

Operating Instructions for Ultrasonic Generators of the SONIC DIGITAL

Premium, Basic & OF Versions

MULTI PURPOSE



Contents

Introduction	3
Safety instructions	3
Assembly	5
Operation	10
Functions in the Settings menu	18
Functions in the Administrator Settings menu	24
Error messages and troubleshooting	32
Maintenance	34
Specifications	34
ULC OF special part	35
Warranty	38
CE declaration of conformity	38
Index	39
Service telephone	39
Spare parts	39

Introduction

Dear customer,

Thank you for purchasing this Sharpertek Ultrasonics product. You have decided on a high quality, state-of-the-art product.

Please read and follow these operating instructions carefully before starting the product for the first time or before installing the product, otherwise there is a risk of danger 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 your device for the first time, please read the following instructions thoroughly for your own safety and for the operating safety of the device.

Depending on the transducers' installation type and location, ambient sound levels may arise necessitating ear protection to be worn in line with current legal requirements.

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

The electrics may only be connected 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 in the factory or are described in this handbook. 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 extent 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.

Attention: 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 any liquid cleaning agents or cleaning sprays, but only 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 procedures specified 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 socket 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 standard operation

IMPORTANT: Only qualified personnel may carry out work on the device.

Assembly

Notes on the installation location	6
Power supply	6
Connections on the back of the generator	7
Assignment of the 15-pole interface socket	8
Interface description	8

Notes on the installation location

During operation the generator will get very hot.

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 "OVER TEMPERATURE" 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 AC 230 V / 50 / 60 Hz via the accompanying non-heating appliance cable.

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

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

ATTENTION: • 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 on the back of the generator



Converter negative connection: Shield of the BNC socket

Converter positive connection: Inner conductor of the BNC socket

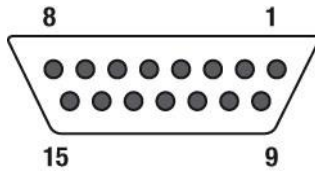
IMPORTANT: When connecting the converter via a BNC cable, a safe PE conductor connection must be established between the generator and converter using a cable with a sufficient cross section (at least 1.5 mm²). To connect this PE conductor, there is a PE conductor terminal on the back of the generator.

Only use cables specified by the manufacturer. Only use shielded transducer connecting cable! Connect the shielding to the PE conductor on the generator side.

Only use cables with sufficient cross-section.

Minimum cross-section: 1.5 mm².

Assignment of the 15-pole interface socket: Available Only for Required customer application!



PIN no. on DSUB socket interface X1	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" or control output
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 on 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 emit a voltage for the "HF-DA" and/or "Error" functions.

This voltage can also be used to activate the generator at 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 linked).

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 12 V 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 shared reference point for all input/output signals.

Operation

Operating and display elements on the front panel	11
Operating and display elements on the external control console	12
The LCD display	13

Operating and display elements on the front panel



Premium version:

- Sonic LED:** Lights up when the generator emits HF voltage
- Mode LED:** No function
- <>Nominal LED:** Lights up when a window function is activated and the generator is operated outside the set window.
- Error LED:** Lights up in the event of an error
- Power indicator LED:** Shows the emitted output power in 10% increments 10 – 100%
- Optional Controller:** For setting and entering values
- "TEST" button:** Press this button to switch on the generator.

Operating and display elements of the external control console

- 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:

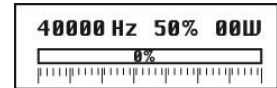
The generator can be switched on by pressing this button

The LCD display

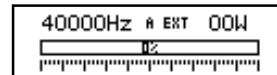
Various screens and functions are available in the LCD display:

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.



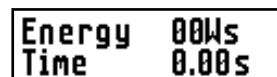
Power output display depending on the welding mode set

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).

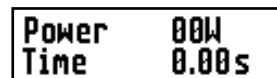
If "Weld by Remote", "Weld by Time" or "Weld by Pulse" are set, the current power output is shown on the display in watts. After switching off the device, the maximum power output reached is saved until the next time the device is switched on.



