

Power source

**Picotig 200 MV TG**

099-002059-EW501

30.11.2015

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# General instructions

## CAUTION



### **Read the operating instructions!**

**The operating instructions provide an introduction to the safe use of the products.**

- Read the operating instructions for all system components!
- Observe accident prevention regulations!
- Observe all local regulations!
- Confirm with a signature where appropriate.



***In the event of queries on installation, commissioning, operation or special conditions at the installation site, or on usage, please contact your sales partner or our customer service department on +49 2680 181-0.***

***A list of authorised sales partners can be found at [www.ewm-group.com](http://www.ewm-group.com).***

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## 2 Safety instructions

### 2.1 Notes on the use of these operating instructions



#### **DANGER**

**Working or operating procedures which must be closely observed to prevent imminent serious and even fatal injuries.**

- Safety notes include the "DANGER" keyword in the heading with a general warning symbol.
- The hazard is also highlighted using a symbol on the edge of the page.



#### **WARNING**

**Working or operating procedures which must be closely observed to prevent serious and even fatal injuries.**

- Safety notes include the "WARNING" keyword in the heading with a general warning symbol.
- The hazard is also highlighted using a symbol in the page margin.



#### **CAUTION**

**Working or operating procedures which must be closely observed to prevent possible minor personal injury.**

- The safety information includes the "CAUTION" keyword in its heading with a general warning symbol.
- The risk is explained using a symbol on the edge of the page.

#### **CAUTION**

**Working and operating procedures which must be followed precisely to avoid damaging or destroying the product.**

- The safety information includes the "CAUTION" keyword in its heading without a general warning symbol.
- The hazard is explained using a symbol at the edge of the page.








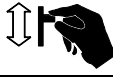








#### ***Special technical points which users must observe.***

Instructions and lists detailing step-by-step actions for given situations can be recognised via bullet points, e.g.:

- Insert the welding current lead socket into the relevant socket and lock.

## 2.2 Explanation of icons

Symbol	Description
	Special technical points which users must observe.
	Correct
	Wrong
	Press
	Do not press
	Press and keep pressed
	Turn
	Switch
	Switch off machine
	Switch on machine
<b>ENTER</b>	enter the menu
<b>NAVIGATION</b>	Navigating in the menu
<b>EXIT</b>	Exit the menu
	Time display (example: wait 4s/press)
	Interruption in the menu display (other setting options possible)
	Tool not required/do not use
	Tool required/use

## 2.3 General



### DANGER



#### Electromagnetic fields!

The power source may cause electrical or electromagnetic fields to be produced which could affect the correct functioning of electronic equipment such as IT or CNC devices, telecommunication lines, power cables, signal lines and pacemakers.

- Observe the maintenance instructions - See 6 Maintenance, care and disposal chapter!
- Unwind welding leads completely!
- Shield devices or equipment sensitive to radiation accordingly!
- The correct functioning of pacemakers may be affected (obtain advice from a doctor if necessary).



#### Do not carry out any unauthorised repairs or modifications!

To avoid injury and equipment damage, the unit must only be repaired or modified by specialist, skilled persons!

The warranty becomes null and void in the event of unauthorised interference.

- Appoint only skilled persons for repair work (trained service personnel)!



#### Electric shock!

Welding machines use high voltages which can result in potentially fatal electric shocks and burns on contact. Even low voltages can cause you to get a shock and lead to accidents.

- Do not touch any live parts in or on the machine!
- Connection cables and leads must be free of faults!
- Switching off alone is not sufficient!
- Place welding torch and stick electrode holder on an insulated surface!
- The unit should only be opened by specialist staff after the mains plug has been unplugged!
- Only wear dry protective clothing!
- Wait for 4 minutes until the capacitors have discharged!



### WARNING



#### Risk of injury due to radiation or heat!

Arc radiation results in injury to skin and eyes.

Contact with hot workpieces and sparks results in burns.

- Use welding shield or welding helmet with the appropriate safety level (depending on the application)!
- Wear dry protective clothing (e.g. welding shield, gloves, etc.) according to the relevant regulations in the country in question!
- Protect persons not involved in the work against arc beams and the risk of glare using safety curtains!



#### Explosion risk!

Apparently harmless substances in closed containers may generate excessive pressure when heated.

- Move containers with inflammable or explosive liquids away from the working area!
- Never heat explosive liquids, dusts or gases by welding or cutting!

## WARNING



### **Smoke and gases!**

**Smoke and gases can lead to breathing difficulties and poisoning. In addition, solvent vapour (chlorinated hydrocarbon) may be converted into poisonous phosgene due to the ultraviolet radiation of the arc!**

- Ensure that there is sufficient fresh air!
- Keep solvent vapour away from the arc beam field!
- Wear suitable breathing apparatus if appropriate!



### **Fire hazard!**

**Flames may arise as a result of the high temperatures, stray sparks, glowing-hot parts and hot slag produced during the welding process.**

**Stray welding currents can also result in flames forming!**

- Check for fire hazards in the working area!
- Do not carry any easily flammable objects such as matches or lighters.
- Keep appropriate fire extinguishing equipment to hand in the working area!
- Thoroughly remove any residue of flammable substances from the workpiece before starting welding.
- Only continue work on welded workpieces once they have cooled down.  
Do not allow to come into contact with flammable material!
- Connect welding leads correctly!



### **Risk of accidents due to non-compliance with the safety instructions!**

**Non-compliance with the safety instructions can be fatal!**

- Carefully read the safety instructions in this manual!
- Observe the accident prevention regulations and any regional regulations!
- Inform persons in the working area that they must comply with the regulations!



### **Danger when coupling multiple power sources!**

**Coupling multiple power sources in parallel or in series has to be carried out by qualified personnel and in accordance with the manufacturer's guidelines. Before bringing the power sources into service for arc welding operations, a test has to verify that they cannot exceed the maximum allowed open circuit voltage.**

- Connection of the machine may be carried out by qualified personnel only!
- When decommissioning individual power sources, all mains and welding current leads have to be safely disconnected from the welding system as a whole. (Danger due to inverse voltages!)
- Do not couple welding machines with pole reversing switch (PWS series) or machines for AC welding, as a minor error in operation can cause the welding voltages to be combined.

## CAUTION



### **Noise exposure!**

**Noise exceeding 70 dBA can cause permanent hearing damage!**

- Wear suitable ear protection!
- Persons located within the working area must wear suitable ear protection!



**CAUTION****Obligations of the operator!****The respective national directives and laws must be observed for operation of the machine!**

- National implementation of the framework directive (89/391/EWG), as well as the associated individual directives.
- In particular, directive (89/655/EWG), on the minimum regulations for safety and health protection when staff members use equipment during work.
- The regulations regarding work safety and accident prevention for the respective country.
- Setting up and operating the machine according to IEC 60974-9.
- Check at regular intervals that users are working in a safety-conscious way.
- Regular checks of the machine according to IEC 60974-4.

**Damage due to the use of non-genuine parts!****The manufacturer's warranty becomes void if non-genuine parts are used!**

- Only use system components and options (power sources, welding torches, electrode holders, remote controls, spare parts and replacement parts, etc.) from our range of products!
- Only insert and lock accessory components into the relevant connection socket when the machine is switched off.

**Damage to the machine due to stray welding currents!****Stray welding currents can destroy protective earth conductors, damage equipment and electronic devices and cause overheating of components leading to fire.**

- Make sure all welding leads are securely connected and check regularly.
- Always ensure a proper and secure electrical connection to the workpiece!
- Set up, attach or suspend all conductive power source components like casing, transport vehicle and crane frames so they are insulated!
- Do not place any other electronic devices such as drillers or angle grinders, etc., on the power source, transport vehicle or crane frames unless they are insulated!
- Always put welding torches and electrode holders on an insulated surface when they are not in use!

**Mains connection****Requirements for connection to the public mains network**

High-performance machines can influence the mains quality by taking current from the mains network. For some types of machines, connection restrictions or requirements relating to the maximum possible line impedance or the necessary minimum supply capacity at the interface with the public network (Point of Common Coupling, PCC) can therefore apply. In this respect, attention is also drawn to the machines' technical data. In this case, it is the responsibility of the operator, where necessary in consultation with the mains network operator, to ensure that the machine can be connected.

## CAUTION



### EMC Machine Classification

In accordance with IEC 60974-10, welding machines are grouped in two electromagnetic compatibility classes - See 8 Technical data chapter:

**Class A** machines are not intended for use in residential areas where the power supply comes from the low-voltage public mains network. When ensuring the electromagnetic compatibility of class A machines, difficulties can arise in these areas due to interference not only in the supply lines but also in the form of radiated interference.

**Class B** machines fulfil the EMC requirements in industrial as well as residential areas, including residential areas connected to the low-voltage public mains network.

### Setting up and operating

When operating arc welding systems, in some cases, electro-magnetic interference can occur although all of the welding machines comply with the emission limits specified in the standard. The user is responsible for any interference caused by welding.

In order to **evaluate** any possible problems with electromagnetic compatibility in the surrounding area, the user must consider the following: (see also EN 60974-10 Appendix A)

- Mains, control, signal and telecommunication lines
- Radios and televisions
- Computers and other control systems
- Safety equipment
- The health of neighbouring persons, especially if they have a pacemaker or wear a hearing aid
- Calibration and measuring equipment
- The immunity to interference of other equipment in the surrounding area
- The time of day at which the welding work must be carried out

### Recommendations for **reducing interference emission**

- Mains connection, e.g. additional mains filter or shielding with a metal tube
- Maintenance of the arc welding equipment
- Welding leads should be as short as possible and run closely together along the ground
- Potential equalization
- Earthing of the workpiece. In cases where it is not possible to earth the workpiece directly, it should be connected by means of suitable capacitors.
- Shielding from other equipment in the surrounding area or the entire welding system

## 2.4 Transport and installation

### WARNING



#### **Incorrect handling of shielding gas cylinders!**

**Incorrect handling of shielding gas cylinders can result in serious and even fatal injury.**

- Observe the instructions from the gas manufacturer and in any relevant regulations concerning the use of compressed air!
- Place shielding gas cylinders in the holders provided for them and secure with fixing devices.
- Avoid heating the shielding gas cylinder!



#### **Risk of accident due to improper transport of machines that may not be lifted!**

**Do not lift or suspend the machine! The machine can fall down and cause injuries! The handles and brackets are suitable for transport by hand only!**

- The machine may not be lifted by crane or suspended!

### CAUTION



#### **Risk of tipping!**

**There is a risk of the machine tipping over and injuring persons or being damaged itself during movement and set up. Tilt resistance is guaranteed up to an angle of 10° (according to IEC 60974-1).**

- Set up and transport the machine on level, solid ground.
- Secure add-on parts using suitable equipment.



#### **Damage due to supply lines not being disconnected!**

**During transport, supply lines which have not been disconnected (mains supply leads, control leads, etc.) may cause hazards such as connected equipment tipping over and injuring persons!**

- Disconnect supply lines!

### CAUTION



#### **Equipment damage when not operated in an upright position!**

**The units are designed for operation in an upright position!**

**Operation in non-permissible positions can cause equipment damage.**

- Only transport and operate in an upright position!

## 2.4.1 Ambient conditions

### CAUTION



#### **Installation site!**

**The machine must not be operated in the open air and must only be set up and operated on a suitable, stable and level base!**

- The operator must ensure that the ground is non-slip and level, and provide sufficient lighting for the place of work.
- Safe operation of the machine must be guaranteed at all times.

### CAUTION



#### **Equipment damage due to dirt accumulation!**

**Unusually high quantities of dust, acid, corrosive gases or substances may damage the equipment.**

- Avoid high volumes of smoke, vapour, oil vapour and grinding dust!
- Avoid ambient air containing salt (sea air)!



#### **Non-permissible ambient conditions!**

**Insufficient ventilation results in a reduction in performance and equipment damage.**

- Observe the ambient conditions!
- Keep the cooling air inlet and outlet clear!
- Observe the minimum distance of 0.5 m from obstacles!

