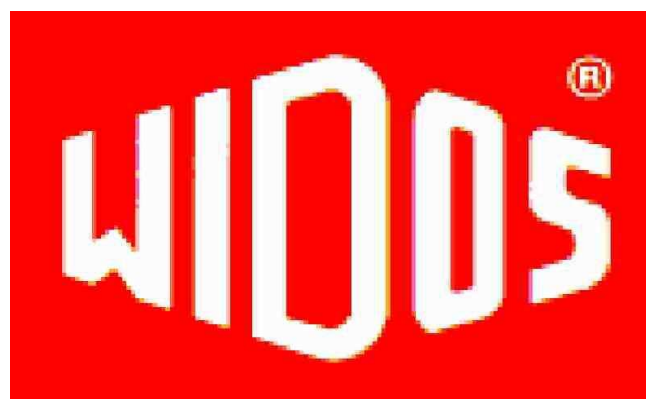


Working Instruction Translation

Barcode Electro Fusion Control Box
WIDOS ESI2000



Keep for further use!

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Please note the safeguards in chapter 3

Dear customer,

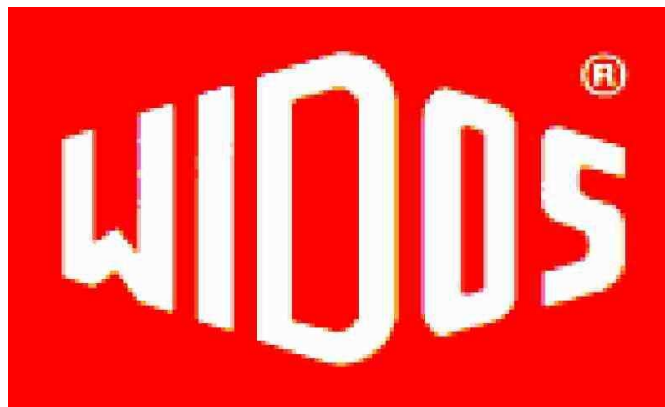
we thank you for the confidence in our product and wish you a contented work with it.

The present instructions manual includes, beside the description of the use of the devices, important notes for your safety and the scope of application.

Therefore, you should read carefully the present instructions manual before the first use of the device.

In case of failure or interruption of the workflow read the appropriate chapter of this manual.

Self-evidently we are ready to assist you at any time:



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Any changes subject to technical innovations.

1 Introduction

All notes and technical specification in this instructions manual were prepared with all necessary care. The manufacturer keeps the right to make technical changes at the device, which are not directly included into the present instructions manual.

1.1 Maintenance periods

Please note, that the bought product is a technically demanding machine for field application. In accordance to the applicable standards like DVS 2208-1, BGV A2, ISO 12176-2 and most national and international standards, these machines have to be subjected to a periodical maintenance. The maintenance period is 12 month. When the machine is used quite often the maintenance should be carried out more often.

During the maintenance the machine will be upgraded to the current technical state. Additionally you get a 3-month function guarantee for the maintained device.

The maintenance and the related checks are important for you safety and the continuous working reliability of the control unit. Therefore the maintenance and all necessary repairs, have to be carried out by the manufacturer or a authorised service point.

2 Scope of application and technical data

2.1 Scope of application

The electro fusion control units of type **WIDOS ESI2000** are exclusively for the electro fusion of thermoplastic pipes (e.g. made of PE-HD, PE80, PE100 or PP) by use of electro fusion fittings with a welding voltage lower than 48V. The control units conform to the standard DVS 2208-1 as well as the ISO 12176-2, which refer to the standards applicable for the electro fusion fittings to be used.

It is not allowed to use the electro fusion controllers, to which the present instruction manual refers to, for an application not covered by the above stated terms. The manufacturer is not liable for the use of the machine out of the scope of application.

2.2 Input of welding parameters

The electro fusion controllers of type **WIDOS ESI2000** provide the following means for entering the welding parameters:

BARCODE (ISO-TR 13950, Type 2/5i, 24 digits)

The barcode attached on the most electro fusion fittings in the market contains all necessary data for processing them. After reading the barcode with the reading device, the process data is automatically taken over by the control unit. The barcodes contain mainly the following data: Manufacturer, type, diameter, fusion voltage, fusion time (with temperature correction, if applicable), resistance and resistance tolerance.

MANUAL input of the barcode digits:

If the barcode on the fitting or the barcode reading device is defect, it is possible to enter the barcode digits (if available) into the control unit manually.

MANUAL input of the fusion voltage and time:

If none of the above stated methods are usable, it is possible to enter directly the fusion voltage and fusion time of the fitting to the control unit.

2.3 Range of fitting dimensions

For which range of fitting dimensions an electro fusion control unit can be used depends essentially on the power consumption of the used fittings itself. Since the power consumption of the fittings are different for different fitting manufacturers, a general statement concerning this point is hardly to make. In case of doubt, each single case has to be checked separately. For electro fusion control units of the type **WIDOS ESI2000** the following general statement can be made, with the assumption, that all welding processes were made one after the other, i.e. that the control unit is able to cool down during the preparation time of the next fitting:

Use for dimension **20-710mm** without any limit.

