

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** 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.

MIGATRONIC

INSTRUCTION MANUAL

DynaMig



Version G

50175300

EC DECLARATION OF CONFORMITY

MIGATRONIC A/S
Aggersundvej 33
9690 Fjerritslev
Denmark

hereby declare that our machine as stated below

Type: DynaMig
as of: week 45, 1995

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

European Standards: EN60974-1
EN50199

Issued in Fjerritslev on 6th November 1995.

Peter Roed
Managing director

Valid from 9713

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IMPORTANT SAFETY INSTRUCTIONS

The safety instructions contained in the **PERSONAL SAFETY** section of this manual should be read and observed when installing and operating the machine.

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

Full understanding of this manual requires a skilled welder's knowledge of welding and of the risks involved.

DESCRIPTION OF FUNCTIONS

The DynaMig range is comprised of 5 machines of different welding capacity:

DynaMig 265

DynaMig 335

DynaMig 405

DynaMig 505

DynaMig 605

Depending on its capacity, the DynaMig is available either as a Compact version or as a STB version (separate wire feed unit).

The machines are divided into the following main modules: *power source, wire feed unit, electronic box, and optional water module for use with watercooled torches.*

Power source

The power source consists of a three-phase welding transformer, one or two voltage selector switches, a rectifier and an inductor.

Wire feed unit

The wire feed unit has either a 2-roll or 4-roll drive system. For many welding operations it is recommended to use 4-roll drive, especially when welding with fluxcored wire.

Furthermore, it is essential to use wire feed rolls which correspond to the dimension of the wire and to use torch liners of the correct diameter and material (see the section concerning fitting of welding wire).

Electronic box

The electronic box controls the machine and allows communication with the user from the front of the electronic box and from the torch.

Water module

The water module consists of a water tank, a watercooling system, a water pump, a filtre and a flow control.

The flow control reports watercooling error in case of insufficient or lacking flow of cooling water.

INITIAL OPERATION

S -marking

This machine meets the demands made for machines which are to operate in environments with an increased hazard of electric shock.

In certain types of welding jobs there is an increased hazard of getting an electric shock, e.g. in environments where the welder has to work in a crouched position and is therefore in contact with the work-piece, in places which are partially or totally surrounded by conductive parts, and in wet, damp or hot places.

When welding under such conditions there must be a person nearby who can render help in case of an emergency and he must be able to quickly cut off the current.

Protection class

The machine is designed for indoor operation and meets the requirements of protection class IP21.

Please ensure that the air inlet and outlet are not blocked.

Electromagnetic emissions and the radiation of electromagnetic disturbances

In conformity with the Electromagnetic Compatibility (EMC) Directive within the European Union this high-quality welding machine for industrial and professional use is designed, built and tested in accordance with the European Standard EN50199 on radiation and incident radiation of electromagnetic disturbances, the purpose of this standard being to prevent the occurrence of situations, where the machine is disturbed or is itself the source of disturbance in other electrical equipment or appliances.

The responsibility of the user

A trouble-free performance without disturbances or disruption caused by electromagnetic emissions, does, however, require that certain measures are taken when installing and using the welding equipment.

Thus it is the responsibility of the user to ensure that the operation of this machine does not occasion disturbances of the above mentioned nature.

Before installing and operating the welding machine, an assessment of the surrounding area is therefore required and this assessment is best performed by the specialist installing the welding machine.

Assessment of area

The following shall be taken into account:

1. Supply cables for other equipment, control cables, signalling and telephone cables in the vicinity of the welding machine.
2. Radio or television transmitters and receivers.
3. Computers and any control equipment.
4. Critical safety equipment, e.g. electrically or electronically controlled guards or protective systems around process equipment.
5. The medical health circumstances of people in the area, e.g. the use of pace-makers, hearing aids etc.
6. Equipment used for calibration and measurement.
7. The immunity to disturbance or disruption of other equipment in the environment which may be disturbed and which therefore may require special protection measures.

8. The time of day that welding or other activities are to be carried out.

The size of the surrounding area to be considered will depend on the structure of the building and those other activities that are to take place in the environment. Special circumstances may require an extension of this area.

Use in domestic establishments

This welding machine is normally expected to be used in industrial situations and areas, and if used in a domestic establishment the hazard of disturbing other electric appliances is increased and it may be necessary to take special and additional precautions in order to prevent problems of emission.

