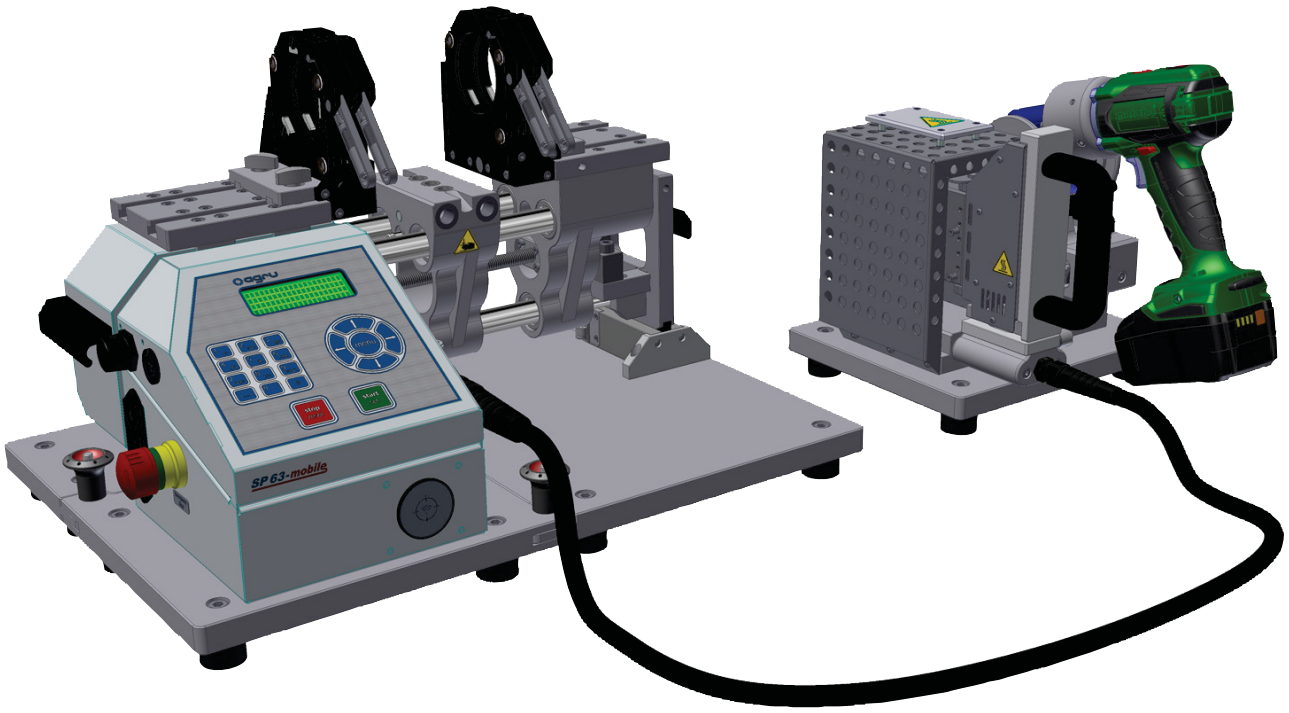
User's Manual

Mobile Infrared Butt-welding Machine

SP 63-M



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Contents


Caution

The machine has to be operated exclusively with a power supply line equipped with a protective grounding conductor, as a power supply without this safety element may cause severe machine damage. If the machine is operated through a power supply without a grounding conductor, this will void any and all warranty under which the product may be.

1 Introduction

Dear Customer:

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

The development, manufacture, and check of the mobile, i. e., overhead-welding-enabled, infrared butt-welding machine for thermoplastics has been guided by our concern to offer a unit characterized by superior operation safety and user-friendliness. The unit was manufactured and checked according to the most recent standards as they are applied, and bearing ergonomic aspects in mind.

To ensure maximum operation safety, please conform to the appropriate messages in this booklet and the regulations for the prevention of accidents. Carefully read the User's Manual to avoid damage to the machine or hardware in its environment as well as injury.

This manual is applicable to the following machines:
agru SP 63-mobile

Thank you.

2 Safety Messages

This User's Manual contains important instructions for operating the infrared welding machine for thermoplastics agru SP 63-mobile safely. Every person who operates the machine will have to conform to the instructions of this manual.

The machine has been developed and checked with respect to welding AGRU pipes and fittings. For welding other makes, no experiential data are available and/or no liability or warranty can be assumed for the fitness and the reliable operation of the machine.

2.1 The User's Manual

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

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 machine. Non-compliance may cause problems of operation and damage to the machine.


Info

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

2.3 Safety Messages and Information on Remaining Risk

Protect the power supply cord from cutting edges. Have an authorized service shop replace damaged cables or lines immediately.

The machine has to be operated with a 230 V, 50/60 Hz power supply with safety fuse or breaker of 16 A maximum. If power is connected through a power line manifold, the power supply has to feature an earth-leakage circuit breaker.

The length of the power supply cord must not exceed 10 m (30 feet) from the circuit breaker.


Caution

Parts Under Power
After opening the machine or removing the cover, parts of it are accessible that may be under power. The machine may be opened exclusively by an authorized service shop and only after it was disconnected from power.


Caution

Pipe Facing Tool
Start the pipe facing tool only when it is in its working position. When facing pipes, do not wear jewellery; if needed, wear a hair snood or net. It is forbidden to remove shaving from the machine while the facing process is running. Make sure nobody is present in this danger zone.


Caution

Heating Plate and Heating Plate Housing
When working with the machine, be extremely cautious while the heating plate is operating. Since the plate and its housing guard present a very high temperature during the welding process, it must not be operated if unobserved, and sufficient distance to combustible materials in its surroundings has to be ensured. Do not touch the heating plate or the plate housing. **The safety alerts affixed to it have to be complied with strictly.**


Caution

Danger of Bruises and Injury
Do not remain in the danger zone while the machine opens or closes and be sure not to have your hands between the moving and the fixed parts of the machine.


Caution

Acceptable Work Conditions
The work zone has to be clean and has to have proper lighting. It is dangerous to operate in a humid environment or close to flammable liquids. In regard of this, acceptable work conditions have to be ensured (e.g., sufficient distance between the machine and other functional areas of the workshop).
Overhead work is prohibited, unless:-
- the machine is safely and securely fastened and positioned;
- access to a large area around the worksite is controlled/limited (risk of falling objects); see also Sect. 2.5;
- a hardhat and safety goggles are worn (risk of falling objects and small blades of shaving during component facing)


Important

Power Supply Only through Line with Protective Grounding Conductor
The machine has to be operated exclusively with a power supply line equipped with a protective grounding conductor, as a power supply without this safety element may cause severe machine damage. **If the machine is operated through a power supply without a grounding conductor, this will void any and all warranty under which the product may be.**

Power Only to Operational Machine
Power must never be applied to the machine before it is completely installed and ready for operation.

Important

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

Info

2.4 User/Operator Obligations

- The machine may be operated exclusively by persons who are familiar with the applicable rules, the guidelines for the prevention of accidents, and the User's Manual.
- The machine may be operated only when observed. Only persons who were properly trained by agru or another, authorized organization and whose training was acknowledged by the appropriate certificates are allowed to operate and observe the machine. Other persons must neither operate nor observe it.
- The operating/owning organization engages to check at reasonable intervals if the machine is operated by the users with the intended use and under proper guidelines of safe work.
- The machine must never be operated if not in proper state of repair. Before welding, the user is required to make sure that the state of the machine is in order.
- The user has to make sure that only one person is present in the zone where the machine is operating.

2.5 Worksite Description

- The conditions have to fully ensure that the machine cannot slide. As well the segments of the base plate as the mechanical structure and the base plate have to be securely connected to each other before any components are clamped fast. In case of (overhead) welding operations using the mechanical structure without the base plate, the welding mechanics has to be securely fastened at the components to be jointed with the supplied belts.
- Worksite access limitations have to be provided. Appropriate equipment to achieve this can be requested from a service point or the selling entity.

