

# NAVIGATOR 2500 / 3000

Brugsanvisning  
Instruction manual  
Betriebsanleitung  
Manuel d'instruction  
Bruksanvisning  
Manuale d'istruzione



# MIGATRONIC

Valid from 0248

50113117 B

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**EC DECLARATION OF CONFORMITY**

MIGATRONIC A/S  
 Aggersundvej 33  
 9690 Fjerritslev  
 Denmark

hereby declare that our machine as stated below

Type: NAVIGATOR 2500 / 3000  
 As of week 40, 2001

conforms to directives 73/23/EEC and 89/336/EEC.

European Standards: EN60974-1  
 EN50199

Issued in Fjerritslev on 1st October 2001.

Peter Roed  
 Managing director

## ENGLISH



### WARNING



Arc welding and cutting can be dangerous to the user, people working nearby, and the surroundings if the equipment is handled or used incorrectly. Therefore, the equipment must only be used under the strict observance of all relevant safety instructions. In particular, your attention is drawn to the following:

#### Electricity

- The welding equipment must be installed according to safety regulations and by a properly trained and qualified person.
- Avoid all contact with live components in the welding circuit and with electrodes and wires if you have bare hands. Always use dry welding gloves without holes.
- Make sure that you are properly and safely earthed (e.g. use shoes with rubber sole).
- Use a safe and stable working position (e.g. avoid any risk of accidents by falling).
- Make sure that the welding equipment is correctly maintained. In the case of damaged cables or insulation work must be stopped immediately in order to carry out repairs.
- Repairs and maintenance of the equipment must be carried out by a properly trained and qualified person.

#### Light and heat emissions

- Protect the eyes as even a short-term exposure can cause lasting damage to the eyes. Use a welding helmet with suitable radiation protection glass.
- Protect the body against the light from the arc as the skin can be damaged by welding radiation. Use protective clothes, covering all parts of the body.
- The place of work should be screened, if possible, and other persons in the area warned against the light from the arc.

#### Welding smoke and gases

- The breathing in of the smoke and gases emitted during welding is damaging to health. Make sure that any exhaust systems are working properly and that there is sufficient ventilation.

#### Fire hazard

- Radiation and sparks from the arc represent a fire hazard. As a consequence, combustible materials must be removed from the place of welding.
- Working clothing should also be secure against sparks from the arc (e.g. use a fire-resistant material and watch out for folds and open pockets).

#### Noise

- The arc generates surface noise according to welding task. In some cases, use of hearing aids is necessary.

Use of the machine for other purposes than it is designed for (e.g. to unfreeze water pipes) is strongly deprecated. If occasion should arise this will be carried out without responsibility on our part.

**Read this instruction manual carefully  
before the equipment is installed and in operation**

### Electromagnetic emissions and the radiation of electromagnetic disturbances

This welding equipment for industrial and professional use is in conformity with the European Standard EN50199. The purpose of this standard is to prevent the occurrence of situations where the equipment is disturbed or is itself the source of disturbance in other electrical equipment or appliances. The arc radiates disturbances, and therefore, a trouble-free performance without disturbances or disruption, requires that certain measures are taken when installing and using the welding equipment. The user must ensure that the operation of the machine does not occasion disturbances of the above mentioned nature.

The following shall be taken into account in the surrounding area:

1. Supply and signalling cables in the welding area which are connected to other electrical equipment.
2. Radio or television transmitters and receivers.
3. Computers and any electrical control equipment.
4. Critical safety equipment e.g. electrically or electronically controlled guards or protective systems.
5. Users of pacemakers and hearing aids etc.
6. Equipment used for calibration and measurement.
7. The time of day that welding and other activities are to be carried out.

8. The structure and use of buildings.

If the welding equipment is used in a domestic establishment it may be necessary to take special and additional precautions in order to prevent problems of emission (e.g. information of temporary welding work).

Methods of reducing electromagnetic emissions:

1. Avoid using equipment which is able to be disturbed.
2. Use short welding cables.
3. Place the positive and the negative cables close together.
4. Place the welding cables at or close to floor level.
5. Remove signalling cables in the welding area from the supply cables.
6. Protect signalling cables in the welding area, e.g. with selective screening.
7. Use separately-insulated mains supply cables for sensitive electronic equipment.
8. Screening of the entire welding installation may be considered under special circumstances and for special applications.

