MI200T SPOTWELDER – 220 V
USER MANUAL

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Other languages are available on the SD card.
Thank you for choosing this Chief Automotive Technologies product! Please read the instructions carefully before installing, using the product, or before maintenance in order to avoid accidents, and keep the manual in a safe place for future reference.

Chief Automotive Technologies cannot be held responsible for damage to persons or items, as a result of using the machine in the following circumstances:
- Modification or neutralisation of safety elements has been undertaken
- Safety recommendations written in this manual have not been adhered to
- Modification of the product's specifications
- Use of accessories not specified by the manufacturer
- Failure to observe regulations specific to the country or state in which the machine is used.

1. PRESENTATION, SAFETY RECOMMENDATIONS AND GENERAL PRECAUTIONS

This product has been designed to carry out the following operations in car body workshops:
- Spot welding on metal sheets with a pneumatic clamp,
- Welding of metal sheets with a single sided gun,
- Welding of nails, rivets, washers and studs,
- Repair of bumps and dents (small dents, i.e. from hail or small stones with the « quick repair” option)

GENERAL PRECAUTIONS
1. Operators must have received appropriate training.
2. Repair and maintenance operations must only be carried out by qualified personnel.
3. The operator is responsible for respecting the car manufacturer’s recommendations regarding the protection of the car's electrical and electronic equipment (on-board computer, car radio, alarm, air bags, etc…).
4. Ensure compressed air supply is disconnected and depressurised before any repair or maintenance operation is carried out.
5. The electrodes, arms, and other secondary conductors can reach a very high temperature and remain hot for a long time after the machine has stopped. Pay particular attention to the risks of serious burns.
6. It is necessary to make a regular preventive maintenance on the machine.

MAINS SUPPLY
1. The unit must be connected to an earthed power supply - ensure that the earth connection is in good condition.
2. Ensure the workbench is connected to the earth.
3. Dry, protective clothing and accessories must be worn before working with the metal.
4. Make sure that the operator has no contact with the metal parts to be welded without any protection or with wet clothes.
5. Avoid contact with the welding pool.
6. Do not undertake welding, or place the machine, in wet areas or on wet flooring.
7. Before performing any control or maintenance operation, switch off and disconnect the unit directly from the electricity supply.

EYE AND BODY PROTECTION
1. During the welding process, the operator must protect themselves from possible metal projections: leather gloves, welding aprons, safety shoes, welding helmets or glasses for filtering radiation and projections. Similarly, during grinding or hammering operations, the operator must wear eye protection.
2. The tightening force of the clamp can reach 550 daN. Keep all body parts away from the mobile elements of the clamp to avoid any risk of injury - particularly to fingers and other small extremities.
3. Do not wear rings, watches, or jewellery, as metal current conductors can cause serious burns.
4. All protection boards must be in good condition and kept in place.
5. Never look at a welding arc without eye protection.
6. Protect the environment surrounding the work area from projections and reflections.

FIRE
1. Do not undertake welding near flammable material as sparks may cause fire.
2. Ensure that there is a fire extinguisher in close proximity to the operator
3. Ensure the machine is used in an area with adequate ventilation.
4. Do not weld on, or near, combustible or lubricant containers or those used to contain flammable material, even if empty.
5. Do not weld in an atmosphere charged with flammable gas or fuel fumes.

ELECTRO-MAGNETIC COMPATIBILITY
When using the welding equipment, ensure that:
- There are no other power supply cables, control lines, or any sensitive electronic devices (mobile phones, radios, computers, medical equipment etc…) in the vicinity of the machine.
- People using electronic medical devices (such as pacemakers, or hearing aids) should consult their doctor before using this device. Take extra protections if other products are to be used in the vicinity of the machine.
- The battery is disconnected from the vehicle.

We recommend you to take the machine away at the maximum from all the devices of the vehicle (calculators, relay, embedded computer…).
2. DESCRIPTION DE LA MACHINE

Front panel
- SD card reader
- Display panel

Rear panel
- 40A D-Curve Switch
- 30 mA differential
- Pneumatic filter, Pneumatic network air connector

C clamp
- Button (A) : Open / Close the clamp.
- Button (B) : remote control of welding parameters.
- Lock / Unlock Lever
- Removable electrode
- C-Arm
MI 200T Stand assembly

- **a** X4
- **b** X4
- **a** X2
- **b** X2
- **d** X4
- **e**
- **f**
- **g**
- **h**
- **i**

### Parts List

<table>
<thead>
<tr>
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<th>Description</th>
<th>Quantity</th>
</tr>
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<tbody>
<tr>
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<td>M8 x 12</td>
<td>2</td>
</tr>
<tr>
<td>b1</td>
<td>1 mm</td>
<td>2</td>
</tr>
<tr>
<td>a</td>
<td>M8 x 16</td>
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<td>b</td>
<td>2 mm</td>
<td>6</td>
</tr>
<tr>
<td>c</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>d</td>
<td>M5 x 10</td>
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</tr>
<tr>
<td>e</td>
<td></td>
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<tr>
<td>i</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>
3. INSTALLATION OF THE MACHINE

Before use
Several checks are necessary before using the unit to ensure good performance of the machine:
- Check the electrical line voltage: it should be between 200 V and 240 V, 3 phases, with a 40 A delayed circuit breaker, curve D (or aM type fuse).
- Check the cross section of the cable going from the main electrical board to the socket where the machine will be plugged in to: it should be 4x10 mm² (AWG8). If the cable is longer than 10m, use a 10mm² conductor. If you are using an electrical extension cord, use a 6 mm² conductor (use 10 mm² if the total length of the electrical line + extension cord is greater than 10 m).
- Connect a 3 phase plug with earth (minimum 40 A) to the power cable.

3 phases 220 V / 50 Hz

- In case of bad connection or bad voltage on the electrical line, the following screen will appear:

On the right hand side of the screen appears the voltage on each phase.

- Overvoltage: the mains voltage lies beyond 268 V rms.
- Low voltage: the mains voltage lies below 160 V rms.
- Unbalanced phase: one phase has a significantly lower voltage than the other two.
- Missing phase: one phase is not connected properly.