### 2.4.1.1 In operation

**Temperature range of the ambient air:**

- -25 °C to +40 °C

**Relative air humidity:**

- Up to 50% at 40 °C
- Up to 90% at 20 °C

### 2.4.1.2 Transport and storage

**Storage in an enclosed space, temperature range of the ambient air:**

- -30 °C to +70 °C

**Relative air humidity**

- Up to 90% at 20 °C

### 3 Intended use



#### **WARNING**



##### **Hazards due to improper usage!**

**Hazards may arise for persons, animals and material objects if the equipment is not used correctly. No liability is accepted for any damages arising from improper usage!**

- The equipment must only be used in line with proper usage and by trained or expert staff!
- Do not modify or convert the equipment improperly!

### 3.1 Applications

#### 3.1.1 TIG welding

TIG welding with direct current.

Non-contact HF ignition or contact ignition with Liftarc.

#### 3.1.2 MMA welding

Manual arc welding or, for short, MMA welding. It is characterised by the fact that the arc burns between a melting electrode and the molten pool. There is no external protection; any protection against the atmosphere comes from the electrode.

### 3.2 Documents which also apply

#### 3.2.1 Warranty



*For more information refer to the "Warranty registration" brochure supplied and our information regarding warranty, maintenance and testing at [www.ewm-group.com](http://www.ewm-group.com)!*

#### 3.2.2 Declaration of Conformity



The designated machine conforms to EC Directives and standards in terms of its design and construction:

- EC Low Voltage Directive (2006/95/EC),
- EC EMC Directive (2004/108/EC),

This declaration shall become null and void in the event of unauthorised modifications, improperly conducted repairs, non-observance of the deadlines for the repetition test and / or non-permitted conversion work not specifically authorised by the manufacturer.

The original copy of the declaration of conformity is enclosed with the unit.

#### 3.2.3 Welding in environments with increased electrical hazards



In compliance with IEC / DIN EN 60974, VDE 0544 the machines can be used in environments with an increased electrical hazard.

#### 3.2.4 Service documents (spare parts and circuit diagrams)



**DANGER**



**Do not carry out any unauthorised repairs or modifications!**

**To avoid injury and equipment damage, the unit must only be repaired or modified by specialist, skilled persons!**

**The warranty becomes null and void in the event of unauthorised interference.**

- Appoint only skilled persons for repair work (trained service personnel)!

Original copies of the circuit diagrams are enclosed with the unit.

Spare parts can be obtained from the relevant authorised dealer.

#### 3.2.5 Calibration/Validation

We hereby confirm that this machine has been tested using calibrated measuring equipment, as stipulated in IEC/EN 60974, ISO/EN 17662, EN 50504, and complies with the admissible tolerances.

Recommended calibration interval: 12 months

## 4 Machine description – quick overview

### 4.1 Front view

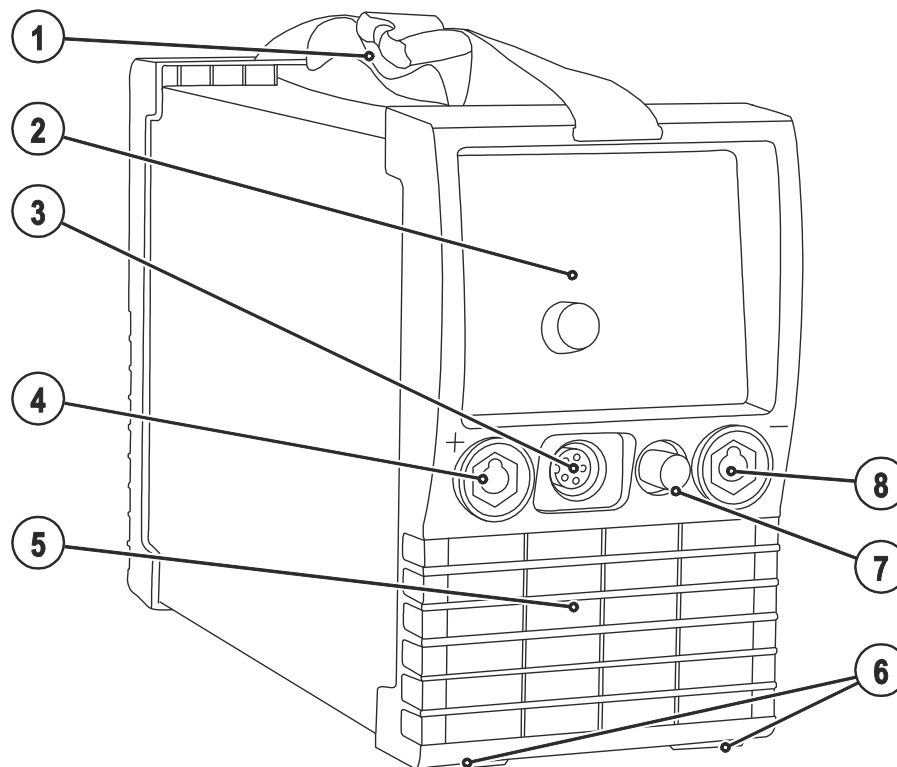






Figure 4-1

Item	Symbol	Description
1		<b>Carrying strap</b> - See 5.4.1 Adjusting the length of the carrying strap chapter
2		<b>Machine control</b> - See 4.3 Machine control – Operating elements chapter
3		<b>Connection socket, 5-pole</b> Standard TIG torch control lead
4		<b>Connection socket, "+" welding current</b> <ul style="list-style-type: none"> <li>TIG: Connection for workpiece lead</li> <li>MMA: Electrode holder or workpiece lead connection</li> </ul>
5		<b>Cooling air outlet</b>
6		<b>Machine feet</b>
7		<b>1/4" connecting nipple</b> Shielding gas connection (with yellow insulating cap) for TIG welding torch
8		<b>Connection socket, "-" welding current</b> <ul style="list-style-type: none"> <li>TIG: Welding current lead connection for TIG welding torch</li> <li>MMA: Electrode holder or workpiece lead connection</li> </ul>

## 4.2 Rear view

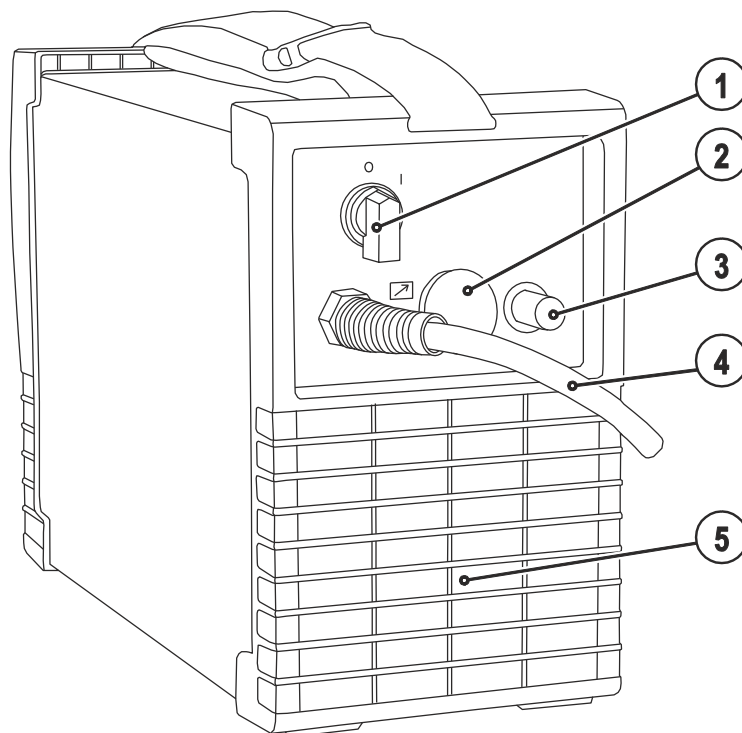


Figure 4-2

Item	Symbol	Description
1		<b>Main switch, machine on/off</b>
2		<b>Connection socket, 19-pole</b> Remote control connection
3		<b>G1/4" connecting nipple</b> Shielding gas connection on the pressure regulator.
4		<b>Mains connection cable</b> - See 5.5 Mains connection chapter
5		<b>Cooling air inlet</b>



## 4.3 Machine control – Operating elements

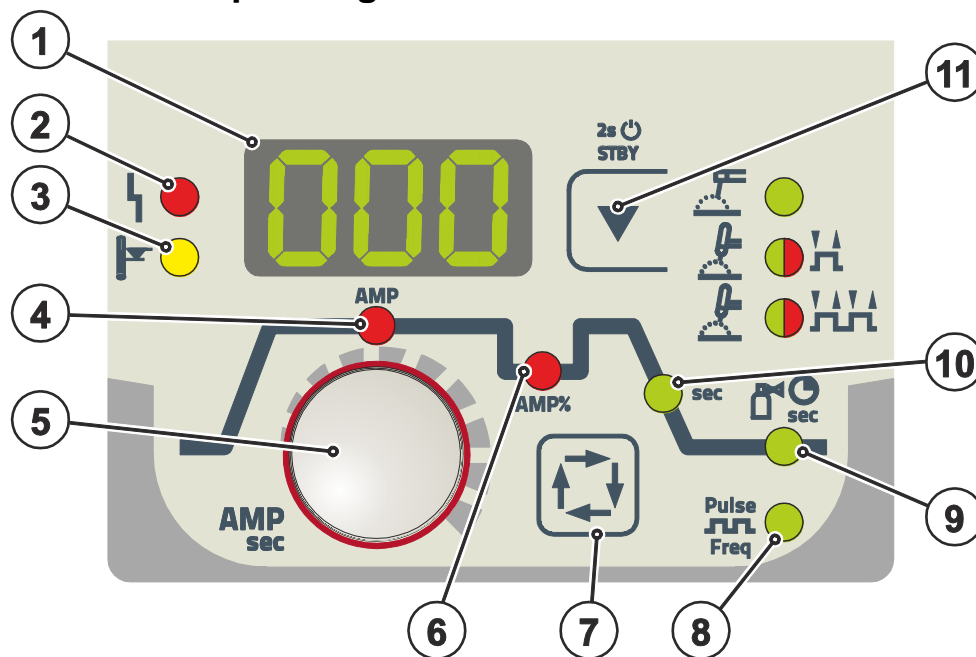













Figure 4-3

Item	Symbol	Description
1		<b>Welding data display (3-digit)</b> Displays the welding parameters and the corresponding values
2		<b>Collective interference signal light</b> For error messages, - See 7 Rectifying faults chapter
3		<b>Excess temperature signal light</b> In case of excess temperature, temperature monitors de-activate the power unit, and the excess temperature control lamp comes on. Once the machine has cooled down, welding can continue without any further measures.
4	<b>AMP</b>	<b>Main current signal light</b> Imin to Imax (1 A increments)
5		<b>Welding parameter setting rotary dial</b> Setting currents, times and parameters.
6	<b>AMP%</b>	<b>Secondary current (TIG)</b> Setting range 1 % to 200 % (1 % increments). Percentage of the main current.
7		<b>Select welding parameters button</b> This button is used to select the welding parameters depending on the welding process and operating mode used.
8		<b>Signal light, MMA pulsed welding</b> On: Function switched on Not on: Function switched off Flashing: Parameter selection and frequency setting PUL: (on) Function switched on/(off) Function switched off FrE: Frequency setting (0.2 Hz500 Hz, ex works: 1.0 Hz)
9	<b>sec</b>	<b>Gas post-flow time (TIG)</b> Setting ranges: 0.1 s to 20.0 s (0.1 s increments).
10	<b>sec</b>	<b>Down-slope time (TIG)</b> 0.00 s to 20.0 s (0.1 s increments).

Item	Symbol	Description
11		<b>Welding procedure/power-saving mode push-button</b>   MMA welding     TIG welding (non-latched operating mode)     TIG welding (latched operating mode) Signal light green: HF start (contactless) switched on (ex works) Signal light red: Liftarc (contact ignition) switched on STBY Press for 2 s to put the machine into power-saving mode. To reactivate, activate one of the operating elements.