2.6 Warranty

Warranty claims may be raised only if the conditions for warranty given in the General Terms and Conditions of Sale and Shipment obtain. Furthermore, the provisions and instructions contained in the User's Manual have to have been respected.

Info

The term of warranty under which the welding machine is shipped is 12 months:-
— from the date of purchase, if the machine is bought as a new machine;
— from the date of first use, if the machine is used independently of purchase (e.g. when lent) or if it is not bought as a new machine.

2.7 Transport and Storage

During transport, the machine must be at all times in the transport box it is shipped in.

Important

Ensure that the heating plate, the facing tool, and all movable/removable parts of the machine are safely stowed away and,

if applicable, secured with the transport lock during transport at all times (see explanations and figures in Sect. 4.1).

The transport box should also be used to store the machine. The machine has to be stored in a dry location, be clean or has to be cleaned, and be locked against unwanted operation.

Mobile Stumpfschweißmaschine
Typ agru SP 63-mobile
Geräte-Nr. 06310281
Netz 230V 50Hz 1700W IP54
Gewicht ca. 45 kg Baujahr: 2014
Lizenzhersteller
CE
HÜRNER Schweißtechnik GmbH
Nieder-Ohmener Str. 26
D - 32325 Mücke

Typ agru SP 63-mobile

Exklusives Produkt der Fa.
agru Kunststofftechnik GmbH
Ing.-Pesendorfer-Str. 31
A - 4540 Bad Hall
Tel. +43 7258 7900
Fax +43 7528 3863

2.8 Identifying the Machine

Each machine is identified by a name plate. It shows the machine model (“Typ”), its year of manufacture (“Baujahr”), the serial number (“Geräte-Nr.”), the rated power (“Netz”), and the manufacturer (“Lizenzhersteller”).

3 Product Description and Principles of Operation

3.1 Intended Use

The agru SP 63-mobile Welding Machine is designed exclusively for welding thermoplastic pipes and fittings using the butt-welding process with plasticization by infrared beams.

Only the welding parameters shown on the screen display (preprogrammed by the manufacturer or defined by the user) can be selected for a welding operation. If a modification of preinstalled parameters os needed exeptionally, contact agru Kunststofftechnik.

It is also part of the intended use to conform to the instructions provided in the User’s Manual.


Important

The manufacturer can in no circumstances be held liable for damage or consequential damage that occurs as a result of the non-compliance with the procedures described in the User’s Manual, the modification of the manufacturer-programmed welding parameters, or non-intended use. Any such deviation or modification will void any and all warranties under which the product may be.

3.2 Machine Description

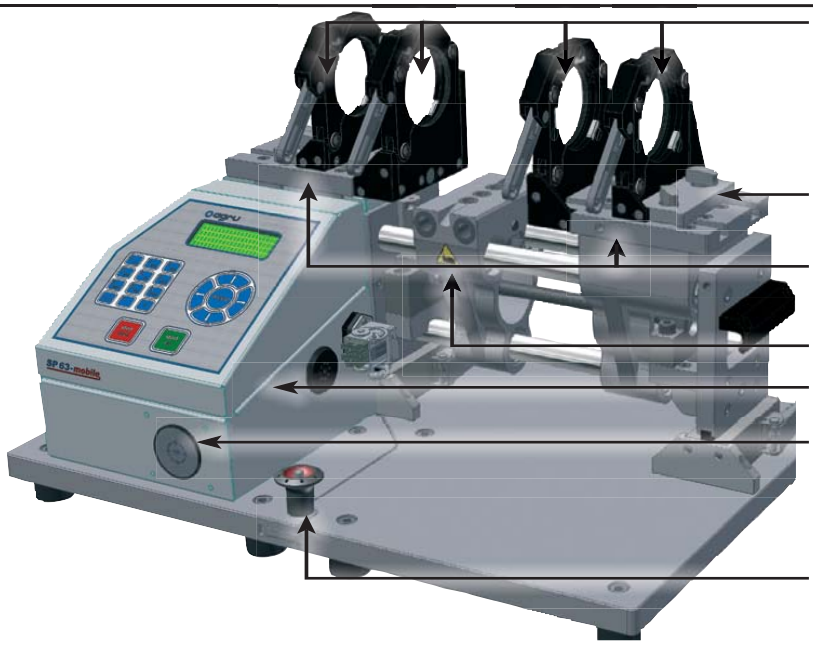
The machine can be used as an in-shop installation, and with anodized aluminum and stainless steel components, it is also suited for clean room applications. The machine enables users to enter the data that are relevant for the welding process and for the traceability of the welded joint. From the entered welding parameters, it calculates automatically the applicable forces, times, and temperatures and controls the semi-automatic welding process.

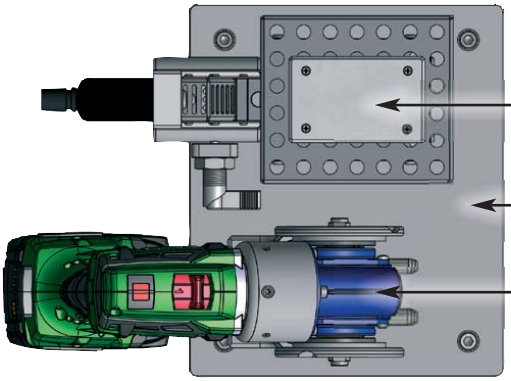
All welding and traceability data are entered either directly at the machine, on the keypad of its front panel with display screen, or read from a transponder card by the transponder reader. The welding process in monitored in its entirety and saved to a welding report. All welding reports can the be downloaded to a USB stick as an abstract, an extended report or as a DataWork database file.

Using the menus displayed on the screen, the machine can be customized to the application in hand (see section 4.3, Configuring the Machine).

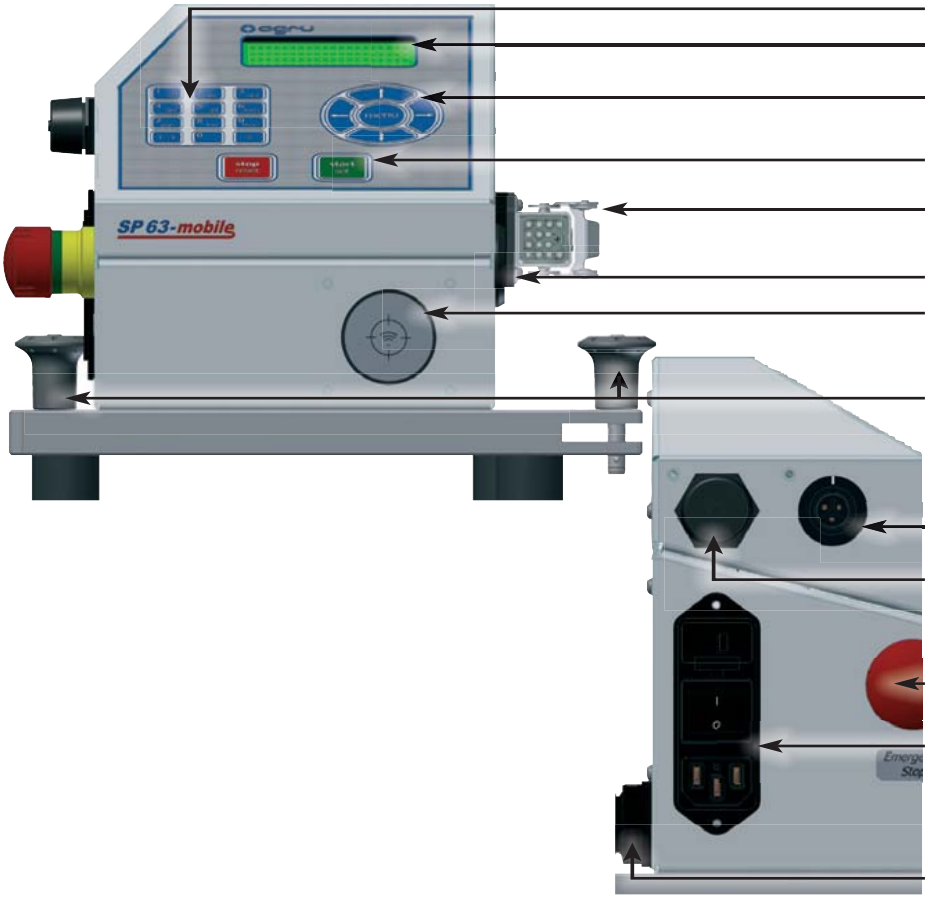
3.2.1 Component Overview

(see figure on next page)





