



TECHNICAL SERVICE MANUAL FOR MASTERTIG ACDC MACHINES

TECHNICAL SERVICE MANUAL FOR MASTERTIG ACDC

INTRODUCTION / GENERAL MAINTENANCE OF MASTERTIG ACDC

Maintenance of the Mastertig ACDC machine would normally involve a general check of the electrical connections of the machine, cleaning of the unit's interior with soft brush and vacuum cleaner and a physical check of parts such as switches, connectors, potentiometers and fuses.

NOTE! If you use compressed air for cleaning, there is a risk that dirt may be driven into pcb connectors and other components.

Maintenance of the power source and tig torch will normally consist; checking of electric connections, general cleaning and change of consumable parts like: gas nozzle, torch body, electrode and electrode shield, tightening bush and housing for tighten bush and all isolating of torch body. Check also that flow of the shielding gas is free and even. Due to high temperature the welding end of TIG torch requires maintenance most. Check also the condition of the welding and connection cables daily! Check also mains connection cables! Do not use damaged cables!

The number of systems in operation and the importance of minimize not running time will determine to what extend consumable- and spare parts will be stocked. The amount of use and an unusual working enviroment have a special effect on the need of maintenance.



WARNING !

DISCONNECT THE POWER SOURCE FROM MAINS SUPPLY VOLTAGE BEFORE REMOVING SIDE PANELS. DANGEROUS DC VOLTAGE STILL EXISTS EVEN AFTER REMOVAL OF MAINS SUPPLY. WAIT AT LEAST TWO MINUTES (RECOMMENDED DISCHARGE TIME FOR CAPACITORS) BEFORE REMOVING THE CASING PLATES.

Troubleshooting

Start troubleshooting by looking for signs of over heating, fractures and damage to internal components and power semiconductors. Visual inspection before troubleshooting may help to isolate the defective circuit.

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TROUBLESHOOTING CHART

PROBLEM	CAUSE	REMEDY
<p>The MASTERTIG ACDC won't start at all. Internal water cooler not operational</p> <p>The signal lamps of machine are not switched on and LEDs are not on in the function panel.</p>	<p>Blown fuse(s) in mains supply line *).</p> <p>Faulty main supply cable.</p> <p>Faulty main switch S001.</p> <p>Malfunctioning auxiliary transformer T002 or loose connection.</p> <p>Faulty EMC filter card Z002.</p>	<p>Check all three supply voltage phases so that the fuses are not blown, change if needed.</p> <p>Check/repair faulty main supply cable.</p> <p>Check the main supply voltage before and after main switch, change switch if needed.</p> <p>Check the transformers supply and 0 V lines, change T002 if needed.</p> <p>Check the mains supply line voltage from Z002. Change PCB if need.</p>
<p>When the machine is switched on the cooling fan continuously rotates and the function panel does not work, the LED's are not on.</p> <p>Some functions from the panel are not working.</p>	<p>Broken function panel or loose connection between panel and PCB A002.</p>	<p>Check the flat cables and connectors from panel and A002, X1 and X2. Change the function panel if needed.</p> <p>NOTE! IF SOME FUNCTIONS OF PANEL ARE MISSING, OR IT IS NOT WORKING PROPERLY CHANGE THE PANEL MEMBRANE</p>
<p>The machine will not start, and the signal LED in function panel for over/under/wrong supply voltage is switched on.</p> <p>Uin Err message in the main display</p>	<p>The machine is connected to wrong supply voltage.</p>	<p>Unplug the machine from the mains supply and select the correct voltage from the voltage change-over switch which is located under the function panel.</p>
<p>Short breaks in the welding arc and over/under/wrong supply voltage LED is on during these breaks</p>	<p>Overvoltage in mains supply line.</p>	<p>Check the mains supply line. The approx. voltage limits are mentioned in TABLE 4.</p>
<p>*) Main supply line fuse(s) burned.</p>	<p>Faulty main supply cable.</p> <p>Short circuit in primary part of the machine.</p> <p>Short circuit in secondary part of the machine.</p>	<p>Check/repair faulty main supply cable.</p> <p>Check/change the main switch, primary rectifier, primary IGBT unit and inverse parallel diode.</p> <p>Check/change the secondary rectifier unit (diode blocks) and secondary IGBT unit. See also TROUBLESHOOTING FOR POWER SEMICONDUCTORS.</p>
<p>Err 1 message in the main display.</p>	<p>Secondary voltage of machine has been over 90 volts more than 4 seconds.</p>	<p>IGBT V47, which is located in control card A003 PICTURE 1., is faulty. Check and change the pcb or IGBT.</p>

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PROBLEM	CAUSE	REMEDY
<p>The cooling unit is not operational or H001 light is on.</p> <p>The water doesn't circulate by switch SW302.</p> <p>Water doesn't return back to the tank.</p>	<p>Blown fuse F002 2A.</p> <p>Broken or faulty auxiliary-transformer T005.</p> <p>Broken pressure switch S002.</p> <p>Pressure switch set value is unsuitable for the TIG torch which is in use (other than original Kemppi torch).</p> <p>Air bubbles in the system.</p> <p>Leakages in the cooling system.</p> <p>Pump motor 5μ starting capacitor C004 is faulty.</p> <p>Broken or faulty PCB A005 .</p>	<p>Check and change the fuse if needed.</p> <p>Check first the supply voltage of transformer from Z004, connector 1=230V, 2=400, and 3=460V. Then check the secondary voltage of transformer, check it from terminal block XW301 between 4 and 5 the voltage is c. 230 VAC.</p> <p>Check the voltage over the pressure switch or from PCB A005 X2/1 and X2/8; enough pressure 0V and lack of pressure c. 5V.</p> <p>Adjust the pressure set value from the adjustment screw, of pressure switch according following instructions:</p> <p>I START PRESSING TEST SWITCH SW302 AND ADJUST THE ADJUSTMENT SCREW (SEE PICTURE 3.) FOR PRESSURE, IN SUCH WAY THAT THE SIGNAL LAMP H001 IS ONLY JUST SWITCHED OFF.</p> <p>II RELEASE SWITCH SW302 AND WAIT FOR APPR. 10 S AND CHECK THAT SIGNAL LAMP H001 IS NOT FLASHING.</p> <p>III STILL CHECK BY WELDING FOR APPROX. 20 S THAT THERE ARE NO MORE DISTURBANCES.</p> <p>Blow compressed air into tank, closing the filling hole by hands is enough.</p> <p>Check/repair the connection of cooling system connector by connector. Repair the system if needed.</p> <p>Check and change the capacitor if needed.</p> <p>Change/repair PCB A005.</p>
<p>The solenoid valve Y001 is not operating // stuck open</p>	<p>Faulty solenoid valve Y001 or broken PCB A002.</p>	<p>Check the 24 VDC from A002 connector X9 between pins 1 and 2. If it is ok, change the solenoid valve.</p>

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TROUBLESHOOTING CHART

PROBLEM	CAUSE	REMEDY
Remote control unit is not operating properly.	Defective remote control unit, faulty control cable or faulty control card A003 in Mastertig ACDC. Faulty function panel. Selection for remote unit type is not correct. Fuse F001, 0.8A, blown.	Check and repair the remote control unit and cable according to TABLE 3 . Change PCB A003 in Mastertig ACDC. Check the function panel, see TABLE 1 , that the switching for selection for local/remote is working. Change the panel membrane if needed. See the paragraph SELECTION OF REMOTE CONTROL UNIT . Check and change the fuse if necessary.
Machine is overheating. Signal lamp for thermal protection is on even if the duty-cycle time has not been exceeded.	Faulty cooling fan(s) or PCB A002. Loose connector.	Check the 24 VDC voltage from fan connectors: X9 between pins 3 and 4, another between 6 and 7, if it is all right change the fan(s), if it is not change the PCB.
There are occasional disturbances during welding, set value is not stable or arc is intermittent. Arc is stopping intermittently.	Remote control unit is faulty Faulty start switch in TIG torch. Broken/faulty TIG torch, loose start wire(s) in TIG torch. Faulty Reed relay, K001.	Check/repair the control cable and remote control unit according to TABLE 3 . Check and change the start switch if needed. See also TABLE 2 . Check and tighten the start wire(s) inside the TIG torch. Check it by opening the connector X009, change reed relay if needed.
Welding quality is bad in all methods: <ul style="list-style-type: none">• arc is not stable• bad arc start• not enough arc voltage• lack of power	One mains phase is missing or mains cable is cut or loose. Faulty main switch, S001, or primary rectifier, VG101/G001. Faulty capacitor C003. Blown diode(s) in the secondary rectifier G002, G003 or G004. Gas is missing or gas leakage in the TIG torch. Broken/untightened earth cable or earth clamp.	Check all mains phases from terminal block X001. Change mains fuse if needed, tighten mains cables. Check using multimeter that S001 is all right, check also that all diodes in primary rectifier are functional. Check/change capacitor C003. Check and change diode blocks according to APPENDIX 1 . Check gas flow and solenoid valve as described earlier. Repair/change TIG torch if needed. Check and change the earth clamp and the cable if necessary.

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TROUBLESHOOTING CHART

PROBLEM	CAUSE	REMEDY
Porosity in the weld joint.	Shield gas flow is not correct, leakage in the gas hose or faulty solenoid valve.	Check the gas flow; adjust correct flow according welding parameters or repair faulty component in gas flow system.
No HF ignition	Faulty control card A004. Broken HF-transformer T003.	During HF ignition the voltage from connector X1/1 and X1/3 should be about 1kV. You can also check the control signal of microprocessor from connector X2/2 which is located between panel and PCB A002. If the voltage from PCB is all right change the HF-transformer T003.
Welding characteristics are bad when welding method is AC TIG .	Additional pulse to ignite the positive half cycle is missing.	Check the function of control card A003. The pulse circuit driving component is small IGBT V47. Check and change the IGBT if needed.
Positive or negative half cycle is missing, or both are missing. Machine is creating high pitched or rattling sound.	Faulty control card A002 or A003. Faulty IGBT in primary or secondary inverter. Faulty gate IGBT connection in control card A002 or A003.	Check that control of selecting welding method is working from the PCB A003, see PICTURE 1 . Check according following text; Primary inverter is VG 101. When the current goes through VG201 the method is DC+. If the current goes through VG202 the method is DC-. When the current goes through both of them the method is AC. See also PICTURE 4 .
If security code is in use and panel is locked.	Wrong security code.	The locked panel can be unlocked at an authorised KEMPPI service repair shop with a special code . The unlock code is available only in these places.
Maximum positive or negative current adjustment is incorrect.	Wrong/changed adjustment in control card A002.	Maximum positive and negative current can adjust from A002, see also PICTURE 2 .

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TABLE OF JUMPERS, EXTRA FUNCTIONS.

In addition to the standard Master-tig functions there are some extra features which may be called up by using the so called 'electronic jumpers'. These jumpers may be set to tailor the machine to the customer's needs and include the following;

JUMPER NUMBER	FUNCTION ON	FUNCTION OFF
J01 UP SLOPE	UP SLOPE TIME DEPENDS ON SET VALUE OF CURRENT	UP SLOPE TIME IS INDEPENDENT OF SET VALUE OF CURRENT
J02 DOWN SLOPE	DOWN SLOPE TIME DEPENDS ON SET VALUE OF CURRENT	DOWN SLOPE TIME IS INDEPENDENT OF SET VALUE OF CURRENT
J03 TIG ANTIFREEZE	TIG ANTIFREEZE IS ON	TIG ANTIFREEZE IS OFF
J04 AC BALANCE	MANUAL AC BALANCE CONTROL IS IN USE	SMART BALANCE FUNCTION IS IN USE, SCALE OF PANEL IS IN USE
J05 TACK WELDING	TACK WELDING IS AUTOMATIC	DOWN SLOPE FUNCTIONS IMMEDIATELY
J06 DOWN SLOPE CUT OFF LEVEL	DOWN SLOPE CUT OFF LEVEL IS MINIMUM CURRENT	DOWN SLOPE CUT OFF LEVEL IS 20 % OF SET VALUE
J07 OPEN CIRCUIT VOLTAGE	OPEN CIRCUIT VOLTAGE IS 70 V	OPEN CIRCUIT VOLTAGE IS C. 39.5 V
J08 "CHINA LOGIC" TIG WELDING IN 4T	POSSIBILITY TO PRESET STARTING CURRENT, WELDING CURRENT AND END CURRENT	NORMAL 4T FUNCTION
J09 Inverter Frequency	INVERTER FREQUENCY IS 18 KHZ IN THE WHOLE CURRENT RANGE	INVERTER FREQUENCY IS 18 KHZ/ 36 KHZ IN MMA!
J10 2T Hot/ soft start	HOT/ SOFT START IS IN USE WITH TIG 2T LOGIC	
J11 2T Hot/ soft start time setting	HOT/ SOFT START TIME IN 2T LOGIC. ADJUSTMENT RANGE IS 0,0-9,9 SECONDS	
J12 2T Downslope	IN 2T THE DOWNSLOPE DOESN'T END WITH A SHORT OR A LONG PULL, SO THE WELDING CURRENT CAN BE TAKEN UP AND DOWN WITH A SHORT PULL ON THE TRIGGER	IN 2T THE WELDING IS ENDED DURING DOWNSLOPE WITH A SHORT PULL ON THE TRIGGER
J13-15	NOT IN USE	
JO16 POSITIVE START CYCLE OF AC-TIG	ADJUSTMENT FOR LENGTH OF POSITIVE START CYCLE, FACTOR 0.0 2.0	FACTORY SETTING IS 1
JO17 MMA IGNITION PULSE	ADJUSTMENT OF MMA IGNITION PULSE (0,0-2,0)	FACTORY SETTING IS 1

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SELECTION OF REMOTE CONTROL UNIT

1. Turn off the machine.
2. Press the **REMOTE** key and at the same time turn the machine on; the display will show the text **rEn 01**. The machine is now selected to use for hand held remote control units (C 100C, C 100D, or C 100AC).
3. Turn the current adjustment knob so that the display shows **rEn 02**. The machine is now selected to use foot controlled remote unit (C 100F).
4. Press the **REMOTE** key so that the setting is saved in the memory.

CALIBRATION OF THE PANEL

It is possible to calibrate the current meter of the Mastertig ACDC in DC - and DC + at two different points, 10 A and 100A. If you want to calibrate the current setting of the machine you will need a shunt resistor, loading bench and multimeter to monitor real current value.

1. First set machine polarity to DC - and note the meter readings when set value is 10 A and 100 A. Repeat this process for DC + polarities
2. Turn off the machine.
3. Press the **POST GAS** key and at the same time turn the machine on.
4. Press the **BROKEN ARC** key; display will show text **CU1 010**. Now you can feed in, by the current adjustment knob, the real measured value for DC - 10 A.
5. By pressing the **REMOTE** next time display will show text **CU2 100**, you can now feed in the measured DC -100 A value.
6. Repeat same with DC +, **CU3 010** is for DC + 10 A and **CU4 100** is for DC + 100 A.
7. Press the **POST GAS** key so that the calibration setting is saved in the memory.
8. Check the corrected values from the panel display.

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TABLE 1. FUNCTION SIGNALS CONNECTORS X1 AND X2 OF PCB A001

PIN NUMBER	DESCRIPTION
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X1

X1/1	IDENTIFICATION OF THE SIZE OF THE MACHINE
X1/2	SET VALUE FROM THE REMOTE CONTROL UNIT
X1/3	SELECTION OF METHOD FROM THE REMOTE CONTROL UNIT
X1/4	THERMAL PROTECTION(PTC)
X1/5	NOT IN USE
X1/6	CONTROL OF COOLING FANS
X1/7	CONTROL OF MAINS SUPPLY VOLTAGE FROM T002 SECONDARY WINDING
X1/8	NOT IN USE
X1/9	WELDING CURRENT ; POSITIVE HALF-CYCLES OF DC+ OR AC
X1/10	WELDING CURRENT ; NEGATIVE HALF-CYCLES OF DC- OR AC
X1/11	WELDING VOLTAGE ; NEGATIVE HALF-CYCLES OF DC- OR AC
X1/12	WELDING VOLTAGE ; POSITIVE HALF-CYCLES OF DC+ OR AC
X1/13	CONTROL OF MAINS VOLTAGE
X1/14	OVER CURRENT
X1/15	SWITCH OF TIG TORCH
X1/16	ADDITIONAL AC PULSE FOR TIG

X2

X2/1	SOLENOID VALVE
X2/2	CONTROL OF TIG SPARK
X2/3	NOT IN USE
X2/4	PWM POSSIBLE
X2/5	CONTROL OF SECONDARY IGBT
X2/6	CONTROL OF SECONDARY IGBT
X2/7	+16 V
X2/8	+15 V
X2/9	+5 V
X2/10	+5 V
X2/11	GND
X2/12	GND
X2/13	START OF COOLING UNIT
X2/14	STOP OF COOLING UNIT
X2/15	NOT IN USE
X2/16	NOT IN USE

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TABLE 2. CONNECTOR XW101 IN MASTERTIG ACDC

PIN NUMBER	SIGNAL VALUE	DESCRIPTION
A	3.5 VAC start not active 0 V start is active	Torch start switch
B	3.5 VAC start not active 0 V start is active	Torch start switch
C	-	-
D	-	-

TABLE 3. CONNECTOR XW102 IN MASTERTIG ACDC

PIN NUMBER	SIGNAL VALUE	DESCRIPTION
A	-	-
B	30 VAC	Operating voltage for external equipment, fuse 0.8 A
C	30 VAC	Operating voltage for external equipment, fuse 0.8 A
D	-	-
E	+5 VDC	Voltage reference of remote control (upper end of the potentiometers)
F	0 V	GND (lower end of potentiometers)
G	-	-
H	0 - +5 VDC	Set value for power source
I	+2 VDC=TIG +5 VDC=MMA	Selection of characteristic TIG/MMA curve
J	-	-

TABLE 4. OVER AND UNDER VOLTAGE LIMITS, (WHEN OCV)