## MACHINE PROGRAMME

NAVIGATOR 2500/3000 is a line of welding machines, especially designed for welding in e.g. the sheet metal and tube industries.

There are several versions of the machine: *MMA*, *TIG DC* and *TIG AC/DC*. DC stands for welding with direct current. AC stands for welding with alternating current.

All versions are designed for welding with coated electrodes and are equipped with antifreeze, adjustable arc power and hot-start. Moreover, the machine can be used for pulse welding with the possibility of setting of pulse time, pause time and base amp.

In TIG welding the following functions are included:

- adjustable slope up and slope-down
- adjustable gas pre-flow and gas post-flow time
- adjustable start Amp and stop Amp
- adjustable reduced current
- choice of 2-times-, 4-times- and spot welding
- LIFTIG
- HF-TIG
- connection and disconnection of pilot arc
- AC-balance
- AC welding frequency
- digital display
- current control from the TIG torch handle
- remote control facility (option)
- programming of up to ten welding settings

In LIFTIG ignition the TIG arc is ignited after making contact between the workpiece and the tungsten electrode, after which the trigger is activated and the arc established by lifting the electrode away from the workpiece.

In HF-TIG ignition the TIG arc is ignited without contact. A high-frequency (HF) impulse initiates the arc when the trigger is activated.

### Transportation equipment

The MIGATRONIC programme includes a transport trolley which can be used for all versions.

### Welding hoses

The machine can be equipped with TIG welding hoses, electrode holders and return current cables from the MIGATRONIC programme. If an adjustable TIG torch is used, the welding current can be adjusted from the torch.

### External adjustment (option)

Remote control and foot control units can be delivered to NAVIGATOR 2500/ 3000.

### Torch cooling module (option)

An integrated torch cooling module can be delivered which enables use of watercooled TIG welding torches from the MIGATRONIC programme.

## CONNECTION AND OPERATION

### Lift instructions

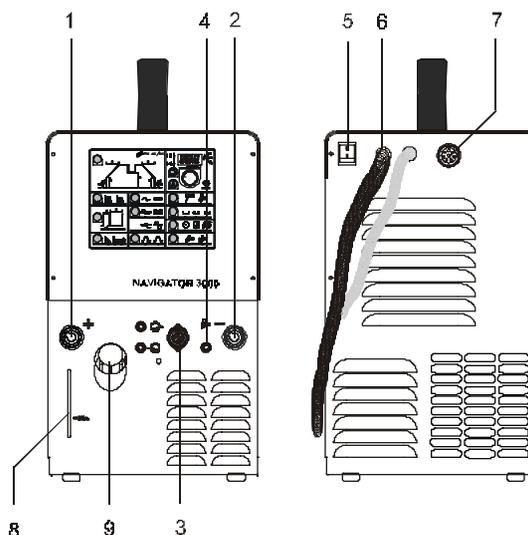


### Mains connection

NAVIGATOR 2500/3000 is designed for connection to the mains voltage mentioned on the type plate. After the mains plug has been connected to the mains cable (6) the machine is ready for use. Please note that all cable connections must be made by authorised and qualified staff. Switch on and off the machine by means of the breaker on the rear of the machine (5).

### Configuration

MIGATRONIC disclaims all responsibility for damaged cables and other damages related to welding with under sized welding torch and welding cables measured by welding specifications e.g. in relation to permissible load.



### Gas connection

Connect the machine to the gas system by means of a gas flow control.

### Connection of welding cables

Connect the welding cables and the return current cable to the front of the machine (1 and 2). Please note that the plug must be turned 45 degrees after insertion into the socket - otherwise the plug can be damaged due to excessive contact resistance.

Connect always the TIG connection in the minus (-) tap (2) and the return current cable in the plus (+) tap (1).

The control signals from the TIG torch are transformed to the machine through the circular 7-poled plug (3). When the plug has been assembled please secure it by turning the "circulator" clockwise. Connect the gas hose to the quick connection (4).

Electrodes are marked with a polarity on the packing. Mount the electrode tongs in accordance with this marking to the plus/minus taps of the machine (1 and 2).

