

Operating Instructions for Ultrasonic Generators of the **SONIC DIGITAL HS MD**



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Introduction

Dear Customer, Thank you for purchasing this Weber Ultrasonics product. You have chosen a first-class product that was developed using the latest technology.

It is vital that you read these operating instructions and follow them carefully before installing or commissioning your product. Failure to observe these instructions can present a risk to life.

Units may be operated by trained personnel only. Failure to comply with this stipulation will result in a loss of warranty rights.

The device may only be operated and maintained by personnel who have read and understood this operating manual and are familiar with the applicable legal regulations for accident prevention and workplace safety.

Safety instructions

Before starting up your device, please read through the following instructions carefully, both for your own safety and for the safety of the device.

Keep the operating manual in a place that is accessible to all users at any time.

The electrical connections may only be established by trained personnel.

The ultrasonic generator may only be operated by trained personnel.

Due to its principle of operation, **additional safety measures** must be taken if the device is to be used in potentially explosive atmospheres.

The electromagnetic compatibility complies with the standards and regulations listed in the specifications.

All necessary settings were either made at the factory or are described in this manual. However, should problems occur during start-up, please do not make any unauthorised adjustments to the device, as this would endanger your warranty rights.

If in doubt, please contact our technical service staff.

Work inside the device may only be carried out to the scope described and, as with the electrical connection, should only be performed by skilled personnel. When performing such work, the ultrasonic generator must be completely disconnected from the mains (unplug the mains connection). (Disconnect mains plug)

Inputs or outputs that are used for controlling or monitoring purposes should be twisted and shielded. The device must not be in close proximity to electrically charged components or cables.

The shielding should be connected to the generator's earth on one side of the generator.

Important: All connections for the signal or control lines are galvanically connected to the generator.

Always observe any warnings or instructions given on the device itself.

The device must always be disconnected from the mains before cleaning or when installing/uninstalling an option. Do not use liquid cleaners or sprays. Only use a damp cloth.

Never operate the device in areas where moisture could penetrate the device.

The platform for the device must be sufficiently stable, as severe damage could result if the device is jolted or dropped.

Ensure that the power supply specifications given on the device are met.

Only converters with the correct frequency, power output and dimensions may be used with this generator.

HF lines between the generator and the transducer and mains cables to the generator should not be rolled up if they are too long, but must be shortened to the necessary length due to the potential risk of overheating.

With the exception of the permitted tasks listed in the manual, you should never attempt to repair or modify the device yourself.

In the following cases you should disconnect the device from the mains and contact a qualified service engineer:

- **If the mains cable or connector is damaged**
- **If liquid has penetrated into the device**
- **If the device has been dropped or the housing is damaged**
- **If the device displays noticeably different behaviour than during standard operation**

IMPORTANT: Repairs and modifications may only be carried out by competent, skilled personnel.

Assembly

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Notes on the installation location

During operation the generator will become very hot.

To ensure that the generator can dissipate this heat well, the generator must be fitted with the fan facing downward. If the generator is to be fitted horizontally, it must be assembled with the cooling profile at the top. Ensure that there is sufficient space for air circulation.

If the generator cannot dissipate this heat sufficiently, after a short time it will display an error message signalling that the temperature is too high (also refer to the **"TEMPERATURE LIMIT REACHED"** error description).

In addition, ambient temperatures of over 30°C should be avoided at the installation site.

Choose a suitable location that will protect the device from moisture, water, excessive sunlight and heat.

IMPORTANT: • Choose a location that will prevent steam or any other aggressive vapours from penetrating the device.

• Long-term exposure to chemically contaminated ambient air can result in irreparable damage to the device.

Power supply

The ultrasonic generator is supplied with alternating voltage of **230 V / 50 / 60 Hz** via an external cable, which is connected using a plug.

It is equipped with an internal main fuse (10 AF).

If you need to change the fuses, unscrew the cover of the housing.

IMPORTANT: • For safety reasons always disconnect the mains cable before replacing the fuse.

- Only connect the generator to earthed mains sockets.
- Only replace blown fuses with new fuses of the same type.
- This should only be performed by qualified and skilled personnel.

Connections of the generator



Assignment of the mains connection

Connection PIN 1: 230 VAC (L)
Connection PIN 2: 230 VAC (N)
Connection PIN 3: PE conductor (PE)

BNC-socket:

Converter negative connection: Shield of the BNC socket
Converter positive connection: Inner conductor of the BNC socket

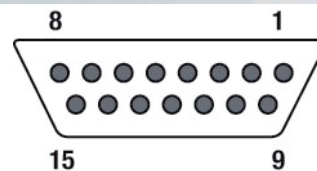
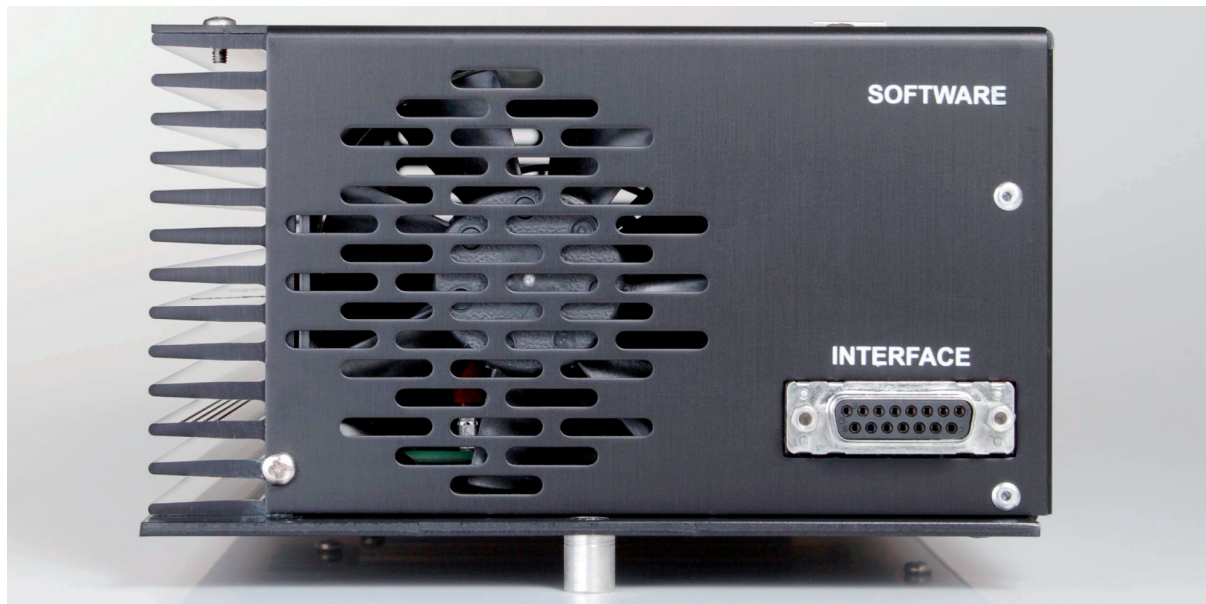
Use only the specially provided connection cable from Weber Ultrasonics to connect the converter!