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. After switching off the device, the maximum power output reached is saved until the next time the device is switched on.



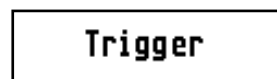
Frequency display

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

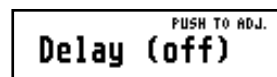


Trigger

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.



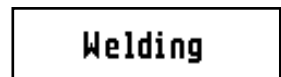
The delay time is set by pressing the encoder. The delay time can be set by turning the encoder. The selected delay time is confirmed by pressing the encoder again. In the "off" position this setting option is deactivated.



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.



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



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 is activated during After Burst, the generator switches once more to welding mode without deactivating the output signal.



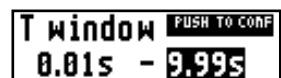
Welding mode is set by pressing the encoder. The required values can be set by turning. Pressing the encoder again applies the selected values. If you then turn the encoder to the right, the "T-Window" and "P-Window" sub-menus are opened (provided they have not been deactivated in the Administrator Settings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



The desired 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 applies the selected values. In the "off" position this function is deactivated.



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.



The desired 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 applies the selected values. In the "off" position this function is deactivated.



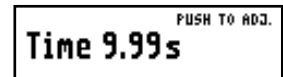
This function can be deactivated in the Administrator Settings menu and then no longer appears in the menu.

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.



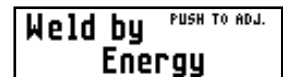
The welding mode and time are set by pressing the encoder. The required values can be set by turning. Pressing the encoder again applies the selected values. If you then turn it to the right, the "T-Window" and "P-Window" sub-menus are opened (provided they have not been deactivated in the Administrator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

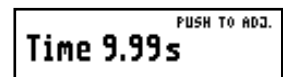
Weld by Energy

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.

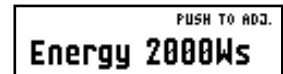


The welding operation starts when the test button is pressed or the generator is activated via the remote control input. If you release the test button or deactivate the remote control input before the set time has elapsed, the error message "Cycle not completed" appears on the display and the red Error 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.

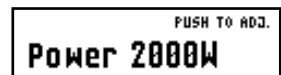
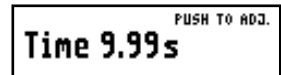


Weld by Peak Power

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 if 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.

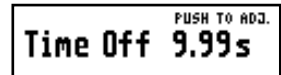
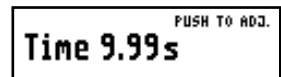


Weld by Pulse

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 if 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 has been set in the Trigger menu and in the Holding menu, the cycle begins with the Trigger delay time and only ends after 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 applies 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.

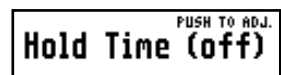
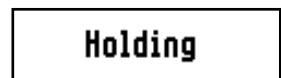
This welding mode can be deactivated in the Administrator Settings menu and then no longer appears in the menu. If only one welding mode is enabled, the "Weld by ..." screen is omitted.



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.

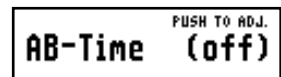
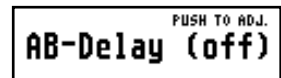
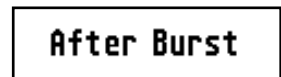
This menu option can be deactivated in the Administrator Settings menu and then no longer appears in the menu.



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 ultrasound) of up to 30 seconds. The times are set by pressing the encoder. By turning, you can set the desired time. The selected time is confirmed by pressing the encoder again. In the "off" position this setting option is deactivated.

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

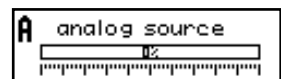
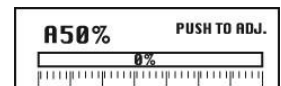


Amplitude setting

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

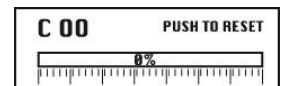
The required amplitude is set by pressing the encoder. By turning, you can set the desired amplitude. Pressing the encoder again confirms the selected amplitude. You can also adjust the amplitude while the generator is emitting ultrasound.

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.



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".