#### **Connection of external adjustment (option)**

Connect the remote control unit on the rear of the machine on the circular 8-poled plug (7).

#### **Control of cooling liquid**

If the machine is delivered with an integrated torch cooling module, it will be necessary to inspect the cooling liquid level by means of the level control (8). Refillment of cooling liquid takes place through the filler neck (9).

#### **Usage of the machine (NAVIGATOR 3000)**

When welding, heating of various components of the machine takes place and during breaks these components will cool down again.

It must be ensured that the air intake and outlet are not blocked.

It is not possible to overload the machine in normal use, and there is no need for cooling down periods at current settings up to 190 Amps. When the machine is set for welding currents higher than these, there will be a need for periods during which the machine can cool down.

The length of these periods depends on the current setting, and the machine should not be switched off during cooling to avoid stop of the cooling fan. If the periods for cooling down during use of the machine are not sufficiently long, the overheating protection will automatically stop the welding process and the yellow LED will come on. The yellow LED switches off when the machine has cooled down sufficiently, and the machine is ready for welding.

Max. load is:

100 % max. load	190 A
60 % max. load	240 A
25 % max. load	300 A

60 % max. load when MMA welding means that a cooling period of 4 minutes after welding for 6 minutes is required at a current setting of 240 A, 10 minutes between start of each welding period must be calculated in connection with the above table.

## **MAINTENANCE**

Insufficient maintenance may result in reduced operational reliability and in lapse of guarantee.

The NAVIGATOR 2500/3000 welding machines require virtually no maintenance. However, exposure to extremely dusty, damp or corrosive air is damaging to welding machines.

#### **Periodical maintenance**

In order to prevent problems arising, the following procedure should be observed at least once a year or as required.

- disconnect the machine from the mains supply and wait 2 minutes before removing the front panels.
- clean the fan blades and the components in the cooling pipe with clean, dry, compressed air.
- drain the cooling liquid out of the cooling module and welding hoses. Remove dirt and flush with pure water in the tank and cooling hoses. Fill up with new cooling liquid. The machine is delivered with a cooling liquid of type propylene glycol in the ratio 1:3 which provides an anti-freeze solution up to -10°C.



## Overheating

The overheating indicator is alight or flashes on and off with a yellow light if welding is interrupted due to overheating of the machine. The indicator remains illuminated 5 seconds after the overheating error is removed. Please read chapter conc. "fault indication".

## Mains error

The mains error indicator is illuminated with red if the mains voltage is too high or low. The indicator remains illuminated 5 seconds after the mains error is corrected so short-term errors on the mains voltage can be noticed by the welder. Please see paragraph conc. fault indication.



### Welding process

This display is used to select the welding process, e.g. MMA electrode or TIG. The function is fixed during welding, and shift from TIG to MMA is not possible before the post-flow has been finished.

### MMA electrode

MMA electrode welding has been selected.

### TIG

TIG welding has been selected.



### Function of the torch trigger

(The trigger method)

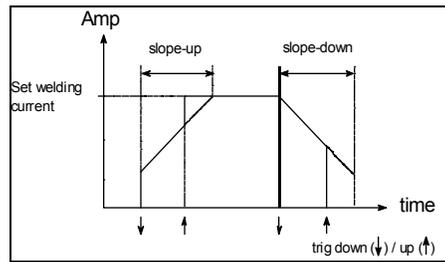
This display is used to decide whether the start/stop method of the TIG welding process is to be two-times, four-times (latching), or spot. Welding process means the phases: pre-flow, slope-up, welding with adjusted current, if necessary, reduced current, slope-down and post-flow. It is not possible to change trigger method during the welding process.

### Two-times

The welding process begins by pressing the torch trigger. Welding continues until the trigger is released again which effects the slope-down period. The machine can be reactivated during slope-down and gas post-flow.

### Four-times

The welding process begins by pressing the torch trigger. Releasing the torch trigger during gas pre-flow activates the slope-up period. If the torch trigger is released during the slope-up period welding continues with the adjusted welding current. In order to stop the welding process the trigger must be pressed again after which the slope-down period begins. The slope-down period can be stopped by releasing the trigger.



