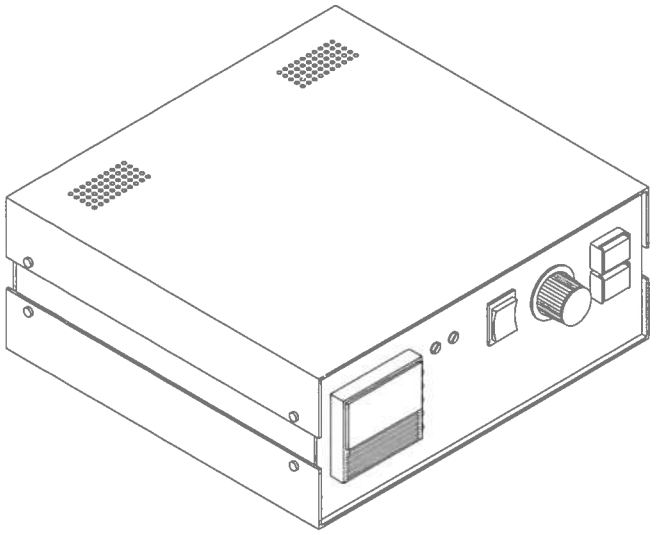
April 1998

Directions for use
Arc Height Controller



Version B

The manual is subject to alteration

Contents

IMPORTANT SAFETY INSTRUCTIONS

Carefully read Operator's Manual before handling the machine. Observe instructions and safety rules when operating. The safety instructions contained in the **PERSONAL SAFETY** sections of this manual should be read and observed when installing and operating the machine.

This manual and the accompanying instructions for use must be accessible at all times to the staff engaged in the installation, operation and maintenance of the machine.

EC Declaration of Conformity

Manufactuer:	
Company Name :	Migatronic Automat Division A/S
Address :	Knøsgaardvej 112
	DK 9440 Aabybro
Telephone :	(+45) 98 - 24 42 33

hereby declare that

Machine:	
Name	: Arc Height Controller
Type, year of construction:	AVC, 2001

was manufactured in conformity with the provisions in the COUNCIL DIRECTIVE of 14 June 1989 on mutual approximation of the laws of the Member States on the safety of machines (89/392/EEC as amended by directive 91/368/EEC and 93/44/EEC) with special reference to Annex 1 of the Directive on essential safety and health requirements in relation to the construction and manufacture of machines

June 2001 Søren C. Jensen

Chapter 2: General information

An electronic arc voltage controller which rapidly adjusts the arc to the selected voltage level during TIG/Plasma welding or plasma cutting. The arc is kept at a fixed distance from the workpiece, thereby helping to make the final result perfect.

The arc voltage controller measures the arc continuously - as the torch approaches the workpiece, arc voltage is reduced and the controller automatically lifts the torch to ensure that the required arc voltage is maintained. Similarly, as the torch gets further away from the workpiece, arc voltage increases and the arc voltage controller lowers the torch into correct position.

The arc voltage controller is always used with an electric torch slide which has various working lengths and which can be used in automatic systems.

Chapter 3: Personal safety and warnings

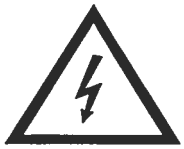
PERSONAL SAFETY

Light and heat emission

A welding arc emits radiation which is damaging to the human eye. Even short-term exposure to this radiation can cause lasting damage. Protect your eyes from powerful radiation by infra-red, visible and also ultra-violet light by installing suitable radiation protection glass in your welding helmet.
Your skin can also be damaged by welding radiation. Radiation can cause serious burns. Protect your skin by wearing a welding helmet, working clothing covering all exposed parts, and gloves.
During welding, warn other people in the vicinity of the danger of radiation and sparks. If possible, place a screen between the place of work and the surroundings.
The heat emitted from the arc and pool crater - as well as the sparks emitted during welding - represent a fire hazard. Consequently, welding should never be carried out near combustible materials.
Working clothing must not be made of substances which are easily combustible, and should have no folds or open pockets into which sparks can fall. Wear a fire resistant apron if necessary.

Welding fumes

The smoke and gasses emitted during welding are damaging to health. Consequently, the inhalation of welding smoke and gasses should be avoided by taking suitable preventive measures (e.g. local air extraction, ventilation, or supply of fresh air to welding helmet).



Electricity

Avoid contact with all live components.
The voltages used in welding are not sufficient to represent a danger in themselves. However, if damp clothing is worn, or if working in damp conditions, electric shocks can be caused, representing an indirect source of danger. Considerable electric shocks can be caused by HF high voltage ignition during TIG welding in particular, and may lead to minor burns beneath the skin.
Consequently, all contact with live components should be avoided as far as possible.
Always use dry, leather welding gloves and wear dry working clothing and shoes. Keep cables, torches, and the welding machine itself dry at all times.
Make sure that the welding machine's earth connection is properly and safely earthed. Do not open the machine to expose live components. Maintenance and service which require access to live components inside the machine must be carried out by an authorized electrician.

