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Operating instructions

GB

Multi-process welding machines for

TIG welding

MMA welding

MIG/MAG welding (option)

- **TRITON 260 DC**
- **TRITON 400 DC**
- **TRITON 500 DC**

These operating instructions must be read before commissioning.
Failure to do so may be dangerous.

Machine may only be operated by personnel familiar with the appropriate safety regulations.

The machines bear the conformity mark and thus comply with the

- **EC Low Voltage Directive (73/23/EEC)**
- **EC EMC Directive (89/336/EEC)**

In compliance with IEC 60974, EN 60974, VDE 0544 the machines can be used in environments with an increased electrical hazard.

 Art. No.: 099-000072-EWM01 Revised: 19.08.04

EG - Konformitätserklärung

EU - conformity declaration

Déclaration de Conformité de U.E.

Name des Herstellers:
Name of manufacturer:
Nom du fabricant:

EWM HIGHTEC WELDING GmbH
(nachfolgend EWM genannt)
(In the following called EWM)
(nommé par la suite EWM)

Anschrift des Herstellers:
Address of manufacturer:
Adresse du fabricant:

Dr.- Günter - Henle - Straße 8
D - 56271 Mündersbach – Germany
info@ewm.de

Hiermit erklären wir, daß das nachstehend bezeichnete Gerät in seiner Konzeption und Bauart sowie in der von uns in Verkehr gebrachten Ausführung den grundlegenden Sicherheits-anforderungen der unten genannten EG- Richtlinien entspricht. Im Falle von unbefugten Veränderungen, unsachgemäßen Reparaturen und / oder unerlaubten Umbauten, die nicht ausdrücklich von EWM autorisiert sind, verliert diese Erklärung ihre Gültigkeit.

We herewith declare that the machine described below meets the standard safety regulations of the EU- guidelines mentionned below in its conception and construction, as well as in the design put into circulation by us. In case of unauthorized changes, improper repairs and / or unauthorized modifications, which have not been expressly allowed by EWM, this declaration will lose its validity.

Par la présente, nous déclarons que la conception et la construction ainsi que le modèle, mis sur le marché par nous, de l´appareil décrit ci - dessous correspondent aux directives fondamentales de sécurité de la U.E. mentionnées ci- dessous. En cas de changements non autorisés, de réparations inadéquates et / ou de modifications prohibeés, qui n´ont pas été autorisés expressément par EWM, cette déclaration devient caduque.

Gerätebezeichnung:
Description of the machine:
Déscription de la machine:

Gerätetyp:
Type of machine:
Type de machine:

Artikelnummer EWM:
Article number:
Numéro d´article

Seriennummer:
Serial number:
Numéro de série:

Optionen:
Options:
Options:

keine
none
aucune

Zutreffende EG - Richtlinien:
Applicable EU - guidelines:
Directives de la U.E. applicables:

EG - Niederspannungsrichtlinie (73/23/EWG)
EU - low voltage guideline
Directive de la U.E. pour basses tensions
EG- EMV- Richtlinie (89/336/EWG)
EU- EMC guideline
U.E.- EMC directive

Angewandte harmonisierte Normen:
Used co-ordinated norms:
Normes harmonisées appliquées:

EN 60974 / IEC 60974 / VDE 0544
EN 50199 / VDE 0544 Teil 206

Hersteller - Unterschrift:
Signature of manufacturer:
Signature du fabricant:

Michael Szczesny , **Geschäftsführer**
managing director
gérant

05.2000

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Table of contents Page

Safety instructions

For Your Safety

Ignoring the following safety precautions can be fatal.
Observe accident prevention regulations.

Designed use

This machine is manufactured according to the current state of the art and current regulations and standards. It is to be operated only for the designed use (see Chap. Commissioning/Area of application).

Use not as designed

This machine may be a hazard to persons, animals and property, however, if it is

- not used as designed
- used by unskilled persons who have not been trained,
- modified or converted improperly

Our operating instructions will provide you with an introduction into the safe use of the machine.
Therefore please read them closely and only start work when you are familiar with them.

Any person involved in operation, maintenance and repair of this machine must read and follow these operating instructions, especially the safety precautions. Where appropriate, this must be confirmed by signature.

Furthermore, the

- relevant accident prevention regulations,
- generally recognized safety regulations,
- regionally specific provisions etc. are to be adhered to.

Electric shocks can be fatal

- **The machine may only be connected to correctly earthed sockets.**
- **Only operate with intact connection lead including protective conductor and safety plug.**
- **An improperly repaired plug or damaged mains cable insulation can cause electric shocks.**
- **The machine may only be opened by qualified and authorised personnel.**
- **Before opening, pull out the mains plug. Switching off is not sufficient. Wait for 2 minutes until capacitors are discharged.**
- **Always put down welding torch, stick electrode holder in an insulated condition.**
- **The machine must not be used to defrost pipes.**

Even touching low voltages can cause you to jump and lead to accidents, so:

- **Safeguard yourself against falls, e.g. from a platform or scaffolding.**
- **When welding, operate earth tongs, torch and workpiece properly, not in ways for which they are not intended. Do not touch live parts with bare skin.**
- **Only replace electrodes when wearing dry gloves.**
- **Never use torches or earth cables with damaged insulation.**

Safety instructions

Smoke and gases can lead to breathing difficulties and poisoning.

- **Do not breathe in smoke and gases.**
- **Ensure that there is sufficient fresh air.**
- **Keep solvent vapours away from the arc radiation area. Chlorinated hydrocarbon fumes can be converted into poisonous phosgene by ultraviolet radiation.**

Workpiece, flying sparks and droplets are hot

- **Keep children and animals well away from the working area. Their behaviour is unpredictable.**
- **Move containers with inflammable or exposive liquids away from the working area. There is a danger of fire and explosion.**
- **Never heat explosive liquids, dusts or gases by welding or cutting. There is also a danger of explosion if apparently harmless substances in closed containers are able to build up excess pressure when they are heated.**

Take care to avoid fire hazards

- **Any kind of fire hazards must be avoided. Flames can form e.g. when sparks are flying, when parts are glowing or hot slag is present.**
- **A constant check must be kept on whether fire hazards have been created in the working area.**
- **Highly inflammable objects, such as matches and cigarette lighters for example, must not be carried in trouser pockets.**
- **You must ensure that fire extinguishing equipment - appropriate to the welding process - is available close to the welding work area and that easy access is possible.**
- **Containers in which fuels or lubricants have been present must be thoroughly cleaned before welding begins. It is not sufficient simply for the receptacle to be empty.**
- **After a workpiece has been welded, it must only be touched or brought into contact with inflammable material when it has cooled down sufficiently.**
- **Loose welding connections can completely destroy protective conductor systems of interior installations and cause fires. Before beginning welding work, ensure that the earth tongs are properly fixed to the workpiece or welding bench and that there is a direct electrical connection from the workpiece to the power source.**

Noise exceeding 70 dBA can cause permanent hearing damage

- **Wear suitable earmuffs or plugs.**
- **Ensure that other people who spend time in the working area are not inconvenienced by the noise.**

Secure gas cylinder

- **Place shielding gas cylinders in the holders provided for them and secure with safety chains.**
- **Take care when handling cylinders; do not throw or heat, guard against them toppling over.**
- **When moving by crane, take off the gas cylinder from the welding machine.**

Interference by electrical and electromagnetic fields is possible e.g. from the welding machine or from the high-voltage pulses of the ignition unit.

- **As laid down in Electromagnetic Compatibility Standard EN 50199, the machines are intended for use in industrial areas; if they are operated e.g. in residential environments problems can occur in ensuring electromagnetic compatibility.**
- **The functioning of heart pacemakers can be adversely affected when you are standing near the welding machine.**
- **Malfunctioning of electronic equipment (e.g. EDP, CNC equipment) in the vicinity of the welding location is possible.**
- **Other mains supply leads, trip leads, signal and telecommunications leads above, under and near the welding device may be subject to interference.**

Electromagnetic interference must be reduced to such a level that it no longer constitutes interference. Possible reduction measures:

- **Welding machines should be regularly maintained (see Sect. “Maintenance and care”)**
- **Welding leads should be as short as possible and run closely together on or near to the ground.**
- **Selective shielding of other leads and equipment in the environment can reduce radiation.**

Repairs and modifications may only be carried out by authorised, trained, specialist personnel. The warranty becomes null and void in the event of unauthorised interference.

Our operating instructions will provide you with an introduction into the safe use of the machine.

Therefore please read them closely and only start work when you are familiar with them.

Safety instructions

Transport and set-up

Machines may only be moved and operated in an upright position.

Before moving, pull out mains plug and place on the machine.

Secure high-pressure shielding gas cylinder with safety chain to prevent it from toppling over.

When setting up the machine, tilt resistance is only guaranteed up to an angle of 15° (as specified in EN 60974).

Environmental conditions

The welding machine can be operated in a location where there is no risk of explosion at

- an **ambient temperature** of -10°C (plasma machines 0°C) to +40°C and
- a **relative air humidity** up to 50% at 40°C.
- where the surrounding air is free of **unusual** amounts of dust, acids, corrosive gases or substances etc., insofar as they do not occur during welding.
  Examples of **unusual** operating conditions:
  Unusual corrosive smoke, vapour, excessive oil vapour, unusual vibrations or jolts, excessive quantities of dust such as grinding dust etc., severe weather conditions, unusual conditions near the coast or on board ship.
- When setting up the machine, ensure that air inlets and outlets are unobstructed.
  The machine is tested to **Protection Standard IP23**, i.e.:
- Protection against penetration of solid foreign bodies ∅ > 12mm,
- Protection against water spray up to an angle of 60° to the vertical.

Notes on the use of these operating instructions

These operating instructions are arranged in Sections.

To help you find your way around more quickly, in the margins you will occasionally see, in addition to sub-headings, icons referring to particularly important passages of text which are graded as follows depending on their importance:

(Note): Applies to special technical characteristics which the user must note.

(Warning): Applies to working and operating procedures which must be followed precisely to avoid damaging or destroying the machine.

(Caution): Applies to working and operating procedures which must be followed precisely to avoid endangering people and includes the “Warning” symbol.

Instructions and lists detailing step-by-step actions in given situations can be recognised by bullet points, e.g.:

- Insert plug of welding current lead into socket **(Sect. 5, G2)** and lock.

Meaning of the diagram descriptions:

e.g. **(C1)** means: Item C / Figure 1 in the respective Section

e.g. **(Sect. 3, C1)** means: in Section 3 Item C / Figure 1

1 Technical data

1.1 TRITON 260

		TRITON 260		
Setting range: **Welding current / voltage** **TIG,** **MMA** **MIG/MAG**		5A/ 10.2V – 260A/ 20.4V 5A/ 20.2V – 230A/ 29.2V 5A/ 14.3 – 240A/ 26V		
Max. welding current at		TIG	MMA	MIG/MAG
20ºC ambient temperature:	**50%DC**	260A	230A	240A
	60%DC	240A	210A	220A
	100%DC	190A	160A	170A
40ºC ambient temperature:	**25%DC**	260A	230A	240A
	35%DC	230A	200A	210A
	60%DC	170A	150A	160A
	100%DC	130A	110A	120A
Load alternation		10min (60% DC ≙ 6 min welding, 4min break)		
Open circuit voltage		93V		
Mains voltage (tolerances)		3 x 400V (-25% - +15%) 3 x 415V (-25% - +10%)		
Frequency		50/60 Hz		
Mains fuse (safety fuse - slow-blow)		3 x 16A		
Mains connection lead		4 x 1.5mm^2		
Max. connected power		10.8kVA		
Recommended generator rating		14.6kVA		
cosφ / efficiency		0.99 / 89%		
Insulation class / Protection classification		H / IP 23		
Ambient temperature		-10°C to +40°C		
Machine cooling / Torch cooling		Fan / Gas		
Workpiece lead		35mm^2		
Dimensions L/W/H [mm]		560 x 245 x 365		
Weight		approx. 24.5Kg		
constructed to standard		IEC 60974 / EN 60974 / VDE 0544 EN 50199 / VDE 0544 Teil 206 S / CE		

1 Technical data

1.2 TRITON 400/500

	TRITON 400	TRITON 500
Setting range: **Welding current / voltage** **TIG,** **MMA** **MIG/MAG**	 5A/ 10,2V - 400A/ 26,0V 5A/ 20,2V - 400A/ 36,0V 5A/ 14,3V - 400A/ 30,0V	 5A/ 10.1V -500 A/ 30.0V 5A/ 20.1V -500A/ 40.0V 5A/ 14.2V -500A/ 39.0V
Duty cycle at 40°C ambient temperature: **40%dc** **60%dc** **100%dc** **Duty cycle at 20°C ambient temperature:** **40%dc** **45%dc** **60%dc** **65%dc** **100%dc**	 400A 360A 300A - 400A - 360A 300A	 500A 450A 340A 500A - 475A - 390A
Load alternation	10min (60% DC ≙ 6 min welding, 4min break)	
Open circuit voltage	92V	79V at 400V 91V at 460V
Mains voltage (tolerances)	3 x 400V (-25% - +20%) 3 x 460V (-25% - +15%)	3 x 400V (-25% - +20%) 3 x 460V (-25% - +15%) 3 x 415V (-25% - +10%)
Frequency	50/60 Hz	
Mains fuse (safety fuse - slow-blow)	3 x 35A	
Mains connection lead	4 x 4mm^2	
Max. connected power	21,5kVA	29 kVA
Recommended generator rating	29,0kVA	39.2kVA
cosφ / efficiency	0.99 / 89%	
Insulation class / Protection classification	H / IP 23	
Ambient temperature	-10°C to +40°C	
Machine cooling / Torch cooling	Fan / Gas	
Workpiece lead	70mm^2	95mm^2
Dimensions L/W/H [mm]	625 x 335 x 560	
Weight	approx. 55kg	approx. 58Kg
constructed to standard	IEC 60974 / EN 60974 / VDE 0544 EN 50199 / VDE 0544 Teil 206 Ⓢ / CE	

2 Description of the machine

2.1 TRITON 260

2.1.1 Front view

Fig. 2/1, Front view

Item	Symbol	Description
A1		**Carrying handle**
		Carrying strap (no illustr.)
B1		**Operating elements** (see control T101, chap. 3.1)
C1		**5-pole connection socket:** Standard TIG torch control lead
D1		**8-pole connection socket:** TIG Up/Down or potentiometer torch control lead
E1	+	**Welding current socket (welding current potential "+"):** MMA welding: Workpiece or electrode holder connection, TIG welding: Workpiece connection, MIG/MAG welding: Welding current connection to the WF unit or workpiece connection
F1	–	**Welding current socket (welding current potential "-"):** MMA welding: Workpiece or electrode holder connection
G1		**19-pole connection socket:** Remote control connection
H1		**Welding current socket (welding current potential "-"):** TIG welding: Welding current connection for welding torch MIG/MAG welding: Welding current connection to the WF unit or workpiece connection
I1		**Connecting nipple G¼ (welding current potential"-")** Shielding gas connection to the welding torch
J1		**Air inlet**
K1		**Rubber feet**
L1		**MIG/MAG operating elements (option), see chap. 3.1.1**

2 Description of the machine

2.1.2 Rear view

Fig. 2/2, Rear view

Item	Symbol	Description
A2		**8-pole connection socket** cooling unit control lead
B2		**Main switch** Welding machine and where appropriate cooling module "On/Off"
C2		**Mains connection cable**
D2		**7-pole connection socket** wire feed unit control lead
E2		**Connecting nipple G¼** shielding gas connection to the pressure reducer
F2		**Types of ignition changeover switch** HF : Welding with HF ignition. ⊠ : Welding with Liftarc.
G2		**Changeover switch characteristics** Changing between each of two characteristics in the welding processes MMA: rutile / basic MIG/MAG: solid / cored wire
H2		**4-pole connection socket** cooling unit voltage supply
I2		**Air outlet**

2 Description of the machine

2.2 TRITON 400/500

2.2.1 Front view

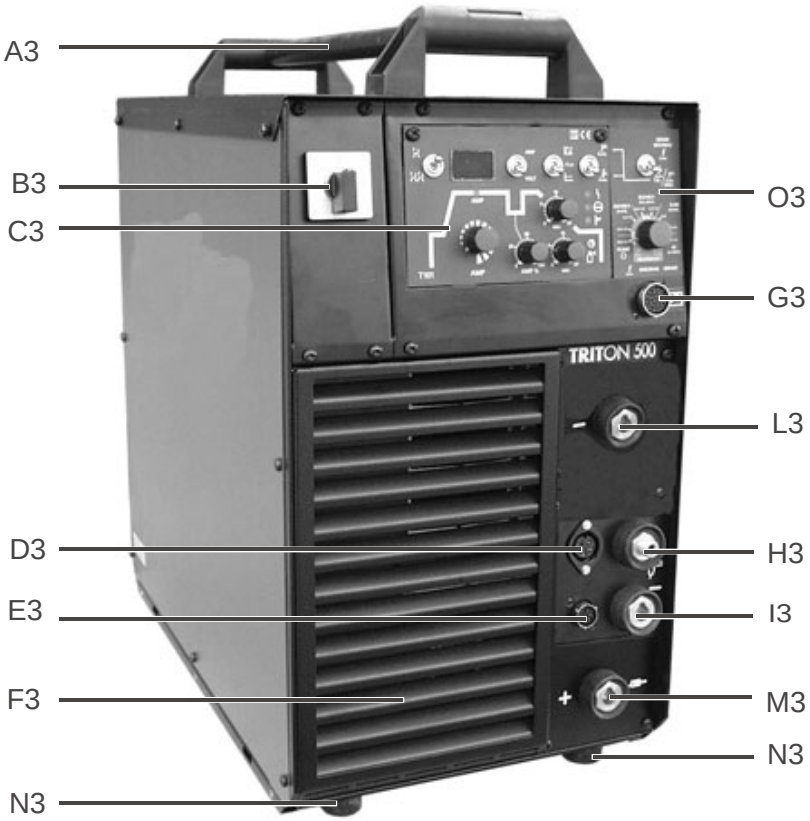


Fig. 2/3, Front view

Item	Symbol	Description
A3		**carrying handle**
B3		**Main switch** Welding machine and where appropriate cooling module "On/Off"
C3		**Operating elements** (see control T101, chap. 3.1)
D3		**5-pole connection socket:** TIG standard torch control lead
E3		**8-pole connection socket:** TIG Up/Down or potentiometer torch control lead
F3		**Air inlet**
G3		**19-pole connection socket:** Remote control connection
H3		**Connecting nipple G¼ (welding current potential"-")** Shielding gas connection to the welding torch
I3		**Welding current socket (welding current potential "-"):** TIG welding: Welding current connection for welding torch MIG/MAG welding: workpiece connection
L3		**Welding current socket (welding current potential "-"):** MMA welding: Workpiece or electrode holder connection
M3		**Welding current socket (welding current potential "+"):** MMA welding: Workpiece or electrode holder connection, TIG welding: workpiece connection
N3		**Rubber feet**
O3		**MIG/MAG operating elements (option), see chap. 3.1.2**