- Caution: in order to avoid voltage drops which can generate bad welding spots, do not overload the electricity supply, do not use cables with insufficient diameter/cross section. Do not use a mains socket that is located too far from the circuit breaker.
- If the machine is not sufficiently powered, it will not be possible to ensure a good quality weld.
- Check that the compressed air network can deliver a minimum of 7 bars (dry air), then connect the compressed air network to the back of the machine.

The machine must not be used on a compressed air network with a pressure lower to 3 bars.

Assembling the clamp handle and the air connector

Assemble the clamp handle on the left side of the clamp

Air connector
Screw the air connector on the back of the air filter.
**Filling the cooling tank**

Chief Automotive Technologies recommends that you specific welding machine coolant with antifreeze and corrosion inhibitors in this cooling tank.

The use of other cooling liquids, and in particular standard cooling liquids, can lead to the accumulation of solid substances inside the cooling system (due to electrolysis), this will negatively impact the cooling efficiency, and possibly cause total obstruction of the system. Any degradation to the machine caused by the use of cooling liquids with bad quality (or equivalent) will not be considered under warranty.

Any damage to the machine due to the freezing of cooling liquid will not be accepted under warranty.

To fill the tank with cooling liquid, proceed as follows:
- Put the pneumatic clamp on its stand
- Fill the tank with 30 litres of cooling liquid - this should reach the middle of the min / max indicator on the side of the machine.

**Safety recommendations regarding cooling liquid:**
- In case of contact with the eyes, rinse thoroughly with plenty of water immediately after contact (remove contact lenses first if worn). Seek medical help if necessary.
- In case of contact with the skin, wash thoroughly with soap and plenty of water. Remove any contaminated clothing, and if skin irritation occurs (redness etc..) consult doctor.
- In case of ingestion, rinse the mouth out thoroughly, and drink plenty of water - consult your doctor immediately.

**Maintenance:**

It is recommended that the cooling liquid is changed every 2 years. To empty the coolant tank, proceed as follows:
- Make sure an arm is fitted on the C-clamp
- Select the C-clamp adjustment mode in the machine menu.
- Unscrew the mobile electrode from the clamp.
- Select the normal mode in the menus.
- Press the welding button on the clamp to activate the pump.
- Use the container to collect the liquid as it drains from the clamp.
- In the absence of welding, the pump will stop automatically after 2 minutes. It will therefore be necessary to press this button several times to completely empty the tank.
- When the tank is empty, go back to the C-clamp adjustment mode in the menus and re-connect the mobile electrode to the clamp.

Fill the tank with the new cooling liquid.

**Starting the machine**

Switch ON the circuit breaker. The electronic card starts a test and initialisation cycle of the parameters for approximately 10 seconds. At the end of this cycle, the machine is ready to use.

When the machine starts up, liquid will circulate in the cables. **Check that there are no leaks.**
4- PRODUCT OPERATION

Key definition

- **key**
  - This key is used to select the tool required: Clamp, single-sided gun or “clamp adjustment”
  - Press for 2 seconds: to return to normal mode from any other mode.
  - To re-set the spot-counter to 0 (when displayed): Press for 2 seconds.
  - In visualisation mode: Press twice to erase the report that is displayed on the screen.
  - In Program Saving mode: Press the button briefly to erase the selected program.

- **Save a report**
  More details can be found on this function in the corresponding chapter.
The « record » key enables or disables the saving of a report.
The « View » key allows the user to read the sequence of spots performed.

- **Using advanced modes**
The MODE button navigates through 4 different modes: STANDARD MODE, MULTISHEET MODE, MANUAL MODE, and AUTO MODE. A prolonged press on the MODE key enters the configuration mode, where the language and date can be edited and the warning sound activated for “current too low” or “low pressure” messages. The up and down keys go through the parameters to modify (sheet thickness, type of steel, arm used). The + and – keys allow modification of each parameter. sich die Werte ändern oder auswählen; die + und – Tasten erhöhen bzw. verringern den ausgewählten Wert.

- **Saving of user welding parameters**
The « save » button allows the user to save selected welding parameters (mode, sheet thickness, welding current, welding time or electrode force)
The “open” button will restore previously saved welding settings. The machine automatically goes to manual mode, recalling the saved parameters (current, welding time, force) and the tool used (clamp or gun).

- **Select sheet thickness**
The sheet thickness can be adjusted using the + and – keys. The thickness can be selected from the following preset values: 0.6, 0.8, 1.0, 1.2, 1.5, 1.8, 2.0, 2.5, 3.0 mm.

- **Select type of steel**
This allows the selection of the type of metal to weld from 4 different options: coated steel, HTS steel, UHTS steel, BORON steel. This setting can be adjusted using the + and – keys.

- **Adjustment of the arm used**
When a clamp is used (either C or X), the user should specify the length of the arms fitted to the clamp, so that the machine will automatically adjust the air pressure to reach the required electrode force.
Recommendations on the use of welding modes:

Only qualified and specially trained personnel are permitted to use the spot-welder. Please observe repair manuals of respective car manufacturers before carrying out any welds. The correct application of instructions specified in the user manual and commitment to the indications of the manufacturer as well as the necessary preparations, implementations and tests of welding jobs lies within the responsibility of the user.

Several welding modes are available on MI200T spot welding machines.

The STANDARD and MULTI modes allow programming the machine by entering sheet thickness and type of steel.

The MANUAL mode allows programming individually each welding parameter according to the car manufacturer’s specification: welding current, welding time, clamp force.

The AUTO, ENERGY, and CAR MANUFACTURER modes are available on MI200T models only.

The AUTO mode allows welding without entering any parameter inside the machine. This mode may be used on all welding spots identified as non-critical by the car manufacturers. For the welding spots identified as critical by car manufacturers, refer to their repair specification, and use either the MANUAL mode or the CAR MANUFACTURER is mode. In the MANUAL mode, the exact welding parameters from the repair specification may be entered. In the CAR Manufacturer’s mode, welding parameters approved and sometimes requested by car manufacturers are saved and can be recalled.

