



Transtig DC 250i

SERVICE MANUAL

Note:

For information on DC 250i refer to LTN 255

READ THIS FIRST

Maintenance and repair work should be performed by an experienced person, and electrical work only by a trained electrician. Use only recommended replacement parts.

This service manual is intended for use by technicians with electrical/electronic training for help in connection with fault-tracing and repair.

Use the connection diagram as a form of index for the description of operation. The circuit board is divided into numbered blocks, which are described individually in more detail in the description of operation. All component names in the connection diagram are listed in the component description.

This manual contains details of all design changes that have been made up to and including October 2000.

The LTN 255 is designed and tested in accordance with international and European standard IEC/EN 60974-1 and EN 50199.
On completion of service or repair work, it is the responsibility of the person(s) etc. performing the work to ensure that the product does not depart from the requirements of the above standard.



WARNING



ARC WELDING AND CUTTING CAN BE INJURIOUS TO YOURSELF AND OTHERS. TAKE PRECAUTIONS WHEN WELDING. ASK FOR YOUR EMPLOYER'S SAFETY PRACTICES WHICH SHOULD BE BASED ON MANUFACTURERS' HAZARD DATA.

ELECTRIC SHOCK - Can kill

- Install and earth the welding unit in accordance with applicable standards.
- Do not touch live electrical parts or electrodes with bare skin, wet gloves or wet clothing.
- Insulate yourself from earth and the workpiece.
- Ensure your working stance is safe.

FUMES AND GASES - Can be dangerous to health

- Keep your head out of the fumes.
- Use ventilation, extraction at the arc, or both, to keep fumes and gases from your breathing zone and the general area.

ARC RAYS - Can injure eyes and burn skin.

- Protect your eyes and body. Use the correct welding screen and filter lens and wear protective clothing.
- Protect bystanders with suitable screens or curtains.

FIRE HAZARD

- Sparks (spatter) can cause fire. Make sure therefore that there are no inflammable materials nearby.

NOISE - Excessive noise can damage hearing

- Protect your ears. Use ear defenders or other hearing protection.
- Warn bystanders of the risk.

MALFUNCTION - Call for expert assistance in the event of malfunction.

READ AND UNDERSTAND THE INSTRUCTION MANUAL BEFORE INSTALLING OR OPERATING.

PROTECT YOURSELF AND OTHERS!

COMPONENT DESCRIPTION

This component description refers to the connection diagram on page 8.

The LTN 255 is a primary-switched power unit, using parallel-connected MOSFET-transistors as the switching elements. The switching frequency is 48.5 kHz. The conducting interval varies between zero and 9.5 μ s, depending on the welding current output. The conducting time and frequency are controlled by circuit board AP01.