From a diameter for **710mm and higher** there must be provided longer off-times to ensure a cooling down of the control unit (Error message "Device too hot"). Before processing fittings in this dimension range, you have to check that the welding current of the fitting does not exceed the maximum output current of the control unit.

All above made statements refer to an ambient temperature of 20°C.

2.4 Technical data

Technical Data - Technische Daten		WIDOS ESI2000
ISO 12176-2 Class - Klassifizierung	P2 3 U S1 V AK X	
Input Voltage - Eingangsspannung	230V ~/AC, (185V-300V)	
Input Current - Eingangsstrom	16A	
Input Frequency - Eingangsfrequenz	50Hz (40-70Hz)	
Power Factor - Leistungsfaktor	cos ρ < 0.6 – 0.9 (Phase Angle Control / Phasenanschnitt)	
Output Voltage - Ausgangsspannung	8-48V	
Output Current - Ausgangsstrom	80A (max.: 1100A)	
Energy Adjustment - Energieanpassung	Temperature Compensation – Temperaturkompensation	
Power Consumption - Leistungsaufnahme	3600VA	
Temperature Range - Arbeitstemperatur	-10°C - +50°C	
Protection Class - Gerätesicherheit	IP54, Class 2	
Weight incl. Cables - Gewicht inkl. Kabel	18kg	
Main Supply Cable - Netzkabel	4,5 m (Euro-Plug – Euro-Stecker)	
Welding Cable - Schweißkabel	4m (fixed – fest)	
Welding Terminals - Anschlußkontakt	4,0mm (opt. 4,7mm)	
Display - Display	4 x 20 Characters (alphanum.), background lighting 4 x 20 Zeichen (alphanumerisch), Hintergrundbeleuchtung	
Dimension - Abmessungen	440mm x 380mm x 320mm	
Monitoring Functions - Überwachungsfunktionen		
Input - Eingang	Voltage / Current / Frequency - Spannung / Strom / Frequenz	
Output - Ausgang	Voltage / Resistance / Contact / Short circuit / Current Monitoring Spannung / Widerstand / Kontakt / Kurzschluß / Stromüberwachung	
Other - Sonstige	System / Working Temperature / Service System / Arbeitstemperatur / Wartung	
Error Messages - Fehlermeldung	Plain Text / Acoustic Signal Klartext im Display / Dauerwarnton	
Enclosed Parts - Lieferumfang		
	Control Box, Instructions Manual Gerät, Bedienungsanleitung	

Technical Data for 110V Control Units

Technical Data – Technische Daten		WIDOS ESI2000
Input Voltage - Eingangsspannung	110V ~/AC, (90V-150V)	
Input Current - Eingangsstrom	40A	
Input Frequency - Eingangsfrequenz	50Hz (40-70Hz)	

2.5 Data Recording

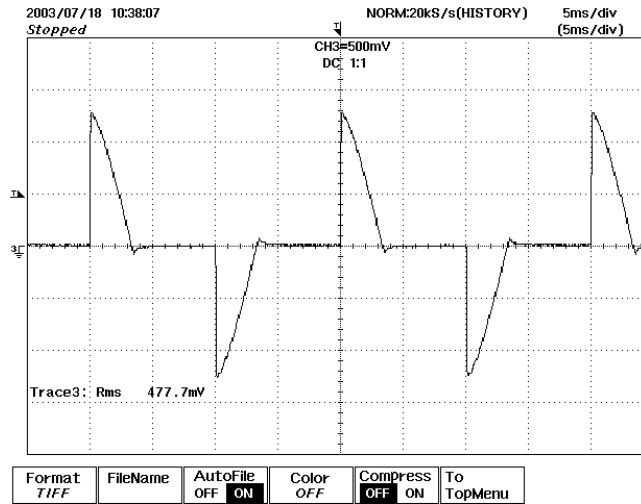
The **ESI2000** Control unit does not provide any recoding functions.

2.6 Technical File – WIDOS ESI2000 (ISO 12176-2)

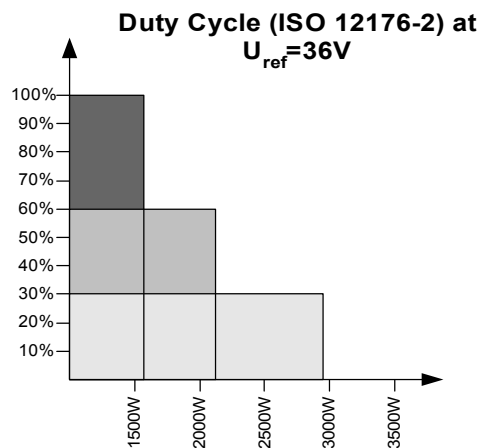
Classification

Machine Type	Classification
WIDOS ESI2000	P ₂ 3 U S ₁ V AK X

Simulation Curved at 24V (Output voltage)



Duty Cycle at 100%, 60% and 30%



Additional Information

Soft Start:	2sec ramped
Ambient Temperature Compensation:	As stated in ISO/TR 13950
Fitting Temperature Compensation:	No
Fusion Data Recorder:	No

3 Important safeguards

Before turning on the welding device, please, read this operating instructions as well as the relevant safety and processing directions carefully.