- ATTENTION:**
- Only use cables specified by the manufacturer.
 - Use only shielded transducer connection cables!
 - Connect the shielding to the PE conductor on the generator side.
 - Only use cables with sufficient cross-section.
 - Minimum cross-section 1,5 mm².

DANGER: RISK TO LIFE!

During operation, i.e. while ultrasound is being emitted, there is a life-threatening voltage on the HF socket!

Assignment of the 15-pole interface socket



PIN no. on DSUB socket interface	Signal name	Description
1	+15 VOLT OUT	15 Volt for external use
2	POUT	Output 0 – 10 Volt = Power output 0 – 100%
3	P-EXT.-IN	Input 5 – 10 Volt for power control
4	GND	Shared reference point = Ground
5/9	HF-DA-ERROR	Relay root (shared) for "HF-DA" and "ERROR"
6	HF-DA	Relay output "HF-DA"
7	ERROR	Relay output "ERROR"
8	NC	Not assigned! Do not connect!
9/5	HF-DA-ERROR	Relay root (shared) for "HF-DA" and "ERROR"
10	NC	Not assigned! Do not connect!
11	<> Nominal	Open collector output for nominal value
12	FAN-ON	Monitoring output = 12 Volt when the fan is running
13	FS-24 V	Remote control input (with 15 –24 Volt)
14	FS-GND	Remote control input (to GND)
15	GND	Shared reference point = Ground

IMPORTANT: A shielded control cable must always be used for the interface.

INTERFACE DESCRIPTION

1.) The "+15 Volt Out" signal

DSUB pin 1

A voltage of 15V is available at this output. This voltage can be loaded with max. 100 mA and can, for example, be used to output a voltage for the "HF-DA" and/or "Error" functions.

This voltage can also be used to switch on the generator on the "FS-24 V" input.

2.) The "POUT" signal

DSUB PIN 2

A voltage proportional to the power output of between 0 and 10 V (= 0 – 100 % power output) is available at this output.

Reference point = "GND"

3.) The "P-EXT.-IN" signal

DSUB PIN 3

By applying a voltage of between 5 V and 10 V, the power output of the generator can be set to between 50% and 100% of its nominal amplitude or power output. To activate this function, open the Settings menu (password 6354) and select the "external voltage" setting under "Ctrl Assignment".

Reference point = "GND"

4.) The "HF-DA ERROR" signal

DSUB PIN 5/9

Shared output/input or root for the internal relay "HF-DA" and "ERROR" (these pins are internally connected).

5.) The "HF-DA" signal

DSUB PIN 6

If the ultrasonic generator has been switched on by one of the signals "FS-24 V", "FS-GND" or by using the test button on the front panel or the external control console and is emitting HF voltage (i.e. there is no malfunction), an internal floating relay contact is closed (between pin 6 and pin 5/9).

The "root" of this relay contact leads through to pin 5/9 (these pins are connected internally) of the DSUB socket. This relay contact can now be queried by an external control system. It is, of course, possible to switch through a voltage connected to pin 5/9 (max. load 24 VDC/100 mA).

It is particularly useful to query this contact if a timer operation is being executed and the generator switches off automatically when the time has elapsed. The contact can also be set to the opposite polarity in the "I/O polarities" item of the Settings menu.

Factory default settings: Contact closed when generator emits HF voltage.

6.) The "Error" signal

DSUB PIN 7

This is the output of an internal relay (root to pin 5/9).

This relay reports generator malfunctions. This means that if the generator is switched on and the power output does not correspond to the set level for some reason, this relay is activated.

Factory default settings: Closed in the event of a malfunction. The polarity can be changed in the Settings menu under "I/O Polarities" ("Error detect"). An external voltage connected to "HF-DA-Error" can, of course, also be switched through here (max. load 24 VDC / 100 mA).

7.) The "FAN – ON" signal

DSUB PIN 12

At this output, a control voltage of 12V is available for monitoring the fan function when the internal fan is running.

8.) The "FS-24 Volt" signal

DSUB PIN 13

Activation of the generator (ultrasound on) by the supply of 15 - 24 V between PIN 13 and GND (PIN 4/15)

9.) The "FS-GND" signal

DSUB PIN 14

Activation of the generator (ultrasound on) with a relay contact or switch by connecting PIN 14 on the DSUB socket to GND (PIN 4/15).

10.) The "<> Nominal" signal

DSUB PIN 11

Open Collector output: high signal if a window function is activated and the generator is operated outside the set window, low signal if a window function is activated and the generator is operated inside the set window.

11.) The "GND" signal

DSUB PIN 4, 15

The GND signal is available on multiple pins of the DSUB socket.
It is the common reference point for all input and output signals.

