

DCS Welding Machines

IEG -Systems

MEGA 2000 AC/DC
MEGA 2000 DC



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subject to alteration

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MEGA 2000 AC/DC_{pfc} and MEGA 2000 DC_{pfc}

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General Information

Dear Customer,

you have bought a German quality product - Made in Germany - from the company DCS

- we thank you for your confidence

Our machine has been exclusively equipped with high quality components, which ensure a long life when used industrially.

The various components conform with national and international standards.

The DCS Welding machines have the CE label and the symbol **S** for welding machines according to the standard **EN 60974-1**, which applies to machines with an increased electrical hazard.

The operating instructions should help the user of the machine to avoid making operating errors. In order to make proper use of these machines it is essential that the operating instructions are read before starting.

The welding machines should only be used by persons who are qualified to do so.

1.0 Description

By using state-of-the-art pfc-technology the welding machines MEGA 2000 pfc and MEGA 2000 AC/DC pfc attain a welding current of 210 A with a mains connection of 230 volt and 16 A fuse.

The machine stands out with its excellent welding properties on all metals.

In the AC field the MEGA 2000 AC/DC meets the highest demands with its rectangular shaped voltage and adjustable frequency of 40-200 Hz and balance adjustment +/- 30%.

Mains voltage fluctuations are corrected without problems by the control, thus ensuring that a constant and excellent performance.

The cooling of the power components is made by a quiet fan, which is switched on automatically when required by the thermal control.

Welding with an increased electrical risk is possible according to the standard EN 60974-1.

The following standard functions are easy to use:

Choice of operating mode: TIG 2-cycle/TIG 4-cycle + stick electrodes

Precise setting of welding voltage: I1 + I2

(By use of a button on the torch the welding voltage can be switched from I₁ to I₂)

Stepless setting of downslope time avoids the forming of end craters at the end of the welding process.

The gas afterflow can be set: 0-20 sec stepless

AC welding on aluminium 40-200 Hz stepless

When AC welding the balance can be corrected by up to 30% to obtain a good cleaning effect.

MEGA 2000 AC/DC _{pfc}

Technical information

Power source



Mains voltage
Max. no-load voltage
Max. power consumption
Protective system
Cos.Phi
Welding current

MEGA 2000 DC _{pfc}

230 V 1 Ph.
24 Amp
5,5 kVA
T 16 Amp
0,99
DC

TIG	Electrode
3-210 Amp	10-160 Amp
89 V	89 V
210A/18,5V	160A/26,5V
150A/16V	110A/24,5V
IP 23	
F	
AF	
23 kg	
430x280x485	

MEGA 2000 AC/DC _{pfc}

230 V 1 Ph.
26 Amp
6 kVA
T 16 Amp
0,99
AC/DC

TIG	Electrode
3-210 Amp	10-160 Amp
89 V	89 V
210 A/18,5V	160A/26,5V
150A/16V	110A/24,5V
IP 23	
F	
AF	
24 kg	
430x280x485	

S

This mark means that machine can be used under higher electrical risk

CE

This mark means that machine has been made according to the standard **EN 60974-1** for professional units

3.0 Safety rules

This machine has been built according to the accident prevention regulations VBG15 and VBG4 of the employers' liability insurance association and the EURO-NORM 60974-1 and marked (S) for use under higher electrical risk.

Working and servicing electrical devices can be dangerous, if the machine and its components are not handled competently.

When welding with TIG machines the following accident prevention regulations apply:

VBG 15 - Welding, cutting and related working processes

VBG 14 - Electrical units and operating supplies

Warning: Before repairing or servicing the machine it must be disconnected from the mains

Repairs on electrical components should only be carried out by a professional electrician

3.1 Higher electrical risk

Rooms with higher electrical risk are e.g.:

Rooms in which the space for movement is limited and the welder has to work out-of-position and touch parts which are conductive.

Rooms which are completely or partly conductive and which by inevitable touching can be very dangerous for the welder

Rooms which are influenced by the surroundings in such a way that dampness or sweat can reduce the resistance of human skin or the insulation properties of the protective equipment seriously.

Precautions regarding personal safety

The influence of the radiation from the welding arc and the heated material can lead to burning of the unprotected skin.

Use protective garments according to VBG § 27

Wear such protection even when you are only supervising the welding

Gas cylinders are a potential danger.

Strictly observe the safety regulations of the manufacturer and the employers' liability insurance association.