SUPPLY VOLTAGE	LOWER LIMIT	UPPER LIMIT
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MASTERTIG ACDC 1600

230 VAC	165 VAC	270 VAC
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MASTERTIG ACDC 2500

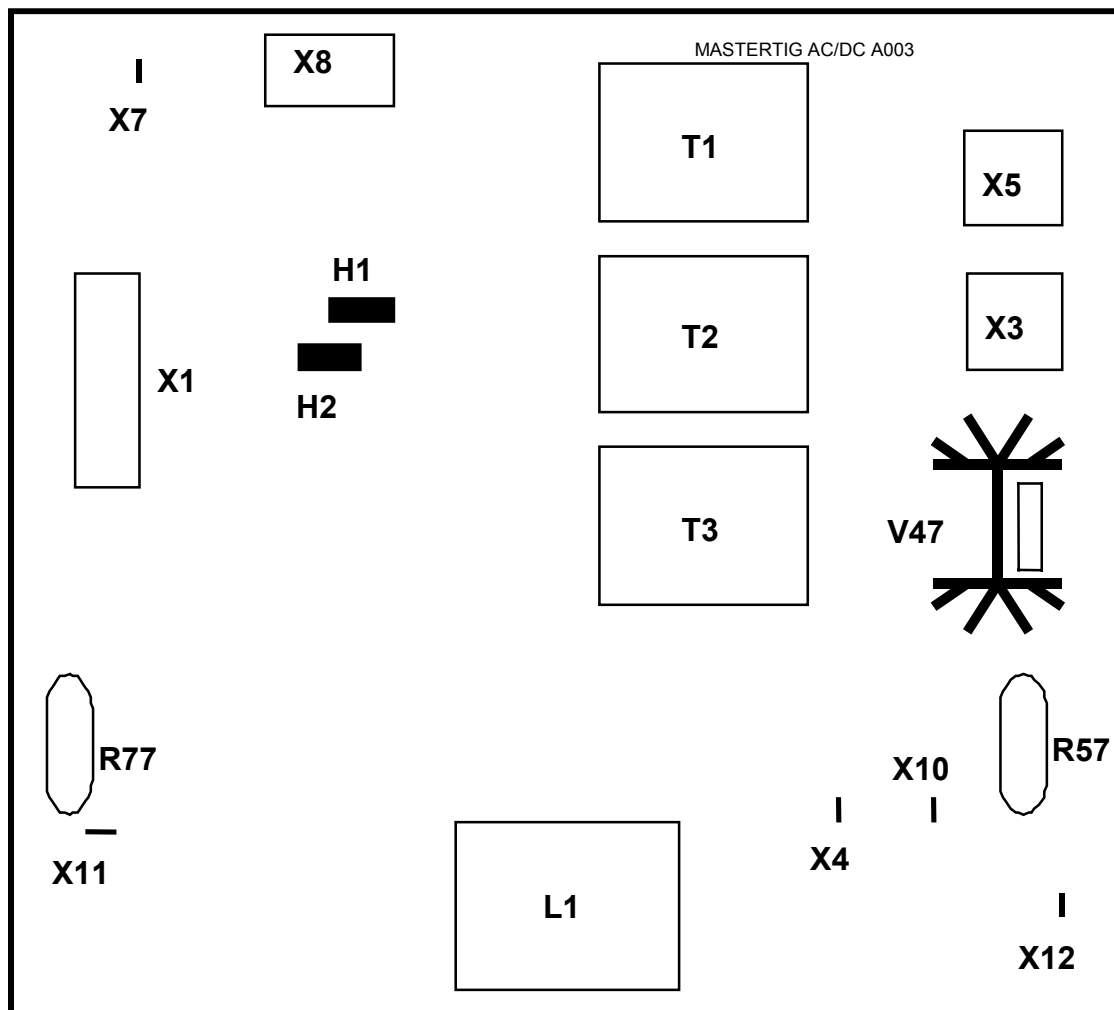
230 VAC	175 VAC	270 VAC
400 VAC	300 VAC	460 VAC
460 VAC	340 VAC	530 VAC

MASTERTIG ACDC 3500

400 VAC	365 VAC	460 VAC
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PICTURE 1. LEDS IN PCB A003



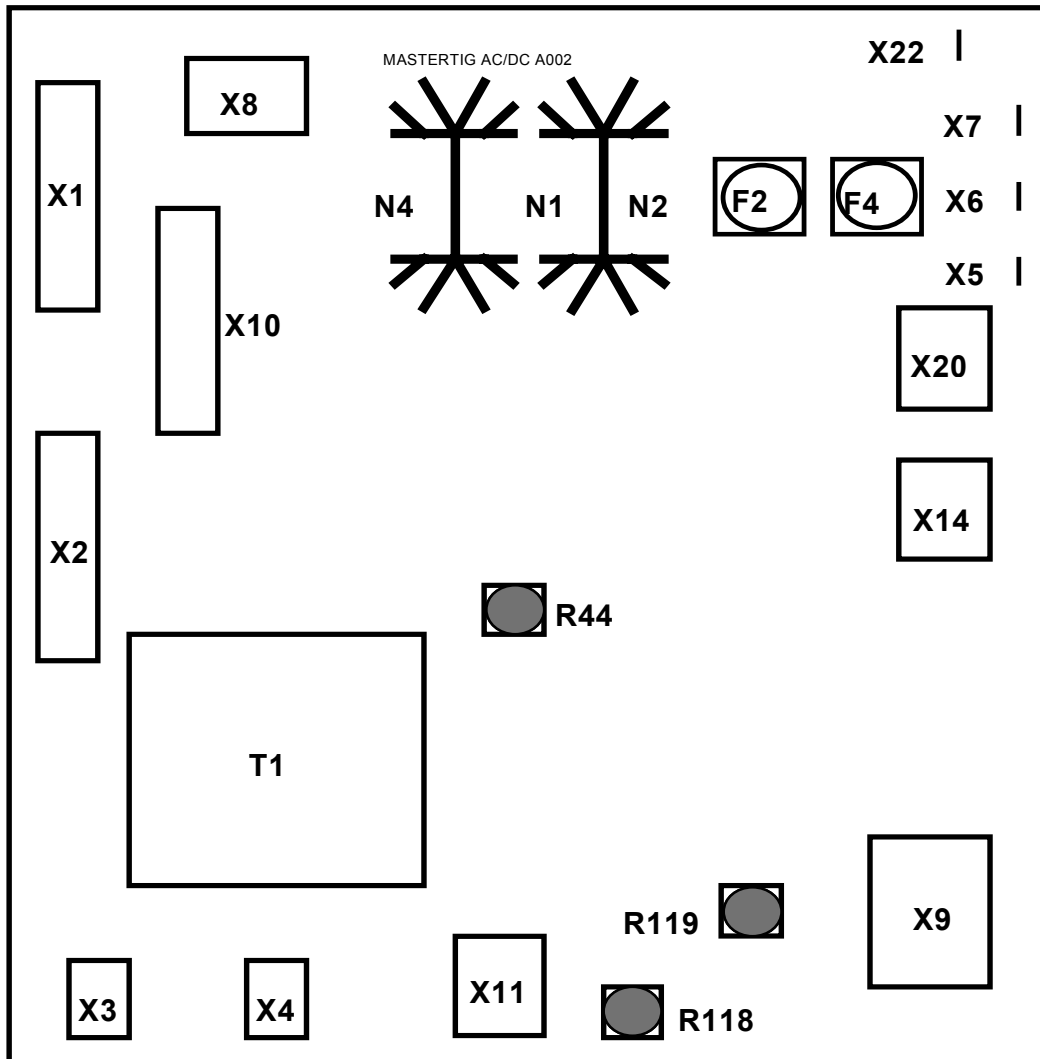
LEDs, are on when machine is generating OCV

H1
H2

H1 IS **ON** WHEN THE MACHINE IS IN **DC-** TIG OR MMA
H2 IS **ON** WHEN THE MACHINE IS IN AC OR **DC +** TIG OR MMA

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PICTURE 2. TRIMMERS IN PCB A002

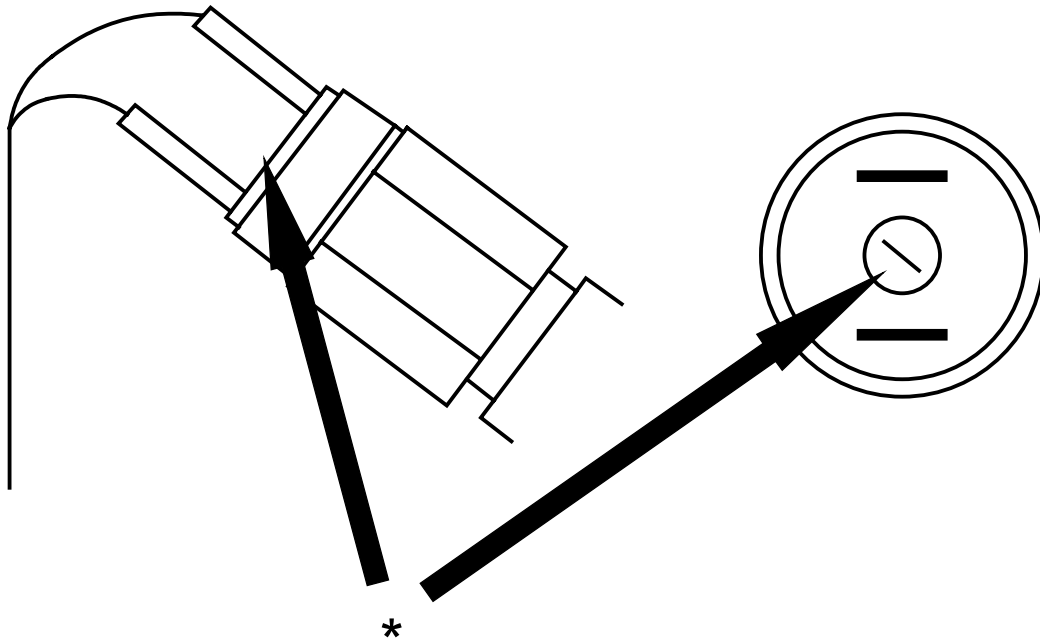


TRIMMERS

- R44 ADJUSTMENT FOR BASIC FREQUENCY
- R118 ADJUSTMENT FOR DC- MAX CURRENT
- R119 ADJUSTMENT FOR DC+ MAX CURRENT

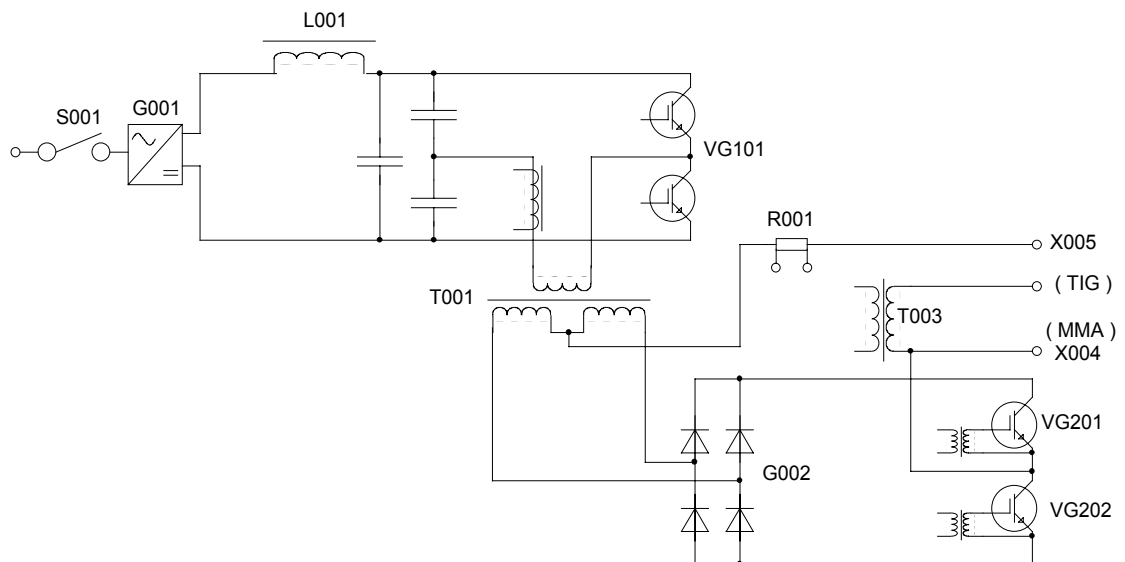
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PICTURE 3. PRESSURE ADJUSTMENT SCREW



* Adjustment screw for adjusting correct set value for pressure

PICTURE 4. MAIN CIRCUIT OF MASTERTIG ACDC



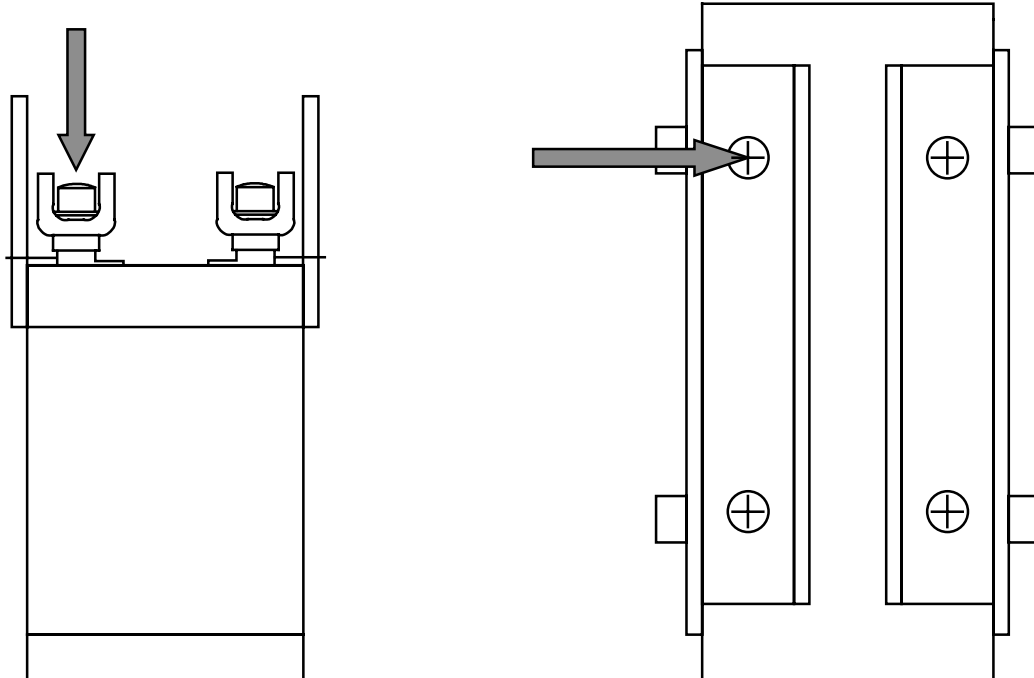
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APPENDIX 1.

CHANGING THE SET OF DIODES IN SECONDARY RECTIFIER OF MASTERTIG ACDC

Rectifier diodes in Mastertig ACDC are plastic case types (2 x 15 A) These are mounted with pressure bars ensuring good thermal transfer to the heat sink. Individual diodes can not be changed because they are specially selected for parallel connection using a forward voltage measurement hence only diodes with the same characteristics can be used. **This means that if one diode is failed the whole set of diodes must be changed!**

The mounting torque for tightening screw of pressure bar is 3.0 Nm. The amount of silicon paste used should not be excessive because electrical contact is made through the mounting surface of components.

