

INTRODUCTION

MIGATRONIC welding equipment has a good reputation - and we know how important it is to live up to the standards we have set ourselves.

The welding machine you have purchased is the result of **MIGATRONIC'S** years of experience in the field of welding machine manufacture. This experience, combined with correct operation and maintenance of your machine, provides a guarantee of excellent performance in the years ahead.

Thank you for buying a **MIGATRONIC** machine.

INSTRUCTION MANUAL

MTE DIALOG

Version C

50174520

EC DECLARATION OF CONFORMITY

MIGATRONIC A/S
Aggersundvej 33
9690 Fjerritslev
Denmark

hereby declare that our machines as stated
below

Type: MTE
as of: week 50, 1995

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

European Standards: EN60974-1
EN50199

Issued in Fjerritslev on 11th December 1995.

Peter Roed
Managing director

Valid from 9946

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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.

GENERAL DESCRIPTION

The **MTE** machines are single-phase, thyristor controlled AC/DC welding machines for manual electrode welding with all types of electrodes as well as for manual and automatic TIG welding.

The special construction of the power source with a bifilar-wound welding inductor provides square waved welding current when welding AC. Contrary to a conventional welding machine with sine waves, square waves have the advantage that the current tops are reduced to ensure a softer arc and less load on the electrode when TIG welding. The special construction of the machine allows an adjustment of the relation between the positive and the negative half-wave to obtain the correct relation between cleaning and penetration, that is, AC balance.

The square wave technique in conjunction with the balance adjustment ensure a stable arc and a better penetration as well as a reduced electrode wastage.

The all-electronic control unit ensures that the actual welding current corresponds to the set value.

When electrode welding an "anti-sticking" device prevents electrodes "sticking" to the workpiece as the current is reduced to 5 A in case of short-circuit.

A watercooling unit type CTU 3000 (part no: 76118013) can be mounted.

TECHNICAL DATA

MTE 320 A/W

Duty cycle %	X	:	100	60	30
Permitted load	I ₂	:	190	245	320
At voltage V	U ₂	:	28	30	30

MAINS VOLTAGE / CURRENT

U ₁ : 1 x 220	I ₁	:	48	65	88
U ₁ : 1 x 250	I ₁	:	42	57	77
U ₁ : 1 x 380	I ₁	:	28	38	51
U ₁ : 1 x 415	I ₁	:	26	36	48
U ₁ : 1 x 440	I ₁	:	24	33	44
*) U ₁ : 1 x 500	I ₁	:	21	28	39

Consumption kVA	:	12,9	16,7	21,8
Consumption max. kVA	:			25

Current range AC	:	20-320
Current range DC	:	5-320

Open circuit voltage AC	:	84-90 dc
Open circuit voltage DC	:	84-90 dc
Ripple voltage, open cir.	:	< 5%

**) Effect 150 A/26 V	:	0,52
**) Effect cos.phi.	:	0,77
**) Efficiency	:	0,60
No load consumption kW	:	0,5

¹ Protection class	:	IP21AF
Standard	:	EN60974-1 EN50199

LxWxH, air	mm	:	1020x570x855
LxWxH, water	mm	:	1020x570x1010
Weight	kg	:	224

*) Not standard, can be delivered for other voltages

**) AC-balance set at 50%

¹ Indicates that the machine cannot be used outside in the rain

TECHNICAL DATA

BOX TYPE:


	I	II	III
Infinitely variable balance adjustment between positive/negative halfwaves	X	X	X
4 cycle, self hold	X	X	X
2 cycle, latching	X	X	X
Spot welding, infinitely variable 0.5-10 sec.	X		
Electrode welding AC and DC	X	X	X
Hot-start when electrode welding, infinitely variable from 0-100%	X	X	X
Pre-flow, gas flow, fixed		X	X
Pre-flow, gas flow, infinitely variable 0-2 sec.	X		
Post-flow, gas flow, infinitely variable 0-30 sec.	X	X	X
Infinitely variable slope-up, 0-10 sec.	X		
Infinitely variable slope-down, 0-10 sec.	X	X	X
Infinitely variable reduced current level	X		
Infinitely variable start and stop current	X		
Analog ammeter			X
Digital ammeter	X	X	
Connection of remote control	X	X	
Pulsatory arc via remote control	X	X	
Pulsatory arc via internal reg.	X		
Pulse current time: (0.03-2.0 sec.)			
Basic current time: (0.03-2.0 sec.)			

Pulse frequencies: Max. 33.3 Hz = 1998 P/min.

Min. 0.5 Hz = 30 P/min.

INITIAL OPERATING

Mains connection

The mains cable is taken through the sleeve at the back of the machine and is connected to the terminal strip at L1 and L2. The yellow/green earth connection is attached to the  marked screw. Before the machine is connected to the mains supply, it must be ensured that the welding transformer is connected to the correct voltage. A switch diagram for the various voltages is placed at the terminal strip on the transformer. The terminal strip is placed behind the left side panel.

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.

WARNING:

electrical mains power must be switched off before the cabinet is opened, and only qualified and authorized electricians should work on electrical machines.

Connection of welding cables

The welding and return cables are connected to the sockets on the front of the machine. After connection the plugs should be turned approximately 90° to avoid damage being caused by high contact resistance.

The control box

All control functions are built into the sealed and easily removed control box.

By loosening the two Allen screws on the front of the machine the control box can be removed without opening the machine.

On the back of the control box is both a multiplug which connects the control box to the machine modules, and the fuse for the protection of the remote control circuit.

The control box is available in 3 versions with different control functions.

WARNING! Only exchange the control box when the electrical mains power is switched off.

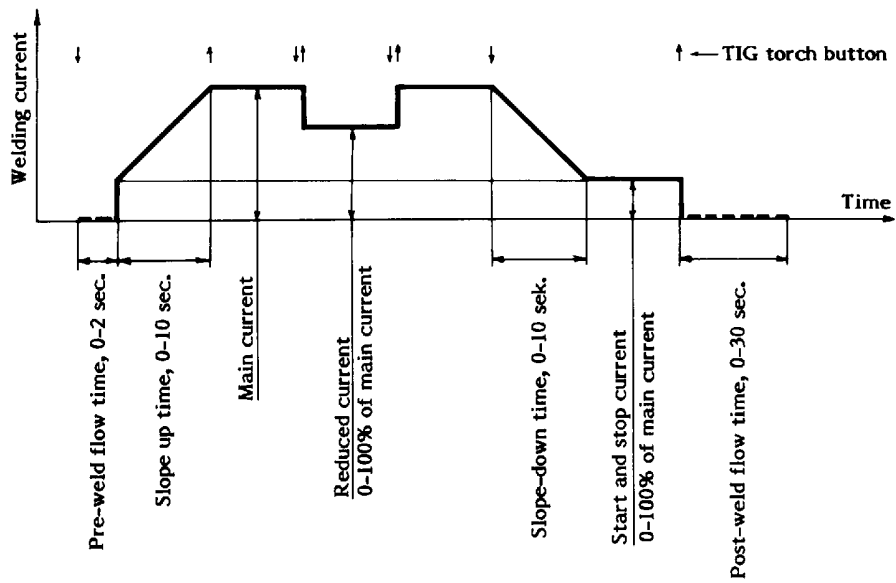
Fuse sizes and cable sizes for various mains voltages.

Mains voltage	220/250 V		380/415 V		440 V		500 V	
	Fuse	Mains cable	Fuse	Mains cable	Fuse	Mains cable	Fuse	Mains cable
MTE 320*	63 A	16 [➤]	50 A	10 [➤]	35 A	6 [➤]	35 A	6 [➤]

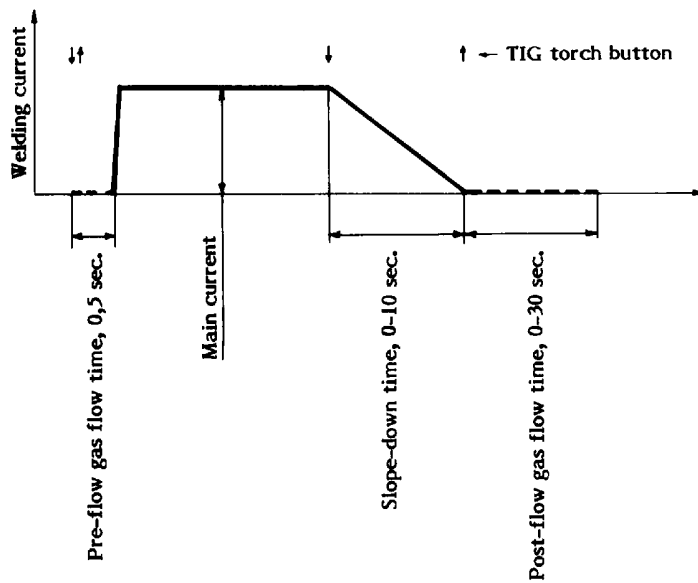
incl. phase compensating condenser.

DEFINITIONS

BOX TYPE I

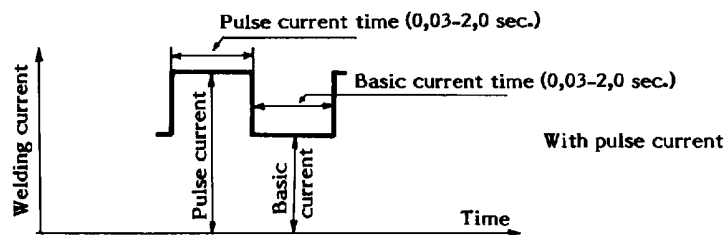


BOX TYPE II OG III

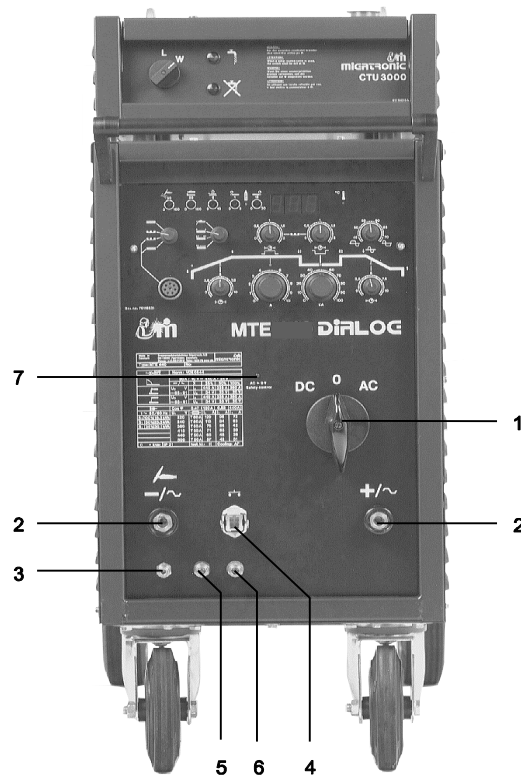


BOX TYPE I (internal pulse/external pulse)

BOX TYPE II OG III (external pulse)



ADJUSTMENT FUNCTIONS



1. Mains switch and switch between AC and DC.

When the machine is turned on, this is indicated by light in the ammeter, and a short opening of the solenoid valve to purge gas hose.

2. Welding cable sockets.

3. Quick release connection for shielding gas.

4. Multiplug for the connection of TIG torch control wire.

5. Quick release connection for water flow to water cooled TIG torch.

6. Quick release connection for recirculation of water from water cooled TIG torch.

7. Safety control.

Control lamp is turned on if there is more than 9 V AC on the welding cable sockets. This lamp should not light when not welding.

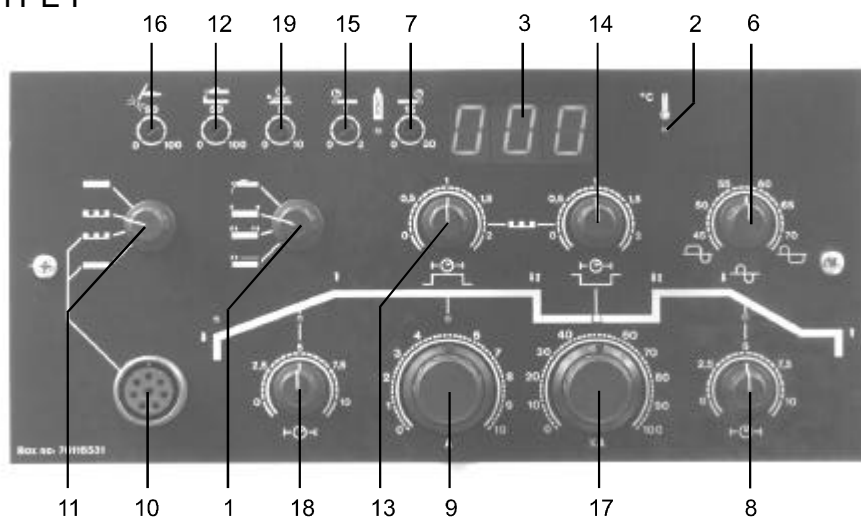
The construction of the MTE machines ensures that the open circuit voltage is **always a DC voltage** with a ripple voltage less than 5 per cent, also for AC welding.