2 Description of the machine

2.2.2 Rear view

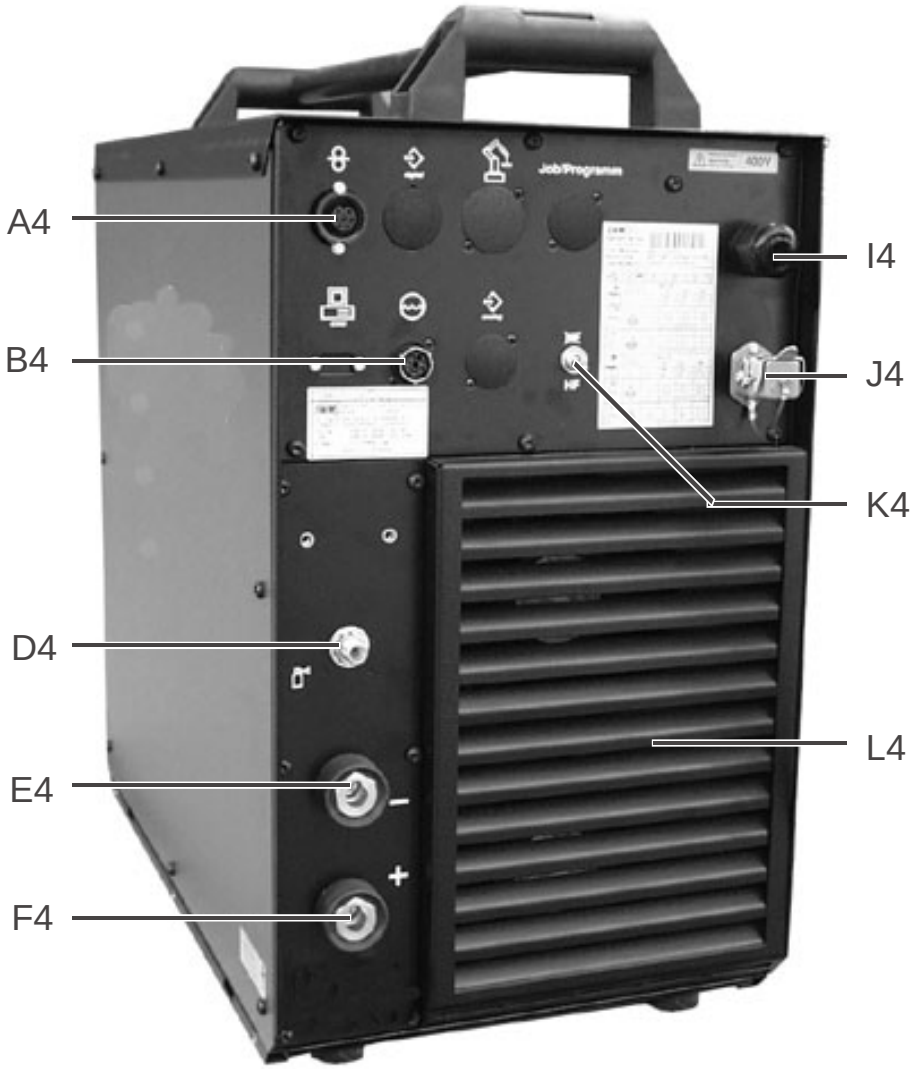


Fig. 4/2, Rear view

Item	Symbol	Description
A4		**7-pole connection socket** wire feed unit control lead
B4		**8-pole connection socket** cooling unit control lead
D4		**Connecting nipple G¼** shielding gas connection to the pressure reducer
E4		**Welding current socket - ;** WF connection
F4		**Welding current socket +**
I4		**Mains connection cable**
J4		**4-pole connection socket** cooling unit voltage supply
K4		**Types of ignition changeover switch** HF : Welding with HF ignition. ⊠ : Welding with Liftarc.
L4		**Air outlet**

3 Function specification

3.1 Operating elements, control T101

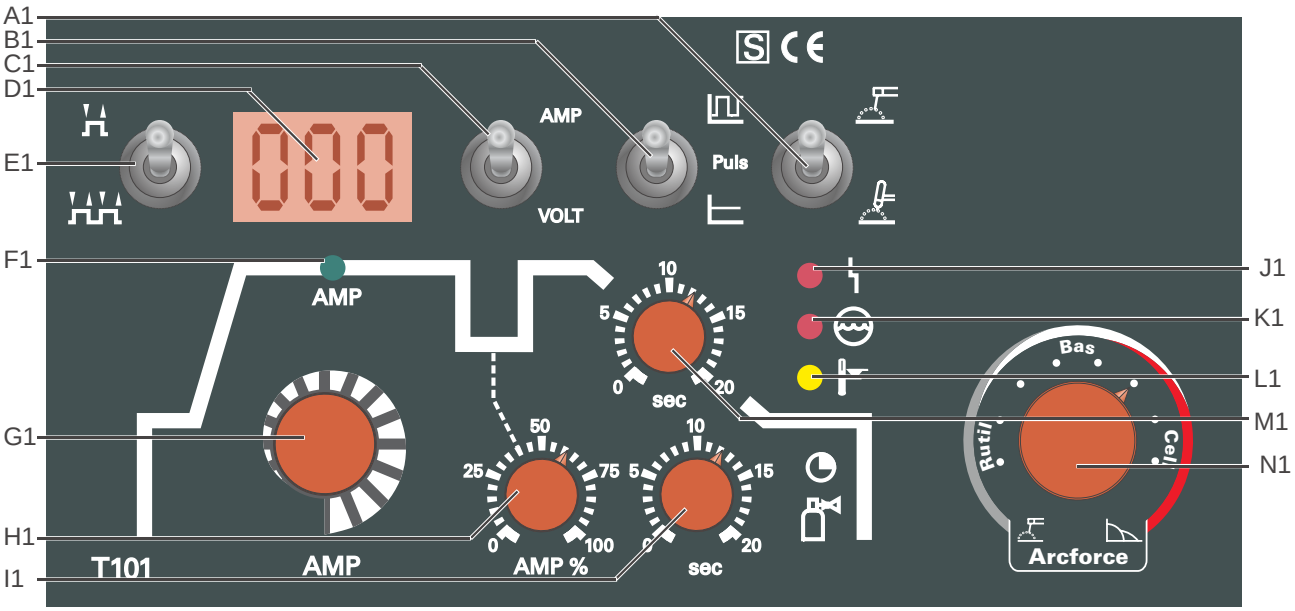
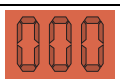
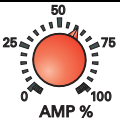


Fig. 3/1: Control T101

Item	Symbol	Description
A1		**Changeover switch MMA / TIG welding process** = MMA welding = TIG welding The changeover switch (A2) must be switched to TIG / MMA welding
B1		**TIG pulse /standard welding changeover switch** = TIG pulse = TIG standard welding
C1		**Digital display changeover switch** AMP = welding current display VOLT = welding voltage display
D1		**Digital display (lights up when machine is ready)** Displays the welding voltage or welding current, depending on the switch position (C1)
E1		**Non latched / latched operating mode changeover switch** = non-latched = latched
F1		**"AMP" signal light** Open-circuit or welding voltage on
G1		**"AMP" rotary dial** Infinite adjustment of the welding current from 5A to maximum current
H1		**"AMP%" rotary dial** The secondary current "AMP%" is infinitely adjustable in per cent of the main current "AMP" (G1). During the welding process, it is possible to switch from the main current to the secondary current set at any time using the 2nd torch trigger (for further operating variants see 3.2.4 TIG welding torch operating variants) .

3 Function specification

Item	Symbol	Description
I1		**Gas post-flow time rotary dial** The gas post-flow time is infinitely adjustable from 1 to 20 sec.
J1		**Red LED (collective interference)** If the collective interference LED lights up, the power unit is automatically switched off. Because some interferences are only brief and spurious (e.g. mains voltage surges), the LED extinguishes again and the welding machine is ready for welding. If the collective interference LED continues to be lit after an appropriate waiting time, see the chapter on troubleshooting.
K1		**Red LED (low coolant level)** Indicates a low coolant level if the machine is operated with a cooling unit
L1		**Yellow LED (excess temperature)** Thermal monitors in the power unit trigger at excess temperature and the excess temperature indicator lamp lights. Welding can proceed without further measures after cooling.
M1		**DOWN-SLOPE rotary dial** Lowering time of the main current AMP (G1) to the end-crater current I_{end} (minimum current) infinitely adjustable from 0 to 20 sec.
N1		**Applies to MMA welding process only (TRITON 400/500 only)** Selection of arcforcing, rutile, basic or cellulose.

3.1.1 Additional operating elements TRITON 260

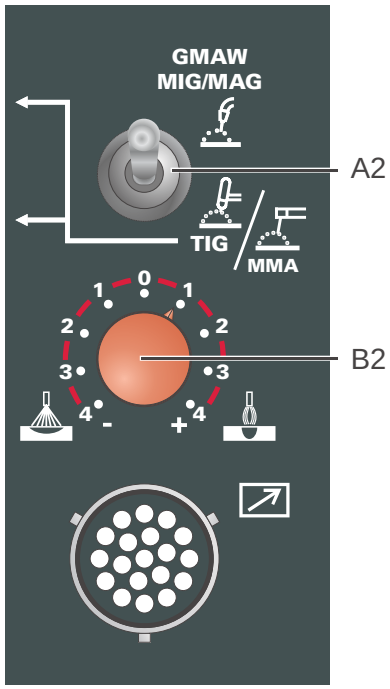
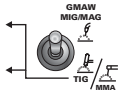


Fig. 3/2: Operating elements front view

Item	Symbol	Description
A2		**MIG/MAG or MMA / TIG welding process changeover switch** = MIG/MAG welding (only possible with WF unit) = TIG or MMA welding, selection on changeover switch (A1) The welding process is preselected with this changeover switch.
B2		**Rotary switch** Dynamic correction / choke effect setting (for MIG/MAG only) hard / narrow (+) to soft / wide arc (-)

3 Function specification

3.1.2 Additional operating elements TRITON 400/500

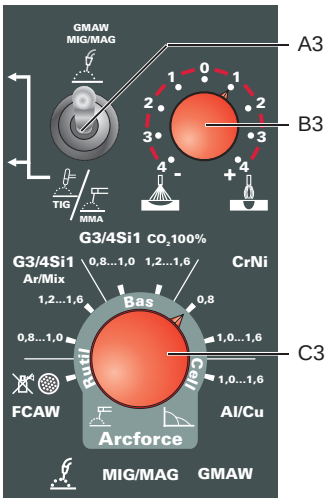
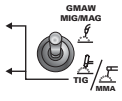


Fig. 3/3: Operating elements front view

Item	Symbol	Description
A3		**MIG/MAG or MMA / TIG welding process changeover switch** = MIG/MAG welding (only possible with WF unit) = TIG or MMA welding, selection on changeover switch (A1) The welding process is preselected with this changeover switch.
B3		**Rotary switch Dynamic correction / choke effect setting (for MIG/MAG only)** hard / narrow(+) to soft / wide arc(-)
C3		**Does not apply to TIG welding** 1. Inner scale, MMA welding: Selection of arcforcing, rutile, basic or cellulose. 2. Outer scale; MIG/MAG welding Setting of the welding task according to the material, wire diameter and type of gas.

3.2 TIG welding, general

If welding is performed alternately by different methods, e.g. TIG, MIG/MAG or MMA and if one or two welding torches and an electrode holder are connected to the machine, the open-circuit/welding voltage is applied simultaneously to both!

Therefore, always place the torch and the electrode holder on an insulated surface before starting work and during breaks.

3.2.1 Types of ignition:

HF ignition

The arc is started without contact by high-voltage ignition pulses.

Liftarc

The arc is ignited with contact with the workpiece:

a) The torch gas nozzle must be placed with its rim on the ignition point such that there is a gap of approx. 2-3 mm between the electrode tip and the workpiece.
b) Carefully touch the workpiece with Tungsten electrode tip. Press torch trigger in accordance with the operating mode selected.
c) The arc ignites when the torch is lifted off and swivelled into its normal position.

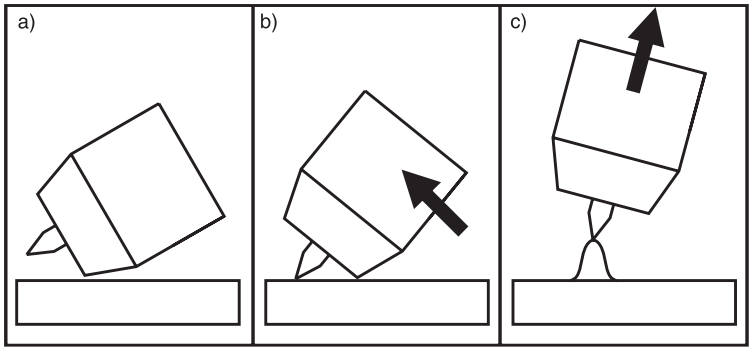


Fig. 3/3: Liftarc

3.2.2 Automatic shut-off

If **ignition of the arc does not occur** after starting or if the **arc** is **interrupted** when the torch is moved away, an **automatic cut-out occurs after 3 sec**. HF, gas and the open circuit voltage (power unit) are switched off.

3.2.3 Digital display

On the digital display (D1), the welding parameters

- welding current and
- welding voltage are shown.

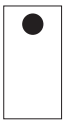
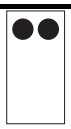
Whether the welding current or welding voltage is to be displayed is selected on the changeover switch (C1).

3.2.4 TIG welding torch, operating variants

The welding process can be controlled with various torch designs (TT=torch trigger):

3.2.4.1 Standard TIG torch, 5-pole connection plug

The welding machine is prepared for these torch types as standard.

Symbol	Description	Functions	Operation with
	Standard TIG torch Design: 1 trigger	Welding current On/Off	TT 1
		secondary current	TT 1 in tapping mode
	Standard TIG torch Design: 2 trigger	Welding current On/Off	TT 1
		secondary current	TT 2
		secondary current	TT 1 in tapping mode
	Standard TIG torch Design: 2 triggers (MG rocker)	Welding current On/Off	TT 1 (rocker forwards)
		secondary current	TT 2 (rocker back)
		secondary current	TT 1 (rocker forwards) in tapping mode

Special functions with standard TIG torches such as e.g. Up/Down operation (see Chapter 3.10)

3.2.4.2 TIG Up/Down torch, 8-pole connection plug

The welding machine is prepared for this torch type as standard.

Symbol	Description	Functions	Operation with
	TIG Up/Down torch Design: 1 trigger + 2 triggers (rocker)	Welding current On/Off	TT
		secondary current	TT in tapping mode
		Increase / reduce welding current	Rocker forwards / rocker back

The last welding current set is stored in the memory and is available after switching on again.

3.2.4.3 TIG potentiometer torch, 8-pole connection plug

Before commissioning, the welding machine must be converted for this type of torch! (see Chapter 3.12)

Symbol	Description	Functions	Operation with
	TIG potentiometer torch Design: 1 trigger + 1 wheel (potentiometer)	Welding current On/Off	TT
		secondary current	TT in tapping mode
		Increase / reduce welding current	Turn potentiometer backwards / forwards

3.2.5 Tapping operating mode.

The tapping mode was included particularly for the secondary current (AMP%) by the use of a trigger on the welding torch.

Torch with one trigger:

- by tapping (brief pressing and releasing) torch trigger 1
  (Repeated tapping switches back to the main current).

Torch with two triggers:

There are two ways of switching to the secondary current:

- by tapping (see torch with one trigger)
- by pressing down and holding torch trigger 2.

Adjustment:

The "tapping operating mode" can be deactivated on the T101/1 circuit board (see Chap. 3.9.4).

3 Function specification

3.3 TIG function sequences

In the TIG operating modes, the following welding parameters can be adjusted via rotary dials:

- Main current AMP,
- Secondary current AMP%,
- Down-slope time,
- Gas post-flow time.

Other welding parameters are preadjusted to optimum settings for most applications, but can be changed internally (see Chapter 3.9).

3.3.1 Explanation of symbols

Symbol	Meaning
	Press torch trigger 1
	Release torch trigger 1
AMP	Main current (5A to maximum current)
AMP%	Secondary current (0% to 100% of AMP)
I_{start}	Ignition current (0% to 100% of AMP, adjustable internally, search arc at minimum setting))
I_{end}	End-crater current = minimum current
t_{Up}	Up-slope time (adjustable internally)
t_{Down}	Down-slope time
	TIG/MMA welding process (preselection for welding process)
	TIG welding process
	MMA welding process
	Standard TIG welding (pulses switched off)
	TIG pulses On
	Non-latched mode
	Latched mode
	HF ignition switched on
	HF ignition switched off
	Gas pre-flows (adjustable internally)
	Gas post-flows

3.3.2 TIG non-latched operation

- Adjust the appropriate changeover switches to the following settings:

When the foot-operated remote control RTF is connected, the machine switches automatically to non-latched operation. The Up- and Down-slopes are switched off.

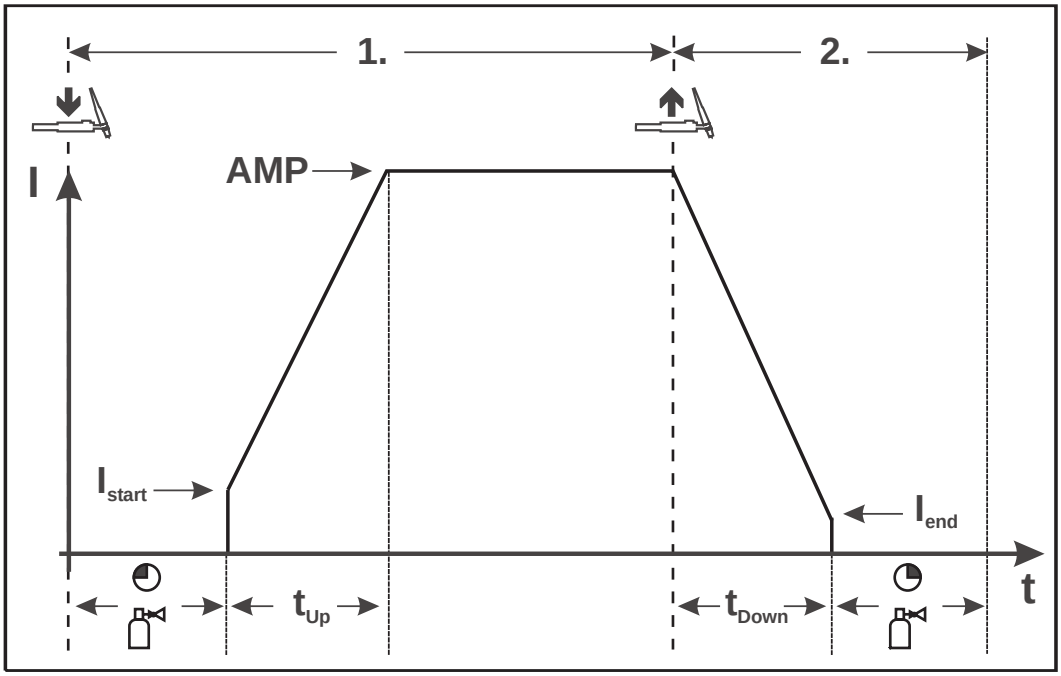


Fig. 3/4: Function sequence of TIG non-latched operation

1st step:

- Press and hold torch trigger 1.
- The gas pre-flow time passes.
- HF ignition pulses jump from the electrode to the workpiece, the arc ignites.
- The welding current flows and immediately assumes the value set for the ignition current I_{start}.
- HF is switched off.
- The welding current increases in the adjusted Up-slope time to the main current AMP.