Safeguard the bottles against falling and the influence of heat

Make sure that the current-carrying cables and plug-connectors are faultless

Wear dry protective clothing which is also oil-free

Use the available ventilation

4.1 Operating devices

1. On/off switch (back plate)
2. Workpiece connection socket
3. TIG torch and electrode cable connection
4. Gas connection G 1/4"
5. Socket control cable
6. Selection switch TIG 2 cycle / TIG 4 cycle / Electrode

TIG 2 cycle operation

TIG 4 cycle operation

Electrode welding

7. Rotary switch „current I₁“
8. Rotary switch „current I₂“
9. Control lamp „Operation I₁“
10. Control lamp „Operation I₂“
11. Digital display
12. Mains control lamp
13. Temperature control lamp
14. Rotary switch „Slope-Down time 1-10 sec.“
15. Rotary switch „Gas postpurge time 2-20 sec.“
16. Rotary switch „Frequency 40-200 Hz (aplicable only for AC)
17. Rotary switch „Balance +/-30% (aplicable only for AC)
18. Selection switch „DC/AC/Test“
19. Control lamp function danger reduction device
20. Socket for remote control

5.0 Operation

1. On/off switch (back plate)
Position - 0 - Machine is not connected to mains
Position - 1 - Machine is connected to the mains, the control lamp mains lights up, the current display lights up
2. Workpiece connection socket - earth clamp (+)
3. Welding cable socket (-)
Connection of TIG torch or electrode holder
4. Gas connection with 1/4" thread
5. Socket for control cable
To connect the control line of the welding torch
See circuit diagram
6. Operation selection switch

TIG 2-cycle operation

for short welds and tack welding.

1st cycle: Press torch button. The inert gas flows. After a short gas pre-flow time, the arc ignites with the current set with rotary switch I1.

2nd cycle: Let go of torch button. The arc goes out. The gas flows at the set gas post-flow rate.

TIG 4-cycle operation

1st cycle: After a short gas pre-flow time the arc ignites with 20% of the current set by the rotary switch I1.

2nd cycle: Let go of torch button. The current increases to the current set by the rotary switch I1.

3rd cycle: Press torch button. The current sinks in the set time (rotary switch **no. 9** downslope) to the minimum.

4th cycle: Let go of torch button. Arc goes out. The gas flows at the set gas post-flow rate.

Electrode Welding

Ignition with hot-start, 20% above set current.

Welding range 10-160 Amp.

5.0 Operation - 1

7. Rotary switch **Current I1**

For the infinitely variable adjustment of welding current I1

Welding range for TIG: 3-210 Amp.

Welding range for electrode: 10-160 Amp.

8. Rotary switch **Current I2**

For the infinitely variable adjustment of welding current I2, as a percentage of the set value of I1.

By using a 2nd button or rocker switch on the torch you can switch over from Current I1 to I2 while welding.

Current I2 is switched on as long as button **S2** is pressed.

9. Control lamp Operation I1

10. Control lamp Operation I2

11. Current display

Displays the set current in Amperes.

Blinks when there is a fault.

12. Control lamp mains

Lights up when the operating voltage has been attained and the machine is ready for operation.

Blinks if there is under- or overvoltage.

13. Control lamp Temperature is too high

Warning: Do not switch the machine off!

Lights up when overheating occurs. The machine switches off automatically.

After a few minutes the light goes out and the machine is ready for operation again.

14. Rotary switch downslope (1-10 sec.)

Applicable only with TIG 4-cycle operation

Adjustable time, during which the current decreases during the third cycle from I1 to the minimum of 3 Amp.

15. Rotary switch gas post-flow time (2-20 sec.)

Applicable only for TIG use

Infinitely variable setting of gas post-flow time of 2-20 sec.

To save gas, a gas post-flow does not occur when the machine is started but no ignition takes place.

16. Rotary switch Frequency 40-200 Hz (only for the MEGA 2000 AC/DC pfc)

infinitely variable from 40-200 Hz for AC use. A higher frequency causes a more stable arc, which is suitable for welding thin sheets.

5.0 Operation - 2

17. Rotary switch Balance +/- (only with MEGA 2000 AC/DC pfc)

Using this switch the ratio of the positive to the negative half-wave can be adjusted.

By varying the half-waves, the depth of penetration, the thermal capacity of the tungsten electrode and the cleaning properties can be adapted to the various welding tasks.

In the middle position (0) of the switch both half-waves are equal.

Increasing the negative half-wave (turn to the left) causes:

- deeper penetration, finer arc, narrower welded seam
- higher current-carrying capacity of the tungsten electrode
- less thermal capacity of the tungsten electrode
- less cleaning effect

Increasing the positive half-wave (turn to the right) causes:

- flatter penetration, wider welded seam
- less current-carrying capacity of the tungsten electrode
- higher thermal capacity of the tungsten electrode
- better cleaning effect

18. Selection switch DC/AC Test (only in connection with MEGA AC/DC pfc)

DC Position

Choice of DC or electrode welding

AC Position

Section of AC welding

Test position

Test function to control the danger reduction device. This device checks whether the control of the output voltage is still being ensured.