3.2.2 Control Panel and Connectors of the Control Unit



3.2.3 Specifications

agru SP 63-mobile	
Power Characteristics	
Voltage	230 V
Frequency	50/60 Hz
Total Rated Power	1.7 kW
Heating Element	1.38 kW
Electrical Cordless Power Facing Tool	18 V, 5.2 Ah (on battery, w/ 2 batteries)
Charger for Power Facing Tool	220 - 240 V AC, 50/60 Hz, 0.085 kW
Power Facing Tool with Cord (optional)	0.56 kW (facing tool as power tool connected to mains socket provided on site, not on control unit)
Welding Operation Specs	
Welding Force	10 - 500 N
Speed of Cordless Facing Tool	approx. 66 rpm (in 2nd gear, speed set to max.)
Speed of Facing Tool with Cord	approx. 73 rpm
Ambient Temperature (operation)	+ 10°C to + 40°C (50°F to 104°F)
Ambient Temperature (storage)	– 5°C to + 50°C (23°F to 122°F)
Operating Range	20 - 63 mm (3/4" - 2-1/2")
Travel Stroke of Movable Carriage	approx. 115.5 mm (4-1/2")
Dimensions and Weight	
Dimensions (W x D x H)	
Mechanical Assy (carriage moved apart)	460 x 174 x 311 mm (18-1/8" x 6-13/16" x 12-1/4")
Electronic Assembly	279 x 245 x 219 mm (11" x 9-5/8" x 8-5/8")
Mechan. & Electron. on Base Plate	550 x 376 x 348 mm (21-11/16" x 14-25/32" x 13-11/16")
Dedic'ed Base Pl. w/ Facer/H. Elem.	260 x 350 x 294 mm (10-1/4" x 13-13/16" x 11-7/16")
Transport Case	800 x 600 x 608 mm (31-1/2" x 23-5/8" x 23-15/16")
Weight	
Mechanical Assembly	14.2 kg (31.2 U.S. lbs)
Electronic Assembly	6.6 kg (14.5 U.S. lbs; on base plate)
Mechan. & Electron. on Base Plate	30 kg (66 U.S. lbs)
Facing Tool	4.2 kg (9.2 U.S. lbs)
Heating Element	3.9 kg (8.6 U.S. lbs)
Dedic'ed Base Pl. w/ Facer/H. Elem.	14.4 kg (31.7 U.S. lbs)
Transport Case (w/ mach., access.)	85 kg (187 U.S. lbs)
Transport Case, emptyx	30 kg (66 U.S. lbs)

3.3 Welding Process Overview

The welding process is performed as follows:

Important

Prior to welding, the mechanical structure of the machine has to be secured, either to the base plate or to the components to be jointed (see Sect. 4.6).

- The facing tool is inserted between the carriages, into its position for clamping the components in the machine, and the clamps themselves are adjusted to the spacer pins of the facing tool.
- The components are clamped and the facing distance is adjusted.
- The facing tool is moved to its position for facing.
- Pipe ends are worked using the pipe facing tool until a continuous blade of shaving material forms.
- Pipe alignment is checked and confirmed by the welder.
- Insertion of the heating element; when inserting it, the heating element has to be clean.
- After the heating element was inserted, closing in the movable carriage is confirmed, and the pipes close in at the predefined force.
- When the carriages close in, they also align the heating element exactly in-between the pipe butts.
- The pipe butts are then heated to the predefined temperature.
- When the heating phase is over, the pipes are moved apart automatically to allow for manually removing the heating element.

- Once the heating element removal is confirmed, the pipes close in on each other again.
- This is followed by a steady force increase until the fusion force is reached.
- The pipe then cools down at the predefined force.
- After the cooling time is over, the force is automatically removed from the carriages and the pipe or fitting can be taken out of it.

4 Operation

Before putting the machine into operation, review the transport locks and safety auxiliaries as well as the way the machine is set into its transport box. Whenever the machine is moved or shipped, it has to be set into this box and all locks and auxiliaries have to be engaged. The photographs below help with understanding the transport helpers.


When the printer is moved or shipped, the roll of labels in the printer has to be removed

When installing the reducer inserts, place the narrower inserts into the inner clamps, the broader inserts, into the outer clamps. The insertion and the removal of the inserts is performed **without any tools**. The reducers are secured to the clamps by the force of the magnets only.

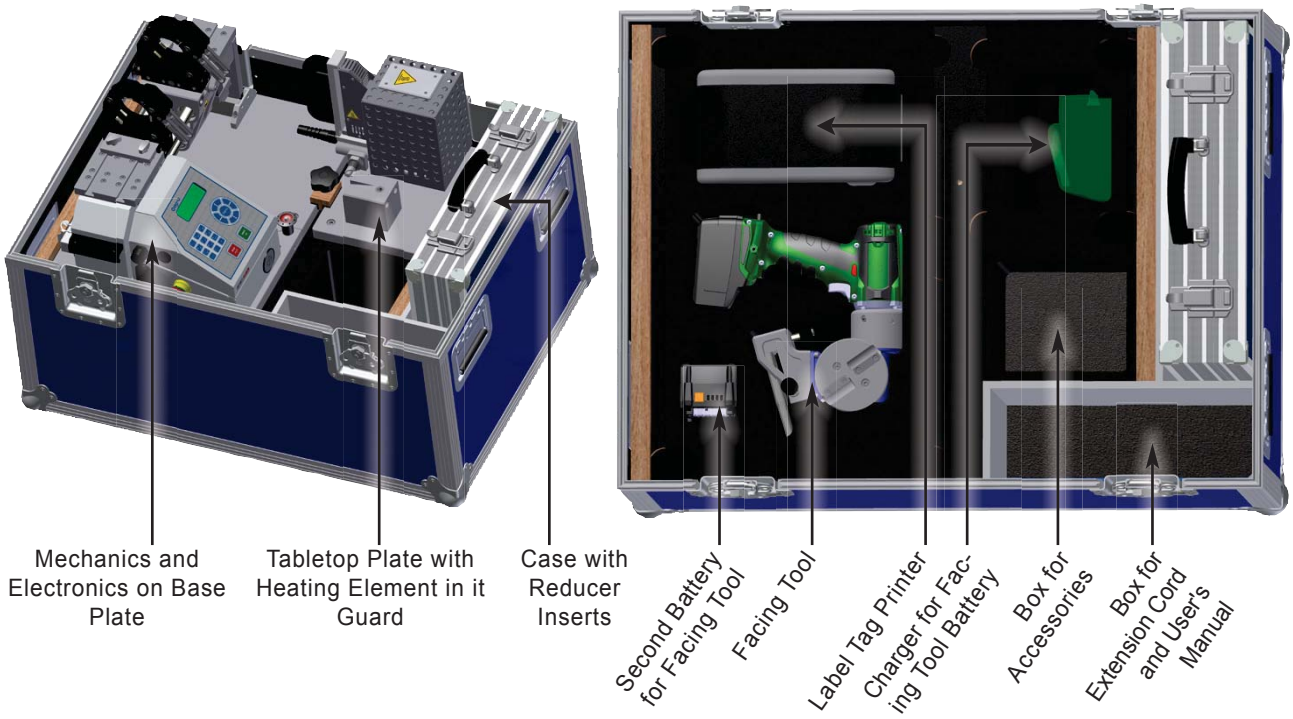
4.1 Check-out, Turning on, Selecting the Display Language