Operation

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Operator elements and display of the generator

- "TEST" button:** This button is used to turn on the generator for testing
- LED-Power:** Lights up when the device is correctly supplied with mains voltage.
- HF LED:** Lights up when the generator emits HF voltage
- Error LED:** Lights up in the event of an error
- Connection for an external control console.**



Operating and display elements of the external controller

- HF LED:** Lights up when the generator emits HF voltage
- Aux1 LED:** Lights up when a window function is activated and the generator is operated outside the set window
- Aux2 LED:** No function
- Error LED:** Lights up in the event of an error
- Power indicator LED 10 – 100%:** Displays the power output in 10% steps.
- Encoder / Select:** For setting and entering values
- Test button:** The generator can be switched on by pressing this button

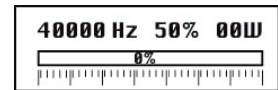


The LCD display

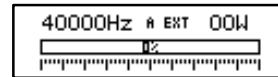
Various screens and functions are available in the LCD display:

Start screen

On the top left is the frequency in Hertz, in the centre the amplitude set in percent (adjustable between 50% and 100%), and on the right the last power output in watts. In the bar graph, the last power output in percent is also shown in diagram form.



If "external voltage" is set in "Ctrl Assignment" in the Settings menu, the following text appears in the centre of the display instead of the set amplitude: A EXT.



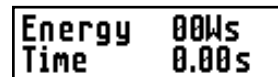
Power output display depending on the welding mode set

There are five different welding modes (the welding modes can be deactivated in the Administrator Settings menu and are then no longer displayed in the menu).

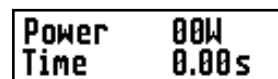
If "Weld by Remote", "Weld by Time" or "Weld by Pulse" are set, the current power output is shown on the display in watts. When the device is switched off, the maximum power output reached is saved until the next time the device is switched on.



If "Weld by Energy" is set, the power output is shown on the display in watt-seconds together with the required time. When the device is switched off, the peak power output is saved until the next time the device is switched on.



If "Weld by Peak Power" is set, the maximum power output is shown in watts on the display together with the required time. When the device is switched off, the maximum power output reached is saved until the next time the device is switched on.



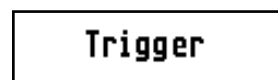
Frequency display

The display shows the frequency of the generator, in this example of a 40 kHz generator.

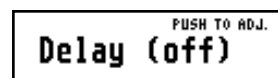


Trigger

A delay time of up to 9.99 seconds can be entered here before the actual welding operation starts. Usage: If the welding sonotrode is installed in a press, for example, the time which the sonotrode requires to reach the workpiece can be set here.



The delay time is set by pressing the encoder. The delay time can be set by turning the encoder. The selected delay time is confirmed by pressing the encoder again. In the "off" position this setting option is deactivated.



This menu item can be deactivated in the Administrator Settings menu and then no longer appears in the menu.

5 different welding modes

Five different welding modes can be selected via the "Welding" menu item (the welding modes can be deactivated in the Administrator Settings menu and then no longer appear in the menu). If only the Remote Mode is enabled and P-Window and T-Window are not, the "Welding Screen" is omitted completely, as no settings can be made.



Welding

Weld by Remote

If the generator is set to "Weld by Remote", welding is carried out for as long as the test button is pressed or if one of the remote control inputs is active. If a delay time was set in the Trigger menu, the welding operation does not start until the set time has elapsed. If you release the test button or deactivate the remote control input before the set trigger time has elapsed, the error message "Cycle not completed" appears on the display and the red Error LED lights up. If Remote Mode is selected, the generator ends the welding mode with an inactive remote signal, and then switches to Holding and After Burst, if enabled. If the remote input or the test button are activated during After Burst, the generator switches once more to welding mode without deactivating the output signal.



Weld by Remote PUSH TO ADJ.

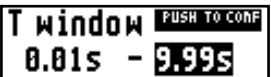
Welding mode is set by pressing the encoder. The required values can be set by turning. Pressing the encoder again confirms the selected values. If you then turn the encoder to the right, the "T-Window" and "P-Window" sub-menus are opened (provided they have not been deactivated in the Administrator Settings menu).

If you turn the encoder to the left, you exit the sub-menus again.

This welding mode can be deactivated in the Administrator Settings menu and then no longer appears in the menu. If only one welding mode is enabled, the "Weld by ..." screen is omitted.

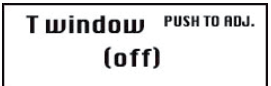
T-Window function

A time window ranging from 0.01 to 9.99 seconds can be set using the "Select" encoder. If the operating time is outside the window, the Nominal LED lights up on the control panel or the LED AUX1 on the hand-held operating device, and there is a high signal at the Nominal output (DSUB PIN 11). If the operating time is shown within this window, there is a low signal at the Nominal output (DSUB PIN 11) on the interface (also refer to interface description).



T window PUSH TO CONF.
0.01s - 9.99s

The selected window is set by pressing the encoder. The minimum and maximum values of the window can be set by turning the encoder. Pressing the encoder again confirms the selected values. In the "off" position this function is deactivated.



T window PUSH TO ADJ.
(off)

This function can be deactivated in the Administrator Settings menu and then no longer appears in the menu

P-Window function

The "Select" encoder can be used here to set a power window. If the power output is outside the window, the Nominal LED lights up on the control panel or the AUX1 LED on the hand-held operating device.



P window PUSH TO ADJ.
87A - 1780W

The selected window is set by pressing the encoder. The minimum and maximum values of the window can be set by turning the encoder. Pressing the encoder again confirms the selected values. In the "off" position this function is deactivated.



P window PUSH TO ADJ.
(off)

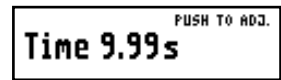
This function can be deactivated in the Administrator Settings menu and is then no longer included in the menu.

Weld by Time

If the generator is set to "Weld by Time", you can set a time of 0.01 seconds to 9.99 seconds. The welding process begins when you press the test button or activate the generator via the remote control input. If you release the test button or deactivate the remote control input before the set time has elapsed, the error message "Cycle not completed" appears on the display and the red Error LED lights up. If a time has been set in the Trigger menu and the Holding menu, the operation starts with the Trigger delay time and only ends when the set Holding cooling time has elapsed.

The welding mode and time are set by pressing the encoder. The required values can be set by turning. Pressing the encoder again confirms the selected values. If you then turn it to the right, the "T-Window" and "P-Window" sub-menus are opened (provided they have not been deactivated in the Administrator Settings menu). If you turn the encoder to the left, you exit the sub-menus again. Refer to "Weld by Remote" for a description of the window functions.