Contrast setting

The contrast of the LCD screen 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.



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.



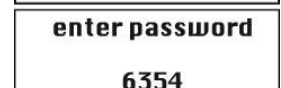
Settings

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

This is also done by turning the encoder.

After selecting the correct number each time, confirm by pressing the encoder.

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

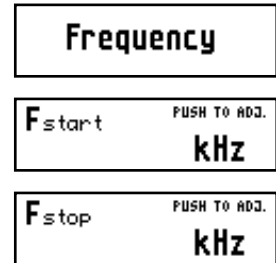


Functions in the Settings menu

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 leads to good results. The capture range of the generator is 2 kHz.

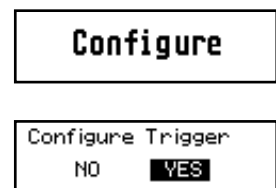
In special cases, however, it can also be necessary to set the starting frequency closer to the resonance of the transducer system. Under no circumstances should the starting frequency be set so that it is below the resonant frequency of the connected transducer system! The starting frequency can be 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.



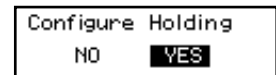
Configure

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

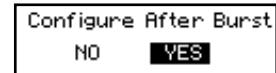
If "YES" is selected in "Configure Trigger", the Trigger function is active in the Operator menu (delay before welding). If "NO" is selected, this function is inactive and does not appear.



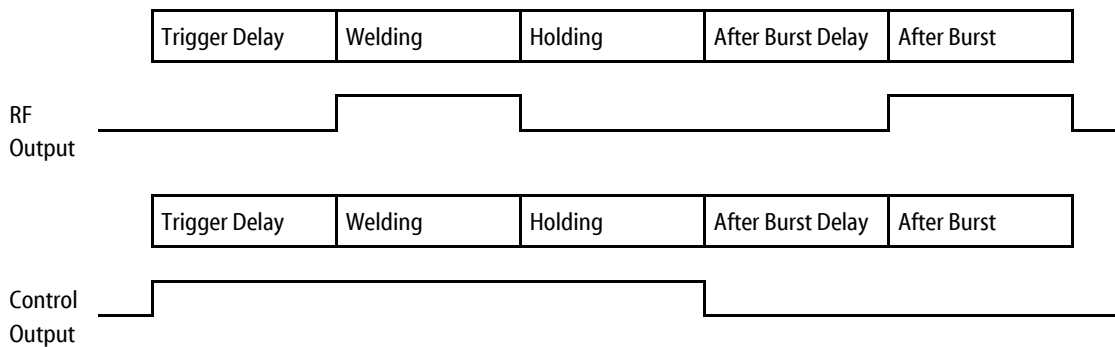
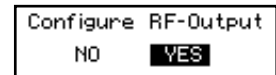
If "YES" is selected in "Configure Holding", the Holding function is active in the Operator menu (wait time after welding). If "NO" is selected, this function is inactive and does not appear.



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.



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.

Configure RemoteMode
NO <input type="checkbox"/> YES <input checked="" type="checkbox"/>

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.

Configure Time Mode
NO <input type="checkbox"/> YES <input checked="" type="checkbox"/>

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.

Configure EnergyMode
NO <input type="checkbox"/> YES <input checked="" type="checkbox"/>

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.

Configure PeakPowerM
NO <input type="checkbox"/> YES <input checked="" type="checkbox"/>

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.

Configure Pulse Mode
NO <input type="checkbox"/> YES <input checked="" type="checkbox"/>

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.

Configure T - Window
NO <input type="checkbox"/> YES <input checked="" type="checkbox"/>

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.

Configure P - Window
NO <input type="checkbox"/> YES <input checked="" type="checkbox"/>

Control Assignment

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

Ctrl Assignment

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).

Cntrl's & Params are accepted from internal front

Cntrl's & 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 <input type="checkbox"/> <input type="checkbox"/> error out <input type="checkbox"/> <input type="checkbox"/> rf detect <input type="checkbox"/> <input type="checkbox"/> (<input type="checkbox"/> = 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 complete 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

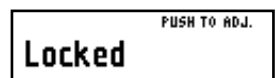
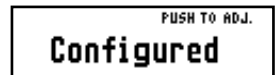


Status

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".