Place the machine on a level surface and ensure it cannot slide or secure it safely at the components to be jointed. Sufficient distance has to be kept to other areas in the workshop, especially to those in which combustible materials are used, in order for the heating element temperature of up to 500°C (930°F) not to be hazardous. When starting the machine up, remove the transport locks before applying power to the machine if it was transported before start-up and the locks were engaged. Furthermore, if the label tag printer ist planned to be used later on, connect it to the machine and insert the roll of labels before the first welding operation.

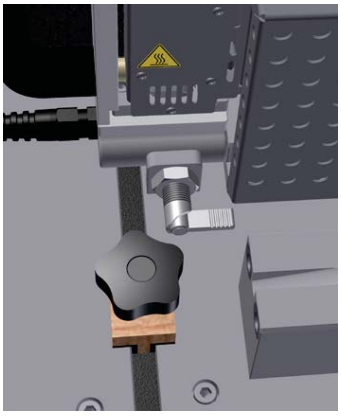
Independently of the order of the explanations in this booklet, the steps for setting the machine up and preparing everything for welding are always performed in the following order (see the following figures for reference):

1. Open the transport box.
2. Loosen the transport lock pole using the the star knob.
3. Take the dedicated plate for the facing tool and heating element out of the box, set it on a level surface, making sure it will not slide, and remove the transport lock of the heating element.
4. Take the base plate with the electronics and the mechanics out of the box, set it on a level surface, making sure it will not slide, and remove the transport lock of the movable carriages from in-between the carriages (unlock the locking ball pin and remove it, then slide the transport lock out of its seat in the opposite direction).
5. Take the facing tool out of the box and set it on its tabletop plate.
6. Take the battery charger out of the transport box.
7. Check the battery level and charge the batteries as needed.
8. Connect the mechanics and the heating element to the electronic control unit.
9. Connect the V-lock power cable to its socket and the mains.
10. Switch the machine on and zero the movable carriage position.
11. Insert the reducers into the clamps.

Depending on the piece that is going to be welded, the outer clamps



Inside view of the case for the reducer inserts



Star knob securing the base and tabletop plates, and transport lock (self-locking pin) of heating element

Transport lock of facing tool/ heating element carrier and movable carriage (locking ball pin on the back to unlock locking bar)

may have to be repositioned or removed. To do so, loosen the locking thumb screws and either remove the clamp or re-adjust it and secure it by tightening the locking screws again.

If the diameter of the pieces to be welded is smaller than the clamp, insert the reducer inserts. This can be done without using any tools since the inserts are fastened in the clamps by magnetic attraction.

Important

Pipe clamps and reducer inserts have to be clean or must be cleaned before welding starts. To insert or remove the inserts, do not use heavy tools (hammer, wrench). They may damage the inserts and the magnets.

Important

The surfaces of the heating plate have to be free of grease and clean, or they have to be cleaned. Clean the heating element only when it is cold. Refer to a service point for detailed information on the procedures for cleaning the heating element.

Important

Make sure all connectors are tight in their sockets and make sure that the machine is operated only if the conditions for safe and intended use are met (see also section 2).

After preparing the machine for welding and connecting the power supply cord to the mains power supply, the machine is turned on using the On/ Off switch. The welcome screen, as reproduced in Display 1, appears on the touchscreen panel. It disappears after a couple of seconds or when you press a key, and in the next screen you can select the display language that the machine will use, using the cursor keys. The selected language has to be confirmed by pressing the START/SET key.

After the language was selected, the machine takes the user to the screen for setting the system clock and date, if this still needs to be done or the auto-test determines they cannot be correct, and then to the welder code input screen. Without a valid welder identification code, the machine does not move on to the preparation of welding and the welding process, since working with the machine without a welder identification is prohibited.

```
********************
    SP 63-mobile
 ASP006_00_14003_01
********************
```

Display 1

Read the welder from a transponder card by RFID. If no card with the welder identification code is available, it can also be typed on the keypad and saved to memory by touching the START/SET key.


Info

All inputs for which a transponder card is available can be entered by holding the card in front of the RFID reader.

```
*** Welder Code ****
********************
_    **********
[RESET]        [SET]
```

Display 2


Info

Depending on the software version installed in your machine, some screens may differ slightly on your machine from the reproductions in this manual.

When the welder code was entered, the movement position of the movable carriage has to zeroed (see below). Then the machine displays the so-called default screen (see Display 3). In this display, it is possible to start the welding process and to customize the configuration of the machine.

Zeroing the Position of the Movable Carriage


Wichtig

Without proper zeroing of the reference position of the movable carriage, proper welding is impossible. Therefore, zeroing will be skipped only when the machine remains at the same spot for the next welding and no emergency stop was triggered. Zeroing the carriage position is required and cannot be skipped after the machine was switched on or the emergency stop switch was pressed.

```
Next Welding?
PVDF    40mm    2.27
22.10.14    15:24:58
[RESET]    +0N [SET]
```

Display 3

To zero the carriage position, the facing tool has to be removed from in-between the carriages if it still is positioned between them, and the START/SET key must then be pressed for confirmation (see Display 4). If it hasn't, press the STOP/RESET key. If the spacer pins of the facing tool are placed in the recesses of the carriages, the movable carriage can be moved apart by pressing the ⇨ cursor key.

The same holds for the heating element. If it is still set on the carrier between the two carriages of the machine, the user is requested to remove it. Only after the removal was confirmed by START/SET, the process continues.

The same query appears again for the pipes/components that might still be in the clamps from the last welding operation. They, too, have to be taken out of them, which has to be confirmed by START/SET.

```
Facing tool removed?


[RESET]        [SET]
```

Display 4

When the welder confirms that there are no pipes in the clamps, the machine asks that the movable carriage be closed in on the fixed one by holding down the ⇦ cursor keys, just as for facing, heating or joining, until the message "Searching reference point" appear on the screen. When

this message is showing, the machine determines the zero point of the movable carriage as compared to the position of the fixed carriage, that will apply for the next welding.

When this reference position/zero point was automatically zeroed and saved to memory in the control unit, the machine asks the welder to move the carriage apart, which indicated that the machine has now been zeroed. To move the carriage apart, press the ⇨ cursor key. The machine returns to the default screen (see Display 3). Welding can now be started or parameters can be edited.

4.2 Configuring the Machine

In the default screen (Display 3), the key parameters of the last welding are shown (material, diameter, and wall thickness of the welded pipe) along with the date and time. The last line of the display can be switched to showing the current temperature and the current percentage of heating performance by pressing the number key 1 and to showing the applied force by pressing the key 2. Both keys are toggle switches, i.e. will switch the fourth display line back to what is reproduced in Display 3 when pressed again.