## 5 Design and function

### 5.1 General

#### WARNING

**Risk of injury from electric shock!****Contact with live parts, e.g. welding current sockets, is potentially fatal!**

- Follow safety instructions on the opening pages of the operating instructions.
- Commissioning may only be carried out by persons who have the relevant expertise of working with arc welding machines!
- Connection and welding leads (e.g. electrode holder, welding torch, workpiece lead, interfaces) may only be connected when the machine is switched off!

#### CAUTION

**Risk of burns on the welding current connection!****If the welding current connections are not locked, connections and leads heat up and can cause burns, if touched!**

- Check the welding current connections every day and lock by turning in clockwise direction, if necessary.

**Risk from electrical current!****If welding is carried out alternately using different methods and if a welding torch and an electrode holder remain connected to the machine, the open-circuit/welding voltage is applied simultaneously on all cables.**

- The torch and the electrode holder should therefore always be placed on an insulated surface before starting work and during breaks.

#### CAUTION

**Using protective dust caps!****Protective dust caps protect the connection sockets and therefore the machine against dirt and damage.**

- The protective dust cap must be fitted if there is no accessory component being operated on that connection.
- The cap must be replaced if faulty or if lost!

### 5.2 Machine cooling

To obtain an optimal duty cycle from the power components, the following precautions should be observed:

- Ensure that the working area is adequately ventilated.
- Do not obstruct the air inlets and outlets of the machine.
- Do not allow metal parts, dust or other objects to get into the machine.

## 5.3 Workpiece lead, general

### ⚠ CAUTION



**Risk of burns due to incorrect connection of the workpiece lead!**

**Paint, rust and dirt on the connection restrict the power flow and may lead to stray welding currents.**

**Stray welding currents may cause fires and injuries!**

- Clean the connections!
- Fix the workpiece lead securely!
- Do not use structural parts of the workpiece as a return lead for the welding current!
- Take care to ensure faultless power connections!

## 5.4 Transport and installation

### ⚠ WARNING



**Risk of accident due to improper transport of machines that may not be lifted!**

**Do not lift or suspend the machine! The machine can fall down and cause injuries! The handles and brackets are suitable for transport by hand only!**

- The machine may not be lifted by crane or suspended!

### ⚠ CAUTION



**Installation site!**

**The machine must not be operated in the open air and must only be set up and operated on a suitable, stable and level base!**

- The operator must ensure that the ground is non-slip and level, and provide sufficient lighting for the place of work.
- Safe operation of the machine must be guaranteed at all times.

### 5.4.1 Adjusting the length of the carrying strap



**To demonstrate adjustment, lengthening the strap is shown in the figure. To shorten, the strap's loops must be inched in the opposite direction.**

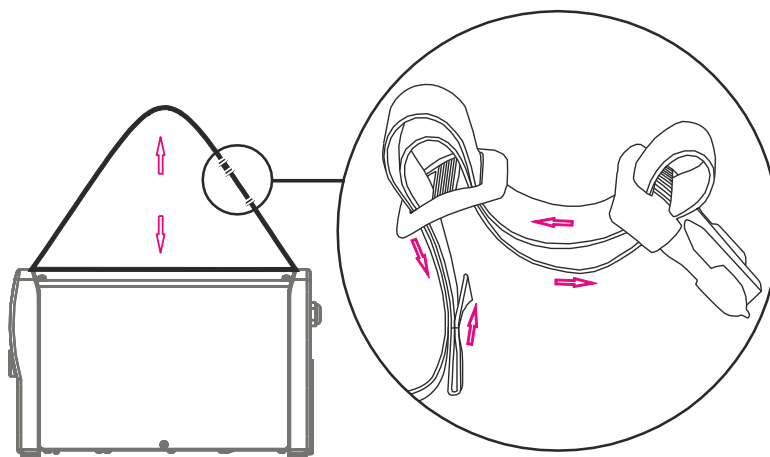


Figure 5-1

## 5.5 Mains connection



### DANGER



#### Hazard caused by improper mains connection!

An improper mains connection can cause injuries or damage property!

- Only use machine with a plug socket that has a correctly fitted protective conductor.
- If a **mains plug must be fitted, this may only be carried out by an electrician in accordance** with the relevant national provisions or regulations!
- Mains plug, socket and lead must be checked regularly by an electrician!
- When operating the generator always ensure it is earthed as stated in the operating instructions. The resulting network has to be suitable for operating devices according to protection class 1.

### 5.5.1 Mains configuration



**The machine may only be connected to a one-phase system with two conductors and an earthed neutral conductor.**

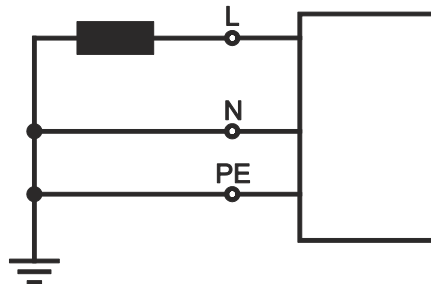


Figure 5-2

#### Legend

Item	Designation	Colour code
L	Outer conductor	brown
N	Neutral conductor	blue
PE	Protective conductor	green-yellow

### CAUTION




#### Operating voltage - mains voltage!

The operating voltage shown on the rating plate must be consistent with the mains voltage, in order to avoid damage to the machine!

- - See 8 Technical data chapter!

- Insert mains plug of the switched-off machine into the appropriate socket.

## 5.5.2 Welding data display

The machine will be calibrated for approx. 2 seconds each time it is switched on. This will be indicated by  on the display. If the machine is connected to 115 V mains voltage this is indicated by "115." for a couple of seconds.

Subsequently, the value set for the dynamic power adjustment will be displayed for approx. 3 s.

The value shown on welding data display depends on the selected parameter (current or time). After approx. 5 s the display switches back to the welding current nominal value.

Advanced parameters are shown by the alternate display of the welding parameter with the respective value (the parameter code illuminates for approx. 2 s, parameter value illuminates for approx. 2 s). After approx. 60 s the display switches back to the welding current nominal value.

In case of failures, error codes are shown on the display.

## 5.6 TIG welding

### 5.6.1 Welding torch and workpiece line connection

Prepare welding torch according to the welding task in hand (see operating instructions for the torch).

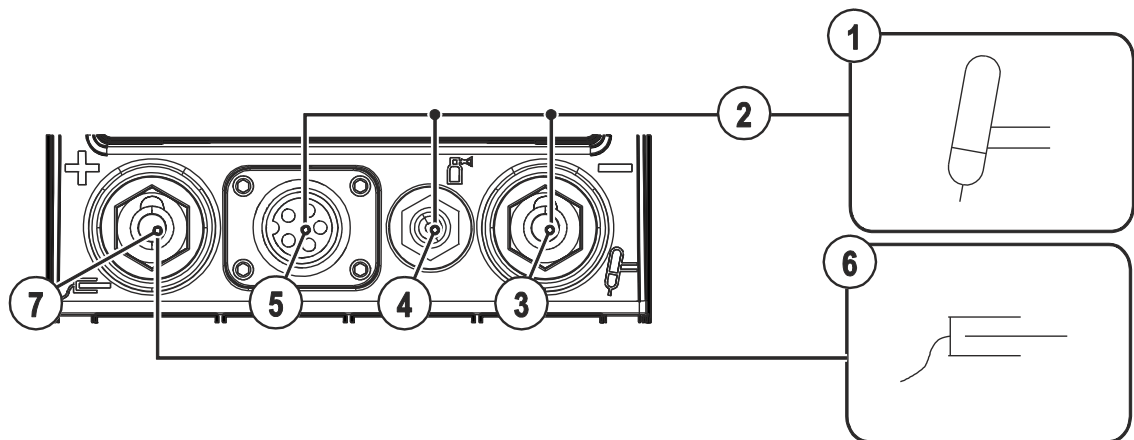
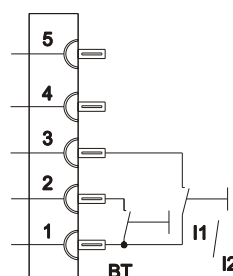


Figure 5-3

Item	Symbol	Description
1		<b>Welding torch</b>
2		<b>Welding torch hose package</b>
3		<b>Connection socket, "-" welding current</b> Welding current lead connection for TIG welding torch
4		<b>G<math>\frac{1}{4}</math>" connecting nipple</b> TIG welding torch shielding gas connection
5		<b>Connection socket, 5-pole</b> Standard TIG torch control lead
6		<b>Workpiece</b>
7		<b>Connection socket for "+" welding current</b> Workpiece lead connection

- Insert the welding current plug on the welding torch into the welding current connection socket and lock by turning to the right.
- Remove yellow protective cap on G $\frac{1}{4}$ " connecting nipple.
- Screw welding torch shielding gas connection tightly onto the G $\frac{1}{4}$ " connection nipple.
- Insert the control lead plug on the welding machine into the connection socket for the welding torch control lead (5-pole) and tighten.
- Insert the cable plug on the work piece lead into the "+" welding current connection socket and lock by turning to the right.

### 5.6.2 5-pole control lead



## 5.6.3 Shielding gas supply (shielding gas cylinder for welding machine)

### ⚠ WARNING



#### Incorrect handling of shielding gas cylinders!

**Incorrect handling of shielding gas cylinders can result in serious and even fatal injury.**

- Observe the instructions from the gas manufacturer and in any relevant regulations concerning the use of compressed air!
- Place shielding gas cylinders in the holders provided for them and secure with fixing devices.
- Avoid heating the shielding gas cylinder!

### CAUTION



#### Faults in the shielding gas supply.

**An unhindered shielding gas supply from the shielding gas cylinder to the welding torch is a fundamental requirement for optimum welding results. In addition, a blocked shielding gas supply may result in the welding torch being destroyed.**

- Always re-fit the yellow protective cap when not using the shielding gas connection.
- All shielding gas connections must be gas tight.



**Before connecting the pressure regulator to the gas cylinder, open the cylinder valve briefly to expel any dirt.**

### 5.6.3.1 Connecting the shielding gas supply

- Place the shielding gas cylinder into the relevant cylinder bracket.
- Secure the shielding gas cylinder using a securing chain.

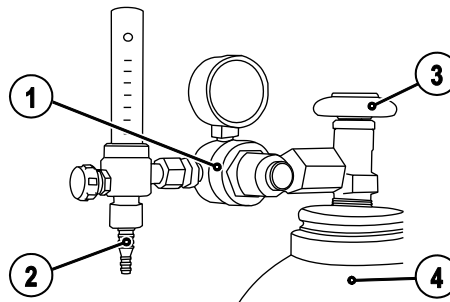


Figure 5-4

Item	Symbol	Description
1		Pressure regulator
2		Shielding gas cylinder
3		Output side of the pressure regulator
4		Cylinder valve

- Tighten the pressure regulator screw connection on the gas bottle valve to be gas-tight.
- Screw gas hose connection crown nut onto the output side of the pressure regulator.



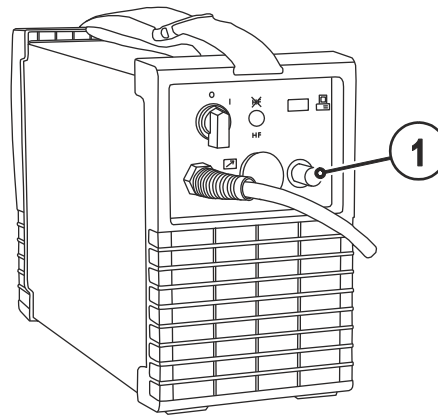



Figure 5-5

Item	Symbol	Description
1		<b>G<math>\frac{1}{4}</math>" connecting nipple</b> Shielding gas connection on the pressure regulator.

- Screw the gas hose connection nipple onto the G $\frac{1}{4}$ " connection nipple.