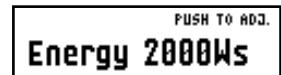
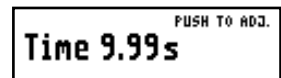
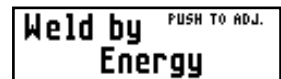
This welding mode can be deactivated in the Administrator Settings menu and then no longer appears in the menu. If only one welding mode is enabled, the "Weld by ..." screen is omitted.

**Weld by Energy**

In the "Weld by Energy" menu option, you can set a time of up to 9.99 seconds and an energy (Watt second) that is to be output within the set time. If the set energy is not reached within the defined time, the "Timeout" error appears on the display and the red Error LED lights up. The welding operation starts when the test button is pressed or the generator is activated via the remote control input. If you release the test button or deactivate the remote control input before the set time has elapsed, the error message "Cycle not completed" appears on the display and the red Error LED lights up. If a time was set in the Trigger menu and the Holding menu, the operation starts with the Trigger delay time and only ends when the set Holding cooling time has elapsed.

The welding mode, time and energy are set by pressing the encoder. The required values can be set by turning. Pressing the encoder again confirms the selected values. If you then turn it to the right, the "T-Window" and "P-Window" sub-menus are opened (provided they have not been deactivated in the Administrator Settings menu). If you turn the encoder to the left, you exit the sub-menus again. Refer to "Weld by Remote" for a description of the window functions.

This welding mode can be deactivated in the Administrator Settings menu and then no longer appears in the menu. If only one welding mode is enabled, the "Weld by ..." screen is omitted.



Weld by Peak Power

In the "Weld by Peak Power" menu option, you can set a time of up to 9.99 seconds and a power (Watt), that is to be emitted within the set time. If the set power output is not reached within the defined time, the "Timeout" error appears on the display and the red Error LED lights up.

The welding process begins when you press the test button or activate the generator via the remote control input. If you release the test button or deactivate the remote control input before the set time has elapsed, the error message "Cycle not completed" appears on the display and the red Error LED lights up. If a time was set in the Trigger menu and the Holding menu, the operation starts with the Trigger delay time and only ends when the set Holding cooling time has elapsed.

The welding mode, time and output are set by pressing the encoder. The required values can be set by turning. Pressing the encoder again confirms the selected values. If you then turn it to the right, the "T-Window" and "P-Window" sub-menus are opened (provided they have not been deactivated in the Administrator Settings menu). If you turn the encoder to the left, you exit the sub-menus again. Refer to "Weld by Remote" for a description of the window functions.

This welding mode can be deactivated in the Administrator Settings menu and then no longer appears in the menu. If only one welding mode is enabled, the "Weld by ..." screen is omitted.

Weld by PUSH TO ADJ.
Peak Power

Time 9.99s PUSH TO ADJ.

Power 2000W PUSH TO ADJ.

Weld by Pulse

If the generator is set to "Weld by Pulse", you can set a welding time and an "Off time" of 0.01 seconds to 9.99 seconds. The welding process begins when you press the test button or activate the generator via the remote control input. If the welding time (Time) has elapsed, the generator switches off for the set "Time Off" and then restarts. If you release the test button or deactivate the remote control input, the welding process ends. If a time was set in the Trigger menu and the Holding menu, the operation starts with the Trigger delay time and only ends when the set Holding cooling time has elapsed.

The welding mode and time are set by pressing the encoder. The required values can be set by turning. Pressing the encoder again confirms the selected values. If you then turn it to the right, the "T-Window" and "P-Window" sub-menus are opened (provided they have not been deactivated in the Administrator Settings menu). If you turn the encoder to the left, you exit the sub-menus again. Refer to "Weld by Remote" for a description of the window functions.

This welding mode can be deactivated in the Administrator Settings menu and then no longer appears in the menu. If only one welding mode is enabled, the "Weld by ..." screen is omitted.

Weld by PUSH TO ADJ.
Pulse

Time 9.99s PUSH TO ADJ.

Time Off 9.99s PUSH TO ADJ.

Holding

A cooling time of up to 9.99 seconds can be entered here before the actual welding operation starts. Usage: during this time the press remains with the sonotrode on the workpiece until the welding spot has cooled and the welded material has bonded. The cooling time is set by pressing the encoder. The cooling time can be set by turning the encoder. The selected cooling time is confirmed by pressing the encoder again. In the "off" position this setting option is deactivated.

This menu item can be deactivated in the Administrator Settings menu and then no longer appears in the menu.

Holding

Hold Time (off) PUSH TO ADJ.

After Burst

In order to clean the sonotrode of residue from the previous welding process, you can again emit energy to the sonotrode here. You can set a delay time before the After Burst of up to 9.99 seconds. In addition, you can set a maximum after burst time (sonotrode emits ultra-sound) of up to 30 seconds. The times are set by pressing the encoder. The required time can be set by turning. The selected time is confirmed by pressing the encoder again. In the "off" position this setting option is deactivated.

This menu item can be deactivated in the Administrator Settings menu and then no longer appears in the menu.

After Burst

AB-Delay (off) PUSH TO ADJ.

AB-Time (off) PUSH TO ADJ.

Setting the amplitude

The required output amplitude can be set within a range of 50 - 100% using the "Select" encoder.

The required amplitude is set by pressing the encoder. The required amplitude can be set by turning the encoder. Pressing the encoder again confirms the selected amplitude. You can also adjust the amplitude while the generator is emitting ultrasound.

If "external voltage" is set in "Ctrl Assignment" in the Settings menu, the following text appears in the centre of the display instead of the set amplitude: analog source.

The amplitude is then set to 50 to 100% of the nominal amplitude by applying an external control voltage of 5V to 10V to the interface. Also refer to the description of the interface assignment.

A50% PUSH TO ADJ.

A analog source

Counter

This counts how often the welding procedure has been started. This counter can be reset by the operator. It is always set to zero after "Power on".