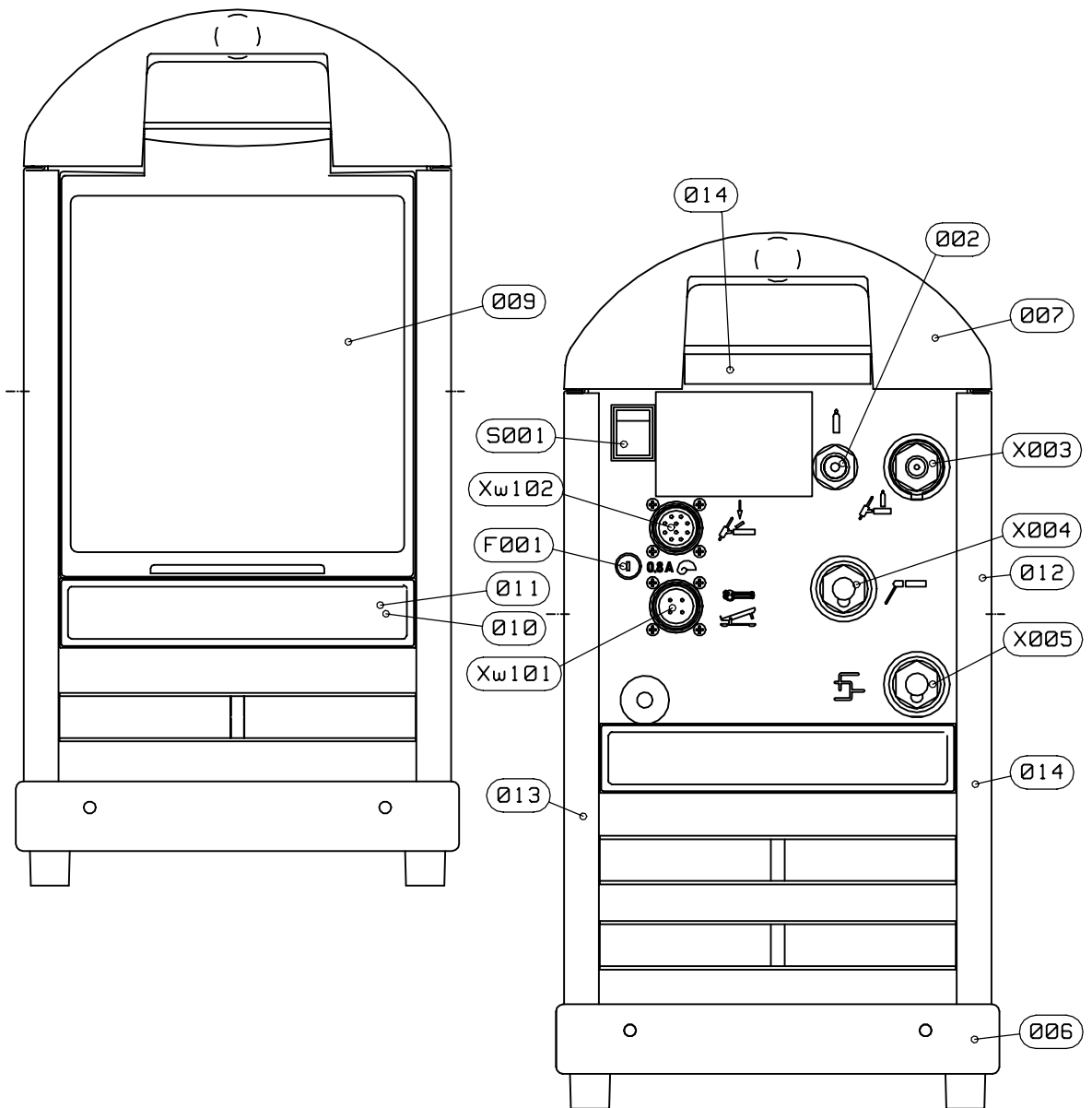


MASTERTIG AC/DC 1600

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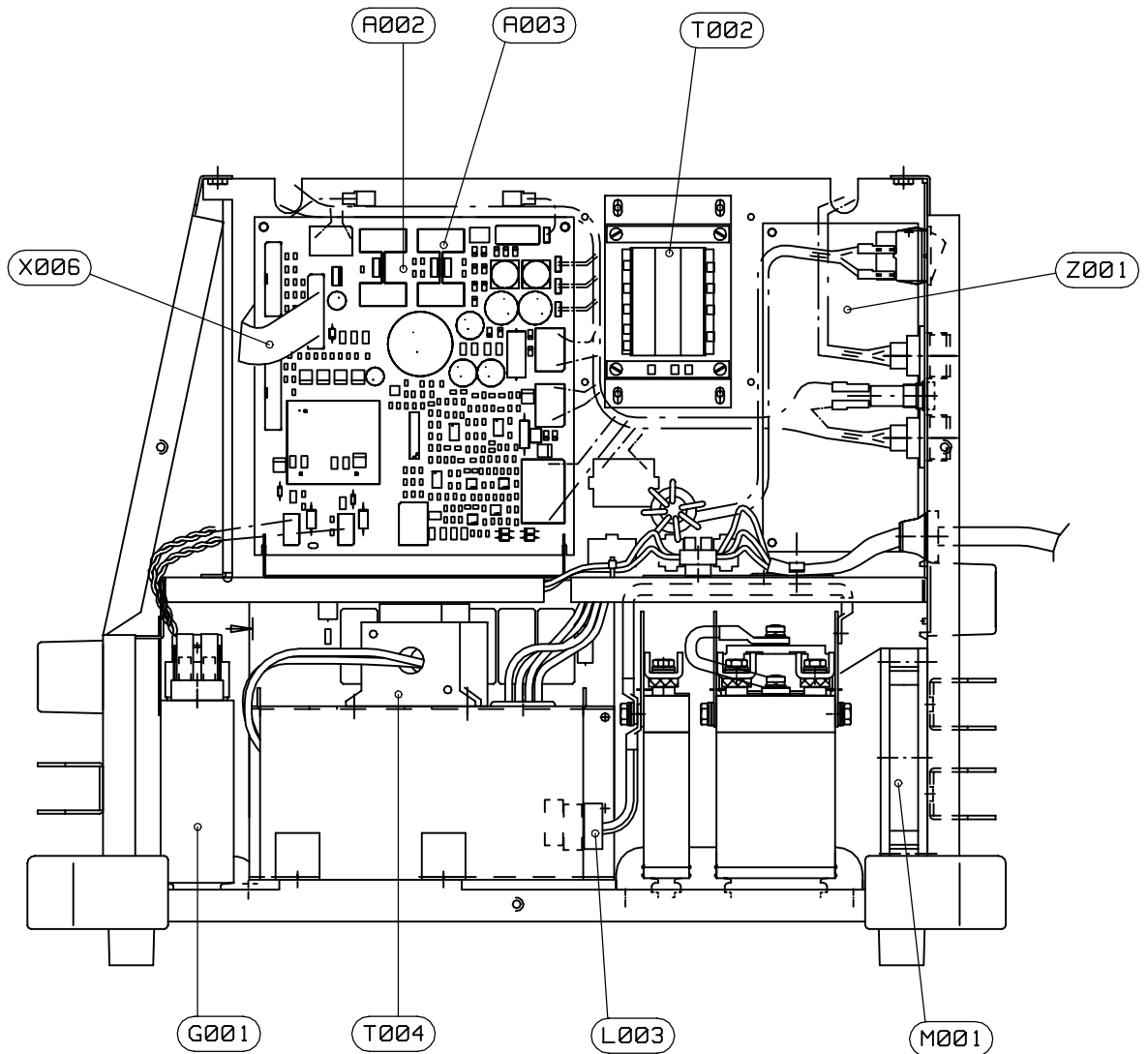
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MASTERTIG AC/DC 1600

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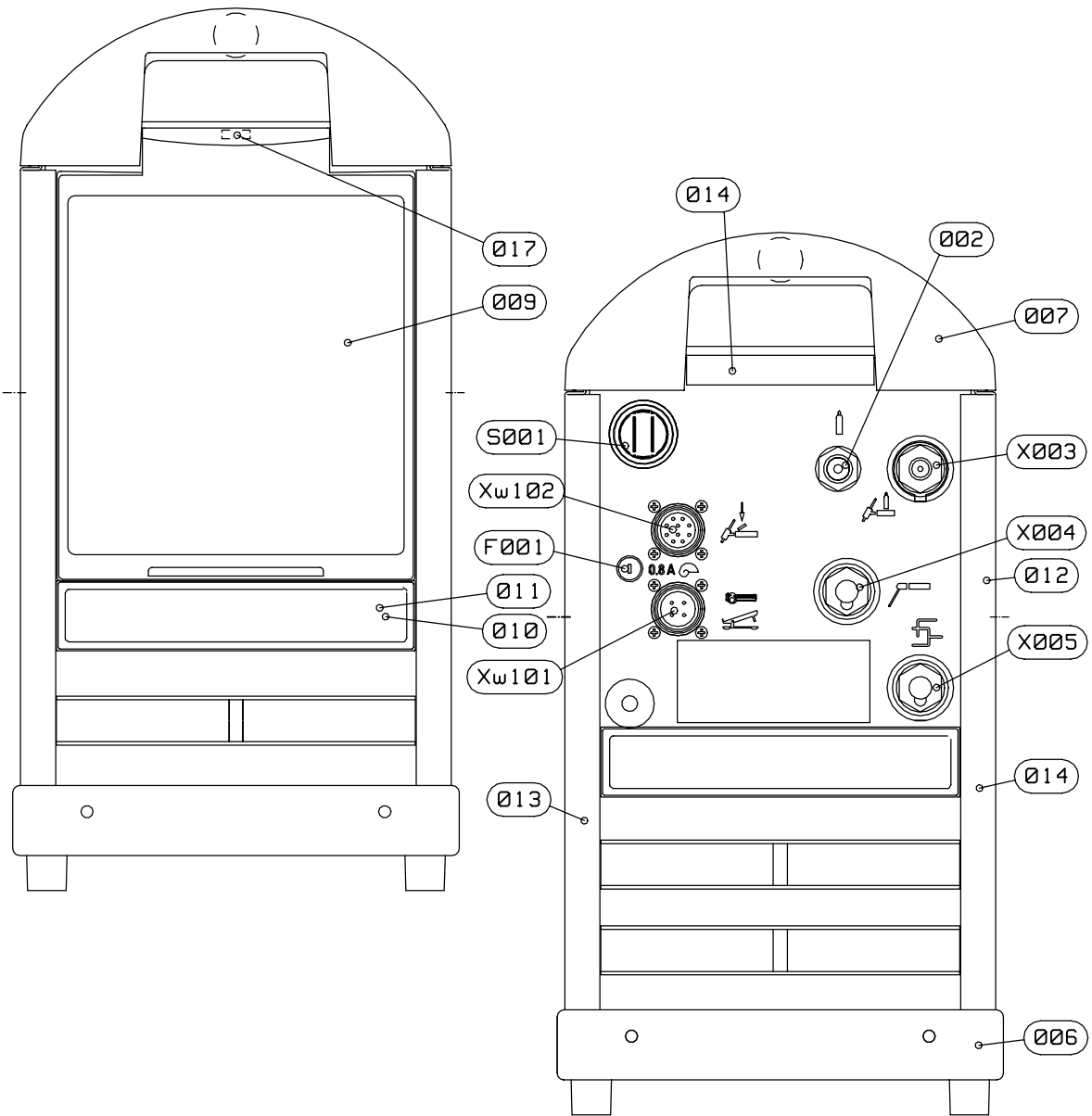
Order no.	Part	Description	Pc.
4295710	A002	CONTROL CARD A002 MASTERTIG AC/DC	1
4277540	A003	CONTROL CARD MAS.TIG AC/DC A003	1
4280540	A004	CONTROL CARD MAS.TIG AC/DC A004	1
4283150	C001	CAPACITOR C001 AC/DC	1
9772516	F001	FUSE 0,8A DELAYED 5 X 20	1
9772551		FUSE BOX + NUT	1
4281530	GA001	DIODE CARD	1
4286000	VG101	SPARE PART IGBT	1
9750126	VG102	DIODE BRIDGE	1
4280860	G001	PRIMARY UNIT	1
3139530	G002	SECONDARY UNIT	1
4290890	VG201	IGBT, SECONDARY AC/DC	1
4280880	G003	SECONDARY UNIT G003 MTIG 1600 ACDC	2
3140270	L001	PRIMARY CHOKE	1
9777115	L003	FERRITE RING 25/15 X 10	1
9544213	M001	COOLING FAN MASTER 1500/2200	1
4260200	R001	SHUNT RESISTOR MASTER 1500/2200	1
9761221	S001	FLIP-FLOP SWITCH WITH PILOT LAMP	1
2067620	T001	MAIN TRANSFORMER	1
9777825	T002	AUXILIARY TRANSFORM.	1
2067590	T003	SPARK TRANSFORMER	1
9777537	T004	CURRENT TRANSFORMER 1:250 PRO	1
9770105	XW101	CONTROL CONNECT. 4 POLES, FEMALE	1
9770116	XW102	MACHINE SOCKET	1
4292780	X003	CONIC COUPLING R 1/4-M 8X1	1
9771530	X004	MACHINE SOCKET 50/70	1
9771530	X005	MACHINE SOCKET 50/70	1
4262810	X006	FLAT CABLE L=175	1
9563002	Y001	SOLENOID VALVE	1
9755615	ZC213	CAPACITOR 470 UF	1
4281560	Z001	FILTER CARD	1
4282130	Z002	MAIN CIRCUIT CARD	1
4282300	001	RUBBER	1
3134270	002	HOSE CONNECTOR R1/8-M12	1
4286030	003	GAS CONNECTOR	1
9377205	004	HOSE CLAMP	1
9370182	005	PLASTIC HOSE 5/8 BLUE	0,25
2067100	006	FOOT	1
2067120	007	HANDLE MTIG 1600/2500 AC/DC	1
4280870	008	HANDLE	1
2067130	009	PROTECTIVE COVER MTIG 1600/2500 AC/DC	1
3139460	010	PLASTIC PIECE	1
4296190	011	STICKER MASTERTIG AC/DC	1
2067260	012	SIDE PLATE LEFT MTIG1600 ACDC	1
2067270	013	SIDE PLATE RIGHT MTIG1600 ACDC	1
3139520	014	COVER MTIG1600 ACDC	1
3133020	015	FOOT F COOL.PROFIL	1
4280560	016	FAST.PC F COOL.PROF.	1
3140350		CIRCUIT DIAGRAM MASTERTIG 1600AC/DC	1
9770456		PLUG 2 POLES	1
9770457		PLUG 3-POLES	1
9770458		PLUG 6 POLES	1
9770460		PLUG 15 POLES	1
9770462		CONTACT , MALE	1
9770464		CONTACT, FEMALE	1

MASTERTIG AC/DC 2000

V162001

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SPARE PARTS
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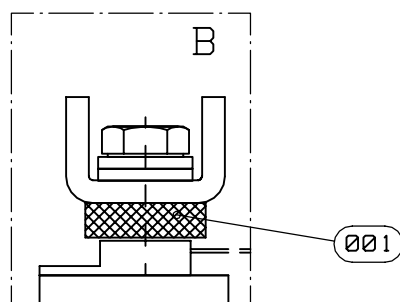
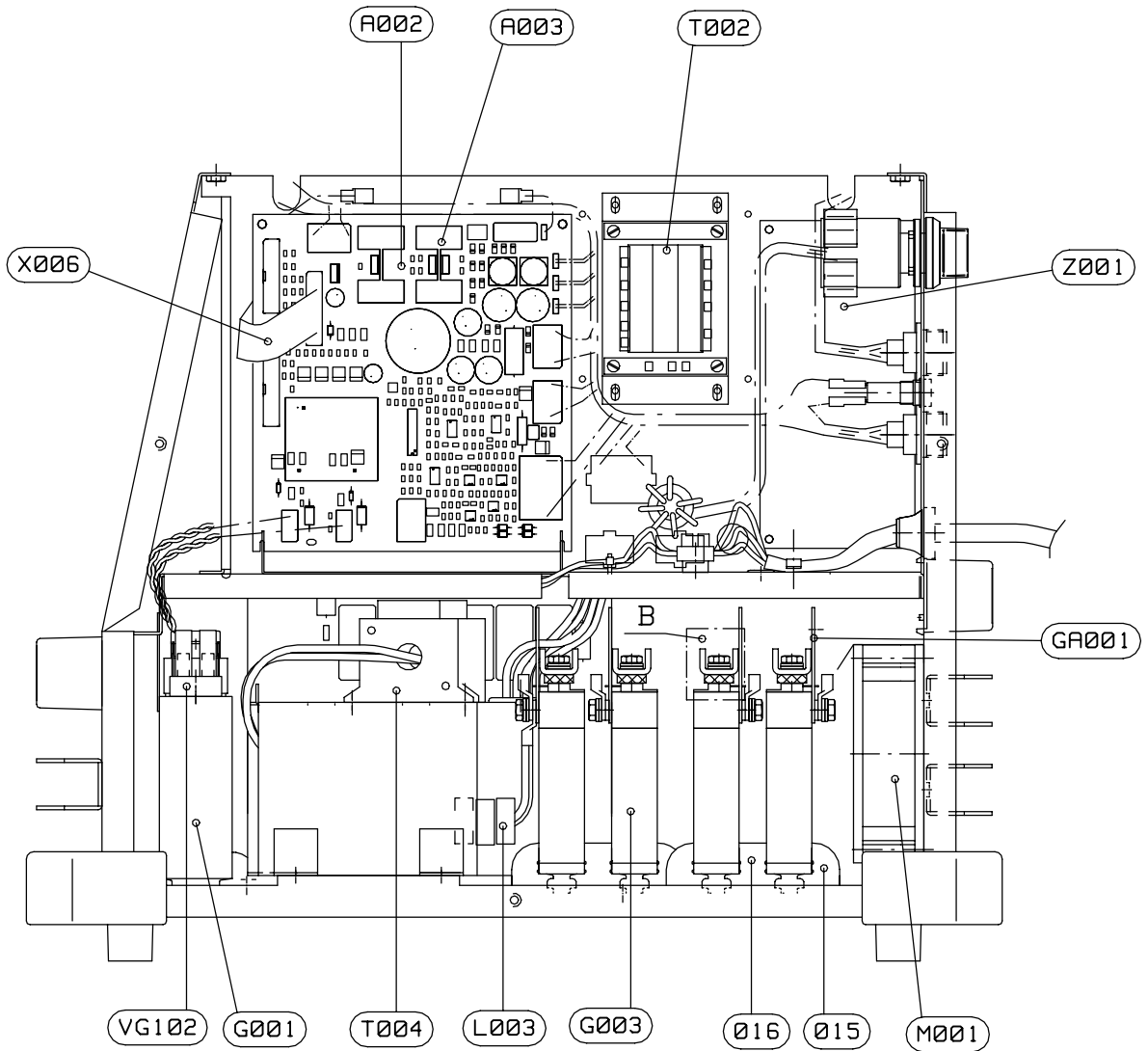
The Joy of Welding