Range of application:

The arc voltage controller is always used with an electric torch slide which has various working lengths and which can be used in automatic systems and also with welding tractors types Mini-Flex and Maxi-Flex.

Removal of safety devices:

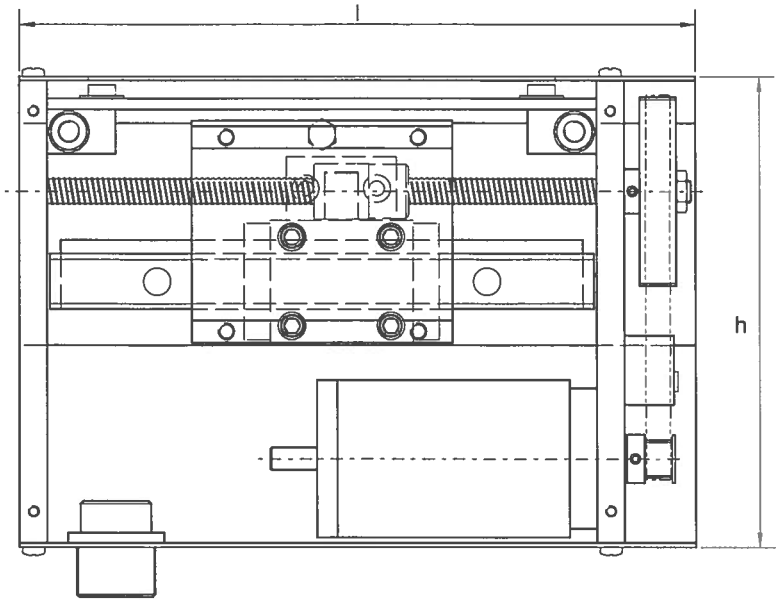
During operational circumstances it is not allowed to remove safety devices or to take them out of operation.

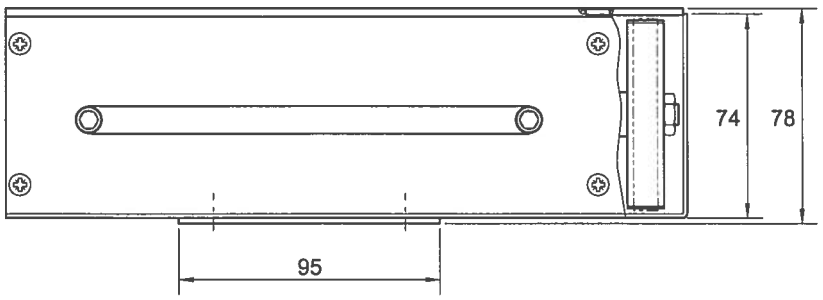
Accurate placing of workpiece:

Before start the operator must ensure that the workpiece is correctly placed and is properly secured.

Chapter 4: Function of machine

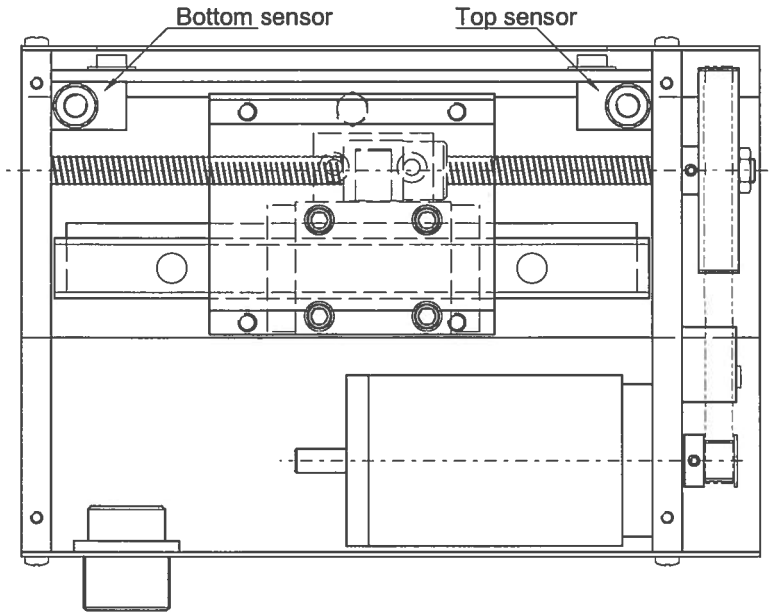
Sketch of the electric torch slide:



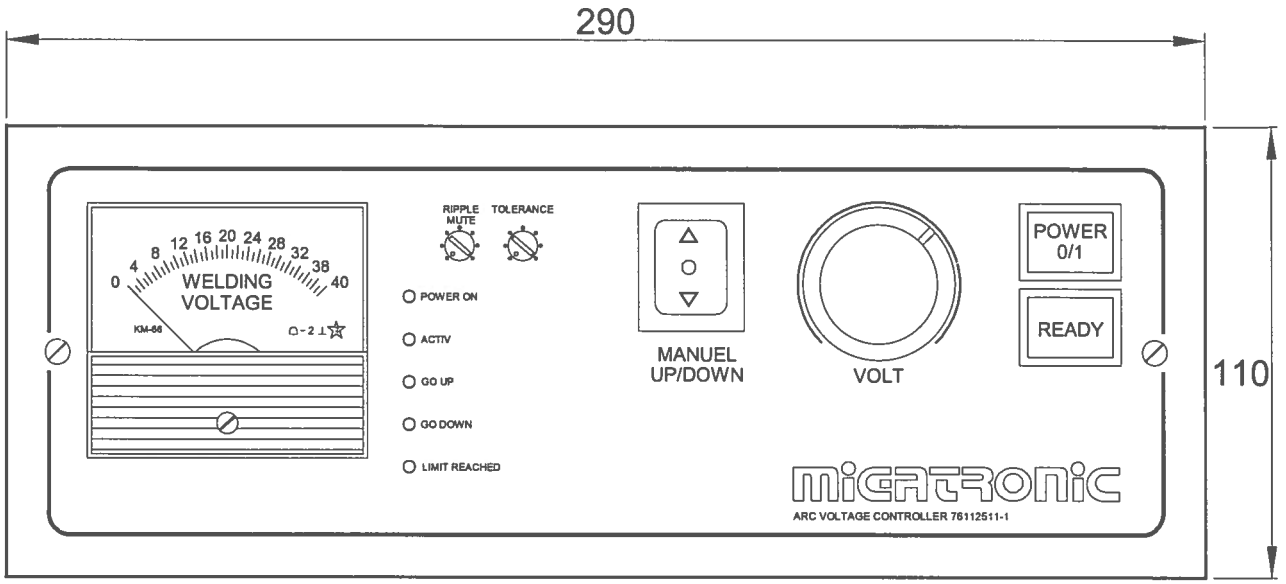


Partnumber	75100103-1	75100170-1	75100240-1	75100310-1	75100380-1
Workinglength mm	100	170	240	310	380
Dimensions mm l	246	316	386	456	526
h	170	170	170	170	170

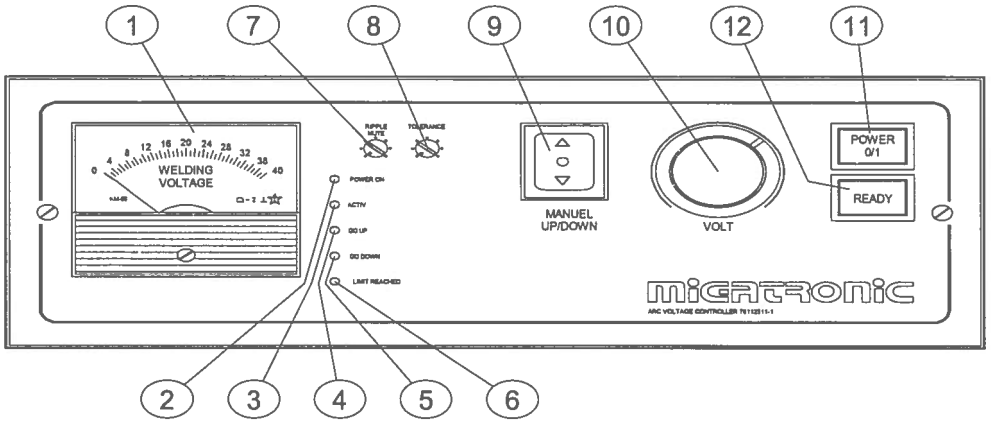
Placement of sensors in the electric torch slide:



Sketch of control:



Functions with control:



Pos. 1 Voltmeter, showing present welding/cutting voltage.
Pos. 2 Light to indicate system ON.
Pos. 3 Light to indicate that voltage controller is in its active area, which for TIG welding is approx. 5 - 20V and plasma welding approx. 50 - 150V.
Pos. 4 Light to indicate that torch is going up.
Pos. 5 Light to indicate that torch is going down.
Pos. 6 Light to indicate that torch slide end stop has reached either top or bottom position. The slide will stop.
Pos. 7 Button for setting/muting of welding/cutting ripple voltage from 0 - 100 %.
The more muted, the more slowly the controller works.
Pos. 8 Button for setting of tolerance voltages between which controller is active.
Pos. 9 Button for manual operation with torch slide up and down.
Manual control of torch slide is only possible when controller is not active.
Pos. 10 Button for setting of torch height (welding/cutting voltage).
Pos. 11 Power button.
Pos. 12 Button for deactivation of controlleren. the controller is active while this button is depressed.
Manual operation possible:
a) When arc signal to controller has been removed.
b) When the "Ready" button is out.

Directions for Use:

By menans of the "Volt" button (pos. 10) the arc voltage required is set, and thus also the arc length. During operation the voltage may be read from the instrument (pos. 1), and it should be possible to observe that a turning of the "Volt" button counter-clockwise reduces the arc voltage, and thus the arc length. The opposite is reached by turning the button clockwise.

