

## 5.6 POWER SUPPLY A6

### 5.6.1 Description A6

#### Diagram 1

Diagram 1 comprises the following circuit parts:

- input circuit
- converter circuit
- line trigger circuit

#### Input circuit

Input to the circuit is the mains voltage. The following voltages are allowed:

- AC voltage between 90 and 250 V
- Theoretically a DC voltage between 100 and 380 V can be applied.

The mains input is primarily protected by a slow acting 1.6 A fuse (1.6 AT), which is located on the rear of the instrument.

Inrush current limiting is provided by NTC resistor R1001.

By means of the capacitors C1002, C1003, C1004 and C1006, an input signal for the line trigger generator is made. The capacitors form a voltage divider. This functions only if the mains voltage is AC.

C1001, 1002, 1006, 1007 and L1001 are for interference suppression.

The mains voltage is rectified by V1001 through 1004 and smoothed by C1008 and C1009.

The output voltage from the rectifier at C1009 can be between 100 and 380 V.

**WARNING:** For measurements in the primary circuit, the use of an isolating transformer is strongly recommended. If no isolating transformer is used, all measurements in the primary circuit must be carried out with floating measuring instruments.

#### Converter circuit

The power supply is a multiple output flyback converter of the SOPS (Self Oscillating Power Supply) principle. Basically, the converter consists of a switch with control circuitry (transistor V1019) and a transformer (T1001).

The first switching-on of V1019 is initiated by a small current via R1007/R1008. When V1019 is ON, the control voltage of T1001 pin 18 to C1011 is positive and this keeps V1016 and V1019 ON. During the ON or FORWARD cycle, the current through the primary winding of T1001 increases linearly, and energy ( $0.5 LI^2$ ) is stored into this transformer. At about 2.5 A, this value is determined by the control circuit, thyristor V1014 is switched ON and due to this, V1019 is switched OFF. This is the beginning of the OFF or FLYBACK cycle. Now, the transformer voltages are reversed and the stored energy is transformed to the secondary windings. As long as the transformer is not fully demagnetized, the voltage from pin 18 to C1011 is negative and this will keep V1007, V1016 and V1019 switched OFF. As soon as the transformer demagnetizing has ended, this voltage becomes zero and so, a positive going voltage appears at C1011. Due to this, V1007, V1016 and V1019 are switched ON and the FORWARD cycle starts again.

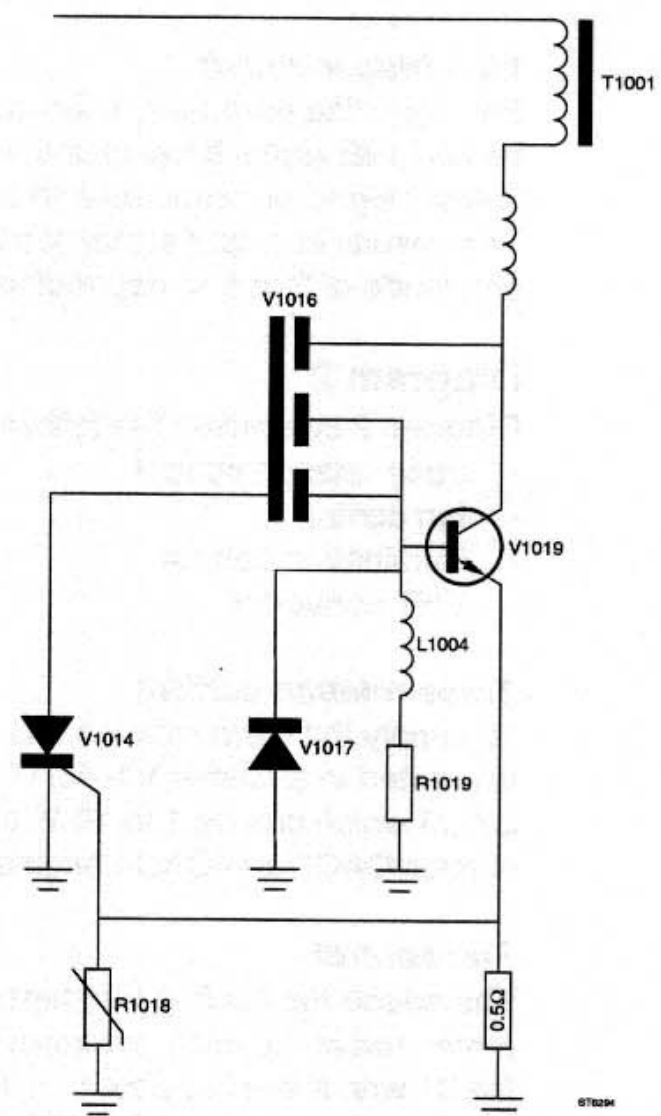


Figure 5.5 Converter circuit