Warning! With the use of electric tools you have to note the following basic safety direction to protect against electric shock, injury and fire.

1. Keep your working area in order !

Disorder involves a certain danger.

2. Consider the influence of environment !

Do not expose electro tools to rain. Do not use electro tools in wet or damp surroundings or in the neighbourhood of combustible liquids or gases.

3. Protect yourself against electric shock !

Avoid body contact with grounded components (e.g. radiators, metal pipes) or live cables. Do not carry the device, with the finger on the power switch. Pull out the plug when you do not use the tool or when changing the adapters attachments.

4. Keep unauthorized people and children away !

Do not allow other people touch the device or cables – keep them away from your working place.

5. Store up your device safely !

Unused machines should be kept in a dry and locked room, inaccessible for children and unauthorized people.

6. Use permitted accessories only!

Do only use accessories, especially current sources and lengthening cables, that are stated in the operating instructions or recommended by us. The use of attachments, that are not stated in the operating instructions, involves a certain danger for you. Do only use permitted and marked lengthening cables outdoors.

7. Do not expose the cables to avoidable loads !

Do not carry the machine with the cable and do not use the cable to pull out the plug. Protect the cables against heat, oil and sharp edges.

8. Lock after your tools carefully !

Keep your device clean. Follow the servicing instructions and the instructions for changing the tools. Keep oil and grease away from the straps.

9. Check your device for damages !

Check your tools before every use for damages and function of the protection devices and machine parts. All parts have to be mounted in the right way. They have to fulfil all conditions for a impeccable running of the tool. Damaged protection devices and machine parts have to be repaired or replaced by an authorized service point.

Caution: To avoid danger for your health, do not touch the fitting or cables during the welding process. Kept minimum safe distance of 1m.

4 Controls and Plugs



(1)	Display	(5)	Power Switch
(2)	START (green)	(6)	Welding Cable
(3)	STOP (red)	(7)	Cable Holder and Handle
(4)	CURSOR KEYS	(8)	Power Supply Cable (not shown)
●	Select key		

5 Power Connection

The connecting conditions of EVU, the VDE-directions, the accident prevention regulations, DIN/CEN-regulations as well as national regulations have to be considered.

Electro Fusion Control Units have to be used by operators, which are trained and authorised conform the national and international standards and directives, only. The operator has to supervise the electro fusion control box during the whole fusion process.

The electro fusion control unit has to be used within the following ranges:

Parameter	230V Control Units	110V Control Units
Input Voltage:	185V – 300V (AC)	90V – 150V (AC)
Input Frequency::	40Hz – 70Hz	40Hz – 70Hz
Ambient Temperature:	-10°C – +50°C	-10°C – +50°C
Max. Output Power:	4000W	4000W

Caution: 110V Control Units shall not be used at 230V power supply and vice versa.

When operating on a electric distributor or the main power supply of nominal 230V, a min. 16 Amps slow fuse comprising a *residual current-operated protective device* (RCCB) should be used (110V: min. 32Amps).

Extension Cables:

To extend the power supply cable you have to follow the following rules:

Cable length	Cross Section (230V)	Cross Section (110V)
Up to 20m	3 x 1.5mm ²	3 x 4mm ²
20 to 50m	3 x 2.5mm ²	3 x 4mm ²
50-100m	3 x 4mm ²	-

It is not allowed to extend the welding cable!

Important notes for the use of generators:

- **First start generator, then plug in the device.**
- **No other machine or device shall be connected to the generator**
- The idle running voltage should be regulated to 240V – 260V (AC) at nominal 230V (nominal 110V: 120V – 130V (AC)).
- Plug out welding device before turning off the generator.
- The usable generator power will decrease by 10% per 1000m height.
- Check the fuel level before starting the welding process.

5.1 Generator suitability

The Electro Fusion Controllers of type **WIDOS ESI2000** provide the following means to increase the generator suitability:

- Wide tolerance for input voltage (185-300 V for 230V) and Input frequency (40-70 Hz).
- Display of current input voltage and frequency.
- Soft-Start for limitation of the generator load.

Despite this characteristics, the generators to be used have to fulfil the following requirements and recommends, in order to avoid damaged of the control unit and to ensure that the internal monitoring function of the control unit will not interrupt the welding process:

- suitable to drive inductive loads and phase cut systems
- no-load voltage adjustable to 240 V – 260 V at nominal 230 V (nominal 110 V: 120 V – 130 V (AC)).
- output current of 18 A at one phase at nominal 230 V (nominal 110 V: 36 A).
- stable output voltage and engine speed, also at fast alternating loads
- synchronous generators with mechanical speed control preferred
- voltage peaks must no exceed 800 V

Min. required generator output power 230 V, 50 Hz, 1-phase

Diameter	Output Power
20-75 mm	2 kW
90-160 mm	3,2 kW
180-710 mm	4.5 kW (mechanically controlled) 5 kW (electronically controlled)

For generators with insufficient control performance or voltage control it has to be selected 3-3.5 times higher output power than the stated ones to achieve an undisturbed operation. Electronically controlled generators tent to oscillate with the control of the welding process, which can lead to high output voltage peaks. Please, test suitability before using that kind of generators.