## 5.6.3.2 Setting the shielding gas quantity

### CAUTION



#### Electric shocks!

When setting the shielding gas quantity, high voltage ignition pulses or open circuit voltage are applied at the welding torch; these can lead to electric shocks and burning on contact.

- Keep the welding torch electrically insulated from persons, animals or equipment during the setting procedure.



#### **Incorrect shielding gas setting!**

- **If the shielding gas setting is too low or too high, this can introduce air to the weld pool and may cause pores to form.**
- **Adjust the shielding gas quantity to suit the welding task!**



























#### **Rule of thumb for the gas flow rate:**

**Diameter of gas nozzle in mm corresponds to gas flow in l/min.**

**Example: 7mm gas nozzle corresponds to 7l/min gas flow.**

- Press the torch trigger and set the shielding gas quantity with the flow gauge of the pressure regulator.

## 5.6.4 Welding task selection

Operating element	Action	Result
		<b>Select welding procedure</b>
		  MMA welding
		   TIG welding (non-latched operating mode)
		   TIG welding (latched operating mode)
		Signal light green: HF start (contactless) switched on Signal light red: Lift arc start (contact ignition) switched on
		<b>Welding current setting range</b>
		<b>Secondary current AMP% selection</b>
		<b>Secondary current setting</b> Setting range 1% to 200% (percentage depending on the main current).
		<b>Down-slope time selection</b>
		<b>Down-slope time setting sec</b> Setting range 0.0 s to 20.0 s
		<b>Gas post-flow time selection sec</b>
		<b>Gas post-flow time setting</b> Setting range 0.0 s to 20.0 s



**This completes the basic settings and you can now start welding.**

Further welding parameters, such as gas pre-flow time, are predefined for the most common applications but can be adjusted when necessary- See 5.6.10 Expert menu (TIG) chapter.

## 5.6.5 Arc ignition



**The HF ignition type is activated ex works.**

To switch the ignition type, access the machine control advanced menu- See 5.6.10 Expert menu (TIG) chapter.

### 5.6.5.1 HF ignition

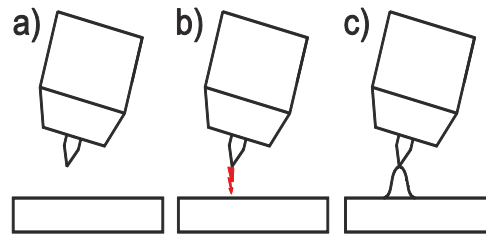


Figure 5-6

**The arc is started without contact from high-voltage ignition pulses.**

- Position the welding torch in welding position over the workpiece (distance between the electrode tip and workpiece should be approx. 2-3mm).
- Press the torch trigger (high voltage ignition pulses ignite the arc).
- Ignition current flows, and the welding process is continued depending on the operating mode selected.

**End the welding process: Release or press the torch trigger depending on the operating mode selected.**

### 5.6.5.2 Liftarc ignition

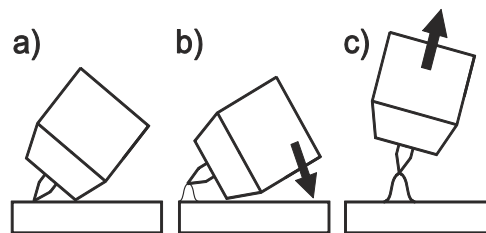


Figure 5-7

**The arc is ignited on contact with the workpiece:**

- Carefully place the torch gas nozzle and tungsten electrode tip onto the workpiece and press the torch trigger (liftarc current flowing, regardless of the main current set).
- Incline the torch over the torch gas nozzle to produce a gap of approx. 2-3 mm between the electrode tip and the workpiece. The arc ignites and the welding current is increased, depending on the operating mode set, to the ignition or main current set.
- Lift off the torch and swivel to the normal position.

**Ending the welding process: Release or press the torch trigger depending on the operating mode selected.**

## 5.6.6 TIG automatic cut-out



**The automatic cut-out function will be triggered by two conditions during the welding process:**

- During the ignition phase (ignition fault) If there is no welding current within 3s after starting the welding.**
- During the welding phase (arc interruption) If the arc is interrupted for longer than 3s.**

**In both cases, the welding machine ends the ignition or welding process immediately.**





## 5.6.7 Function sequences/operating modes

Using the welding parameter push-button and welding parameter setting rotary knob the sequence parameters are set.

By pressing the "select welding parameter" push-button for approx. 2 s you can access the advanced settings and optimise further parameters for your welding task.

- See 5.6.10 Expert menu (TIG) chapter

### 5.6.7.1 Legend

Symbol	Meaning
	Gas pre-flows (factory setting 0.5 s)
$I_{\text{start}}$	Ignition current (factory setting 20%)
$t_{\text{Up}}$	Upslope time (factory setting 1.0 s)
<b>AMP</b>	Main current (minimum to maximum current)
<b>AMP%</b>	Secondary current (1% to 200% of main current AMP)
$t_{\text{Down}}$	Downslope time
$I_{\text{end}}$	End-crater current (factory setting 20%)
	Gas post-flow time
	Press torch trigger 1
	Release torch trigger 1
<b>I</b>	Welding current
<b>t</b>	Time

## 5.6.7.2 TIG non-latched operation



*When the foot-operated remote control RTF is connected, the machine switches automatically to non-latched operation.*

*The up- and down-slopes are switched off.*

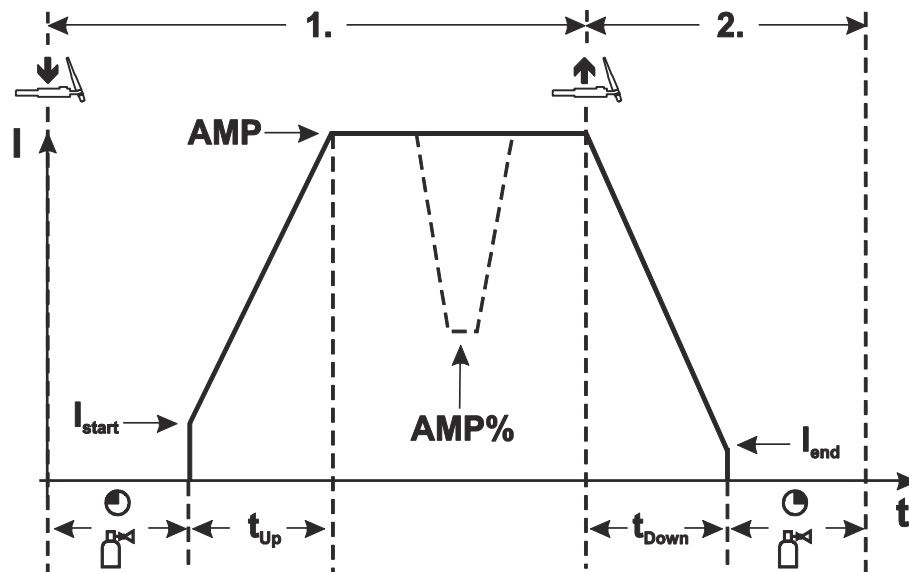


Figure 5-8

### 1st cycle:

- Press and hold torch trigger 1.
- The gas pre-flow time elapses.
- HF ignition pulses jump from the electrode to the workpiece, the arc ignites.
- The welding current flows and immediately assumes the value set for the ignition current  $I_{start}$ .
- HF is switched off.
- The welding current increases in the set up-slope time to the main current AMP.

**If torch trigger 2 is pressed together with torch trigger 1 during the main current phase, the welding current decreases to the secondary current AMP%.**

**If torch trigger 2 is released, the welding current increases again to the main current AMP.**

### 2nd cycle:

- Release torch trigger 1.
- The main current decreases in the set down-slope time to the end-crater current  $I_{end}$  (minimum current).

**If torch trigger 1 is pressed during the down-slope time, the welding current increases again to the set main current AMP.**

- The main current reaches the end-crater current  $I_{end}$ , the arc extinguishes.
- The set gas post-flow time elapses.

## 5.6.7.3 TIG latched operation

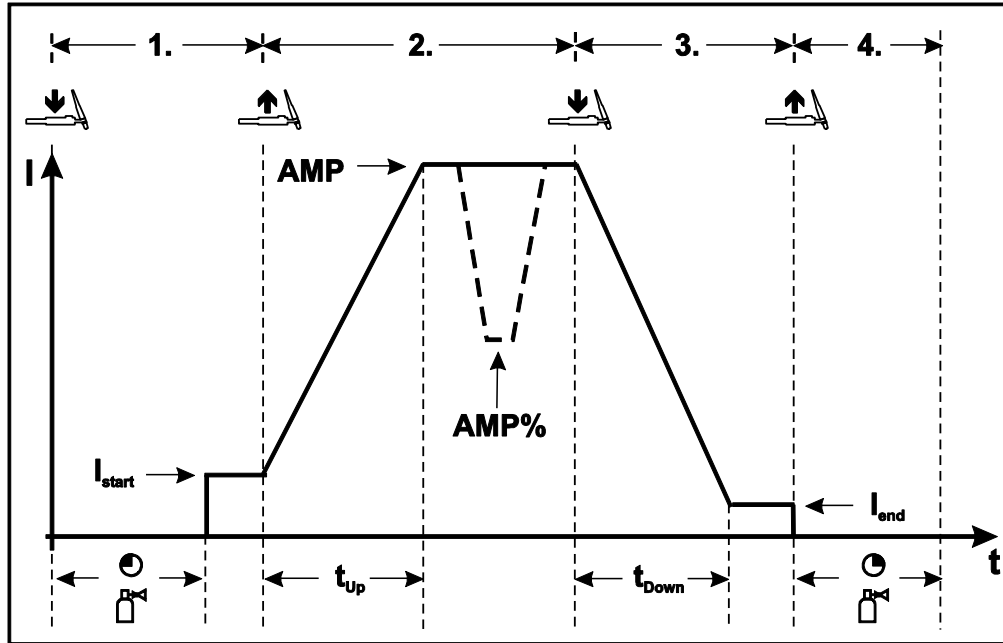


Figure 5-9

### Step 1

- Press torch trigger 1, the gas pre-flow time elapses.
- HF ignition pulses jump from the electrode to the workpiece, the arc ignites.
- Welding current flows and immediately assumes the ignition current value set (search arc at minimum setting). HF is switched off.

### Step 2

- Release torch trigger 1.
- The welding current increases with the set up-slope time to the main current AMP.

### Switching from main current AMP to secondary current AMP%:

- Press torch trigger 2 or
- Tap torch trigger 1

The slope times can be set.

### Step 3

- Press torch trigger 1.
- The main current drops with the set down-slope time to the end-crater current  $I_{end}$  (minimum current).

### Step 4

- Release torch trigger 1, the arc extinguishes.
- The set gas post-flow time begins.

### Immediate termination of the welding procedure without down-slope and end-crater current:

- Briefly press the 1st torch trigger (3rd and 4th step).  
The current drops to zero and the gas post-flow time begins.



**When the foot-operated remote control RTF is connected, the machine switches automatically to non-latched operation.**

**The up- and down-slopes are switched off.**






**To use the alternative welding start (tapping start) a double-digit torch mode (11-x) has to be set at the welding machine control. The number of torch modes available depends on the machine type. For single-digit torch modes (1-x) this function is disabled.**

## 5.6.8 Welding torch (operating variants)

Welding torches in different operating versions can be connected. The torch trigger (BRT) functions and operating elements can be customised in different modes.

**Explanation of operating element symbols:**

Symbol	Description
 BRT 1	Press torch trigger
 BRT 1	Tap torch trigger
 BRT 2	Tap torch trigger and then press

- See 5.6.9 Torch mode and up/down speed setting chapter

### 5.6.8.1 Tap torch trigger (tapping function)



***Swiftly tap the torch trigger to change the function.***

***The torch mode set determines the operating mode of the tapping function.***

## 5.6.9 Torch mode and up/down speed setting

The user has the modes 1 to 3 and modes 11 to 13 available. Modes 11 to 13 include the same function options as 1 to 3, but without tapping function for the secondary current.