If the lamp lights when not welding, the machine does not meet the safety regulations for welding under special conditions as described in the power current regulations.

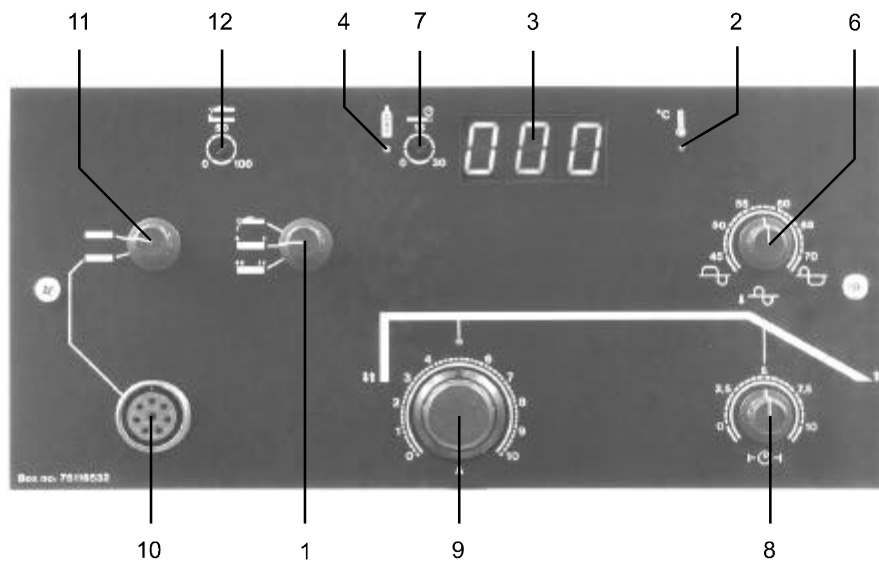
It is usual for the lamp to light during AC welding.

ADJUSTMENT FUNCTIONS BOXES

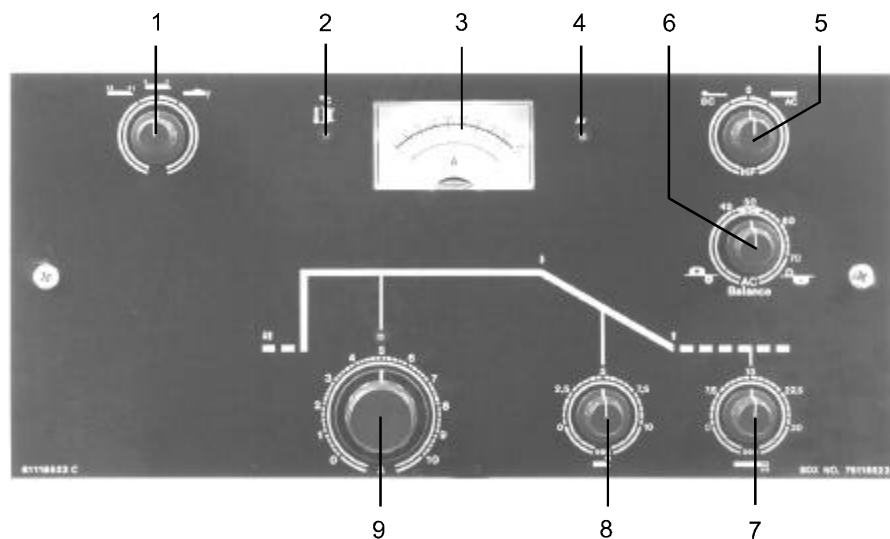
TYPE I



TYPE II







TYPE III



ADJUSTMENT FUNCTIONS BOXES

1. Switch for functions:

Self hold , seam , electrode welding . Control boxes of type I are also equipped with the spot welding function .

If the switch is set at electrode welding the "hot-start" and "anti-sticking" automatics are activated. In the other positions these functions are automatically cut out.

If the machine is activated by a pressure on the torch button when it is not welding, the machine is automatically cut out after approximately 10 sec. (self hold and spot welding).

2. Overload indicator

The red lamp lights if the automatic thermal overload protection device has cut out the machine. The thermostatically controlled fan continues working until the machine has cooled to normal temperature, after which the red light will turn off automatically and the machine is ready for use.

3. Ammeter



Shows the set welding current. The machine is equipped with a very exact electronic circuit measuring the welding current. On the basis of the measured and the set current, comparisons and adjustments are currently made to ensure a constant welding current irrespectively of varying mains voltage, cable lengths or machine heating.

4. Green control lamp

indicating that the solenoid valve has opened for the shielding gas

5. HF switch

Only on box type III. Boxes of type I and II have automatic switch.

If the selector switch is at , the HF will work only at the time of ignition and will cut out automatically when the arc is stable. At , the HF striking works during the whole welding activity. This position is used for AC welding. During electrode welding the HF striking is automatically cut out.

6. AC balance




Button for adjustment of the relation between cleaning effect and penetration at aluminium welding. This is done through a regulation of the positive and negative halfwaves.

A setting at "70" gives the highest penetration and "45" the highest cleaning effect. At DC welding the AC balance is set at "50" as this gives the lowest consumption of mains current. At type I and II boxes, this happens automatically.

7. Post-weld gas flow

The post-weld gas flow time should be set in accordance with the plate thickness and the diameter of the tungsten electrode to prevent oxidation of electrode and welding seam when the welding is ended. The time is correctly set when there is no temper colour at the end of the tungsten electrode after the burn-back delay is over, and a correct setting will extend the life of the tungsten electrode. The max. post-weld gas flow time is 30 sec.

8. Slope down control

Crater formation at the end of a weld seam can be prevented by using this control to set the time for the welding current to decay after completing the welding seam. If the switch (pos. 1) is at self hold , the slope down works as long as the torch button is held down and the welding ends when it is released. If the switch is at seam  or spot , the welding only stops when the slope down time has expired.

9. Set current

The welding current is adjusted by this potentiometer equipped with a multidrive reduction.

Control boxes I and II are furthermore equipped with the following:

10. Multiplug

for connection of remote control or welding robot. Signals for set current, measured current and "arc established".

11. Remote control switch

Switch between external or internal current adjustment and for box I furthermore internal adjustment of pulsatory arc. Machines equipped with box I or II can also weld with pulsatory arc by addition of remote control FPB (part no. 76116383). Max. pulse frequency is 16 Hz.

12. Hot start

This control can only be used when electrode welding.

If this control is set at 100% the machine will start with a welding current twice as high as the set main current (pos. 9). This hot-start surge continues for 1 second after which the machine automatically drops to the set welding current.

Control box I is also equipped with the following:

13. Pulse current time

Here the duration of the pulse current is variable between 0.03 and 2 seconds when the remote control switch (pos. 11) is at "internal pulse".


14. Basic current time

Here the duration of the basic current is variable between 0.03 and 2 seconds when the remote control switch is set at "internal pulse".

15. Pre-weld gas flow



The pre-weld gas flow time is adjustable between 0 and 2 seconds. It is thus possible to choose the optimum pre-weld gas flow time.

16. Start and stop current

With this control it is decided at what current level the welding shall start and stop. Start and stop current are set in percentage of the set current (pos. 9). When the switch (pos. 1) is at self hold , the stop current is switched on as long as the torch button is held down after the slope down time has expired.

17. Reduced current

With this control a reduced current level is set in percentage of the set current (pos. 9).




If the switch (pos. 1) is at self hold  or at spot , a brief pressure (less than 0.3 sec.) on the torch button will make the machine start on reduced current. A long pressure (more than 0.3 sec.) will make it start on set current, with or without slope up. The yellow lamp over the button shows that the welding current is at the reduced setting. Please observe that the reduced current cannot be set to a lower value than the one set at the button for start and stop current (pos. 16).

During welding a brief pressure on the torch button makes the machine switch from set current to reduced current and back again. The slope down function can work from set current as well as reduced current.

If the remote control switch (pos. 11) is at "internal Pulse", the basic current is controlled by the reduced current knob (pos. 17), while the pulse current can be adjusted by current potentiometer (pos. 9).

When "reduced current" is activated by a brief pressure at internal pulse, the pulse is stopped and can be started again by a brief pressure. The yellow lamp will light together with the pulse current.

18. Slope-up

For some difficult welding jobs it is advantageous to use the slope up function. If the switch (pos. 1) is at self hold , the slope up works as long as the torch button is held down and when it is released the current will jump to "set current". If the switch is at seam  or spot  the slope up function works until set current has been reached. The slope up time is adjustable between 0 and 10 seconds.

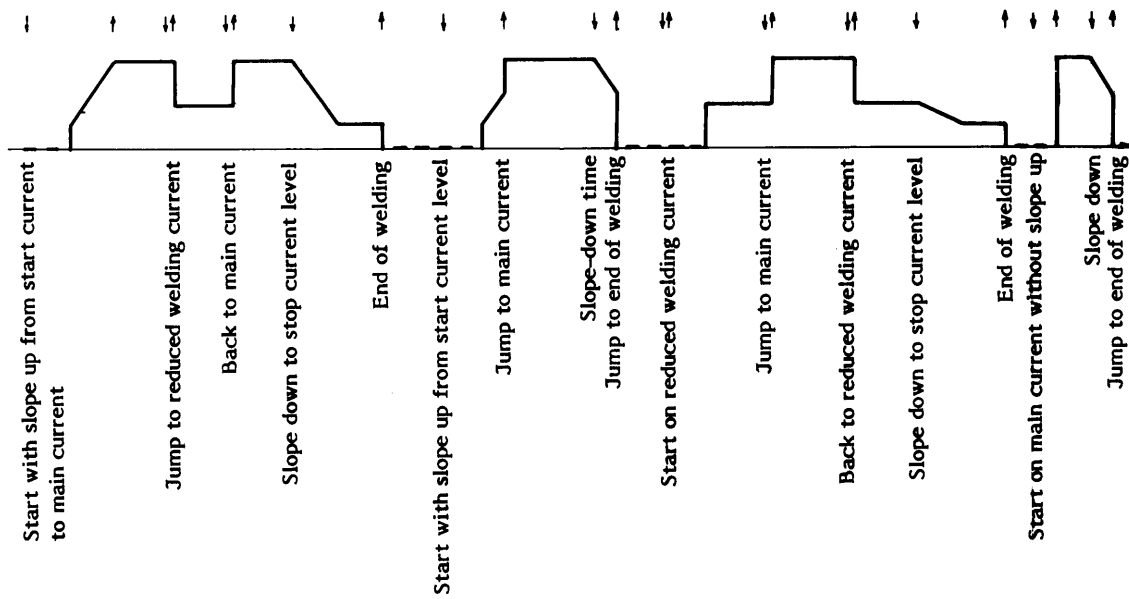
19. Spot welding time

Here the spot welding time can be set between 0.5 and 10 seconds. The time is measured after the arc has been struck and when the time expires the slope down function is activated.

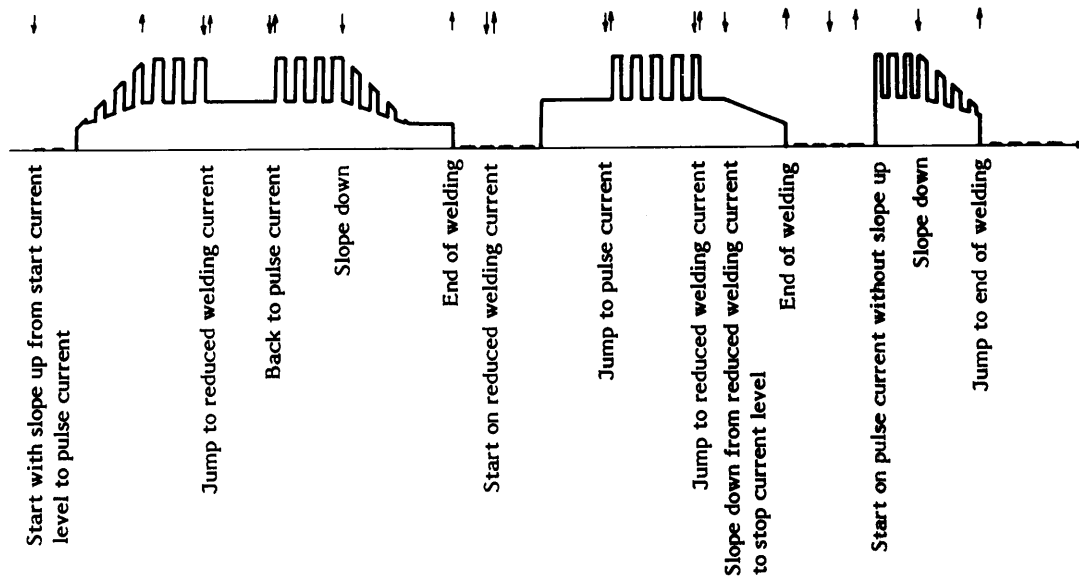
Over the buttons slope-up, set current, slope down and crater filling current there is a green lamp indicating how long the machine has reached in the programme. The following two pages show the many variations of the programmes.