Methods of reducing electromagnetic emissions

- The welding cables should be kept as short as possible.
- The welding cables should be positioned with the negative and the positive cables close together.
- The welding cables should be running at or close to floor level.
- Mains cables and other cables, e.g. telephone, computer, and signalling cables, should not be carried or placed parallel and close to each other, e.g. not in the same cable tray or box.
- Separately-insulated mains supply cables for sensitive electronic equipment, e.g. computers.
- Selective screening of cables may be considered under special circumstances.
- Screening of the entire welding installation may be considered under special circumstances and for special applications.

Mains connection

The machine must be connected to a three-phase mains supply and it is important to ensure that the mains supply voltage is in accordance with the voltage to which the machine is built. The safety conductor (earth) is yellow/green.

The machine is equipped with a thermal cut-out protecting against overload of the machine and excession of max. current for the mains cable.

It is possible to select the mains fuse so the mains cable is only protected against short-circuits.

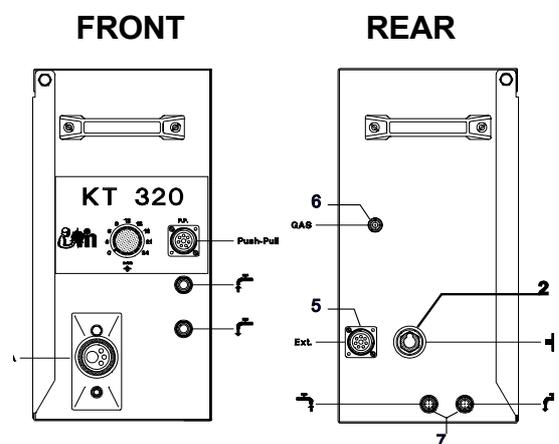
The protection indicated on the type plate of the machine will provide protection against both overcurrent and short circuits.

How to connect the gas

The gas hose, which is connected to the rear of the machine, should be connected to a gas supply with a flow setting of 8-20 l/min, depending on the welding operation in use.

How to connect the separate wire feed unit

Connect the rear of the separate wire feed unit to the machine using an extension cable which contains cables and hoses for welding positive (pos. 2), control signals (pos. 5), gas (pos. 6) and cooling water (pos. 7), if a water module is incorporated in the machine.



CONNECTION FOR MIG/MAG WELDING

Assembly of the welding torch

The welding torch is fitted to the central adaptor (pos. ZA) on the front of the wire feed unit and the connection is fastened by hand. The earth cable is fitted to the inductance outlet wanted (depending on the dimension of the welding wire). If the machine has a water module the two water hoses are fitted to the quick release connectors for water.

Fitting the welding wire

Turn the tension spring aside and tip up the lever (fig. 1). Check that the wire feed roll, wire guide liner, contact tip, and capillary tube all correspond to the wire diameter. Capillary tube and wire guide liner as below are recommended (Fig 3).

Unscrew the contact tip if it is fitted to the welding torch. Insert the wire reel and feed the wire through the teflon inlet nozzle, the wire feed, and then on into the capillary tube. Tip down the lever, turn the tension spring into place. Press the inching button (pos. 12) and the wire will be fed through the welding cable. When the wire is through the hose, the contact tip is fitted. The pressure of the thumbscrew is adjusted to allow the wire feed roller just to slide on the wire when this is stopped at the contact tip.

With the push-pull hose: Remember to let open the liner unit of the torch when fitting the wire (fig 2).