Caution: 110 V control units shall not be used at 230 V power supply and vice versa.

6 Starting a welding process

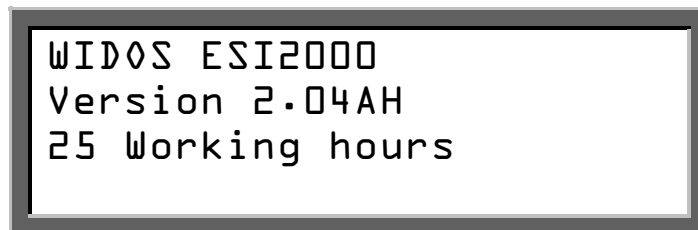
6.1 Preparation

Before starting you have to carry out the following steps in the given order:

1. Check the device, cables and adapters visually. If necessary you have to replace them.
2. Plug in Detachable welding cables.
3. Unroll welding, power and extension cables completely.
4. Switch of the Power Switch of the control unit.
- 5. Start the generator before you plug in the control unit. Wait until the generator output voltage has stabilized.**
6. Plug in the power cable of the control unit.
7. Switch on the power switch.

Caution: 110V Control Units shall not be used at 230V power supply and vice versa.

After this procedure, the control unit signals its readiness with two beeps. In addition the display backlight is turned on automatically. The following display message appears:



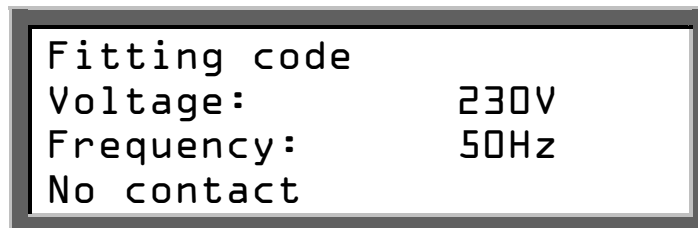
```
WIDOS ESI2000
Version 2.04AH
25 Working hours
```

Line 1 and 2 show the type and version of the control unit.

Line 3 shows the total amount of working hours of the control unit.

If there occurred any error or change of the system configuration at the last weld before turning off the device, this will be indicated by a message in the display once again. After pressing the red **STOP**-key you are able to carry out a new welding process.

As long as no fitting is connected, no welding process can be started. The Message **No contact** prompts you to connect a fitting.



```
Fitting code
Voltage:      230V
Frequency:    50Hz
No contact
```

Welding Terminals:

- The contacts of the welding connector and the fitting plug must be clean – dirty or coated contacts can lead to overheating and burn at the connectors.
- Generally the terminals have to be protected against dirt. If there is a coating or loss of stick force on the connectors they have to be replaced.
- Use Adapters to connect certain fitting types. Adapters wear out with the time and have to be checked before every use.

Connect the welding terminals of the control unit to the pins of the fitting. Take care on a firm and proper fit.

6.2 Welding with the Barcode-mode

Pay attention to the installation instructions of the fitting, special instructions (ISO, CEN, DVGW, DVS), European and national directions as well as the instructions of the manufacturers!

After preparing and connecting the fitting, the following message demands you to read in a fitting barcode with the scanner or reading pen:

Fitting code	
Voltage:	230V
Frequency:	50Hz
Temperature:	+23°C

Error messages will be shown in the last row. In case of generator use check that the voltage is at about 240-260V at nominal 230V (nominal 110V: 120V – 130V (AC)).

For welding in the Barcode-Mode, read in the barcode label, which is attached to the fitting you want to process. If it is not readable because of damage, you can use by the way of exception the readable barcode of an identical fitting of the same manufacturer. **In any case it is forbidden to use the barcode of a different fitting.** If you read in a barcode which is defect or invalid the error will be displayed and indicated by a bleep. You read in the barcode by using the scanner or reading pen.

Using the reading pen:

Place the tip of the reading pen left or right beside the bar code. Move the reading pen with a constant speed over the whole barcode. Do not stop the movement or lift the reading pen off.

You read-in the barcode by using the scanner or reading pen. If the device detects a valid barcode, it indicates its readiness by showing the following message:

```
Start
Nom. time:      0200s
+PF+  CPL  d063  +23°C
```

Row 1 indicates that you have to press the green **START**-key to start the welding process. Before that you are obliged to check and compare the shown values with the ones given on the connected coupler.

Row 2 shows the nominal welding time.

Row 3 shows the manufacturer, type and diameter decoded from the barcode. The type information is shown like follows:

CPL	Coupler	TEE	Tee
SKT	End cap	RED	Reducer
SAD	Saddle	ERS	Transition
BOW	Elbow	TDW	Tapping Saddle

There is also given the ambient temperature. If the fitting barcode provides *temperature compensation*, the nominal fusion time will be adapted to the ambient temperature.