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MASTERTIG AC/DC 2000

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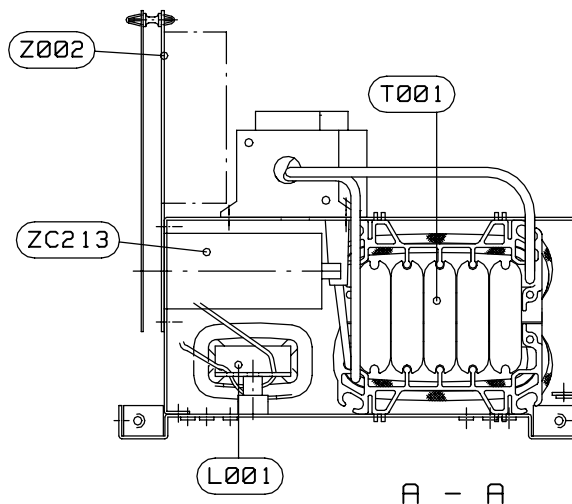
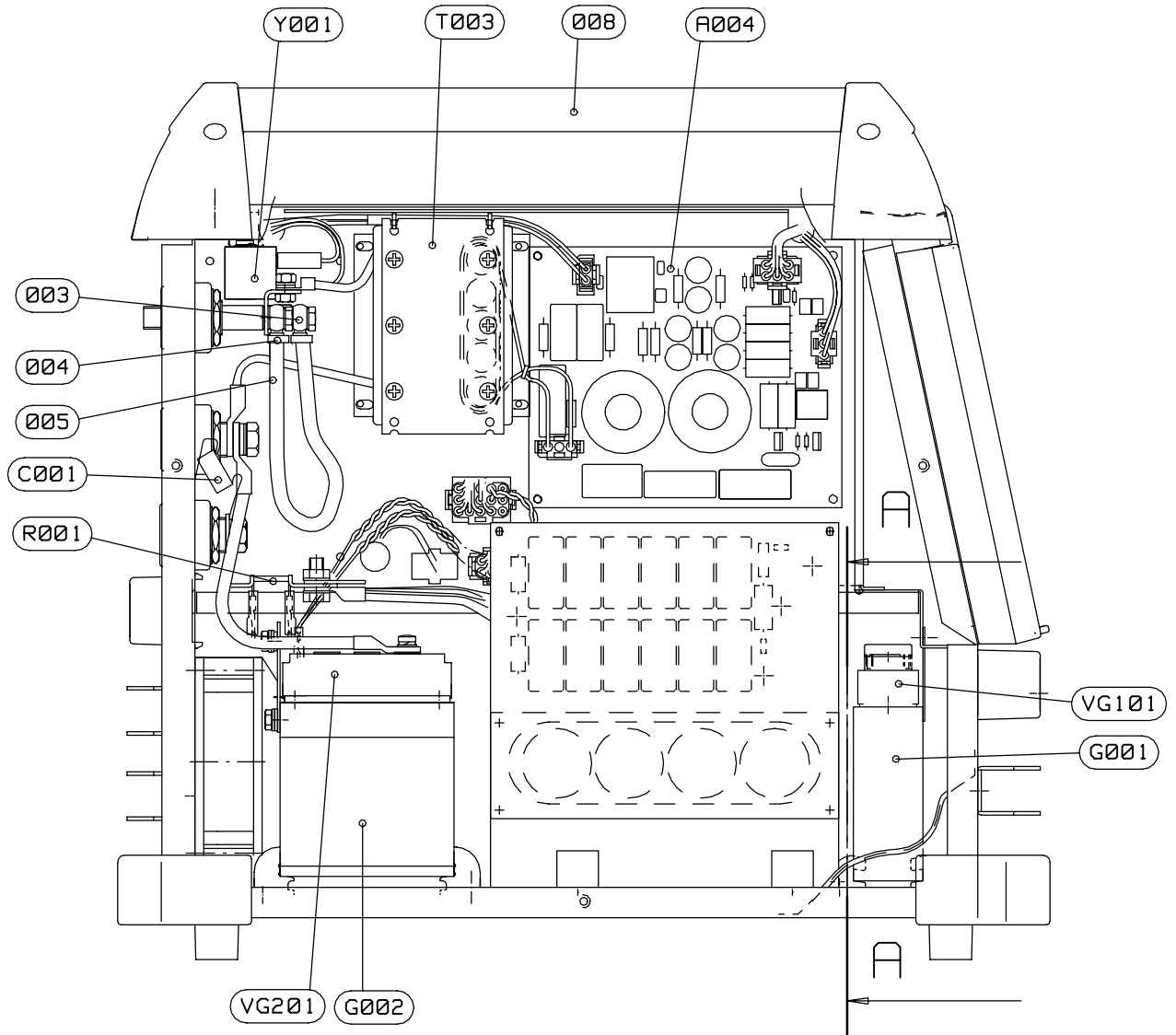
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MASTERTIG AC/DC 2000

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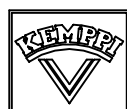
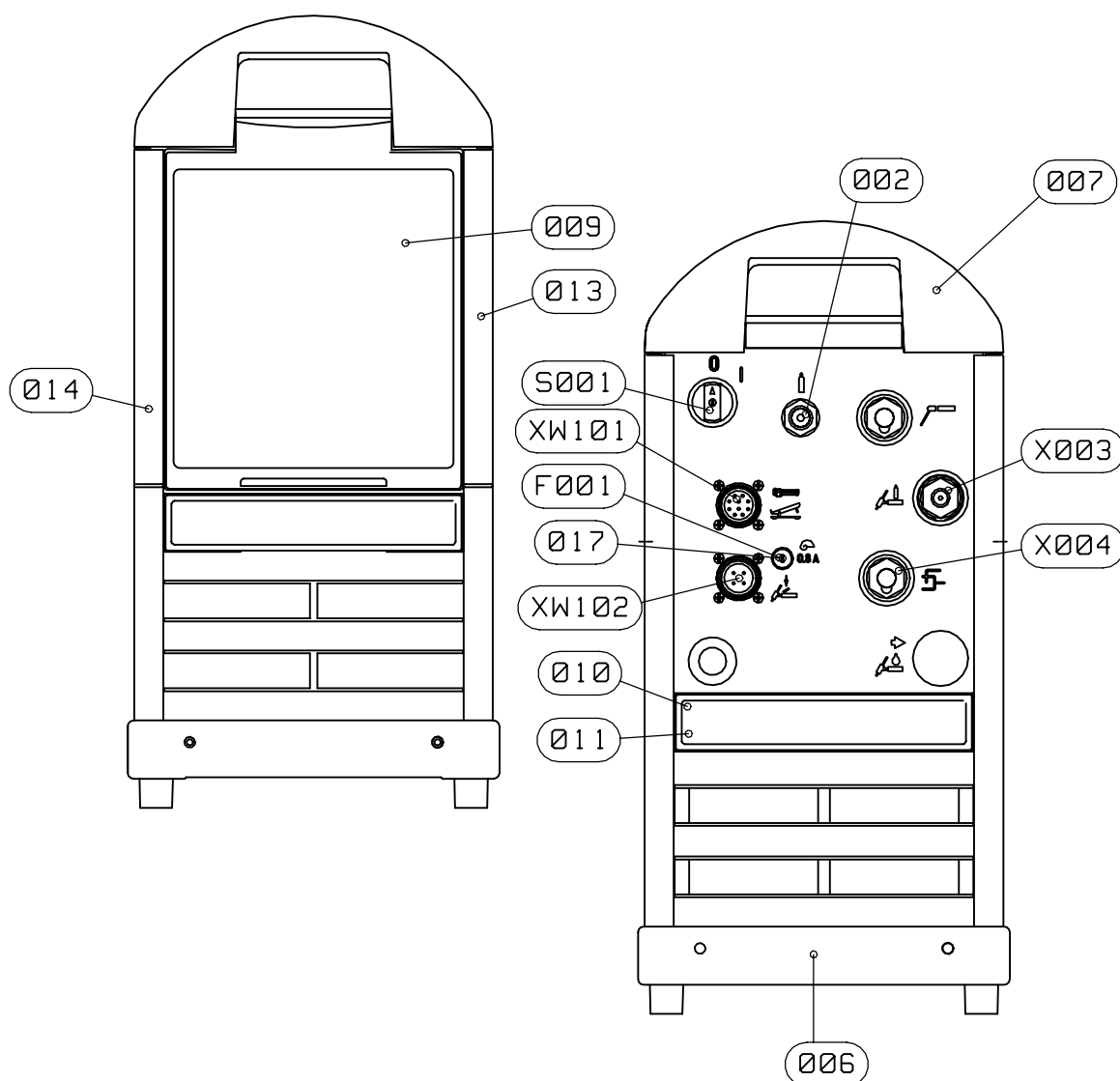
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4283150	C001	CAPACITOR C001 AC/DC	1
9772516	F001	FUSE 0,8A DELAYED 5 X 20	1
9772551	F001	FUSE BOX + NUT	1
428086001	G001	PRIMARY UNIT G001 MTIG AC/DC 2000	1
428600001	VG101	SPARE PART IGBT MASTERTIG AC/DC 2000	1
9750126	VG102	DIODE BRIDGE	1
4299800	G002	SECONDARY UNIT G002 MTIG AC/DC 2000	1
4300750	VG201	IGBT, SECONDARY 2PCS 2X200A ACDC2000	1
429089001	VG201	IGBT, SECONDARY 1 PC 2X400A ACDC2000	0
4280880	G003	SECONDARY UNIT G003 MASTERTIG AC/DC	4
4281530	GA001	DIODE CARD	4
3149440	L001	PRIMARY CHOKE MASTERTIG AC/DC 2000	1
9777115	L003	FERRITE RING 25/15 X 10	6
9544221	M001	COOLING FAN MASTER,-TIG MLS	2
4260200	R001	SHUNT RESISTOR MASTER 1500/2200	1
9760604	S001	SWITCH	1
2067620	T001	MAIN TRANSFORMER	1
9777825	T002	AUXILIARY TRANSFORM.	1
2067590	T003	SPARK TRANSFORMER	1
9777537	T004	CURRENT TRANSFORMER 1:250 PRO	1
9770105	XW101	CONTROL CONNECT. 4 POLES, FEMALE	1
9770116	XW102	MACHINE SOCKET	1
4292780	X003	CONIC COUPLING R 1/4-M 8X1	1
9771530	X004	MACHINE SOCKET 50/70	2
4262810	X006	FLAT CABLE L=175	1
9563002	Y001	SOLENOID VALVE	1
9755615	ZC213	CAPACITOR 470 UF	4
4281560	Z001	FILTER CARD	1
4282130	Z002	MAIN CIRCUIT CARD	1
4282300	001	RUBBER	4
3134270	002	HOSE CONNECTOR R1/8-M12	1
4286030	003	GAS CONNECTOR	1
9377205	004	HOSE CLAMP	2
9370182	005	PLASTIC HOSE 5/8 BLUE	0,25
2067100	006	FOOT	2
2067120	007	HANDLE MTIG 1600/2500 AC/DC	2
4280870	008	HANDLE	1
2067130	009	PROTECTIVE COVER MTIG 1600/2500 AC/DC	1
3139460	010	PLASTIC PIECE	2
4296190	011	STICKER MASTERTIG AC/DC	2
206726001	012	SIDE PLATE LEFT MASTERTIG AC/DC 2000	1
206727001	013	SIDE PLATE RIGHT MASTERTIG AC/DC 2000	1
3139520	014	COVER MTIG ACDC 1600,2000	1
3133020	015	FOOT F COOL.PROFIL	11
4280560	016	FAST.PC F COOL.PROF.	4
4280580	017	SPRING MASTERTIG AC/DC	1
3149110		CIRCUIT DIAGRAM MASTERTIG 2000 AC/DC	1
9770458		PLUG 6 POLES	2
9770460		PLUG 15 POLES	1
9770462		CONTACT , MALE	1
9770464		CONTACT, FEMALE	1

MASTERTIG AC/DC 2500

1916150
V162501

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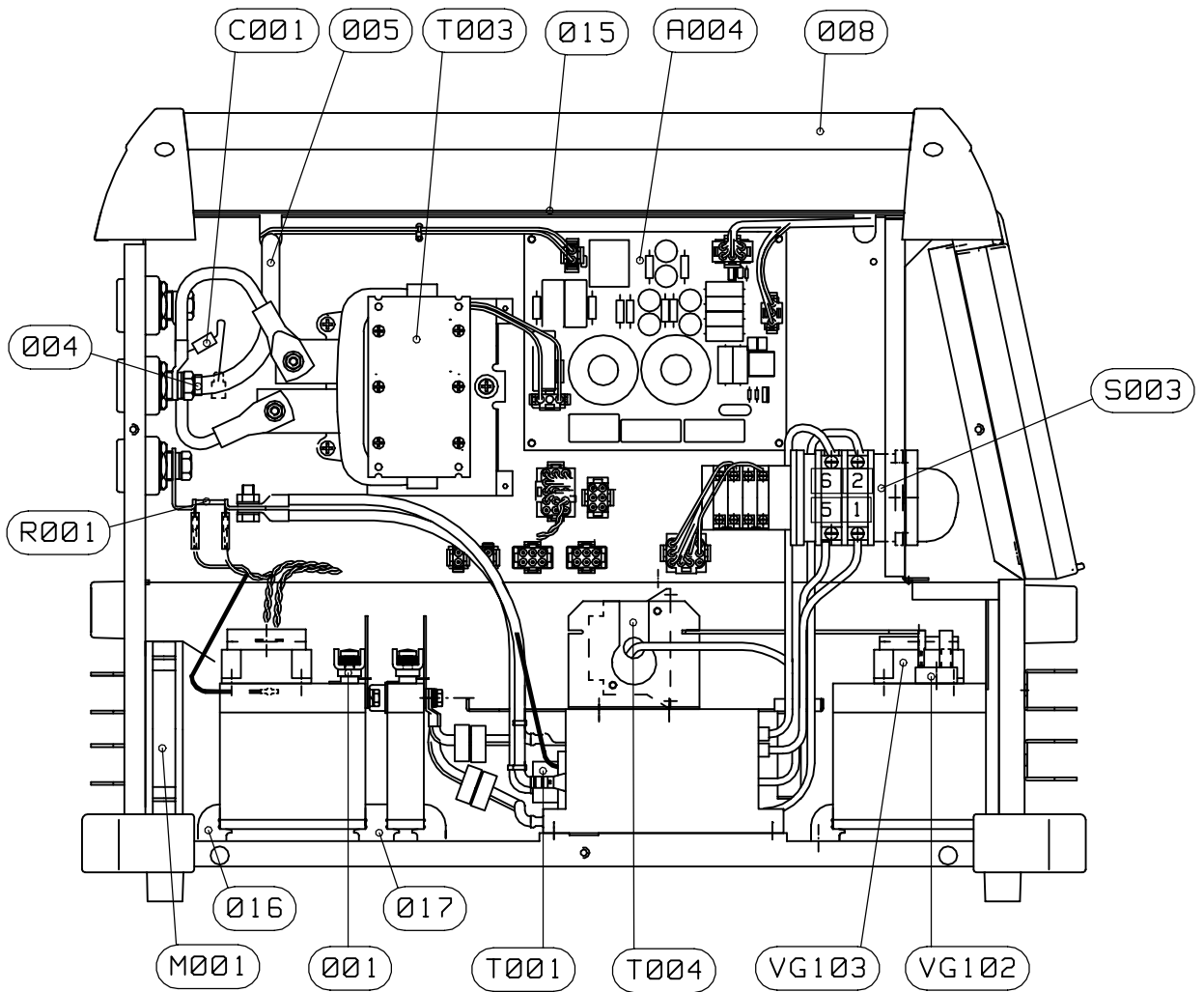


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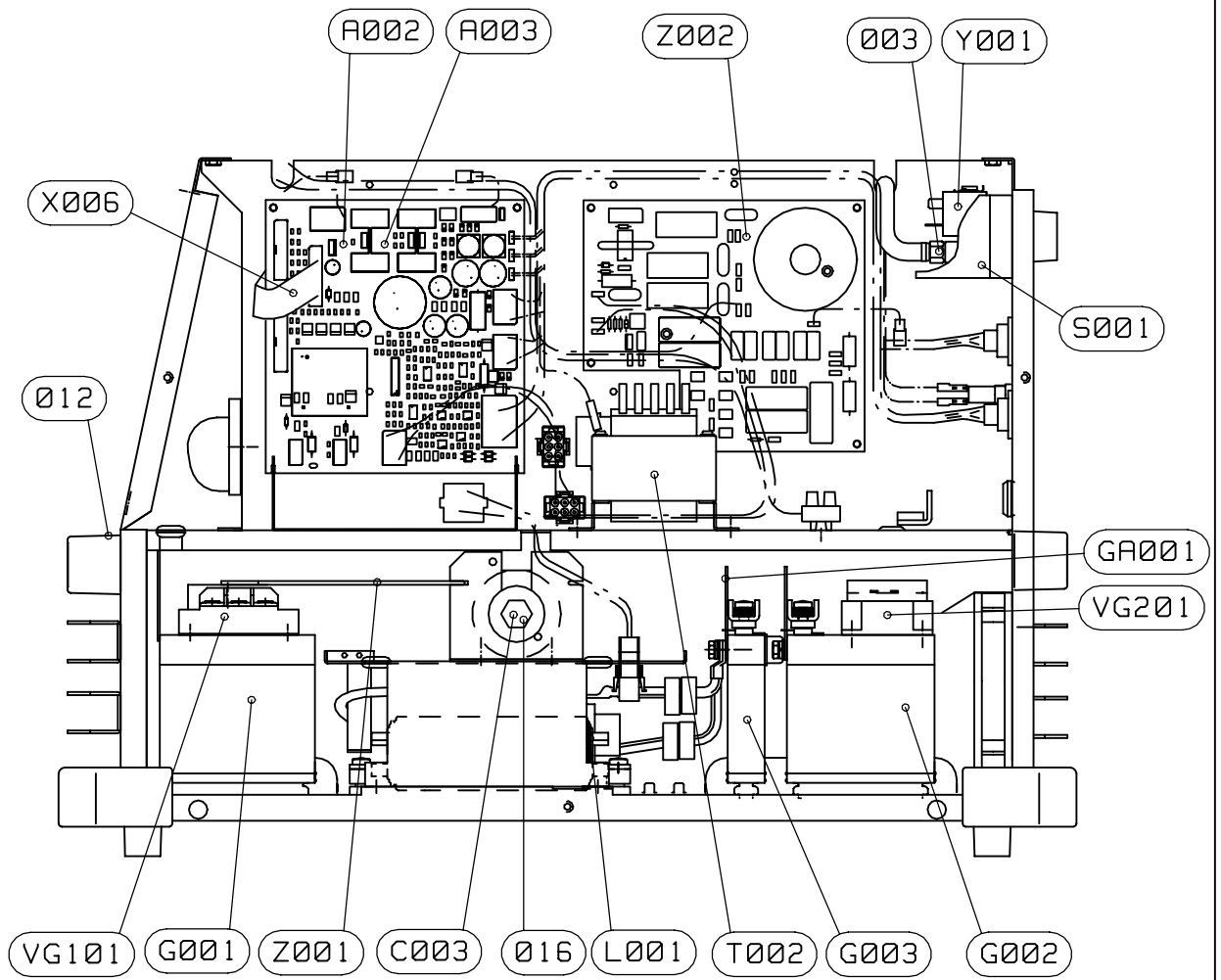
MASTERTIG AC/DC 2500