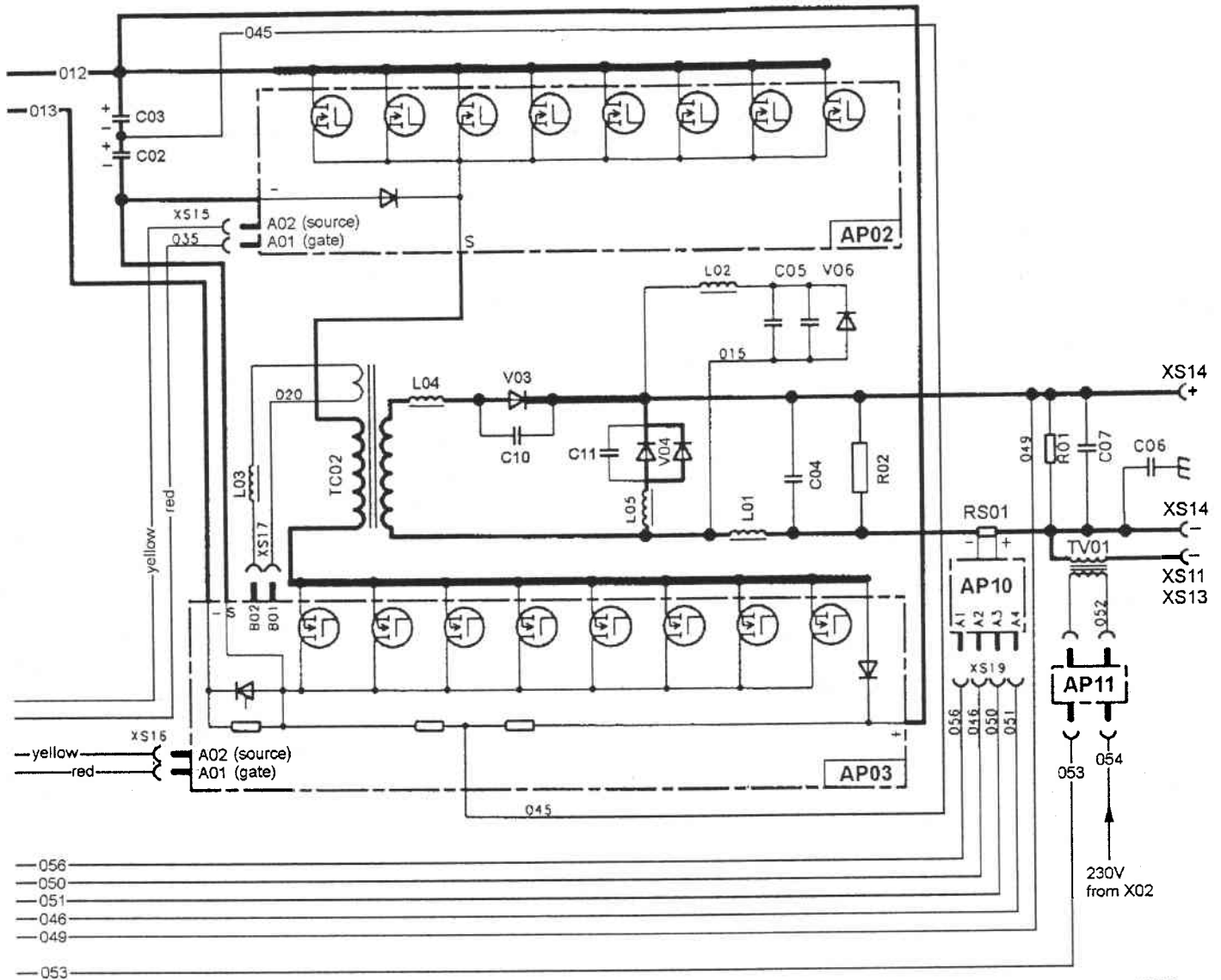
WARNING !

STATIC ELECTRICITY can damage circuit boards and electronic components.

- Observe precautions for handling electrostatic sensitive devices.
- Use proper static-proof bags and boxes.

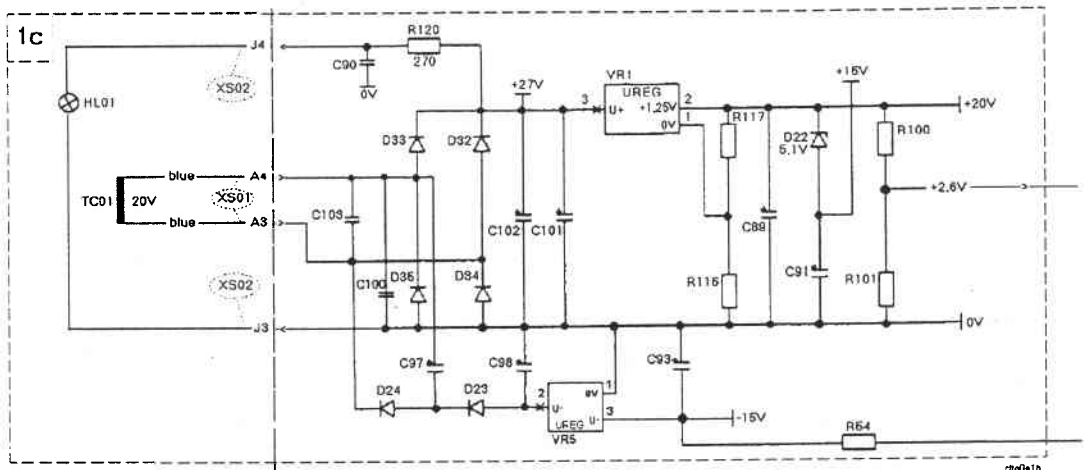
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| AP01 | The main circuit board with control electronics. See description on page 10. |
| AP02 | Circuit board with power transistors for the positive pole, see description on page 22. WARNING! the transistors are connected to mains voltage potential. |
| AP03 | Circuit board with power transistors for the negative pole, see description on page 24. WARNING! the transistors are connected to mains voltage potential. |
| AP05 | Circuit board control panel. The circuit diagram is shown on page 28. |
| AP06 | Display driver board with pulse generator. The circuit diagram is shown on page 30. |
| AP07 | Interference suppression circuit board: see the circuit diagram on page 31. |
| AP08 | Interference suppression circuit board. Prevents mains-borne interference. The circuit diagram is shown on page 32. |
| AP09 | Interference suppression circuit board, remote control connector, see the diagram on page 33. |
| AP10 | Circuit board shunt amplifier, see description on page 13. |
| AP11 | HF generator. |
| C01 | Capacitor, 0.1 μ F, 1000V DC, transient protection. |
| C02, C03 | Capacitors, 1000 μ F, buffer/smoothing capacitors. Time to discharge after turning off the unit: about two minutes. |
| C04 | Decoupling capacitor, 0.1 μ F, 1000V DC, protects against HF. |