Row 4 shows possible error messages.

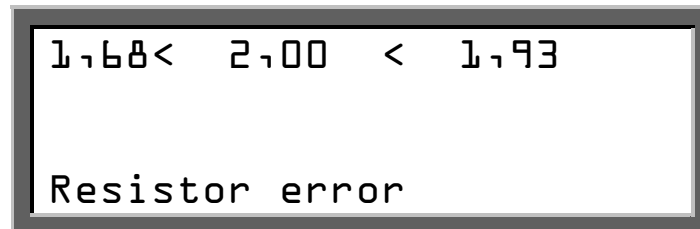
After pressing the green **START**-key a message will remind you of your duty to fix and prepare the pipes according to the general guidelines:

```
Is the pipe scraped ?
```

If you have any doubt about the right preparation, you can break off the procedure by actuating the red **STOP**-key. Confirm the proper preparation by pressing the green **START**-key.

Resistor Error

Now, the welding device begins to measure the fitting resistance. In the case that it is outside the valid range, the error will be indicated by a bleep and a appropriate message will appear in the display:



Row 1 shows in the middle the measured resistance. At the left and right the borders of the resistance range given in the barcode is shown.

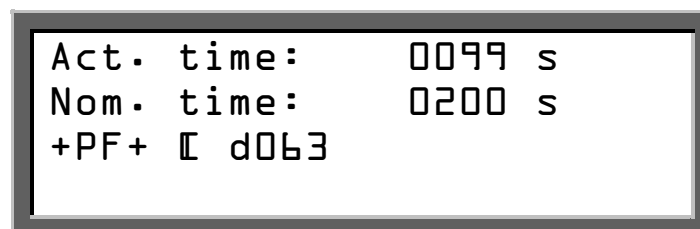
Row 4 shows the error message.

Plug the welding terminals out of fitting plugs. Check the connectors of the fitting and welding cable for dirt or coating. If the fitting causes another resistor error, it maybe defect. Replace it.

If no resistor error occurs, the welding device starts the welding process automatically.

Caution: To avoid danger for your health, do not touch the fitting or cables during the welding process. Kept minimum safe distance of 1m.

The display shows the actual and nominal welding time:



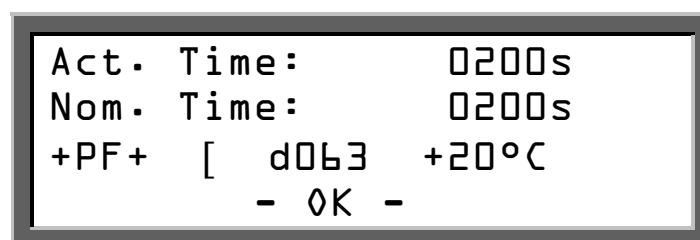
Row 1 shows the actual welding time, which is counted upwards.

Row 2 shows the nominal welding time.

Row 3 shows the manufacturer, type and diameter.

Row 4 shows possible error messages.

The welding process will stop automatically when the actual time reaches the nominal time. This will be indicated by two bleeps and the following message:



Pull off the welding connectors to go back to the start message.

6.3 Welding with Manual-Mode

Pay attention to the installation instructions of the fitting, special instructions (ISO, CEN, DVGW, DVS), European and national directions as well as the instructions of the manufacturers!

As long as no fitting is connected, no welding process can be started. When connecting the welding terminals to the pin at the fitting pay attention to a firm a proper fit. As soon as a fitting is connected, the following message appears in the display:

```

Fitting code
Voltage:      230V
Frequency:    50Hz
Temperature:  +23V
  
```

Error messages will be shown in the last row. In case of generator use check that the voltage is at about 240-260 V at nominal 230 V (nominal 110 V: 120 V – 130 V (AC)).

After connecting the fitting, press the select key ● to show the function menu in the display.

```

>Contrast
Manual Input
Print
  
```

The function menu contains a list of available functions. The first three are shown in the display. The symbol > represents the cursor, which marks the menu item to be selected. Use the ◀-keys to move the cursor to the item **Man. Input** and press select key ●.

The display shows the entry fields of the welding parameters.

```

Weld Voltage
U(V)=  40 V
t(s)= 0020 s
  
```

Row 1 shows the name of the active entry field (here: Welding Voltage).

Row 2 shows the welding voltage entry field.

Row 3 shows the welding time entry field

An underlined or flashing digit marks the number to be changed

- ◆ Increases or decreases the digit which is marked.
- ◀ ▶ Moves the marking to the left or right digit.

START Confirms the entered welding voltage.

Note: You have to use the welding parameters stated on the fitting or given by the fitting manufacturer. You are not allowed to use other parameters, since incorrect welding parameters can lead to explosion of the fitting.

