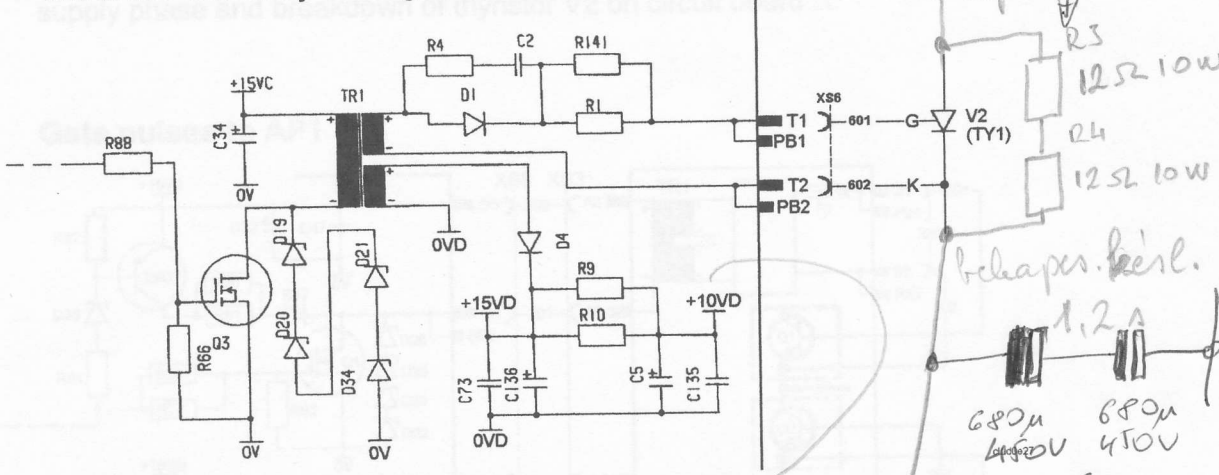# Overvoltage and Undervoltage protection
## WARNING: MAINS VOLTAGES!

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.
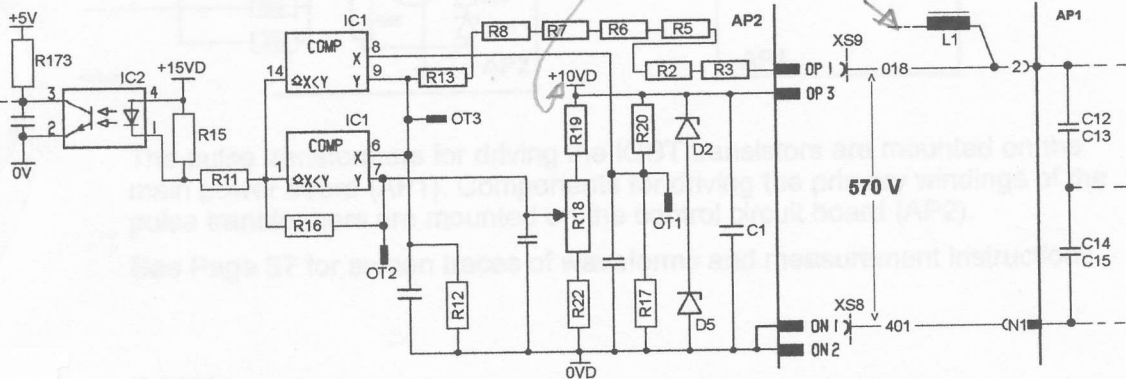
Overvoltage and undervoltage protection

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
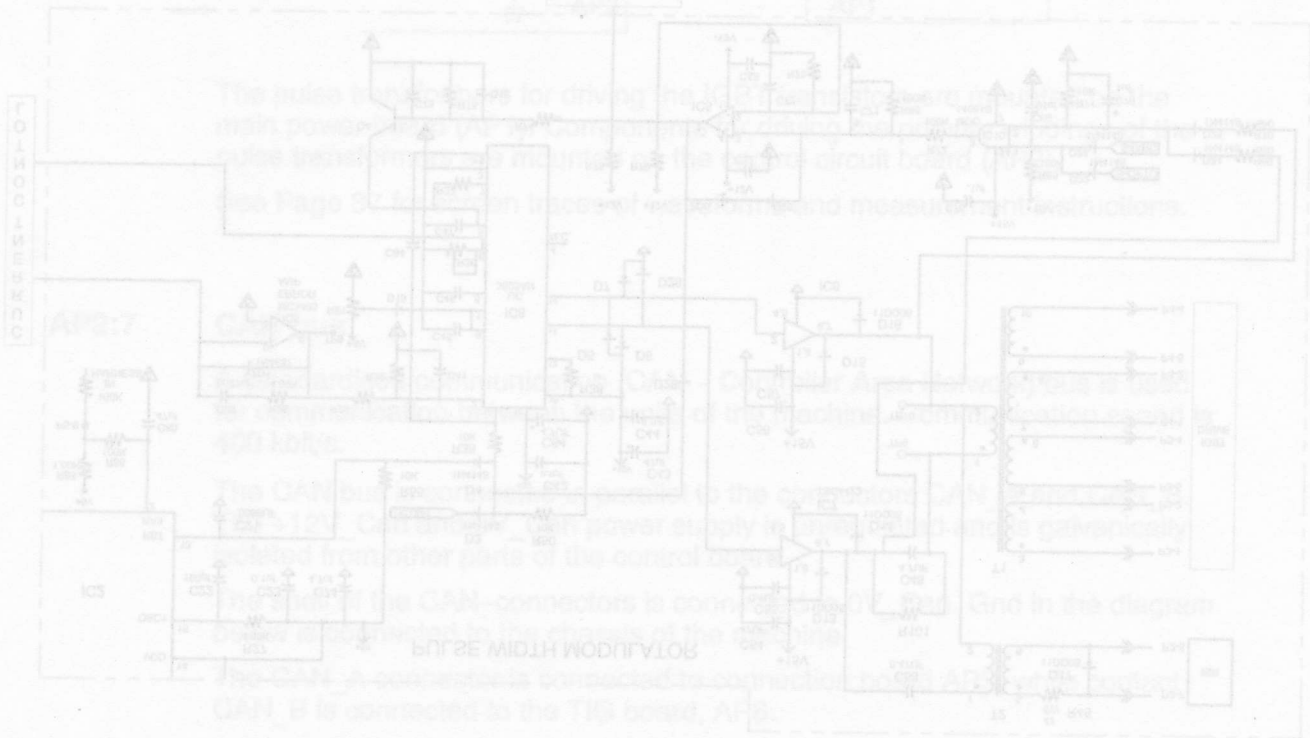670V to allow the gate pulses to restart.

Undervoltage protection

The voltage at IC1:9 is compared with a reference voltage at IC1:8. Its value is 1.5V ∓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