1916150

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SPARE PARTS
ERSATZTEILE
ONDERDELEN
PIECES DETACHEES

V162501



Order no.	Part	Description	Pc.
4295710	A002	CONTROL CARD A002 MASTERTIG AC/DC	1
4277540	A003	CONTROL CARD MAS.TIG AC/DC A003	1
4280540	A004	CONTROL CARD MAS.TIG AC/DC A004	1
4283150	C001	CAPACITOR C001 AC/DC	1
9755264	C003	CAPACITOR 75 UF	1
9414086		BOX NUT	1
9772516	F001	FUSE 0,8A DELAYED 5 X 20	1
9772551		FUSE BOX + NUT	1
4286780	VG103	SPARE PART IGBT 2 X 200A	1
9750126	VG102	DIODE BRIDGE	1
9750174	VG101	RECTIFIER UNIT	1
2067020	G001	PRIMARY UNIT MTIG2500 3J ACDC	1
3139440	G002	SECONDARY UNIT MTIG 2500 ACDC	1
4281520	GA001	DIODE CARD	1
4286020	VG201	IGBT, SECONDARY AC/DC	1
4280570	G003	SECONDARY UNIT	2
3137400	L001	PRIMARY CHOKE L001/MASTER2850 3J	1
9777115	L003	FERRITE RING 25/15 X 10	1
9544213	M001	COOLING FAN MASTER 1500/2200	1
4260200	R001	SHUNT RESISTOR MASTER 1500/2200	1
976050201	S001	MAIN SWITCH K60/12 D22,5	1
2067930	T001	MAIN TRANSFORMER	1
9760632	S003	V.CHANGE-OVER SW.	1
9777825	T002	AUXILIARY TRANSFORM.	1
2062420	T003	SPARK TRANSFORMER MASTERTIG 2800/3500	1
9777537	T004	CURRENT TRANSFORMER 1:250 PRO	1
9770116	XW101	MACHINE SOCKET	1
9770105	XW102	CONTROL CONNECT. 4 POLES, FEMALE	1
4292780	X003	CONIC COUPLING R 1/4-M 8X1	1
9771530	X004	MACHINE SOCKET 50/70	2
4262810	X006	FLAT CABLE L=175	1
9563002	Y001	SOLENOID VALVE	1
4277550	Z001	MAIN CIRCUIT CARD MTIG AC/DC 2500	1
4282080	Z002	FILTER CARD	1
4282300	001	RUBBER	1
3134270	002	HOSE CONNECTOR R1/8-M12	1
9568913	003	HOSE CONNECTOR R1/8-6ML	1
9377256	004	HOSE CLAMP	1
9370101	005	PVC HOSE	0,25
2067100	006	FOOT	1
2067120	007	HANDLE MTIG 1600/2500 AC/DC	1
4280930	008	HANDLE MTIG 2500 ACDC	1
2067130	009	PROTECTIVE COVER MTIG 1600/2500 AC/DC	1
3139460	010	PLASTIC PIECE	1
4296190	011	STICKER MASTERTIG AC/DC	1
4282960	012	VOLTAGE STICKER ACDC	1
2067060	013	SIDE PLATE LEFT MTIG2500 ACDC	1
2067070	014	SIDE PLATE RIGHT MTIG2500 ACDC	1
2067080	015	COVER MTIG2500,3500W ACDC	1
3133020	016	FOOT F COOL.PROFIL	1
4280560	017	FAST.PC F COOL.PROF.	1
3140360		CIRCUIT DIAGRAM MTIG 2500 AC/DC	1
9770456		PLUG 2 POLES	1
9770457		PLUG 3-POLES	1
9770458		PLUG 6 POLES	1
9770460		PLUG 15 POLES	1
9770462		CONTACT , MALE	1
9770464		CONTACT , FEMALE	1

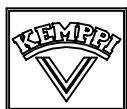
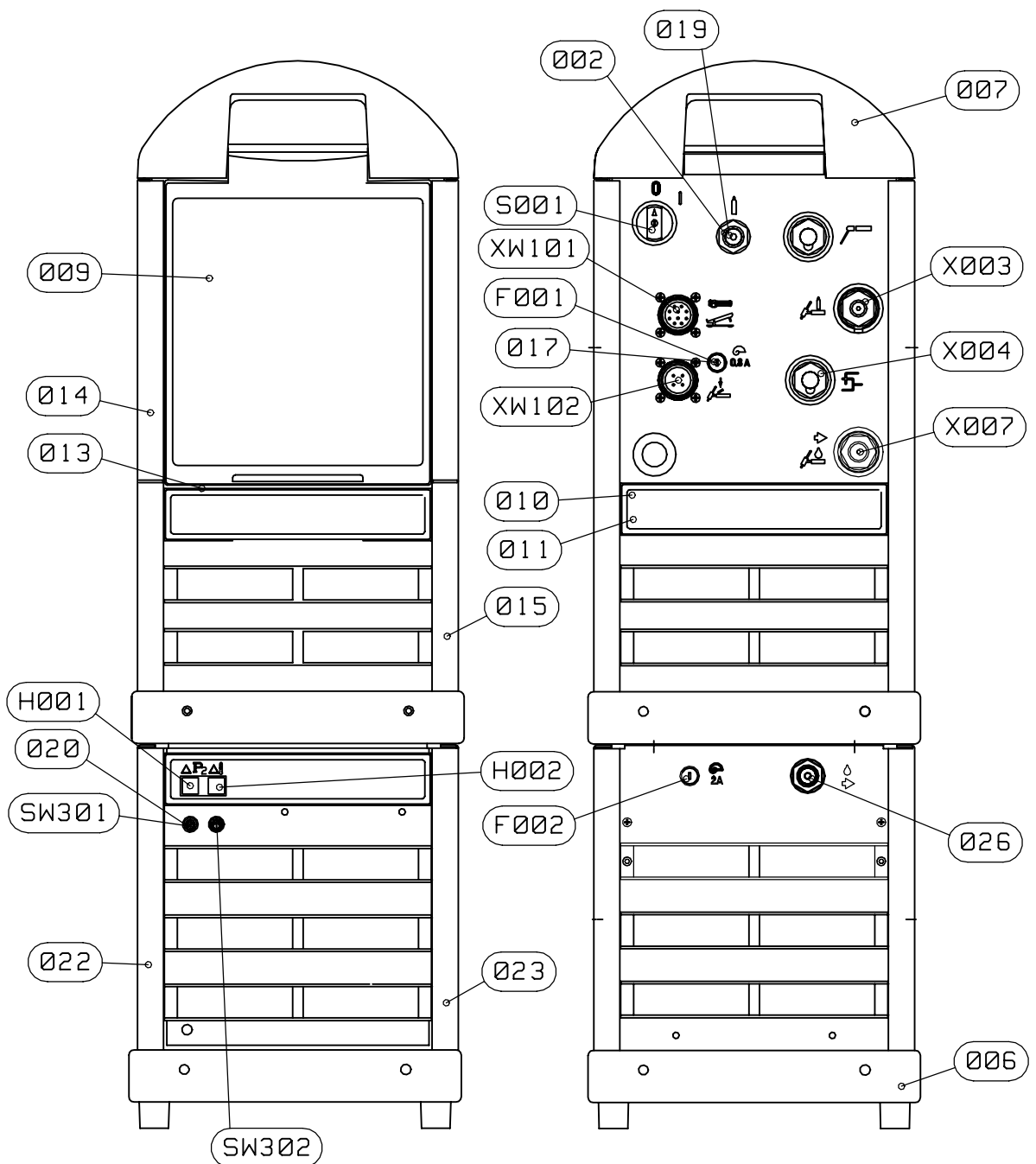
MASTERTIG 2500W ACDC

1916160

V162506

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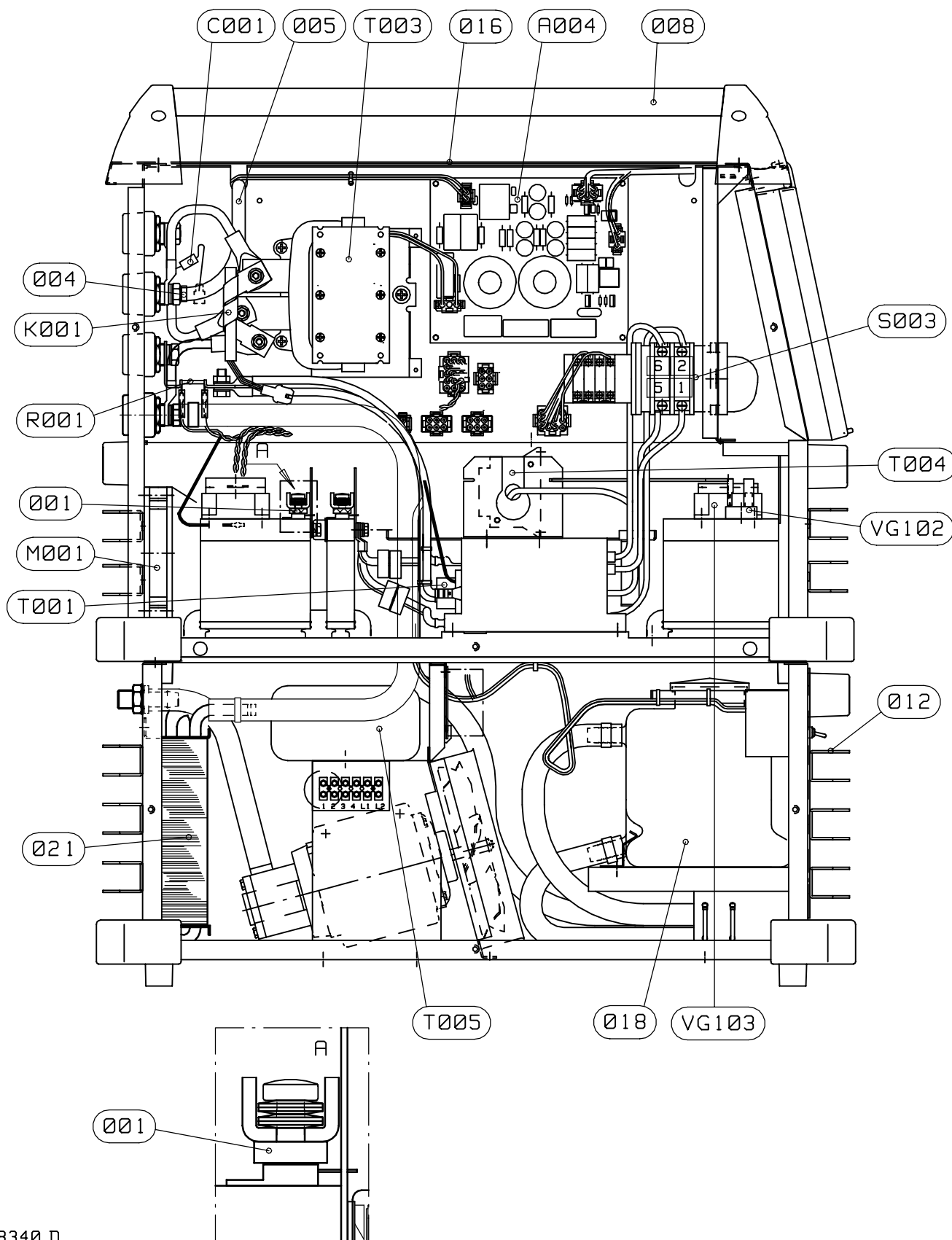
MASTERTIG 2500W ACDC

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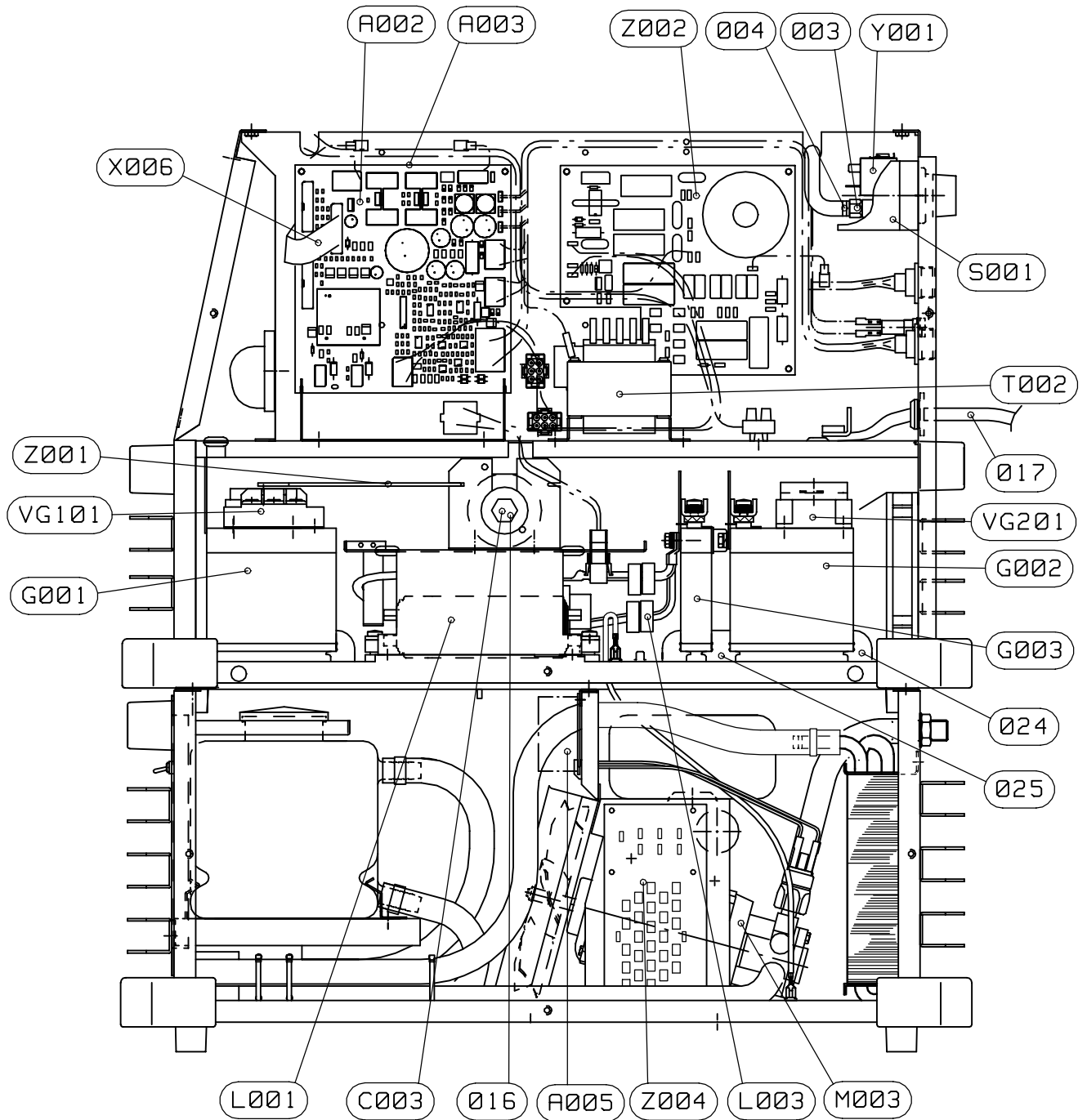
MASTERTIG 2500W ACDC

1916160

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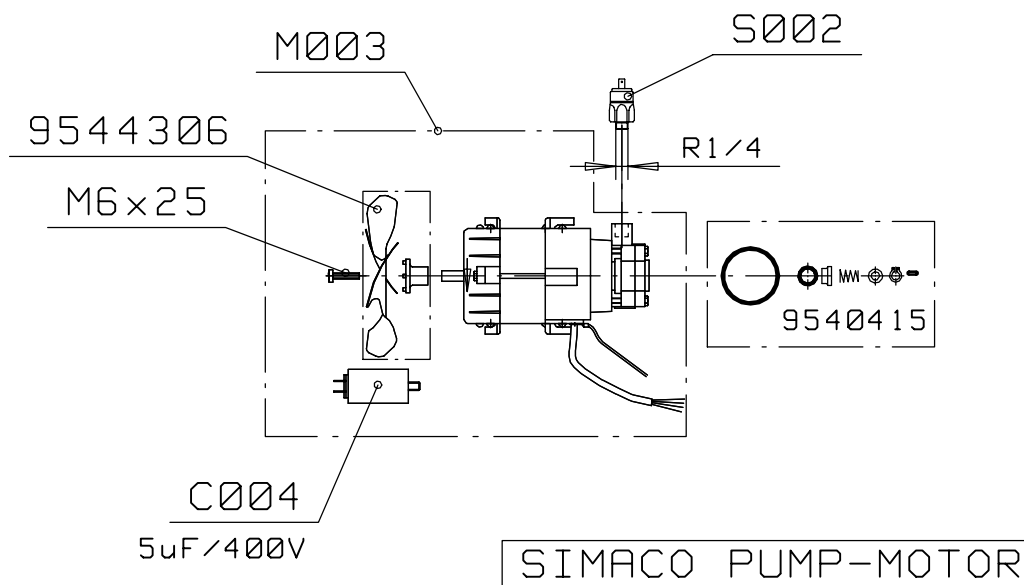
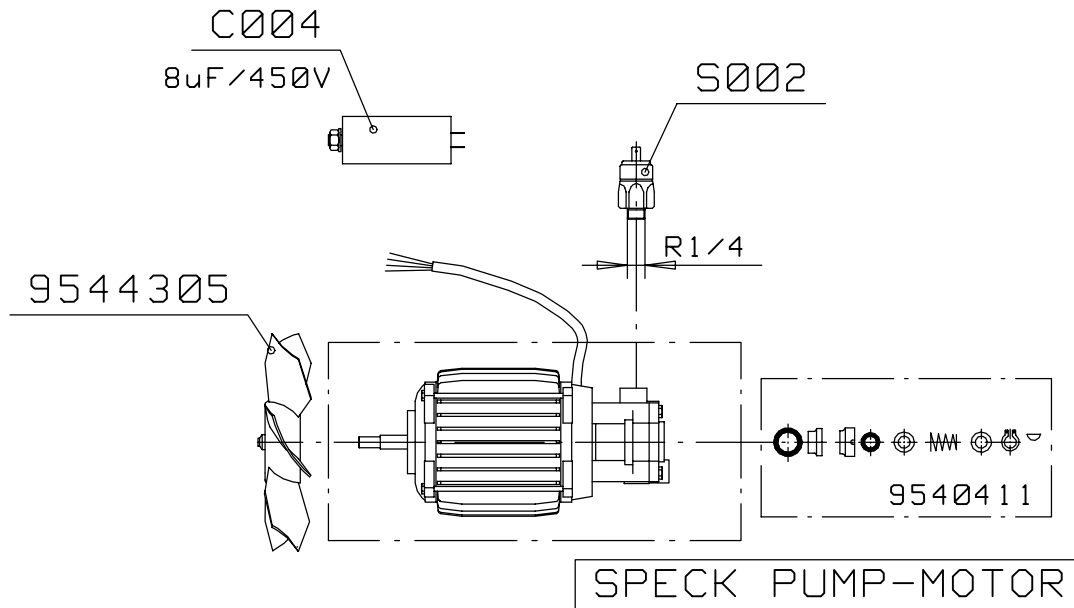
MASTERTIG 2500W ACDC