If the current is changed, an equivalent correction should be made by means of the "Volt" button, as a higher current will result in a higher arc voltage, which the regulator will try to maintain at the previous level by reducing the distance. At a higher current a regulation upwards should be made by means of the "Volt" button in oder to maintain the arc length.

By means of the "Tolerance" button (pos. 8) the voltage area permitted by the control is set, before regulations up or down are made. Counter-clockwise turning gives the finest regulation, but may also cause unnecessary torch movement.

The button "Ripple" (pos. 7) may be used for setting the damping or time delay of the regulator. A clockwise turning makes the control slower, and unstable at the end. Turn the button counter-clockwise, until the regulation takes place in a suitable pace, but without unnecessary height corrections.

Maintenance

Regular maintenance is important.

Regular maintenance guarantees you:

* Long life for the machine

* Safety

* Safety of working

Many of the tasks of maintenance are easy to take care of yourself, if you are a little mecanically gifted and have a few tools. These tasks are described below. Please note that some tasks of maintenance require special tools and special knowledge. These tasks ought to be done by qualified Migatronic personnel. Even if you are an experienced do-it-yourself mechanic, we recommend that you let us have the repairs and maintenance.

Basic safety precautions

Warning

All power must be disconnected before working on any electrical connections or components.

- Make sure that the working area is clean.
- When work with the equipment is finished or when the work area is left unattended turn off the electricity supplies to the equipment.

DAILY CHECK BEFORE START

Examine machine:

A. Blow out with dry air.
B. Ordinary mechanical examine (screws, nuts, etc.).

Check control:

A. Check if all mains lamps and security lamps are on.
B. Check plug at the back of the control.
C. Run a cycle without welding.

Welding control:
Weld subject - compare it with the subject from the same time the day before.
If everything is OK, save the last welded subject to the start of next day.

WEEKLY CHECK

Clean all the most important surfaces with clean dry air and oil with machine oil.

Sign the form of maintenance.

MONTHLY CHECK

In addition to the weekly chech also check all nuts and screws especially by the bearings and torch support.

Check the carbonholder and the length of carbon.

Check gear motor for leakage in gear gasket and check wires.

Check if there is play in the bearings.

Clean current supply inside **(Remember to remove mains cable).**

Sign the form of maintenance.

FORM OF MAINTENANCE

Date	Weekly check	Monthly check	Remarks	Init.

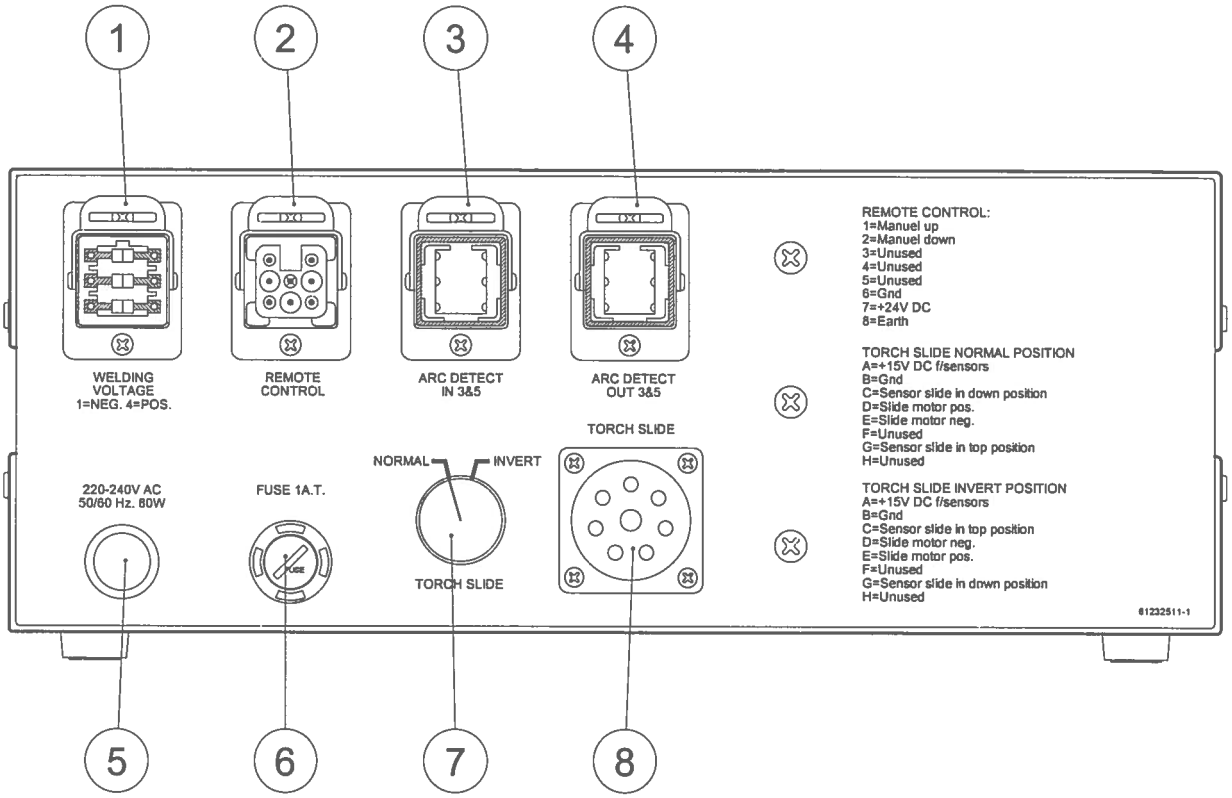
Keeping the directions for use:

The directions for use should be kept available to operators, maintenance personnel and service mechanics.

Chapter 5: Assembling and disassembling

Installation and connection:

Rear side of control:



Pos. 1 Output voltage before/without high-frequency.

Pos. 2 Connection of remote control for manual operation with torch slide.

Pos. 3 Arc signal in. The controller will not start until it recieves the signal that the arc has established.

Pos. 4 Relay outlet for established arc - e.g. to other automatic machines.

Pos. 5 Mains connection 220 - 240V with earth.

Pos. 6 Fuse 1 Amp slow.

Pos. 7 Regulation of torch slide's direction of travel.

Pos. 8 Plug for torch slide.

Disassembling:

The old Arc Height Controller contains parts which may be recycled.
Therefore, do not deliver your Arc Height Controller over to the nearest waste disposal site, but contact the local authority or a scrap dealer for the possibility of recycling.

All external connections (electricity etc.) must be disconnected before disassembling.

Chapter 6: Technical specifications

TIG welding:

Active control area	: 5 - 15V
Tolerance setting	: 1 - 3V adjustable

TIG BDH pulse:

Active control area	: 5 - 22V
Tolerance setting	: 0.8 – 4.5V adjustable

Plasma welding:

Active control area	: 13 - 32V
Tolerance setting	: 1 - 5V adjustable

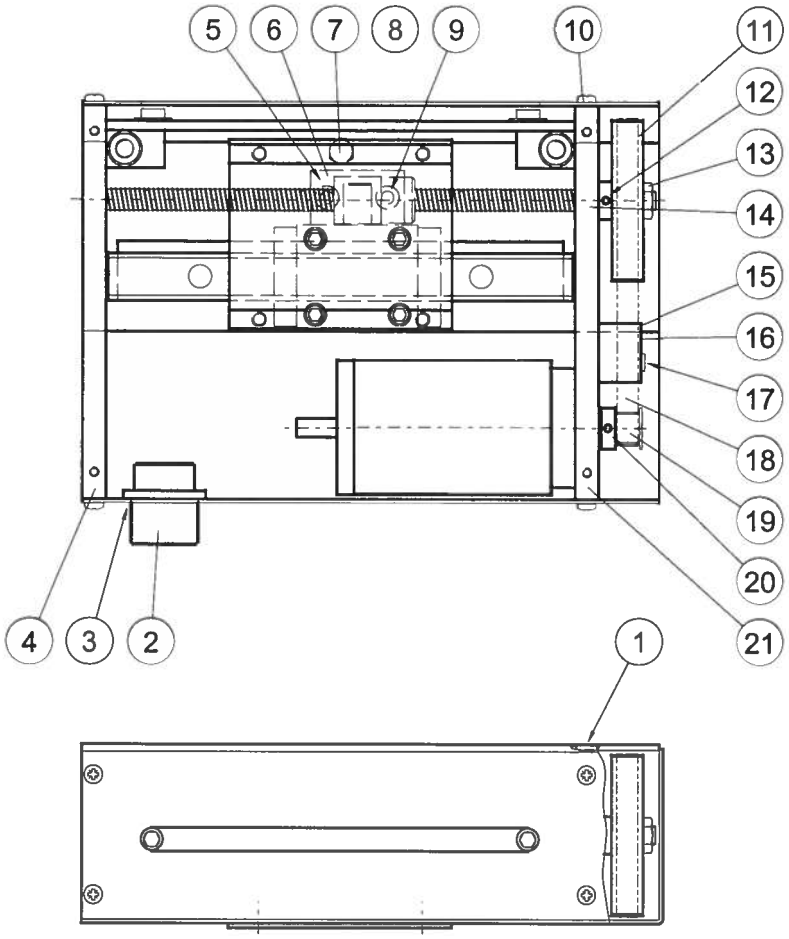
Plasma cutting:

Active control area	: 50 - 150V
Tolerance setting	: 7 - 30V

Common data:

Dimensions (control) HxWxD	: 110 x 290 x 270mm
Weight (control)	: 6.5kg
Mains voltage	: 220 - 240V~ 50/60Hz
Power consumption	: 80 Watt
Noise level	: < 70 dB(A)