In Display 3, the welder has the possibility to:

- immediately start a welding process that will be performed with the same welding parameters as the previous welding (press the START/SET key and move on to section 4.6);
- enter new traceability data, including another welder ID code, for the next welding (press the STOP/RESET key and move on to section 4.3);
- change the machine settings in the configuration menu (press the MENU key);


Info

Other functionalities that are called when the default screen is showing, are explained below in this booklet, including how to call them from this screen.

```
**** Main Menu *****
>Settings         -M-
 Adv. Settings    -M-
 Machine Settings-M-
```

Display 5

After the MENU key was pressed, Display 4 appears and allows selecting one of the various parts of the configuration menu. The options under “Settings” of the configuration menu are immediately accessible, the options under “Advanced Settings” will be displayed only after an access code was entered and confirmed by START/SET. The menu has the items listed in the following table. The items under “Machine Data” are not listed, as they are relevant for setting up and servicing the machine only, not for normal operation, and, therefore, protected by another access code, which will be disclosed to authorized personnel only.

To toggle from « On » to « Off » or vice versa for an option, press the ⇨ cursor key, to open a submenu or go to an additional screen for an option, which is indicated by the letter – M –, press the MENU key.

Any changes in the configuration menu are saved to memory and will be used by the machine in the future when the menu is quit by pressing the START/SET key. By qutting it by pressing the STOP/RESET key, the previous state is kept and no changes, if there were any, are saved.

Designation	Setting	Description / Data to be entered
—— “Settings” submenu ————————		
Number of Tags	Menu	In a sub-menu, the number of tags to be printed after welding for sticking them onto the welded pipes, can be selected.
Unit of Length (mm / inch)	Menu	In a sub-menu, the unit of length used for displaying and saving welding data can be selected.

Temperature Unit (°C / °F)	Menu	In a sub-menu, the temperature unit used for displaying and saving welding data can be selected.
Buzzer	ON / OFF	if ON: The audible signal that validates certain steps in the process is turned on; if OFF: At the end of the respective steps no signal can be heard.
Buzzer Volume	Menu	In a sub-menu, the volume of the audible signal that the machine emits to validate the execution of a given step in the process can be set.
Language	Menu	In a sub-menu, the display language of the machine can be selected.
Info	Menu	In a sub-menu, information on the machine and the installed control software version is displayed.
Contact	Menu	In a sub-menu, information on contact details for sales, maintenance, and service is displayed.
—— “Advanced Settings” submenu ————————		
Memory Control	ON / OFF	if ON: Machine refuses further welding operations when the memory is full; if OFF: Machine overwrites the oldest report when the memory is full.
Date/Time	Menu	In a sub-menu, date and time can be set.
Delete Reports	Menu	In a sub-menu, it is possible to delete **all** welding reports currently in memory. *To access this sub-menu, the so-called selection code is required; the reports will be deleted only after another safety warning was confirmed.*
Set Additional Materials	Menu	Through a sub-menu, the key parameters for welding can be defined for additional pipe materials that are not installed ex works (see Sect. 4.5).

4.3 Changing Key Parameters of the Welding

In the default screen (see Display 3), it is possible to change the weld-specific parameters for the joint to be welded. To do so, press the STOP/RESET key. The screen that allows selecting the material of the components that are going to be welded, is then displayed on the screen (see Display 6). A selection can be made of default, or standard, (preinstalled) or extra (user-defined) parameters or materials, using the ⇧, ⇩ cursor keys, and entering additional and traceability data for the welded joint can also be selected. The selection has then to be confirmed by pressing the MENU key.

```
>Sel. Std. Para. -M-
 Sel. Extra Para.-M-
 Enter Welder    -M-
 Enter Comm. No. -M-
```

Display 6

Additional (extra) parameters may be defined (see section 4.5) for a maximum of four materials.

No matter whether default/standard or extra parameters were selected, after pressing the MENU key, first the ⇧, ⇩ cursor keys are used to select the material of the components to be welded, the selection is confirmed by pressing START/SET, and then, in the next screen, the component diameter is selected in the same manner.

When you select an additional material, this has to be confirmed by entering the access code for the configuration menu (see sub-section 4.2). Default materials can be welded without entering this code.

Important

The machine must never be used to weld pipe materials, diameters, and thicknesses other than those available in the welding parameter screens. The manufacturer is in no circumstances liable for damage or consequential damage that occurs as a result of deviations from these pipe data or of modifications or attempted modifications to the control software. Furthermore, this will cancel any claims to warranty expressed for the ma-

chine. To make a material available in this screen, it has to be entered previously with all its technical welding parameters in the configuration menu.

4.4 Entering Traceability Data for the Joint

After the welder identification code was entered, the traceability data for the joint can be entered after the STOP/RESET key was pressed at the default screen (see Sect. 4.3).If no traceability data are entered, those currently saved to memory will be assigned to the next welding. This means that no data input is needed if the data for the last joint that was welded can be re-used for the next welding operation.

```
>Enter Welder     -M-
 Enter Comm. No. -M-
 Enter Add. Data -M-
 Enter Instal.Co.-M-
```

Display 7

The input routine is identical for all additional/traceability data: selection in the list reproduced in Display 6 using the ⇧, ⇩ arrow keys (welder ID code (but see Sect. 4.1 for this particular input), commission number, additional data such as place or particularities of the joint, installing company), confirmation in order to open the screen for entering that information using the MENU key, input of data with the keypad, and finally confirmation of that input by pressing the START/SET key.

4.5 Definition of Welding Parameters for Additional Materials

The configuration menu (see section 4.2) has an option “Extra Parameters” in its “Advanced Parameters” submenu which allows defining parameters the machine should use that are not yet preinstalled.

If no additional, operator-defined parameters have been saved to system memory, the unit displays an input screen that allows entering the name (max. 5 characters) of the material for which the parameters for welding it shall be defined. Enter the name on the keypad (see Display 8) and confirm it by pressing START/SET. The machine moves on to the next input screen, in which a pipe diameter for this material has to be entered in the same way. After having confirmed this input by “OK” once more, another screen allows entering the wall thickness for this material and size. After the wall thickness, the pressure level per SDR has to be entered in the next screen. After this, define the welding parameters for the material just entered, e.g. 50 mm PE pipe with a wall 2.3 mm thick (SDR 22). To define them, the unit walks the operator through a series of input screens in which the following can be entered: joining force, heating time, cooling time, heating element temperature, force ramp, facing force, preheat time. All inputs are made using the keypad and saved by pressing START/SET. The definition of an extra material can be cancelled in any screen by pressing the STOP/RESET key. This will delete all parameters that were already entered for the extra material being defined.

```
** Enter Material **
       MAT01

[RESET]        [SET]
```

Display 8

If additional, user-defined welding parameters have already been entered and saved previously, the unit shows a list of alle defined materials or the entry “-----” wherever no material is saved to an existing slot (see Display 9). As usual, with the ⇧, ⇩ cursor keys, a line may be selected and the selection, confirmed by the MENU key. (When the ⇩ cursor key is pressed at the last entry of a list, the cursor moves to the first entry of that list.)

If an empty entry is selected, a new material with all its welding parameters can be entered for it, as described above. When a line with a material is selected, pressing the MENU key will move you on to a screen of the same kind with all diameters associated with the previously selected material. On this screen, the material can be added a new diameter after the selection of an empty entry, “--mm,” and pressing the MENU key. This launches the above-described input process, not for the material, but for the size.

```
Extra Material Menu
>1.MAT01          -M-
 2.MAT02          -M-
 -----            -M-
```

Display 9

When a line with a diameter entry is selected, another similar screen shows, in which the same can then be done for the wall thickness/SDR. When a wall thickness entry is selected in that screen and the MENU key is pressed, a new selection menu appears with the options “Edit Branch,” “Delete Branch,” and “Delete Tree.”

The “branch” meant by the menu options is the set of a user-defined component material, its size, and its wall thickness or SDR value, e. g. 50 mm PE pipe with a 2.3 mm wall, that is, SDR 22. Selecting the “Edit Branch” option, then, allows modifying the welding parameters applicable to that material, size, and wall thickness in the same way as they are entered for the first time, as described above.