The function options in the individual modes can be found in the tables for the corresponding torch types.

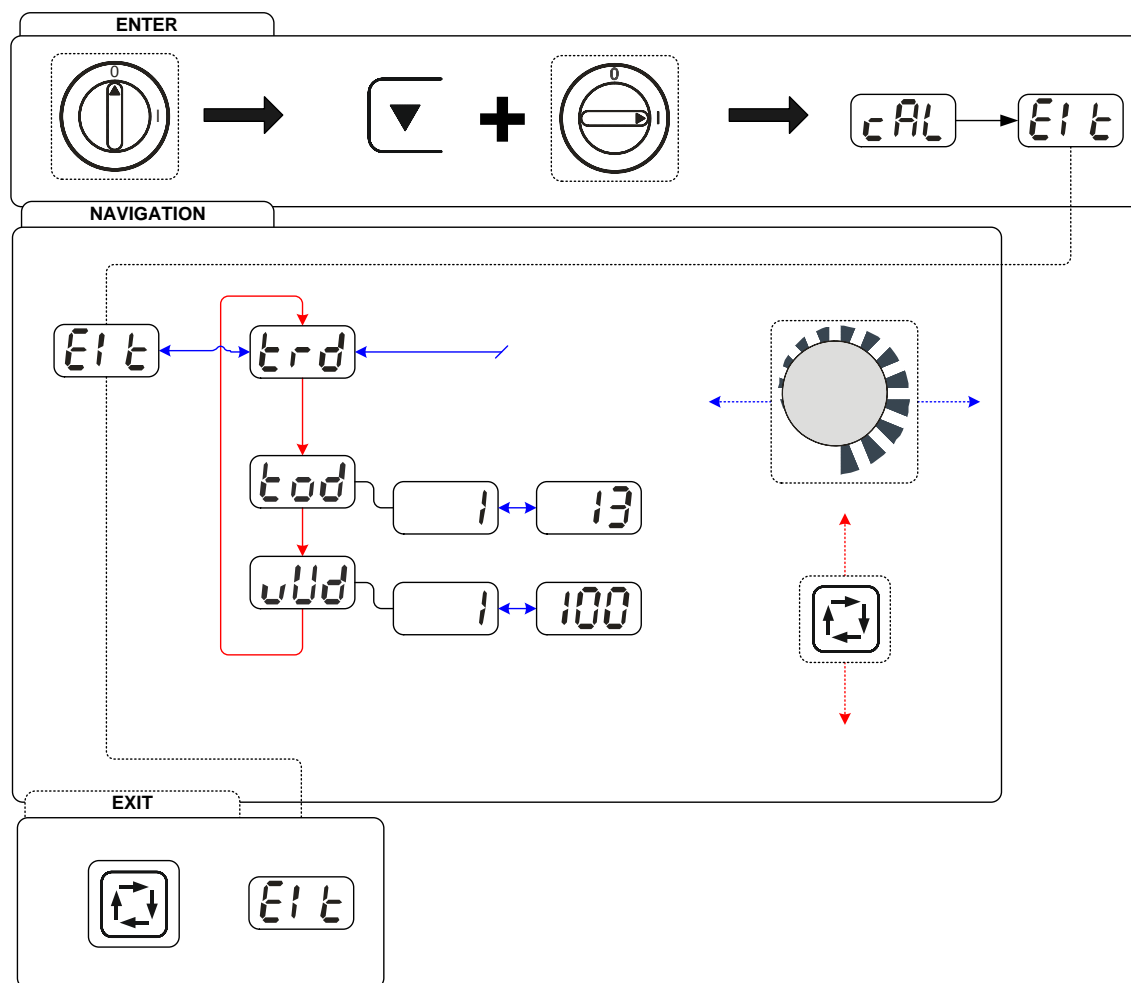



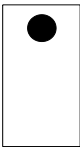


Figure 5-10

Display	Setting/selection
<b>cal</b>	<b>Calibration</b> The machine will be calibrated for approx 2 seconds each time it is switched on.
<b>El t</b>	<b>Exit the menu</b> Exit
<b>trd</b>	<b>Torch configuration menu</b> Set welding torch functions
<b>tod</b>	<b>Torch mode (factory setting 1)</b>
<b>uud</b>	<b>Up-/Down speed</b> Increase value = rapid current change (factory setting 10) Reduce value = slow current change


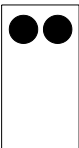
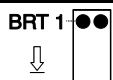
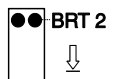
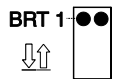
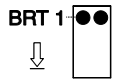
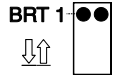
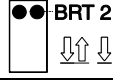
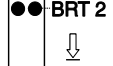


## 5.6.9.1 Standard TIG torch (5-pole)


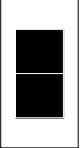
Standard torch with one torch trigger:

Diagram	Operating elements	Explanation of symbols
		BRT1 = Torch trigger 1 (welding current on/off; secondary current via tapping function)
Functions	mode	Operating elements
Welding current On/Off	1 (factory-set)	
Secondary current (Latched mode)		












Standard torch with two torch triggers:

Diagram	Operating elements	Explanation of symbols
		BRT1 = torch trigger 1 BRT2 = torch trigger 2
Functions	mode	Operating elements
Welding current On/Off	1 (factory-set)	
Secondary current		
Secondary current (tapping mode) / (latched mode)		
Welding current On/Off	3	
Secondary current (tapping mode) / (latched mode)		
Up function		
Down function		

## Standard torch with one rocker (MG rocker, two torch triggers)

Diagram	Operating elements	Explanation of symbols
		BRT 1 = torch trigger 1 BRT 2 = torch trigger 2

Functions	mode	Operating elements
Welding current On/Off	<b>1</b> (factory-set)	 BRT 1
Secondary current		 BRT 2
Secondary current (tapping mode) / (latched mode)		 BRT 1
Welding current On/Off	<b>2</b>	 BRT 1 + BRT 2
Secondary current (tapping mode)		 BRT 1 + BRT 2
Up function		 BRT 1
Down function		 BRT 2
Welding current On/Off	<b>3</b>	 BRT 1
Secondary current (tapping mode) / (latched mode)		 BRT 1
Up function		 BRT 2
Down function		 BRT 2

## 5.6.9.2 TIG pulsed welding

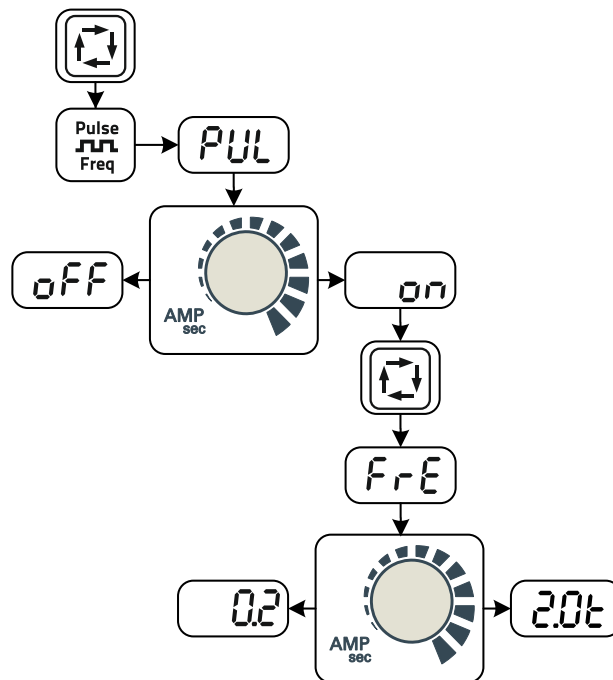


Figure 5-11

Display	Setting/selection
<b>PUL</b>	<b>Pulsed welding</b> <ul style="list-style-type: none"> <li>• On = Function switched on</li> <li>• Off = Function switched off (ex works)</li> </ul>
<b>FrE</b>	<b>Pulsed TIG welding frequency</b> Setting range: 0.2 Hz–2.0 kHz

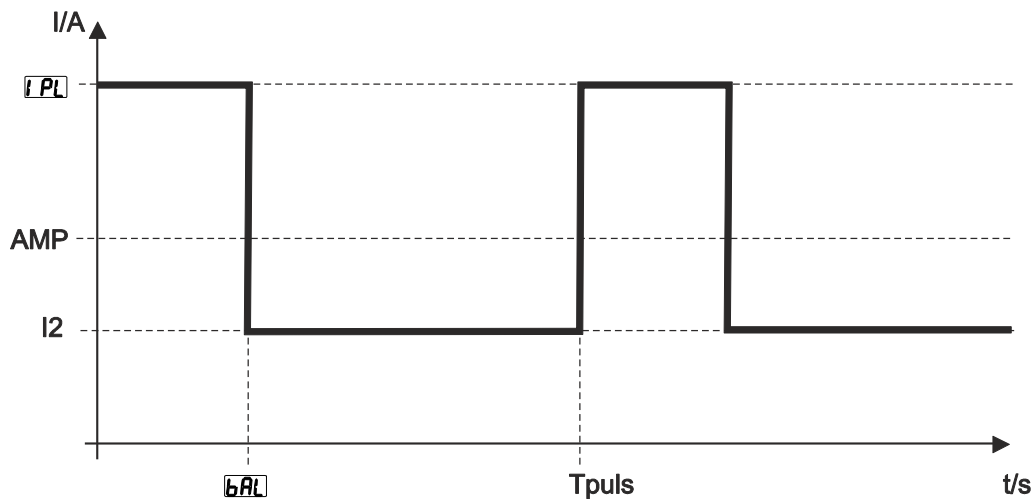


Figure 5-12

AMP = Main current; e.g. 100 A

IPL = Pulse current =  $IP1 \times AMP$ ; e.g.  $170\% \times 100 \text{ A} = 170 \text{ A}$

I2 = Pulse pause current

Tpuls = Duration of one pulse cycle =  $1/FrE$ ; e.g.  $1/1 \text{ Hz} = 1 \text{ s}$

bAL = Balance =  $bAL \times Tpuls$ ; e.g.  $30\% \times 1 \text{ s} = 0.3 \text{ s}$



**For parameter setting, - See 5.7.6 Expert menu (MMA) chapter.**



**The pulse pause current (I2) requires no setting. This value is calculated by the machine control, so that the welding current average value always corresponds to the main current selected.**

## 5.6.10 Expert menu (TIG)

- To change the advanced setting parameters, hold down the "Welding parameters" button for 2 seconds after selecting the welding process.  
The following diagram shows the setting options.