The regulation speed is internally adjustable.
Other regulation areas are available according to customer specification.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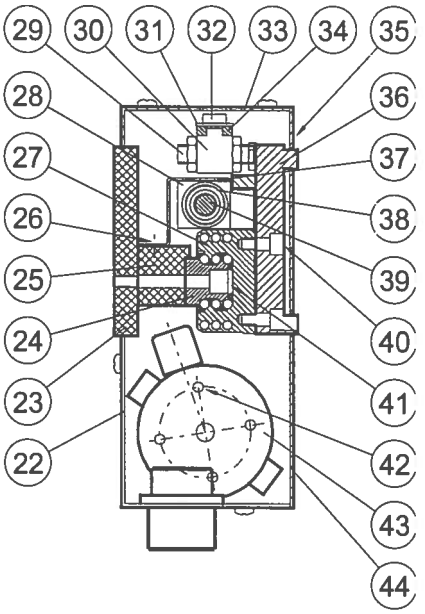
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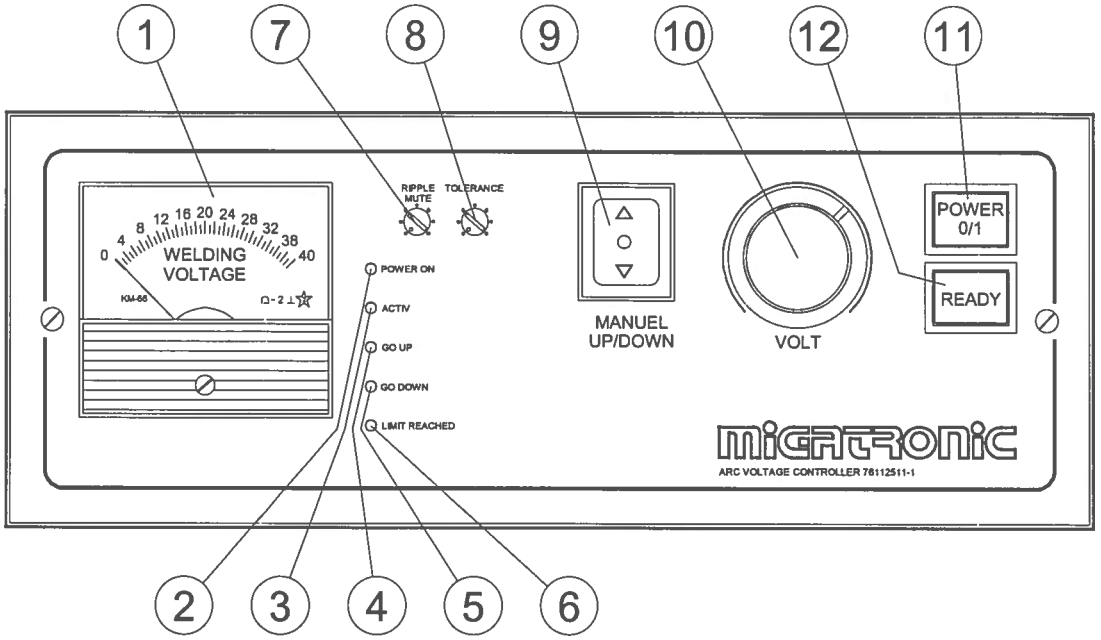
Spare parts - torch slide:
(following list refers to drawing on page 16)