ILLUSTRATION OF CONTROL PROGRAMMES FOR BOX TYPE I

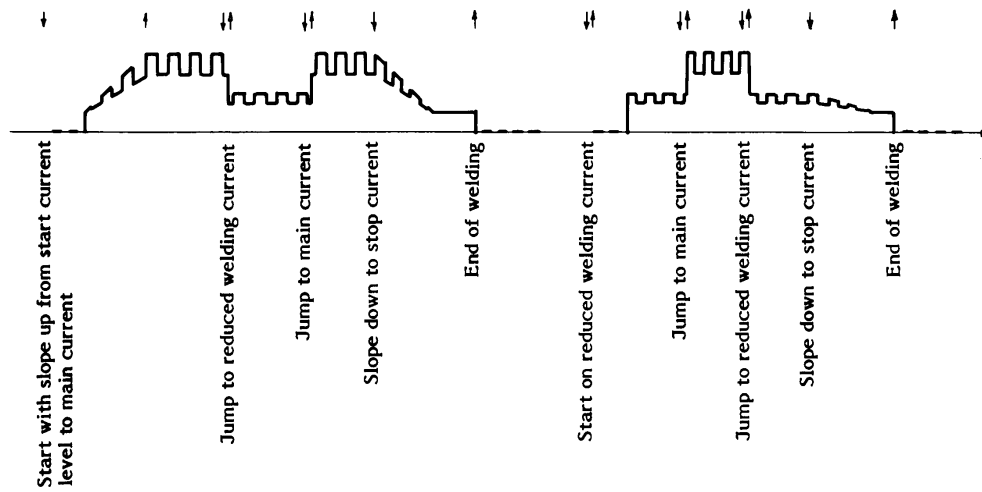
Programme: self hold



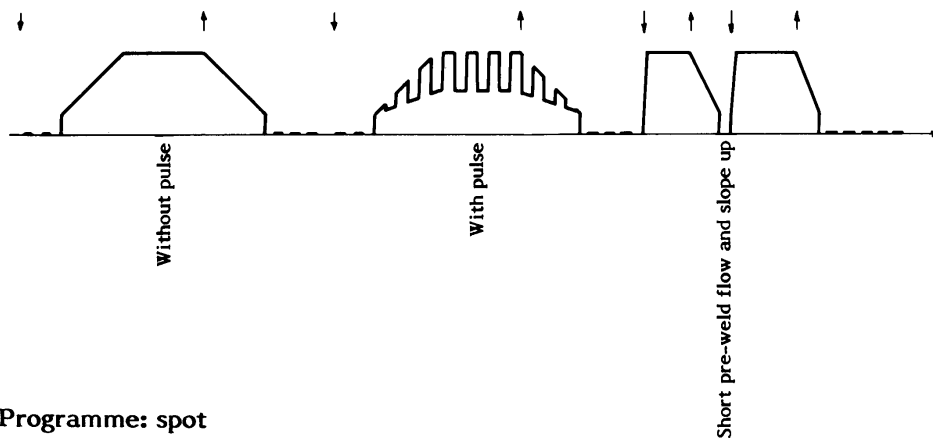
Programme: self hold, internal pulse



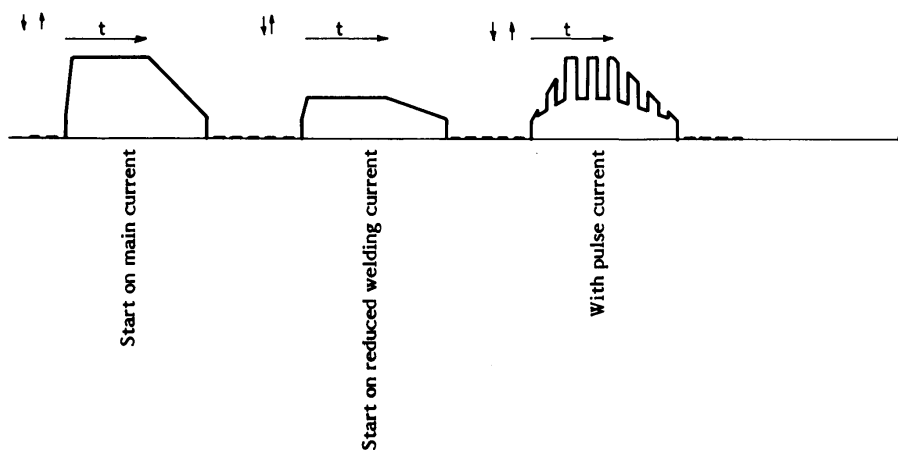
Programme: self hold, pulse via pulse remote control



Programme: seam



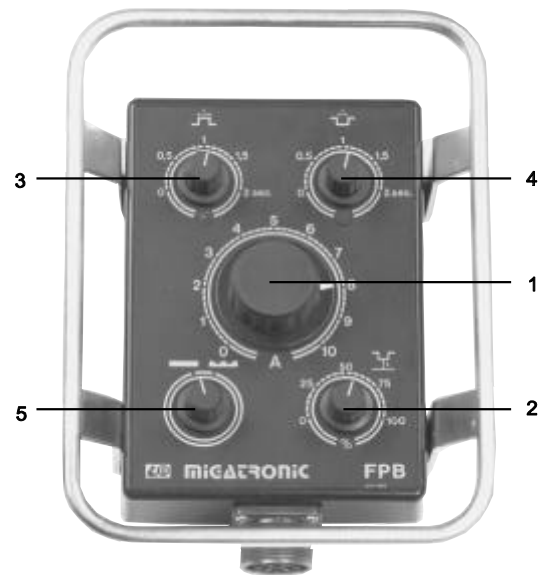
Programme: spot




REMOTE CONTROL

FPB (part no. 76116380)


By using the FPB with the TDE 400 unit, MTE machines equipped with control box type I or II become pulse TIG welding units. The FPB has the following controls.



Pos. 1 Welding current potentiometer

Here the welding current is infinitely variable and when the switch (pos. 5) is in position "  ", the pulse current is set.

Pos. 2 Basic current potentiometer

Here the basic current for the pulsatory arc is set when the switch (pos. 5) is in position "  ". The basic current is shown as a percentage of the pulse current.



Pos. 3 Potentiometer for pulse current time

The duration of the pulse current is infinitely variable between 0.03 and 2.0 seconds.

Pos. 4 Potentiometer for basic current time

The duration of the basic current is infinitely variable between 0.03 and 2.0 seconds.

Pos. 5 Switch

Under symbols "  " and "  " the machine can be set at constant or pulsatory current respectively.

FSB (part no. 76116381)

This remote control is equipped with a multidrive potentiometer for easy and fine adjustment of the welding current. (reduction ratio 1:6)

**FSL (part no. 76116382)**

An FSL remote control has the same function as the FSB but is in a handy pocket size.

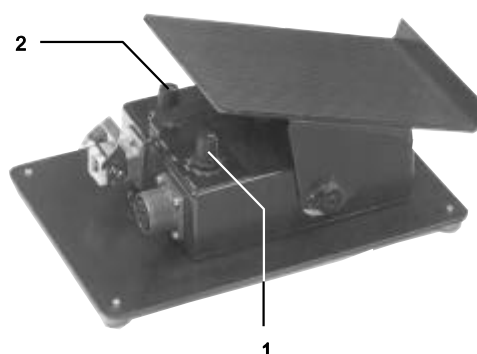
**FHB (part no. 76116383)**

The FHB remote control allows infinitely variable adjustment of the welding current and the hot start current by use of two control knobs.

**FSF (part no. 76116384)**

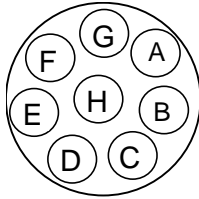
This remote control is fitted with a footswitch remote control, and has two potentiometers and a cut-out.

Current adjustment is infinitely variable throughout the range and is set by the potentiometer (pos. 1) and (pos. 2).

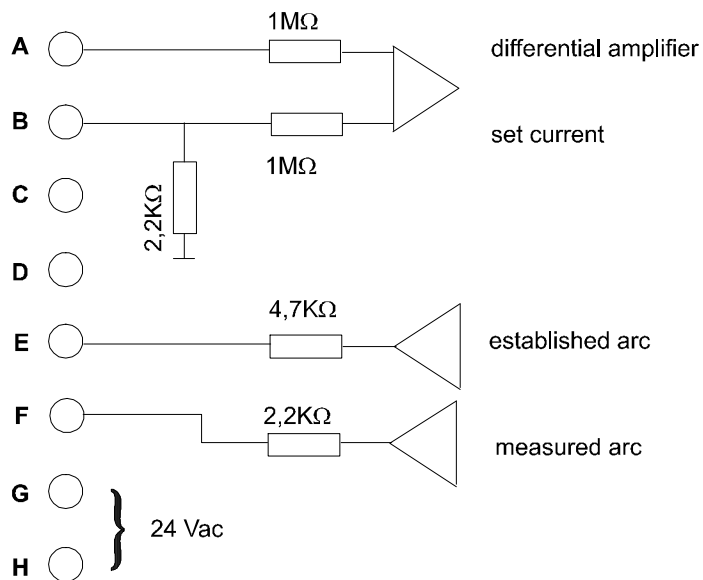


TECHNICAL DATA FOR CONNECTION OF REMOTE CONTROL

MTE-machines equipped with control box of type I or II can be controlled via a remote control or a welding robot. The remote control socket has terminals for the following function:



- A. Input signal for welding current (main current), 0 - +10 V input impedance: 1 Mohm.
- B. Signal ground, reference for all signals, input impedance 2.2 Kohm.
- C. NC
- D. NC
- E. Output signal for established arc, low = arc (0 V), high = not arc (+15 V). Output impedance 4.7 Kohm.
- F. Output signal for measured welding current 0 - -10 V (-2 V / 100 A). Output impedance 2.2 Kohm.
- G. Supply voltage for remote control etc. 24 Vac, slow fuse on back of control box 5 A.
- H. Supply ground



The figure shows a part of the MTE box diagram.

MAINTENANCE

Lack of maintenance can lead to reduced reliability and cancellation of the guarantee.

MTE type machines require little maintenance but dusty and damp conditions are to be avoided if possible.

A recommended procedure at least once a year is to open the machine and clean all parts with dry, compressed air. The fan blades should also be cleared, and all terminals should be inspected and cleaned or replaced as necessary. All mechanical connections on the electrical wires can be sprayed with a silicon-based spray for damp-proofing.

N.B. No other type of spray should be used.

The water module

If the volume of liquid in the tank goes down to a level, which might cause the cooling of the torch to stop and interruption of the weld procedure by the supervision circuit, cooling liquid must be filled up. Only use glycol and water (mixture 30/70); the cooling liquid must contain an anti-bacteria-agent in order to prevent cultures of bacteria from damaging the cooling liquid. This means that ordinary motor cooling liquid cannot be used if this agent has not been added, since the temperature of the cooling liquid when welding is not sufficient to kill the bacteria.

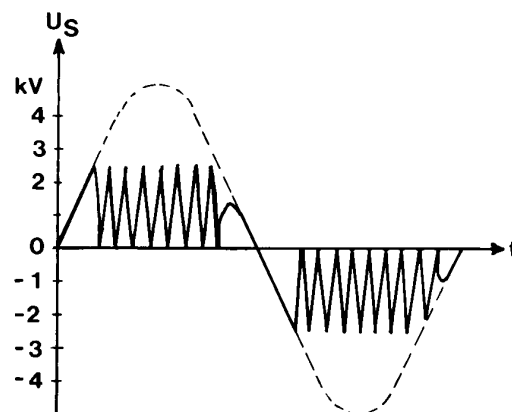
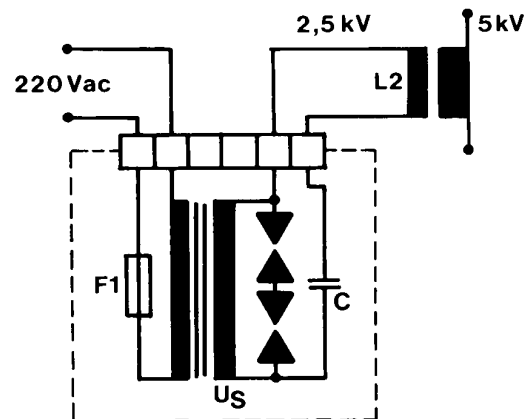
Cooling liquid with anti-bacteria-agent can be ordered under part no. 99290400.

FUNCTIONS HF

A voltage of 220 V is led to the primary coil of the transformer. On the secondary coil it is transformed to 3 kV.

Via the primary winding (L2) of the air transformer the condenser is charged and when the voltage is approx. 2.5 kV it is short circuited by the two multiple spark gaps. When the condenser is discharged the charging of it starts again.