C 00 PUSH TO RESET

Contrast setting

The contrast of the LCD display can be adjusted by pressing and turning the encoder. Pressing the encoder again applies the set value. Set the contrast so that the LCD display is easily readable.

LCD-Contrast

Display backlight

The backlight of the LED display can be switched on and off by pressing and turning the encoder. For optimum readability, we recommend turning the backlight on.

Backlight

Settings

The Settings menu can be accessed by entering the password "6354":

This is also accessed by turning the encoder.

If the correct number is selected in each case, confirm by pressing the encoder.

If you enter the incorrect number, "you loose" appears on the display and the start screen appears.

Settings

enter password

6354

Functions in the Settings menu

Control Assignment

Here you can set how the generator receives the reference value specifications.

Internal Front means with the front control panel (or with the external control console on the Basic version), ext. Voltage means that the generator can be operated by means of an external voltage (refer to Interface assignment).

Ctrl Assignment

Cntrls & Params
are accepted from
internal front

Cntrls & Params
are accepted from
ext. voltage

I/O Polarities

Remote IN: By changing this value, you can change the polarity of the remote control input.
Factory default settings: A closed contact switches the generator on.

Symbol "H": When the contact is closed, the generator is switched on





Symbol "L": When the contact is open, the generator is switched on

Error out: By changing this value, you can switch the polarity of the internal error relay.
Factory default settings: Open contact is an error, which safeguards the system in the event of a broken cable. By changing this value, you can switch the polarity of the internal error relay.

Symbol "L": Closed contact is an error

Symbol "H": Open contact is an error

I/O polarities

remote in 
error out 
rf detect 
( = low-active)

If the polarity is changed in such a way that a closed contact generates an error message, it should be noted that when the generator is disconnected from the mains or there is a general failure, the contact is open.

Recommendation: Leave the factory default setting, as this will safely detect the above-mentioned errors.

RF detect: By changing this value, you can change the HF-DA status signal (generator is emitting HF voltage).
Factory default settings: Closed contact when generator emits HF voltage.

Symbol "H": Closed contact – generator emits HF voltage

Symbol "L": Open contact – generator emits HF voltage

Please note that when the generator is not connected to the mains or there is a general failure, this contact is open.

Recommendation: Do not change the factory settings.

TEST BUTTON

Here are three configuration options for the test button on the front plate:

- PUSH** Generator is switched on when the test button is pushed and switched off when the button is released.
- TOGGLE** Generator is switched on when the test button is pushed. Pressing the button again switches the generator off.
- DISABLED** Test button has no function

Test Button

Test Button
push

Operating hours indicator

T Power: This displays the activation time of the generator.

T Sonic: This displays the time during which the generator emitted HF.

Display format: Days, hours, minutes.

Total run time

T Power 00d 0h 0m
T Sonic 00d 0h 0m

Info

In the Info menu option, you can see the software version number of the front plate and the software version number of the generator. If you press the encoder again, you can see the serial number and the date of manufacture of the generator.

Info

Fro.Sw. U
Gen.Sw. U

Ser. No.
Assemb.

Sensorics

By connecting a voltage between 5V and 10V to PIN 3 of the interface, the output of the generator can be set to between 50% and 100% of the nominal amplitude or power. The voltage connected can be read here as a percentage. 10 V corresponds to 100%, so in this example we can see that the voltage is 6.5 V. Reference point is "GND".

Sensorics

A EXT

65%

EXIT – exit the Settings menu and save any changed parameters

Exit

Functions in the Administrator Settings menu

This Administrator Settings menu is only for qualified service personnel. Faulty settings in this menu can irreparably damage the generator or the connected transducer system. The password is only issued to registered administrators and is available from our service contact number.

Adjusting the starting frequency

The resonant frequency of the connected system must be known. Generally a starting frequency which is approximately 500 Hz above the resonant frequency of the connected system produces good results. The capture range of the generator is 2 kHz.

In special cases, however, it can also be necessary to set the starting frequency closer to the resonance of the transducer system. Under no circumstances should the starting frequency be set so that it is below the resonant frequency of the connected transducer system! The starting frequency can be changed by pressing and then turning the encoder. The area which is covered depends on the device type. The capture range of the generator can be limited with the stop frequency.

Configure

Various menu items from the operator menu can be activated and deactivated with the Configure menu item.

If "YES" is selected in "Configure Trigger", the Trigger function is active in the operator menu (delay before welding). If "NO" is selected, this function is inactive and does not appear.

If "YES" is selected in "Configure Holding", the Holding function is active in the Operator menu (wait time after welding). If "NO" is selected, this function is inactive and does not appear.

If "YES" is selected in "Configure After Burst", the After Burst function is active in the Operator menu (energy for cleaning the sonotrode). If "NO" is selected, this function is inactive and does not appear.

With the "Configure RF Output" function, you can switch the output on the interface between the RF Output Signal ("YES") and the Control Output Signal ("NO"). When the RF output is set, the interface output is only active when ultrasound is active. When the control output is set, the interface output is only active during the Trigger Welding and Holding phases.