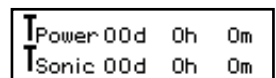
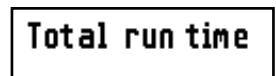


Operating hours indicator

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

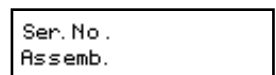
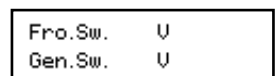
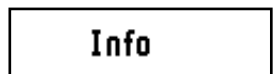
T Sonic: This displays the time during which the generator emitted HF.

Display format: Days, hours, minutes.



Info

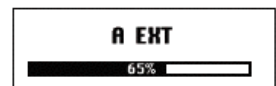
In the Info menu option, you can see the software version number of the front plate and the software version number of the generator. If you press the encoder again, you can see the serial number and the date of manufacture of the generator.



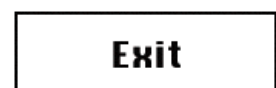
Sensorics

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".



EXIT – exit the Settings menu and save any changed parameters



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 leads to 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

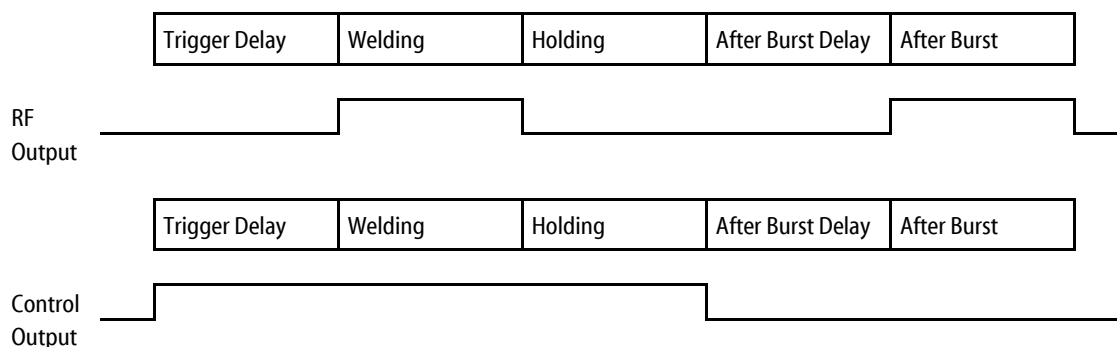
Configure

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.

Configure RemoteMode
NO <input type="checkbox"/> YES <input checked="" type="checkbox"/>

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.

Configure Time Mode
NO <input type="checkbox"/> YES <input checked="" type="checkbox"/>

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.

Configure EnergyMode
NO <input type="checkbox"/> YES <input checked="" type="checkbox"/>

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.

Configure PeakPowerM
NO <input type="checkbox"/> YES <input checked="" type="checkbox"/>

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.

Configure Pulse Mode
NO <input type="checkbox"/> YES <input checked="" type="checkbox"/>

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.

Configure T - Window
NO <input type="checkbox"/> YES <input checked="" type="checkbox"/>

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.

Configure P - Window
NO <input type="checkbox"/> YES <input checked="" type="checkbox"/>

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 for the Basic version), ext. voltage means that the generator can be operated via an external voltage (see Interface assignment).

Ctrl 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

I/O polarities

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

If the polarity is changed so that a closed contact is an error, please note that this contact is open when the generator is not connected to the mains or if there is a complete failure.

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 notification (generator emits HF voltage).
Factory default settings: Closed contact when generator emits HF voltage.

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

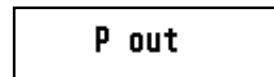
Symbol "L": Open contact – generator emits HF voltage

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.

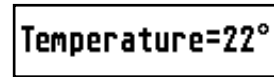
Pout displayed maximum output

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



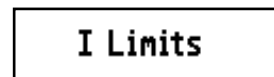
Temperature

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.