2nd step:

- Release torch trigger 1.
- The main current falls in the adjusted Down-slope time to the end-crater current I_{end} (minimum current).
- The main current reaches the end-crater current I_{end}, the arc extinguishes.
- The gas post-flow time set passes.

If the 1st torch trigger is pressed during the Down-slope time, the welding current returns to the main current AMP set.

3.3.3 TIG latched operation

- Adjust the appropriate changeover switches to the following settings:

When the foot-operated remote control RTF is connected, the machine switches automatically to non-latched operation. The Up- and Down-slopes are switched off.

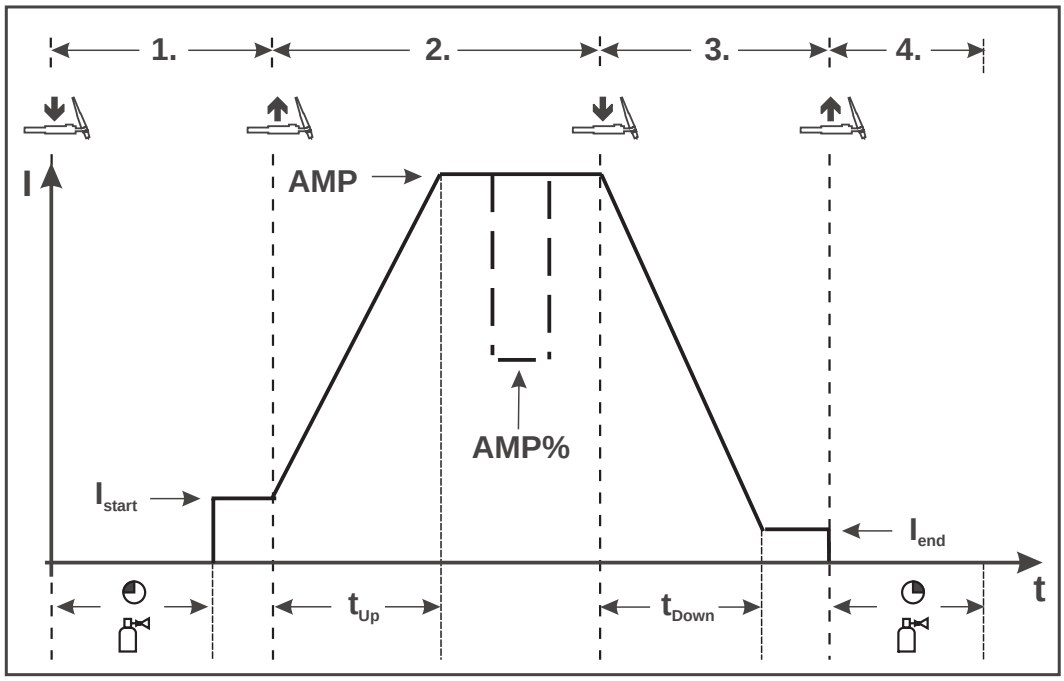


Fig. 3/5: TIG latched function sequence

Step 1

- Press torch trigger 1, the gas pre-flow time passes.
- HF ignition pulses jump from the electrode to the workpiece, the arc ignites.
- Welding current flows and immediately assumes the ignition current value set (search arc at minimum setting). HF is switched off.

Step 2

- Release torch trigger 1.
- The welding current increases in the adjusted Up-slope time to the main current AMP. (Secondary current AMP% see Chap. 3.1)

Changeover from the main current AMP to the secondary current AMP%:

- **Press torch trigger 2 or**
- **Tap torch trigger 1 (tapping mode see also Chap. 3.2.4)**

Step 3

- Press torch trigger 1.
- The main current falls in the adjusted Down-slope time to the end-crater current I_{end} (minimum current).

4th step

- Release torch trigger 1, the arc extinguishes.
- The gas post-flow time set begins.

Immediate termination of the welding procedure without Down-slope and end-crater current:

- **Briefly press the 1st torch trigger (3rd and 4th step).**
  The current falls to zero and the gas post-flow time begins.

3.4 TIG pulses, function sequences

The machines have an integrated TIG pulse device as standard.
Entering the pulse parameters:

- **Pulse current = main current AMP,**
- **Break current = secondary current AMP%.**

The times for the pulse and break current are pre-set at 0.3 sec ex works and can be changed internally (see Chap. 3.9.5)

TIG pulses can also be realized with the pulse remote controls RTP1 and RTP2.

The function sequences of TIG pulses are principally the same as for standard TIG welding. As soon as the arc has ignited, the current switches to and from between the pulse current and pause current with particular times.

When the foot-operated remote control RTF is connected, the machine switches automatically to non-latched operation. The Up- and Down-slopes are switched off.

See the explanation of symbols under Chap. 3.3.1.

3.4.1 TIG pulses - non-latched operation

- Adjust the appropriate changeover switches to the following settings:

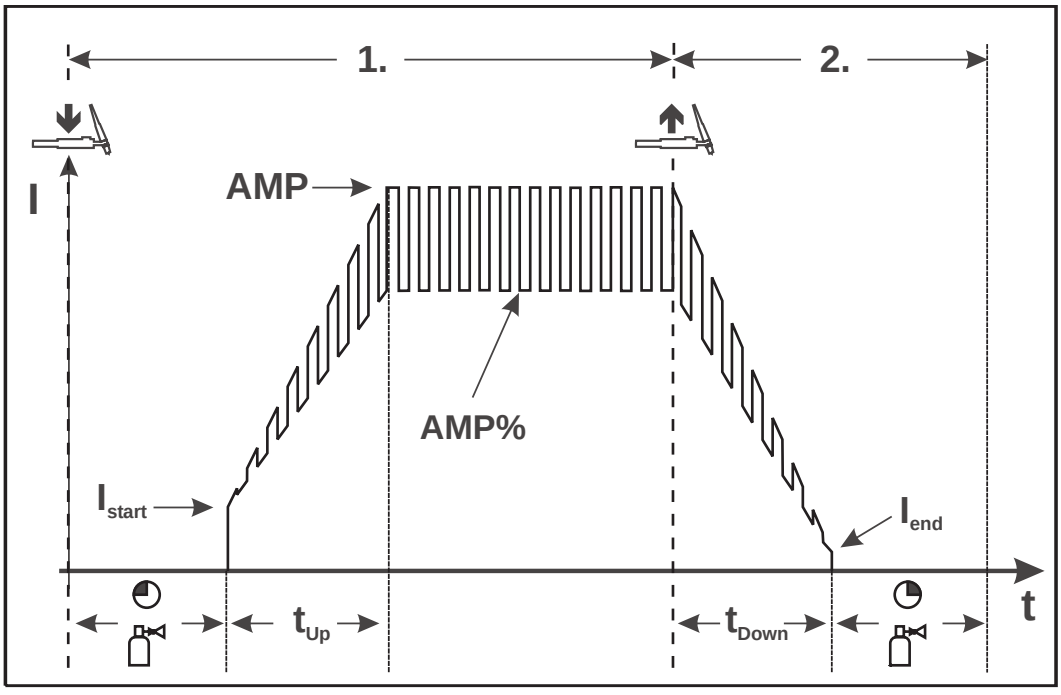


Fig. 3/6: TIG pulses non-latched function sequence

3.4.2 TIG pulses - latched operation

- Adjust the appropriate changeover switches to the following settings:

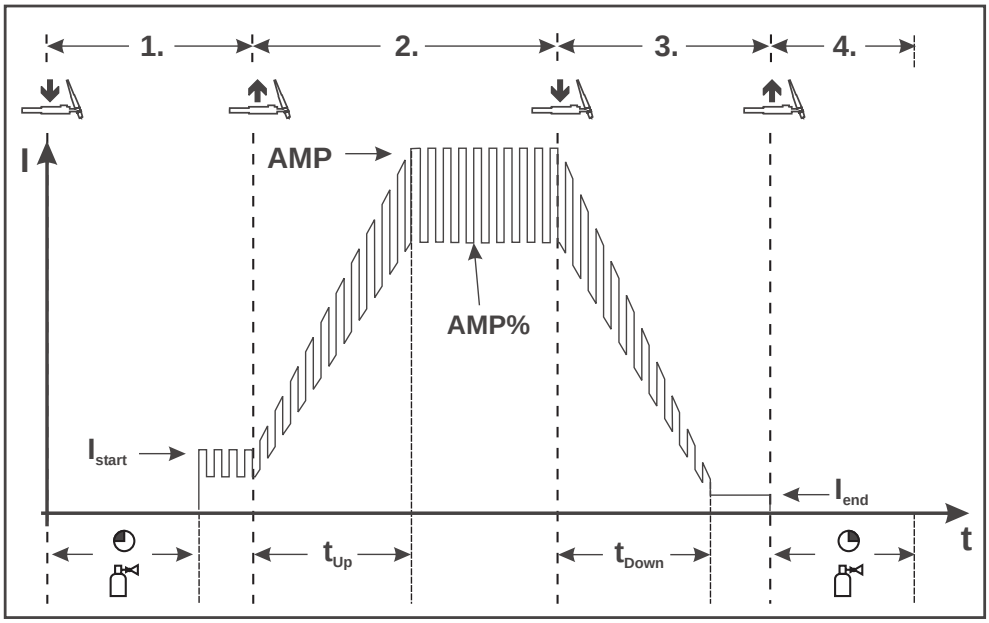


Fig. 3/7: TIG latched function sequence

3.5 MMA welding

If welding is performed alternately by different methods, e.g. TIG, MIG/MAG or MMA and if one or two welding torches and an electrode holder are connected to the machine, the open-circuit/welding voltage is applied simultaneously to both!

Therefore, always place the torch and the electrode holder on an insulated surface before starting work and during breaks.

- Adjust the appropriate changeover switches to the following settings:

This machine has the following features in electrode operation:

Arcforcing

Shortly before the electrode threatens to stick, the arcforcing device sets an increased current designed to impede sticking of the electrode. The value of the current increase depends on the arcforce setting. Excellent welding properties are achieved with all difficult electrodes by adjustable arcforcing.

Hotstart

The hotstart device has the effect of better ignition of the stick electrodes by an increased ignition current.

Antistick

If the stick electrode sticks in spite of the arcforcing device, the machine automatically switches over to the minimum current within about 1 sec, so that overheating of the electrode is prevented. If the antistick device has responded, check the main current setting and if necessary correct it.

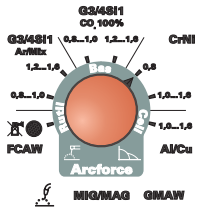
3.5.1 TRITON 260 adjustable arcforcing

Two arcforcing settings can be selected on the characteristics changeover switch (Chap. 2, G2) on the rear of the machine:

- **Characteristics 1: BASIC (welding with stick electrodes enveloped with basic material),**
- **Characteristics 2: RUTILE (welding with stick electrodes enveloped with rutile),**

3.5.2 TRITON 400/500 adjustable arcforcing

☞ **Adjustment at 8 levels is possible before and during the welding operation.**



Settings are made on the inner scale:
"Rutile" setting::
Low arcforcing ⇒ gentle arc,
little increased current before short-circuit.
Used with stick electrodes enveloped with rutile.
"Bas" setting:
Moderate arcforcing ⇒ normal arc,
moderate increased current before short-circuit.
Used with stick electrodes enveloped with basic material.
"Cell" setting:
High arcforcing ⇒ hard arc,
high increased current before short-circuit.
Used with cellulose stick electrodes.

3.6 MIG/MAG welding (Option)

If welding is performed alternately by different methods, e.g. TIG, MIG/MAG or MMA and if one or two welding torches and an electrode holder are connected to the machine, the open-circuit/welding voltage is applied simultaneously to both!

Therefore, always place the torch and the electrode holder on an insulated surface before starting work and during breaks.

☞
- **To be able to use the MIG/MAG welding process, a wire feed unit must be connected. The MIG/MAG function sequences are described in the operating instructions of the wire feed unit.**
- Adjust the appropriate changeover switches to the following settings:

GMAW
MIG/MAG

- Adjust further settings on the WF unit.

3.6.1 TRITON 260

☞ **In MIG/MAG welding, only the following operating and display elements on the welding machine are active:**

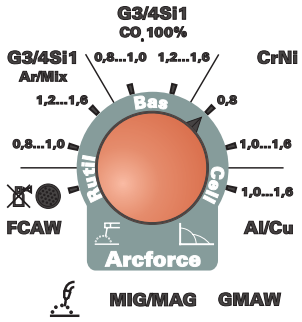
- **The digital display,**
- **the welding voltage or current changeover switch display (C1),**
- **the characteristics changeover switch (Chap. 2, G2) on the rear of the welding machine:**
  Characteristics 1: 0.8-1.0 MIG/MAG GMAW (welding with steel wire),
  Characteristics 2: 0.9-1.2 FCAW (welding with cored wire),
- **Rotary switch Dynamic correction / choke effect setting.**

3.6.2 TRITON 400/500

In MIG/MAG welding, only the following operating and display elements on the welding machine are active:

- **The digital display (D1),**
- **the welding voltage or current changeover switch display (C1),**
- **the roatry dial characteristic line (B3),**
- **Rotary switch Dynamic correction / choke effect setting.**

8 permanently programmed characteristic lines are stored for MIG/MAG welding. These can be called up in 8 levels.
The type of material, wire diameter and type of gas are stored in one characteristic line. Setting is with the aid of the outer scale and can be done before the welding operation.



Characteri-stic line number	Material	Wire diameter (mm)	Type of gas
1	FCAW (cored wire)	0.9 – 1.2	
2	G3/4Si1 (low-alloy steel)	0.8 – 1.0	Ar/Mix
3	G3/4Si1 (low-alloy steel)	1.2 – 1.6	Ar/Mix
4	G3/4Si1 (low-alloy steel)	0.8 – 1.0	CO_2 100%
5	G3/4Si1 (low-alloy steel)	1.2 – 1.6	CO_2 100%
6	CrNi (high-alloy steel)	0.8	various
7	CrNi (high-alloy steel)	1.0 – 1.6	various
8	Al/Cu (aluminium or copper alloys)	1.0 – 1.6	Ar 100%

3 Function specification

3.7 Remote control

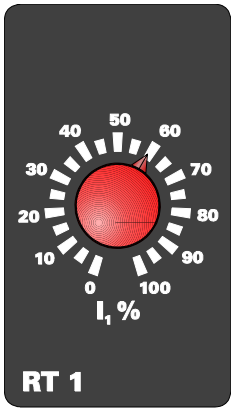
Only the remote controls described in these operating instructions should be connected. Plug in and lock the remote control to the remote control connection socket only, and only when the welding machine is switched off (chap. 2.1.1, G1 for TRITON 260 and chap. 2.2.1, G3 for TRITON 400/500). The remote control must never be connected to a wire feed unit. See the operating instructions for the remote control for more detailed information.

Foot-operated remote control RTF 1

Functions:

- Welding current "ON/OFF" (switches on after the pedal has been pressed).
- Infinitely adjustable welding current (in %) depending on the preselected main current or I_1 of the welding machine.

Manual remote control RT1

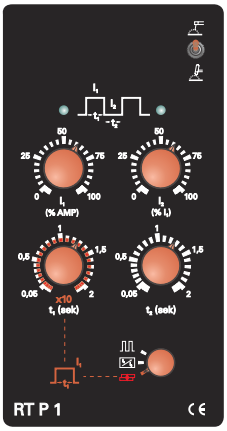


Functions:

- Infinitely adjustable welding current (in %) depending on the welding current I_1 preselected on the welding machine.

When the foot-operated remote control RTF 1 is connected, the machine switches automatically to non latched operation. Up- and Down-Slope will be switched off.

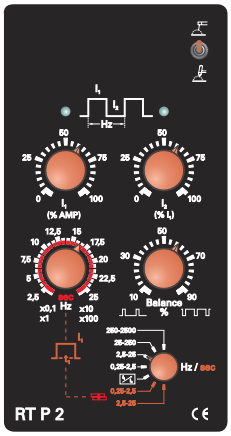
RTP 1 manual remote control



Functions:

- TIG / MMA
- Pulse / spot / normal
- The percentage settings of the main and secondary current depending on the preselected welding current I_1 of the welding machine.
- Pulse, spot and break times are infinitely adjustable.

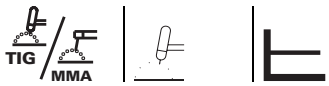
RTP 2 manual remote control



Functions:

- TIG / MMA
- Pulse / spot / normal
- The percentage settings of the main and secondary current depending on the preselected welding current I_1 of the welding machine.
- Frequency and spot times infinitely adjustable.
- Coarse adjustment of the cycle frequency.
- Pulse/break ratio (balance) adjustable from 10% to 90%.

- For remote controls RTP 1 and RTP 2, adjust the following settings on the appropriate changeover switch:



3.8 TIG interface for mechanised welding (remote control connection socket)

The welding current sources feature a very high standard of safety.
This safety standard is also retained when peripheral equipment is connected for automatic welding if this peripheral equipment fulfils the same criteria, particularly with regard to their isolation from the mains supply.

This is ensured by the use of transformers according to VDE 0551.
The welding machines are equipped for automated operation as standard.

For automated applications, control inputs and a galvanically isolated relay contact are available at the remote control connection socket **(TRITON 260; Chap. 2, G1); TRITON 400/500; Chap. 2, G3)**.