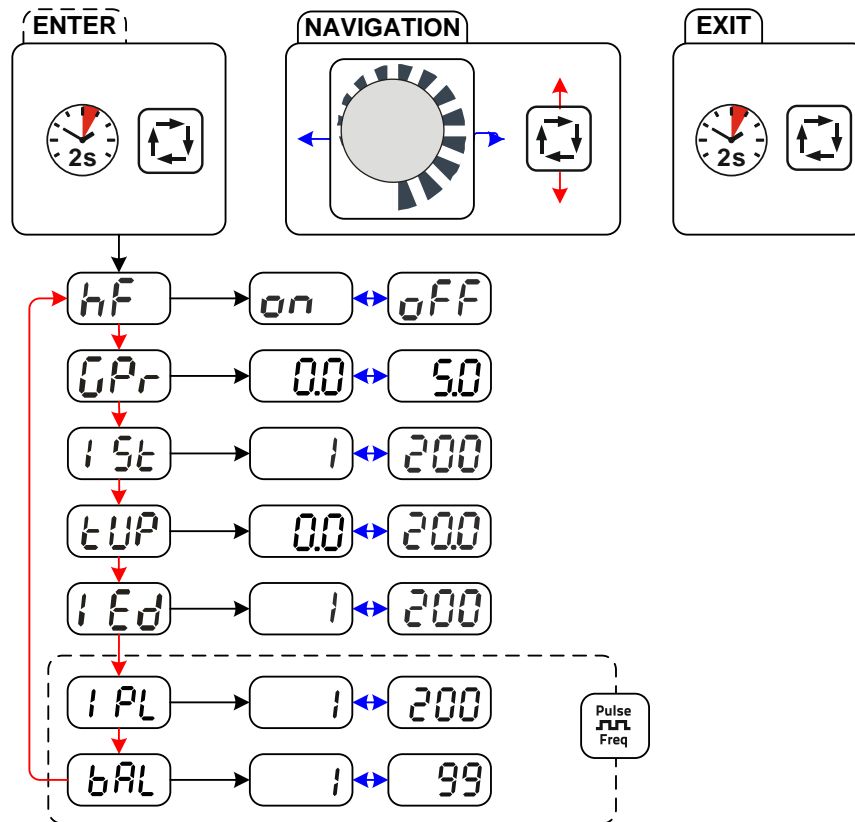


Figure 5-13

Display	Setting/selection
<b>hf</b>	<b>Switch ignition mode</b> <b>on</b> = HF ignition / <b>off</b> = Liftarc
<b>GPr</b>	<b>Gas pre-flow time</b> Setting range: 0.0 s to 5.0 s (0.1 s increments)
<b>ISt</b>	<b>Ignition current</b> Setting: 1% to 200% of main current AMP (depending on main current)
<b>tUP</b>	<b>Upslope time to main current</b> Setting: 0.0 sec. to 20.0 sec. (factory setting 1.0 sec.)
<b>lEd</b>	<b>End-crater current</b> Setting range in percent: 1 % to 200 % depending on main current
<b>lPL</b>	<b>Pulse current</b> Setting range 1%–200%
<b>bAL</b>	<b>Balance</b> Percentage of time from pulse cycle Tpuls for pulse current IP1 Setting range 1%–99%

## 5.7 MMA welding

### ⚠ CAUTION



**Risk of being crushed or burnt.**

**When replacing spent or new stick electrodes**

- Switch off machine at the main switch
- Wear appropriate safety gloves
- Use insulated tongs to remove spent stick electrodes or to move welded workpieces and
- Always put the electrode holder down on an insulated surface.

### 5.7.1 Connecting the electrode holder and workpiece lead

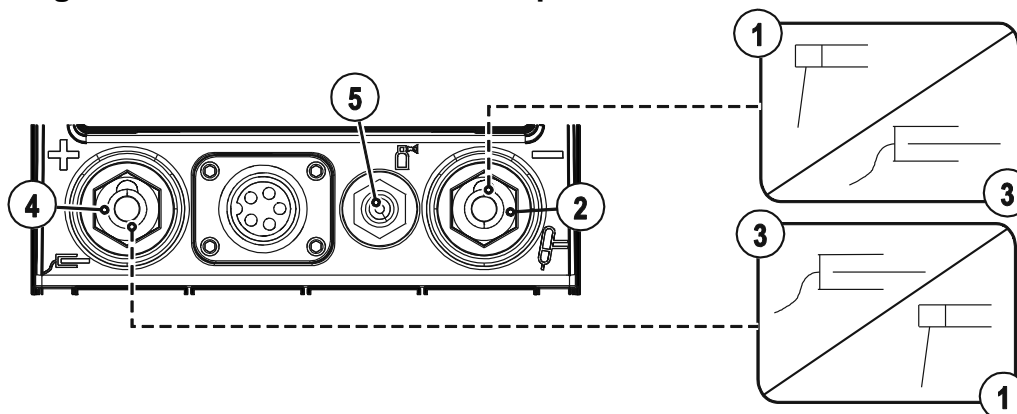


Figure 5-14





Item	Symbol	Description
1		Electrode holder
2		Connection socket, "-" welding current Workpiece lead or electrode holder connection
3		Workpiece
4		Connection socket for "+" welding current Electrode holder or workpiece lead connection
5		Connecting nipple G $\frac{1}{4}$ , shielding gas connection

- Fit yellow protective cap onto G $\frac{1}{4}$ " connecting nipple.
- Insert cable plug of the electrode holder into either the "+" or "-" welding current connection socket and lock by turning to the right.
- Insert cable plug of the workpiece lead into either the "+" or "-" welding current connection socket and lock by turning to the right.



**Polarity depends on the instructions from the electrode manufacturer given on the electrode packaging.**

## 5.7.2 Welding task selection

Operating element	Action	Result
		 MMA welding signal light illuminated
		Main current setting



**This completes the basic settings and you can now start welding.**

The optimum values for hot start current, hot start time and arcforcing are predefined ex works, but can be adjusted when necessary- See 5.7.6 Expert menu (MMA) chapter.

## 5.7.3 Hotstart

The hotstart device improves the ignition of the stick electrodes using an increased hotstart current.

After striking the stick electrode, the arc ignites with hotstart current (iht) for the preset hotstart time (tht) and then reduces to the main current (AMP).

The parameter values for hotstart current and time can be optimised for the electrode types being used.



**For parameter setting, - See 5.7.6 Expert menu (MMA) chapter.**

The hotstart device improves the ignition of the stick electrodes using an increased ignition current.

- a) = Hotstart time
- b) = Hotstart current
- I = Welding current
- t = Time

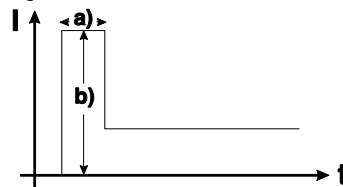


Figure 5-15

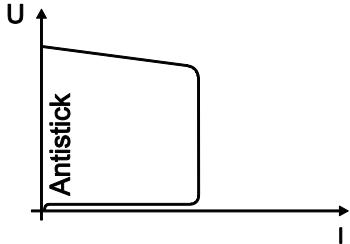
## 5.7.4 Arcforce

During the welding process, arcforce prevents the electrode sticking in the weld pool with increases in current. This makes it easier to weld large-drop melting electrode types at low current strengths with a short arc in particular.



**For parameter setting, - See 5.7.6 Expert menu (MMA) chapter.**

5.7.5 Antistick



**Anti-stick prevents the electrode from annealing.**  
If the electrode sticks in spite of the Arcforce device, the machine automatically switches over to the minimum current within about 1 second to prevent the electrode from overheating. Check the welding current setting and correct according to the welding task!

5.7.5.1 MMA pulsed welding

Welding characteristics:

- Especially suitable for root welding
- Fine-flaked weld surface with a TIG look for final passes
- Less finishing work thanks to less spatter
- Highly suitable for difficult electrodes
- Outstanding gap bridging with no sagging of the root side
- Less distortion thanks to controlled heat input

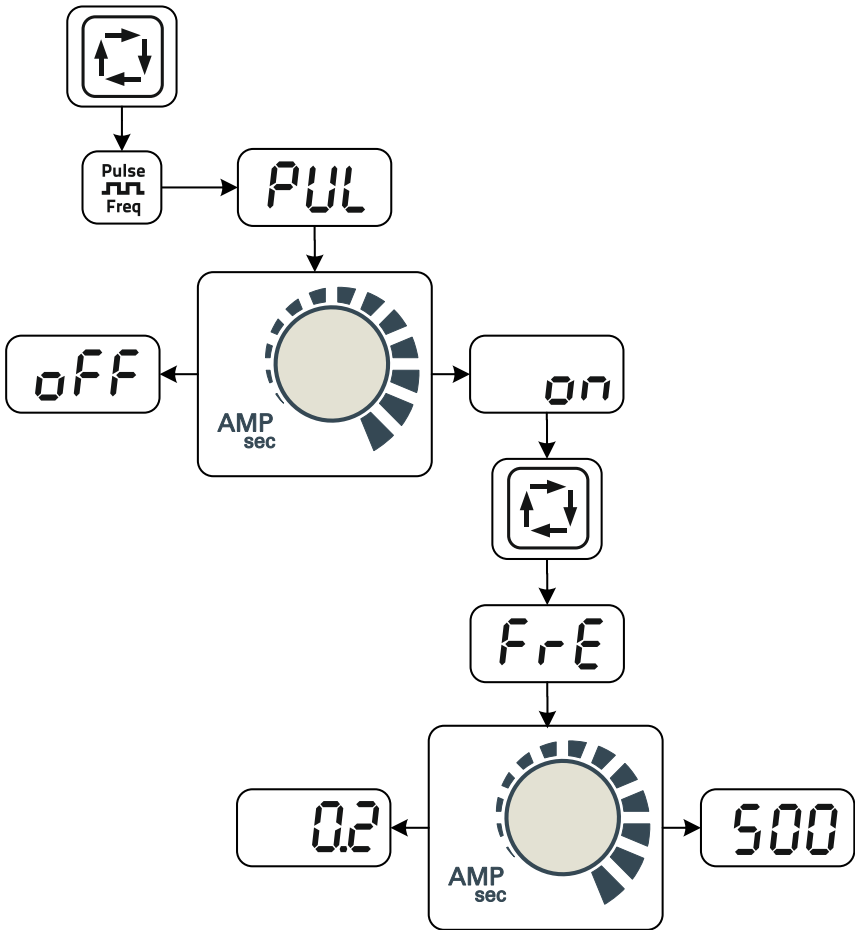


Figure 5-16

Display	Setting/selection
PUL	<b>Pulsed welding</b> <ul style="list-style-type: none"><li>• On = Function switched on</li><li>• Off = Function switched off (ex works)</li></ul>
Fr-E	<b>Frequency, MMA pulsed welding</b> Setting range 0.2 Hz to 500 Hz, 1.2 Hz ex works.



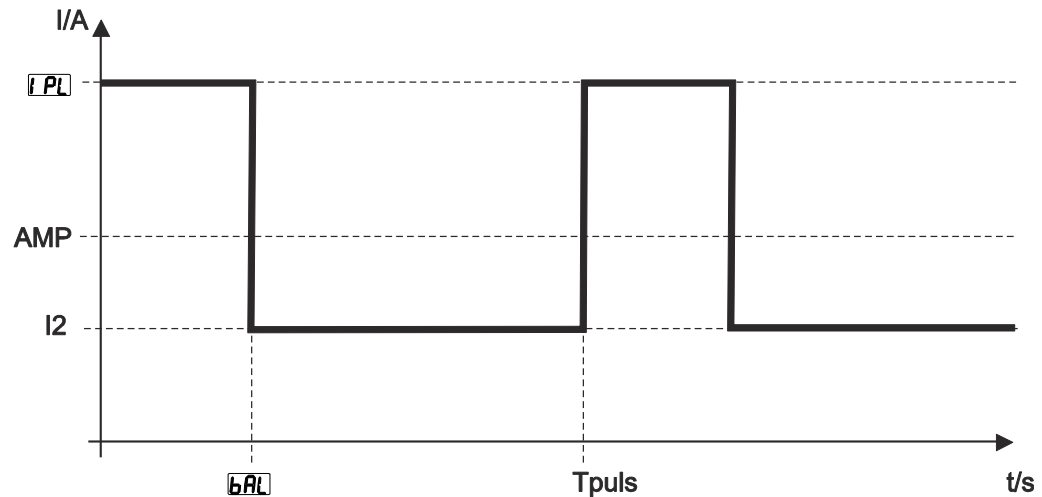


Figure 5-17

AMP = Main current; e.g. 100 A

$I_{PL}$  = Pulse current =  $IP1 \times AMP$ ; e.g.  $170\% \times 100 \text{ A} = 170 \text{ A}$

$I_2$  = Pulse pause current

$T_{puls}$  = Duration of one pulse cycle =  $1/FrE$ ; e.g.  $1/1 \text{ Hz} = 1 \text{ s}$

$bAL$  = Balance =  $bAL \times T_{puls}$ ; e.g.  $30\% \times 1 \text{ s} = 0.3 \text{ s}$

 **The pulse pause current ( $I_2$ ) requires no setting. This value is calculated by the machine control, so that the welding current average value always corresponds to the main current selected.**

 **For parameter setting, - See 5.7.6 Expert menu (MMA) chapter.**

## 5.7.6 Expert menu (MMA)



To change the advanced setting parameters, hold down the "Welding parameters" button for 2 seconds after selecting the welding process.  
The following diagram shows the setting options.