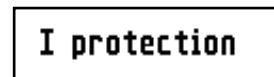
I-Limits

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.**



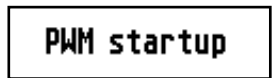
I-Protection

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.**



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.**



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 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: Here, the activation time of the generator is displayed.

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

Display format: Days, hours, minutes.

Total run time

TPower 00d 0h 0m
TSonic 00d 0h 0m

Factory Reset

All parameters can be reset in the Factory Reset menu item. Following a Factory Reset, the status of the generator is set to "Not Configured", which means the generator cannot be started (see the Status menu item).

Please be aware that the I-Limits and I-Protection parameters are also reset. Following a Factory Reset, the correct parameters need to be re-entered again. If this is not done, the generator or the transducer system will be damaged.

Recommendation: A Factory Reset should only be carried out after consulting the manufacturer.

Factory reset

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.

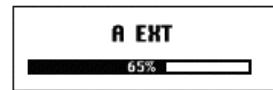
Sensorics

By connecting a voltage between 5V and 10

V 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".



EXIT – Exit the Settings menu



Error messages and troubleshooting

The following error messages may appear in 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 connector 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

OVER TEMPERATURE

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

No Mode configured

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

Remedy:

- Activate at least one welding mode in the Administrator Settings menu



Timeout

In the "Weld by Energy" or "Weld by Peak Power" menu items, you can set a time of up to 9.99 seconds and the energy (watt-second) or power (watts) that should be output within the set time. If the set energy or power is not reached in the set time, the "Timeout" error message appears on the display and the red error LED lights up.

Remedy:

- Reduce the energy or power to be output
- Increase the amount of time in which the energy or power is to be output



Cycle not completed

This error message is dependent on the set welding mode.

Weld by Remote

If the generator is set to "Weld by Remote", the welding operation is performed as long as the test button is held down or 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.

Weld by Time

If the generator is set to "Weld by Time", you can set a time between 0.01 seconds and 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.

Weld by Energy

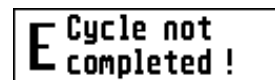
The welding operation starts when the test button is pressed or the generator is activated via the remote control input. If you release the test button or deactivate the remote control input before the set time has elapsed, the error message "Cycle not completed" appears on the display and the red Error 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.

Weld by Peak Power

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.

Remedy:

- Only release the test button once the set time has elapsed
- Only deactivate the remote control input once the set time has elapsed



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

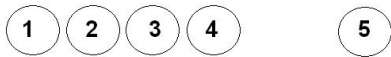
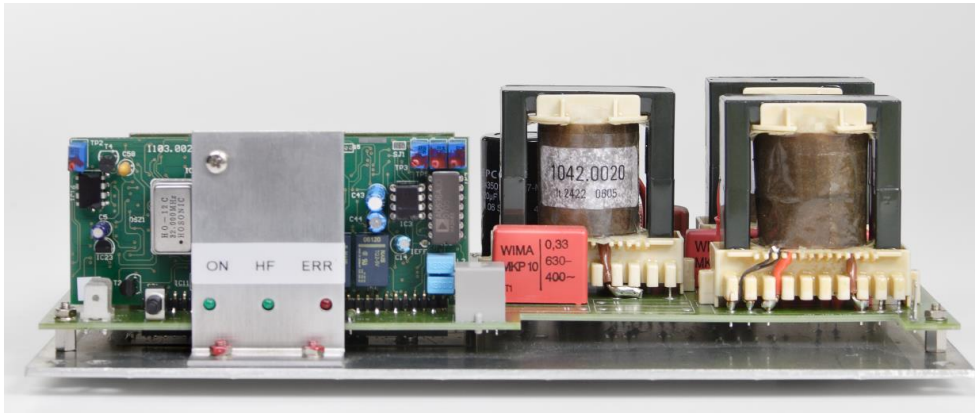
SONIC DIGITAL ULC MD series