Interface for mechanised welding

19 pole connection socket **(TRITON 260; Chap.2, G1); TRITON 400/500; Chap. 2, G3):**

- Pin A Output: Connection for cable screen.
- Pin B/L Output: Current relay contact (I>0) to the user (galvanically isolated) maximum load +/- 15 V / 100 mA.
- Pin F Output: Potentiometer reference voltage 10 V, max. 10 mA.
- Pin K Output: Power supply +15 V, max. 75 mA.
- Pin V Output: Power supply -15V V, max. 25mA mA.
- Pin C Input: Nominal value for main current, 0-10V (0V = I_{min}, 10V = I_{max})
- Pin D Input: Nominal value for secondary current, 0-10V (0V = I_{min}, 10V = I_{max}).
- Pin J/U Output: 0V
- Pin R Input: Start / stop.
- Pin H Input: Switching between main and secondary current.
- Pin S Input: Switching between MMA and TIG operation.
- Pin M/N/P Input: Nominal value identification.
- Pin G Output: $I_{nominal}$ 0-10V

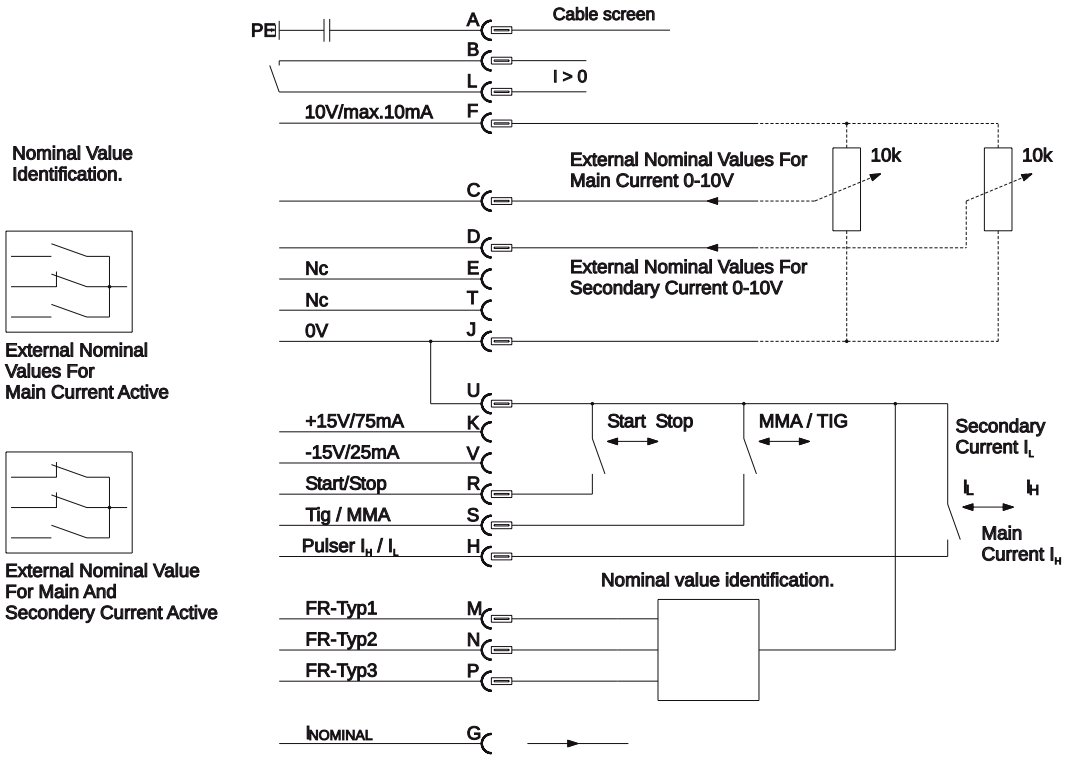


Fig. 3/8: Interface for mechanised welding, 19-pole

3 Function specification

3.9 Welding parameter adjustments "internally"

The welding parameters are preadjusted to optimum settings for most applications, changes are only necessary for special applications.
The welding parameters can be changed on the T101 circuit board in the welding machine.

Explanation of symbols

Symbol	Meaning
	Jumper open
	Jumper closed
	Turn trimmer to the right
	Turn trimmer to the left

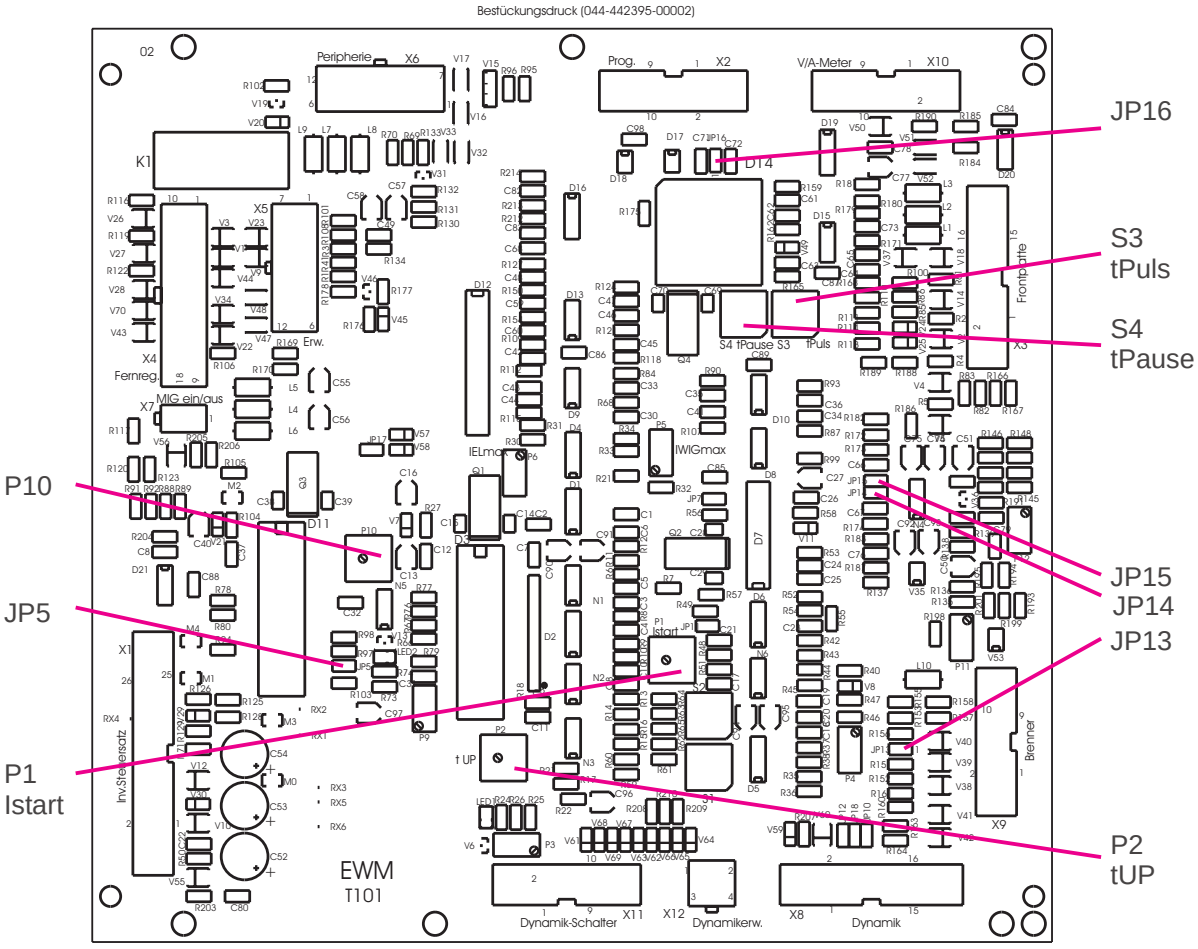


Fig. 3/9: T101 screen printed PCB

3.9.1 P10: Gas pre-flow time

The gas pre-flow time is infinitely adjustable from 0 to 5 sec (works setting 0.2 sec).

Function	Setting
Increase gas pre-flow time	
Reduce gas pre-flow time	

3.9.2 P1 I-start: Ignition current

The ignition current is infinitely adjustable from 0% to 100% of the main current AMP (G1) (works setting 30%)

Function	Setting
Increase ignition current	
Reduce ignition current	

(search arc in 0% position)

3.9.3 P2 t-UP: Up-slope time

Current increase from the ignition current I_{start} to the value of the main current AMP (G1) infinitely adjustable from 0 to 5 sec (works setting 0.1 sec).

Function	Setting
Increase Up-slope time	
Reduce Up-slope time	

3.9.4 JP5: Switching between normal or tapping operation

(works setting tapping operation)

Operating mode configuration	Setting
Tapping released	☒ JP5
Tapping blocked	☐ JP5

3.9.5 S3 tPulse and S4 tPause: TIG pulses, pulse and break time adjustment

Switch position	0/1	2/3	4/5	6/7	8/9	A/B	C/D	E/F
Time [sec]	0.1	0.3	0.5	0.7	0.9	1.1	1.3	1.5

Table 1: Coding switch

3.9.5.1 S3 tPulse: Pulse time (works setting 0.3 sec)

The pulse time can be adjusted from 0.1 sec to 1.5 sec in 0.2 sec steps on coding switch S3 (see table 1)

3.9.5.2 S4 tPause: Pulse break (works setting 0.3 sec)

The pulse break can be adjusted from 0.1 sec to 1.5 sec in 0.2 sec steps on coding switch S4 (see table 1)

3.9.5.3 Example of settings for the pulse time and pulse break

Requirement: The pulse time should be 1.1 sec and the break time 0.5 sec:

- Coding switch S3 must be switched to position A or B,
- Coding switch S4 must be switched to position 4 or 5,

3 Function specification

3.10 Programming of the torch operation variants

The user can select the following functions (TT=torch trigger):

- Operating modes standard TIG welding torch with 5-pole connector plug
  Mode1: Operation with standard TIG torch, welding current on/off, no Up/Down function (MG rocker or separate TT)
  Mode2: Up-Down operation with standard TIG torch (MG rocker)
  Mode3: Up-Down operation with standard TIG torch (2 separate TT)
- Changing Up-Down speed.

The function is selected with the torch triggers on the welding torch
(does not apply to standard TIG torches with one TT, see also Chap. 3.10.4).

3.10.1 Mode1, standard operation (works setting) with standard TIG torch

Design: 2 trigger

Symbol	Functions	Operation with
	Welding current On/Off	TT 1
	secondary current	TT 2
	secondary current	TT 1 in tapping mode

Design: (MG rocker)

	Welding current On/Off	TT 1 (rocker forwards)
	secondary current	TT 2 (rocker back)
	secondary current	TT 1 (rocker forwards) in tapping mode

Programming Mode1:

- Switch off the machine and wait approx. 3 sec.
- Set the main current rotary dial (G1) to maximum.
- Press and hold torch triggers 1 and 2 at the same time.
- Switch on the machine ➔ Display (D1) indicates maximum current.
- Release both torch triggers➔ Display (D1) indicates minimum current.
- Torch trigger 2: press 1x.
- Press torch trigger 1 ➔ the mode is stored in the memory ➔ the half-maximum current is displayed.
- Switch off the machine, wait approx. 3 sec and switch on again ➔ machine ready in mode 1.

3.10.2 Mode 2, Up/Down operation for standard torches with a rocker

Design: 2 triggers (MG rocker)

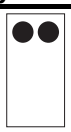
Symbol	Functions	Operation with
	Welding current On/Off	TT 1+2 simultaneously
	UP function:	TT 1 (rocker forwards)
	Down function:	TT 2 (rocker back)
	secondary current	TT 1+2 in tapping mode

Programming Mode2:

- Switch off the machine and wait approx. 3 sec.
- Set the main current rotary dial (G1) to maximum.
- Press and hold torch triggers 1 and 2 at the same time.
- Switch on the machine ➔ Display (D1) indicates maximum current.
- Release both torch triggers➔ Display (D1) indicates minimum current.
- Press torch trigger 2 2x.
- Press torch trigger 1 ➔ the mode is stored in the memory ➔ the half-maximum current is displayed.
- Switch off the machine, wait approx. 3 sec and switch on again ➔ machine ready in mode 2.

3.10.3 Mode 3, Up/Down operation for standard torches with two triggers

Design: 2 trigger

Symbol	Functions	Operation with
	Welding current On/Off	TT 1
	secondary current	TT 1 in tapping mode
	Up/Down function Down = press and hold Up = tap and hold	TT 2

Programming Mode3:

- Switch off the machine and wait approx. 3 sec.
- Set the main current rotary dial (G1) to maximum.
- Press and hold torch triggers 1 and 2 at the same time.
- Switch on the machine ➔ Display (D1) indicates maximum current.
- Release both torch triggers➔ Display (D1) indicates minimum current.
- Press torch trigger 2 3x
- Press torch trigger 1 ➔ the mode is stored in the memory ➔ the half-maximum current is displayed.
- Switch off the machine, wait approx. 3 sec and switch on again ➔ machine ready in mode 3.

3.10.4 Setting the Up/Down speed

This adjustment applies both to the standard TIG torches (5-pole), and to the Up/Down torches (8-pole).

It is possible to select 3 changing speeds of the Up-Down function:

- Up-Down speed=1 (rapid current changing speed)
- Up-Down speed=2 (moderate current changing speed)
- Up-Down speed=3 (slow current changing speed)

Programming Up/Down speed:

- Switch off the machine and wait approx. 5 sec.
- Set the main current rotary dial (G1) to maximum.
- Press and hold torch triggers 1 and 2 at the same time.
- Switch on the machine ➔ Display (D1) indicates maximum current.
- Release both torch triggers➔ Display (D1) indicates minimum current.
- Press torch trigger 1 1 to 3x, depending on the Up/Down speed required.
- Press torch trigger 2 ➔ the mode is stored in the memory ➔ the maximum current is displayed.
- Switch machine off and on again ➔ programmed Up/Down speed is programmed.

3.11 Returning the machine to the works settings

Necessary if the machine has been changed to Up/Down function but no standard TIG torch with a trigger is available at the moment.

Switch off machine > plug in jumper JP16 > switch on machine > switch off machine > remove jumper JP16.

After resetting the machine, it has the works settings with the following values:

- Up-Down value at maximum (100% of AMP)
- Up-Down mode = 1 (i.e. Up-Down function for standard TIG torches is switched off)
- Up-Down speed = 2 (i.e. moderate current changing speed)

3.12 JP13, JP14 and JP15: Configure welding torch connection

When connecting a potentiometer torch, the following jumpers must be changed inside the welding machine (see fig. 3.9):

Welding torch configuration	Setting
Prepared for TIG standard or Up-Down torch (works setting)	☒ JP13 ☐ JP14 ☒ JP15
Prepared for potentiometer torches	☐ JP13 ☒ JP14 ☐ JP15

3.13 TRITON 400/500 interface for mechanised MIG/MAG welding (option)

The welding current sources feature a very high standard of safety.
This safety standard is also retained when peripheral equipment is connected for automatic welding if this peripheral equipment fulfils the same criteria, particularly with regard to their isolation from the mains supply.

This is ensured by the use of transformers according to VDE 0551.
The welding machines are equipped for automated operation as standard.

For automated applications, control inputs and galvanically isolated relay contacts are available on the machine connection sockets.

Use only shielded control leads!

Interface for mechanised welding

Pin	Input / Output	Designation
A	Output	Connection for cable screen
B	Output	+Iactual (10V = 1000A welding current)
C	Input	Interface for mechanised welding ON (relay with 0V)
D/E/F	Input	Selection of welding process*
G/S	Output	0V
H	Output	Power supply +15 V, max. 75 mA
J/U	Input	Fixed-wire
L	Output	+Uactual (10V = 100V welding voltage)
M	Input	UnominalAU (2V to 10V = 10V to 50V welding voltage)
N	Input	Nominal value input for WF, 0-10V (0V = 0.5m/min, 10V = 24m/min wire feed speed)
P	Input	Start signal of machine (relay with 0V)
R	Output	Reference voltage 10 V, max. 10 mA.
T	Output	Power supply -15V , max. 25mA
V	Output	Current relay contact (I>0) to the user (galvanically isolated) maximum load +-15V / 100 mA

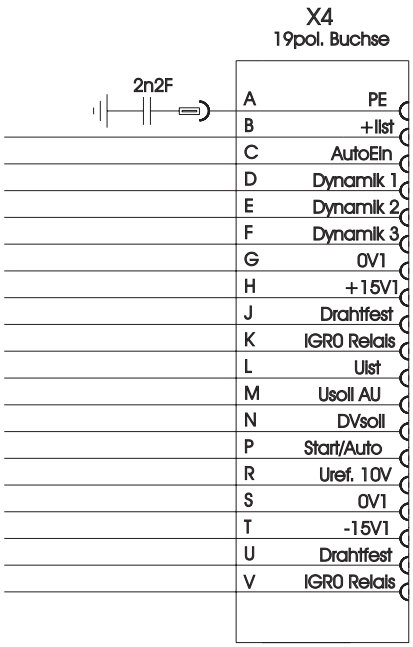
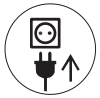
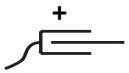
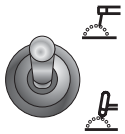
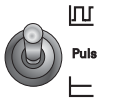
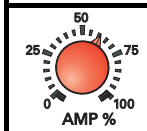
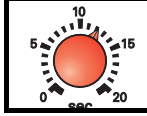


Fig. 3/6: Interface for mechanised welding, 19-pole

*Selection of welding characteristic line (see Chap. 3.6.2)	Interface for mechanised welding, Pin		
	D	**E**	**F**
1	10V	10V	10V
2	0V	10V	10V
3	10V	0V	10V
4	0V	10V	10V
5	10V	10V	0V
6	0V	10V	0V
7	10V	0V	0V
8	0V	0V	0V

4 Quick start – the fastest way to weld

	Preparations
	• Plug in the mains plug. (Remember fuse protection!)
	• Plug in the workpiece lead, lock and attach conductively to the workpiece.
	• Insert the welding current plug of the torch
	• Connect torch trigger plug.
	• Establish the shielding gas supply, adjust the gas flow
	• Plug in the remote control connection plug
	• Switch on machine at the main switch

	Settings
	• Set the welding process
	• Select TIG pulses or standard TIG welding
	• Select the operating mode.
	• Select main current
	• Select secondary current (in % of main current)
	• Select gas post-flow time (1 – 20sec.)
	• Select down-slope time (0 – 20sec.)

	Settings and troubleshooting
	• Select arcforcing (only applies to MMA applications and TRITON 400, 500)
	• Set the ignition mode: HF HF ignition Liftarc (contact ignition)
	<u>Excess temperature LED on:</u> • Duty cycle exceeded > Allow machine to cool down
	<u>Water deficiency LED:</u> • When operating water cooled welding machines with a cooling module, the Water Deficiency LED will be active.
	<u>Collective interference LED:</u> • Power unit is switched off. Some errors are short-term, one-off errors and the collective interference signal light goes off again and the welding machine is ready for welding again.

5 Commissioning

5.1 Area of application

5.1.1 Designed use

These welding machines are suitable exclusively for TIG, MMA and MIG/MAG welding.
Any other use is regarded as "not as designed", and no liability is assumed for any damage arising therefrom.

We can only guarantee smooth and trouble-free operation of the machines when used in conjunction with the cooling units, welding torches and accessories from our delivery programme!

5.1.2 Triton 260

- MMA directff current welding for rutile and basic coated electrodes.
- TIG direct current welding with HF ignition or Liftarc for
  low- and high-alloy steels, copper, nickel-based alloys and special metals.
- MIG/MAG welding in combination with an additional wire feed unit (optional) for
  steel-CrNi ∅ 0.8mm-1.0mm,
  aluminium ∅ 1.0mm-1.2mm and
  cored wires ∅ 0.9mm-1.2mm.

5.1.3 Triton 400/500

- MMA direct current welding for rutile, basic and cellulose electrodes.
- TIG direct current welding with HF ignition or Liftarc for
  low- and high-alloy steels, copper, nickel-based alloys and special metals.
- MIG/MAG welding in combination with an additional wire feed unit (optional) for
  steel-CrNi ∅ 0.8mm to 1.6mm,
  aluminium ∅ 1.0mm to 1.6mm and
  cored wires ∅ 0.9mm to 1.2mm.

5.2 Setting up the welding machine

Follow safety instructions on the opening pages entitled "For Your Safety"!

Set up the machine so that there is enough room to adjust the operating components.

Ensure that the machine is set up in a stable position and appropriately secured.

5.3 Mains connection

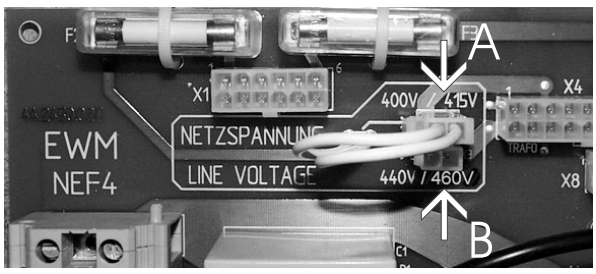
The correct mains plug must be attached to the mains supply lead of the machine.