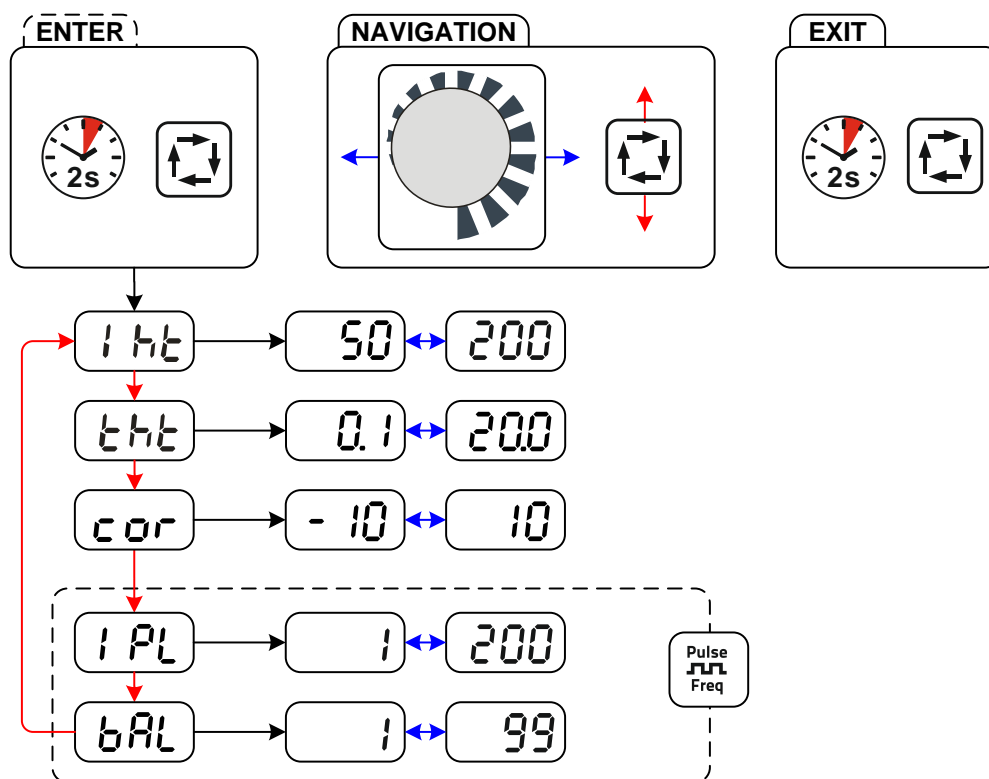


Figure 5-18

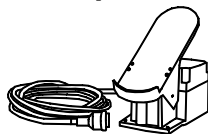
Display	Setting/selection
<b>1 ht</b>	<b>Hotstart current</b> Hotstart current setting (50 % to 200 %)
<b>t ht</b>	<b>Hotstart time</b> Hotstart time setting (0,1 s to 20,0 s)
<b>cor</b>	<b>Arcforce correction (setting -10 to 10, factory setting 0)</b> <ul style="list-style-type: none"> <li>• Increase value &gt; harder arc</li> <li>• Decrease value &gt; softer arc</li> </ul>
<b>1 PL</b>	<b>Pulse current</b> Setting range 1%–200%
<b>b AL</b>	<b>Balance</b> Percentage of time from pulse cycle Tpuls for pulse current IP1 Setting range 1%–99%

## 5.8 Remote control



*The remote controls are operated on the 19-pole remote control connection socket (analogue).*

### 5.8.1 Foot-operated remote control RTF1 19POL



#### Functions

- Infinitely adjustable welding current (0% to 100%) depending on the preselected main current on the welding machine.
- Start/stop welding operation (TIG)

### 5.8.2 Manual remote control RT1 19POL



#### Functions

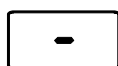
- Infinitely adjustable welding current (0% to 100%) depending on the preselected main current on the welding machine.

### 5.8.3 Multi-voltage machine (MV)

MV series machines are equipped with an automatic adaptation feature, e.g. for national mains voltages- See 8 Technical data chapter.

### 5.8.4 Power-saving mode (Standby)

You can activate the power-saving mode by either pressing the push-button for a prolonged time or by setting a parameter in the machine configuration menu (time-controlled power-saving mode).



When power-saving mode is activated, the machine displays show the horizontal digit in the centre of the display only.

Pressing any operating element (e.g. tapping the torch trigger) deactivates power-saving mode and the machine is ready for welding again.

- See 4.3 Machine control – Operating elements chapter
- See 5.9 Machine configuration menu chapter

5.9 Machine configuration menu

- ENTER (Enter the menu)**
- Switch off machine at the main switch.
  - Hold down the "Welding process" button and simultaneously switch the machine on again. Wait until the "Elt" menu item is shown and release the button.
- NAVIGATION (navigating in the menu)**
- Parameters are selected by pressing the "welding parameters" button.
  - Set or change the parameters by turning the "welding parameter setting" rotary dial.
- EXIT (Exit the menu)**
- Select the "Elt" menu item.
  - Press the "Welding parameters" button (settings will be applied, machine changes to the ready-to-operate status).

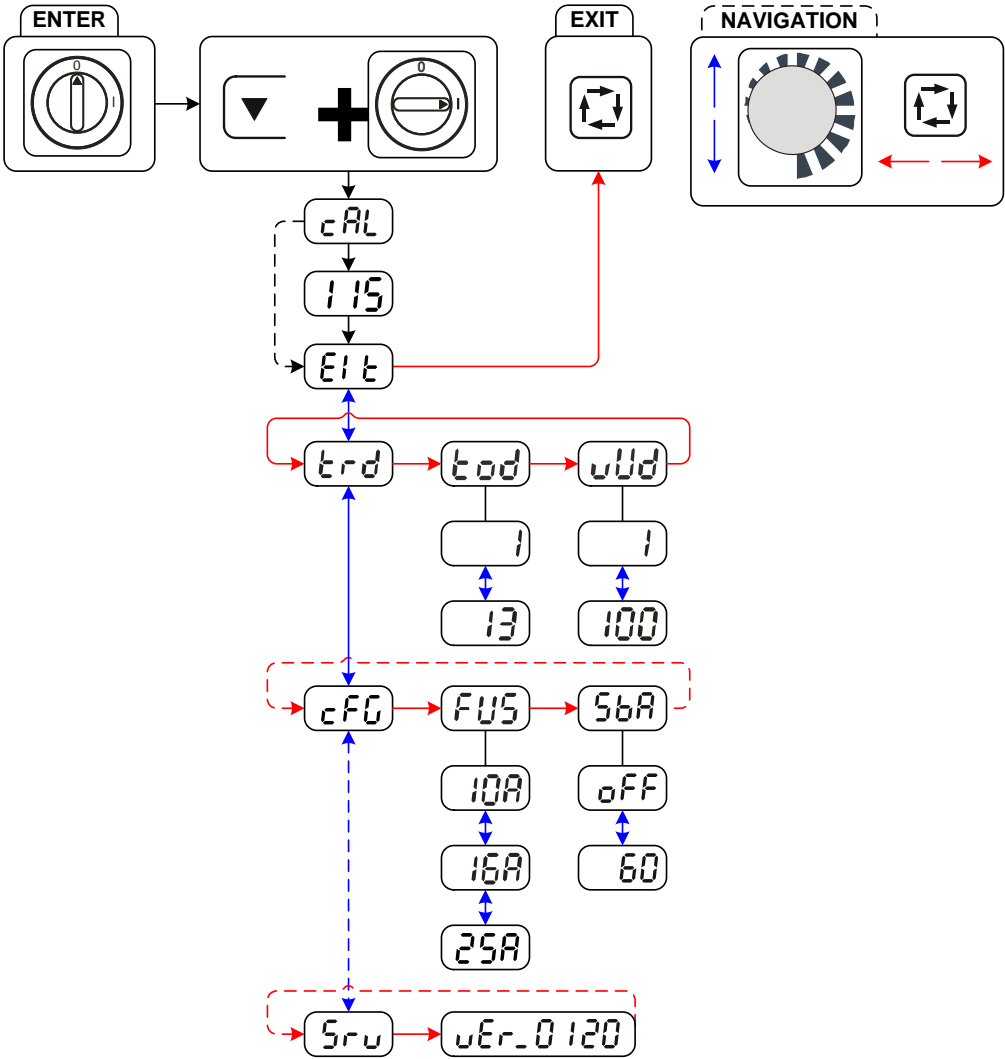














Figure 5-19

Display	Setting/selection
	<b>Calibration</b> The machine will be calibrated for approx 2 seconds each time it is switched on.
	<b>Mains voltage detection 115 V</b> Display of the detected mains voltage 115 V. No display with 230 V mains voltage.
	<b>Exit the menu</b> Exit

Display	Setting/selection
	<b>Torch configuration menu</b> Set welding torch functions
	<b>Torch mode (factory setting 1)</b>
	<b>Up-/Down speed</b> Increase value = rapid current change (factory setting 10) Reduce value = slow current change
	<b>Machine configuration</b> Settings for machine functions and parameter display
	<b>Dynamic power adjustment</b> <div>  Setting with 25 A mains fuse (with 115 V mains voltage)         </div> <div>  Setting with 20 A mains fuse (with 230 V mains voltage)         </div> <div>  Setting with 16 A mains fuse         </div> <div>  Setting with 10 A mains fuse         </div>
	<b>Time-based power-saving mode</b> <ul style="list-style-type: none"> <li>5 min.–60 min. = Time to activation of power-saving mode in case of inactivity.</li> <li>off = inactivated (ex works 20 min.)</li> </ul>
	<b>Service menu</b> Modifications to the service menu may only be carried out by authorised maintenance staff!
	<b>Software version of the machine control</b> Version display

## 6 Maintenance, care and disposal



### **DANGER**



#### **Improper maintenance and testing**

The equipment may only be cleaned, repaired or tested by specialist, skilled persons! A skilled person is one who, due to training, knowledge and experience, is able to recognise the dangers that can occur during testing of this equipment as well as possible subsequent damage and who is able to implement the required safety procedures.

- Complete all tests given in the chapter below!
- Only put the equipment back into operation following a successful test.



#### **Risk of injury from electric shock!**

**Cleaning machines that are not disconnected from the mains can lead to serious injuries!**

- Disconnect the machine completely from the mains.
- Remove the mains plug!
- Wait for 4 minutes until the capacitors have discharged!

Repair and maintenance work may only be performed by qualified authorised personnel; otherwise the right to claim under warranty is void. In all service matters, always consult the dealer who supplied the machine. Return deliveries of defective equipment subject to warranty may only be made through your dealer. When replacing parts, use only original spare parts. When ordering spare parts, please quote the machine type, serial number and item number of the machine, as well as the type designation and item number of the spare part.

### 6.1 General

When used in the specified environmental conditions and under normal operating conditions, this machine is largely maintenance-free and requires a minimum of care.

There are some points, which should be observed, to guarantee fault-free operation of your welding machine. Among these are regular cleaning and checking as described below, depending on the pollution level of the environment and the length of time the unit is in use.

### 6.2 Maintenance work, intervals

#### 6.2.1 Daily maintenance tasks

##### 6.2.1.1 Visual inspection

- Mains supply lead and its strain relief
- Gas tubes and their switching equipment (solenoid valve)
- Other, general condition

##### 6.2.1.2 Functional test

- Welding current cables (check that they are fitted correctly and secured)
- Gas cylinder securing elements
- Operating, message, safety and adjustment devices (Functional test)

#### 6.2.2 Monthly maintenance tasks


##### 6.2.2.1 Visual inspection


- Casing damage (front, rear and side walls)
- Transport elements (strap, lifting lugs, handle)

##### 6.2.2.2 Functional test

- Selector switches, command devices, emergency stop devices, voltage reducing devices, message and control lamps

### 6.2.3 Annual test (inspection and testing during operation)

 **The welding machine may only be tested by competent, capable persons!** A capable person is one who, because of his training, knowledge and experience, is able to recognise the dangers that can occur while testing welding power sources as well as possible subsequent damage and who is able to implement the required safety procedures.