Settings

enter password

Frequency

F_{start} PUSH TO ADJ.
kHz

F_{stop} PUSH TO ADJ.
kHz

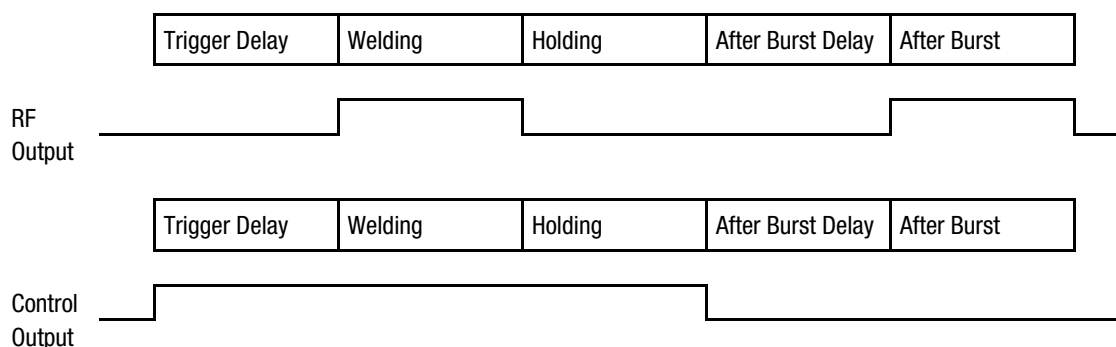
Configure

Configure Trigger
NO **YES**

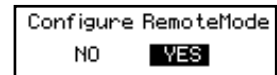
Configure Holding
NO **YES**

Configure After Burst
NO **YES**

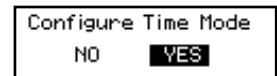
Configure RF-Output
NO **YES**



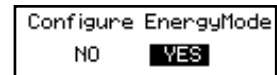
If "YES" is selected in "Configure Remote Mode", the "Weld by Remote" welding mode is active in the Operator menu (activation via test button or one of the interface activation signals). If "NO" is selected, this mode is inactive and does not appear.



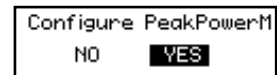
If "YES" is selected in "Configure Time Mode", the "Weld by Time" welding mode is active in the Operator menu. If "NO" is selected, this mode is inactive and does not appear.



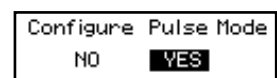
If "YES" is selected in "Configure Energy Mode", the "Weld by Energy" welding mode is active in the Operator menu. If "NO" is selected, this mode is inactive and does not appear.



If "Yes" is selected in "Configure Peak Power Mode", the "Weld by Peak Power" welding mode is active in the Operator menu. If "NO" is selected, this mode is inactive and does not appear.



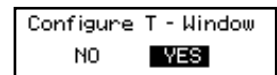
If "YES" is selected in "Configure Pulse Mode", the "Weld by Pulse" welding mode is active in the Operator menu. If "NO" is selected, this mode is inactive and does not appear.



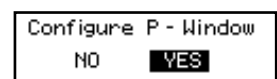
If no welding mode has been activated in the Operator menu, the "No Mode configured" message appears in the display.



If "YES" is selected in "Configure T-Window", the "T-Window" function is active in the Operator menu. If "NO" is selected, this mode is inactive and does not appear.



If "YES" is selected in "Configure P-Window", the "P-Window" function is active in the Operator menu. If "NO" is selected, this mode is inactive and does not appear.



Control Assignment

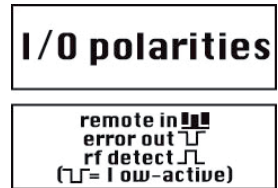
Here you can set how the generator is to be controlled.

Internal Front means with the front control panel (or with the external control console on the Basic version), ext. Voltage means that the generator can be operated by means of an external voltage (refer to Interface assignment).



I/O Polarities

- Remote IN:** By changing this value, you can change the polarity of the remote control input.
Factory default settings: A closed contact switches the generator on.
- Symbol "H":** When the contact is closed, the generator is switched on
- Symbol "L":** When the contact is open, the generator is switched on
- Error out:** By changing this value, you can switch the polarity of the internal error relay.
Factory default settings: Open contact is an error, which safeguards the system in the event of a broken cable.
 By changing this value, you can switch the polarity of the internal error relay.
- Symbol "L":** Closed contact is an error
- Symbol "H":** Open contact is an error



If the polarity is changed in such a way that a closed contact generates an error message, it should be noted that when the generator is disconnected from the mains or there is a general failure, the contact is open.

Recommendation: Leave the factory default setting, as this will also safely detect the above-mentioned errors.

- RF detect:** By changing this value, you can change the HF-DA status signal (generator is emitting HF voltage).
Factory default settings: Closed contact when generator emits HF voltage.
- Symbol "H":** Closed contact – generator emits HF voltage
- Symbol "L":** Open contact – generator emits HF voltage

Please note that when the generator is not connected to the mains or there is a general failure, this contact is open.

Recommendation: Do not change the factory settings.

Pout displayed maximum output

In this menu option, you can set the maximum output of the generator shown in the display.
Do not change these settings as the equipment has already been configured in our test facility.

P out**Temperature**

This menu item shows the current temperature of the generator. You can set the temperature at which the generator switches off (Shutoff) and displays an overheating error in the display. The temperature at which the fan should be activated (Fan Threshold) can also be set here. If the thresholds are set too high, this can cause permanent damage to the generator.

Temperature=22°**Shutoff 70°
Fan Thresh. 40°****I-Limits**

Do not change these settings as the equipment has already been configured in our test facility.
Incorrectly set values can cause irreparable damage to the transducer system and/or the generator.

I Limits**I_{min}
I_{max}****I-Protection**

Do not change these settings as the equipment has already been configured in our test facility.
An incorrectly set value can cause irreparable damage to the generator.

I protection**PWM Startup**

Modification of this value causes a change in the switch-on behaviour of the generator. Increasing the start value or the step value reduces the start-up time, but makes the activation process sharper. **Never change the factory default settings.**

PWM startup**PWM start 5
PWM step 5**

Soft Amplitude

With this menu item the soft start can be activated (enabled) or deactivated (disabled). Please read carefully!

It is possible that a transducer system does not start up with the required amplitude (e.g. high contact pressure, high transducer system quality, etc.). The soft amplitude function starts at 50 % of the maximum amplitude of the welding operation and then increases by the entered steps within the set time. Refer to examples.

This means that a transducer system starts (without E-Search message).
The step can be set from 1 to 10, the time can be set from 0.01 to 0.5 seconds.

Example 1: Before starting with the Softstart configuration, note the generator-specific factory settings that are displayed in the I-LIMITS menu item.