The connection must be made by an electrician in compliance with current VDE regulations. The phase sequence is irrelevant and has no effect on the direction of rotation of the fan!

The operating voltage shown on the rating plate must be consistent with the mains voltage! For mains fuse protection, please refer to the technical data (chapter 3)!

- Insert mains plug of the switched-off machine into the appropriate socket.

5.3.1 Reconnecting the mains voltage 400/415V and 440/460V



The plug on the NEF4 must be changed over according to the mains voltage. The PCB NEF4 is located inside of the machine on the left side.

- **For 400/415V: Plug to pos. A (works setting)**
- **For 440/460V: Plug to pos. B**

5 Commissioning

5.4 Welding machine cooling system

To obtain an optimal duty cycle from the power components, the following precautions should be observed:

- Ensure that the working area is adequately ventilated,
- Do not obstruct the air inlets and outlets of the machine,
- Metal parts, dust or other foreign bodies must be kept out of the machine.

5.5 Workpiece lead, general

Remove paint, rust and dirt from clamping and welding areas with a wire brush! The workpiece clamp must be mounted near the welding point and must be fixed in such a way that it cannot come loose of its own accord.

Structural parts, pipes, rails etc. may not be used as return leads for the welding current unless they are the workpiece themselves!
A perfect current connection must be ensured where welding benches and appliances are concerned!

5.6 Connection groups

If welding is performed alternately by different methods, e.g. TIG, MIG/MAG or MMA and if one or two welding torches and an electrode holder are connected to the machine, the open-circuit/welding voltage is applied simultaneously to both!

Therefore, always place the torch and the electrode holder on an insulated surface before starting work and during breaks.

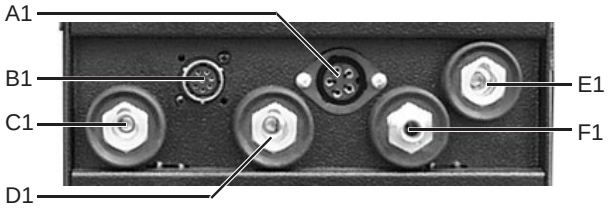


Fig. 5/1 Group of connections on the front of the machine TRITON 260

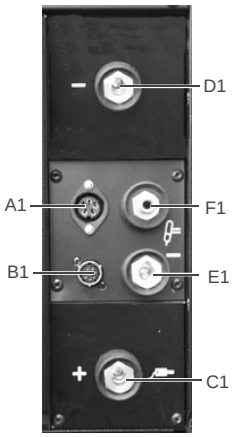


Fig. 5/3 Group of connections on the front of the machine TRITON 400/500

Fig. 5/2 Group of connections on the rear of the machine TRITON 260

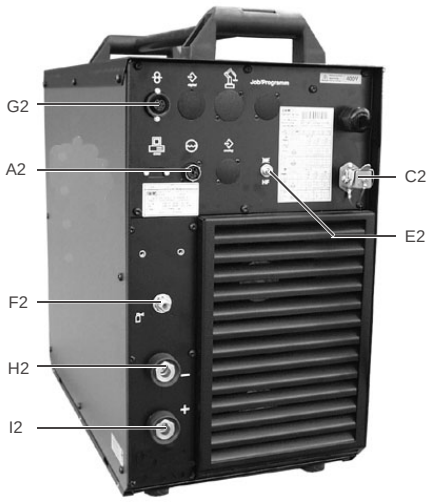


Fig. 5/4 Group of connections on the rear of the machine TRITON 400/500

5 Commissioning

5.7 MMA welding

When replacing spent or new stick electrodes, always switch off the machine at the main switch.

Always use insulated tongs to remove used stick electrodes or to move welded workpieces. Always put the electrode holder down when insulated.

5.7.1 Electrode holder

- Insert cable plug of the electrode holder into the welding current socket (C1 "+" or D1 "-") and lock by turning to the right.

The polarity depends on the instructions from the electrode manufacturer given on the electrode packaging.

Clamp stick electrode into electrode holder. Caution: Risk of injury from crushing! Always put down stick electrode holder in an insulated position.

5.7.2 Workpiece lead

- Insert cable plug of the workpiece lead into the welding current socket (C1 "+" or D1 "-") and lock by turning to the right.

The polarity depends on the instructions from the electrode manufacturer given on the electrode packaging.

5.8 TIG welding

We can only guarantee the perfect functioning of our machines when used with our range of welding torches.

Standard TIG welding torches with shielded torch trigger control leads should not be connected (see torch operation instructions)!

Follow the safety instructions on the opening pages entitled "For your safety".

Before welding ensure that all coolant hoses are connected.

5.8.1 Welding torch, general

Always put down welding torch when insulated.

- Fit tungsten electrode and gas nozzle onto the welding torch (observe current load, see torch operating instructions).
- Engage the rapid-action closure nipple of the TIG torch in the rapid-action closure coupling for the coolant supply (blue) and return (red) lines of the cooling unit (only for water-cooled torches).
- If a gas-cooled torch is used on a water cooled unit, either a tube bridge must be connected between the water supply and the cooling unit return to prevent the coolant pump from running hot, or the control lead of the cooling unit must be removed from the welding machine.
- Insert the welding current plug into socket "-" (E1) and lock by turning to the right.
- Screw shielding gas connection of the welding torch tightly on to the connection nipple G¼ (F1).

5.8.1.1 Standard TIG torch

- Insert the torch control lead plug (5-pole) into the connection socket (A1) and lock.

The welding machines are supplied as standard with torch trigger pin assignment B1 and gas connection G1/4".

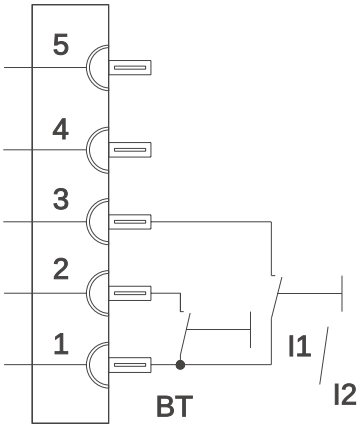


Fig. 5/5: Connection socket connection B1

5.8.1.2 TIG Up/Down or TIG potentiometer welding torch

Potentiometer torches available on the market e.g. from Binzel can be used.

- Insert the torch control lead plug (8-pole) into the connection socket (B1) and lock.

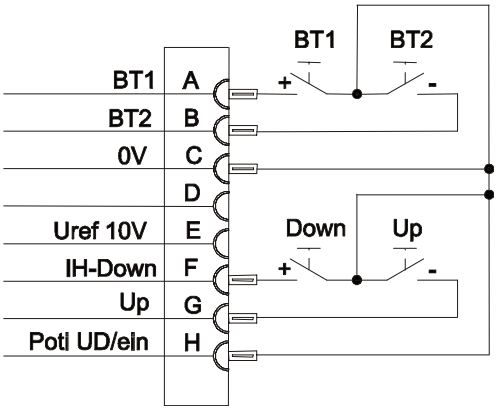


Fig. 5/6 Connection socket assignments Up/Down torch

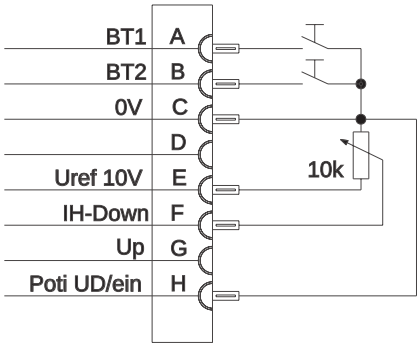


Fig. 5/7: Connection socket assignments Potentiometer torch

5.8.2 Shielding gas supply (shielding gas cylinder to the welding machine)

No impurities must be allowed to enter the shielding gas supply as these could cause blockages in the shielding gas supply.

- Place shielding gas cylinder in the retainer provided for it and secure with chains.
- Before connecting the pressure reducer to the gas cylinder, open the cylinder valve briefly to blow out any dirt present.
- Screw the pressure reducer onto the cylinder valve, ensuring a gas-tight connection.
- Connect the pressure reducer to the G¼ shielding gas connection (F1) on the rear of the machine.
- Open gas cylinder valve and set recommended gas quantity on the pressure reducer.

Rule of thumb for gas flow rate:

Diameter of gas nozzle in mm corresponds to gas flow in l/min.
Example: 7 mm gas nozzle corresponds to 7 l/min gas flow

5.8.3 Workpiece lead

- Insert cable plug of the workpiece lead into the welding current socket (C1) and lock by turning to the right.

5 Commissioning

5.9 MIG/MAG welding (option)

Simultaneous TIG and MIG/MAG welding is not possible

5.9.1 TRITON 260

Always put down welding torch when insulated.

In MIG/MAG welding, only the following operating and display elements on the welding machine are active:

- **Digital display (chap.3, D1),**
- **Welding voltage / welding current display changeover switch (chap.3, C1),**
- **Characteristics changeover switch (chap. 2, G2) on the rear of the welding machine:**
  Characteristic 1: 0.8-1.0 MIG/MAG GMAW (welding with steel wire),
  Characteristic 2: 0.9-1.2 FCAW (welding with solid/cored wire) and
- **Dynamic correction / choke effect rotary switch (chap.3, B2).**

5.9.1.1 Supply to the wire feed unit

- Insert the welding current plug of the WF unit in the welding current socket (C1 "+") and lock by turning to the right.

For special MIG/MAG applications such as welding cored wires for example, the WF unit welding current plug is plugged into the "-" socket (E1) and locked by turning to the right.

- Insert the control lead plug (7-pole) into the connection socket (G2) and lock (rear of machine).
- Please see the wire feed unit operating instructions for further information.

5.9.1.2 Workpiece lead

- Insert cable plug of the workpiece lead into the welding current socket (C1 "+" or E1 "-" depending on the application) and lock by turning to the right.

5.9.2 TRITON 400/500

In MIG/MAG welding, only the following operating and display elements on the welding machine are active:

- **Digital display,**
- **Welding voltage or current display changeover switch,**
- **Characteristics rotary dial (chap.3, C3) and**
- **Dynamic correction / choke effect rotary switch (chap.3, B3).**

If only one torch (either TIG torch or MIG/MAG torch) is to be connected (e.g. infrequent changing between processes),

the cooling units COOL 71U40 or COOL 71U41 can be used.

In this case, either TIG torches or MIG/MAG torches may be connected.

- With MIG/MAG welding the WF unit should be connected to the cooling unit
- For this application, the coolant supply line (blue) and return line (red) on the cooling unit should be connected to the coolant supply line (blue) and return line (red) on the WF unit.

5 Commissioning

If a TIG torch and MIG/MAG torch are to be connected at the same time (e.g. frequent changing between the processes) the more powerful cooling unit COOL 71U41 should be used.
Under certain circumstances, limitations in cooling output may arise despite the more powerful cooling unit;
e.g. excessively long intermediate hose packages or torches, special torches, etc.

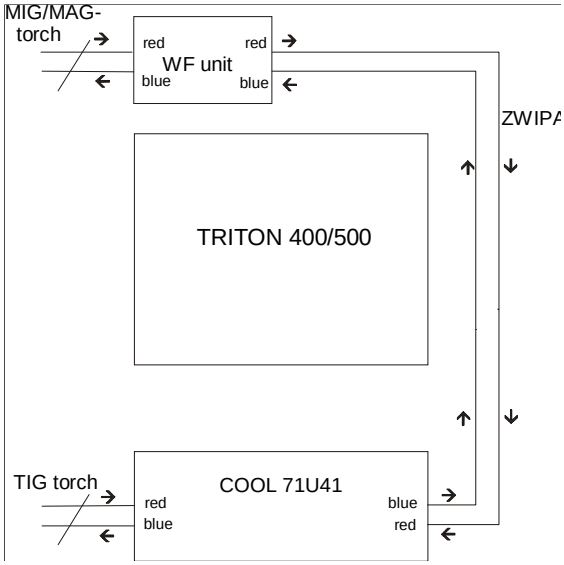


Fig. 5/8

5.9.2.1 Supply to the wire feed unit

- Insert the welding current plug of the WF unit in the socket (I2 "+") (option) and lock by turning to the right.

For special MIG/MAG applications such as welding cored wires for example, the WF unit welding current plug is plugged into the "-" socket (H2) (option) and locked by turning to the right.

- Insert the torch control lead plug (7-pole) into the connection socket (G2) and lock (rear of machine).
- Please see the wire feed unit operating instructions for further information.

5.9.2.2 Workpiece lead

- Insert cable plug of the workpiece lead into the welding current socket (C1 "+" or E1 "-" depending on the application) and lock by turning to the right.

5.10 Cooling unit function specification

A function test of the cooling module is performed after the welding machine is switched on.

The coolant pump and the fan are switched on.
When the pump is running, the coolant level is sufficient and a sufficient hydrostatic pressure has built up, the cooling module is switched off after 2 seconds.

If the level is not sufficient a coolant error is reported and the pump runs for a maximum of 30 seconds so that the operator can top up the coolant.

The cooling unit is switched on at the start of the TIG or MIG/MAG welding process.
After the welding process has stopped, the water pump and fan continue to run for a further 5min and then switch off.

5.10.1 Coolant error

If there is no coolant pressure for longer than 2.5 sec during the welding operation e.g. because of a lack of coolant, pump failure or a burst or leaking hose:

- an error message is issued (LED see fig. 3/1, pos. K1)
- and the welding process is ended in a controlled manner
  (coolant pump and power unit of the welding machine are switched off).

With renewed starting of the welding process, the coolant error is reset and the cooling module switched on. If still no coolant pressure has built up after 2.5 sec, the cooling module is switched off, the LED coolant level low (see fig. 3/1, pos. K1) lights up and the welding process is ended in a controlled manner.

6 Maintenance and care

Under normal operating conditions, these welding machines are largely maintenance-free and ... minimum of care. However, a number of points should be observed to guarantee fault-... welding machine. Among these are regular cleaning and checking, as ... the level of contamination in the environment and the usage time of ...

...chines may only be carried out by ... any one of the following tests the ...

6.1 Clean...

To do this, carefully ...
(Switching off or unscrewing t...
Wait for 2 minutes until the capacitors h...

... components should be handled as follows:

... ding on the amount of dust, blow out cur...

... tronic components or circuit boards with t...

... leaner.

6.2 ... VGB 15

... test

Not observing these instructions can be potentially fatal!

The follow... instructions. If req...

You are recommended to carry o... be carried out after every repair. Test sequ...

...t:

- ... condition
- ... resistance
- ... source
- Measurement of op...
- Function test of the welding ma...

6... check of correct condition

... inspected for externally visible faults (with... ...e paid, for example, to the following points:

- ...ble, e.g. insulation faults, scorch or pressu...
- ...e connecting lead, mains switch.
- ...
- Damage to ...
- Improper interference an...
- The type plate and warning symbol ...

6.2.2 Measurement of protective conductor resist...

Measure between safety contact of the mains plug and metal parts wh... casing screws. During measuring, the entire length of the machine's connecting l... near the connecting points, must be moved.
The resistance must be < 0.1Ω. The measurement must be performed using at least 200 mA.

D

Die im Kapitel "Wartung und Pflege" aufgeführten Hinweise, Richtlinien und Normen wurden grundlegend überarbeitet und sind aus diesem Grund nicht mehr gültig!
Die relevanten Hinweise, Richtlinien und Normen finden Sie in den beiliegenden Ergänzungsblättern "Allgemeine Hinweise zu 3 Jahre Garantie", Art. Nr.: 099-000GAR-EWMxx.
Sollten die Dokumente nicht vorliegen, können diese über den autorisierten Fachhändler angefordert werden!

Außerachtlassung kann lebensgefährlich sein!

GB

The instructions, guidelines and standards given in the "Maintenance and Care" chapter have been completely revised and are therefore no longer valid!
The relevant instructions, guidelines and standards can be found in the enclosed supplements "General notes on the 3 year warranty",item no.: 099-000GAR-EWMxx.
If these documents are missing, they can be requested from your authorised specialist dealer!

Not observing these instructions can be potentially fatal!

F

Les consignes, directives et normes indiquées au chapitre « Maintenance et entretien » ont été mises à jour et ne sont donc plus valables !
Vous trouverez les consignes, directives et normes applicables dans les additifs « Consignes générales relatives à la garantie de 3 ans », à l´article : 099-000GAR-EWMxx.
Si vous ne possédez pas les documents, vous pouvez vous les procurer auprès de votre revendeur autorisé !

Le non-respect des consignes peut représenter un danger de mort !

I

Le istruzioni, direttive e norme presenti nel capitolo „Manutenzione e cura” sono state completamente riviste e per questo motivo non sono più valide!
Le istruzioni, direttive e norme rilevanti le trovate nell'aggiornamento qui allegato “Istruzioni generali sui 3 anni di garanzia”, Nr. Art.: 099-000GAR-EWMxx.
Se i documenti non fossero disponibili, possono essere richiesti al rivenditore autorizzato!

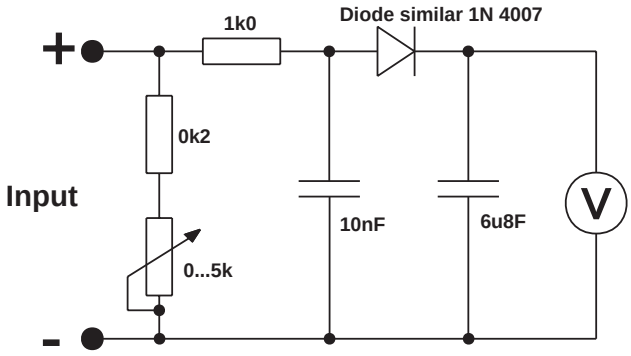
L'inosservanza delle istruzioni può comportare pericolo di vita!

6.2.3 Measurement of insulation resistance

Disconnect the machine from the mains. Pull out the mains plug!
Open the machine and clean carefully (as described above).
Switch on mains switch.

- **Insulation resistance mains current circuit-casing**
  Switch on mains switch.
  a) Step switch controlled machines:
  The machine must be opened. Measure the insulation resistance from the main fuse input and mains fuse output to the casing. At the mains fuse input it is necessary to measure from each connection, at the mains fuse output only from one connection.
  The resistance must be > 2.5 MΩ.
  b) Inverter machines:
  Measure from one phase of the mains plug to the housing.
  The resistance must be > 2.5 MΩ.
- **Insulation resistance welding current circuit-casing**
  Measure between a welding socket and protective conductor.
  The resistance must be > 2.5 MΩ.
- **Insulation resistance mains current circuit welding-current circuit**
  Switch on mains switch.
  a) Step switch controlled machines:
  Measure the insulation resistance between the mains fuse output and a welding current socket.
  The resistance must be > 5 MΩ.
  b) Inverter machines:
  Measure between a phase of the mains plug and a welding current socket.
  The resistance must be > 5.0 MΩ.

6.2.4 Measurement of open circuit voltage (according to EN 60974-1 / VDE 0544 T1)



Measurement circuit for peak values

Connect the measuring circuit to the welding current sockets as shown in Fig. 1. The voltmeter must indicate the mean value. Adjust the potentiometer from 0kΩ to 5kΩ during the measurement.
The measured voltage must not deviate from that specified on the rating plate (U_0) by more than 10% and must be no higher than 113V.