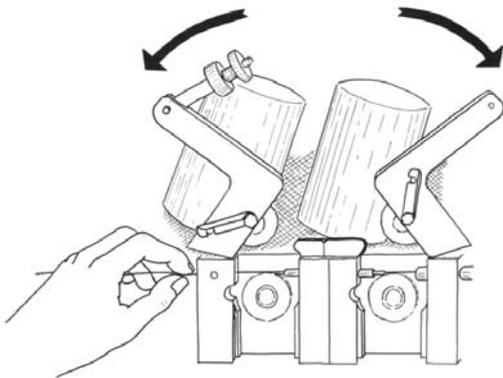


fig. 1

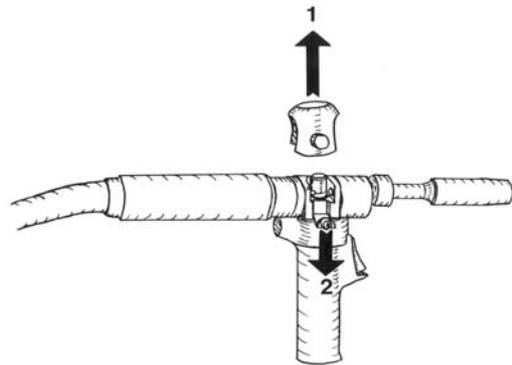


fig. 2

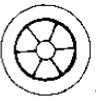
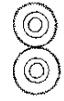
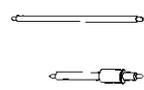
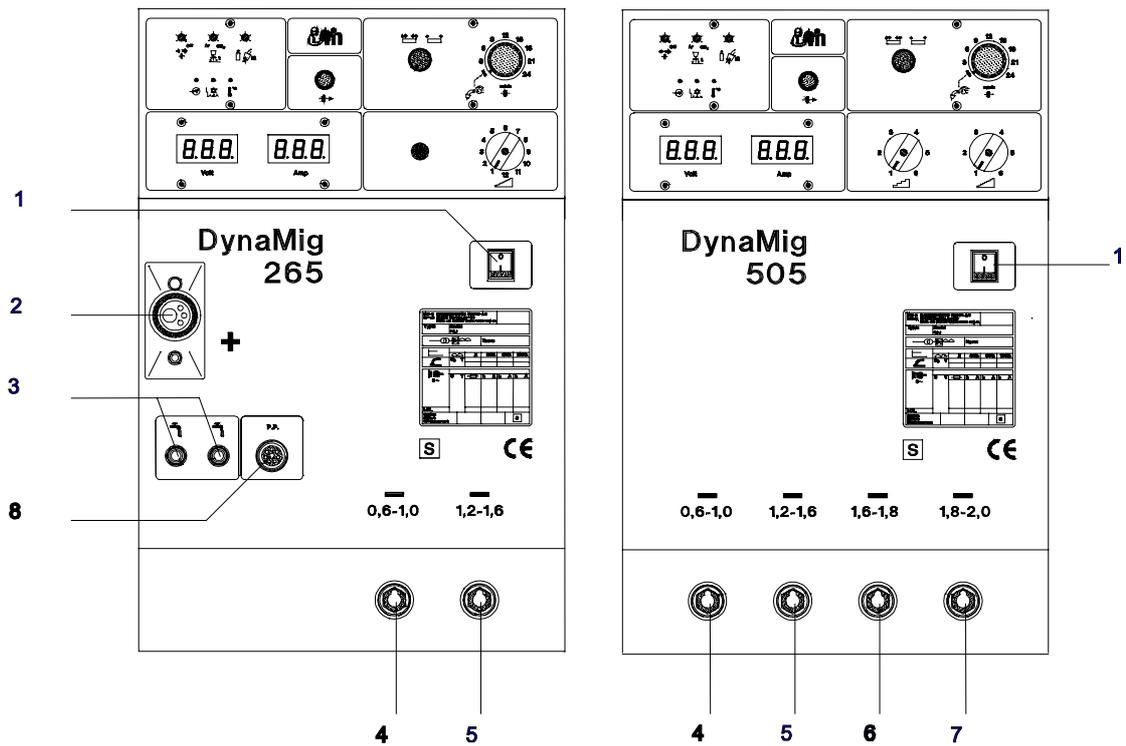
 4				
0,8	0,8	white	1,2	0,8
1,0	1,0	blue	1,5	1,0
1,2	1,2	red	2,0	1,2
1,6	1,6	red	2,0	1,6
2,0	2,0	yellow	2,7	2,0
2,4	2,4	yellow	2,7	2,4