## Spot

The welding process begins by pressing the torch trigger. Welding stops automatically, depending on the time set in spot time.



### Amp setting function

The keypad is used to select the method by which the required welding current shall be established. This adjustment method cannot be changed during the welding process.



### Internal adjustment

The control knob positioned below the digital display is used to set the current.



### External adjustment

Current setting to be by means of a Migatronic remote control unit. The remote control unit is connected to a plug positioned on the rear of the machine (not standard equipment).



### Torch adjustment

Current setting to be by means of the current control knob located in the handle of a Migatronic dialog torch, if a dialog torch is used. The maximum current is set with the control knob on the front panel. The torch control is used to reduce the current from the maximum set current to the minimum current.



### Ignition of TIG welding

It is possible to choose between two different methods of ignition for TIG welding: High-frequency (HF) and LIFTIG ignition. The method of ignition cannot be changed during the welding process.



### Two-stroke

This symbol means contact-free striking. The arc is established in the following way:

- 1) The torch is placed so that the Tungsten electrode is quite close to the welding spot (1 or 2 mm).
- 2) The torch trigger is activated, and the high voltage generator of the machine will produce a voltage impulse that ignites the arc. The welding process has started. The welding process will stop when the torch trigger is deactivated. The arc will extinguish after the period of slope-down time. The torch is held at the welding spot until after the period of gas post-flow time in order to protect the welding spot against oxidation.

#### 4T Four-stroke

This symbol means contact-free striking. The arc is established in the following way:

- 1) The torch is placed so that the Tungsten electrode is quite close to the welding spot (1 or 2 mm).
- 2) The torch trigger is activated, and the high voltage generator of the machine will produce a voltage impulse that ignites the arc.

The torch trigger is deactivated. The welding process will stop when the torch trigger is re-activated. The arc will extinguish after the period of slope-down time. The torch is held at the welding spot until after the period of gas post-flow time in order to protect the welding spot against oxidation.

#### 2T Two-stroke

This symbol means LIFTIG ignition. The arc is established in the following way:

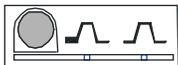
- 1) The torch is placed so that the Tungsten electrode has contact with the welding spot.
- 2) The torch trigger must be kept pressed down.
- 3) The arc is established by lifting the torch, and the welding process has started. In order to stop the welding process, the torch trigger is deactivated. The arc will extinguish after the period of slope-down time. The torch is held at the welding spot until after the period of gas post-flow time in order to protect the welding spot against oxidation.

#### 4T Four-stroke

This symbol means LIFTIG ignition. The arc is established in the following way:

- 1) The torch is placed so that the Tungsten electrode has contact with the welding spot.
- 2) The arc will be established when the torch trigger is activated and the torch is lifted. In order to stop the welding process, the torch trigger is reactivated. The arc will extinguish after the period of slope-down time. The torch is held at the welding spot until after the period of gas post-flow time in order to protect the welding spot against oxidation.

Please note! Both HF as well as LIFTIG ignition cannot be effected until post-flow is finished.



#### Pilot arc

In this section it is possible to choose whether the pilot arc should be activated or not. Connection/disconnection of this function cannot be changed during the welding process.



**The pilot arc cannot be activated**



**The pilot arc can be activated**

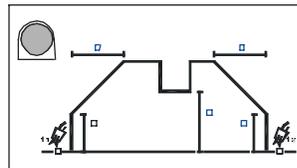
Used only in the TIG welding process, a pilot arc is a weak arc which illuminates the workpiece, and thereby makes it easier to find the starting point of the actual welding process.

The pilot arc can be ignited by briefly activating the torch trigger (less than 0.3 seconds). If activation is longer (more than 0.3 seconds), the machine switches automatically to ordinary welding.

Switch from pilot arc to ordinary welding by keeping the torch trigger activated when two-times TIG-welding or by long activation (>0.3 seconds) when four-times TIG or spot welding. The welding process then continues in normal fashion.

However, after slope-down the machine does not switch directly to post-flow but to pilot arc again. It is now possible to continue with a new welding process by a lengthy activation of the torch trigger (> 0.3 seconds), or to go to standby automatically by a brief activation (< 0.3 seconds).

