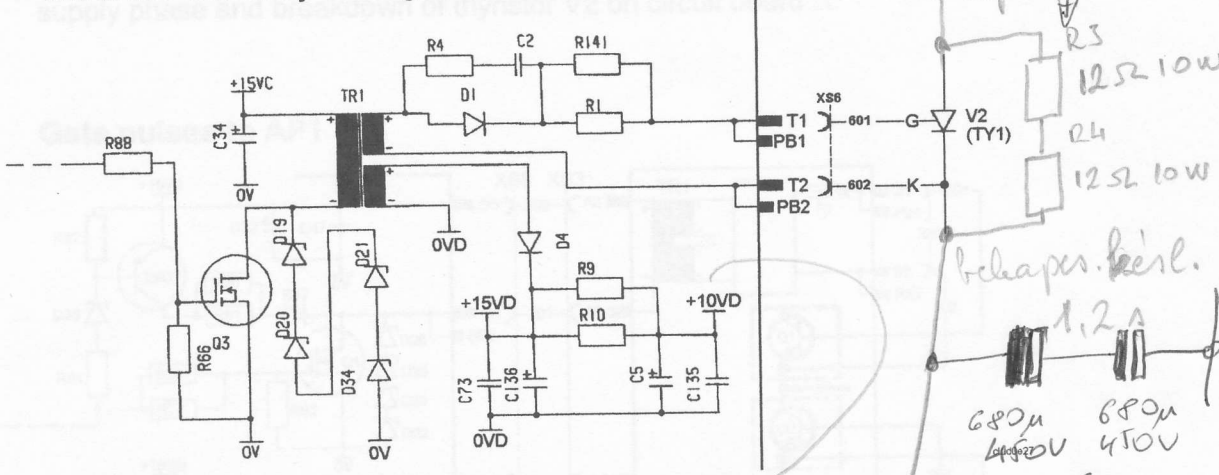


Overvoltage and Undervoltage protection

WARNING: MAINS VOLTAGES!

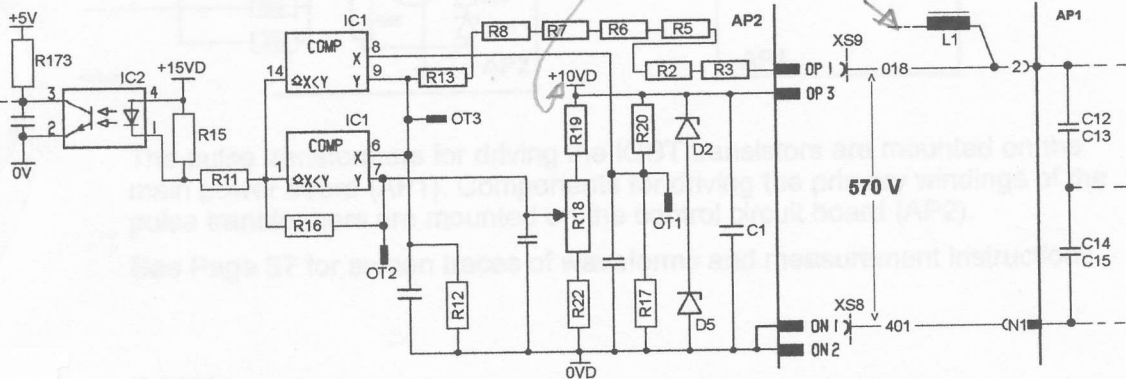
The overvoltage and undervoltage protection receives its power supply from one of the secondary windings on pulse transformer TR1.



+15VD power supply to overvoltage and undervoltage protection

The +10VD reference voltage is stabilised to 10.3V ± 5% by zener diodes D2 and D5.

Optocoupler IC2 provides galvanic isolation from the other electronic circuitry. See the circuit diagram below.



Overvoltage and undervoltage protection

The rectified mains voltage from the power source is connected to contacts OP1 (plus) and ON1 (minus). Through a potential divider, the voltage is applied to inputs 6 and 9 of comparator IC1.

If the voltage is above or below its limits, optocoupler IC2 is activated by IC1, and its output turns off the gate pulses to the IGBT transistors. The setting unit displays fault code 5 (= +DC voltage outside limits).