fig. 3

CONTROL SWITCHES



1. Main switch

2. Central adaptor
For welding torch.

3. Quick release connector
For the torch cooling system.

4. Inductance output
 \varnothing 0,6 - 1,0

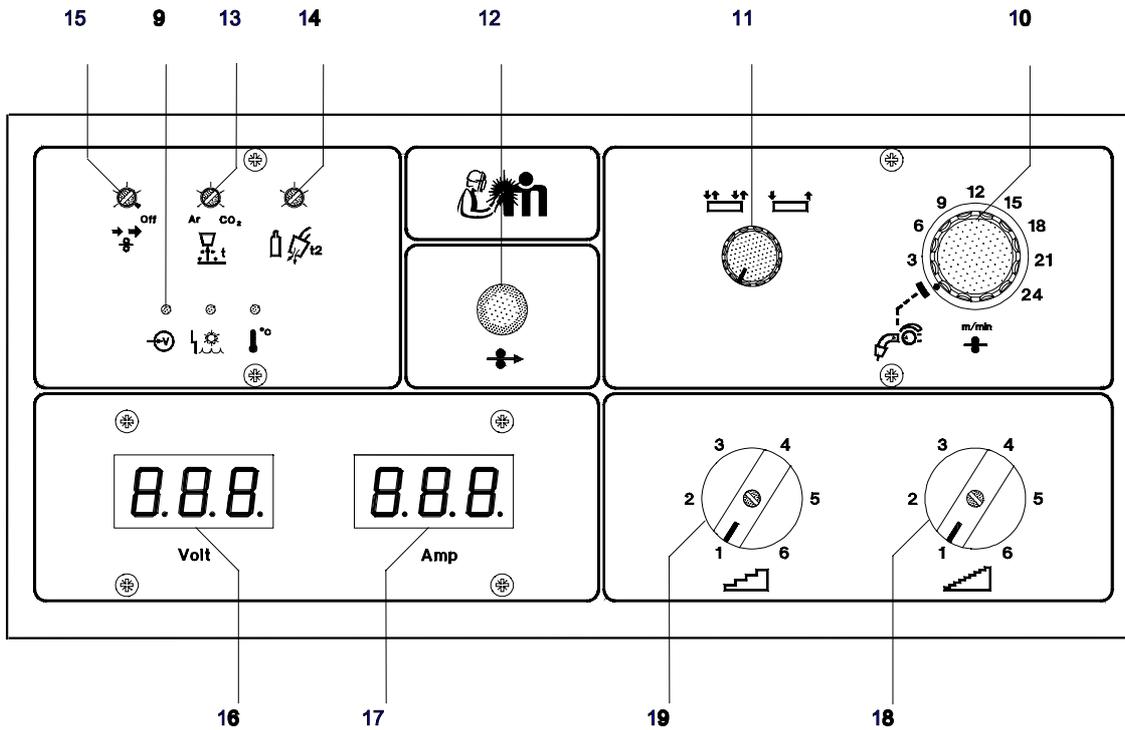
5. Inductance output
 \varnothing 1,2 - 1,6

6. Inductance output
 \varnothing 1,6 - 1,8

7. Inductance output
 \varnothing 1,8 - 2,0

8. Connection for push-pull hose and
torch assembly

CONTROL SWITCHES



9. ON

Lights when the machine has been turned on.

10. Wire speed

This control knob is used to set the required wire speed.

Adjustable from 1.7 to 24 m/min.

11. Trigger mode

This switch is used for setting of either 2-times or 4-times trigger function.

12. Inching button

This button is used for fitting of the welding wire. When the button is activated the wire is fed at the speed selected by the wire speed control knob (pos. 10).

Inching can also be done by means of the trigger of the torch handle by activating it for at least 3 sec. Afterwards the wire will inch at the speed selected on the wire speed control knob (pos. 10).

13. Burn-back

Adjustable delay to prevent the welding wire from sticking to the contact tip.

Adjustable between 0.05 and 1 sec.

14. Gas post-flow

Gas post-flow time.

Adjustable between 0 and 20 sec.

15. Soft-start

Pre-setting of soft-start determines the speed at which the wire will feed before the arc is initiated.

Adjustable between 1.7 and 5 m/min.

In position "OFF" the wire will start feeding at the speed selected on the wire speed control knob. (pos. 10).

16. Voltmeter (optional)

Shows the welding voltage.

17. Ammeter (optional)

Shows the welding current.