After pressing the **START**-button the entry field for the welding voltage will be activated:

```
Weld time
U(V)= 40 V
t(s)= 0020 s
```

The value will be entered the same way as described above. After the confirmation with the **START**-button the welding parameters will be shown once again.

```
Start
Nom. time : 20 s
Weld voltage 40 V
```

Check carefully the correctness of the parameters before confirming them by pressing the green **START**-key. The following message will remind you of your duty to fix and prepare the pipes according to the general guidelines:

```
Is the pipe scraped?
```

If you have any doubt about the right preparation, you can break off the procedure by actuating the red **STOP**-key. Confirm the proper preparation by pressing the green **START**-key.

The welding device starts the welding process automatically.

Caution: To avoid danger for your health, do not touch the fitting or cables during the welding process. Kept minimum safe distance of 1m.

The display shows the actual and nominal welding time:

```
Act. time:      0009 s
Nom. time:      0020 s
Weld voltage 40V
```

Row 1 shows the actual welding time, which is counted upwards.

Row 2 shows the nominal welding time.

Row 3 shows the nominal welding voltage.

Row 4 shows possible error messages.

The welding process will stop automatically when the actual time reaches the nominal time. This will be indicated by two beeps and the following message:

```
Act. Time:      0020s
Nom. Time:      0020s
+PF+ [ d063 +20°C
      - 0K -
```

Pull off the welding connectors to go back to the start message.

7 Additional Functions

7.1 Function Menu

After connecting the device to the power supply and switching the device on, wait for the readiness of the device (two bleeps) and aboard all error messages with the red **STOP**-key.

Press the select key ● to view the function menu in the display.



The function menu contains a list of available functions. The first three are shown in the display. The symbol > represents the cursor, which marks the menu item to be selected.

- ◆ Moves the cursor upwards and downwards.
- Selects the item marked by the cursor <.

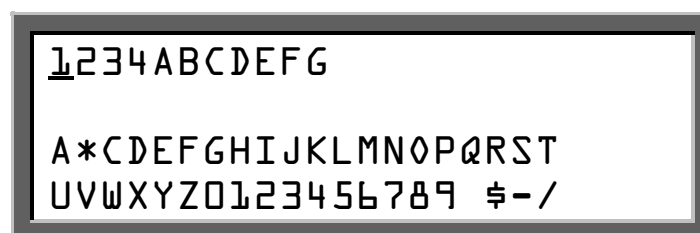
The following table shows the available functions with the referring pages of this manual.

Function	Description	Page
Fitting Code	Manual Input of the fitting code	21
Man. Input	Manual input of welding time and voltage	17
Contrast	Adjust display Contrast	21
System Config.	System configuration	22

7.2 Letter Input Field

For the manual input of data, as for example Commission number, Inventory-Number, and so on, the *Letter Input Field* will be shown in the display. In any case the handling of this field is the same. Because of that, it will be described here in detail.

The *Letter Input Field* will look as follows:



Line 1 and 2 (*Input field*) show the already entered letters. Sometimes there will be shown an initial string. The flashing or underlined digit shows the actual position, where a selected letter will be inserted.

Line 3 and 4 (*Letter Field*) show the letters that can be chosen and entered into the *Input Field*. Here the actual letter to be selected is covered by an asterisk *.

1) Entering a string of letters

The letters will be entered at the position of the flashing or underlined digit in the *Input Field*. Move the asterisk * by using the cursor keys ◀ ▶ under the letter, that you would like to enter and select it by pressing the select key ●. The chosen letter will be entered and the mark will move to the next digit of the Input Field. Enter all digits of the wanted string one after the other.

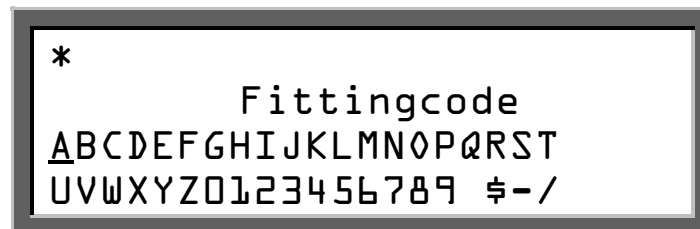
2) Editing a string of letters

If you want to correct a certain digit of a string, move the asterisk * out of the *Letter Field* by using the ▲-key. Now you can move the flashing position of the *Input Field* with the ◀ ▶-keys under the wanted digit of the present string. Then press the select key ● ones to let appear the asterisk back in the *Letter Field*. Now you can enter the new letter to the marked digit as described in 1).

Always confirm your input by pressing the green **START**-key. You can abort the letter input function with the red **STOP**-key. In this case your input will not be used for the following process.

7.3 Manual input of the fitting code

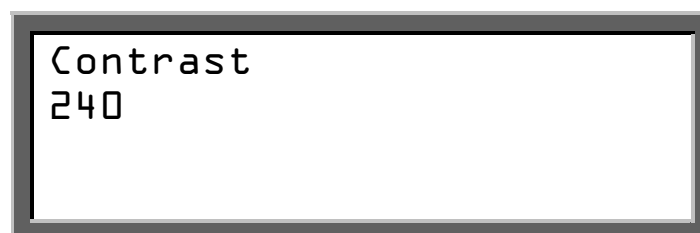
This function offers the possibility to enter the numeric code of a damaged barcode manually. After selecting the **Fitting Code** function the following message will appear in the display:



The input of the fitting code can be done by using the shown letter input field. Confirm the entered fitting code by pressing the green **START**-key and proceed as stated in section 6.2.