#### The welding process



#### for TIG welding

The parameters can be selected and adjusted during the welding process.

#### Pre-flow



Pre-flow is the period of time for which gas flows after the torch switch is pressed and before the HF arc is established, or until the torch is lifted away from the workpiece in the LIFTIG process. Variable 0-10 secs.



#### Start Amp

Immediately after the arc has been established, the machine regulates the welding current to the value stated in the Start Amp parameter. Start Amp is set as a percentage of the required welding current and is variable between 0-100% of the welding current with a minimum value of 5 A.



#### Slope-up

Once the arc has been established, the welding process enters a slope-up stage during which the welding current is increased in linear fashion from the value stated in the Start Amp parameter to the required welding current. The duration of this slope-up time is variable 0-10 secs.



#### Slope-down

When welding has stopped by activating the trigger, the machine enters a slope-down stage. During this stage current is reduced from welding current to Stop Amp over a period of time called the slope-down time and variable 0-10 secs.



#### Stop Amp

The slope-down stage is completed when the current level has fallen to the value stated in the Stop Amp parameter. Stop Amp is stated as a percentage of the required welding current and is variable between 0-100% of the welding current with a minimum value of 5 A.



### Post-flow

Post-flow is the period of time for which gas flows after the arc is extinguished and is variable 3-30 secs.

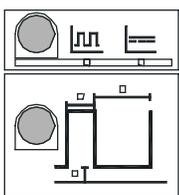


### Reduced current

When four-times welding a reduced current is activated by pressing the trigger briefly. This reduced current is set to a percentage value of the welding current and is variable between 0-100% of the welding current with a minimum value of 5 A.

### Indication of a welding process

During welding, when adjustment of current is activated by means of the A-keypad, it is possible to see the actual phase of the welding process.



### Pulse welding

This section contains functions for pulse welding. The section is divided in two: the above connects or disconnects pulse welding, the below contains the different pulse parameters.

Pulse cannot be connected or disconnected during the welding process.



### Pulse

Pulse welding has been selected.

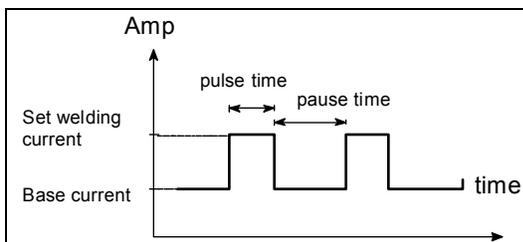


### No pulse

Welding without pulse has been selected. The pulse parameters cannot be activated.

### Pulse parameters

The pulse parameters can be both selected and changed during pulse welding. The figure below illustrates the meaning of the three pulse parameters.



### The pulse time

Reflects the time the machine is welding with the pulse current. The pulse current is the adjusted welding current. Time is adjustable between 0.01 and 10 seconds.



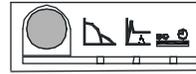
### Pause time

Reflects the time the machine is welding with base current. Time is adjustable between 0.01 and 10 seconds.



### Base Amp

Is set as a percentage value between 1 and 99% of the current level set on the display (= pulse current), although this percentage cannot be less than a value that corresponds to 5 A.



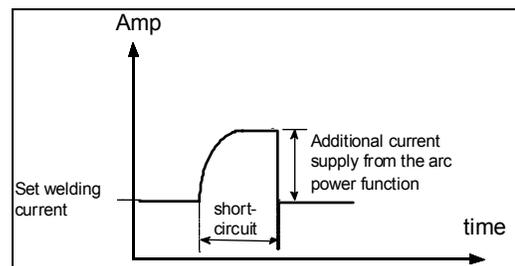
### Parameters for MMA welding and TIG spot welding

Parameters can be both selected and adjusted during welding.



### Arc-power

The arc power function is used to stabilise the arc in MMA welding. This can be achieved by increasing welding current during the short-circuits. The additional current ceases when the short circuit is no longer present.