The output voltage of the HF can be set by an adjustment of the distance between the spark gaps. However, the voltage also influences the spark frequency so that the higher the voltage is the lower the frequency is. The distance between the spark gaps is normally set to 0.4 mm.



FAULTS

Only to be carried out by qualified electricians.

If the machine does not weld satisfactorily, follow the check list.

Action		Check
Change fuses	no	Are the mains fuses satisfactory? (Use testing meters)
		yes
Repair connection plug, cable etc.	no	Is there voltage on mains cable connection in MTE? Check all 3 phases.
		yes
Change defective mains switch	no	Are all 3 phases reaching terminals U and W on the transformer? (See circuit diagram)
		yes
Return defective box	yes	Check the electronic box by exchanging it for another box. Is the problem solved?
		no
Change defective triac print	yes	Check triac print (A2) by exchanging it for another triac print. Is the problem solved?
		no
Change defective HF box	yes	Does the HF work. Check by exchanging the box for another one. Is the problem solved?
		no
		Call the Service Engineer

WELDING TABLES

TABLE 1 – GUIDE VALUES FOR ALUMINIUM AND ALUMINIUM ALLOYS							
Plate thickness (mm)	Electrode diameter (mm)	Welding current (AC) with HF pulses (Amp.)	Gas nozzle (no.)	Gas quantity (l/min.)	Filler wire diameter (mm)	Welding speed (mm/min.)	Remarks
1.0	1.0	40 - 50	4	4 - 6	-	400	Flanging
1.5	1.6	60 - 70	4 - 6	4 - 6	2	300 - 350	
2.0	1.6	80 - 90	4 - 6	5 - 6	2	300 - 350	
3.0	2.4	120 - 140	5 - 7	6 - 7	2 - 3	260 - 300	
5.0	3.2	200 - 240	6 - 8	8 - 10	3 - 5	220 - 250	
6.0	4.0	220 - 340	8	8 - 10	4	200 - 250	

TABLE 2 - GUIDE VALUES FOR MAGNESIUM AND MAGNESIUM ALLOYS							
Plate thickness (mm)	Electrode diameter (mm)	Welding current (AC) with HF pulses (Amp.)	Gas nozzle (no.)	Gas quantity (l/min.)	Filler wire diameter (mm)	Welding speed (mm/min.)	Remarks
1.0	1.0	25 - 45	4	6	- 1.5	300	preferably flanging
1.5	1.6	40 - 60	4 - 6	6	- 1.5	300	
2.0	1.6	50 - 80	4 - 6	6	2	300	
3.0	1.6 - 2.4	80 - 110	4 - 6	8	3	250	
5.0	2.4	110 - 130	5 - 7	8	4 - 5	-	first layer
	2.4	150 - 170	6	8	4 - 5	-	
	1.6 - 2.4	80 - 90	5 - 6	9	4 - 5	-	second layer

High welding current with backing – low welding current without backing

TABLE 3 – GUIDE VALUES FOR ALLOYED AND NON-ALLOYED STEEL							
Plate thickness (mm)	Electrode diameter (mm)	Welding current (DC) (Amp.) straight polarity	Gas nozzle (no)	Gas quantity (l/min.)	Filler wire diameter (mm)	Welding speed (mm/min.)	Remarks
1.0	1.0	30 - 60	4	4	- 1.5	300 - 350	
1.5	1.6	70 - 80	4 - 5	5	- 1.5	300	
2.0	1.6	90 - 110	4 - 5	5	2	280 - 300	
3.0	1.6 - 2.4	130 - 150	4 - 6	5	3	250 - 300	
5.0	2.4 - 3.2	180 - 250	6 - 8	6	4	200 - 240	
6.0	4.0	190 - 340	8	6	4	180 - 220	

TABLE 4 – GUIDE VALUES FOR COPPER							
Plate thickness (mm)	Electrode diameter (mm)	Welding current (DC) (Amp.) straight polarity	Gas nozzle (no)	Gas quantity (l/min.)	Filler wire diameter (mm)	Welding speed (mm/min.)	Remarks
1.0	1.6	80 - 100	5 - 6	6	- 1.5	280 - 320	
1.5	1.6	110 - 140	5 - 6	6	- 1.5	270 - 300	
2.0	2.4	140 - 170	6 - 7	7	2	260 - 300	
3.8	2.4 - 3.2	170 - 220	6 - 8	7	3	240 - 280	
5.0	3.2 - 4.0	250 - 300	8	7	4,5	200 - 240	

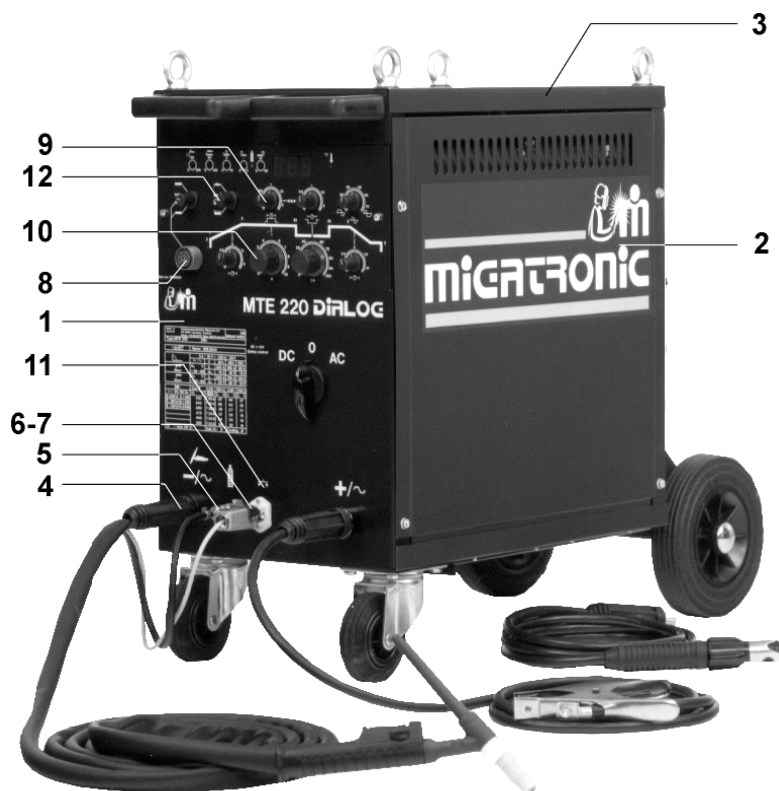
Reservedelsliste
Spare parts list
Ersatzteilliste
Liste des pièces de rechange

MTE DIALOG

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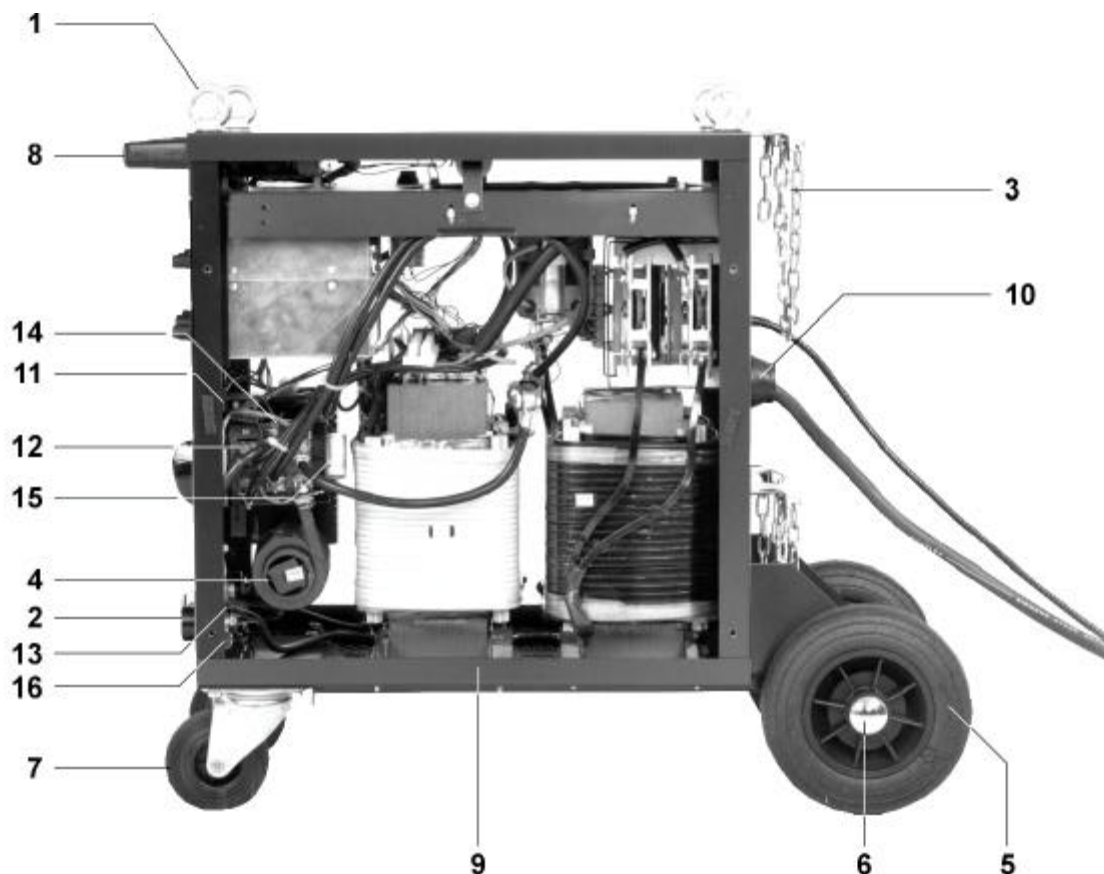
Valid from 2000 week 12

MTE 220 DIALOG



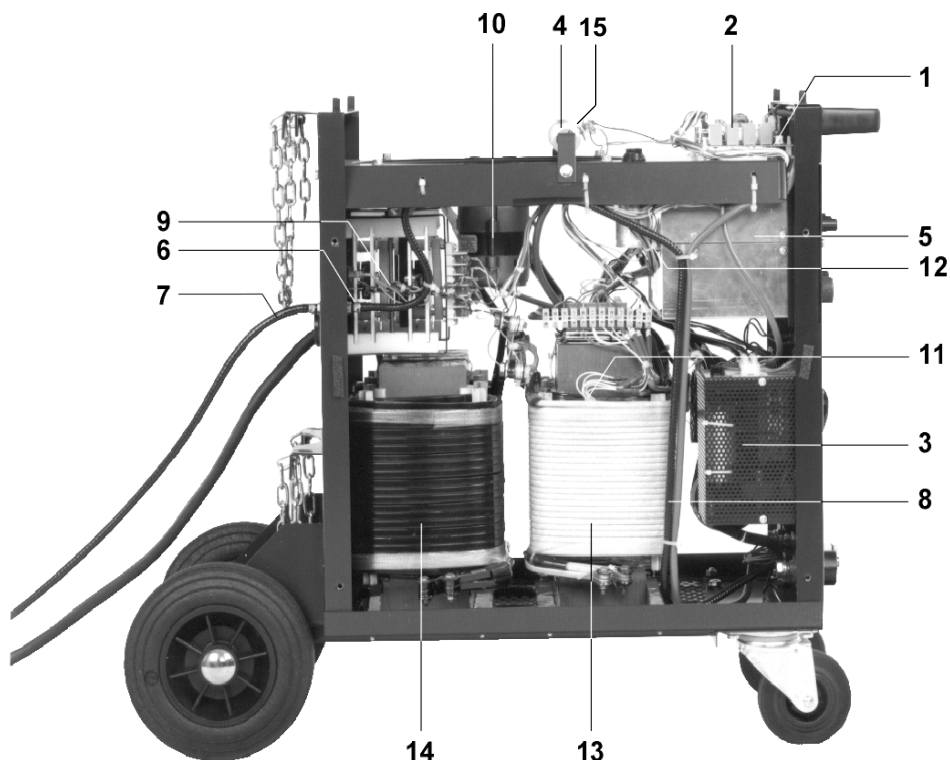
Pos.	No.	Varebetegnelse Warenbezeichnung	Description of goods Désignation des pièces
1	61114523	Frontpanel, MTE 220 Frontplatte, MTE 220	Front plate, MTE 220 Pièce avant, MTE 220
2	24414526	Sideskærm, grøn MTE 220 Seitenschirm, grün MTE 220	Side panel, green MTE 220 Plaque latérale, vert MTE 220
3	24414521	Låg, grøn MTE 220 Deckel, grün MTE 220	Lid, green MTE 220 Couvercle, verte MTE 220
4	18110008	TIG-tilslutning WIG-Anschluß	TIG connection Connexion de TIG
5	43120007	Ar.-tilslutning Ar.-Anschluß	Ar. connection Connexion de Ar.
6	17200001	Multistik 6-pol Vielfachstecker 6-Pol	Multiplug 6-pole Prise multibroche mâle 6-pôle
7	18200002	Hus for multistik 6-pol Vielfachstecker Gehäuse 6-Pol	Multiplug socket 6-pole Prise multibroche fixe 6-pôle
8	17200023	Multistik 8-pol Vielfachstecker 8-Pol	Multiplug 8-pole Prise multibroche mâle 8-pôle
9	18508003	Heva knap ø21,5 Knopf ø21,5	Button ø21,5 Bouton ø21,5
10	18503605	Knap ø28 Knopf ø28	Button ø28 Bouton ø28
10	45070012	Pileskive for knap ø28 Pfeilscheibe für den Knopf ø28	Arrow dial for button ø28 Disque à fleche de bouton ø28
10	18521205	Dæksel for knap ø28 Deckel für den Knopf ø28	Cover for button ø28 Couvercle de bouton ø28
11	71616526	Støjdæmpningsfilter Störfilter	Noise filter Filtre anti-brouilleur
12	18502602	Knap ø15 Knopf ø15	Button ø15 Bouton ø15
12	18511302	Afdækning for knap ø15 Deckel für den Knopf ø15	Uncovering for ø15 button Couverture pour ø15 bouton
12	18521302	Dæksel for knap ø15 Deckel für den Knopf ø15	Cover for button ø15 Couvercle de bouton ø15