In order to safeguard the quality of each welding spot we recommend carrying out 2 sample welds and a pull out test with the same steels and applying the same distance from one another required by the job. The welding spot is acceptable if the pull-off leads to the extraction of the nugget and the tearing of the steel, with a minimum nugget diameter in accordance with the car manufacturer specifications.
Using the C pneumatic clamp
- Tighten the C-clamp using the locking lever and check that the screw between the arm and the clamp is correctly tightened.
- The clamping force is calculated by the machine, considering the force setting or the thickness of the sheets selected.

CLAMP SETTING MODE

The key is used to enter the clamp adjustment mode. The clamp adjustment mode allows the user to close the clamp and apply the programmed force on the electrodes without any current flowing. This mode is used to adjust the arms. The clamp will remain closed as long as the button remains pressed; this allows the user to check the alignment of the electrodes and positioning of the caps.

Press the key for more than 2 seconds allows returning to the STANDARD mode.

STANDARD Mode

This is the default mode when the machine starts. Quick and easy spot welding by selection of:
- The C-arm used
- The Sheet thickness: it can vary from 0.60mm up to 3.00mm in steps of 0.05mm.
When welding 2 metal sheets, enter the thickness of thinnest one. When welding 3 metal sheets, enter the total of the 3 divided by 2.
- The type of steel (standard steel, HSS steel, UHSS steel, BORON steel).
- The up and down keys go through the parameters to modify sheet thickness, type of steel, arm used. The + and - keys allow the modification of each parameter.

Button (B) on the clamp allows the user change the thickness of the sheets to be welded remotely. Button (A) on the clamp allows the user to spot weld with the selected parameters.

Before the weld: If the input air pressure is too low to reach the required electrode force, a warning will sound, and the machine will display the error message “Pressure too low”. Pressing the button for a second time will force the execution of the welding spot with the available air pressure.

After the weld: If the welding current measured during the spot is 6% less than the setting, the machine will display the error message “Current too low” - the welding spot should be checked.

A message will be displayed at the end of every welding spot, showing the measured welding current and electrode force. This message is displayed on the screen until a key on the control panel is pressed, or until a new welding spot is performed, by pressing the button (A) on the clamp.
**MULTI-sheet Mode**

This mode allows the user to specify the thickness and type of each sheet in an assembly of 2 or 3 sheets.

Using the up and down button (key definition diagram, (5)) allows selection of the parameters for each sheet. When the parameters for a sheet are highlighted, the sheet thickness and type of steel can be adjusted using the + and – keys (key definition diagram, (3)). The individual sheet parameters that can be adjusted in this mode are:

- Sheet thickness: it can vary from 0.60 mm up to 3.0 mm in steps of 0.05 mm.
- The type of steel for each sheet: standard steel, HSS steel, UHSS steel, BORON steel.

To activate the required sheet, press the up and down keys (button definition diagram, (3)) to highlight the required sheet; then use the + and – keys to select the thickness and type of steel.

**Before the weld**: If the input air pressure is too low to reach the required electrode force, a warning will sound, and the machine will display the error message “Pressure too low”. Pressing the button for a second time will force the execution of the welding spot with the available air pressure.

**After the weld**: If the welding current measured during the spot is 6% less than the setting, the machine will display the error message “Current too low” - the welding spot should be checked.

A message will be displayed at the end of every welding spot, showing the measured welding current and electrode force. This message is displayed on the screen until a key on the control panel is pressed, or until a new welding spot is performed, by pressing the B button on the clamp.

Press for 2 seconds to revert back to standard mode.

**MANUAL Mode**

This mode allows the user to manually select the welding parameters, for example when following instructions from a Manufacturer.

The default settings in manual mode correspond to the settings automatically selected in standard mode (thickness and type of sheet, electrode force, arm).

The parameters can be adjusted using the + and – keys (Key Definition diagram, (3)). The up and down keys allow navigation from one parameter to the next:

- Welding current (2000 to 13000 A, steps of 100 A) displayed in kA.
- Welding time (100 to 850 ms, steps of 10 ms)
- Electrode force (100 to 550 daN, steps of 5 daN)
- Arm used on the clamp (number and length)

**Before the weld**: If the input air pressure is too low to reach the required electrode force, a warning will sound, and the machine will display the error message “Pressure too low”. Pressing the button for a second time will force the execution of the welding spot with the available air pressure.

**After the weld**: If the welding current measured during the spot is 6% less than the setting, the machine will display the error message “Current too low” - the welding spot should be checked.

A message will be displayed at the end of every welding spot, showing the measured welding current and electrode force. This message is displayed on the screen until a key on the control panel is pressed, or until a new welding spot is performed, by pressing the B button on the clamp.

Press for 2 seconds to revert back to standard mode.

**CAR MANUFACTURER Mode**:

The CAR MANUFACTURER mode is optional and is configurable in the setup menu that is activated by pressing the mode key for 2 seconds (CAR MANUFACTURER: ON / OFF).

This mode allows calling, in a nominative manner, a pre-recorded welding spot according to a car manufacturer repair specification. Select the CAR MANUFACTURER in the left column, then by pressing the (+) key the spots list is displayed on the right column. Select the requested welding spot (highlighted); the machine is ready to weld.
User programmed welding spots can be recalled by selecting USER in the list of car manufacturers. The welding spots can be programmed using the welding spot programming module in the software.

**AUTO Mode:**

The AUTO mode is optional and is configurable in the setup menu that is activated by pressing the mode key for 2 seconds (AUTO MODE : ON / OFF).

This mode can be used with the C1, C2, C3, C4, C5, C6, C7 and C9 arms. It cannot be used with the C8 and C10 arms, for which the error message « ARM NOT COMPATIBLE » will be displayed if they are selected. This mode allows welding steel sheets without specifying any parameter on the screen of the machine. The machine determines the adapted welding parameters.

In order to use this mode, a calibration should be first performed by closing the clamp without any steel between the electrodes. Press the « Close clamp / weld » button. The message « Close clamp without steel » appears on the screen. Press the button again to perform the calibration. Once the calibration has been performed, the machine displays all the parameters to zero, and is ready to weld. Close the clamp on the area to weld and weld automatically, without entering any parameter inside the machine. Every 30 welding spots, a new calibration will be requested.