6.2.5 Function test of the welding machine

Carry out a function test depending on the type of machine.

6.3 Repair work

Repair and maintenance work may only be performed by qualified personnel.

In all service matters, always consult your dealer, the supplier of the machine.
Return deliveries of defective equipment subject to warranty may only be made through your dealer.

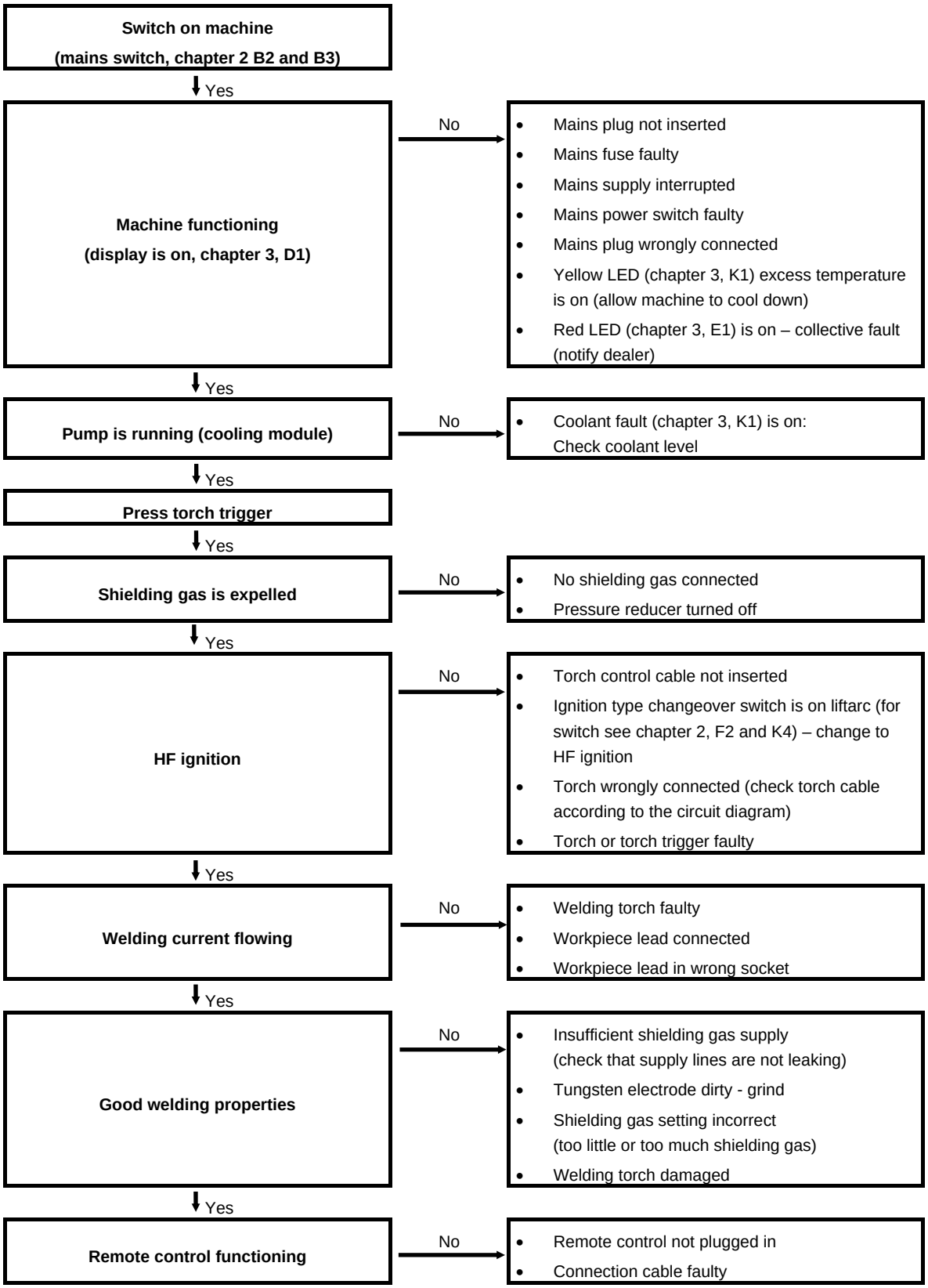
When replacing parts, use only original spare parts.
When ordering spare parts, the machine type, serial number and item number of the machine, as well as the type description and item number of the spare part must be quoted.

If maintenance or repair work is carried out on this machine by personnel who are not trained and authorised to undertake such work, the right to claim under the warranty lapses.

7 Operating faults, causes and remedies

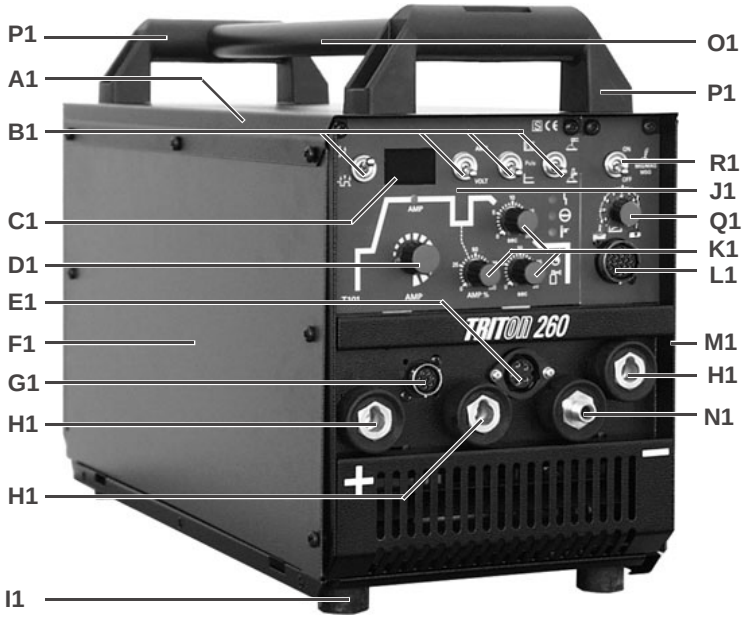
7.1 Customer checklist (TIG welding)

All machines are subjected to strict manufacturing and final inspection procedures. If, despite this, something fails to work at any time, please check machine using the following flowchart. If none of the fault rectification procedures described leads to the correct functioning of the machine, please inform your authorised dealer.



8 Ersatzteilliste / spare part list

8.1 TRITON 260



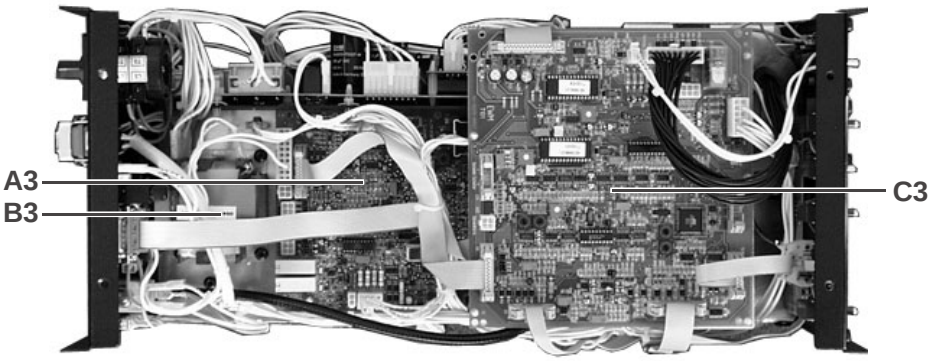
TRITON 260 Abb. 8/1 front view / Fig. 8/1 Vorderseite

Pos	Bezeichnung	Description	Art. Nr. / art. no.
A1 + R1 (Option)	Gehäusedeckel	Casing panel	094-007490-00001
B1	Kippschalter	Toggle switch	044-001939-00000
C1	PCB Verbindungsplatine DVM1/2	PCB connection DVM1/2	040-000449-00000
D1	Drehknopf	Rotary dial	074-000235-00000
	Drehknopfdeckel	Rotary dial cap	074-000235-00001
	Drehknopf Pfeilscheibe	Rotary dial arrow indicator	074-000235-00002
E1	Anschlußbuchse 5 polig	Connection socket 5 pole	094-007570-00000
F1	Seitenblech links	Side panel	094-007538-00002
G1	Anschlußbuchse 8 polig	Connection socket 8 pole	094-006904-00000
H1	Anschlußbuchse	Connection socket	074-000232-00000
I1	Gummifüße	Rubber foot	094-001718-00000
J1	T101 komplett	T101 complete	040-000590-00000
K1 + Q1 (Option)	Drehknopf 16mm	Rotary dial 16mm	094-000131-00000
	Drehknopfdeckel 16mm	Rotary dial cap 16mm	094-000131-00001
	Drehknopf Pfeilscheibe 16mm	Rotary dial arrow indicator 16mm	094-000131-00002
L1	Anschlußbuchse 19-polig	Connection socket 19 pole	094-007651-00000
M1	Seiteblech rechts	Side panel	094-007538-00002
N1	Anschlußnippel G1/4	Connection nipple G1/4	094-002695-00001
	Isolierstück	Insulation piece	094-000075-00000
	Druckscheibe	Pressure washer	094-000076-00000
	Mutter M20	Nut M20	094-000068-00000
	Fächerscheibe	Fan-type lock washer	094-006516-00000
O1	Griffstange	Hand grip	094-007501-00002
P1	Halterung für Griffstange	Hand grip mount	094-007383-00003

8 Ersatzteilliste / spare part list

TRITON 260
Abb. 8/2 Rückseite / Fig. 8/2 rear view

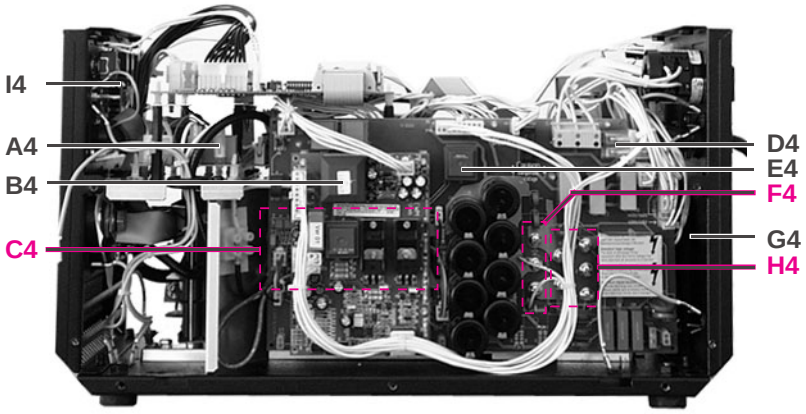
Pos	Bezeichnung	Description	Artikelnummer
A2	Hauptschalter	Mains switch	074-000279-00001
B2	Kabelverschraubung	Screwed cable gland	094-003293-00000
	Mutter	Nut	024-000205-00001
C2	Netzkabel	Mains cable	092-000661-00000
D2	Anschlußbuchse 8polig	Connection socket 8-pole	094-006904-00000
E2	PCB Verbindungsplatine VP 12/D	PCB connection VP 12/D	040-000588-00000
F2	Magnetventil	Solenoid valve	094-000472-00001
G2	Kippschalter	Toggle switch	094-001898-00000
H2	Anbaugehäuse	Extension housing	094-006861-00000
	Kappe Abdeck	Cap	094-006862-00000
	Buchseneinsatz	Socket insert	094-006859-00000



TRITON 260
Abb. 8/3 / Fig 8/3

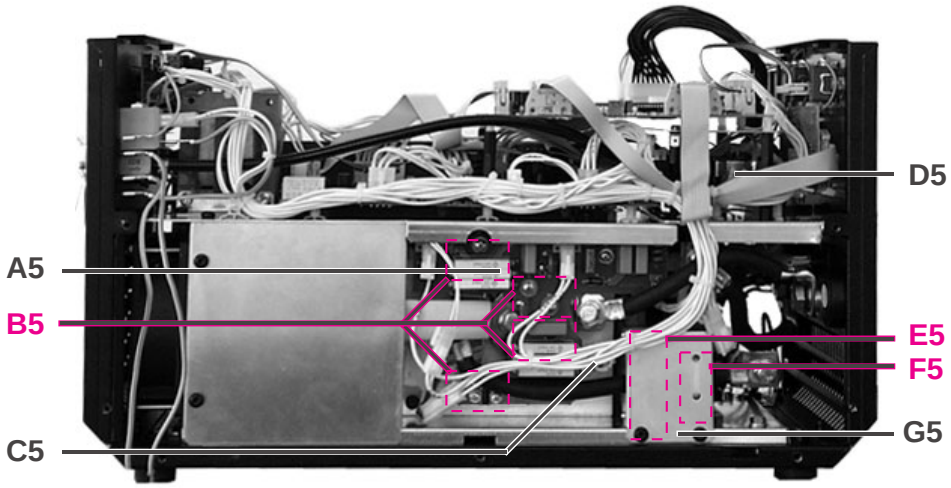
Pos	Bezeichnung	Description	Artikelnummer
A3	PCB Steuerelektronik TRDC 4	PCB control electronicsTRDC 4	040-000581-00000
B3	Versorgungstrafo	Supply transformer	094-007547-00001
C3	PCB Schweißelektronik T101/1	PCB welding electronic T101/1	040-000539-00001

8 Ersatzteilliste / spare part list



TRITON 260
Abb. 8/4 linke Seite / Fig. 8/4 left side

Pos	Bezeichnung	Description	Artikelnummer
A4	Zündgerät	Ignition unit	040-000546-00001
B4	PCB Sperrwandler SPW 6	PCB blocking converter SPW 6	040-000556-00000
C4	Multidul IGBT	Multidul IGBT	080-000306-00000
D4	Sicherung 1,6A 2x	Fuse 1,6A 2x	044-001744-00000
E4	PCB Schweißelektronik DC 260	PCB welding electronics DC 260	040-000583-00000
F4	Thyristormodul	Thyristor module	064-000083-00014
G4	Lüfter	Fan	074-000015-00000
H4	Eingangsbrücke	Input bridge	064-000844-00016
I4	PCB T100/2	PCB T100/2	042-000498-00000



TRITON 260
Abb. 8/5 rechte Seite / Fig. 8/5 right side

Pos	Bezeichnung	Description	Artikelnummer
A5	PCB Schutzbeschaltung DSB 7	PCB protective wiring DSB 7	040-000589-00000
B5	Sekundärdioden 4x	Secondary diodes 4x	044-002601-00000
C5	Thermoschalter	Thermal switch	064-000165-00001
D5	Brennertasterfilter	Torch trigger filter	040-000545-00000
E5	Lemwandler	LEM converter	074-000112-00000
F5	Sättigungswandler	Saturation transformer	072-000476-00000
G5	Stromerfassung komplett	Current recording complete	072-000501-00000

8 Ersatzteilliste / spare part list

8.2 TRITON 400/500

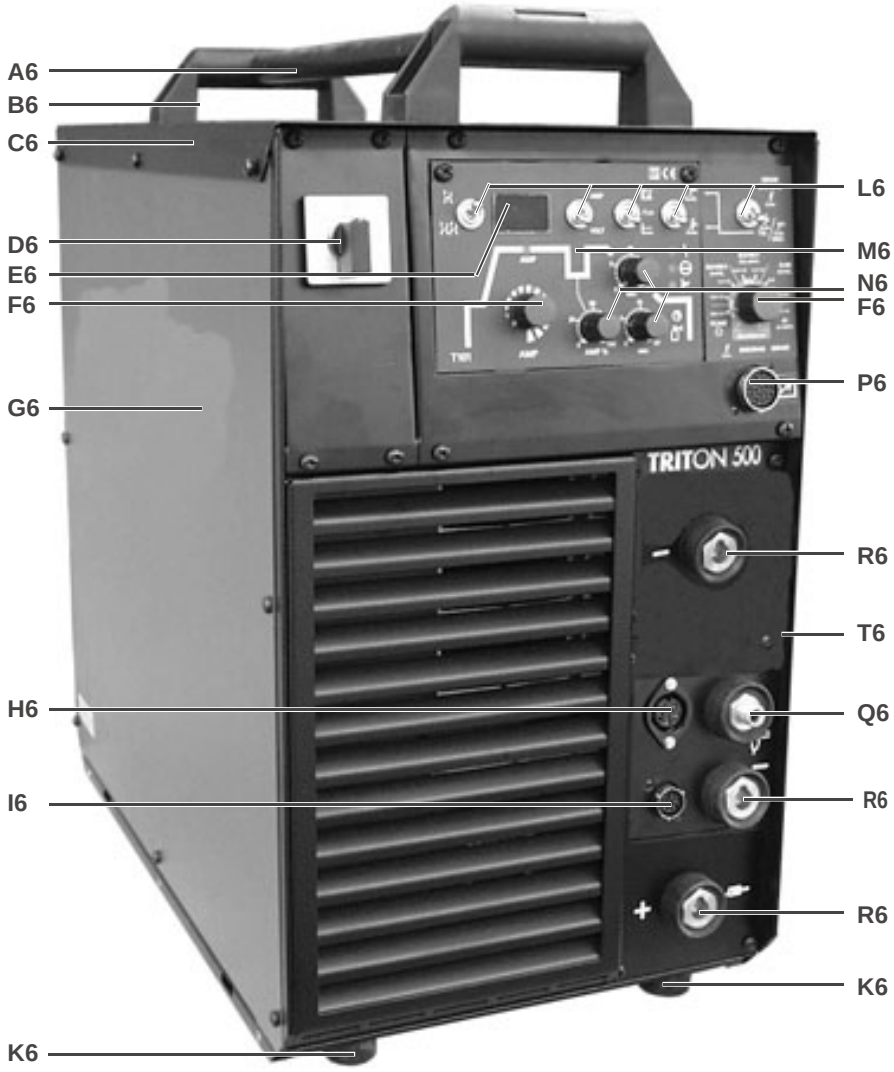


Abb. 8/6 TRITON 400/500 Vorderseite;
Fig. 8/6 TRITON 400/500 front view

8 Ersatzteilliste / spare part list

Pos	Bezeichnung	Description	Art. Nr. / art. no.
A6	Griffstange	Hand Grip	094-007501-00001
B6	Halterung für Griffstange	Hand Grip Mount	094-007383-00003
C6	Gehäusedeckel	Casing Panel	094-006540-00005
D6	Steuerschalter	Control Switch	094-000525-00000
D6	Schaltergriff	Switch Knob	094-001814-00000
E6	PCB Verbindung	PCB Connection	040-000449-00000
F6	Pfeilscheibe	Arrow Indicator	074-000235-00002
F6	Drehknopfdeckel	Knob Cover	074-000235-00001
F6	Drehknopf	Knob	074-000235-00000
G6	Gehäuse Seitenblech links	Casing side panel	094-007740-00004
H6	Flanschdose	Flange Socket	074-000233-00000
I6	Flanschdose	Flange Socket	094-006904-00000
K6	Gummifüsse	Rubber Foot	074-000223-00000
L6	Kippschalter	Toggle Switch	044-001939-00000
M6	T101 Komplett	T101 Complete	040-000590-00000
N6	Pfeilscheibe	Arrow Indicator	094-000131-00002
N6	Drehknopf	Knob	094-000131-00000
N6	Drehknopfdeckel	Knob Cover	094-000131-00001
P6	Kabelkonfektion	Cable Packaging	094-007651-00000
Q6	Mutter M20X1,5	Nut M20X1,5	094-000068-00000
Q6	Fächerscheibe	Fan-Type Lock Washer	094-006516-00000
Q6	Anschlussnippel	Connection Nipple	094-002695-00001
Q6	Druckscheibe	Pressure Washer	094-000076-00000
Q6	Isolierstück	Insulation Piece	094-000075-00000
R6	Schweissbuchse	Welding Socket	074-000517-00000
S6	Schlauchtülle	Tube Bridge	094-000523-00004
S6	Dichtring Kupfer	Conical Nipple Cupfer	094-000527-00000
S6	Schnellkupplung Blau	Rapid-Action Coupling Blue	094-000521-00000
T6	Gehäuse Seitenblech rechts	Casing side panel	094-007744-00004