I min = 25 corresponds to 50% amplitude (same as factory default setting)

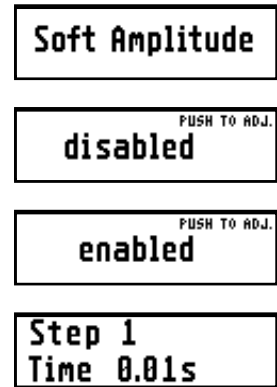
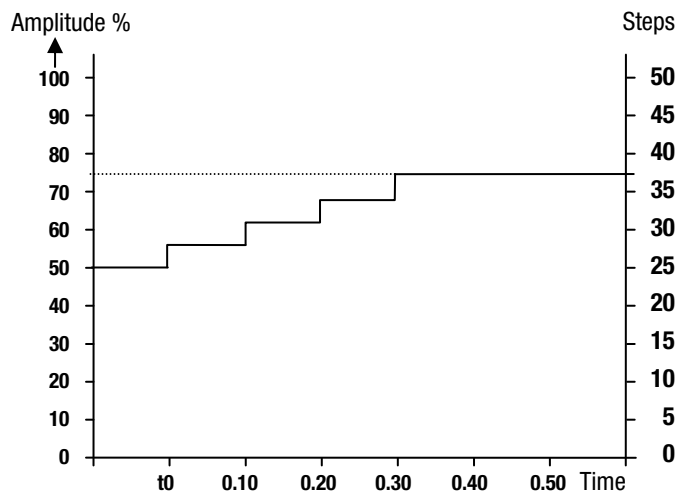
I min = 50 corresponds to 100 % amplitude (same as factory default setting)

I min to I max in this example are therefore 25 steps ($I_{max} - I_{min} = 50 - 25 = 25$)

In this example the generator must run at a 75% amplitude.
A set amplitude of 75% then corresponds to 37.5
(Step 50 = 100% amplitude / Step 25 = 50% amplitude).
There are therefore 12.5 steps from 50% amplitude to 75% amplitude

Settings for the soft amplitude:	Step	3
	Time	0.10s

This means that at this setting, 3 steps are carried out in 0.10 seconds.
12.5 steps divided by 3 steps equals 4 stages.
The sonotrode reaches the set amplitude of 75% within 0.4 seconds.



Example 2: Before starting with the Softstart configuration, note the generator-specific factory settings that are displayed in the I-LIMITS menu item.

I min = 50 corresponds to 50 % amplitude (same as factory default setting)

I min = 100 corresponds to 100 % amplitude (same as factory default setting)

I min to I max in this example are therefore 50 steps ($I_{\max} - I_{\min} = 100 - 50 = 50$)

In this example the generator should run at a 100% amplitude.

A set amplitude of 100% then corresponds to 100

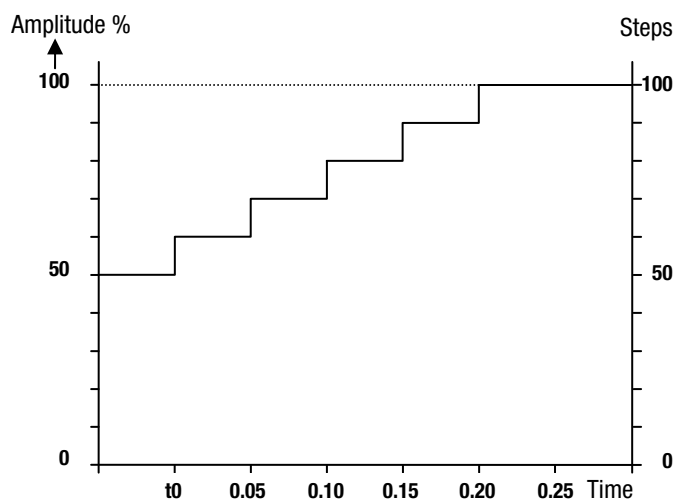
There are therefore 50 steps from 50% amplitude to 100% amplitude

Settings for the soft amplitude:	Step	10
	Time	0.05s

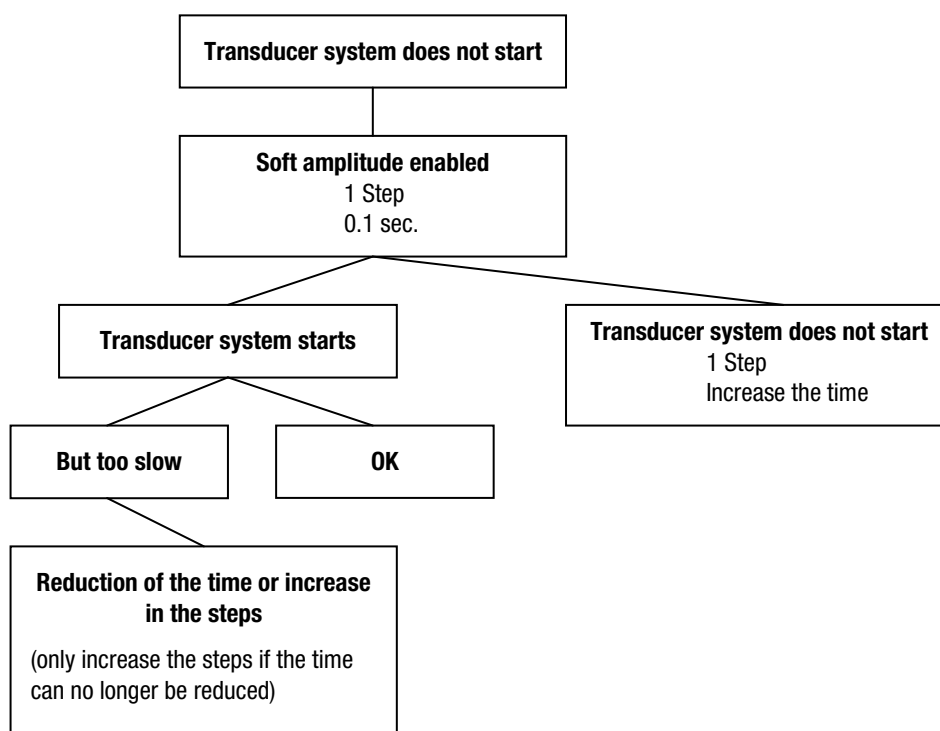
This means that at this setting, 10 steps are carried out in 0.05 seconds.

50 steps divided by 10 steps equals 5 stages.

The sonotrode reaches the set amplitude of 100% within 0.25 seconds.



