is detected, the welding process aborts and the error is displayed.

The error that made the welding abort is displayed on the screen (see Display 32). Additionally, in the welding diagram the LED that belongs to the welding stage with the malfunction starts flashing.

```

WELDING ABORTED
Error Build-up Pres.

229°C ACT. 1.5bar
  
```

Display 32

The errors listed in the following table can be displayed on the screen.

Type of Error	Description
a. Data Input	
Input Error	Error while entering data with the alphanumeric and cursor keys.
Code Error	Error while reading data from a bar code or an RFID card.
b. System and Conditions	
System Error	The welding system has to be disconnected immediately from both the power supply and the fitting. The auto-test has detected an error in the system. The welder must no longer be operated and has to be sent to an approved shop for check and repair.
Clock Error	The internal clock of the machine is defective; re-set the clock in the Configuration Menu.
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.
Ambient Temperature high	Outside temperature outside the range from -10°C to +50°C.
Ambient Temperature low	Outside temperature outside the range from -10°C to +50°C.
Pressure Sensor Defective	The sensor indicated on the display (hydraulic pressure, heating element temperature, ambient temperature) is defective; where possible, check the connections/plug; have the machine inspected by an authorized service shop if needed.
Heating Sensor Defective	
Temperature Sensor Defective	
Printer not Ready (only label tag printer)	The optional printer is not ready (possible reasons also: no communication or faulty cable).
Download Cancelled	During data transfer or printing, an error condition occurred which could not be cleared.
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.
c. Welding Process	
Temperature low	Heating element temperature will be increased automatically.
Temperature high	Heating element temperature will be reduced automatically.
Error Changeover	It took too long to retract the heating plate and bring the pipes to joining; welding will have to be repeated.

Type of Error	Description
Error Drag Pressure	Impossible to determine the drag pressure; maybe pipes will have to be clamped once again; or the pressure is below 1 bar, which is not feasible for technical reasons.
Error Build-up Pressure	Build-up pressure too high or too low and was not re-adjusted in time.
Error Heat Soak Pressure	Heat-soaking pressure too high and was not re-adjusted in time.
Error Joining Pressure	Joining pressure too high or too low and was not re-adjusted in time.
Cooling Stopped	Operator has stopped the cooling time by pressing the STOP/REST key.
Error Plate Temperature	Heating element temperature is out of tolerance; impossible to re-adjust the temperature; maybe the ambient temperature was too low.
Process Stopped	The welding process or a process step were stopped by an external agent.

4.7 Using ViewWeld to View Welding Reports and Print Tags

The ViewWeld feature offers viewing an abstracted version of the welding report recorded during the last welding process 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 33).

```
0011 27.05.14 08:25
PE-HD 630mm SDR26.0
No Error
```

Display 33

To call the ViewWeld abstract of a welding report, press the \uparrow key in the start screen (see Display 3). To print a tag of this operation, press the START/SET key in the ViewWeld screen.

After the ViewWeld abstract was accessed, it is possible to browse through all abstracts in memory by pressing the \leftarrow and \rightarrow cursor keys.

5 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.

5.1 Selecting the File Format and the Welding Process

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 or the format of the welding data management application DataWork. 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 34

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.

The reports will then be sent to the USB mass media in the previously selected format.

5.2 Downloading All Reports

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

5.3 Downloading by Commission Number, Date or Report Range

After the file type and the welding process were 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 \downarrow 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 cursor keys can be used (see first info in Sect. 4.1) 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.

5.4 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 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.

5.5 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.

5.6 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. 5, to maintain data integrity and avoid any inadvertent deletion of the reports in memory.

6 Service and Repair

As the product is used in applications sensitive to safety considerations, it may be serviced and repaired only on our premises or by partners who were specifically trained and authorized by us. Thus, constantly high standards of operation quality and safety are maintained.



Important

Non-compliance with this provision will dispense the manufacturer from any warranty and liability claims for the product and any consequential damage.

7 Service and Repair Contact

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Info

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

8 Accessories/Parts for the Product

Sensor Cable for Pressure Sensor	600-100-030
Sensor Cable for Temperature Sensor	600-100-031
Bar Code Scanner	206-030-253
USB Stick	300-010-154
Welder ID Card	216-080-031



Info

Only genuine spare parts are acceptable. The use of non-genuine parts voids any and all liability and warranty on the part of the manufacturer.

For consultation and ordering spare parts, refer to the seller or manufacturer of the product.