 **For more information refer to the "Warranty registration" brochure supplied and our information regarding warranty, maintenance and testing at [www.ewm-group.com](http://www.ewm-group.com)!**

A periodic test according to IEC 60974-4 "Periodic inspection and test" has to be carried out. In addition to the regulations on testing given here, the relevant local laws and regulations must also be observed.

## 6.3 Disposing of equipment

 **Proper disposal!**

**The machine contains valuable raw materials, which should be recycled, and electronic components, which must be disposed of.**

- **Do not dispose of in household waste!**
- **Observe the local regulations regarding disposal!**



### 6.3.1 Manufacturer's declaration to the end user

- According to European provisions (guideline 2002/96/EG of the European Parliament and the Council of January, 27th 2003), used electric and electronic equipment may no longer be placed in unsorted municipal waste. It must be collected separately. The symbol depicting a waste container on wheels indicates that the equipment must be collected separately.  
This machine is to be placed for disposal or recycling in the waste separation systems provided for this purpose.
- According to German law (law governing the distribution, taking back and environmentally correct disposal of electric and electronic equipment (ElektroG) from 16.03.2005), used machines are to be placed in a collection system separate from unsorted municipal waste. The public waste management utilities (communities) have created collection points at which used equipment from private households can be disposed of free of charge.
- Information about giving back used equipment or about collections can be obtained from the respective municipal administration office.
- EWM participates in an approved waste disposal and recycling system and is registered in the Used Electrical Equipment Register (EAR) under number WEEE DE 57686922.
- In addition to this, returns are also possible throughout Europe via EWM sales partners.

## 6.4 Meeting the requirements of RoHS

We, EWM AG Mündersbach, hereby confirm that all products supplied by us which are affected by the RoHS Directive, meet the requirements of the RoHS (Directive 2011/65/EU).

## 7 Rectifying faults

All products are subject to rigorous production checks and final checks. If, despite this, something fails to work at any time, please check the product using the following flowchart. If none of the fault rectification procedures described leads to the correct functioning of the product, please inform your authorised dealer.

### 7.1 Checklist for rectifying faults



**The correct machine equipment for the material and process gas in use is a fundamental requirement for perfect operation!**

Legend	Symbol	Description
	↗	Fault/Cause
	✕	Remedy

#### Functional errors

- ↗ Machine control without displaying the signal lights after switching on
  - ✕ Phase failure > check mains connection (fuses)
- ↗ No welding performance
  - ✕ Phase failure > check mains connection (fuses)
- ↗ Connection problems
  - ✕ Make control lead connections and check that they are fitted correctly.

#### No arc ignition

- ↗ Incorrect ignition type setting.
  - ✕ Set ignition type changeover switch to the HF ignition setting.

#### Bad arc ignition

- ↗ Material inclusions in the tungsten electrode due to contact with filler material or workpiece
  - ✕ Regrind or replace the tungsten electrode
- ↗ Bad current transfer on ignition
  - ✕ Check the setting on the "Tungsten electrode diameter/Ignition optimisation" rotary dial and increase if necessary (higher ignition energy).

#### Welding torch overheated

- ↗ Loose welding current connections
  - ✕ Tighten power connections on the torch and/or on the workpiece
  - ✕ Tighten contact tip correctly
- ↗ Overload
  - ✕ Check and correct welding current setting
  - ✕ Use a more powerful welding torch

#### Unstable arc


- ↗ Material inclusions in the tungsten electrode due to contact with filler material or workpiece
  - ✕ Regrind or replace the tungsten electrode
- ↗ Incompatible parameter settings
  - ✕ Check settings and correct if necessary

#### Pore formation

- ↗ Inadequate or missing gas shielding
  - ✕ Check shielding gas setting and replace shielding gas cylinder if necessary
  - ✕ Shield welding site with protective screens (draughts affect the welding result)
  - ✕ Use gas lens for aluminium applications and high-alloy steels
- ↗ Unsuitable or worn welding torch equipment
  - ✕ Check size of gas nozzle and replace if necessary
- ↗ Condensation (hydrogen) in the gas tube
  - ✕ Purge hose package with gas or replace



## 7.2 Machine faults (error messages)

 **A welding machine error is indicated by the collective fault signal lamp (A1) lighting up and an error code (see table) being displayed in the machine control display. In the event of a machine error, the power unit shuts down.**

 **The display of possible error numbers depends on the machine version (interfaces/functions).**

- If multiple errors occur, these are displayed in succession.
- Document machine errors and inform service staff as necessary.

Error message	Possible cause	Remedy
E 0	Start signal set in the event of errors	Do not press the torch trigger or the foot-operated remote control
E 4	Temperature error	Allow the machine to cool down
E 5	Mains overvoltage	Switch off the machine and check the mains voltage
E 6	Mains undervoltage	
E 7	Electronics error	Switch the machine on and off again.
E 9	Secondary overvoltage	If the error persists, notify service department
E12	Voltage reduction error (VRD)	
E13	Electronics error	
E14	Adjustment error in current recording	Switch off the machine, place the electrode holder in an insulated position and switch the machine back on. If the error persists, notify service department
E15	Error in on of the electronics supply voltages	Switch the machine off and on again. If the error persists, notify service department
E23	Temperature error	Allow the machine to cool down
E32	Electronics error	Switch the machine on and off again. If the error persists, notify service department
E33	Adjustment error in voltage recording	Switch off the machine, place the electrode holder in an insulated position and switch the machine back on. If the error persists, notify service department
E34	Electronics error	Switch the machine on and off again. If the error persists, notify service department
E37	Temperature error	Allow the machine to cool down
E40	Motor fault	Check wire feed unit, switch the machine off and on again, inform the service department if the fault persists.
E55	Failure of a mains phase	Switch off the machine and check the mains voltage
E58	Short circuit in welding circuit	Switch off machine and check welding current leads for correct installation, e.g., put down electrode holder in an electrically insulated manner, disconnect degausser current lead.

### 7.3    Resetting welding parameters to the factory settings

 *All customised welding parameters that are stored will be replaced by the factory settings.*

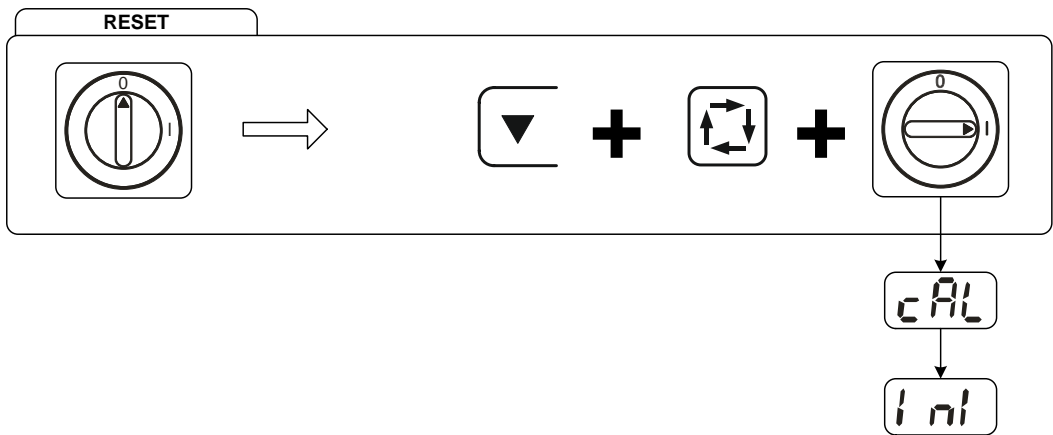






Figure 7-1

Display	Setting/selection
	<b>Calibration</b> The machine will be calibrated for approx 2 seconds each time it is switched on.
	<b>Initialising</b> Keep the push-button pressed until "InI" is shown on the display.
	<b>Input confirmation</b> User entries are applied, release button(s).

### 7.4    Display machine control software version

 *The query of the software versions only serves to inform the authorised service staff. It is available in the machine configuration menu.*

### 7.5    Dynamic power adjustment

 *This requires use of the appropriate mains fuse.  
Observe mains fuse specification- See 8 Technical data chapter!*

The dynamic power adjustment automatically adjusts the welding performance to an uncritical level for the fuse.

The dynamic power adjustment can be set in three increments in the machine configuration menu using parameter "FUS": 25 A, 16 A, 10 A.

The currently selected value will be shown on the "cal" section of the display for three seconds after the machine has been switched on.

## 8 Technical data



*Performance specifications and guarantee only in connection with original spare and replacement parts!*

### 8.1 Picotig 200 MV

with connection voltage	230 V		115 V	
Setting range	TIG	MMA	TIG	MMA
Welding current	5 A–200 A	5 A–150 A	5 A–150 A	5 A–110 A
Welding voltage	10.2 V–18.0 V	20.2 V–26 V	10.2 V–16.0 V	20.2 V–24.4 V
Duty cycle (DC) at 25 °C	200 A/25% 150 A/60% 120 A/100%	150 A (50%) 120 A (100%)	150 A/35% 120 A/60% 100 A/100%	110 A/40 % 90 A/60% 80 A/100%
Duty cycle (DC) at 40 °C	200 A/25 % 150 A/60% 120 A/100%	150 A/35% 120 A/60% 100 A/100%	150 A/35% 120 A/60% 100 A/100%	110 A/35% 90 A/60% 80 A/100%
Load cycle	10 min. (60% DC $\triangle$ 6 min. welding, 4 min. pause)			
Open circuit voltage	90 V			
Mains voltage (tolerances)	1 x 230 V (-20% to +15%)		1 x 115 V (-15% to +15%)	
Frequency	50/60 Hz			
Mains fuse (safety fuse, slow-blow)	1 x 16 A		1 x 25 A	
Mains connection lead	H07RN-F3G2,5			
Max. connected load	6.0 kVA	6.4 kVA	4.1 kVA	4.5 kVA
Recommended generator rating	8.6 kVA		6.1 kVA	
cos $\phi$ /efficiency	0.94/86%			
Insulation class/protection classification	H/IP 23			
Ambient temperature	-25 °C to +40 °C			
Machine cooling	Fan			
Torch cooling	Gas			
Workpiece lead	35 mm <sup>2</sup>			
Dimensions L/W/H	428 x 181 x 294 mm			
Weight	9.8 kg			
EMC class	A			
Constructed to standard	IEC 60974-1, -3, -10 S / C €			

## 9 Accessories



*Performance-dependent accessories like torches, workpiece leads, electrode holders or intermediate hose packages are available from your authorised dealer.*

### 9.1 Transport systems

Type	Designation	Item no.
Trolley 35-1	Transport vehicle	090-008629-00000

### 9.2 Options

Type	Designation	Item no.
ON Filter MV/Tetrix 200	Dirt filter for air inlet	092-002547-00000

### 9.3 Remote controls and accessories

Type	Designation	Item no.
RT1 19POL	Remote control current	090-008097-00000
RTF1 19POL 5 M	Foot-operated remote control current with connection cable	094-006680-00000
RA5 19POL 5M	Remote control e.g. connection cable	092-001470-00005
RA10 19POL 10M	Remote control e.g. connection cable	092-001470-00010
RA20 19POL 20M	Remote control e.g. connection cable	092-001470-00020
RV5M19 19POLE 5M	Extension cable	092-000857-00000

### 9.4 General accessories

Type	Designation	Item no.
DMDIN TN 200B AR/MIX 35L	Manometer pressure regulator	094-000009-00000
GH 2X1/4" 2M	Gas hose	094-000010-00001
ADAP CEE16/SCHUKO	Earth contact coupling/CEE16A plug	092-000812-00000

## 10 Appendix A

### 10.1 Overview of EWM branches

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