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SPARE PARTS
ERSATZTEILE
ONDERDELEN
PIECES DETACHEES

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V162506



Order no.	Part	Description	Pc.
4295710	A002	CONTROL CARD A002 MASTERTIG AC/DC	1
4277540	A003	CONTROL CARD MAS.TIG AC/DC A003	1
4280540	A004	CONTROL CARD MAS.TIG AC/DC A004	1
4279500	A005	CONTROL CARD A002 KWELD 4000W	1
4283150	C001	CAPACITOR C001 AC/DC	1
9414086	C003	BOX NUT	1
9755264	C003	CAPACITOR 75 UF	1
9755223	C004	CAPACITOR 8UF/450V AC	1
9772516	F001	FUSE 0,8A DELAYED 5 X 20	1
9772551	F001	FUSE BOX + NUT	1
9772520	F002	FUSE DELAYED 2A 5X20	1
9772551	F002	FUSE BOX + NUT	1
2067020	G001	PRIMARY UNIT MTIG2500 3J ACDC	1
4286780	VG103	SPARE PART IGBT 2 X 200A	1
9750126	VG102	DIODE BRIDGE	1
9750174	VG101	RECTIFIER UNIT	1
3139440	G002	SECONDARY UNIT MTIG 2500 ACDC	1
4281520	GA001	DIODE CARD	1
4286020	VG201	IGBT, SECONDARY AC/DC	1
4280570	G003	SECONDARY UNIT	2
9775731	H001	SIGNAL LAMP RED	1
9775729	H002	SIGNAL LAMP YELLOW	1
4249080	K001	REED RELAY	1
3140840	L001	PRIMARY CHOKE	1
9777115	L003	FERRITE RING 25/15 X 10	1
9544213	M001	COOLING FAN MASTER 1500/2200	1
3138320	M003	PUMP-MOTOR COMB. SIMACO	1
9544306	M003	COOLING FAN WING SIMACO	1
9544305	M003	COOLING FAN WING SPECK	1
9540415	M003	REPAIR SET FOR PUMP SIMACO	1
9540411	M003	REPAIR SET FOR PUMP SPECK	1
4260200	R001	SHUNT RESISTOR MASTER 1500/2200	1
9761375	SW301	LEVER SWITCH	1
9761323	SW302	CHANGE OVER SWITCH	1
976050201	S001	MAIN SWITCH K60/12 D22,5	1
9761622	S002	PRESSURE SWITCH	1
9760632	S003	V.CHANGE-OVER SW.	1
2067930	T001	MAIN TRANSFORMER	1
9777825	T002	AUXILIARY TRANSFORM.	1
2062420	T003	SPARK TRANSFORMER MASTERTIG 2800/3500	1
9777537	T004	CURRENT TRANSFORMER 1:250 PRO	1
3141530	T005	TRANSFORMER	1
9770116	XW101	MACHINE SOCKET	1
9770105	XW102	CONTROL CONNECT. 4 POLES, FEMALE	1
4292780	X003	CONIC COUPLING R 1/4-M 8X1	1
9771530	X004	MACHINE SOCKET 50/70	2
4262810	X006	FLAT CABLE L=175	1
4292790	X007	CURRENT/WATER CONN. R3/8"/R1/4"	1
9563002	Y001	SOLENOID VALVE	1
4277550	Z001	MAIN CIRCUIT CARD MTIG AC/DC 2500	1
4282080	Z002	FILTER CARD	1
4278020	Z004	FILTER CARD	1
4282300	001	RUBBER	1
3134270	002	HOSE CONNECTOR R1/8-M12	1
9568911	003	HOSE CONNECTOR R1/8-5ML	1
9377256	004	HOSE CLAMP	1
9370101	005	PVC HOSE	0,25
2067100	006	FOOT	1
2067120	007	HANDLE MTIG 1600/2500 AC/DC	1
4280930	008	HANDLE MTIG 2500 ACDC	1

Order no.	Part	Description	Pc.
2067130	009	PROTECTIVE COVER MTIG 1600/2500 AC/DC	1
3139460	010	PLASTIC PIECE	1
4296190	011	STICKER MASTERTIG AC/DC	1
4282950	012	STICKER GAS/WATER ACDC	1
4282960	013	VOLTAGE STICKER ACDC	1
2067060	014	SIDE PLATE LEFT MTIG2500 ACDC	1
2067070	015	SIDE PLATE RIGHT MTIG2500 ACDC	1
2067080	016	COVER MTIG2500,3500W ACDC	1
4241513	017	CONNECTION CABLE	1
9592126	018	WATER TANK	1
4237831	019	GAS HOSE D6/R1/8-1.7M	1
9761302	020	PROTECTION SWITCHES'LEVER	1
9581005	021	HEAT EXCHANGER 220X225 SIMACO	1
2069370	022	SIDE PLATE LEFT MTIG2500W,3500WACDC	1
2067360	023	SIDE PLATE RIGHT MTIG2500W,3500WACDC	1
3133020	024	FOOT F COOL.PROFIL	1
4280560	025	FAST.PC F COOL.PROF.	1
4257910	026	CONIC HOSE COUPLING R3/8-1/2 KL	1
3140360		CIRCUIT DIAGRAM MTIG 2500 AC/DC	1
3140370		CIRCUIT DIAGRAM MTIG-W AC/DC	1
9770456		PLUG 2 POLES	1
9770457		PLUG 3-POLES	1
9770458		PLUG 6 POLES	1
9770460		PLUG 15 POLES	1
9770462		CONTACT , MALE	1
9770464		CONTACT, FEMALE	1

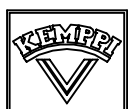
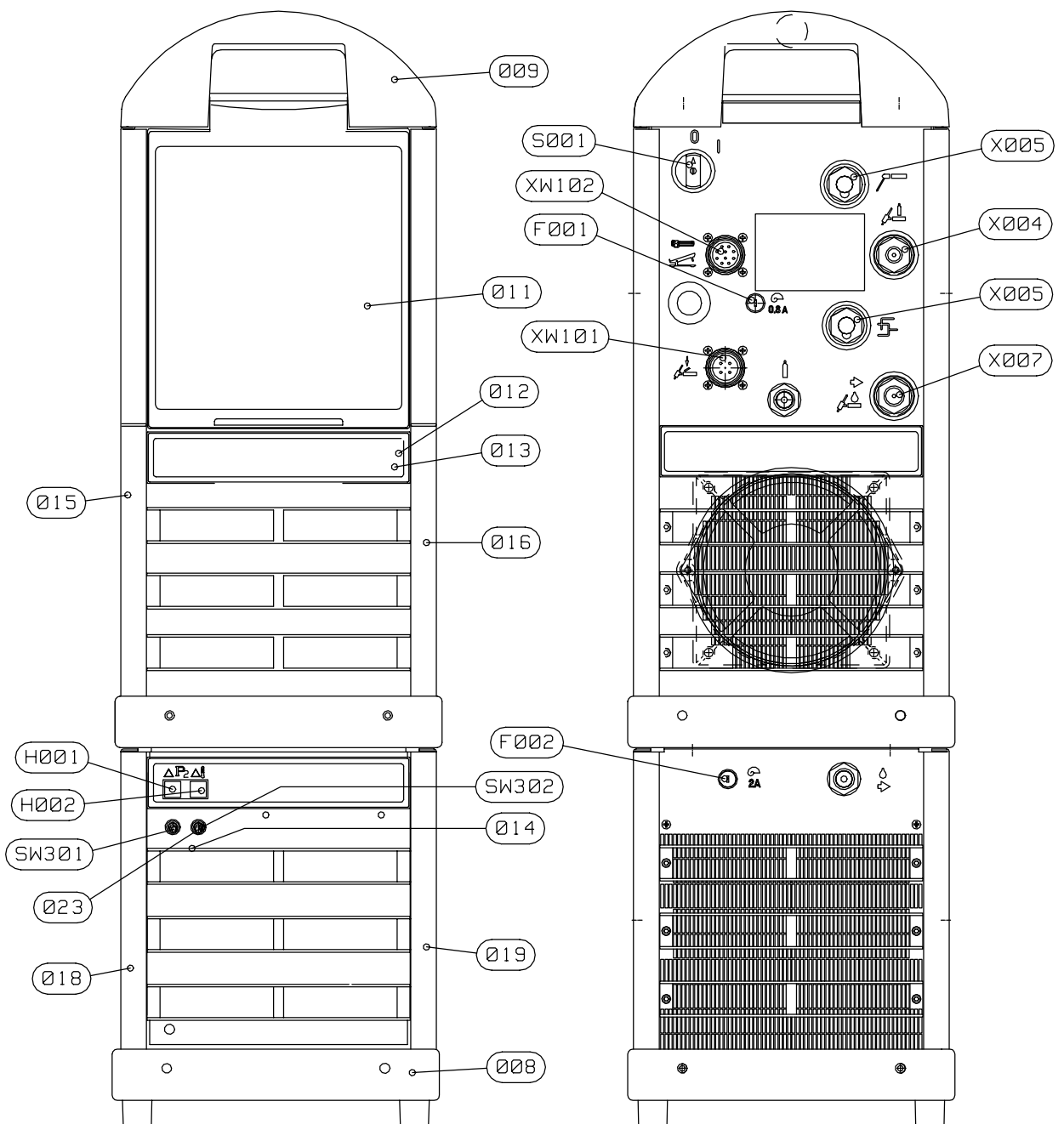
MASTERTIG ACDC 3500W

1916180

V163505

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SPARE PARTS
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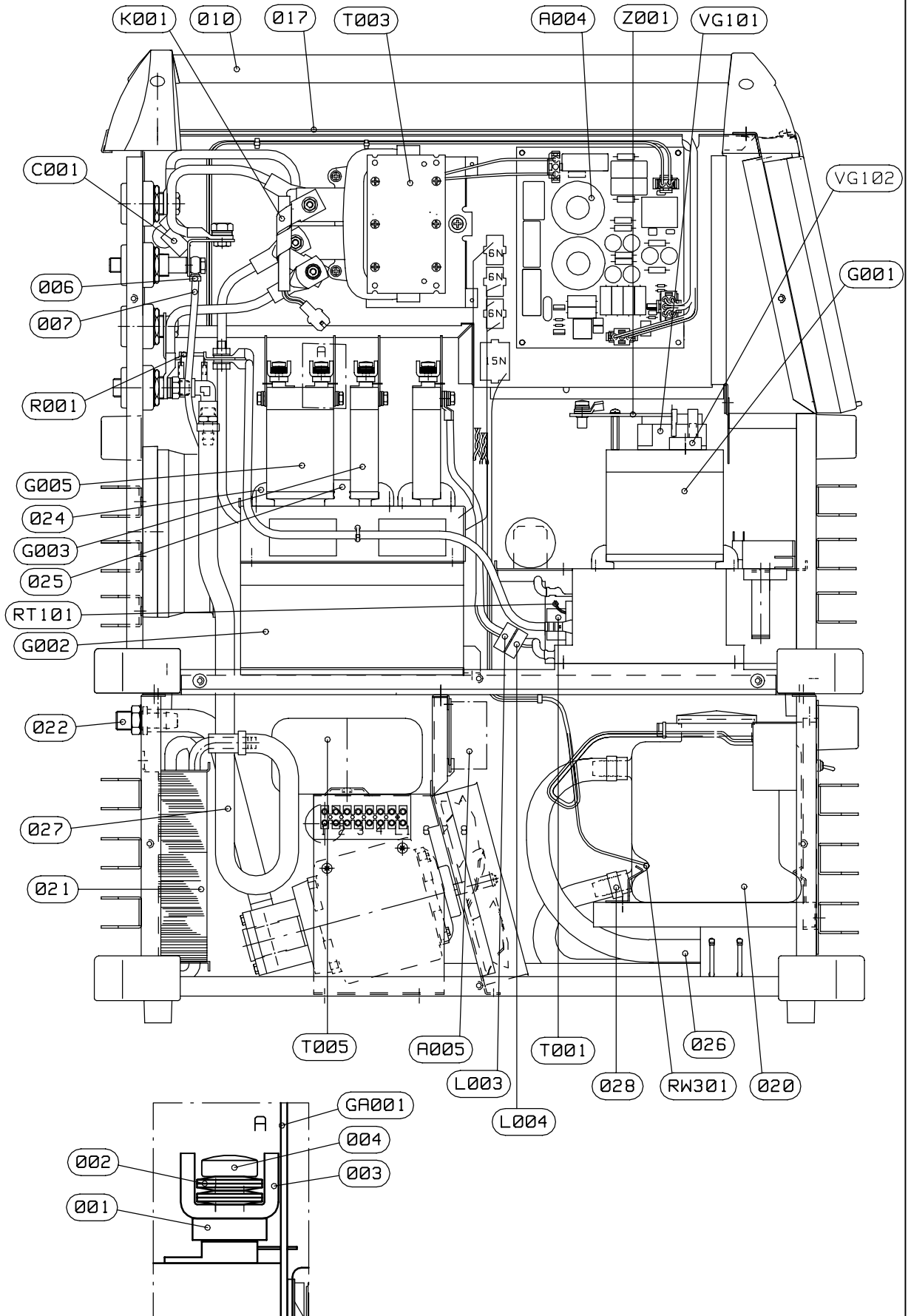
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MASTERTIG ACDC 3500W

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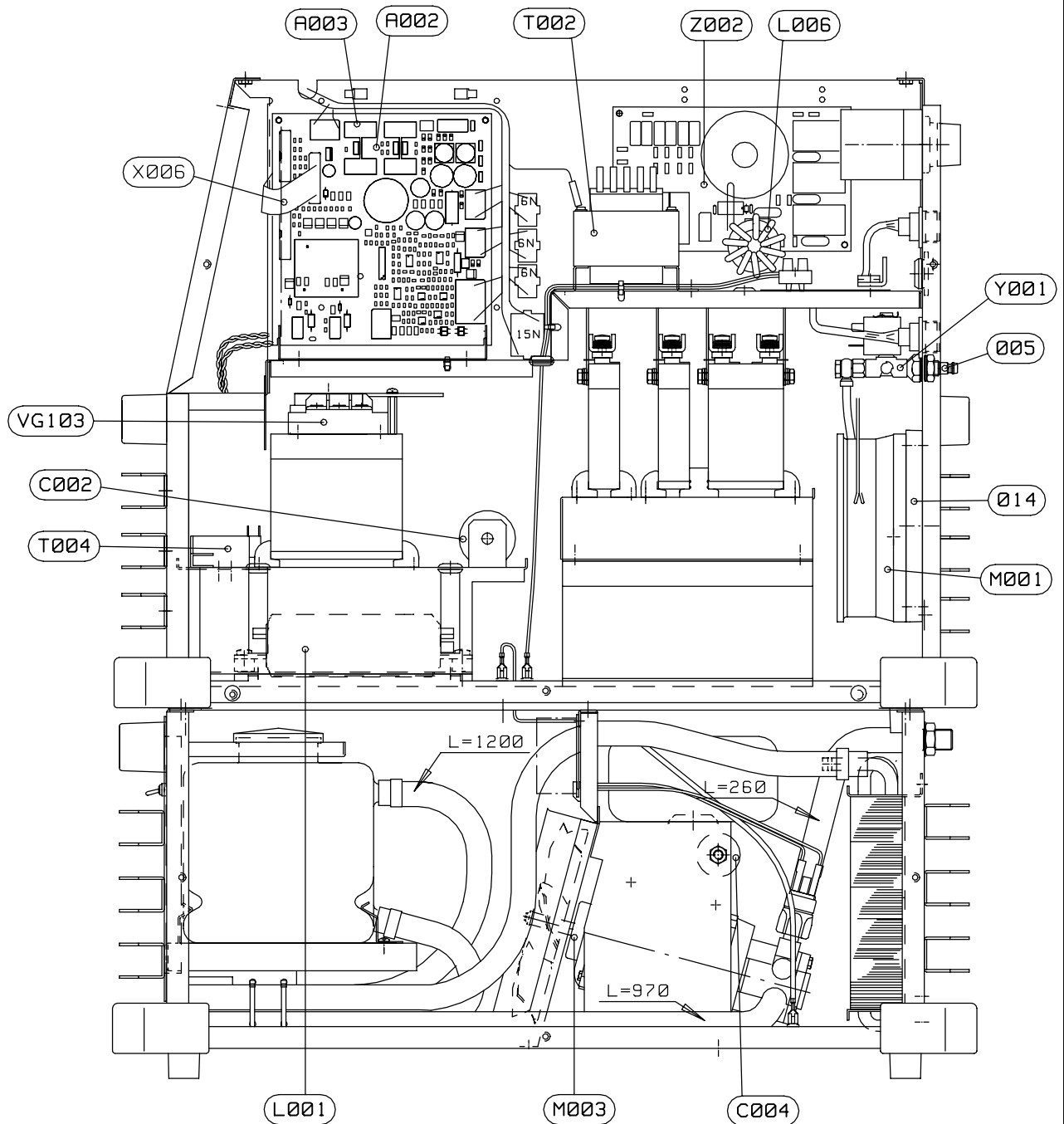
MASTERTIG ACDC 3500W

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SPARE PARTS
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ONDERDELEN
PIECES DETACHEES