Procedure for setting the soft amplitude function:



TEST BUTTON

There are three configuration options for the test button on the front panel:

- PUSH** Generator is switched on when the test button is pushed and switched off when the button is released.
- TOGGLE** Generator is switched on when the test button is pushed and switched on when the button is released.
Pressing the button again switches the generator off.
- DISABLED** Test button has no function

Test Button

Test Button
push

Status

If the device has the status "Not configured", the generator cannot be switched on or programmed. In the setup screens, "Not configured" appears in the top right of the display.

The status is set as "Configured" after a specialist has set up all parameters.

If you set the "Locked" status, all functions of the basic menu, other than setting the LCD contrast and the backlight, are blocked for the user. They can only be changed again once the status has been set to "Configured".

Status

PUSH TO ADJ.
Not configured

PUSH TO ADJ.
Configured

PUSH TO ADJ.
Locked

Operating hours indicator

T Power: This displays the activation time of the generator.

T Sonic: This displays the time during which the generator emitted HF.

Display format: Days, hours, minutes.

Total run time

T Power 00d 0h 0m
T Sonic 00d 0h 0m

Info

In the Info menu option, you can see the software version number of the front plate and the software version number of the generator. If you press the encoder again, you can see the serial number and the date of manufacture of the generator.

Info

Fro.Sw. U
Gen.Sw. U

Ser. No .
Assemb.

Sensorics

By connecting a voltage between 5V and 10V to pin 3 of the interface, the output of the generator can be set to between 50% and 100% of the nominal amplitude or power. The voltage connected can be displayed in percent here. 10 V corresponds to 100%, so in this example we can see that the voltage is 6.5 V.

Reference point is "GND".

Sensorics

A EXT

65%

EXIT – Exit the Settings menu

Exit

Error messages and troubleshooting

The following error messages may appear on the display:

A – PROTECTION ACTIVE

The electronic overcurrent fuse has detected an error

E A protection active

Possible causes:

- Transducer defective
- Supply cable or connector defective

Remedy:

- Unscrew the transducer connection on the housing
- Switch on the generator without the transducer connected

a.) Error message still displayed:

Generator is defective

b.) Error message no longer displayed:

Check the transducer and power supply

NO RF – DETECTED

The electronic overload/short-circuit fuse has detected an error.

E No RF detected!

Causes and remedy: refer to "A-PROTECTION ACTIVE"

E-SEARCH

The generator cannot find the working frequency

E Search

Possible causes:

- No transducer system connected
- Transducer system defective
- Supply cable or connector defective

Remedy:

- Replace the transducer system
- Check the supply cable and connector

TEMPERATURE LIMIT REACHED

The generator is too hot

E Temperature limit reached

Possible causes:

- Ventilation slits of the generator are covered
- Unsuitable installation site for generator
- Transducer defective
- Fan defective

Remedy:

- Check the fan! The fan must start up briefly when the power supply is switched on
- Check the generator's air supply and removal (fan should not be mounted facing upwards)
- Check the transducer

Maintenance

The ultrasonic generator does not require any special maintenance.

Dust and dirt should be removed regularly using a damp cloth.

- IMPORTANT:**
- Do not use aggressive cleaning agents!
 - Do not clean using ultrasound!

Specifications

SONIC DIGITAL LC MD

Device specifications of all generators

Frequency	HS 400 MD 35 kHz 35 kHz 40 kHz	HS 600 MD 20 kHz	HS 800 MD 20 kHz 35 kHz 35 kHz 40 kHz	HS 1000 MD 20 kHz	HS 1200 MD 35 kHz 35 kHz 40 kHz	HS 1500 MD 20 kHz	HS 2000 MD 20 kHz
Operating voltage	230 V +/- 15%						
Power consumption	1.9 A	2.9 A	3.8 A	4.8 A	5,7 A	7.2 A	9.6 A
Effective power output	400 W 440 VA	600 W 660 VA	800 W 880 VA	1,000 W 1,100 VA	1,200 W 1,320 VA	1,500 W 1,650 VA	2,000 W 2,200 VA
Maximum output	400 W	600 W	800 W	1,000 W	1,200 W	1,500 W	2,000 W
Fuse protection	10 A						
3-pole Phoenix socket mains connection	230 V						
Casing dimensions	H x W x D: 385 x 169 x 89 mm						
	Weight 4.0 kg						
Temperature range of generator modules	-10 to +40°C Protection class P 20, IEC 60 529, EN 60 525						
Interface functions							
Remote control	These functions are general features of each generator. See also assignment of the 15-pole DSUB socket on the generator back panel						
Analogue input for controlling power 5 – 10 V							
Floating error relay							
Analogue power indicator 5 – 10V							

Warranty

The period and scope of the warranty are defined in the terms of delivery as part of the general terms and conditions (valid at the time of purchase) or in the sales contract / order confirmation, should any special agreements have been made.

The following cases are not covered by warranty:

- Damage caused by improper operation
- Use of the device which is contrary to its intended purpose
- Improper alterations or modifications made without prior authorisation from the manufacturer
- Damage caused by extreme circumstances, such as knocks, falls, moisture and dirt
- Inadequately qualified operating personnel
- Failure to comply with the applicable safety and accident prevention regulations
- Damage resulting from modifications made to the operating instructions
- Damage resulting from unauthorised actions in the Administrator Settings menu

CE Declaration of Conformity

We: Weber Ultrasonics GmbH,
hereby declare under sole responsibility that the product:

Designation: Ultrasonic generator „HS xxxx MD“incl. transducer system by Weber Ultrasonics
(xxxx stands for the various outputs)

complies with the requirements of the following EMC standards:

EN 50081-1
EN 50082-2
EN 55022
EN 55014
EN 60555
EN 61000

The requirements of the low voltage directive are met.

Karlsbad, 10 November 2004

Markus Weber
Managing Director

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Spare parts

Spare parts and accessories can only be supplied if the serial number of the device is specified.

Service hotline

Should you still have questions after reading the operating instructions thoroughly, please feel free to call our service hotline.

Please have the following information to hand to help us answer your questions quickly.
Device type, serial number (the serial number is on the back of the generator)

Our service hotline number:

+49 (0) 72 48/92 07-0