**ENERGY Mode:**

The ENERGY mode is optional and is configurable in the setup menu that is activated by pressing the mode key for 2 seconds (ENERGY MODE : ON / OFF). This mode allows controlling the energy transferred during the welding spot. This mode is not designed for the repair, but is rather meant to be used by car manufacturers and independent control labs.

In order to use this mode, a calibration should be first performed by closing the clamp without any steel sheets between the electrodes. Press the « Close clamp / weld » button. The message « Close clamp (without steel) » appears on the screen. Press the button again to perform the calibration. Once the calibration has been performed, the machine displays the last parameters selected for welding current and energy.

The user can then change the welding current, the energy, and the impedance. The machine will weld during the time necessary to reach the requested energy. If the welding is too long, the machine will display an error message « Timeout (ms) ». 

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**Example Images:**

1. Calibration screen with AUTO mode and QC1, 95 mm parameters.
2. Error message « Close clamp (without steel) ».
3. Calibration screen with ENERGY mode and I: 8.0 kA, E: 2.0 kVs, ΔZ: 101 mm parameters.
The **SETTINGS** mode can be accessed by pressing the MODE key during more than 2 seconds.

The language of the menus can be selected on line 1.

The date and time can be entered on line 2.

The CAR MANUFACTURER, AUTO and ENERGY modes can be also be disabled in this menu.

**GLUE MODE:**

In the **SETTINGS** menu shown above, a specific mode can be selected in case there is glue in between the steel sheets to be welded. In this case, a GLUE mode can be switched ON or OFF in this menu. If the GLUE mode is activated, a pre-spot is performed prior to the welding spot. The duration of this pre-spot is selected in milliseconds, from 0 to 400 ms, by increments of 50ms. When this mode is selected, the text « GLUE » appears in the welding modes STANDARD, MANUAL, MULTI.

**Use of the single sided gun**

- Connect the copper plate onto the generator's earth cable.
- Firmly fix the earth plate as near as possible to the welding area.

In case of spot welding with the single sided gun, always fix the earth plate to the sheet that will not come into contact with the welding electrode (so that the welding current will flow through the 2 sheets to be welded).
- Select the GUN tool using the key, or by pressing the gun trigger.
- The standard mode with 'star welding' is launched by default.
- The gun can be used in both standard and manual modes.

- In standard mode, the gun can weld a maximum of 1.5 mm thick sheets.
  When using the gun, the operator can choose between several tools (single spot, carbon shrinking, star welding, studs, rivets, washers, stitches). The tool selection is made with + and - keys.

- In manual mode, the maximum permitted welding current is 9 kA during a period that will not exceed 600 ms, it is therefore impossible to select higher values for these parameters.
  Set the generator entering the metal sheet thickness to weld with the keys + and -. It is possible to modify the parameters current and time in manual mode.

Press 📈 for 2 seconds to revert back to standard mode.
When highlighted, a parameter can be adjusted using the + and - keys. The ▲ and ▼ keys allow movement from one parameter to the next.

**Error Management**

Different events might cause the appearance of error messages. They can be classified in three categories:
- General Warnings: i.e. overheating, lack of electrode force or welding current, etc...
  These messages appear on the screen, and remain until a key is pressed.
- Installation Errors (air pressure, electrical power supply).
- Major Faults: These defects cause the display of an error message that locks the machine.
  The thermal protection relies on a thermostat located on the diode bridge, this feature will lock the machine, and display the message "overheating"

**Low battery (clock):**

The message « Low battery (clock) » appears after switch ON of the machine and alerts the user that the voltage of the battery on the command board is too low. This battery ensures the saving of the date and time when switching OFF the machine.

**Tool out of order:**

The message « Tool out of order » appears after switch ON of the machine and alerts the user that a button or trigger is constantly pressed, or a permanent short-circuit is detected. Control the trigger of the gun, as well as the buttons on the clamps in order to make this message disappear.

**Current too low**

If the welding current measured during the spot is 6% less than the setting, the machine will display the error message "Current too low" - the welding spot should be checked. A message will be displayed at the end of every welding spot, showing the measured welding current. This message is displayed on the screen until a key on the control panel is pressed, or until a new welding spot is performed, by pressing the B button on the clamp.

If the machine cannot deliver the requested current, then the following message appears. The welding spot is not performed, and the message must be acknowledged to perform a welding spot.

**Insufficient air pressure**

Before the welding spot: If the input air pressure is too low to reach the required electrode force, the machine will beep and display the following error message "Insufficient Pressure". Pressing the button allows the user to force the execution of the welding spot, which will be performed with the air pressure available. If the actual measured clamping force is too low, then the machine will display the following message "Low Pressure".
Welding spot counter
The spot counter will count the number of spot welds performed with the same caps. If the welding spot is performed
without any problem, the message below left, appears. The counter is displayed on the top left corner of the screen. After
the caps have been replaced, press the button \[\text{\textbullet}\] to reset the counter to zero.
If more than 200 welding spots are done with the same caps, then the machine will display the below warning message. In
this case, the warning message “Change tips” is also recorded in the traceability report.
Attention: After the warning message is displayed, if the caps are not changed before resetting the counter to zero,
the caps may become badly damaged and cause poor quality welding.

Recording features
The "Identification" mode is optional; you can configure it in the settings menu which is activated by pushing the mode
button for 2 seconds (identification mode on/off). If the identification mode is « off », enter a file name and activate it to
store the information of the welding spots made in the memory. The log book stores the spots made with the clamp in the
memory. It is available in all modes by pressing both buttons located bellow the “reporting” icon.
The user’s program is available in all modes by pushing the buttons bellow the “memory” icon.

Report (log book)

Saving a report allows spot welding data to be stored on a memory
card, in order to retrieve it at a later date e.g. on a computer.
Chief Automotive Technologies supplies software called SPOT to read
the SD card and the user manual.
By default, the report mode is not activated when the machine is
started.
Pressing the record button (on/off) \[\text{\textbullet}\] and the « mode » button
starts the recording process in the selected log file. To stop saving the
information, press the save button again.