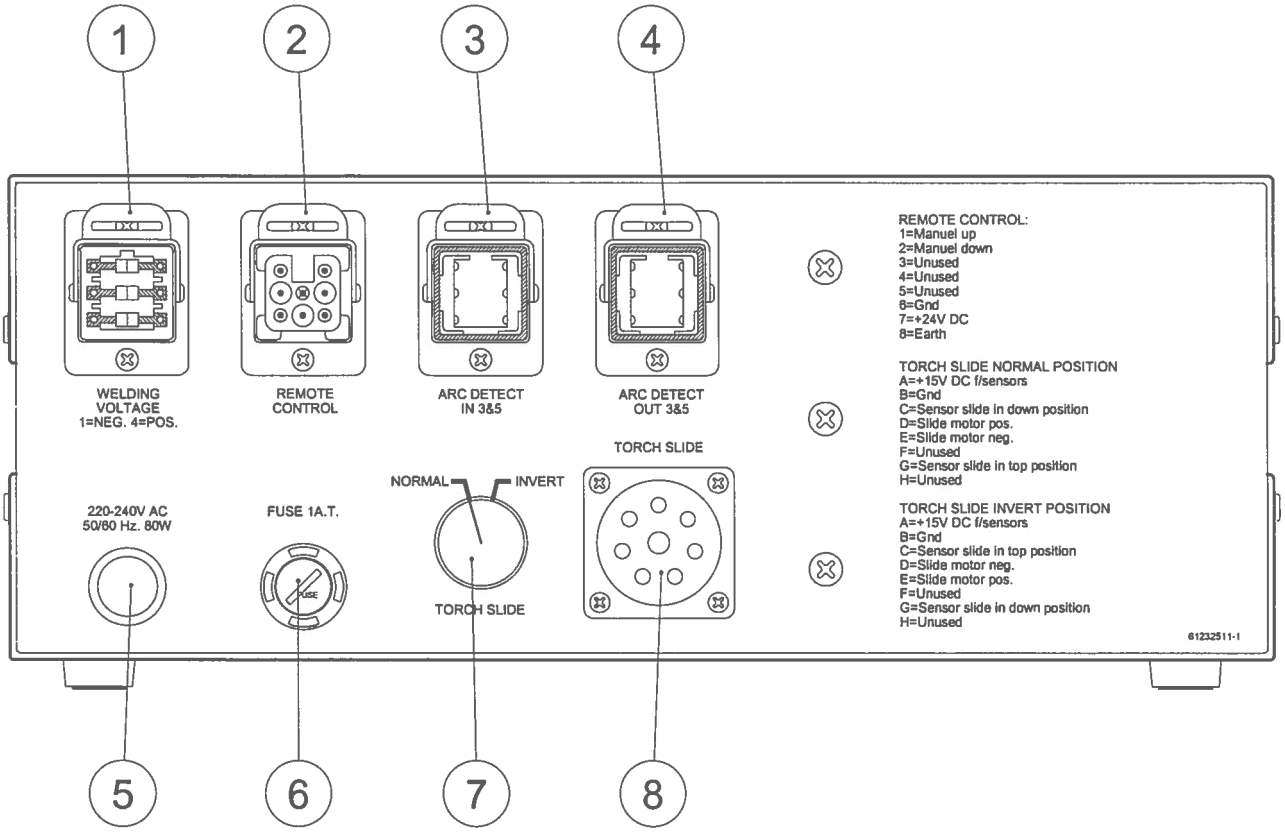
Pos. no.	Pcs.	Description	Partnumber
1	4	Screw CHJ	40310620-1
2	1	Multiple plug, female, 8P	17200023-0
3	4	Screw	40864210-1
4	1	Endplate	24634010-1
5	1	Screw CHJ	40310520-1
6	1	Retaining block	27002002-1
7	1	Screw	40060610-1
8			
9	1	Screw CHJ	40310520-1
10	10	Screw CHJ	40160406-1
11	1	Toothed pulley	47210001-1
12	1	Pointed screw	40510404-1
13	1	Counter nut	41060804-1
14	2	Ball bearing	44106084-1
15	1	Belt tightener	25453004-1
16	1	Eccentric	25403009-1
17	1	Screw CHJ	40160520-1
18	1	Toothed belt	47044000-1
19	1	Toothed pulley	47210000-1
20	1	Pointed screw	40510404-1
21	1	Endplate	24634009-1
22	1	Sideplate for 100mm Sideplate for 170mm Sideplate for 240mm Sideplate for 310mm Sideplate for 380mm	24401034-1 24401035-1 24401036-1 24401037-1 24401038-1
23	1	Bottomplate for 100mm Bottomplate for 170mm Bottomplate for 240mm Bottomplate for 310mm Bottomplate for 380mm	24334001-1 24334002-1 24334003-1 24334004-1 24334005-1
24	1	Guide rail for 100mm Guide rail for 170mm Guide rail for 240mm Guide rail for 310mm Guide rail for 380mm	45032022-1 45032022-1 45032022-1 45032022-1 45032022-1
25	1	Spacer rail for 100mm Spacer rail for 170mm Spacer rail for 240mm Spacer rail for 310mm Spacer rail for 380mm	27133002-1 27133003-1 27133004-1 27133005-1 27133006-1
26	3	Screw CHJ	40160306-1
27	1	Guide carriage	45032030-1
28	1	Nut for spindle	27403001-1
29	2	Sensor	17100801-1
30	2	Fitting for sendor	27131625-1
31	2	Face plate	41961306-1
32	2	Screw CHJ	40310612-1

Pos. no.	Pcs	Description	Partnumber
33	1	Sideplate for 100mm	24401043-1
		Sideplate for 170mm	24401044-1
		Sideplate for 240mm	24401032-1
		Sideplate for 310mm	24401045-1
		Sideplate for 380mm	24401046-1
34	2	Rail for sensor, 100mm	27000012-1
		Rail for sensor, 170mm	27000013-1
		Rail for sensor, 240mm	27000014-1
		Rail for sensor, 310mm	27000015-1
		Rail for sensor, 380mm	27000016-1
35	4	Platescrew	40864210-1
36	1	Travelling carriage	24605004-1
37	1	Shield for 100mm	24401047-1
		Shield for 170mm	24401048-1
		Shield for 240mm	24401049-1
		Shield for 310mm	24401050-1
		Shield for 380mm	24401051-1
38	1	Spindle pin	44480000-1
39	1	Spindle for 100mm	25401001-1
		Spindle for 170mm	25401002-1
		Spindle for 240mm	25401003-1
		Spindle for 310mm	25401004-1
		Spindle for 380mm	25401005-1
40	4	Screw CHJ	40310512-1
41	3	Screw for 100mm	40310540-1
	5	Screw for 170mm	40310540-1
	6	Screw for 240mm	40310540-1
	7	Screw for 310mm	40310540-1
	8	Screw for 380mm	40310540-1
42	4	Screw CHJ	40160416-1
43	1	DC-motor	17293101-1
44	1	Top cover for 100mm	24401039-1
		Top cover for 170mm	24401040-1
		Top cover for 240mm	24401033-1
		Top cover for 310mm	24401041-1
		Top cover for 380mm	24401042-1