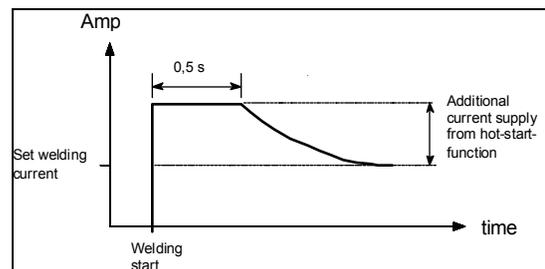
Arc power can be adjusted between 0 and 150% of the welding current setting.

E.g. If the welding current is set to 40A and arc power to 100% the additional current is 40 A equals 80 A when doing arc power. If the arc power is set to 150% the additional current is 60 A equals 100 A when doing arc power.



### Hot start

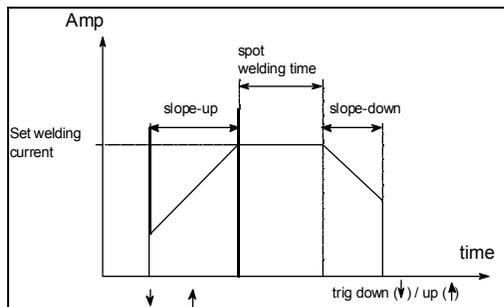
Hot start is a function that helps to establish the arc at the beginning of MMA welding. This can be achieved by increasing welding current (when the electrode is applied to the workpiece) in relation to the set value. This increased start amp is maintained for half a second, after which it decreases to the set value of welding current.



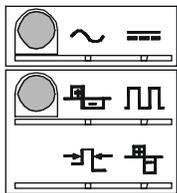
The hot start value reflects the percentage value by which initial current is increased, and can be set between 0% and 100%.

## Spot time

The spot time in TIG is the time from the end of slope up to beginning of slope down. Therefore, the spot time is welding with the adjusted current. The time with the arc and torch trigger activated is the spot time plus slope up time and slope down time.



If spot time is changed during welding, this change will not be carried into effect until next welding process.



### AC-welding

This panel is divided into two sections, with the function current type at the top, and the setting of conditions for special AC-functions at the bottom.



### Current type

It is possible to select either AC (alternating current) or DC (direct current). In the TIG-welding process, AC is used for the welding of aluminium and its alloys, while DC is used for the welding of other materials.

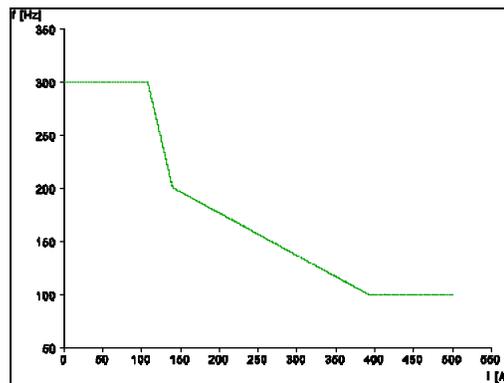
When TIG welding aluminium or its alloys the positive part of the AC-wave removes the oxide film covering the surface of the workpiece, and the negative part of the wave melts the material.

## AC-frequency

The AC frequency can be adjusted from 1 to 300 Hz for TIG welding and from 1 to 100 Hz for MMA-welding. A low frequency during TIG welding increases the tendency for the formation of a large ball at the end of the tungsten electrode. This tendency will be reduced by increasing the frequency.

Note 1: The AC frequency and welding current cannot be adjusted to maximum simultaneously during TIG welding - see the following illustration. When the limit is reached by adjusting the AC-frequency, the A-lamp will illuminate in "units for parameter" and the machine will reduce the AC frequency automatically.

Note 2: If the frequency limit is exceeded by adjustment of the welding current the AC frequency will be reduced automatically (the indicator for AC frequency flashes on and off for 5 sec.).



Note 3: If the pulse function is used during AC-welding the AC frequency can be reduced in proportion to the pulse times. If the AC frequency is too low the indicators for pulse times will flash on and off for 5 seconds.

Note 4: Pulse adjustment error: If the pulse function is used during AC-welding an automatic adjustment of the pulse setting may occur. The indicators for pulse times will then flash on and off for 5 seconds. The pulse times change automatically so the pulse time and base time will be 0.03 seconds.