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| V03, V04 | Rectifier and freewheel diodes. V03 rectifies the welding current. During the time interval between two voltage pulses from transformer TC02, the freewheel diodes V04 maintain the welding current from inductor L01. On the cooling fins three diode modules are mounted. Each diode module consists of two diodes. If one module is broken all modules have to be replaced. For installation instructions, see page 36. |
| V05 | LED, yellow. Lights when thermal cutout ST01 operates (breaks) as a result of high temperature. |
| V06 | Diode, see L02. |
| X01 - X03 | Terminal block. |
| XP01 | Pin connector with jumper. Connected when the machine is used without water cooler. |
| XS . . | Sleeve connectors. |
| XS04 | 26-pole ribbon cable connector. |
| XS10 | 12-pole Burndy contact, for connection of remote control unit. |
| XS11 | TIG central connector: only LTN 255 variant -894. |
| XS12 | 2-pole Cannon connector, only LTN 255 variant -895. |
| XS13 | Welding current connector, OKC, only LTN 255 variant -895. |
| XS14 | Welding current terminals, (two), OKC type. |
| XS20 | 26-pole connector for ribbon cable. |
| XS24 | Connection for 400V to water cooler. (The water cooler is an accessory, which is mounted under the machine.) |
| XS25 | Connection for water flow guard. |
| YV01 | Solenoid valve. |



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| 1 POWER SUPPLY | 8 GAS VALVE |
| 2 POWER SUPPLY MONITORING | 9 MACHINE TYPE SELECTION |
| 3 START/STOP INPUT | 10 THERMAL OVERLOAD SWITCH |
| 4 REMOTE CONTROL INPUT | 11 WELDING PROCESS CONTROL |
| 5 SHUNT INPUT WITH AMPLIFIER AP10 | 12 INTERFACE CIRCUITS FOR CONTROL PANEL |
| 6 ARC VOLTAGE SENSING | 13 PULSE WIDTH MODULATOR |
| 7 HF UNIT | 14 GATE CIRCUIT |



Voltage regulator VR1 produces an output voltage of $+20 \pm 1.0V$, which supplies the pulse width modulator output stage (Block 13).

Potential divider R100/R101 supplies 2.6V to the processor in Block 11. This provides a signal that the power supply is available.

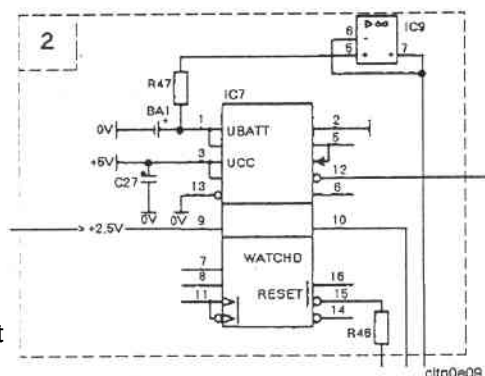
The +27V unregulated DC power supply to VR1 also supplies relay RE1 in Block 7 and indicating lamp HL01 via resistor R120.

Zener diode D22 drops the voltage to +15V, and this, together with the -15V supply, powers the analogue circuits. The processor monitors the -15V supply by a signal from resistor R54.

2 Power supply monitoring

IC7 and IC9 monitor the voltage of battery BA1. The nominal battery voltage is 3V. If it falls below 2.5V, the display shows error message E06. Battery life is about five years.

The machine also operates without battery, but data stored in the welding data memory, see page 46, disappears when the mains voltage is switched off. At power up default values will be read into the memory.



A voltage of about 2.5V is supplied to IC7, pin 9, from power supply circuit 1a. If this voltage drops below the threshold voltage of 1.3V, pin 10 of IC7 goes low, providing the processor with a low power supply voltage signal. The processor then generates a " — — — " warning signal in the display and stores current data.

If the +5V supply to pin 3 of IC7 drops below 4.65V, pin 15 goes low and inhibits the pulse width modulator in block 13. The processor receives a reset signal and data in the RAM memory is protected by the backup battery power supply.

Pin 2 of IC7 supplies the RAM memory in Block 11 with power, both when the machine is energised and when it is shut down.

When power to the machine is turned off, the display also shows " — — — " to confirm that the processor has stored the current data.