18. Adjustment of welding voltage

DynaMig 265 (1 - 12)

DynaMig 335 (1 - 12) fine adjustment

DynaMig 405 (1 - 12) fine adjustment

DynaMig 505 (1 - 6) fine adjustment

DynaMig 605 (1 - 6) fine adjustment

19. Adjustment of welding voltage

DynaMig 335 (1 - 2) coarse adjustment

DynaMig 405 (1 - 2) coarse adjustment

DynaMig 505 (1 - 6) coarse adjustment

DynaMig 605 (1 - 6) coarse adjustment

Gas pre-flow

The gas pre-flow is always 0.2 sec.

Torch regulation

When using a torch with regulation in the handle the wire speed can be adjusted from this.

This function is active when the wire speed potentiometer (pos. 10) is set to the torch symbol on the m/min display.

INDICATION OF ERRORS

Two error situations are registered: Machine overheating error and torch cooling error. The errors divide into two categories; One category where the user can try to correct the error himself and another where MIGATRONIC's Service Department has to be called in. All errors are shown for as long as the error exists.

Machine overheat error	
Origin	Overheating of the machine due to incorrect use, e.g. exceeding the duty cycle of the machine for the welding current in use.
Consequence	The welding process is interrupted and post-flow starts. The LED with the symbol for overheat is lit.
Remedy	If the error is not caused by incorrect use, MIGATRONIC's Service Department has to be called in.
Torch cooling error	
Origin	There is no flow or insufficient flow of cooling water in the torch.
Consequence	The welding process is interrupted and post-flow starts. The LED with the symbol for torch cooling error is lit
Remedy	Refill the water tank and check the hose assembly. Please note that air in the system can prevent the pump from working. Disconnect the return hose from the torch and "bleed" the system of air. If the error persists, call MIGATRONIC's Service Department.

LOCATION OF ERRORS - MIG/MAG WELDING

Fault	Cause
The wire feed has stopped	<ol style="list-style-type: none"> 1. The inlet nozzle and the wire are not in alignment with each other. 2. The reel of wire is too taut, the wire must come off the reel evenly. 3. The inlet tube or contact tip is badly worn or is blocked up. 4. The welding wire is not clean or it is rusty. It could also be of an inferior quality. 5. The pressure roller has to be tightened.
Spatter	<ol style="list-style-type: none"> 1. The wire feed is too fast for the voltage setting. 2. Worn out contact tip.
Porous weld. A cone is formed when spot welding.	<ol style="list-style-type: none"> 1. Contact tip is blocked up 2. A leak in the gas hose draws in air which mixes with the shielding gas.
The wire keeps sticking in the contact tip and feeds very slowly	<ol style="list-style-type: none"> 1. Any damaged wire should be cut off, pulled out and replaced. The pressure on the wire feed roller should be checked and adjusted if necessary. 2. Worn out contact tip.

MAINTENANCE

Only first-class materials have been used for the development and production of **MIGATRONIC** welding machines.

However good the materials that have been used, and no matter how careful the construction, an advanced product such as a welding machine requires your effort if it is to operate perfectly for years.

Wire feed unit

This unit must be cleaned with dry, clean, compressed air and maintained regularly at the wire feed roll and the capillary tubes, as it is of great importance for a satisfactory welding result and a minimum of wear and tear that the wire passes through the wire drive system without any deformations of the wire or the wire feed roll.

The contact tips must be checked often and changed if the copper plating of the wire is damaged on its way through the tips.

Copper dust may prevent free passage of wire through the torch liner. A weekly control and cleaning of the capillary tubes and the wire feed roll is recommended.

Welding hose

Great care should be taken to ensure that the welding hose is not overloaded. It should not be pulled over sharp edges, and heavy machines should not run over it as this may damage the torch liner.

The hose should be dismantled every week and blown out with clean, dry compressed air. The torch should be disconnected during this process.

Welding torch

There are many parts in the welding torch that have to be cleaned regularly. The main ones are the contact tips and the gas shroud.

During the welding process, these parts are bombarded with spatter that sticks in the shroud. This may disturb the shielding gas flowing from the gas shroud down to the molten pool, and should be removed regularly. Add MIG-spray that loosens spatter.

During the cleaning process, the gas shroud should be removed. Do not clean by banging or hitting the torch.

Power source

The power source should be checked and cleaned at least once a year by trained service staff.

Water module

If the level of coolant in the tank falls so low that the machine is disconnected (error information in the control box display), then extra coolant should be added, using the filling nozzle.