V163505

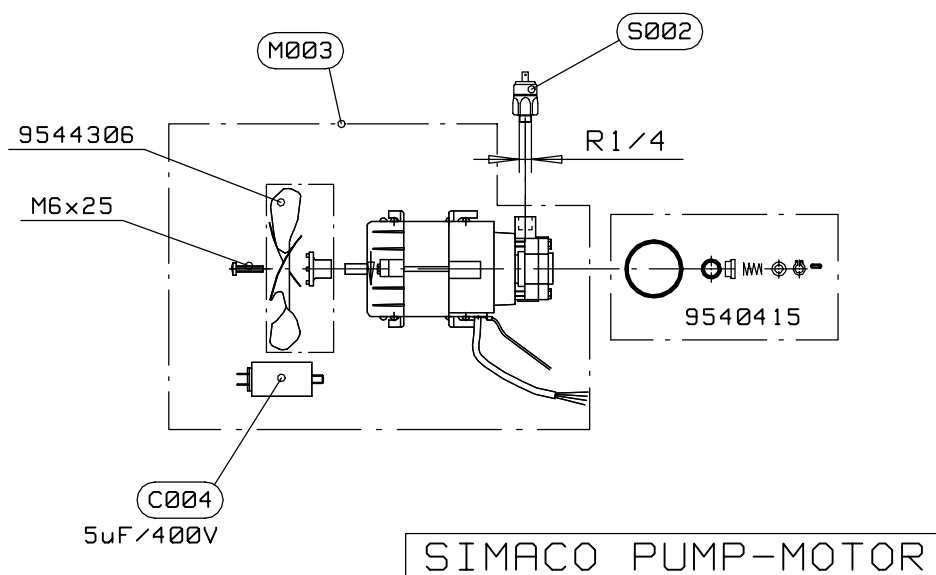
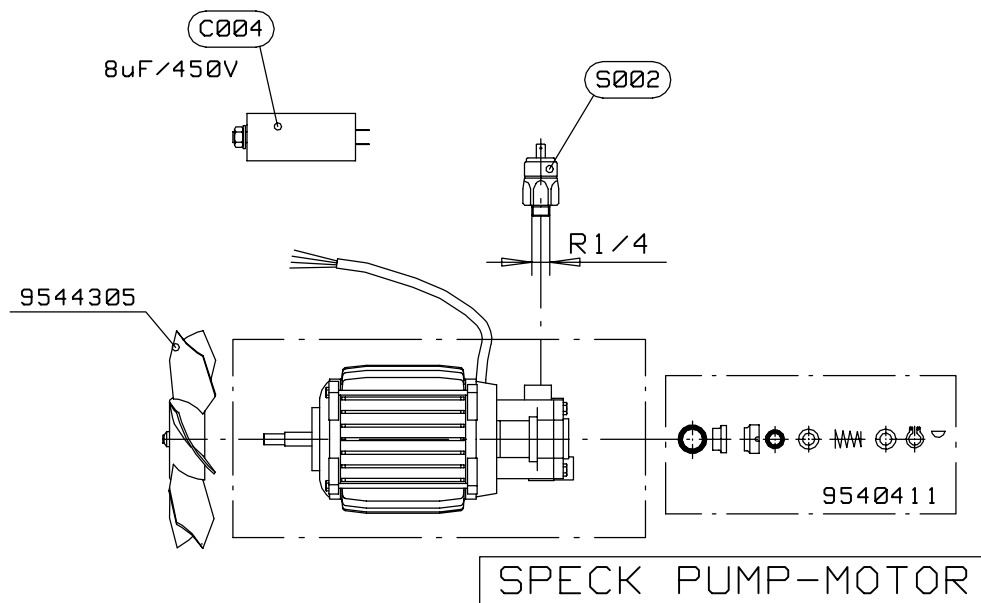


MASTERTIG ACDC 3500W

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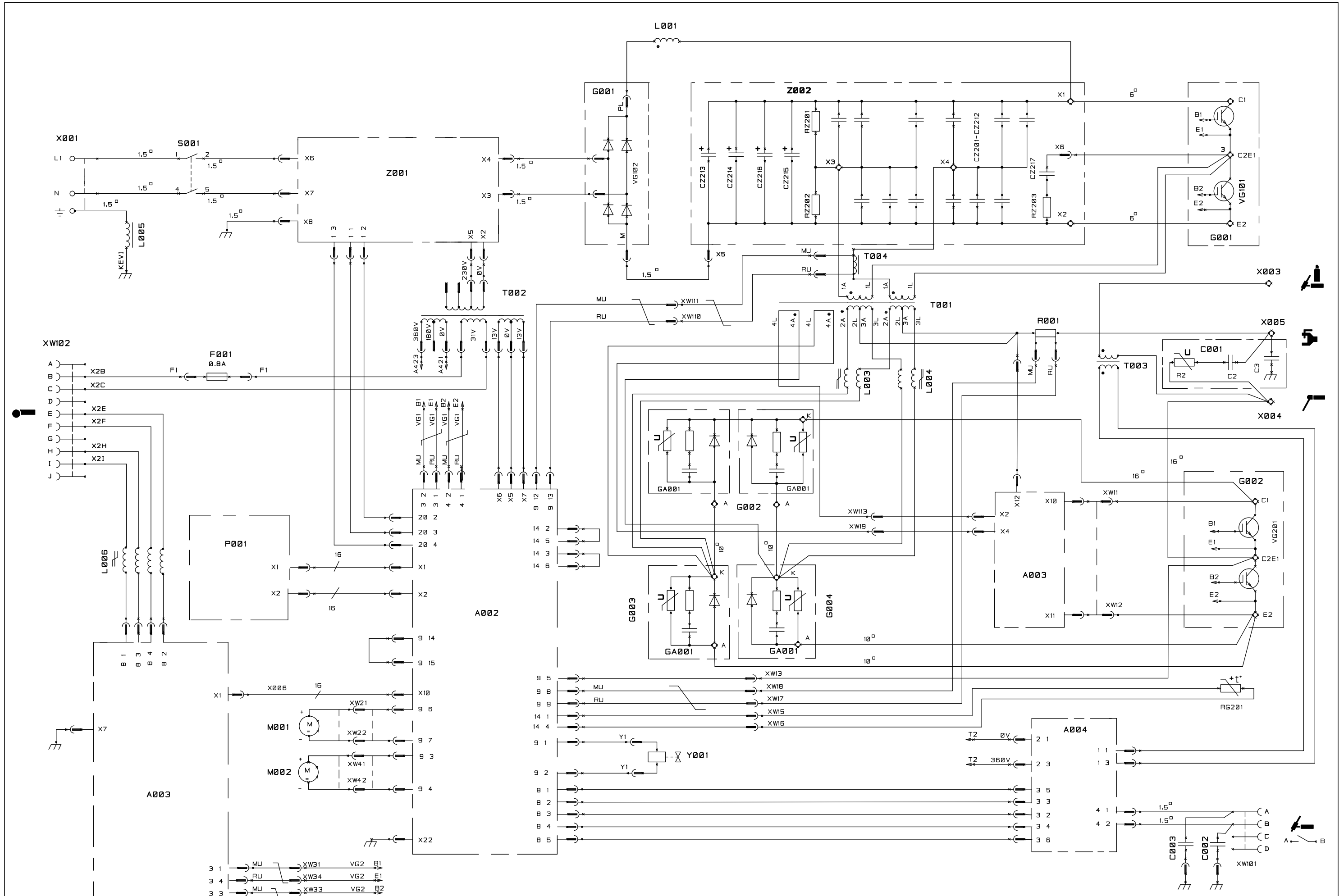
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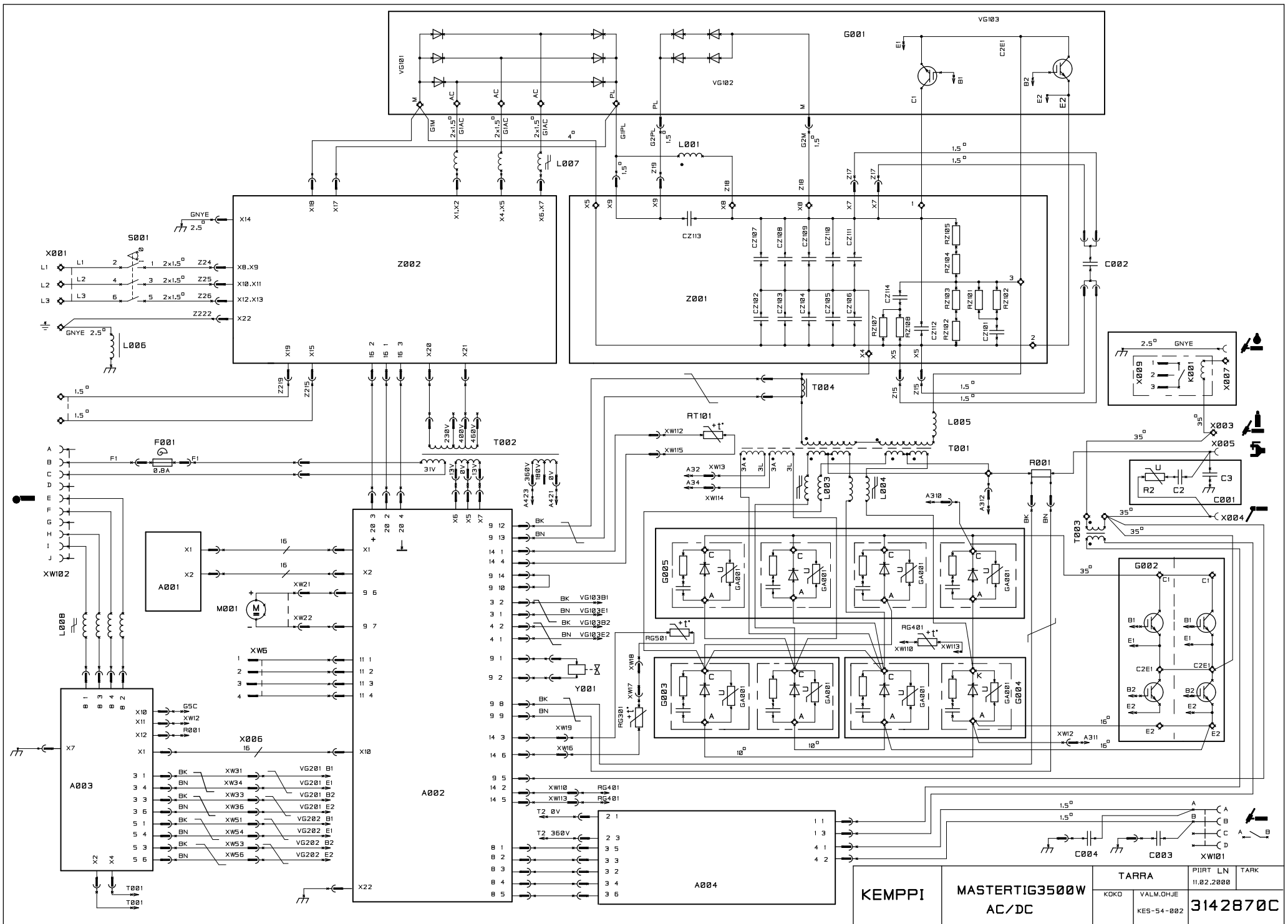


Order no.	Part	Description	Pc.
4295710	A002	CONTROL CARD A002 MASTERTIG AC/DC	1
4277540	A003	CONTROL CARD MAS.TIG AC/DC A003	1
4280540	A004	CONTROL CARD MAS.TIG AC/DC A004	1
4279500	A005	CONTROL CARD A002 KWELD 4000W	1
4283150	C001	CAPACITOR C001 AC/DC	1
9755268	C002	SMOOTHING CAPASITOR 25UF/700VDC	1
9755223	C004	CAPACITOR 8UF/450V AC	1
9772516	F001	FUSE 0,8A DELAYED 5 X 20	1
9772520	F002	FUSE DELAYED 2A 5X20	2
9772551	F002	FUSE BOX + NUT	2
2067020	G001	PRIMARY UNIT MTIG2500 3J ACDC	1
4286780	VG101	SPARE PART IGBT 2 X 200A	1
9750126	VG102	DIODE BRIDGE	1
9750174	VG103	RECTIFIER UNIT	1
2069290	G002	SECONDARY UNIT MTIG 3500W ACDC	1
4288750	VG201	IGBT, SECONDARY MTIG 3500W ACDC	2
3142530	G003	SECONDARY UNIT MTIG 3500W ACDC	2
3142560	G005	SECONDARY UNIT MTIG 3500W ACDC	1
4281520	GA001	DIODE CARD	8
9755118	C101	CAPACITOR 4.7 NF/1000V	1
9753592	R101	VARISTOR 250V 20 MM	1
9753161	R102	RESISTOR 100R 5W	1
4268440	RG003	PTC RESISTOR +90 C	3
9775731	H001	SIGNAL LAMP RED	1
9775729	H002	SIGNAL LAMP YELLOW	1
4249080	K001	REED RELAY	1
3137401	L001	PRIMARY CHOKE MTIG 3500W ACDC	1
9777115	L003	FERRITE RING 25/15 X 10	4
9777121	L005	FERRITE CORE U57/28/16	2
4288500	L006	FERRITE CHOKE	1
9544214	M001	COOLING FAN MASTER 2800/3500	1
3138320	M003	PUMP-MOTOR COMB. SIMACO	1
9544306	M003	COOLING FAN WING SIMACO	1
9544305	M003	COOLING FAN WING SPECK	1
9540415	M003	REPAIR SET FOR PUMP SIMACO	1
9540411	M003	REPAIR SET FOR PUMP SPECK	1
4260200	R001	SHUNT RESISTOR MASTER 1500/2200	1
9761375	SW301	LEVER SWITCH	1
9761323	SW302	CHANGE OVER SWITCH	1
976050201	S001	MAIN SWITCH K60/12 D22,5	1
9761622	S002	PRESSURE SWITCH	1
2069320	T001	MAIN TRANSFORMER MTIG 3500W ACDC	1
4288330	RT101	PTC RESISTOR +140 C	1
9777825	T002	AUXILIARY TRANSFORM.	1
2062420	T003	SPARK TRANSFORMER MASTERTIG 2800/3500	1
9777537	T004	CURRENT TRANSFORMER 1:250 PRO	1
3143110	T005	AUXIL. TRANSFORMER MTIG 3500W ACDC	1
9770105	XW101	CONTROL CONNECT. 4 POLES, FEMALE	1
9770116	XW102	MACHINE SOCKET	1
9771530	X003	MACHINE SOCKET 50/70	1
4219610	X004	CONIC HOSE COUPLING R1/4-6ML	2
9771530	X005	MACHINE SOCKET 50/70	1
4262810	X006	FLAT CABLE L=175	1
4292790	X007	CURRENT/WATER CONN. R3/8"/R1/4"	1
9563002	Y001	SOLENOID VALVE	1
4288230	Z001	MAIN CIRCUIT CARD MTIG 3500W ACDC	1
4288240	Z002	PRIMARY FILTER CARD MTIG3500W ACDC	1
4282300	001	RUBBER	8
9480207	002	CUP SPRING 12.5X6.2X0.7	32
4282030	003	STRAINING BEAM	4

Order no.	Part	Description	Pc.
9433068	004	SLOT-HEADED SCREW M6X25	8
3134270	005	HOSE CONNECTOR R1/8-M12	1
9568911	005	HOSE CONNECTOR R1/8-5ML	1
9377200	006	HOSE CLAMP	1
9370182	007	PLASTIC HOSE 5/8 BLUE	0,25
2067100	008	FOOT	4
2067120	009	HANDLE MTIG 1600/2500 AC/DC	2
4280930	010	HANDLE MTIG 2500 ACDC	1
2067130	011	PROTECTIVE COVER MTIG 1600/2500 AC/DC	1
3139460	012	PLASTIC PIECE	3
4296190	013	STICKER MASTERTIG AC/DC	2
4282950	014	STICKER GAS/WATER ACDC	1
2069050	015	SIDE PLATE LEFT MTIG 3500W ACDC	1
2069060	016	SIDE PLATE RIGHT MTIG 3500W ACDC	1
2067080	017	COVER MTIG2500,3500W ACDC	1
2069370	018	SIDE PLATE LEFT MTIG2500W,3500WACDC	1
2067360	019	SIDE PLATE RIGHT MTIG2500W,3500WACDC	1
9592126	020	WATER TANK	1
9581005	021	HEAT EXCHANGER 220X225 SIMACO	1
4257910	022	CONIC HOSE COUPLING R3/8-1/2 KL	1
9761302	023	PROTECTION SWITCHES'LEVER	2
3130180	024	FOOT T/6	11
4280560	025	FAST.PC F COOL.PROF.	2
9373216	026	RUBBER HOSE 13 MM	2,46
9373215	027	RUBBER HOSE 10/17 MM	0,68
9377130	028	HOSE CLAMP 13-20 MM	8
3142870		CIRCUIT DIAGRAM MTIG 3500W AC/DC	1
3140370		CIRCUIT DIAGRAM MTIG-W AC/DC	1
9770450		FEMALE CONTACT BODY 2 POLES	1
9770452		FEMALE CONTACT BODY 6 POLES	3
9770454		FEMALE CONTACT BODY 15 POLES	1
9770456		PLUG 2 POLES	1
9770457		PLUG 3-POLES	3
9770458		PLUG 6 POLES	8
9770460		PLUG 15 POLES	2
9770462		CONTACT , MALE	25
9770464		CONTACT, FEMALE	73