The new report has: an identifier entered by the user, all the spots made, the arm and the clamp used, the settings (voltage
and pressure). It puts also stores any messages received whilst recording: LOW I, LOW P, CAPS PB. You can enter the
identifier using the 4 buttons: +, -, up or down. If you enter an identifier that has already been used, the unit will save the
new spot information, without erasing the old ones.

The View button \[\text{\textbullet}\] allows the user to retrieve a previously saved report and view it on the screen.
To view a report, stop any current recording by pressing \[\text{\textbullet}\]. Use the « mode » button to exit the report displayed.
To erase the content of a report, it has to be on screen by pressing “view”.

To erase the report shown, press and the following message will be on the screen:

When the warning image is displayed, press again and the report content will be erased. The warning image will disappear after 3 seconds.

**User Identification mode**

If the identification mode setting is « ON », all the fields of the repair order must be completed or the machine will display « identification defect ». To activate or deactivate the identification mode, an “Identification” SD card must be inserted in the BP drive instead of the “Program” SD card. The setting screen below is activated by pressing the mode button for 2 seconds.

When the “Identification” SD card is inserted and the identification mode is « ON », the following screen is displayed.
This screen allows the selection of default fields « registration number, car brand, car model, chassis number »

To exit the screen, press and hold the mode button for 2 seconds. Then, re-insert the “Program” SD card into the BP drive.

**Entry of repair order (screen guide):**

To modify or erase a repair order that has already been created, you will need to use the SPOT software on a PC (you are unable to do this on the machine). You can create maximum 100 repair orders.

**Screen: « Job number »**

The « left » and « right » arrow keys move the cursor within the field. The up and down arrow keys scroll through letters or figures. Press Esc to erase the field.

**Screen: “User identification”**
The Mode button changes the field to modify playback.

Screen: « Registration number » (optional)

Screen: « Vehicle make » (optional)

Screen: « Vehicle model » (optional)

Screen: Chassis number (optional)

**Catalogue**

The View button , allows you to view all repair orders on the screen - "CATALOGUE":

The number of pages is displayed (max 13) at the top

The left and right arrow keys scroll through the pages. The up and down arrow keys scroll through the list of Repair Orders.

Press the Mode button to display the repair order selected.

Use the « mode » button to exit the report view.

* The SD card driver allows the management of SD cards > 2 Gb.
* Each repair order is linked an archive file xxx.dat. (with xxx=identifier from 001 to 100). In each archive, you can save up to maximum 500 welding points. The repair order names and users are displayed.
* The page number is indicated top left.
* All the repair orders are saved in the file catalog.SPOT.
* This file contains the total number of repair orders, the name of each repair order and the name of each user. There are a maximum of 100 repair orders.
User programs

The 'save' option allows a user program to be entered to save information for future use. 20 memory slots are available; each one contains the following parameters: tool, arm, welding intensity, welding time and pressure. A program can be linked to a clamp and gun.

The button  will save the settings in the manual mode (intensity, time and pressure). The 20 memory slots are indicated by their identifier (when in use) or by the symbol « --- ». To enter an identifier, use the 4 buttons +,-, up and down arrow keys. When entering an existing user, the machine will erase the previous parameters.

The « recall » button allows access to previously saved settings. Pressing  will erase the selected program from the saved program list. The « mode » button exits the program selection mode, the machine will then enter manual mode with the parameters and the tool saved in the program. To deactivate a program simply change the parameter value in one of the 3 modes manual, normal or multi metal sheet, or change the tool (clamp or gun) by using the .

The view button  will retrieve a previously saved report and display it on the screen.

SD memory card (ref CEL050914)

This card is a link between the MI200T and a PC to enable the user to:
- Retrieve and print reports for a record of work, and documentation for insurance companies if required.
- Upgrade welding parameters or add new languages.
- Edit the parameters in the SD memory card.

- Access the user manual stored on the SD memory card.

The memory space can store information on more than 65 000 spots. The unit can only work without memory card in manual mode. In other modes, if the memory card is not inserted in the card drive, the following message will appear: The machine must be shut-down and restarted after inserting an SD card". Important: The machine must be switched off before an SD card is inserted or removed from the reader - failure to do so may result in the loss of data from the card.
SPOT Software
The software allows the user to edit and save the weld reports made by a MI200T equipped with a SD drive.
The SPOT software can be installed from files present on the SD card. In the \SPOT V X.XX directory, double click on the INSTALL.EXE file, and follow the instructions to install the software on your PC. A SPOT icon is automatically created on the desktop of your PC.

1/ Language selection
The software contains several languages: French, English, German, Spanish, Dutch, Danish, Finnish, Italian, Swedish, Russian and Turkish. To choose a language, in the menu, select Options, and then click Languages.
Attention: once a language is selected, shut down and re-start the SPOT software in order to apply the change.

2/ User identification
In order to personalise the reports with your company information, the required fields will need to be completed. In the menu, click on Options and select Identity. A new screen is displayed with the following information:
Company name
Address / Post code / City
Phone / Fax / Email / Website
Logo
This information will be displayed on your print-outs.

3/ Traceability
As a default, the SPOT software opens in « Traceability » mode. In the « Welding spot programming » module, click on «Traceability» in the « Options » menu.

3.1/ Import the spot reports made from an SD card
To import the spot reports made with your MI200T to your PC, insert the SD card into the PC card drive, or use a card reader, and start up the SPOT software.
Select the drive and click on the Import icon. When the import is complete, the spot reports will be grouped by the identifier of the repair order. The identifier matches up with the report name established on the welding machine, and is displayed in the tab «In progress». Once the reports have been imported, it is possible to search, edit or archive them. To view the spots made in a report, select a report and the spots will be displayed in the table.
To search for a report, fill the field and click on the icon
To edit a report, select it and click on the icon
To archive a report, select it and click on the icon
Attention! The imported reports cannot be cancelled until they are archived.

3.2/ Consult archived spot reports
To consult the report archives, click on the tab “Archives”. The files are grouped by year and month. To view the spot information, select a report and they will appear in the table. For archived reports, it is possible to search, edit or to erase a report.
Attention! When a report is archived or erased, the SD card must then be formatted to prevent the report from being imported again.
To search for a report, fill the field and click on the icon
To edit a report, select it and click on the icon
To erase a report, select a report and click on the icon

3.3/ Purge the SD card
A purge operation will erase all the reports saved on the SD card.
To purge and SD card, insert the SD card into your PC card drive or a card reader and, in the menu, click on Options and Purge the SD card.
Attention: any reports stored on the SD card that have not already been imported, will be imported automatically before purging.