MTE 220 DIALOG



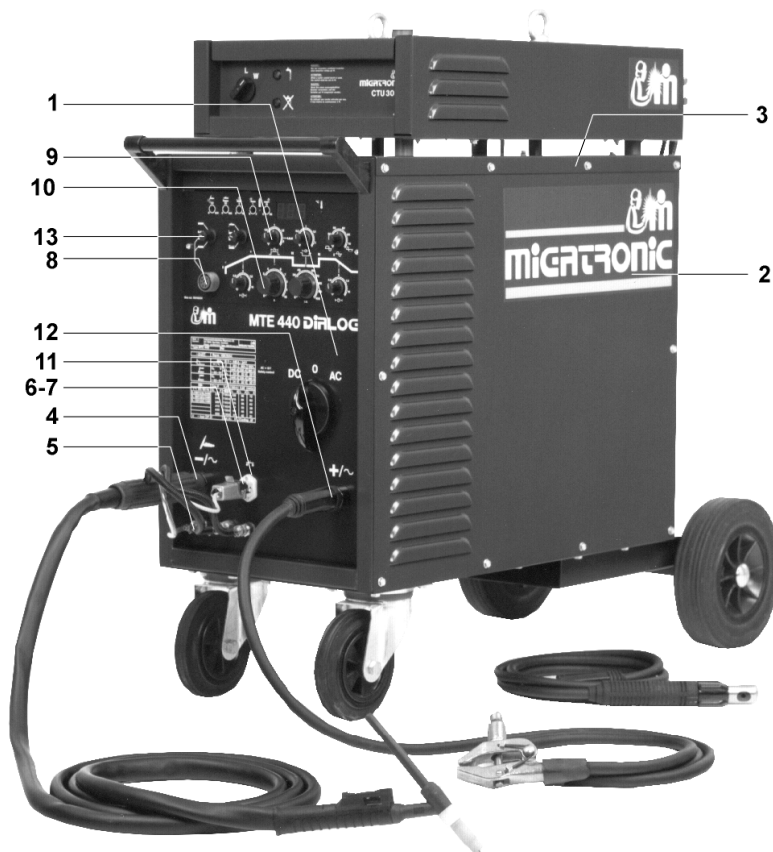
Pos.	No.	Varebetegnelse Warenbezeichnung	Description of goods Désignation des pièces
1	41219010	Løfteøje M10, MTE 220	Ring bolt M10, MTE 220
2	18110002	Ohrbolzen M10, MTE 220	Boulon à oeillet M10, MTE 220
3	42410001	Dinsebøsning	Dinse coupling socket
4	16414531	Dinsebuchse	Douille de raccordement, type Dinse
5	44210200	Kæde	Chain
6	44610001	Kette	Chaîne
7	44220100	HF-trafo MTE 220	HF transformer MTE 220
8	45050007	HF-trafo MTE 220	HF-transformateur MTE 220
9	70114521	Endenavshjul MTE 220	Wheel MTE 220
10	45070005	Nabenrad MTE 220	Roue d'extrémité moyeu MTE 220
11	71614525	Navkapsel	Wheel cap
12	17250043	Nabendeckel	Couvre-moyeu
13	74420022	Drejehjul MTE 220	Swivelling wheel MTE 220
14	74420024	Rad, drehbar MTE 220	Roue pivotante MTE 220
15	74420026	Håndtag MTE 220	Handle MTE 220
16	14990004	Handgriff MTE 220	Poignée MTE 220
		Kabinet grøn, MTE 220	Case green, MTE 220
		Kabinett grün, MTE 220	Carosserie verte, MTE 220
		Kabelafastning	Cable lead-in
		Kabeldurchführung	Traversé de câble
		Rippelovervågning	Ripple control
		Rippelüberwachung	Contrôle ripple
		Omskifter AC-0-DC, MTE 220	Switch AC-0-DC, MTE 220
		Schalter AC-0-DC, MTE 220	Commutateur AC-0-DC, MTE 220
		RC-led	RC-protection
		Überspannungsschutz	Joint de protection contre surcharge
		Støjkondestator	Noise condenser
		Geräuschkondensator	Condensateur de bruit
		RC-led	RC-protection
		Überspannungsschutz	Joint de protection contre surcharge
		Shunt	Shunt
		Messwiderstand	Shunt

MTE 220 DIALOG



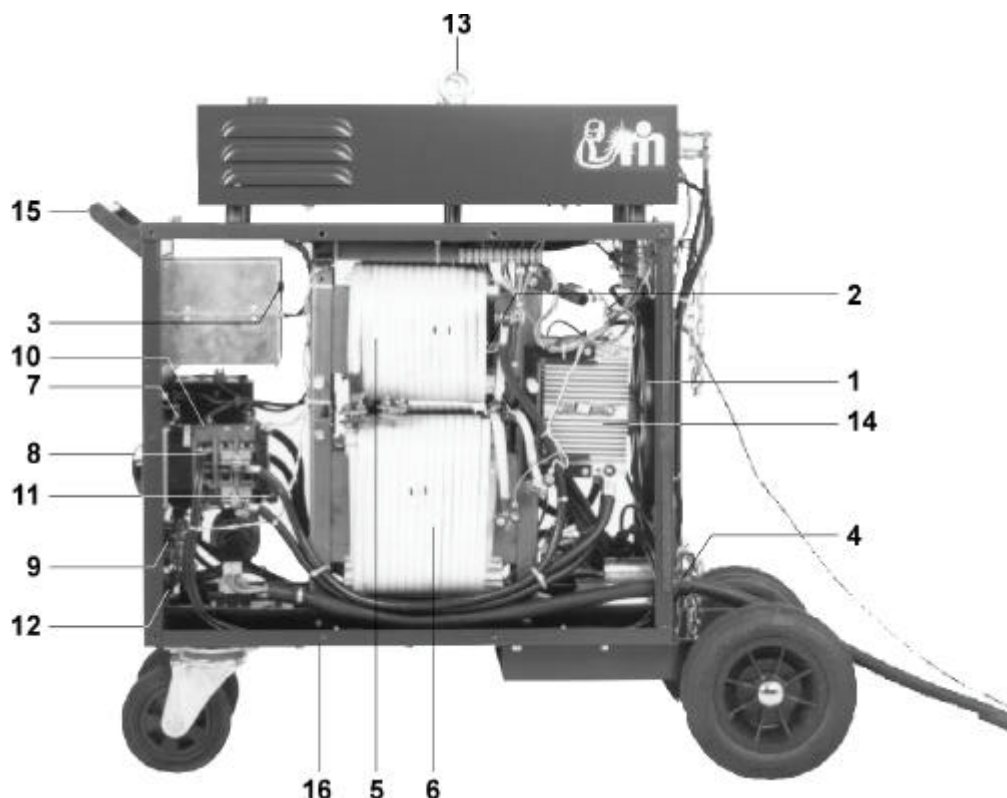
Pos.	No.	Varebetegnelse Warenbezeichnung	Description of goods Désignation des pièces
1	17172020	Sikring 2 A, træg Sicherung 2 A, træg	Fuse 2 A, slow Fusible 2 A, lent
2	71614520	Triacprint Triacplatine	Triac print Platine triac
3	76114528	HF-box HF-box	HF box Boîtier HF
4	14491100	Modstand 10 ohm Widerstand 10 ohm	Resistor 10 ohm Résistance 10 ohm
5	76116531	Elektronikbox type I Elektronikbox Typ I	Control box type I Boîtier de commande type I
5	76116532	Elektronikbox type II Elektronikbox Typ II	Control box type II Boîtier de commande type II
5	76116533	Elektronikbox type III Elektronikbox Typ III	Control box type III Boîtier de commande type III
6	73420008	Magnetventil med studs Magnetventil mit Stutz	Solenoid valve with connection piece Vanne solénoïde avec raccord d'extrémité
7	74120010	Gasslange 2,7 m Gasschlauch 2,7 m	Gas hose 2,7 m Tuyauterie de gaz 2,7 m
8	74121110	Gasslange 1,1 m Gasschlauch 1,1 m	Gas hose 1,1 m Tuyauterie de gaz 1,1 m
9	12280004	Thyristorensretter MTE 220 Thyristor Gleichrichter MTE 220	Thyristor rectifier MTE 220 Redresseur de thyristor MTE 220
10	17300015	Ventilator komplet Ventilator komplett	Fan complete Ventilateur complete
11	74420027	Termosikringssæt Thermosicherungsbausatz	Kit for thermal overload protection Jeu de thermo relais
12	17170050	Sikring 5 A, flink Sicherung 5 A, Flink	Fuse 5 A, quick Fusible 5 A, rapide
13	16114520	Svejsetrafo 190-440 V, MTE 220 Schweißtrafo 190-440 V, MTE 220	Welding transformer 190-440 V, MTE 220 Transformateur de soudage 190-440 V, MTE 220
13	16114521	Svejsetrafo 190-500 V, MTE 220 Schweißtrafo 190-500 V, MTE 220	Welding transformer 190-500 V, MTE 220 Transformateur de soudage 190-500 V, MTE 220
14	16414520	Drosselspole, MTE 220 Drosselspule, MTE 220	Inductor, MTE 220 Bobine d'inductance, MTE 220
15	18130022	Udtag/modstand 10 ohm, 40 W Anzapfung/widerstand 10 ohm, 40 W	Tap/resistor 10 ohm, 40 W Prise/resistance 10 ohm, 40 W
	74470447	Ledningssæt stærkstrøm, MTE 220 Leitungsbündel starkstrom, MTE 220	Wire harness power current, MTE 220 Filerie courant fort, MTE 220
	74470449	Ledningssæt svagstrøm, MTE 220 Leitungsbündel schwachstrom, MTE 220	Wire harness low current, MTE 220 Filerie courant faible, MTE 220