Spare parts - control - front:

Pos. no.	Pcs.	Description	Partnumber
1	1	Indicating instrument	17350010-0
2	1	Diode, 3mm, green	12242052-0
3	1	Diode, 3mm, yellow	12242051-0
4	1	Diode, 3mm, green	12242052-0
5	1	Diode, 3mm, green	12242052-0
6	1	Diode, 3mm, red	12242050-0
7	1	Potentiometer 1Mo	14636100-0
8	1	Potentiometer 2Mo	14636203-0
9	1	Toggle switch 2P	17110006-1
10	1 1 1 1	Friction drive 1:6 Knob Dial Cap	18490001-0 18500605-0 18519001-0 18521205-0
11	1 1 1 1	Pushbutton Switch Lens, green Lamp 28V, 40mA	17110205-1 17140025-1 17180260-1 17190153-1
12	1 1 1 1	Pushbutton Switch Lens, orange Lamp 28V, 40mA	17110205-1 17140025-1 17180290-1 17190153-1

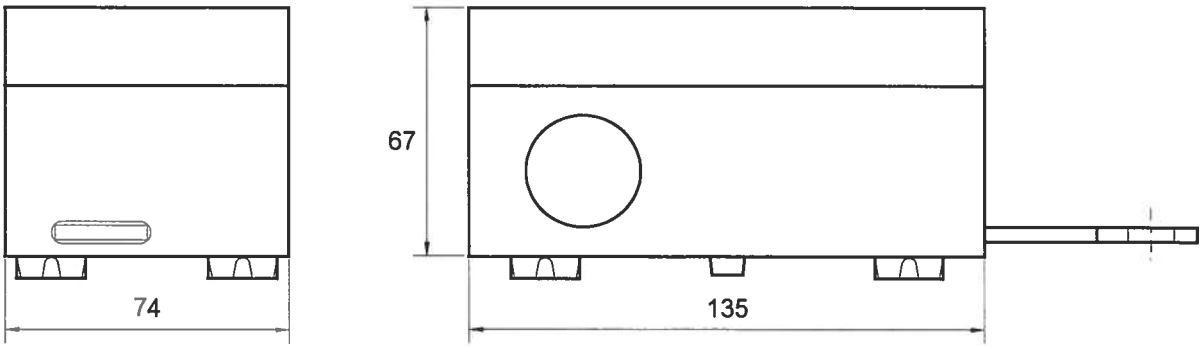


Spare parts - control - rear side:

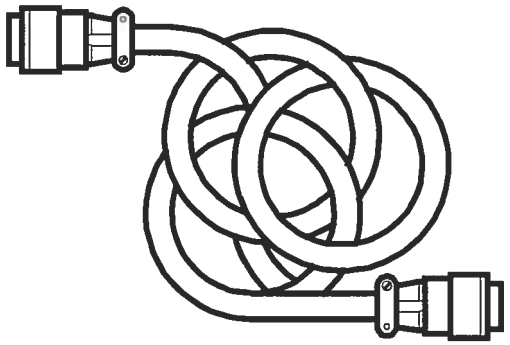
Pos. no.	Pcs.	Description	Partnumber
1	1	Flange socket	18200102-0
	1	Plug 6P, male	17210001-0
2	1	Flange socket	18200102-0
	1	Plug, female	17200005-0
3	1	Flange socket	18200102-0
	1	Plug 6P, female	17200001-0
4	1	Flange socket	18200102-0
	1	Plug 6P, female	17200001-0
5	1	Main cable with earth, 6m	74230002-1
6	1	Fuse holder	17160007-0
	1	Fuse 1A	17172010-0
7	1	Knob	18502603-0
	1	Cap	18521303-0
	1	Switch	17120005-0
8	1	Plug 8P, female	17200023-0

Other spare parts:

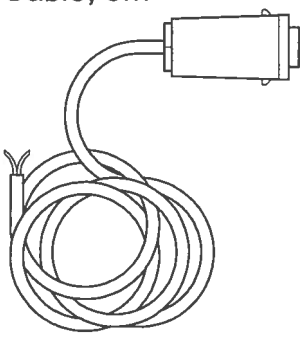
Arc detect control incl. external start-/stop-plug Partnumber : 76118817-1



Remote control cable 8P, 5m Partnumber : 74340003-0



Cable, 5m Partnumber : 74320008-1



Cable, 3m Partnumber : 74341020-1