3.4/ Entering the report information
Each report can include the following information:
User
Car model
Repair order
Registration number
Put into circulation
Intervention
Comments
To enter this data, select a report and enter the information in the report header.
3.5/ Print a report

To print a report, select the one required and click . A print preview is displayed. Click .

3.6/ Export the report as a PDF file

To export the report as a PDF, select a file, and click on . A preview of the print is displayed. Click .

Below shows an example of the parameters saved and printed by using the SPOT software.

4/ Welding spot programming module

In order to enter the « Welding spot programming » mode, click on « Welding spot programming » in the « Options » menu.

The « Welding spot programming » mode allows the user to select welding spots defined by Car Manufacturers. This mode also allows the user to program his own welding spot profiles.

Insert the SD card delivered with your MI200T spot welding machine in the SD card reader of your PC, then select the corresponding reader identifier in the « Unit Choice» menu.

The MI200T spot welding machines can accept up to 16 files, which can contain each up to 48 programmed welding spots.

The first file called « User » cannot be deleted. It enables the user to add, edit or delete a programmed welding spot.
The other files are restricted to Car Manufacturer defined welding spots. It is possible to import downloaded Car manufacturer files from the website. It is not possible to add, edit or delete a welding spot saved in a Car Manufacturer file.

4.1/ Import a Car Manufacturer welding spot file

Double click in the first column and highlight a car manufacturer name.

<table>
<thead>
<tr>
<th>USER</th>
<th>User</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>GM EUROPE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RENAULT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOYOTA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Then, double click in the second column to select a Car Manufacturer file previously downloaded from our website.

<table>
<thead>
<tr>
<th>USER</th>
<th>User</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>GM EUROPE</td>
<td>del</td>
<td></td>
</tr>
<tr>
<td>PSA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RENAULT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOYOTA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The list of welding spots defined by the Car Manufacturer are displayed in the second table below. Select a programmed welding spot in order to display the welding spot profile on the screen.

<table>
<thead>
<tr>
<th>GME 01</th>
</tr>
</thead>
<tbody>
<tr>
<td>GME 02</td>
</tr>
<tr>
<td>GME 03</td>
</tr>
<tr>
<td>GME 04</td>
</tr>
<tr>
<td>GME 05</td>
</tr>
</tbody>
</table>

4.2/ Add a programmed welding spot in the USER file

In order to add a welding spot in the USER file, select the USER file in the list of files and then click on the button on the right of the table below. Enter the name of the welding spot, and then press the TAB key or click outside the list programmed welding spots in order to program the welding parameters.

<table>
<thead>
<tr>
<th>USR001</th>
</tr>
</thead>
</table>

To program a welding spot, it is possible to select:

The prespot tightening duration
The preheating current and duration
The parameters of the pulses (up to 4 maximum), with pulse ramp-up time, current and duration. Inter pulse parameters can also be selected.
The current and duration of the forging stages (hot and cold) can also be selected.

In order to modify the parameters, click on the buttons.

When the user changes a parameter, the chronogram of the welding spot profile is updated.

To validate the programmed welding spot, click on the button.

To cancel a programmed welding spot, click the button.
4.3/ Edit a welding spot programmed in the USER file

In order to edit the parameters of a programmed welding spot, select a welding spot in the list and then edit the welding parameters.

To validated the modifications, click on the button ✅.

To cancel the modifications, click on the button 🚧.

4.4/ Delete a welding spot programmed in the USER file

Select a welding spot programmed in the list, then click on the button 🗑️ on the right of the list.
5. USE AND MAINTENANCE PRECAUTIONS

User training
Any operator of this machine should receive training adapted to its use in order to gain maximum performance from the unit (e.g.: car body repair training).

Adjust the balancer’s spring tension
Adjust the balancer’s spring tension with the Allen key equipped. Do not leave the clamp hanging for a long time on the balancer, as it would induce early wear out of this part. Do not let the clamp fall down repeatedly without holding it, as it could damage the balancer.

Preparation of the work-piece:
Grind and clean the work-piece thoroughly before welding.
If protection is being used, ensure that the parts are conducting by testing a sample.

Single sided gun welding
Before repairing a car, check that the car manufacturer authorizes that welding process.

Cooling liquid level and efficiency
The cooling liquid level is important to ensure the unit functions correctly. The liquid level should always be between the minimum and maximum levels indicated on the tank. Check the level and efficiency of the cooling liquid regularly, replace if needed. It is recommended replacing the cooling liquid every 2 years.

Cleaning the pneumatic filter
Ensure the dehumidifier filter located at the back of the machine is cleaned regularly.

Generator maintenance
The maintenance and repair of the generator should only be carried out by a Chief Automotive Technologies technician. Any repair/maintenance made to the generator by unauthorized personnel will invalidate the machine’s warranty - Chief Automotive Technologies will not take responsibility for any incident or accident under these circumstances.

Cleaning / replacement of welding tools and other items
All welding tools are consumable and will deteriorate during use.
To extend the lifespan and efficiency of the tools, ensure that they are inspected and cleaned regularly.
When using with the Pneumatic Clamp, check that the condition of the electrodes/CAPS (flats, rounded or beveled) is good.
If the condition is poor, clean with fine grain sandpaper, or replace (see reference on the machine).
When using with the gun, check the condition of the tools: star, single-point electrode, carbon electrode. Clean, or replace if necessary.
Ensure the pneumatic filter is clean to prevent the machine overheating.

Replacement of the caps/electrodes:
- To ensure an efficient welding point, you need to replace the caps every 200 spots - remove the caps using the spanner.
- Use grease (ref: CEL050440) when replacing caps
- Caps type A (ref: CEL049987)
- Caps type F (ref: CEL049970)
- Caps beveled (ref: CEL049994)

Caution: The caps must be perfectly aligned. To check the electrode line, see change of arms on pages 18 and 19.
Installation and use of the gun

The gun and the earth clamp are optional. Ref: CEL051010

- Select the clamp adjustment mode in the menus, in order to stop the pump and the flow of cooling liquid.
- Fix the earth cable on the removable electrode; put the clamp and tighten the lever.
- Remove the arm from the top and put the gun cable instead of that one.