MTE 320/440 DIALOG



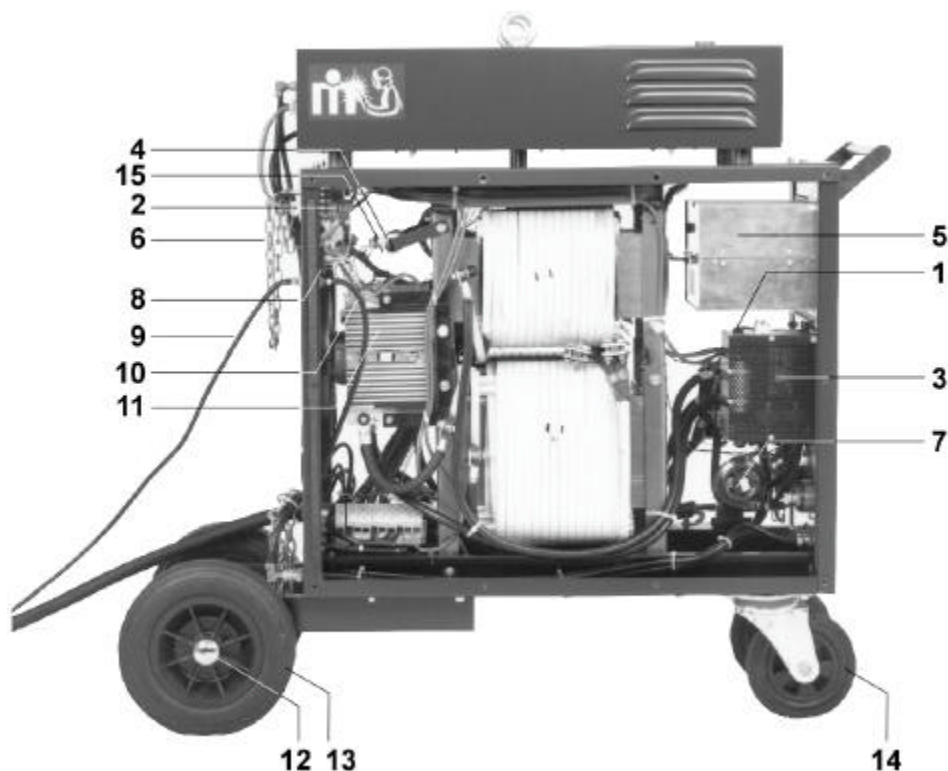
Pos.	No.	Varebetegnelse Warenbezeichnung	Description of goods Désignation des pièces
1	61114554	Frontpanel, MTE 320 Frontplatte, MTE 320	Front plate, MTE 320 Pièce avant, MTE 320
1	61114544	Frontpanel, MTE 440 Frontplatte, MTE 440	Front plate, MTE 440 Pièce avant, MTE 440
2	24434554	Sideskærm, venstre, grøn MTE 320/440 Seitenschirm, link, grøn MTE 320/440	Side panel, left, green MTE 320/440 Plaque latérale, gauche, verte MTE 320/440
2	24434555	Sideskærm, højre, grøn MTE 320/440 Seitenschirm, recht, grøn MTE 320/440	Side panel, right, green MTE 320/440 Plaque latérale, droite, verte MTE 320/440
3	24414552	Låg, grøn MTE 320/440 Deckel, grøn MTE 320/440	Lid, green MTE 320/440 Couvercle, verte MTE 320/440
4	18110008	TIG-tilslutning WIG-Anschluß	TIG connection Connexion de TIG
5	43120007	Ar.-tilslutning Ar.-Anschluß	Ar. connection Connexion de Ar.
6	17200001	Multistik 6-pol Vielfachstecker 6-Pol	Multiplug 6-pole Prise multibroche mâle 6-pôle
7	18200002	Hus for multistik 6-pol Vielfachstecker Gehäuse 6-Pol	Multiplug socket 6-pole Prise multibroche fixe 6-pôle
8	17200023	Multistik 8-pol Vielfachstecker 8-Pol	Multiplug 8-pole Prise multibroche mâle 8-pôle
9	18508003	Heva knap ø21,5 Knap ø21,5	Button ø21,5 Bouton ø21,5
10	18503605	Knap ø28 Knap ø28	Button ø28 Bouton ø28
10	45070012	Pileskive for knap ø28 Pfeilscheibe für den Knopf ø28	Arrow dial for button ø28 Disque à fleche de bouton ø28
10	18521205	Dæksel for knap ø28 Deckel für den Knopf ø28	Cover for button ø28 Couvercle de bouton ø28
11	71616526	Støjdæmpningsfilter Störfilter	Noise filter Filtre anti-brouilleur
12	18110002	Dinsebøsning Dinsebuchse	Dinse coupling socket Douille de raccordement, type Dinse
13	18502602	Knap ø15 Knap ø15	Button ø15 Bouton ø15
13	18511302	Afdækning for knap ø15 Deckel für den Knopf ø15	Uncovering for ø15 button Couverture pour ø15 bouton
13	18521302	Dæksel for knap ø15 Deckel für den Knopf ø15	Cover for button ø15 Couvercle de bouton ø15

MTE 320/440 DIALOG



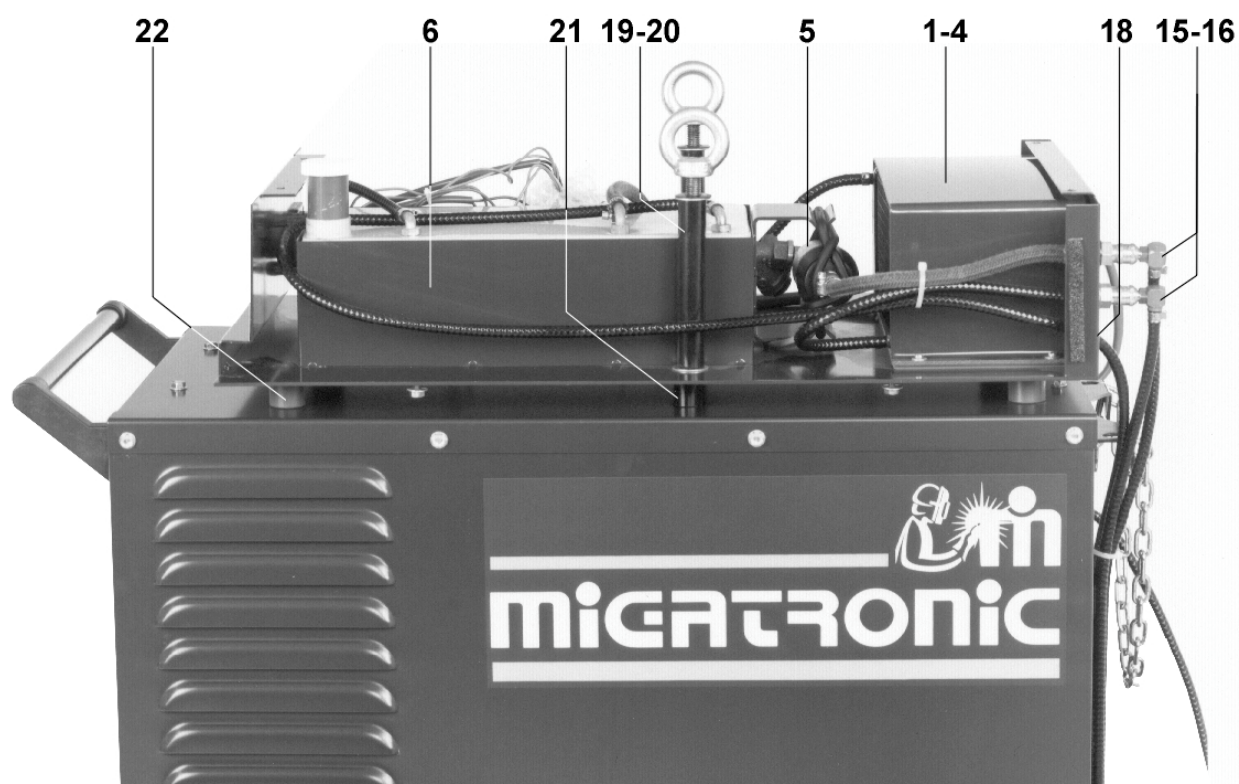
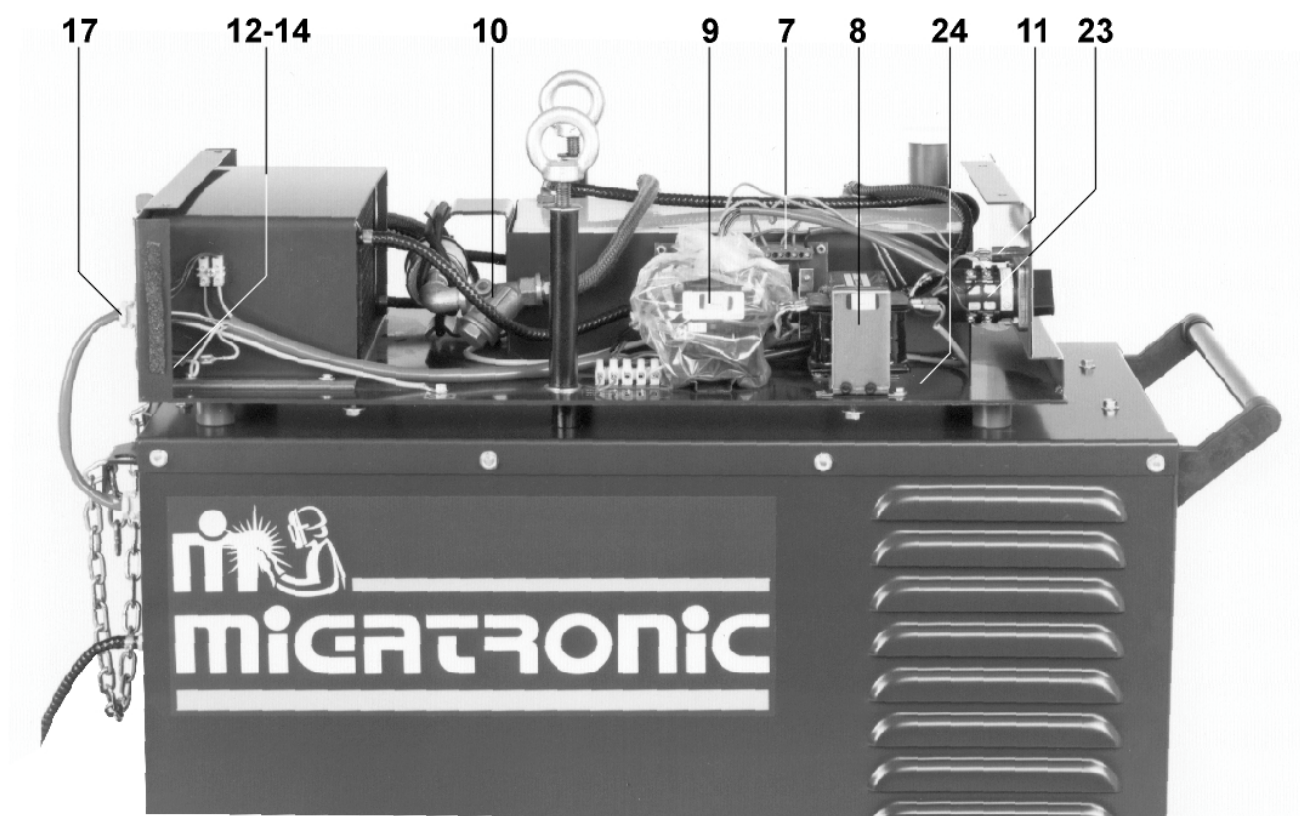
Pos.	No.	Varebetegnelse Warenbezeichnung	Description of goods Désignation des pièces
1	17300015	Ventilator komplet Ventilator komplett	Fan complete Ventilateur complete
2	74420027	Termosikringssæt Thermosicherungsbausatz	Kit for thermal overload protection Jeu de thermo relais
3	17170050	Sikring 5 A, flink Sicherung 5 A, Flink	Fuse 5 A, quick Fusible 5 A, rapide
4	45070005	Kabelaflastning Kabeldurchführung	Cable lead-in Traversé de câble
5	16114553	Svejsetrafo 190-440 V, MTE 320 Schweißtrafo 190-440 V, MTE 320	Welding transformer 190-440 V, MTE 320 Transformateur de soudage 190-440 V, MTE 320
5	16114554	Svejsetrafo 190-500 V, MTE 320 Schweißtrafo 190-500 V, MTE 320	Welding transformer 190-500 V, MTE 320 Transformateur de soudage 190-500 V, MTE 320
5	16114543	Svejsetrafo 190-440 V, MTE 440 Schweißtrafo 190-440 V, MTE 440	Welding transformer 190-440 V, MTE 440 Transformateur de soudage 190-440 V, MTE 440
5	16114542	Svejsetrafo 190-500 V, MTE 440 Schweißtrafo 190-500 V, MTE 440	Welding transformer 190-500 V, MTE 440 Transformateur de soudage 190-500 V, MTE 440
6	16414553	Drosselspole, MTE 320 Drosselspule, MTE 320	Inductor, MTE 320 Bobine d'inductance, MTE 320
6	16414541	Drosselspole, MTE 440 Drosselspule, MTE 440	Inductor, MTE 440 Bobine d'inductance, MTE 440
7	71614525	Rippelovervågning Rippelüberwachung	Ripple control Contrôle ripple
8	17250044	Omskifter AC-0-DC, MTE 320/440 Schalter AC-0-DC, MTE 320/440	Switch AC-0-DC, MTE 320/440 Commutateur AC-0-DC, MTE 320/440
9	74420022	RC-led Überspannungsschutz	RC-protection Joint de protection contre surcharge
10	74420024	Støjcondensator Geräuschkondensator	Noise condenser Condensateur de bruit
11	74420026	RC-led Überspannungsschutz	RC-protection Joint de protection contre surcharge
12	14990004	Shunt Messwiderstand	Shunt Shunt
13	41219012	Løfteøje M12, MTE 320/440 Ohrbolzen M12, MTE 320/440	Ring bolt M12, MTE 320/440 Boulon à œillet M12, MTE 320/440
14	12280005	Thyristorensretter venstre, MTE 320/440 Thyristor Gleichrichter link, MTE 320/440	Thyristor rectifier left, MTE 320/440 Redresseur de thyristor gauche, MTE 320/440
15	70611502	Håndtag MTE 320/440 Handgriff MTE 320/440	Handle MTE 320/440 Poignée MTE 320/440
16	70114553	Kabinet grøn, MTE 320/440 Kabinett grün, MTE 320/440	Case green, MTE 320/440 Carrosserie verte, MTE 320/440