## Electrode preheating (TIG)

On ignition of the AC TIG pilot arc the tungsten electrode is preheated by a direct current with positive polarity. Preheating of an electrode is necessary before starting the AC welding process. The length of the preheat period depends on both the diameter of the electrode and the angle of the point of the electrode, as well as the size of the ball at the end of the electrode.

Adjustment is possible from -9 to +9, with -9 being the minimum and +9 being the maximum preheat periods. If the period is too short the pilot arc will extinguish shortly after ignition. The size of the ball at the end of the electrode will increase if the pre-heat period is too long.



## AC-t-balance, based on time (TIG)

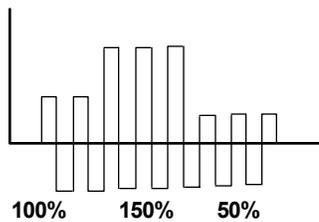
Adjustment of the refinement function during the AC TIG welding of aluminium and its alloys. The function is a balance based on time between the positive and negative halfperiod.

Adjustment is possible between 1 and 100 per cent as the statement in per cent is based on the negative part of the period time. Adjustment continues until a suitable refinement zone is established around the molten pool. When MMA welding the balance can be locked at 50 per cent which means that further regulation is impossible.



## AC-I-balance, based on current intensity (TIG)

The purpose of the function is also adjustment of the refinement zone during AC TIG welding.



However, this balance is based on the current intensity of the positive period proportional to the current intensity of the negative period. A reduction of the positive refinement current may have the effect that dwell time of the tungsten electrode improves.

### TIG-DC

It is also possible to weld in DC TIG with unalloyed tungsten electrodes (green marking). Current is set to AC and both AC-t-balance and AC-l-balance are set at 100 per cent. The machine will then establish the pilot arc by using the preheating function. After finishing the preheating period the welding current will be returned to negative polarity.

### Fixed functions

The functions below are fixed and cannot be connected and disconnected from the display:

#### Anti-freeze

The anti-freeze-function is always on. During MMA and TIG welding the electrode sometimes sticks onto the workpiece. The machine will register that the electrode has stuck onto the workpiece, and will then reduce the welding current so that the area of the workpiece which has melted will harden, making it possible to break off the electrode. Welding can then continue in the usual way.

#### Torch cooling

The machine will automatically start cooling when establishing the arc if the machine has been mounted with a cooling module and a Migatronic water-cooled torch. Cooling continues until 2½ min. after the welding process has stopped.

## FAULT IDENTIFICATION

### **Overheating error**

Welding is interrupted due to overheating if the machine is used beyond the specifications mentioned in chapter "Technical Data". The machine must remain turned on and connected to the mains supply as the fan continues until the machine has been sufficiently cooled. Thereafter, the machine is automatically switched in.

An overheating error is more oftenly seen if the machine is used in surroundings with temperatures above 40°C. It is not recommendable to place the machine in direct sun light as this increases the possibility of an overheating of the machine.

### **Mains error**

The mains error arises if the mains voltage is too high or low.

Please make sure that the mains plug is correctly mounted and that all fuses are intact. Moreover, please control that the mains voltage does not exceed the technical specifications and that there are no short-term voltage drops or voltage peaks.

### **Torch cooling error**

This error can be seen by the text "Etc" in the machine display. Turn off the machine if the cooling water does not flow in the water-cooled torch. Make sure that all hoses have a free passage, see chapter "maintenance". Turn on the machine again when a free passage has been established. Welding can then be continued.

### **Other errors shown in the display**

If other errors arise than those described above, please contact the Migatronic service department.