7.4 Adjusting the display contrast

By selecting the **contrast** function of the **function menu** you can adjust the display contrast to your needs:



The shown value is only given for your orientation. It can show numbers from 100 to 250. At high values the belong to strong contrast.

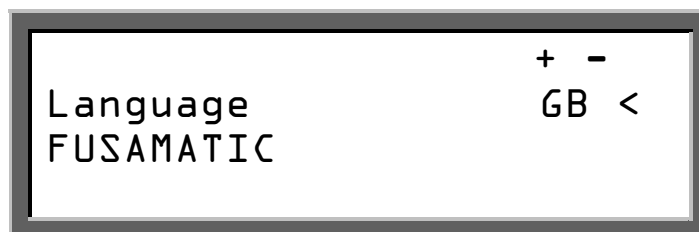
◆ Increases or decreases the value / contrast. If the value reaches 250 it switches back to 100.

Adjust the contrast to a value where you can read the display best. Note, that the display should be readable also if you look at it under certain angles. Confirm your adjustment with the green **START**-key.

The display will ask you “**Are you sure?**”. You can confirm the correctness of your choice by pressing the green **START**-key or cancel the function by using the **STOP**-key.

7.5 System configuration

To show the system configuration menu, you have to select the **System config.** function:



< cursor, which indicates the active option.

◆ moves the cursor up and down.

● selects the active option.

* shows the option state (+ = ON , - = OFF)

◀ ▶ changes the option state

After changing the options you have to press the green **START**-key for confirmation and to confirm the following question “**Are you sure?**” with the green **START**-key also. If you do not want to confirm your changes press the red **STOP**-key.

The following options and functions are available:

Option	Description	Value	Page
Language	Function for changing the display language	Country Code23	
FUSAMATIC	Dis-/ enabling the FUSAMATIC system	ON/OFF-	

7.5.1 Change language

After selecting the language function from the system configuration menu the display will show a list of language indicators.

The indicators stand for: GB = English, SE = Swedish, ES = Spanish, IT= Italian, DK = Danish, PT = Portuguese, DE = German, FR = French, PL = Polish, TR = Turkish, RO = Romanian, etc.



Please note that only 7 languages are available.

- > Represents the cursor, which marks the present current language.
- ◆ Move the cursor upwards or downwards through the available languages.
- Selects the marks language

The display will ask you “**Are you sure?**”. You can confirm the correctness of your choice by pressing the green **START**-key or cancel the function by using the **STOP**-key.

8 Trouble shooting

8.1 Using and servicing the reading pen

Attention: Do not touch the contacts of the welding cable with the reading pen.

Using the reading pen:

Place the tip of the reading pen left or right beside the bar code. Move the reading pen with a constant speed over the whole barcode. Do not stop the movement or lift the reading pen off.

Replace reading pen:

If the reading pen does not work properly you can replace it on your own. Slit open the shirk tube which protects the plug with a sharp knife. Pay attention on the cables. Replace the reading pen and test it before you mount the new shirk tube.

8.2 Replacing Welding Terminals

The welding plugs should be checked frequently. If necessary they can easily be replaced in no time.

1. Switch off the device and disconnect it from the mains supply or generator!
2. Slip off the PVC-cap over the welding terminal.
3. Hold the front part of the brass contact with a pipe wrench and screw the welding terminal with a 8mm-wrench out of the brass contact.
4. The red welding cable has to be equipped by a welding terminal with detection tip! You have to use welding terminals that are delivered by PF only!
5. Screw the new welding terminal tight into the brass contact and slip the PVC-cap over the welding terminal. Pay attention, that the PVC-cap is slipped over so far, that the welding terminal is left blank for about 15mm.

1_0200_001	Welding Terminal 4.7mm, standard
1_0200_003	Welding Terminal 4.0mm, standard
2_0200_003	Welding Terminal 4.7mm, Fusamatic (with detection tip)
2_0200_004	Welding Terminal 4.0mm, Fusamatic (with detection tip)
1_0410_004	PVC-Cap, red
1_0410_003	PVC-Cap, black

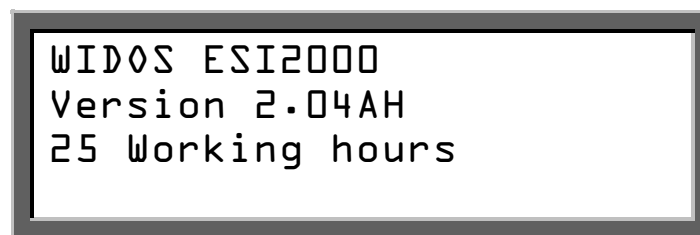
8.3 Adapter

For different fitting types different adapters are needed. In the following table you will find a selection of available adapters:

1_0300_009	Adapter 4.7/4.7 angle
1_0300_001	Adapter 4.7/4.0 angle
1_0300_004	Adapter 4.0/4.7 angle
1_0300_011	Adapter 4.0/4.0 angle
1_0200_005	FUSAMATIC-Adapter 4.7/4.7
1_0200_006	FUSAMATIC-Adapter 4.7/4.0
1_0200_007	FUSAMATIC-Adapter 4.0/4.7
1_0300_010	Adapter 4.0/4.7, straight
1_0300_003	Adapter 4.7/GF (lose ends)
1_0300_014	Adapter 4.0/GF (lose ends)
1_0300_002	Adapter 4.7/FF-flat
1_0300_012	Adapter 4.0/FF-flat
1_0300_008	Adapter 4.7/FF-pin
1_0300_013	Adapter 4.0/FF-pin

8.4 Start messages

After switching on the device the following message appears on the display:

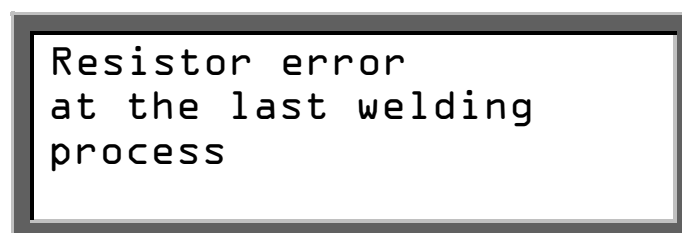


Row 1 and 2 show the *type* and *firmware revision* of the control box.

Row 3 counts the total *amount of working hours* (summed up fusion times).

After ten seconds the above shown display will disappear.

If there occurred any error or change of the system configuration at the last welding before turning off the device (e.g. **Resistor error**), this will be indicated by a message in the display once again:



After pressing the red **STOP**-key you are able to carry out a welding process.

8.5 Error messages

Error messages will be indicated by a bleep. A permanent bleep can be interrupted by pressing the red **STOP**-key.

Error	Cause	Reaction
Code error	Faulty input.	Move the reading pen with a constant velocity over the barcode.
	Barcode defect or error of code structure.	
Frequency error	Input frequency out of working range (40-70Hz).	Check Generator.
Power failure	Last welding was interrupted by a break of the power supply.	Last welding is faulty! Prepare pipe again and use a new Fitting!
Device too hot	Temperature of transformer is too high	Let the device cool down for about 45 min.
No contact	No complete electrical contact with the fitting.	Check connection to the fitting.
	Fitting coil or welding cable is defect.	Use an other Fitting. Change welding cable.
Emergency cut-out	Welding was interrupted by pressing the STOP -key.	Welding is faulty!
Output volt. error	The output voltage deviates from the rated voltage.	Check the generator. Revolutions fluctuate or power too weak.
Current high	Output current is more than 15% higher than the starting current.	Shortcut of fitting coil or welding cable.

Error	Cause	Reaction
Current low	Interrupt of the welding current.	Welding is faulty!
	Current drops down about 15-20% for at least 3s.	Welding is faulty!
System error	Danger! Selftest found an error in the system.	Disconnect power supply immediately. Do not connect the device to the power supply any more. Send it to the next service point.
Temperature error	Surrounding temperature out of working range (-10-+50°C).	
Temp. Meas. error	Temperature measurement is faulty.	Plug in the removable welding cable. Switch device off and on. Welding cable or sensor defect.
Input voltage high	Input voltage >300V at 230V nom. Input voltage >150V at 110V nom.	Adjust generator voltage to 240V-260V. Adjust generator voltage to 120V-130V.
Input voltage low	Input voltage < 190V at 230V nom. Input voltage < 90V at 110V nom.	Unroll the power supply cable. Use power supply cable with the right diameter. Adjust Generator voltage.
Service	The recommended service interval of 200 working hours is exceeded.	The device has to be checked by an authorized service point. The device is still usable, but the manufacturer does not accept any liability for the device until it is checked up.
Interturn shortc.	The current rises more than 15% during the welding. Shortcut of the fitting coil.	Welding is faulty!
Resistor error	Fitting resistance is out of the valid working range.	Clean the contacts. Use an other fitting.
	Fitting resistance outside the valid tolerance range given by the barcode.	Clean the contacts Use an other fitting.

9 Declaration of conformity

In sense of the EC guideline EG-MRL 2006/42/EG

Company

WIDOS GmbH
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D-71254 Ditzingen-Heimerdingen

declares under own responsibility that the product

WIDOS ESI 2000

to which this declaration refers, conforms to the following norms and normative documents:

1. DIN EN ISO 12100 – 1 and 2 (substitute for DIN EN 292 part 1 and 2)
Safety of machines, basic terminology, general design guidelines
2. DIN EN 60204.1
Electric equipment of industrial machines
3. EN 60555, EN 50082, EN 55014,
Electro-magnetic compatibility
4. DIN EN 60950
Safety of facilities of information technology

The technical documentation is completely available.

The working instructions are available in the user's language.

Ditzingen-Heimerdingen, 21.12.2010

Dieter Dommer (Managing director)