MTE 320/440 DIALOG



Pos.	No.	Varebetegnelse Warenbezeichnung	Description of goods Désignation des pièces
1	17172020	Sikring 2 A, træg Sicherung 2 A, træg	Fuse 2 A, slow Fusible 2 A, lent
2	71614520	Triacprint Triacplatine	Triac print Platine triac
3	76114528	HF-box HF-box	HF box Boîtier HF
4	14491100	Modstand 10 ohm Widerstand 10 ohm	Resistor 10 ohm Résistance 10 ohm
5	76116531	Elektronikbox type I Elektronikbox Typ I	Control box type I Boîtier de commande type I
5	76116532	Elektronikbox type II Elektronikbox Typ II	Control box type II Boîtier de commande type II
5	76116533	Elektronikbox type III Elektronikbox Typ III	Control box type III Boîtier de commande type III
6	42410001	Kæde Kette	Chain Chaîne
7	16414551	HF-trafo 440 V, MTE 320/440 HF-trafo 440 V, MTE 320/440	HF transformer 440 V, MTE 320/440 HF-transformateur 440 V, MTE 320/440
8	73420008	Magnetventil med studs Magnetventil mit Stutz	Solenoid valve with connection piece Vanne solénoïde avec raccord d'extrémité
9	74120010	Gasslange 2,7 m Gasschlauch 2,7 m	Gas hose 2,7 m Tuyauterie de gaz 2,7 m
10	74121130	Gasslange 1,3 m Gasschlauch 1,3 m	Gas hose 1,3 m Tuyauterie de gaz 1,3 m
11	12280006	Thyristorensretter højre, MTE 320/440 Thyristor Gleichrichter recht, MTE 320/440	Thyristor rectifier right, MTE 320/440 Redresseur de thyristor droite, MTE 320/440
12	44610001	Navkapsel Nabendeckel	Wheel cap Couvre-moyeu
13	44210250	Endenavshjul MTE 320/440 Nabenrad MTE 320/440	Wheel MTE 320/440 Roue d'extrémité moyeu MTE 320/440
14	44220160	Drejehjul MTE 320/440 Rad, drehbar MTE 320/440	Swivelling wheel MTE 320/440 Roue pivotante MTE 320/440
15	18130022	Udtag/modstand 10 ohm, 40 W Anzapfung/widerstand 10 ohm, 40 W	Tap/resistor 10 ohm, 40 W Prise/resistance 10 ohm, 40 W
	74470446	Ledningssæt stærkstrøm, MTE 320/440 Leitungsbündel starkstrom, MTE 320/440	Wire harness power current, MTE 320/440 Filerie courant fort, MTE 320/440
	74470448	Ledningssæt svagstrøm, MTE 320/440 Leitungsbündel schwachstrom, MTE 320/440	Wire harness low current, MTE 320/440 Filerie courant faible, MTE 320/440

CTU 3000



CTU 3000

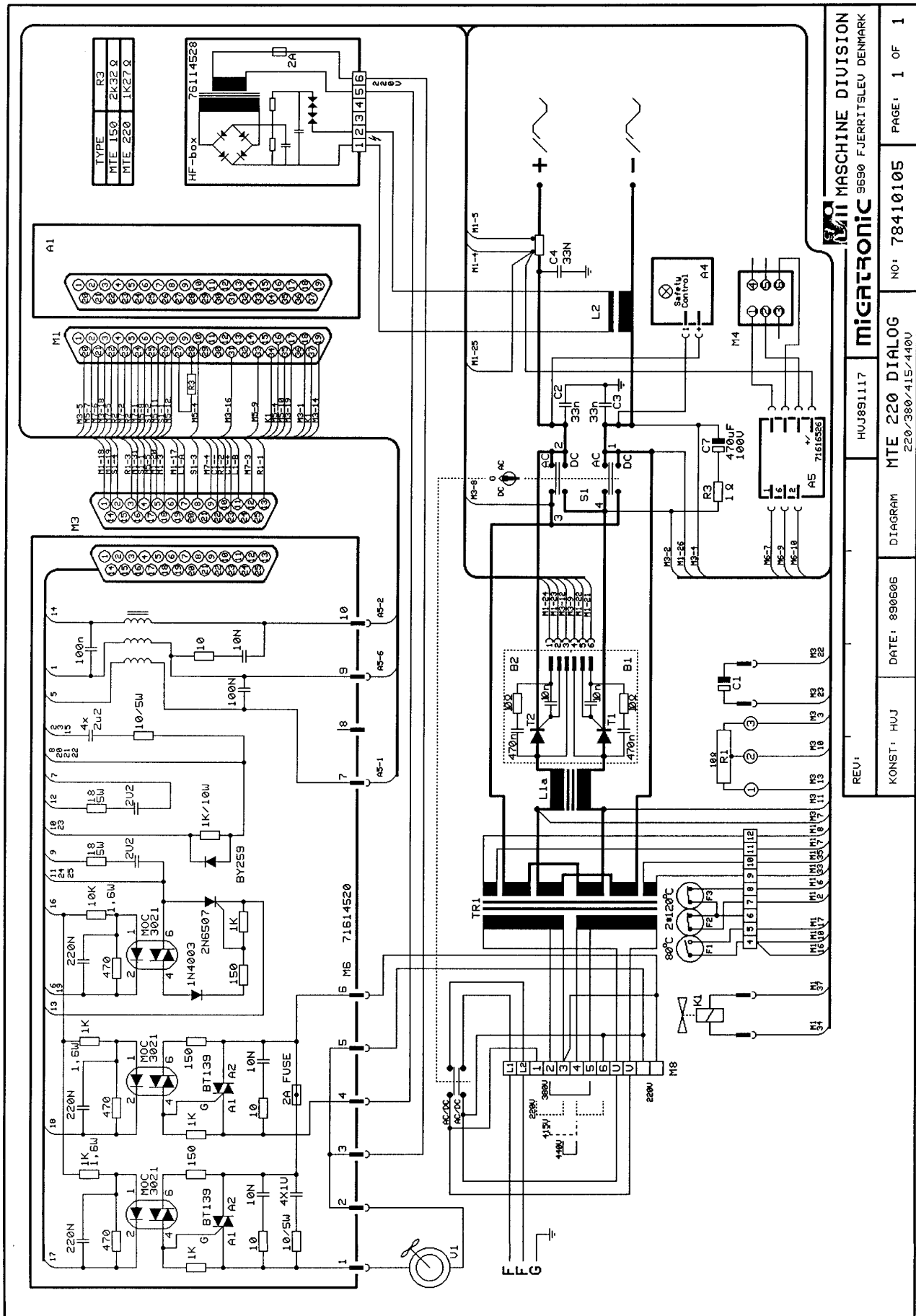
Pos.		Varebetegnelse Warenbezeichnung	Description of goods Désignation des pièces
	78812005	CTU 3000 komplet	CTU 3000 complete
		CTU 3000 komplett	CTU 3000 complète
	24418012	Sideskærm, venstre	Side panel, left
		Seitenschirm, link	Plaque latérale, gauche
	24418013	Sideskærm, højre	Side panel, right
		Seitenschirm, recht	Plaque latérale, droite
	24418039	Låg	Lid
		Deckel	Couvercle
1	17300010	Ventilationsmotor	Fan motor
		Ventilatormotor	Moteur de ventilation
2	71240001	Køler	Refrigerator
		Kühler	Refroidisseur
3	24610757	Svøb for køler	Refrigerator cover
		Kühlerbekleidung	Manchon de refroidisseur
4a	24590047	Isoleringsplade 120x120mm	Insulation plate 120x120mm
		Isolierplatte 120x120mm	Plaque isolante 120x120mm
4b	24590048	Isoleringsplade 290x120mm	Insulation plate 290x120mm
		Isolierplatte 290x120mm	Plaque isolante 290x120mm
5	17310004	Vandpumpe	Water pump
		Wasserpumpe	Pompe à eau
6	73850002	Vandtank	Water tank
		Wassertank	Réservoir à eau
7	71616510	Vandkontrol	Water control
		Wasserkontrolle	Contrôle d'eau
8	16160042	Styrestromstransformator	Control transformer
		Steuerstromstrafo	Transformateur de courant de commande
9	17140018	Kontaktor	Contacteur
		Kontaktor	Contacteur
10	43620002	Slamsamler	Dirt trap
		Schmutzsammler	Collecteur de boues
10a	43490001	Pakning for slamsamler	Gasket for dirt trap
		Verpackung für Schlammsammler	Joint d'étanchéité
11a	17180002	Kontrollampe, rød	Control lamp, red
		Kontrollampe, rot	Lampe-témoin, rouge
11b	17180003	Kontrollampe, grøn	Control lamp, green
		Kontrollampe, grün	Lampe-témoin, verte
12	17160007	Sikringsholder	Holder for fuse
		Halter für Sicherung	Porte-fusible
13	17172016	Sikring 1.6 A træg	Fuse 1.6 A slow
		Sicherung 1.6 A træg	Fusible 1.6 A lent
14	17172008	Sikring 800 mA træg	Fuse 800 mA slow
		Sicherung 800 mA træg	Fusible 800 mA lent
15	43120024	Lynkobling, rød	Quick-clutch, red
		Schnellkupplung, rot	Unité d'accouplement rapide, rouge
16	43129002	Lynkoblingssæt, blå	Quick-clutch, blue
		Schnellkupplung, blau	Unité d'accouplement rapide, bleu
17	18480009	Kabelforskrining	Cable connection
		Kabelverschraubung	Manchon fileté de câble
18	18470002	PVC gennemføring	PVC lead-in
		PVC Durchführung	Traversée PVC
19	40911217	Gevindestykke M12 x 170	Threaded rod M12 x 170
		Gewindestück M12 x 170	Pas de vis M12 x 170
20	26110033	Rør for vandmodul 1/2" x 132	Tube for water module x 132
		Rohr für das Wassermodule 1/2" x 132	Tuyau pour module à eau 1/2" x 132
21	25410083	Gevindrør M12 x 25	Threaded tube M12 x 25
		Gewinderohr M12 x 25	Tuyau fileté M12 x 25
22	25450012	Støtteben	Steadying leg
		Stützbeine	Support
23	17250051	Omskifter	Switch
		Schalter	Commutateur
24	70118019	Kabinet grøn	Case green
		Kabinett grün	Carrosserie verte
	74120031	Slangesæt	Hose bundle
		Schlauchbündel	Jeu de tuyaux

	No.	Varebetegnelse Warenbezeichnung	Description of goods Désignation des pièces
		Stelkabel m/skrueklemme Massekabel	Earth cable Câble de mise à la terre
MTE 220 DIALOG	80502503	25mm ² x 3m	25mm ² x 3m
	80502506	25mm ² x 6m	25mm ² x 6m
	80502510	25mm ² x 10m	25mm ² x 10m
	80502520	25mm ² x 20m	25mm ² x 20m
MTE 320 DIALOG	80505003	50mm ² x 3m	50mm ² x 3m
	80505006	50mm ² x 6m	50mm ² x 6m
	80505010	50mm ² x 10m	50mm ² x 10m
	80505020	50mm ² x 20m	50mm ² x 20m
MTE 440 DIALOG	80507003	70mm ² x 3m	70mm ² x 3m
	80507006	70mm ² x 6m	70mm ² x 6m
	80507010	70mm ² x 10m	70mm ² x 10m
	80507020	70mm ² x 20m	70mm ² x 20m
		Elektrodekabel Elektrodekabel	Electrode cable Câble pince électrode
MTE 220 DIALOG	80512503	25mm ² x 3m	25mm ² x 3m
	80512505	25mm ² x 5m	25mm ² x 5m
	80512510	25mm ² x 10m	25mm ² x 10m
	80512515	25mm ² x 15m	25mm ² x 15m
MTE 320 DIALOG	80512590	25mm ² x >15m	25mm ² x >15m
	80515003	50mm ² x 3m	50mm ² x 3m
	80515005	50mm ² x 5m	50mm ² x 5m
	80515010	50mm ² x 10m	50mm ² x 10m
MTE 440 DIALOG	80515015	50mm ² x 15m	50mm ² x 15m
	80515090	50mm ² x >15m	50mm ² x >15m
	80517003	70mm ² x 3m	70mm ² x 3m
	80517005	70mm ² x 5m	70mm ² x 5m
	80517010	70mm ² x 10m	70mm ² x 10m
	80517015	70mm ² x 15m	70mm ² x 15m
	80517090	70mm ² x >15m	70mm ² x >15m
		Netkabel Netzkabel	Mains supply cable Câble d'alimentation
	74233032	8,5m 3x6 mm ²	8,5m 3x6 mm ²
	74233011	8,5m 3x10 mm ²	8,5m 3x10 mm ²
	74233031	8,5m 3x16 mm ²	8,5m 3x16 mm ²
	74233030	8,5m 3x25 mm ²	8,5m 3x25 mm ²
		Fjernreguleringskabel Fernreglerkabel	Remote control cable Câble pour commande à distance
	74341003	5m, 6-pol	5m, 6-pole
		5m, 6-Pol	5m, 6-pôles
	74341001	10m, 6-pol	10m, 6-pole
		10m, 6-Pol	10m, 6-pôles
	74341002	20m, 6-pol	20m, 6-pole
		20m, 6-Pol	20m, 6-pôles
	74340003	5m, 8-pol	5m, 8-pole
		5m, 8-Pol	5m, 8-pôles
	74340001	10m, 8-pol	10m, 8-pole
		10m, 8-Pol	10m, 8-pôles
	74340002	20m, 8-pol	20m, 8-pole
		20m, 8-Pol	20m, 8-pôles
	74349001	Hot-Start-kabel for FHB, 8-pol Hot-Start-Kabel für FHB 8-Pol	Hot-Start cable for FHB, 8-pole Câble Hot-Start pour FHB, 8-pôles