## TECHNICAL DATA

## WARRANTY

	NAVIGATOR 2500 DC	NAVIGATOR 3000 DC	NAVIGATOR 3000 AC/DC
<b>Power source:</b>			
Mains voltage	3x400 V ±15%	3x400 V ±15%	3x400 V ±15%
Fuse	16 A	16 A	16 A
Consumption max.			
Efficiency			
Permitted load			
- 25% duty cycle	250 A / 32 V	300 A / 32 V	300 A / 32 V
- 60% duty cycle	220 A / 30 V	240 A / 29.6 V	240 A / 29.6 V
- 100% duty cycle	170 A / 27.6 V	190 A / 27.6 V	190 A / 27.6 V
Max. arc voltage	38 V / 250 A	38 V / 250 A	38 V / 250 A
Open circuit voltage	80 V	80 V	80 V
Current range AC	5 – 250 A		5 – 300 A
Current range DC	5 – 250 A	5 – 300 A	5 – 300 A
<sup>1</sup> Application class			
<sup>2</sup> Protection class (IEC 529)	IP 23	IP 23	IP 23
Standards	EN60974-1 EN50199	EN60974-1 EN50199	EN60974-1 EN50199
Dimensions (H- W-L) (mm)	563x300x698	563x300x698	563x300x698
Weight with torch cooling	37 kg	39 kg	43 kg
Weight without torch cooling	31 kg	33 kg	37 kg
<b>Torch cooling:</b>			
Cooling capacity	0.71 kW	0.71 kW	0.71 kW
Tank capacity	4 liters	4 liters	4 liters
<b>Functions:</b>	<b>Process</b>	<b>NAVIGATOR 2500 / 3000</b>	
Arc power	Electrode	0-150 %, max. 250/300 A	
Hot-start	Electrode	0-100 %, max. 250/300 A	
Anti-freeze	TIG/Electrode	always on	
Pilot arc	TIG	5 %, min. 5 A	
Start AMP	TIG	0-100 %, min. 5 A	
Stop AMP	TIG	0-100 %, min. 5 A	
Slope up	TIG	0-10 secs	
Slope down	TIG	0-10 secs	
Gas pre-flow	TIG	0-10 secs	
Gas post-flow	TIG	3-30 secs	
Spot welding time	TIG	0.1-50 secs	
Pulse time	TIG/Electrode	0.01-10 secs	
Pause time	TIG/Electrode	0.01-10 secs	
Base Amp	TIG/Electrode	1-99 %, min. 5 A	
Reduced current	TIG	0-100 %, min. 5 A	
AC-balance	1-100 % (only AC)	1-100 % (only AC)	
AC-balance, Ampere	1-200 % (only AC)	1-200 % (only AC)	
AC-frequency	1-300 HZ (only AC)	1-300 HZ (only AC)	
TIG-ignition	TIG	HF / LIFTIG	
Triggerfunction	TIG	2/4-stroke	
Setting of welding jobs	TIG/Electrode	10	

All MIGATRONIC machines carry a twelve-month guarantee against hidden defects. Such defects must be notified no later than two months after it has been noticed. The warranty runs for twelve months after invoicing to end customer.

The warranty covers material and manufacturing faults that cannot be immediately acknowledged.

### Lapse of warranty

The warranty covers no obvious product characteristics, which in time are thought as being inconvenient.

### Incorrect installation

The warranty does not cover defects due to incorrect installation of the product, e.g. connection to the wrong mains voltage.

### Incorrect or abnormal use of the product

The warranty does not cover use of the product for other purposes than it has been designed for. **If the product is used for more than 8 hours daily, the warranty does not cover defects due to these intensive working conditions.**

### Lack of maintenance

There is a lapse of warranty if the product is not properly maintained. E.g. if the product is dirty to such a degree that cooling is hindered. The warranty does not cover damages, which can be traced back to unauthorised and lacking repairs of the product.

### Over loading/extreme loading

The warranty does not cover over loading or extreme loading. Nor transport damages, damages due to incorrect handling, drops etc. The warranty does not cover abnormal conditions as regards temperature, moisture or environmental loading above the limit, which the machine has been designed for.

### Defects due to infestants

The warranty does not cover defects due to infestants.

### Wear parts

The warranty does not cover parts of the product, which is exposed to wear and tear, e.g. the wire drive rolls. The warranty does not cover depreciation due to normal use, e.g. scratches, rust and mechanical damage. Welding cables and welding hoses are regarded as wear parts and therefore not included in the warranty.

### Resulting damages

Use of the product must stop immediately after acknowledgement of a defect in order to avoid further damage of the product. The warranty does not cover resulting damages due to use of the product after acknowledgement of a defect. Moreover, the warranty does not cover resulting damages on other items due to product defect.

<sup>1</sup>  The machine meets the standards which are demanded of machines working in areas where there is an increased risk of electric shock

<sup>2</sup> Equipment marked IP23 is designed for indoor and outdoor applications