(Waterlevel should be checked regularly and the filter should be cleaned). To ensure reliable operation, always use MIGA-TRONIC coolant (part no. 99290400).

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 gases emitted during welding are damaging to the health. Consequently, the inhalation of welding smoke and gases 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.

TECHNICAL DATA

Power source	DynaMig 265	DynaMig 335	DynaMig 405
Fuse 230 V Fuse 400 V	25 A 16 A	25 A 16 A	40 A 25 A
Consumption max. Efficiency Cos. phi	9.3 KVA 0.76 0.95	13.1 KVA 0.77 0.93	21.7 KVA 0.71 0.87
Open circuit voltage min. Open circuit voltage max.	16.6 - 18.2 V 39.2 - 42.9 V	17.4 - 19.2 V 41.6 - 45.4 V	17.4 - 19.0 V 48.5 - 53.0 V
Voltage positions	12	24	24
100 % duty cycle 60 % duty cycle 35 % duty cycle	190 A 230 A 265 A	240 A 300 A 335 A	265 A 315 A 405 A
Current range min. Current range max.	40 A/16 V 265 A/25 V	40 A/16 V 335 A/29 V	40 A/16 V 405 A/34 V
Inductance positions	2	2	2
Insulation class Protection class Norm	H IP 21 EN60974-1 EN50199	H IP 21 EN60974-1 EN50199	H IP 21 EN60974-1 EN50199
Cooling system	3 L	3 L	3 L
Wire feed unit: Wire feed motor effect Wire reel capacity Wire dimension Wire speed	105/210 W 5 - 15 kg 0.8 - 3.2 1.7 - 24 m/min.	105/210 W 5 - 15 kg 0.8 - 3.2 1.7 - 24 m/min.	105/210 W 5 - 15 kg 0.8 - 3.2 1.7 - 24m/min.
Control: Mode switch Pre-flow Soft-start Burn-back Post-flow	2T/4T 0.2 s 1.7 - 5 m/min. 0.05 - 1 s 0 - 20 s	2T/4T 0.2 s 1.7 - 5 m/min. 0.05 - 1 s 0 - 20 s	2T/4T 0.2 s 1.7 - 5 m/min. 0.05 - 1 s 0 - 20 s
Dim. & weight: Dim. lxwxh Compact Dim. lxwxh STB Total weight Compact Total weight STB	94x51x81 cm 94x51x130 cm 112 kg 127 kg	94x51x81 cm 94x51x130 cm 124 kg 139 kg	94x51x81 cm 94x51x130 cm 152 kg 167 kg

TECHNICAL DATA

Powersource:	DynaMig 505	DynaMig 605	
Fuse 230 V Fuse 400 V	50 A 35 A	63 A 35 A	
Consumption max. Efficiency Cos. phi	26.3 KVA 0.88 0.92	33.8 KVA 0.87 0.85	
Open circuit voltage min. Open circuit voltage max.	17.6 - 19.0 V 54.0 - 59.0 V	17.6 - 19.0 V 59.0 - 64.4 V	
Voltage positions	36	36	
100 % duty cycle 60 % duty cycle 35 % duty cycle	350 A 430 A 505 A	380 A 470 A 605 A	
Current range min. Current range max.	40 A/16 V 505 A/39 V	40 A/16 V 605 A/44 V	
Inductance positions	4	4	
Insulation class Protection class Norm	H IP 21 EN60974-1 EN50199	H IP 21 EN60974-1 EN50199	
Cooling system	7 L	7 L	
Wire feed unit: Wire feed motor effect Wire reel capacity Wire dimension Wire speed	105/210 W 5 - 15 kg 0.8 - 3.2 1.7 - 24 m/min.	105/210 W 5 - 15 kg 0.8 - 3.2 1.7 - 24 m/min.	
Control: Mode switch Pre-flow Soft-start Burn-back Post-flow	2T/4T 0.2 s 1.7 - 5 m/min. 0.05 - 1 s 0 - 20 s	2T/4T 0.2 s 1.7 - 5 m/min. 0.05 - 1 s 0 - 20 s	
Dim. & weight: Dim. lxwxh Compact Dim. lxwxh STB Total weight Compact Total weight STB	- 94x51x130 cm - 205 kg	- 94x51x130 cm - 210 kg	