After turning to TEST the LED **S** should not light up. The control lamp - mains - should also be out (No. 7).

The machine is no longer ready for work.

When this check has been carried out and the two LEDs are both out, the switch can be turned to the position AC or DC again. In order to start the machine the switch at the back of the machine has to be switched off and on again. If both LEDs are not out after this, the machine should not be used.

19. Control lamp Function Danger reduction

As long as the green LED **S** shines the voltage reduction device is working.

6.0 Putting into operation

Read this operating manual before starting to work with this machine.

6.1 Installing the machine

Make sure that when installing the machine there is enough room for supply and extraction of cooling air, so that the set duty cycle can be reached.

It is important that dampness, metal cuttings or other alien element do not penetrate the machine.

6.2 Connection of the Gas cylinder

The gas cylinder has to be set up separately and secured safely.
Connect the pressure reducer and test the tightness of the connection.
Close the cylinder valve after use.

6.3 Connecting of the welding cables

The TIG machine is equipped with plug-in connections for the TIG torch, the electrode welding cable and the ground cable.

The TIG torch is connected to the welding socket marked -.

When welding with an electrode the type of electrode determines the polarity.

A threaded connection G 1/4" is available for the gas hose.

The control line of the torch button is connected to the 3 pole socket.

Make sure that with all connections there is a faultless contact and that the recommended diameters of the welding cable have been kept.

6.4 Connection of the remote control (No. 20)

The standard TIG machines are equipped with a remote control socket.

7.0 Welding

When the on/off switch is switched on the gas valve is pressed once for 0,5 sec to fill the hose package with gas.

7.1 Setting of the gas reducer

The required amount of inert gas in l/min is set at the volume and contents manometer. This depends of the electrode diameter, gas nozzle diameter, welding current and external influences at place of operation.

Example: for 4 mm aluminium and Argon a guide value of approx. 9 l/min can be adopted.

When using helium more inert gas will have to be used.

7.2 Start or 4-cycle welding operation

When welding with 4-cycle operation (pre-set by switch no. 6) and using the torch with two current control (I1 and I2) the following welding procedure is possible:

1st cycle Press torch button or rocker switch.

Gas pre-flow starts and the arc will ignite with 20% of the welding current set at rotary switch I1.

2nd cycle: By letting go of the torch button, the welding current increases up to the value set by I1 (No. 7)

Special feature: Torches with two current rocker switch or press button.

By pressing the button I2 the welding current I2 (set with switch no. 8) can be obtained.

By releasing the I2 welding current button the welding current increases to the I1 welding current value.

3rd cycle: By pressing the torch button for I1 the current sinks during the time set by switch no. 14 (1-10 sec) to the minimum value of 3 Amp.

4th cycle: After releasing the torch button I1 the arc goes out and the gas post flow time of 1-20 sec. set by switch 15 begins-

7.3 Start 2-cycle welding operation

2-cycle welding process set by switch No. 6

1st cycle: Press and hold torch button or rocker switch.

Gas pre-flow starts and the arc will ignite with 20% of the welding current set at rotary switch I1.

2nd cycle: If the torch button is released, the welding current sinks in the time value set by switch no. 14 to the minimum value and the gas post-flow time begins as set.

8.0 Faults, Errors, Cause and Elimination

Attention: Before beginning the servicing, make sure the machine is switched off and disconnected from the mains. Faults and defects on electrical parts should only be repaired by specialist electricians.

Faults / Errors	Cause	Elimination
Mains connected and on/off switch on Display does not light up	Failure of mains voltage	Check mains fuse
Mains connected and on/off switch on Display lights up Mains control lamp does not light up	Voltage reduction device has been set off. Rotary switch set at - TEST - no. 18	Turn switch no. 18 to AC or DC
	Voltage reduction device has been set off.	Send back to supplier for repair
After pressing the torch button no function	Torch button defect	Check torch button
	Torch control line interrupted	Torch control line
	Control lamp temperature too high lights up	See 5.0 Operation Item 13
Porous welding seam	Dirty workpiece surface (paint, rust, oil and grease)	Clean surface
	No gas - solenoid valve does not open	Check valve and replace if necessary
	Insufficient gas	Check volume of gas. Check gas flow and loss (flow meter pipe)
Mains control lamp blinks	Mains over- and under voltage	Check mains voltage

Please note: Because of the pollution in the air, it is recommended to check the machine regularly