8 Ersatzteilliste / spare part list

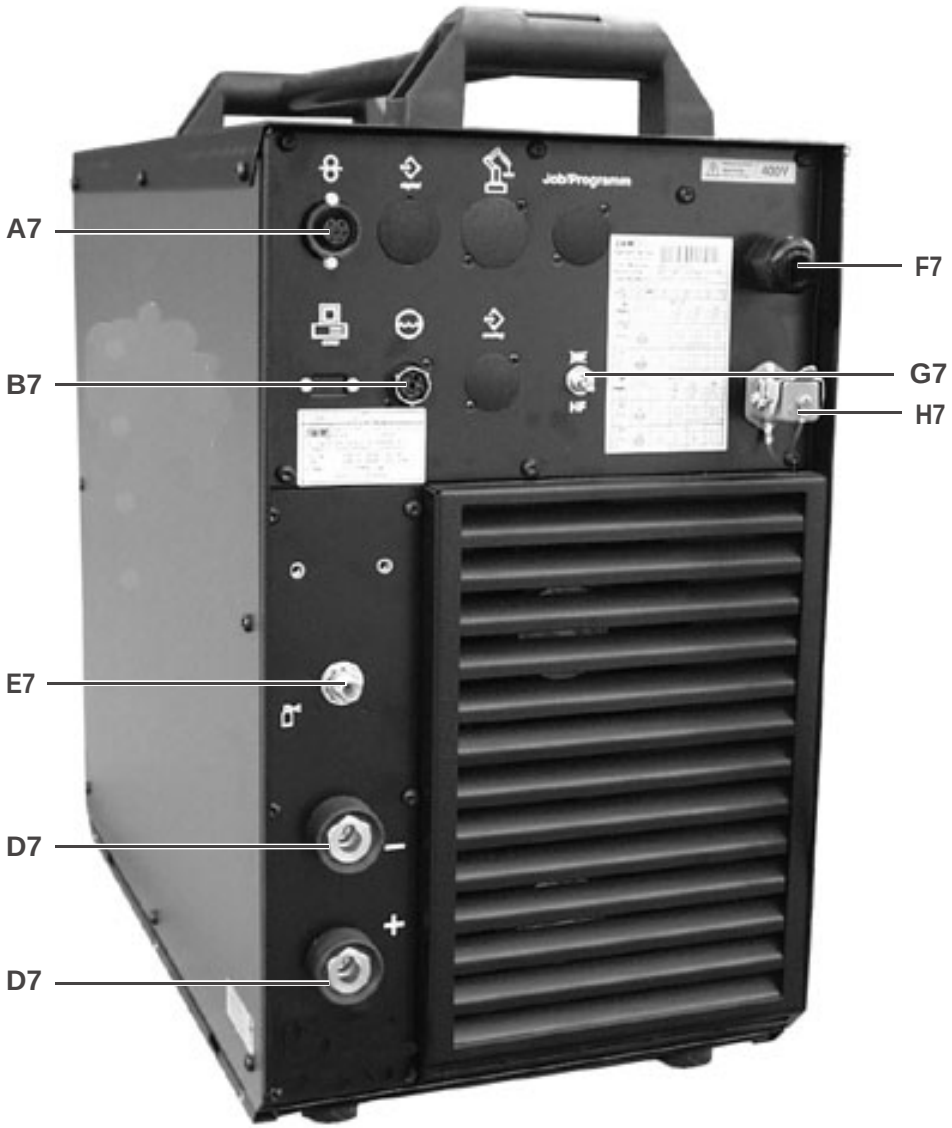


Abb. 8/7 TRITON 400/500 Rückseite;
Fig. 8/7 TRITON 400/500 rear view

Pos	Bezeichnung	Description	Art. Nr. / art. no.
A7	PCB Verbindung	PCB Connection	040-000588-00000
B7	Flanschdose	Flange Socket	094-006904-00000
D7	Schweissbuchse	Welding Socket	074-000517-00000
E7	Schlauchtülle	Tube Bridge	094-000523-00004
E7	Schnellkupplung Rot	Rapid-Action Coupling Red	094-000520-00000
E7	Dichtring Kupfer	Conical Nipple Cupfer	094-000527-00000
F7	Kabelverschraubung	Cable Bushing	094-000208-00000
F7	Netzkabel	Mains Cable	092-000660-00000
G7	Kippschalter	Toggle Switch	044-001939-00000
H7	Abdeckkappe	Cap	094-006862-00000
H7	Anbaugehause	Extension Housing	094-006861-00000
H7	Buchseneinsatz	Socket Insert	094-006859-00000

8 Ersatzteilliste / spare part list

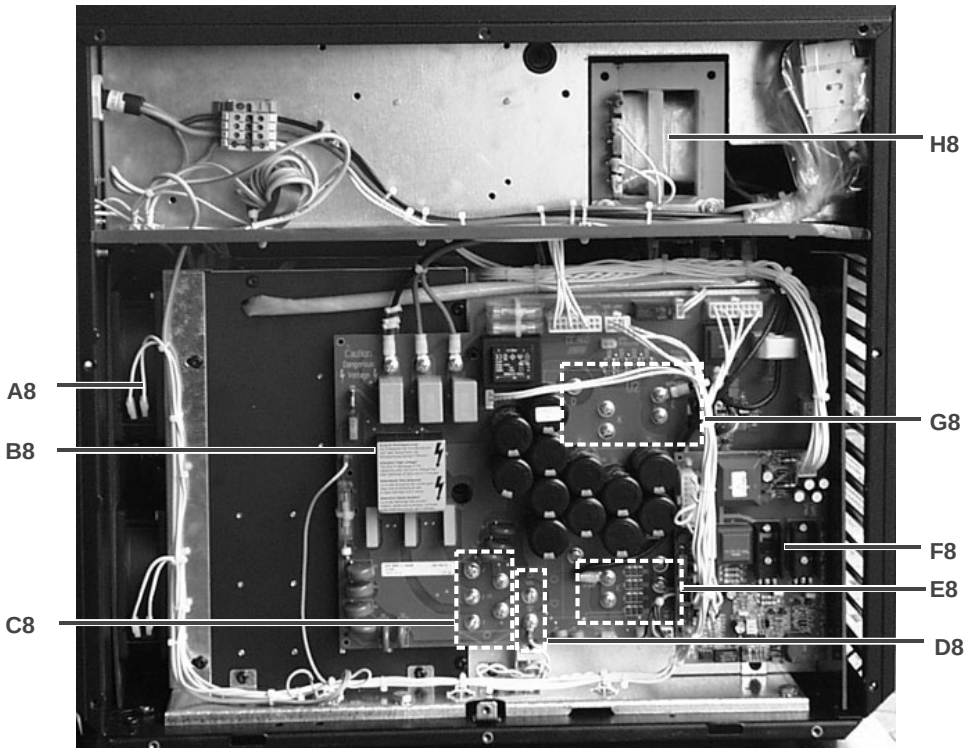


Abb. 8/8 TRITON 400 linke Seite;
Fig. 8/8 TRITON 400 left side

Pos	Bezeichnung	Description	Art. Nr. / art. no.
A8	Lüfter	Fan	074-000015-00000
B8	PCB Schweisselektronik	PCB Welding Electronics	040-000616-00000
C8	Eingangsbrücke	Input Bridge	064-000844-00016
D8	Thyristor-Modul	Thyristor-Module	064-000083-00014
E8	Primärschalter Minus (2X)	Primary Switch Minus (2X)	080-000301-00000
F8	PCB Sperrwandler	PCB Blocking Converter	040-000556-00000
G8	Primärschalter Plus (2X)	Primary Switch Plus (2X)	080-000302-00000
H8	Steuertransformator	Control Transformer	094-006803-00004

8 Ersatzteilliste / spare part list

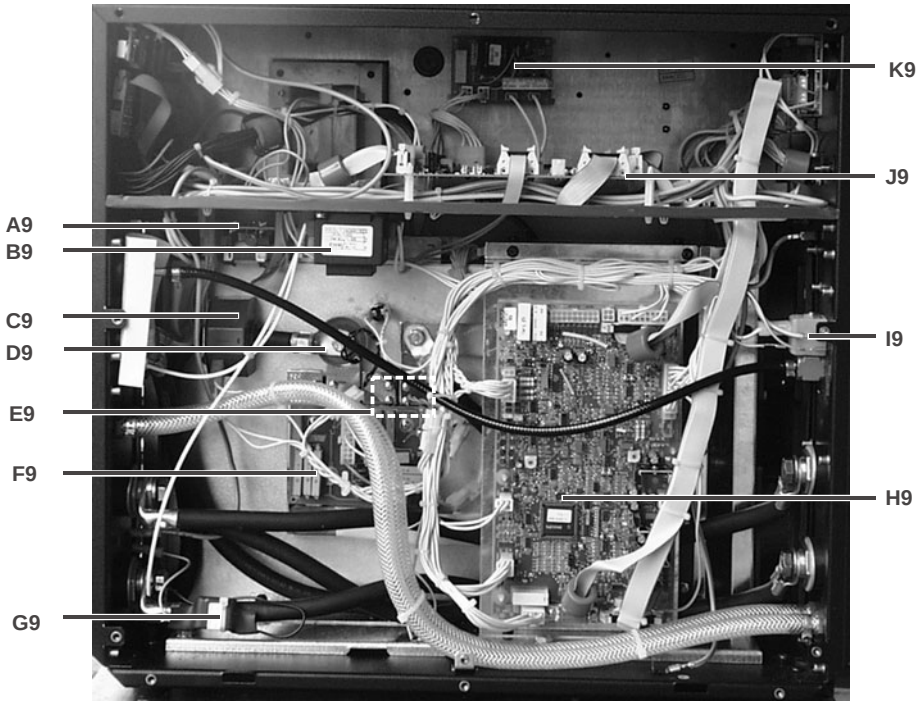


Abb. 8/9 TRITON 400 rechte Seite;
Fig. 8/9 TRITON 400 right side

Pos	**Bezeichnung**	Description	**Art. Nr. / art. no.**
A9	PCB Brenner Taster Filter	PCB Torch Trigger Filter	040-000545-00000
B9	HF-Coil	HF-Coil	040-000586-00000
C9	Sättigungswandler	Saturation Transformer	072-000537-00000
D9	Baugruppe Sättigungswandler	Componentry Saturation Transf.	072-000476-00000
E9	Sekundärdioden 4X	Secondary Diodes 4X	044-002601-00000
F9	PCB Sekundär Beschaltung	PCB Secondary Wiring	040-000617-00000
G9	Kondensator	Capacitor	092-000500-00005
H9	PCB Steuerelektronik	PCB Control Electronics	040-000581-00000
I9	Magnetventil	Solenoid Valve	094-000472-00001
J9	PCB Schweisselektronik	PCB Welding Electronics	040-000539-00001
K9	Zündgerät	Ignition Unit	040-000546-00001

8 Ersatzteilliste / spare part list

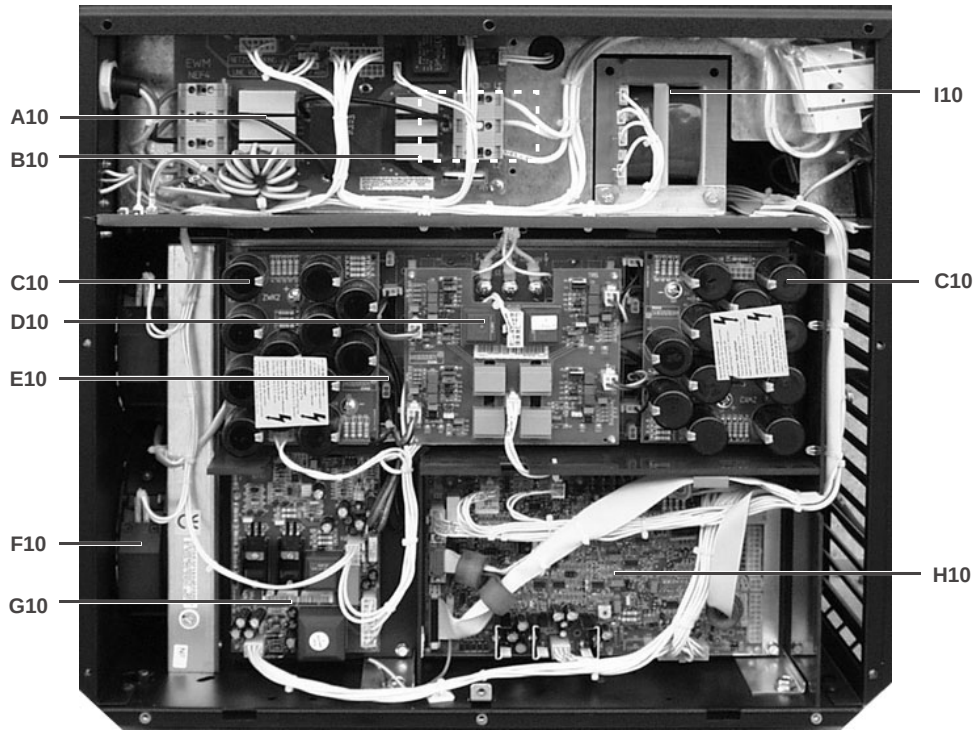


Abb. 8/10 TRITON 500 linke Seite;
Fig. 8/10 TRITON 500 left side

Pos	Bezeichnung	Description	Art. Nr. / art. no.
A10	PCB Zwischenkreis	PCB Intermediate Circuit	040-000561-00000
B10	PCB Schutzbeschaltung	PCB Protective Wiring	042-000705-00000
C10	PCB Zwischenkreis	PCB Intermediate Circuit	040-000560-00000
D10	PCB Treiberelektronik 4-Fach	PCB Driver Electr.	040-000547-00000
E10	Thyristor-Modul	Thyristor-Module	064-000083-00014
E10	Primärschalter Plus (2X)	Primary Switch Plus (2X)	080-000302-00000
E10	Primärschalter Minus (2X)	Primary Switch Minus (2X)	080-000301-00000
E10	Eingangsbrücke	Input Bridge	064-000844-00016
E10	PCB Verdrahtungsplatine	PCB	040-000559-00000
F10	Lüfter	Fan	074-000267-00000
F10	Lüfter	Fan	074-000015-00000
G10	PCB Sperrwandler	PCB Blocking Converter	040-000556-00000
H10	PCB Steuerelektronik	PCB Control Electronics	040-000581-00000
I10	Steuertransformator	Control Transformer	094-006803-00003

8 Ersatzteilliste / spare part list

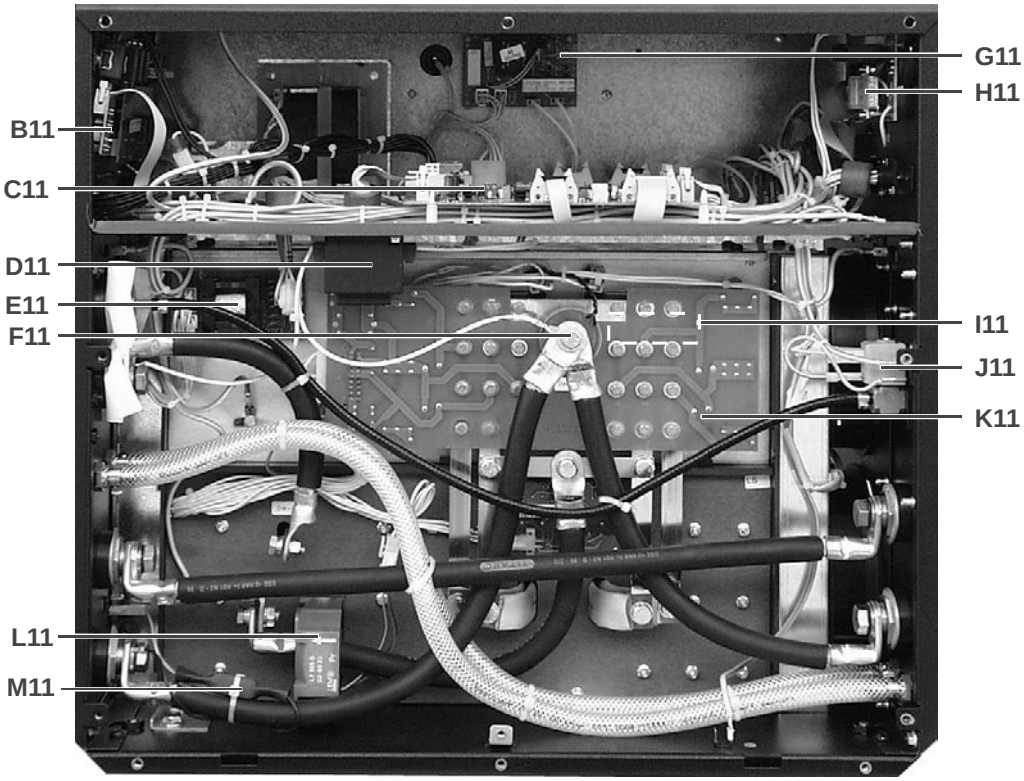


Abb. 8/11 TRITON 500 rechte Seite;
Fig. 8/11 TRITON 500 right side

Pos	Bezeichnung	Description	Art. Nr. / art. no.
B11	PCB Potiplatine	PCB Poti	042-000498-00000
C11	PCB Brenner Taster Filter	PCB Torch Trigger Filter	040-000545-00000
D11	HF-Coil	HF-Coil	040-000586-00000
E11	PCB Brenner Taster Filter	PCB Torch Trigger Filter	040-000545-00000
F11	Baugruppe Sättigungswandler	Componentry Saturation Transf.	072-000476-00000
G11	Zündgerät	Ignition Unit	040-000546-00001
H11	PCB Verbindungsplatine	PCB connection	040-000588-00001
I11	Sekundärdioden (8X)	Isodul Diode (8X)	064-000840-00004
J11	Magnetventil	Solenoid Valve	094-000472-00001
K11	PCB Schutzbeschaltung	PCB Protective Wiring	040-000558-00000
L11	Wandler	Converter	074-002894-00000
M11	Kondensator	Capacitor	092-000500-00005

9 Accessories, options

9.1 TRITON 260

9.1.1 Standard TIG torch

Designation / description	Article No.
WIG torch 26 GD, 4m, two triggers	094-000538-00000
WIG torch 20 WD, 4m, two triggers	094-000487-00000

9.1.2 TIG Up/Down torch

Designation / description	Article No.
WIG torch SRT26 Up-Down GD, 4m	094-007549-00000
WIG torch SRT20 Up-Down WD, 4m	094-007535-00000