The “Delete Branch” option can be selected to delete the “branch” of material, diameter, wall thickness, along with its welding parameters, along which the selection screen was accessed. Deleting has to be confirmed in another safety screen. If this wall thickness or SDR is the only one left for the pipe diameter in question, then the diameter is deleted from the data “tree” too. And if the thus deleted diameter is the only one left for this material, the entire material is deleted.

By selecting the “Delete Tree” option, it is possible to delete **all** additional, user-defined parameters. Here too, deleting is possible only after cofirming it in a safety message. After deleting them, only the default materials with which the machine is shipped, remain.

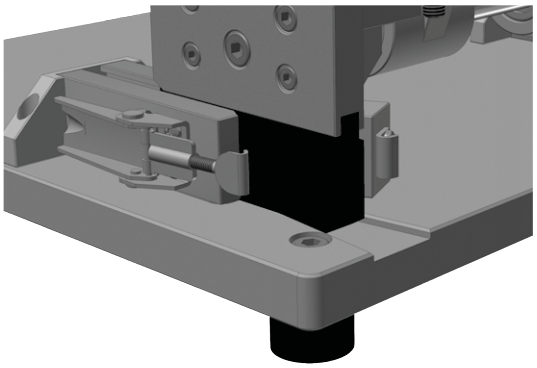

Info

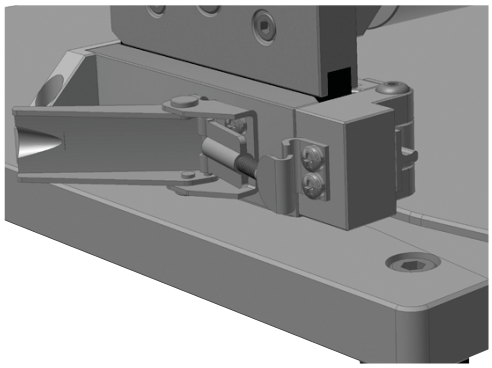
If the material that was used in the last welding operation is deleted, then the next welding operation of necessity requires a new material to be selected for welding.


Info

The screen for selecting to edit or to delete a “branch” or the entire “tree” of welding parameters is not accessible right away and requires selecting the “branch” to be edited or deleted via three selection screens (material, diameter, wall thickness/ SDR).

4.6 Fastening the Mechanical Structure of the Machine



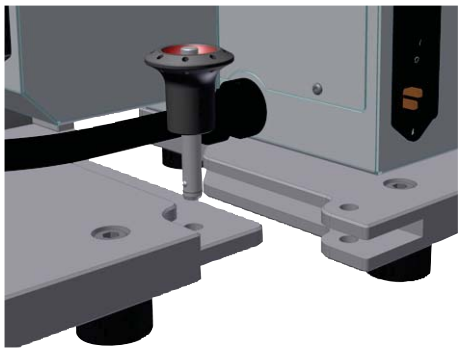


The mechanical structure (chassis) of the machine is fastened to or unfastened from the base plate using the lock frames that the black anodized-aluminum legs of the structure plug into (see left-hand drawing for reference). The leg is secured inside the frame by the fastening latch at its back (seen only in the right-hand drawing), which, in turn, is kept in place by the lock flap hooked into the fastening latch and then tilted towards the back, along the leg. The traction excercised on the fastening latch by the flap can be adjusted by shortening or lengthening the threaded pin that hooks into its mate at the edge of the latch.

The grooves in the base plate help slide the legs of the mechanical structure into the lock frames into which the plug.

Prior to fastening or unfastening the mechanical structure, disconnect all electrical and control cables; reconnect only when done.

A second step of fastening the mechanical structure to the base plate, when it is not planned to use it separate from the plate, is to lock the plates to each other by sliding the one into the other and securing it using the locking ball pins at the front right and back left corner of the plate of the electronic control unit (see drawing to the right, which only shows the locking ball pin at the rear). To unlock a locked pin, push down the head of the pin inside the head.



To conclude the preparations of the welding process, connect the two control cables: the one shown on the drawing to the right to the connector at the back of the mechanical structure and the one from the heating element to that on the right-hand side — when looking at the keypad — of the electronic control (see Sect. 3.2.2).

Caution

When the mechanical structure is properly fastened to the base plate, the fastening elements ensure a safe welding operation. If the machine is used without the base plate, make sure that it is positioned safely — including sufficiently far away from flammable and combustible substances — at the components to be jointed and that any needed means and auxiliaries of support are indeed used.

Caution

When they are not being used and held by the support between the carriages of the machine, the facing tool and the heating element have to be inserted by their bars meant to hold them, into the respective opening of the tabletop support (see drawing to the right).

4.7 Welding Process

With or without calibrating/zeroing the carriage position (see at the end of Sect. 4.1), the machine returns to the default screen (see Display 3). If technical welding parameters or traceability data have to be changed or entered and this has not been done before, it is still possible at this point after pressing the STOP/RESET key (see Sect. 4.3 and 4.4). If it is not needed, the welding process, with the current welding parameters and traceability data, is started by pressing the START/SET key.

Info

Possibly the welder has to wait for the heating element to reach the nominal temperature. This would then be indicated on the screen. If the temperature difference between actual and nominal is large, an additional delay may occur during which the final temperature is adjusted.

4.7.1 Facing the Component Butts

The welding process starts by the insertion of the facing tool. The machine alerts the welder to this next step.

Important

Make sure that the plate carrying the facing tool and the heating element is set on a surface where it can sit safely and does not slide throughout the entire welding process.

First, the machine asks the operator to insert the facing tool into position 1 (see Display 10). This is the position for clamping the components. In this position the spacer pins of the facing tool do not sit in the recesses of the clamp bodies in which they are during facing. Slide the facing tool in-between the carriages of the machine in position 1 and confirm it is in place by pressing the START/SET key.

```
****** Facing ******
Insert facer pos. 1
147N            3.0mm
[RESET] [<->]  [SET]
```

Display 10

When the facing tool is located between the components, the machine asks the operator to close in the carriage. This is done by pressing the ⇦ cursor key until the "<-" on the screen disappear. The process can be aborted by pressing the STOP/RESET key.

When the mobile carriage has been moved in on the fixed one, clamp the components to be jointed into the clamps. While the screen that requests this of the welder can be seen, it is possible, using the ⇦, ⇨ cursor keys, to decrease or increase the distance the carriage will travel during facing by 0.5 mm increments, from 3.0 mm through to 10.0 mm. When the facing distance is as desired, confirm by pressing the START/SET key. The machine moves the carriage apart for the next process item.

This next item of the facing process is to move the tool from position 1 to position 2, the position for facing proper. Again, the screen requests this of the welder. To move the facing tool, release its position lock. When it sits in position 2, press the START/SET key.


Info

Prior to the facing process, checking the direction and the speed of the rotation of the power facer is recommended.

The machine then asks the welder to start the facing tool. Do as you are requested, using the On/Off switch of the power facer, and hold down the ⇦ cursor key until the machine moves the carriage apart automatically. This indicates that the facing process is correct, considering the previously set facing distance. Then switch the facing tool off at its On/Off switch.

```
****** Facing ******
Facing OK?

[RESET]        [SET]
```

Display 11


Info

If the ⇦ key is released before the carriage moves apart, the facing tool pauses to allow for removing shavings; when holding down the ⇦ cursor key again the machine resumes facing.

When the machine has moved the carriage apart, the facing tool can be removed from in-between the pipes. Visually check the components and, if they are o.k., confirm this by pressing the START/SET key (see Display 11). If the result of facing is poor, the process can be repeated after pressing the STOP/RESET key. To face the ends once again, in most cases the pipes have to be re-adjusted in the clamps.