Overvoltage protection

The voltage at IC1:6 is compared with a reference voltage at IC1:7, set at about 3.15V, which is equivalent to a voltage of 680V across the power source. If the overvoltage protection has operated, the voltage must be reduced below 670V to allow the gate pulses to restart.

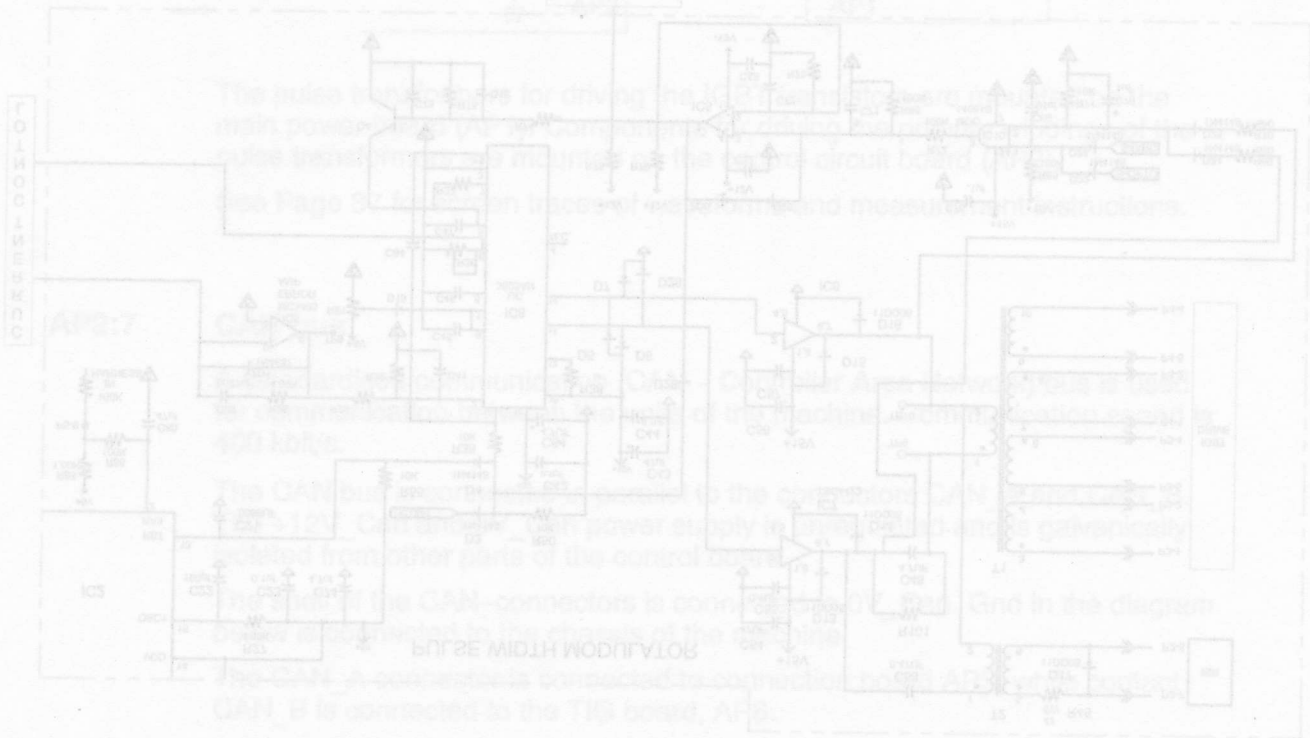
Undervoltage protection

The voltage at IC1:9 is compared with a reference voltage at IC1:8. Its value is $1.5V \pm 0.1V$, which is equivalent to a voltage of 320V across the power source. The undervoltage protection resets when the voltage rises above 320V.

The undervoltage protection protects among other things against loss of a supply phase and breakdown of thyristor V2 on circuit board

AP2:6

Gate pulse to AP1



GAN_B is connected to the TIS board, AP3.
Voltage regulator VR1 supplies a 5 V power supply to the GAN circuits on AP2.

These signals are then routed to the IGBT drive transformer T1 and to the SCR drive transformer T2. The output of IC1 is routed to IC2 and IC3 from pin 11 and 14 respectively. The frequency adjustment is set through pin 14 through the 20-amp resistor, then input to IC3 on pin 2. The IC has two adjustments, current control comes into the board on pin 14 (14) and is routed through IC3 on pin 14.