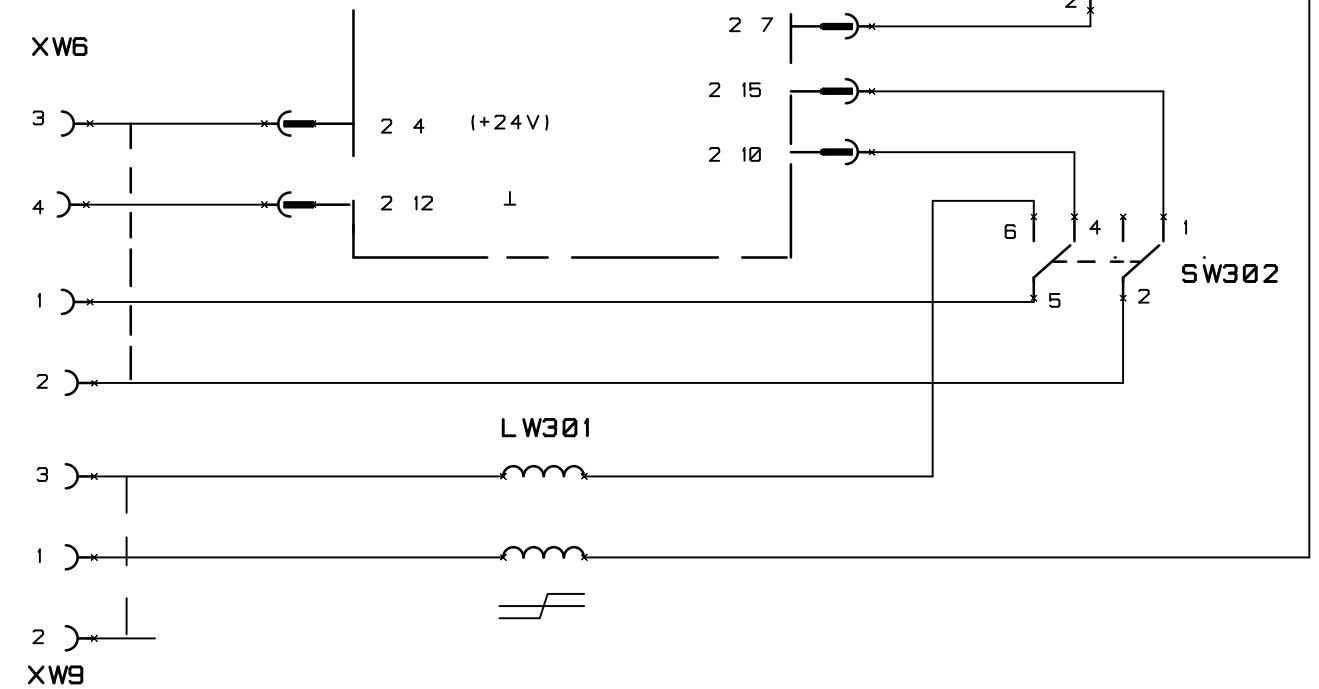
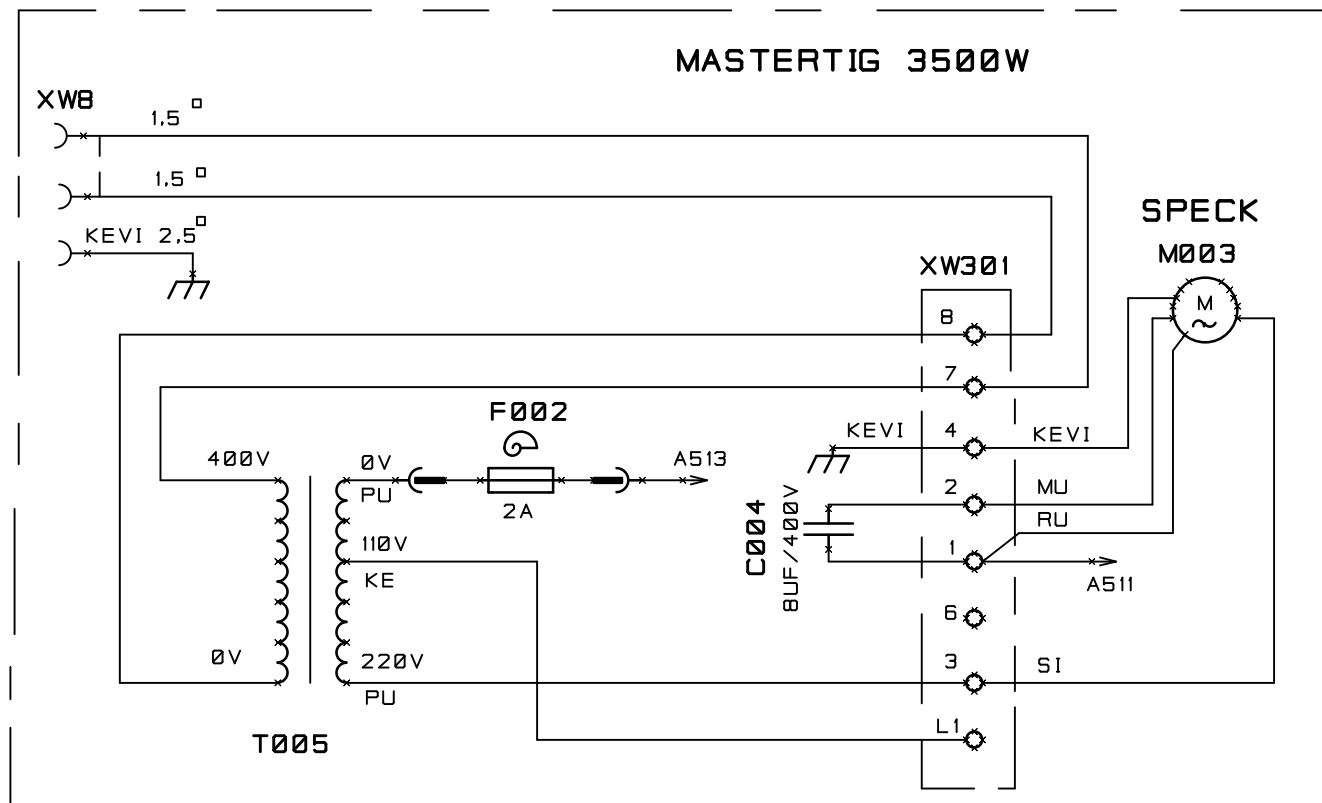
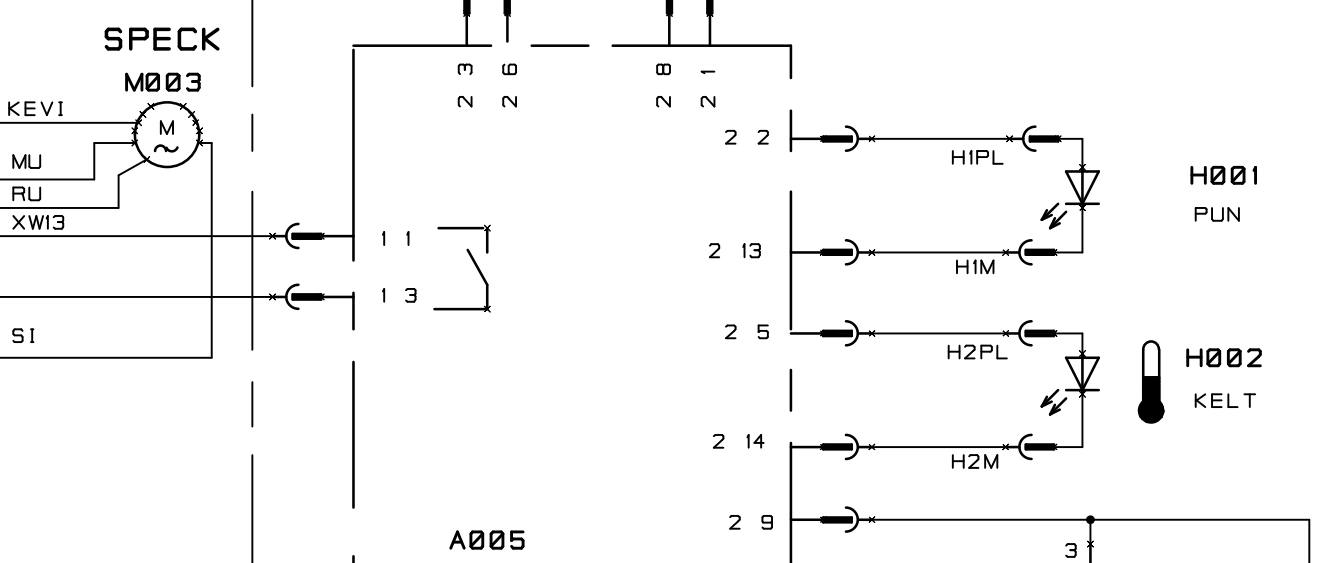
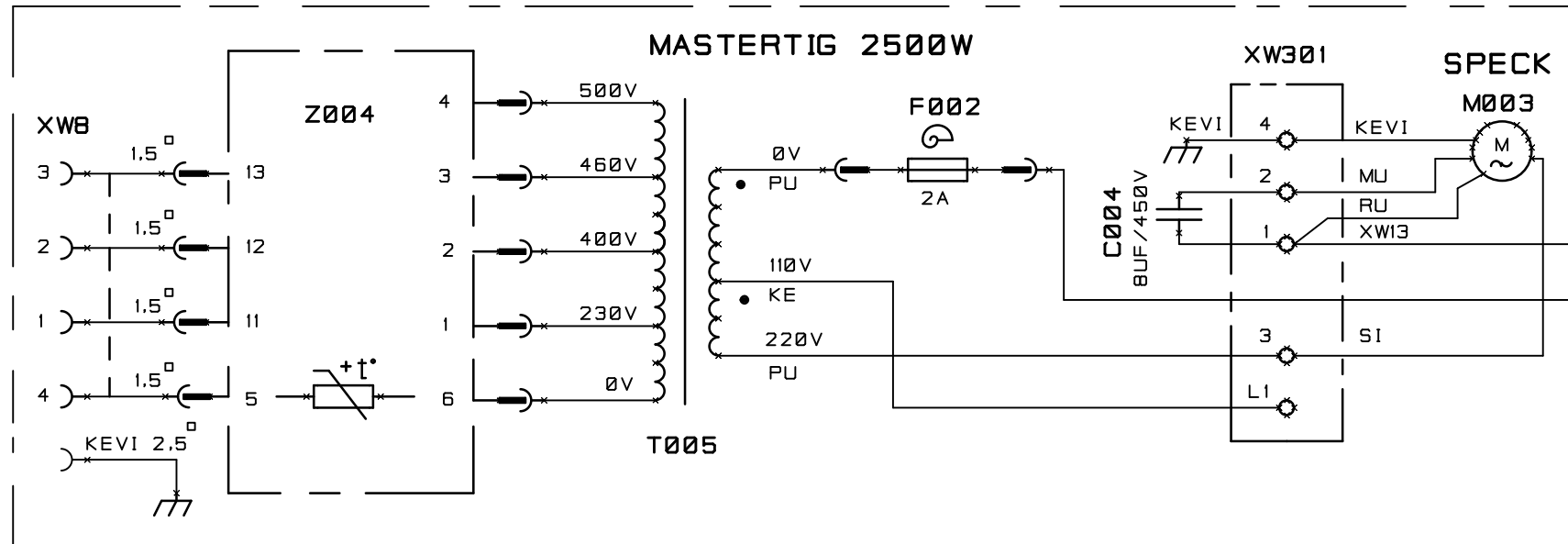
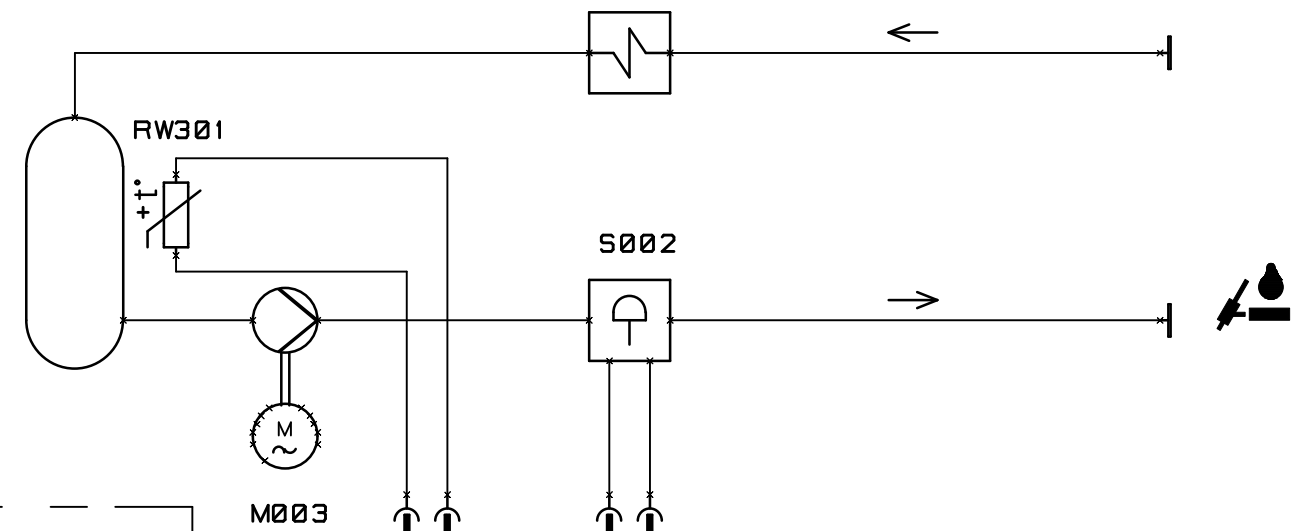
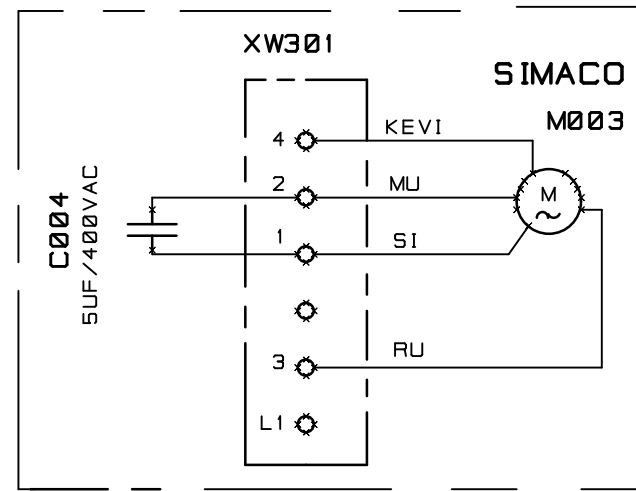


KEMPPI	MASTERTIG AC/DC 1600	TARRA		PIIRT LN	TARK
		KOKO	VALM.OHJE	11.02.2000	
		KES-54-002		3140350D	

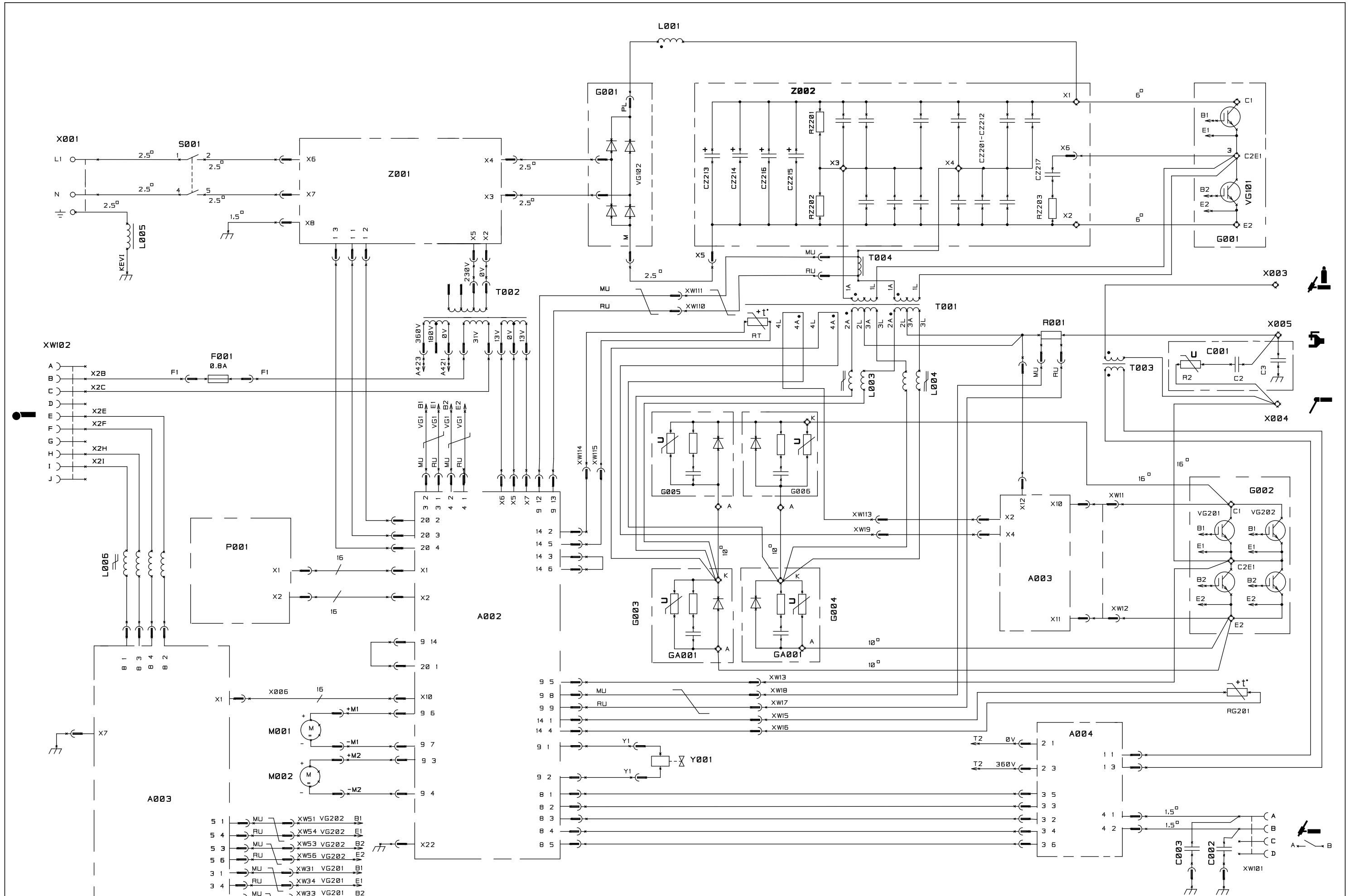


KEMPPPI	MASTERTIG3500W AC/DC	TARRA		PIJRT LN	TARK
		KOKO	VALM.OHJE	11.02.2000	
		KES-54-002		3142870C	

Johdinvarit Ledningsfarger		Conductor colours Leitungsfarbe	
ru	brun	brown	braun
si	bla	blue	blau
mu	svar t	black	schwarz
pu	rod	red	rot
ke	gul	yellow	gelb
vi	grön	green	grün
ha	gra	grey	grau
kevi	gul-grön	yellow-green	grün-gelb



KEMPPI	MASTERTIG AC/DC JÄÄHDYTYSLAITE	TARRA		PIIRT LN	TARK
		KOKO	VALM.OHJE	11.02.2000	
			KES-54-002	3140370C	



KEMPPI	MASTERTIG AC/DC 2000	TARRA		PIIRT RP	TARK
		KOKO	VALM.OHJE	03.05.2002	
		KES-54-002		3149110	