No.	Varebetegnelse Warenbezeichnung	Description of goods Désignation des pièces
	Fjernkontrol Fernbedienung	Remote control Commande à distance
76116382	FSL	FSL
76116381	FSB	FSB
76116380	FPB	FPB
76116383	FHB	FHB
78815010	FTF	FTF
76116387	FAB	FAB

MTE 220 DIALOG

KREDSLØBSDIAGRAM 220/380/415/440 V
CIRCUIT DIAGRAM 220/380/415/440 V
KOPPELDIAGRAMM 220/380/415/440 V
DIAGRAMME DE CIRCUIT 220/380/415/440 V



MIGRATRONIC
9690 FJERRITSLAV DENMARK

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DATE: 890506

KONST: HJ

REV:

DIAGRAM

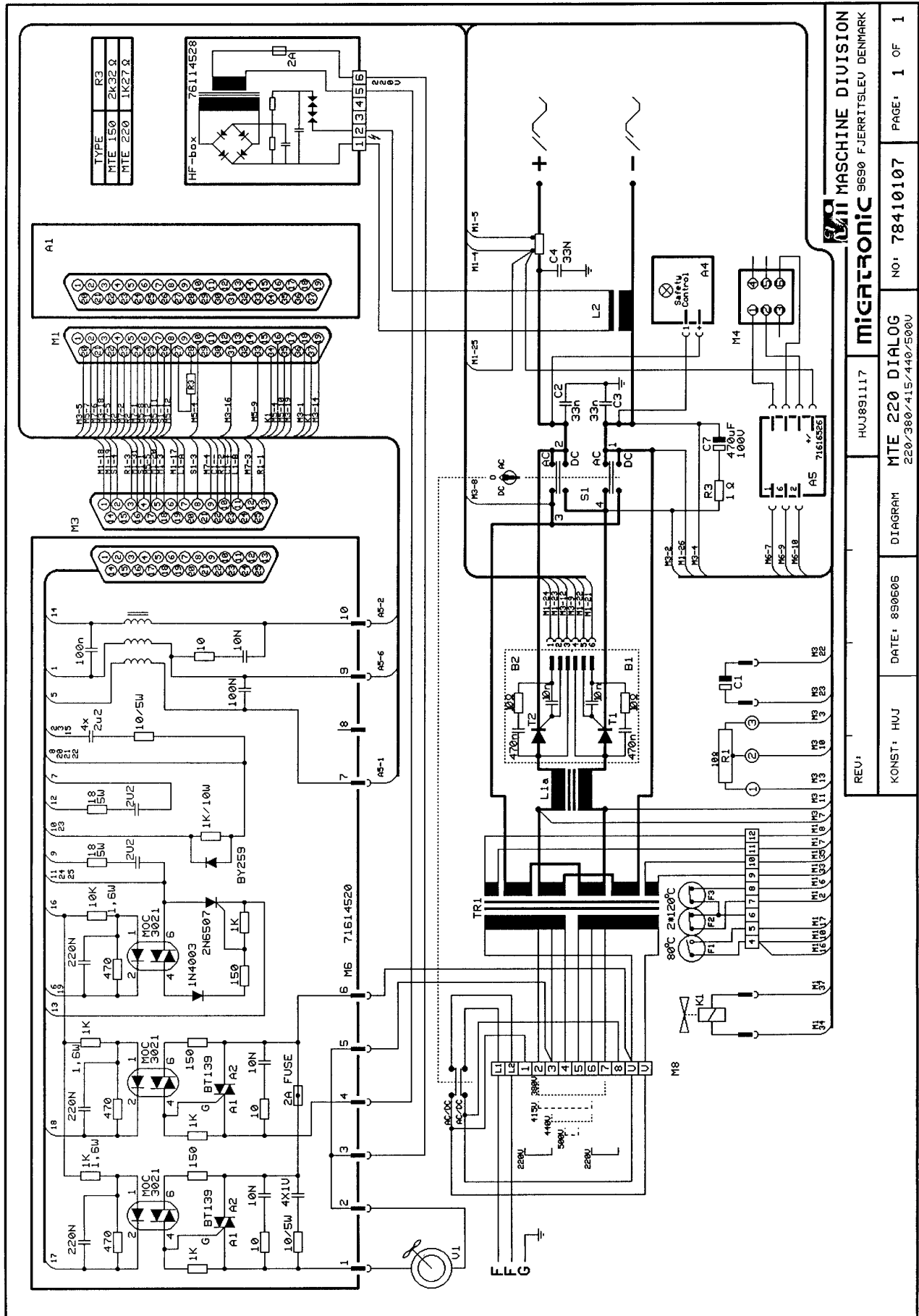
MTE 220 DIALOG

NO: 78410105

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MTE 220 DIALOG

KREDSLØBSDIAGRAM 220/380/415/440/500 V
CIRCUIT DIAGRAM 220/380/415/440/500 V
KOPPELDIAGRAMM 220/380/415/440/500 V
DIAGRAMME DE CIRCUIT 220/380/415/440/500 V

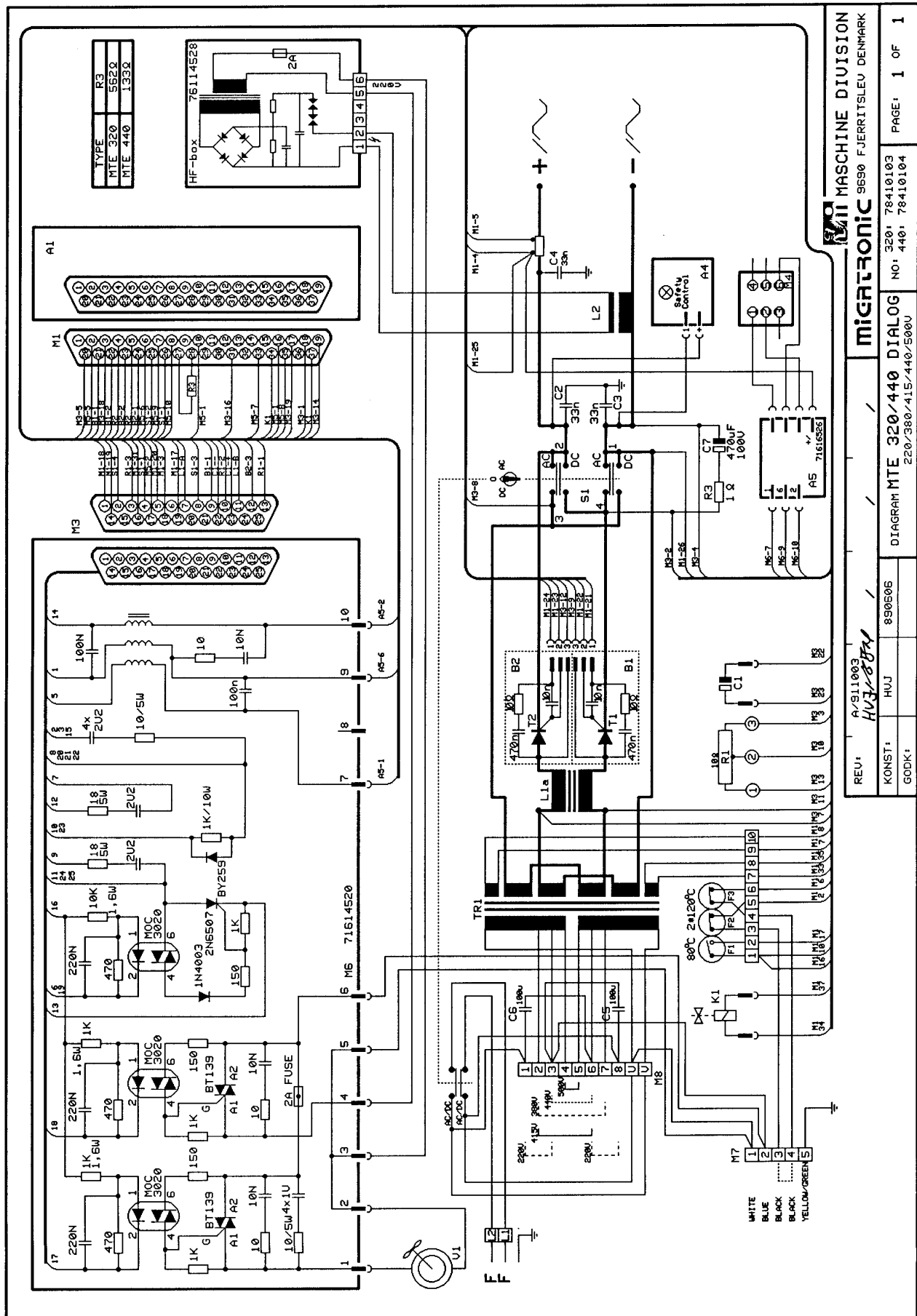


KREDSLØBSDIAGRAM 220/380/415/440 V
CIRCUIT DIAGRAM 220/380/415/440 V
KOPPELDIAGRAMM 220/380/415/440 V
DIAGRAMME DE CIRCUIT 220/380/415/440 V



MTE 320/440 DIALOG

KREDSLØBSDIAGRAM 220/380/415/440/500 V
CIRCUIT DIAGRAM 220/380/415/440/500 V
KOPPELDIAGRAMM 220/380/415/440/500 V
DIAGRAMME DE CIRCUIT 220/380/415/440/500 V



MIGRATRONIC 9690 FJERRITSLEV DENMARK

NO: 320: 78410103
NO: 440: 78410104

DIAGRAM MTE 320/440 DIALOG
220/380/415/440/500V

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Bundesrepublik Deutschland:

MIGATRONIC SCHWEISSMASCHINEN GmbH
Sandusweg 12, D-35435 Wettenberg
Telefon: (+49) 641 982840
Telefax: (+49) 641 9828450

Czech Republic:

MIGATRONIC CZECH REPUBLIC A/S
Tolstého 451, 415 03 Teplice 3, Czech Republic
Telefon: (+42) 0417 570 659
Telefax: (+42) 0417 533 072

Danmark:

MIGATRONIC AUTOMATION A/S
Knøsgårdvej 112, 9440 Aabybro
Telefon: (+45) 98 24 42 33
Telefax: (+45) 98 24 44 27

Danmark:

SVEJSEMASKINEFABRIKKEN MIGATRONIC
Aggersundvej 33, 9690 Fjerritslev
Telefon: (+45) 96 500 600
Telefax: (+45) 96 500 601

Finland:

MIGATRONIC OY
PL 1058, SF-04301 Tuusula
Tel.: (+358) 4052 53931
Telefax: (+358) 9258 60184

France:

MIGATRONIC EQUIPEMENT DE SOUDURE
S.A.R.L.
Parc d'Activités U.I.S., 2, rue d'Yvours, F-69540
Irigny
Tél: (+33) 478 50 6511
Télécopie: (+33) 478 50 1164

Hungary:

MIGATRONIC KFT
Szent Miklos u. 17/a, H-6000 Kecskemét
Tel.: (+36) 76 48 14 12
Fax.: (+36) 76 48 14 12

Italia:

MIGATRONIC s.r.l.
Via Marconi, 6D, I-23871 Lomagna (LC) Italy
Tel.: (+39) 039 92 78 093
Telefax: (+39) 039 92 78 094

Nederland:

MIGATRONIC NEDERLANDS B.V.
Hallenweg 34, NL-5680 AK Best
Tel.: (+31) 499 37 50 00
Telefax: (+31) 499 37 57 95

Norge:

MIGATRONIC NORGE A/S
Ingv. Ludvigsensgt 24, Boks 3585, N-3007
Drammen
Tel. (+47) 32 21 84 84
Telefax: (+47) 32 21 84 94

Sverige:

MIGATRONIC SVETSMASKINER AB
Kärragaten 10, S-431 24 Mölndal
Tel. (+46) 31 44 00 45
Telefax: (+46) 31 44 00 48

United Kingdom:

MIGATRONIC WELDING EQUIPMENT LTD.
21, Jubilee Drive, Belton Park, Loughborough
GB-Leicestershire LE11 5XS
Tel. (+44) 15 09 26 74 99
Fax: (+44) 15 09 23 19 59