Device specifications of all generators

Frequency	ULC 200 MD BASIC PREMIUM 20 kHz 30 kHz 35 kHz 40 kHz	ULC 400 MD BASIC PREMIUM 20 kHz 30 kHz 35 kHz 40 kHz
Operating voltage	230 V +/- 15%	
Power consumption	1.0 A	1.9 A
Effective power output	200 W 220 VA	400 W 440 VA
Maximum output	400 W	800 W
Fuse protection	10 A	
Mains connection on housing; earthing pin plug	230 V	
Housing dimensions	H x W x D 250 x 75 x 180 mm	Weight 2.8 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 a general component of every generator. See also assignment of the 15-pole DSUB socket on generator back wall	
Analogue input for controlling power 5 – 10 V		
Potential-free interference relay		
Analogue power indicator 5 – 10 V		

ULC OF special part

Control elements



OF version:

- 1 "TEST" button:** Press the "test button" to switch the generator on for test purposes
- 2 Power LED:** Lights up when the device is properly supplied with mains voltage
- 3 HF LED:** Lights up when the generator emits HF voltage
- 4 Error LED:** Lights up in the event of an error
- 5 Front socket:** Connection for external control console. Optional!

Connections for ULC OF generator



- 1 Converter positive connection
- 2 Converter negative connection
- 3 Interface socket
- 1 Converter positive connection
- 2 Converter negative connection
- 3 Interface socket
- 4 Voltage supply 230 V ~
- 5 Protective earth conductor (PE)