Connect the cooling liquid pipes to the 2 connectors.
Connect the command cable to the Jack plug.

- Check if the screw connected from the earth plate to the earth clamp terminal is tightened correctly.
Replacement of C arms

Please read the following instructions carefully.
Incorrectly tightening or setting the C clamp arms can lead to the arm and clamp overheating and causing damage. Damage caused by incorrect assembly are not covered under the warranty.

①
- Switch off the machine, or put the machine into « clamp setting » mode.
- Unscrew screw (1) which holds the arm to the clamp. Leave it on the arm to not lose it.

②
- Disconnect the cooling liquid pipes.
- Unscrew screw (2) and loosen the lever (3) on the side of the clamp.

③
- Remove the clamp arm.
- Lubricate both a new arm and the support with contact grease (ref. CEL050440).

Specific Installation for C2 and C8 arms

For these arms, the Stretches will also need to be changed. Unscrew the short stretches with a flat spanner and remove the injector. Centre the injector along the axle of the clamp (Caution: beveled side outside) and insert it manually(1)
Position the long stretches in front and screw it on to the clamp axle (maximum torque 15Nm) (2).

Stretches types:
Short: C1, C3, C4, C5, C6, C7, C9, C10
Long: C2, C8
Adjustment of C arms

- Position screw (4) to fix the arm on the clamp. Tighten it in manually - do not overtighten.
- Tighten ring (5) manually, then the tighten (6) using the Allen key.

- Tighten the lever manually and check it is not end up against the joint stop (see diagram below). If it is the case go back to step ③.

Warning: Clamp and arm may be damaged if the lever is not tightened properly.

- Check the cooling liquid level.
- Check screws and lever, incorrectly tightening can damage the material.
- Switch on the machine.
C clamp overhaul:

The tightening of the following screws need to be inspected every month:

Screw between the arm and the clamp:

These 4 screws fix the arm to the clamp. They need to be tightened to have a good transmission of the current. A bad tightening leads to a loss of current, and worst can damage your arm or clamp irreversibly.

Connexion MI200T / C clamp:

B : Black
G : Green
W : White
Y : Yellow
Arm types for the C clamp:

Arms kits:
- ref. 019126 (C2+C3+C4)
- ref. 050044 (C2+C3+C5+C6+C9)
- ref. 021457 (C2+C3+C4)

C1 - 8bar/550 daN
ref. CEL019140
ref. CEL021402 insulated

C2 - 8bar/550 daN
ref. CEL019133

C3 - 8bar/550 daN
ref. CEL019157
ref. CEL021419 insulated

C4 - 8bar/550 daN
ref. CEL019164
ref. CEL021426 insulated

C5 - 8bar/550 daN
ref. CEL019294

C6 - 8bar/300 daN
ref. CEL01975

C7 - 8bar/550 daN
ref. CEL020009
ref. CEL021433 insulated

C8 - 8bar/550 daN
ref. CEL020016
ref. CEL021440 insulated

C9 - 8bar/550 daN
ref. CEL020078 insulated

C10 - 4bar/150 daN
ref. CEL051638

C11 - 8bar/550 daN
ref. CEL053649

Accessories and consumables

Contact grease
ref. CEL050440

Caps spanner
ref. CEL050846

Box of 40 Caps Type A
ref. CEL049935

Caps Type A
ø13mm
ref. CEL049987
ref. CEL049994

Caps for C11 arm
ø13mm
ref. CEL050617

Caps for C6 arm
x6

Spot control

Ref. CEL050433

HLE / HTS 1.0mm (x150) Ref. CEL050181
THLE / VHTS 2.5mm (x150) Ref. CEL050167
<table>
<thead>
<tr>
<th>SYMPTOMS</th>
<th>REASONS</th>
<th>SOLUTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Spot weld doesn't hold / is not good</td>
<td>The caps used are worn out/faulty</td>
<td>Replace the caps.</td>
</tr>
<tr>
<td></td>
<td>Insufficient grinding / preparation of the workpiece</td>
<td>Sand and clean the metal sheet again.</td>
</tr>
<tr>
<td></td>
<td>The arm selected doesn't match the one installed</td>
<td>Check the arm with the software.</td>
</tr>
<tr>
<td>The spotter makes holes in the steel</td>
<td>The caps used are worn out/faulty</td>
<td>Replace the caps.</td>
</tr>
<tr>
<td></td>
<td>Not enough pressure</td>
<td>Check the compressed air network (min. 7 bar)</td>
</tr>
<tr>
<td></td>
<td>Insufficient preparation of the work-piece</td>
<td>Sand and clean the metal sheet again</td>
</tr>
<tr>
<td>Lack of power on the clamp</td>
<td>Power supply issue</td>
<td>Check the stability of voltage delivered</td>
</tr>
<tr>
<td></td>
<td>Bad tightening of the C arm.</td>
<td>Check procedure for tightening C arm</td>
</tr>
<tr>
<td></td>
<td>The caps used are worn out/faulty</td>
<td>Replace the caps.</td>
</tr>
<tr>
<td>Unit overheats quickly / swelling of the power cable</td>
<td>The arm C badly cooled</td>
<td>Check the connection of the C Arm to the cooling section of the clamp</td>
</tr>
<tr>
<td>Overheating of the gun The spot weld made doesn't hold</td>
<td>Gun sheath outside the gun.</td>
<td>The gun sheath should come inside the gun for the air cooling to cool inside the gun</td>
</tr>
<tr>
<td></td>
<td>Bad tightening of the mandrel.</td>
<td>Check the tightening of the mandrel, the star holder, and the state of the sheath.</td>
</tr>
<tr>
<td>The weld is not good</td>
<td>Bad contact of the earth clamp</td>
<td>Check the earth clamp is securely connected to the metal sheet</td>
</tr>
<tr>
<td>Lack of power with the gun</td>
<td>Bad contact of the earth clamp</td>
<td>Check the ground connection</td>
</tr>
</tbody>
</table>
Installation Registration Form

Thank you for purchasing a Chief Elektron product. Please fill out the information below to register your purchase.