Info

If an error occurs during facing, the machine moves the mobile carriage apart, displaying the corresponding error message.

The facing process can be aborted at any time by pressing the STOP/RESET key.

4.7.2 Checking Alignment

When the component butts are level to satisfaction, it has to be checked if they align properly to each other or if there is an offset. Similar to facing, the screen tells the welder that this is the next step, and the carriage can be closed in on the other by pressing the ⇦ key until the machine stops automatically.

```
Check offset
Move clamps together

[RESET]         [<-]
```

Display 12

If the pipes align properly, confirm by pressing START/SET again, in order to move on in the welding process.

If the alignment offset is too large, or if there is too large or too uneven a distance between the components, press the STOP/RESET key. The machine then asks if facing should be repeated. For if the components have to be re-adjusted in the clamps at this point, facing has to be repeated, too. That is, at the repeat-facing query press START/SET if you want to repeat facing, STOP/RESET, if not. In both cases the machine

asks the operator to move the carriages apart in order to allow inserting the heating plate, if facing is o.k., or the facing tool, if it is not and facing should be repeated. To move the carriage apart, press the ⇨ key. If facing is not o.k. and the repeat-facing message is responded to by pressing STOP/RESET, the process aborts.

4.7.3 Inserting the Heating Element with or without Preheating

After the alignment/offset check and before the heating element is inserted, the cover caps have to be installed to the far ends of the components. This corresponding request shows on the screen. When the cover caps are installed, confirm by pressing the START/SET key.

After that confirmation, use the ⇧, ⇩ cursor keys on the next screen to select if preheating the component should occur not at all, only at the right-hand side or on both sides. The confirm this selection by pressing START/SET. The rationale behind this is that in a pipe-to-fitting joint, the fitting may have to be heated longer than the pipe end to plasticize.

```
Insert heating elem.


[RESET]
```

Display 12


Important

Preheating requires a preheating time ≠ 0 s to be defined in system memory. Preheating would be ineffective if it were selected now, but a preheating time of 0 s or none at all has been defined in the material parameters. Therefore, the preheating selection screen shows only if a preheating time is defined.

With or without preheating selected, the machine tells the welder to insert the heating element in-between the components (see Display 12).As soon as it is properly position, the machine recognizes this automatically and asks the welder to move the mobile clamp/carriage towards the fixed on. To do this, hold down the ⇦ cursor key.

```
Move clamps together
Move heat.el. right

[RESET]
```

Display 13


Info

The line “Move heating element (to the) right” shows only if the option of preheating only the right-hand component was selected. This requires the heating element to be moved slightly to the right manually while the machine closes the mobile carriage in on the fixed one. The machine stops this carriage earlier to allow for preheating the component in the right-hand clamp without closing in the other component too much yet on the heating element. If the welding process was selected to run without or with both-sides preheating, both components close in on the heating element simultaneously. The switch from preheating to the heating stage is automatic.

```
***** Heating ******
 25°C    Nom.   200N
 25°C    Act.   201N
[RESET]      50/  5s
```

Display 14

4.7.4 Heating Stage

In the first welding stage, the pipes close in on the heating element with the defined welding force and are thereby warmed. The stage starts when the mobile carriage is moved in on the fixed one (see Display 13).

During the entire duration of the heating stage, the components continue to soak heat from the heating plate, in order to prepare jointing.

In case of malfunction, the welding process can be aborted by pressing STOP/RESET. If the machine detects a malfunction, it aborts welding and displays an error message as soon as the heating element is removed.

4.7.5 Change-over Stage


Info

10 sec prior to the switch to the change-over stage, the heating stage screen shows the message “Prepare change-over” and an audible signal sounds to alert the welder to the imminent change-over for which he will have only a couple of seconds.

```
*** Change-over ****
Remove heating elem.
 25°C    Act.   201N
[RESET]      3/  1s
```

Display 15

At the end of the heating stage the carriages are moved apart automati-

cally. The heating element has to be removed manually from in-between the components and the removal, confirmed by pressing START/SET as soon as the [SET] option appears on the screen. It being confirmed, the carriage closes in again at the defined jointing force (see Display 16).

The welder has to monitor the change-over and must abort welding by pressing STOP/RESET, in case a malfunction occurs.

```
***** Joining ******
 25°C    Nom.     9N
 25°C    Act.    10N
[RESET]       5/  2s
```

Display 16

4.7.6 Joining Stage

In the joining stage (or, fusion stage) the machine increases the applied force in accordance with the force ramp calculated for the joint. This stage is also indicated on the screen.

```
***** Cooling ******
 25°C    Nom.    96N
 25°C    Act.    96N
[RESET]      50/ 20s
```

Display 17

4.7.7 Cooling Stage

When the full joining force is reached, the machine moves on automatically to the cooling phase (see Display 17). The cooling time is displayed as it progresses. During cooling, the applied joining force is constantly monitored.

4.7.8 End of Welding

After a successful welding operation, the applied force is released, and the pipes can be taken out of the clamps. The screen tells you so.

```
Remove pipes
for visual check

                [SET]
```

Display 18

If no error was detected during the welding process, the machine allows the welder to evaluate the joint by visual check (see Display 18).

When this prompt is responded to by pressing START/SET, the machine displays the most important welding data. Then, the joint can be declared sound by pressing START/SET or poor, by pressing STOP/RESET. Right after this assessment, a label tag is printed off for the joint.

When the label tag has been printed, the machine shows all errors it has registered since the heating element was removed for the change-over stage, or, that no error occurred at all. This info message can be acknowledged by pressing the START/SET key.

5.12 Using ViewWeld to Manage Logged Welding Reports and Print Tags

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 tag printer. The ViewWeld abstract shows the report number, year of machine manufacture, and identifier for the serial number, separated by the letter “m”, parameters of the welded material, the date and time of the welding, along with an evaluation of the quality of the joint/welding operation as o.k. or with errors (see Display 19; “PH” meaning “preheated”), where the first displayed abstract is that of the last performed welding operation.

```
*** 00025m14.587 ***
PE-HD   63mm   5.3mm
28.10.2014     16:44
  PH-WELDP. OK   P
```

Display 19

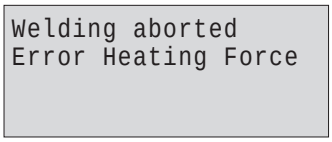
To call the ViewWeld abstract of a welding report, press the ⇧ key in the default screen (see Display 3). Browsing through the saved welding reports is then possible by pressing the ⇦ or ⇨ cursor keys. The machine will “jump” by 1, 10 or 100 reports depending on how long the key is held down. To print 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.

If a USB stick is inserted into the appropriate port while the ViewWeld abstract is showing, the currently displayed report can be downloaded to the stick. The desired file type still has to be selected (see at the beginning of Sect. 5 for reference), and the download starts.

4.9 Aborted Welding Process

All welding-relevant data are constantly monitored while the welding process is running. If one or more of the parameters are out of tolerance and the machine cannot adjust them, the welding process is aborted after a given period of time.

The error that made the welding abort is displayed on the screen (see Display 18), for most of them only as soon as the heating element is taken away from the machine.