9.1.3 Electrode holder /workpiece lead

Designation / description	Article No.
Electrode holder 35mm^2, 4m	092-000052-00000
Workpiece lead 35mm^2, 4m, pole binder	092-000008-00000

9.1.4 Remote control / connection cable

Designation / description	Article No.
RTF1 foot-operated remote control current On/Off 5m, 19-pole	094-006680-00000
RT1 H remote control current without cable, with holding magnet	090-008097-00000
RT1 H remote control spot/pulse without cable, with holding magnet	090-008098-00000
RT2 H remote control spot/pulse without cable, with holding magnet	090-008099-00000
Remote control connection cable 5m 19-pole	092-001470-00005
Remote control connection cable 10m 19-pole	092-001470-00010
Remote control connection cable 20m 19-pole	092-001470-00020

9.1.5 Miscellaneous accessories

Designation / description	Article No.
16A CEE plug	094-000712-00000
TRW 1 transport vehicle	090-008006-00000
Trolley 30-2 building site transport vehicle	090-008092-00000
Trolley 50-2 workshop transport vehicle	090-008103-00000
Cool 30 U20 air-cooling unit	090-008091-00102
DM2 Messer pressure reducer flowmeter 16l/min	094-001980-00000
ADAP1 thread adapter G1/4 to G1/8	094-001650-00000
KF 23E-10 coolant 9.31 (frostpr. -10°C)	094-000530-00000
KF 23E-10 coolant 200l (frostpr. -10°C)	094-000530-00001
KF 37E-20 coolant 9.31 (frostpr. -20°C)	094-006256-00000

9 Accessories, options

9.2 TRITON 400/500

9.2.1 Standard TIG torch

Designation / description	Article No.
WIG torch 18"SC" WD, 4m, two triggers	094-001172-00000

9.2.2 TIG Up/Down torch

Designation / description	Article No.
WIG torch 18"SC" UP-DOWN WD, 4m, two triggers	094-007686-00000

9.2.3 Electrode holder /workpiece lead

9.2.3.1 TRITON 400

Designation / description	Article No.
Electrode holder 70mm^2, 4m	092-000011-00000
Workpiece lead 70 sq.mm, 4m, pole binder	092-000013-00000

9.2.3.2 TRITON 500

Designation / description	Article No.
Electrode holder 95mm^2, 4m	092-000010-00000
Workpiece lead 35mm^2, 4m, pole binder	092-000171-00000

9.2.4 Remote control / connection cable

Designation / description	Article No.
RTF1 foot-operated remote control current On/Off 5m, 19-pole	094-006680-00000
RT1 H remote control current without cable, with holding magnet	090-008097-00000
RT1 H remote control spot/pulse without cable, with holding magnet	090-008098-00000
RT2 H remote control spot/pulse without cable, with holding magnet	090-008099-00000
Remote control connection cable 5m 19-pole	092-001470-00005
Remote control connection cable 10m 19-pole	092-001470-00010
Remote control connection cable 20m 19-pole	092-001470-00020

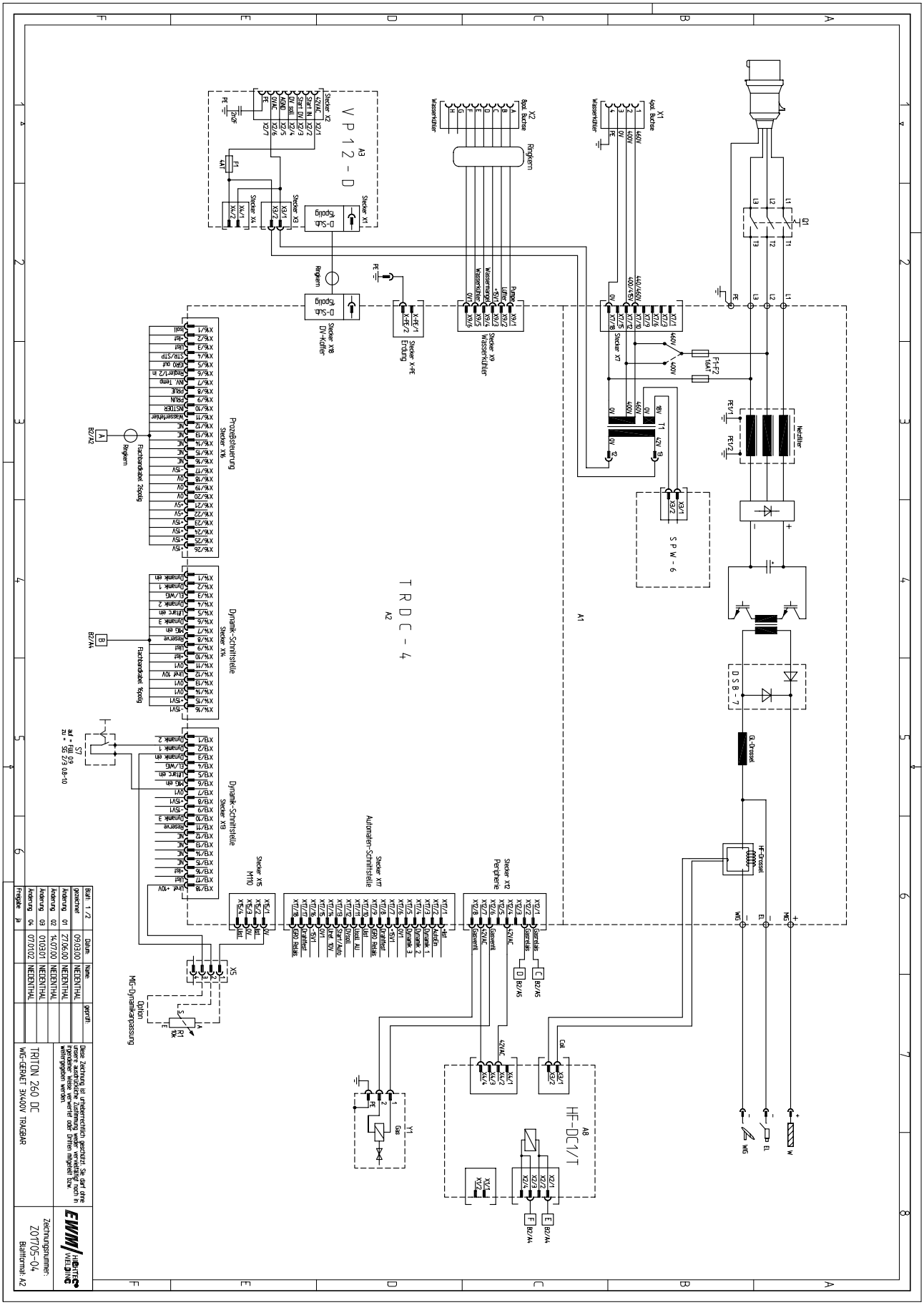
9.2.5 Miscellaneous accessories

Designation / description	Article No.
Hose connection set, needed for connecting the cooling unit to the welding machine	092-001519-00000
Opt. T-piece set for simultaneous connection of TIG and MIG/MAG torches in a parallel circuit	090-008152-00000
32A CEE plug	094-000207-00000
Trolley 70-2 workshop transport vehicle	090-008089-00000
COOL 70U40 air-cooling unit	090-008085-00102
COOL 70U41 air-cooling unit	090-008086-00102
DM2 Messer pressure reducer flowmeter 16l/min	094-001980-00000
ADAP1 thread adapter G1/4 to G1/8	094-001650-00000
KF 23E-10 coolant 9.31 (frostpr. -10°C)	094-000530-00000
KF 23E-10 coolant 200l (frostpr. -10°C)	094-000530-00001
KF 37E-20 coolant 9.31 (frostpr. -20°C)	094-006256-00000

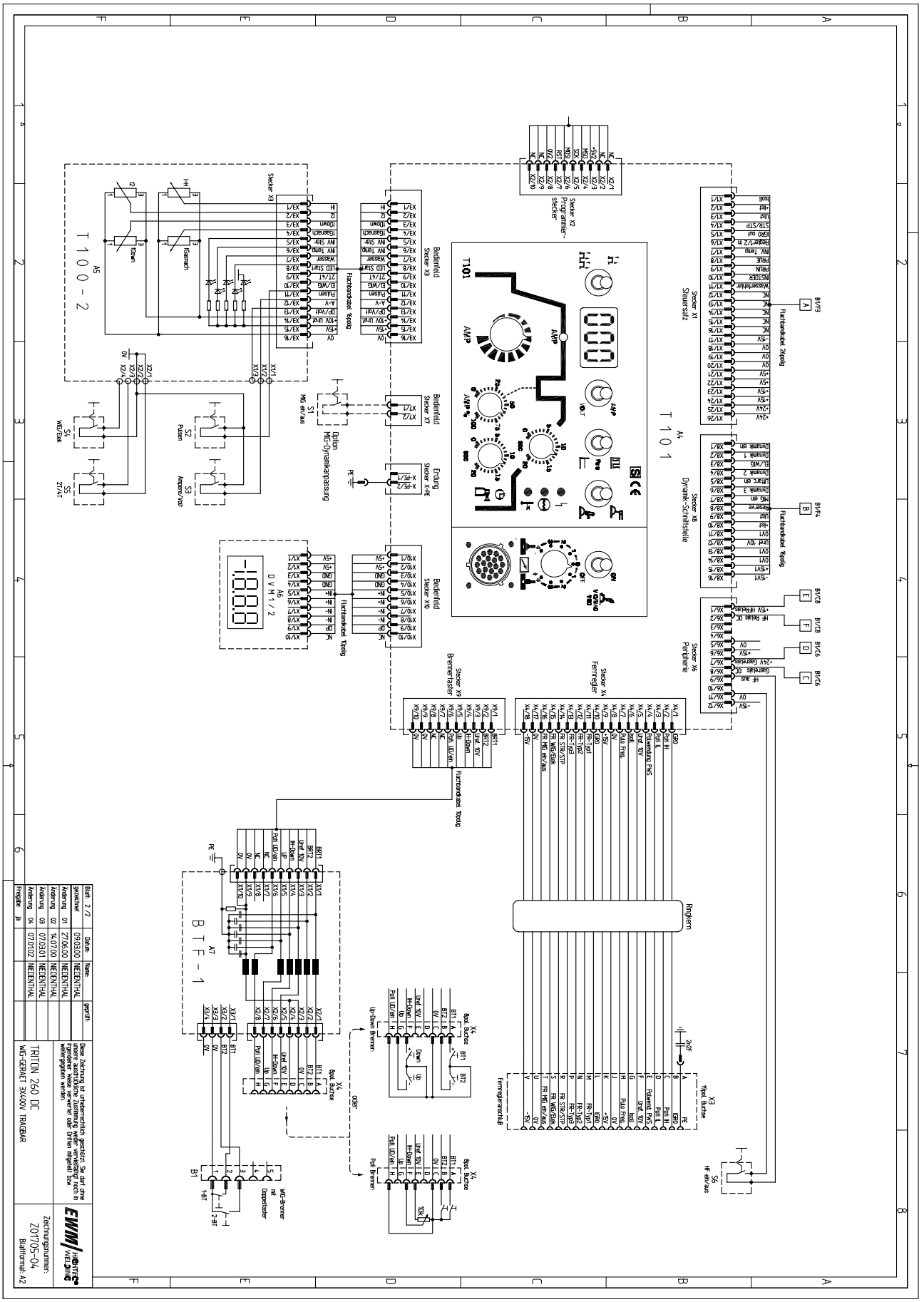
10 Circuit diagram

10.1 TRITON 260

(Circuit diagrams are also in the machine)



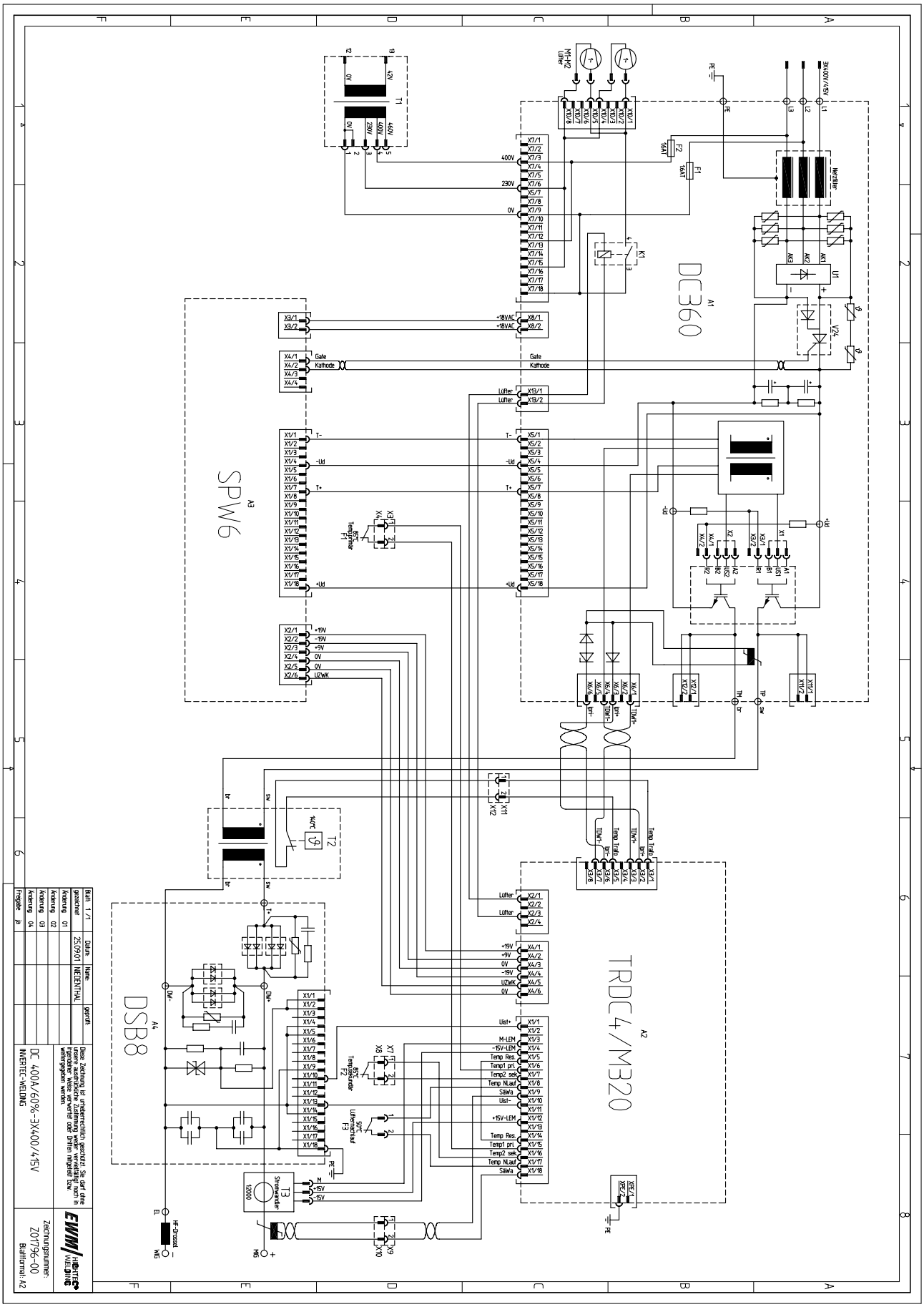
10 Circuit diagram



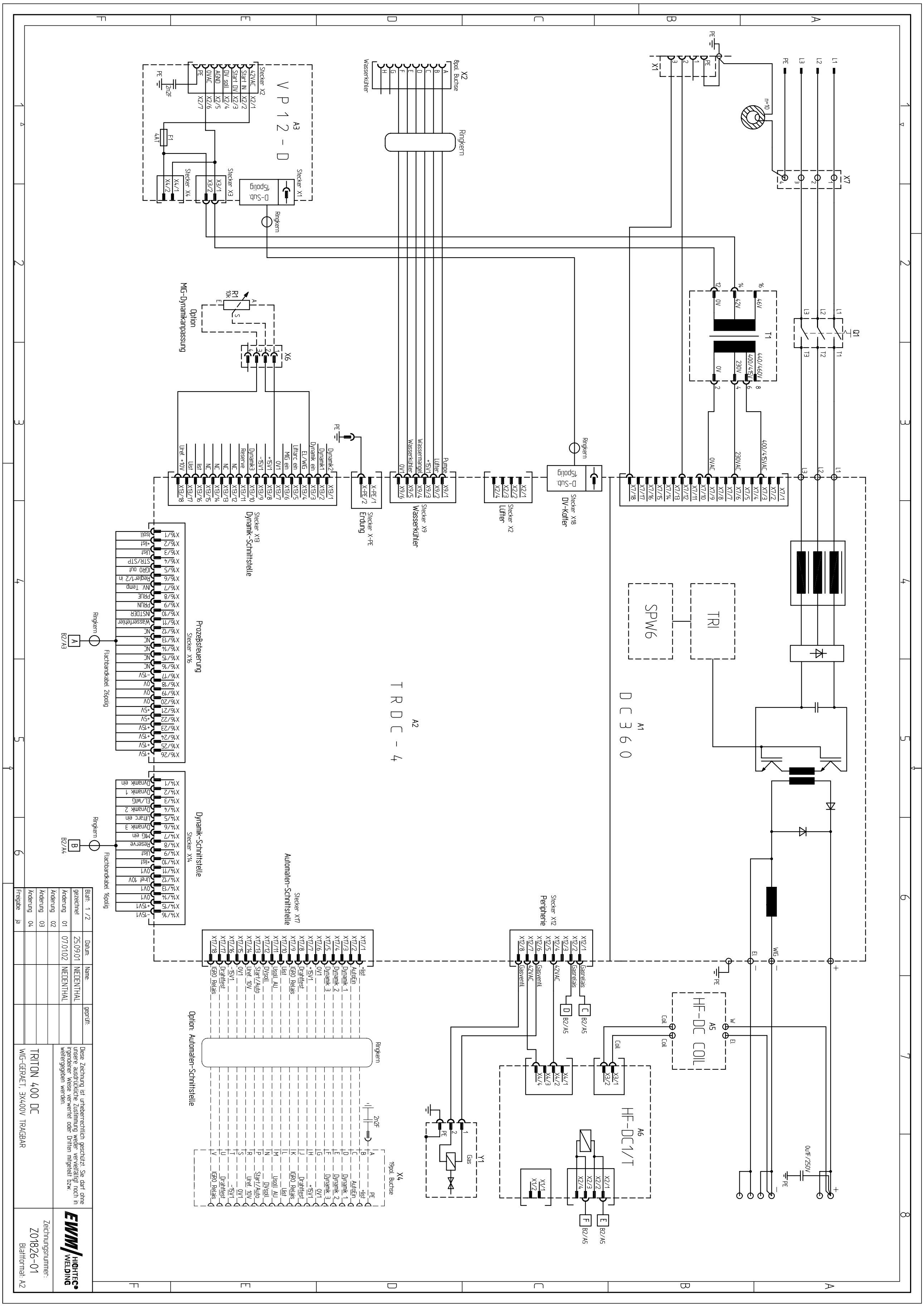
10 Circuit diagram

10.2 TRITON 360/500

(Circuit diagrams are also in the machine)



10 Circuit diagram



10 Circuit diagram