Specifications

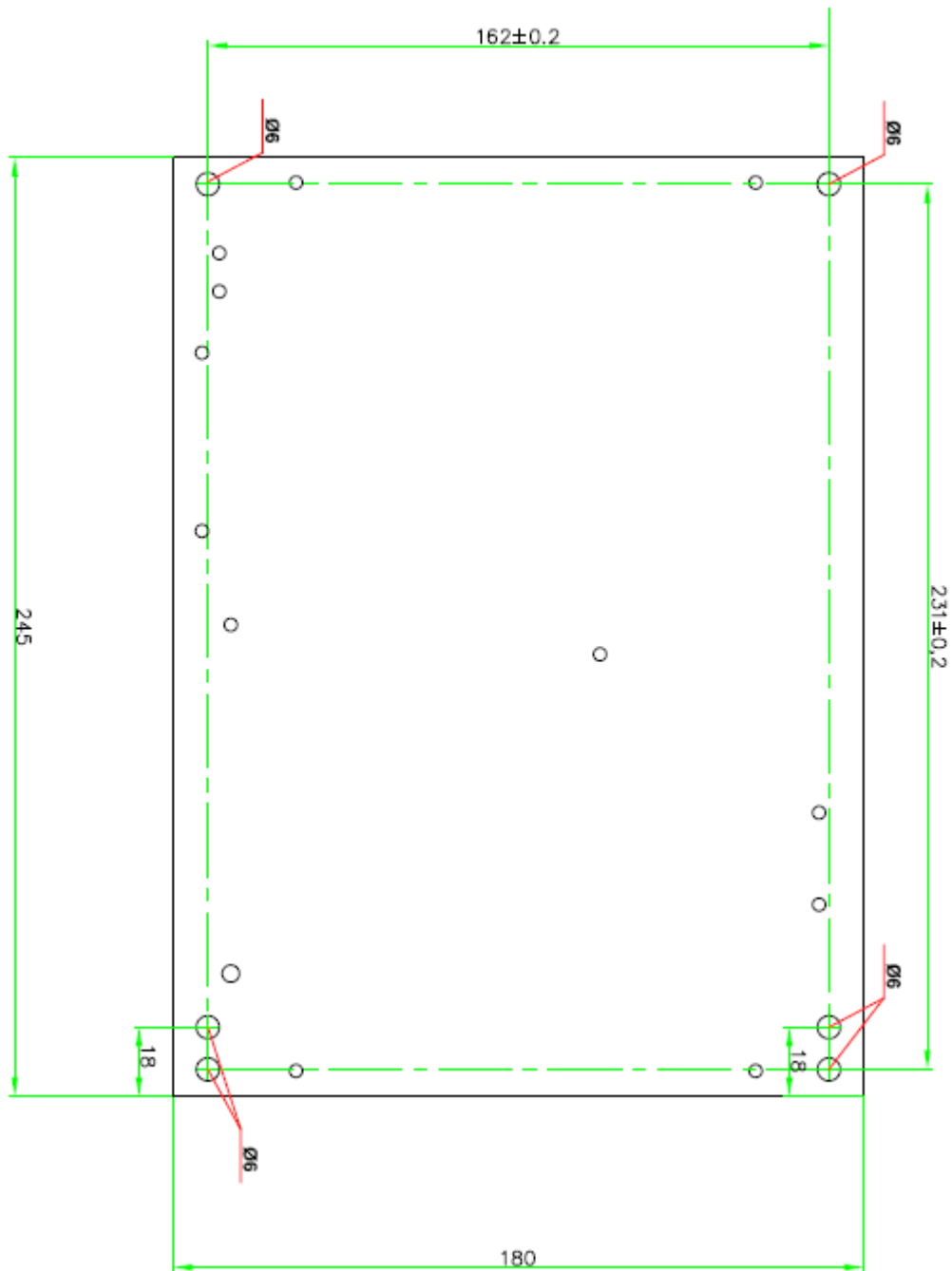
SONIC DIGITAL ULC MD series

Device specifications of all generators

Frequency	ULC 200 MD OF 20 kHz 30 kHz 35 kHz 40 kHz	ULC 400 MD OF 20 kHz 30 kHz 35 kHz 40 kHz
Operating voltage	230 V +/- 15%	
Power consumption	1.0 A	1.9 A
Effective power output	200 W 220 VA	400 W 440 VA
Maximum output	200 W	400 W
Fuse protection	10 A	
Mains connection on housing; earthing pin plug	230 V	
Casing dimensions	H x W x D 75 x 245 x 180 mm	Weight 1.6 kg
Temperature range of generator module	-10 to +40°C	Protection class P 20, IEC 60 529, EN 60 525 must only be operated with additional protective measures
Interface functions		
Remote control	These functions are general features of each generator. Also refer to the assignment of the 15-pole DSUB socket on the rear panel of the generator	
Analogue input for control of the power 5 – 10 V		
Floating error relay		
Analogue power indicator 5 – 10 V		

The ULC OF model is supplied without a housing and is therefore only intended for installation in a customer-specific casing. The customer must ensure that there is adequate cooling. Operation without further measures (protection against touching, foreign objects, cooling) is not permitted.

Dimensions of the base plate



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: Sharpertek hereby declare under sole responsibility that the product:

complies with the following guidelines:

EMC guideline

Low-voltage guideline

The following standards were applied:

EN 55022

EN 55014

EN 60555

EN 61000-6 1-4

Index

A		F		P/Q/R	
Administrator Settings	24			Polarity	20
After burst 17		G		Power output display	13
Assembly	5	H		Power supply	6, 34, 36
Assignment of the interface socket	8	Holding	16	P-Window	14
Assignment of the mains connection	6	I/J		S	
B		Installation site	3, 6	Safety instructions	3
C		Interface	8	Settings	17, 18, 24
CE declaration of conformity	38	Introduction	3	Setting the amplitude	17
Configure	18, 19	K		Soft Amplitude	21, 28
Connections	7, 8	L		Spare parts	39
Connection socket for the external control console	12	LCD display of the external control console	13	Specifications	34, 36
Contrast setting	17	M/N/O		Status	23, 30
Control Assignment	19, 25	Maintenance	28	T/U/V	
D		Operating and display elements of the generator	11, 12	Test button	11, 12
Dimensions of the generator	34, 36	Operating hours	23	Trigger	13
Display backlight	17	Operation	10	T-Window	14
Display elements	12	E		Voltage	6, 34, 36
Error messages	32, 33	F		W/X/Y/Z	
		G		Warranty	38
		H		Weld by Energy	15
		I/J		Weld by Peak Power	16
		K		Weld by Pulse	16
		L		Weld by Remote	14
		M/N/O		Weld by Time	15
		P/Q/R			
		S			
		T/U/V			
		W/X/Y/Z			

Spare parts

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