Display 20

Type of Error	Description
a. Data Input	
Input Error	Error while entering data on the touchscreen.
Code Error	Error while reading data from a transponder card.
RTC Error	The sender/receiver does not work properly. The error message may also be about whether reading or writing data is flawed.
b. System	
System Error	Malfunction in the control system of the machine; power to the machine has to be turned off and unplugged immediately, and the machine has to be sent to the manufacturer or an authorized service point for check and repair.
Motor not Found	The initialization of the servo-motor that moves the mechanical structure has failed.
Proximity Switch Error	A malfunction in the proximity switch having already been energized at the start of zeroing the position of the movable carriage.
Printer not Ready	The printer or USB stick connected to the machine is not ready (no communication or faulty cable).
Error of Memory	If “empty” error: despite no report in memory, download was started; if “full” error: there are no more unused slots for reports, and memory control is enabled.
No Function Available	A control (key, button) was used for which no function is defined.
Welder Code Expired	The welder identification code is no longer valid.
c. Welding Process	
Temperature above Maximum	The heating element temperature is higher than allowed before the facing process.
Welding Aborted Welding Stopped	The process was aborted by pressing the emergency stop or by the control system or stopped by the welder.
No Extra Material	In a welding process that requires an additional (“extra”) material, no such material was entered.
Facing Distance Error	The distance the carriage travelled at facing is too short or too ling; welding has to be repeated.
Excessive Force Error	The applied force is out of tolerance; welding has to be repeated.
Excessive Motor Current Servo-motor Error	When moving the mechanical chassis, the motor drew excessive current; welding must be repeated. When welding is done, this error is called Servo-motor Error
Heating Force Error Heating Elem. Temp. Error Heating Elem. Pos. Error Change-over Delay Error Joining Force Error Joining Distance Error Visual Check Error	All quoted errors appear only after the welding process, as an assessment of the welded joint. The error that occurred or the stage in which it occurred is identified. The Visual Check Error identifies a welded joint declared flawed by the user after the welding process, at the visual check.

Power Supply Failure	In the course of the last welding operation, a power supply failure occurred; welding has to be repeated.
Emergency Stop	The welder has turned the machine off using the Emergency Stop switch. If this was done because of a malfunction of the machine, it must not be turned on again, unless it is beyond doubt that it works properly.
No Label Printed	Despite the system's being set to printing label tags after the welding process, no label was printed.
No facing tool inserted No pipe inserted	The clamps are closer together (or touch) than could be expected at the relevant step in the process.

4.10 Indication of Joint Status and Possible Errors on the Tag

The status of the joint and possible errors during jointing are indicated on the printed label tag and in the report saved to memory that can be viewed (see Sect. 5.2), in the form of an abbreviation or a binary figure.

The abbreviation “WELDP. OK” tells you that the welding process was completed correctly. If the letters “PH” precede this expression, the pre-heating feature was enabled for that welding process.

Instead of the “OK” message, the tag and the report that can be viewed may tell you that something went wrong, by an eight-digit binary figure. The relevant meaning of the binary figure can be seen with the help of the code table below.

For instance, if a label tag says, “00010000,” an error in the pre-heating stage of the process occurred. For that bit is set to “1” which represents an error in the pre-heating stage. The bits are assigned to the following statuses and errors.

Bit	Fehler or Status	Binary-encoded Code
0	Error by Visual Check	0000 0001
1	Error Heating Element Motor or Position	0000 0010
2	Error Because of Power Supply Failure	0000 0100
3	Error Carriage Movement During Welding	0000 1000
4	Error Pre-heating	0001 0000
5	Emergency Off or Manual Stop of Welding Process	0010 0000
6	Error Heating Element Temperature	0100 0000
7	Error Joining Force	1000 0000
-	Welding Process o.k.	WELDP. OK
-	Welding Process with Pre-heating o.k.	PH-WELDP. OK

Important

In the case of a flawed welding process, bit 4 may be the only one set to “1” or along with another bit. If only bit 4 is set (0001 0000), this indicates a pre-heating error. If it is set alongside another bit (e. g., 0001 0100), it is for information only and tells you that this was a process with pre-heating; the error identified by the other bit is the relevant one (in this example, then, it is an error because of a power supply failure in a welding process in which the pre-heating feature was used).

5 Printing Pipe Labels and Downloading Welding Reports

The machine is equipped with USB A interface that gives you the opportunity to connect the tag printer or, if permitted, a USB stick.

5.1 Downloading Welding Reports to a USB Stick

When a USB stick is inserted into the interface port while the default screen (see Display 3) is showing, the machine displays the menu in which the file type can be selected that is going to be used for downloading the reports (Display 21).

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

Display 21

After the selection of the file format for download, a similar screen appears and offers five options of what exactly will be downloaded:

- all reports in memory (i. e., since the reports were last deleted)
- the reports that belong to a certain commission or project
- the reports of operations performed by a certain welder
- all reports in a certain range of dates
- all reports in a certain range of reports/report numbers

When an option that does not send all, but only a selection of reports to the stick was selected, the operator has to define the desired selection/restriction on the next screen. If a commission number or welder is to be selected, reading it from a transponder card or a bar code is also possible. With these two restrictions, he can browse through the reports in system memory to select the desired commission (see Display 20) or desired welder, after the browsing screen was accessed by pressing the ⇦, ⇨ cursor keys simultaneously; to quit the browsing screen, press STOP/RESET. Or he enters the start and the end of the desired date range or report range, of which the reports should be downloaded. Whatever the selected option, the input screen that appears adapts to the input currently needed to enter the desired restriction of reports to download. All inputs have to be confirmed by pressing the START/SET key.

After successful download, the machine displays a message telling the welder that the process was o.k.

5.2 Showing Reports in Memory, Printing Pipe Label Tags

Using the ViewWeld feature (see section 4.8), it is possible to display on the screen a certain welding report saved to memory and to print a label tag of that welding from the ViewWeld screen.

Printing label tags is possible only when the tag printer is connected to the USB A port of the machine. If this is not the case, an error is displayed. The printer can still be connected when the error message is showing; the machine recognizes this, the error disappears from the screen, and the download starts.

5.3 Deleting Reports from Memory

To delete the reports stored in memory, use the appropriate option in the configuration menu (see sub-section 4.2). Upon touching this button, a safety warning asking if you really want to delete them appears on the screen and has to be confirmed to effectively delete the reports currently in memory.

6 System Data

6.1 Setting the Date and the Time of Day

When the “Date/Time” sub-menu was selected in the configuration menu (see sub-section 4.2), the screen shows what is reproduced in Display 22.

```
** Set Time/Date ***

22.11.14       15:49
```

Display 22

The time of day and the date can be set using the keypad on the front panel.

6.2 Data on the Machine and its Control Software

The version of the installed control software and data characterizing the machine itself are displayed when the “Info” sub-menu was selected in the configuration menu (see sub-section 4.2) or when the ⇩ key was pressed in the default screen (see Display 3).

Machine service or (re-) set-up may require certain resets/reinitializations of the machine, which are performed by reading specific transponder cards with the RFID reader. These cards are handed exclusively to authorized personnel with the operating organization.

6.3 Service and Repair

As the machine is used in applications that are sensitive to safety considerations, it may be serviced and repaired only on our premises or by partners who were specifically trained and authorized. 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 unit and any consequential damage.

All machines that are new or newly programmed during maintenance or upon request are shipped with the most recent software version.


Info

At the date of shipment, the service and maintenance interval is set to 18 months or 5000 welding operations (different in some markets), whichever comes first.

7 Service and Repair Contact

Asahi/America
655 Andover St.
Lawrence, MA 01843
1-800-343-3618
asahi@asahi-america.com


Info

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

7.1 Manufacturer Warranty

The warranty assumed by the licensed manufacturer is effective, on principle, for 1 year or up to 3000 welded joints. Claims for warranty may only be raised if the default parameters present in memory at delivery are/were used for welding and if the nominal temperature is/was lower than or equal to 530°C (990°F).

7.2 Technical Documentation

Wiring diagrams, computer-assisted designs and further technical literatures, as complements or more in depth, will be provided by agru Kunststofftechnik upon request at the address given above.

7.3 Risk Assessment

A risk assessment under the provisions of the so-called machinery directive 2006/42/EC was conducted for the machine by a qualified person entitled to the performance of such an assessment.

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