Company Name: _____________________________

Contact: _____________________________ e-mail: _____________________________

Business Address: _____________________________

State/Zip code: _____________________________ Tel: _____________________________ Fax: _____________________________

Chief Elektron Model Purchased:
EL520458 MI-100 Control MX4900
EL520484 MI 100 Control VW/Audi
EL520531 MI-100 MX3900
EL520535 MI 100 Control T MTC6000 OEM
EL515706 Multi-Spot M-80

Chief Elektron Model Purchased:
EL520436 MI-100 Control MC5000
EL520474 MI-100 Control T
MigMag Welder Place Serial Number Below
Other:

Serial Number: S__ ___ ___

Purchased from: _____________________________ Date Installed: ___________

Technical Information: To be completed by installer or electrician

Wire Size: #__________ Breaker Size: ______Amp’s

Main Voltage (at panel): ________V Voltage at Receptacle: ________V

Max Air Pressure: ________PSI

Was a Loop Resistance Check Performed: __________

Information above is confirmed by:

Installer: _____________________________ Shop Owner/Manager _____________________________

Date: __________

Submit form to: Chief Elektron fax #:1-866-275-0173 or salesorders@chiefautomotive.com

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SV0056
Rev. - 4/16/2014

29
CIRCUIT DIAGRAM
10 – COOLING LIQUID CIRCUIT

11 – CLAMP CABLE BEAM CONNECTIONS
**12 - Technical specifications**

### ELECTRICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal input voltage : U1N</td>
<td>3<del>200V 3</del>208V 3<del>230V 3</del>240V</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td>Permanent input current : I1N</td>
<td>40 A</td>
</tr>
<tr>
<td>Power at 50 % duty cycle : S50</td>
<td>20 kVA</td>
</tr>
<tr>
<td>Permanent input power : Sp</td>
<td>14 kVA</td>
</tr>
<tr>
<td>Maximum welding input power : Smax</td>
<td>80 kVA</td>
</tr>
<tr>
<td>Secondary voltage : U2d</td>
<td>6.95V 7.2V 8V 8.3V</td>
</tr>
<tr>
<td>Maximum short-circuit output current : I2cc</td>
<td>12 500A 13 000A 14 500A 14 500A</td>
</tr>
<tr>
<td>Maximum permanent output current : I2P</td>
<td>1 800 A</td>
</tr>
<tr>
<td>Circuit breaker</td>
<td>40 A Kurve D</td>
</tr>
<tr>
<td>Earth Leakage Circuit Breaker</td>
<td>30 mA</td>
</tr>
<tr>
<td>Duty cycle</td>
<td>2%</td>
</tr>
</tbody>
</table>

### THERMAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature range</td>
<td>+5°C +45°C</td>
</tr>
<tr>
<td>Transport and storage temperature range</td>
<td>-20°C +70°C</td>
</tr>
<tr>
<td>Hygrometry</td>
<td>80 %</td>
</tr>
<tr>
<td>Altitude</td>
<td>2000m</td>
</tr>
<tr>
<td>Thermal protection by thermistor on the diodes bridge</td>
<td>70 °C</td>
</tr>
</tbody>
</table>

### MECHANICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection rating</td>
<td>IP21</td>
</tr>
<tr>
<td>Width</td>
<td>610 mm</td>
</tr>
<tr>
<td>Depth</td>
<td>720 mm</td>
</tr>
<tr>
<td>Height</td>
<td>2260 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>100 kg</td>
</tr>
<tr>
<td>Weight of clamp</td>
<td>10 kg</td>
</tr>
<tr>
<td>Network cable length</td>
<td>8.000 mm</td>
</tr>
<tr>
<td>Clamp cable length reference : CEL019614</td>
<td>4.000 mm</td>
</tr>
<tr>
<td>Clamp cable length reference : CEL020320</td>
<td>6.000 mm</td>
</tr>
</tbody>
</table>

### PNEUMATIC CHARACTERISTICS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum air pressure P1</td>
<td>10 bar</td>
</tr>
<tr>
<td>Liquid flow rate</td>
<td>2L/min</td>
</tr>
<tr>
<td>Minimum regulated force : F min</td>
<td>100 daN</td>
</tr>
<tr>
<td>Maximum regulated force with C clamp : F max</td>
<td>550 daN</td>
</tr>
</tbody>
</table>

### 13 - Icons

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td>Volt</td>
</tr>
<tr>
<td>A</td>
<td>Amps</td>
</tr>
<tr>
<td>3 ~</td>
<td>Three-phase power supply</td>
</tr>
<tr>
<td>U 1n</td>
<td>Nominal input voltage</td>
</tr>
<tr>
<td>S p</td>
<td>Permanent input power</td>
</tr>
<tr>
<td>S max</td>
<td>Maximum welding input power</td>
</tr>
<tr>
<td>U 20</td>
<td>Alternating current defined unload</td>
</tr>
<tr>
<td>I 2 cc</td>
<td>Secondary current on short-circuit</td>
</tr>
<tr>
<td>IP 21</td>
<td>Protected against rain and moisture. No access to dangerous parts.</td>
</tr>
<tr>
<td>!</td>
<td>Caution! Read the user manual before use</td>
</tr>
<tr>
<td>!</td>
<td>Separate collection required - Do not throw in a domestic waste bin</td>
</tr>
<tr>
<td>!</td>
<td>Do not use in the open air. Do not use the product in damp/wet environments. IP21.</td>
</tr>
<tr>
<td>!</td>
<td>Risk of interference and disturbance of electronic medical devices (i.e. pace-makers) when near of the product.</td>
</tr>
<tr>
<td>!</td>
<td>Caution! Strong magnetic field. People wearing active or passive implants must be informed.</td>
</tr>
<tr>
<td>!</td>
<td>Always wear suitable protective clothing to shield eyes, hands, and skin, when welding.</td>
</tr>
</tbody>
</table>