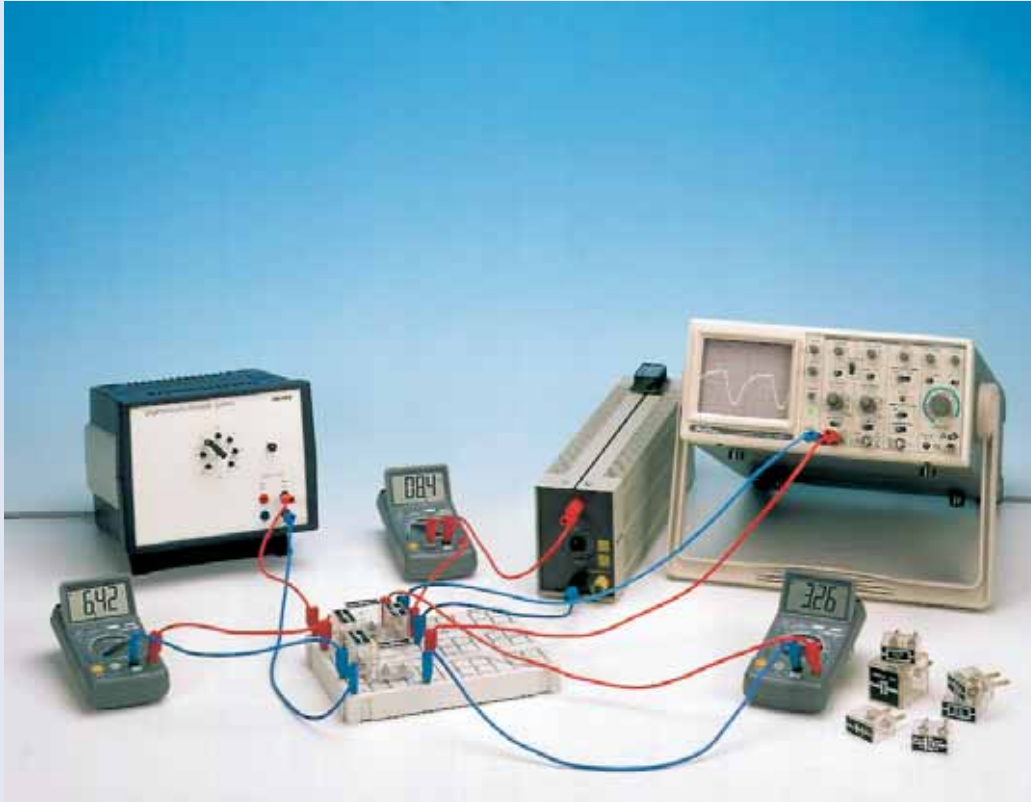


4.4.07-00 Rectifier circuits



What you can learn about ...

- Half-wave rectifier
- Full-wave rectifier
- Graetz rectifier
- Diode and Zener diode
- Avalanche effect
- Charging capacitor
- Ripple
- r.m.s. value
- Internal resistance
- Smoothing factor
- Ripple voltage
- Voltage stabilisation
- Voltage doubling

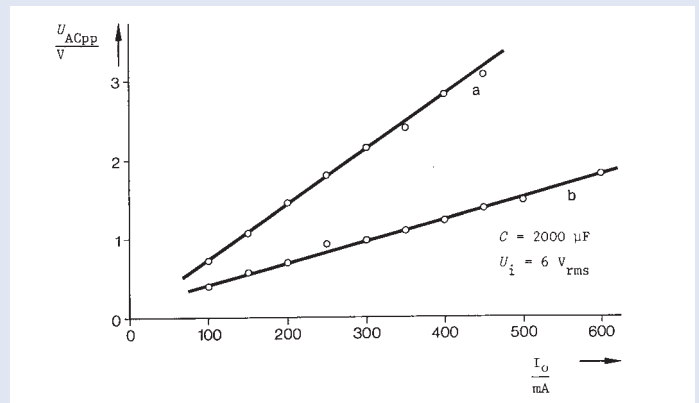
Principle:

The ripple of the output voltage of various rectifier circuits is measured as a function of the load current strength and the charging capacitance. The characteristics of a voltage stabilizer and of a multiplier are investigated.

What you need:

Plug-in board 4 mm plugs	06033.00	1
Silicon diode 1 N 4007, G1	39106.02	4
Electrolyte capacitors, G1, 470 μF	39105.26	1
Electrolyte capacitors G1, 10 μF	39105.28	4
Electrolyte capacitors, G2, 2200 μF	39113.08	1
Electrolyte capacitors G1, 1000 μF	06049.09	1
Carbon resistor 470 Ω , 1W, G1	39104.15	1
Carbon resistor 47 Ω , 1W, G1	39104.62	1
Siliziumdiode ZF 4.7, G1	39132.01	1
Multi-tap transformer with rectifier 14 VAC/12 VDC, 5 A	13533.93	1
Oscilloscope 30 MHz, 2 channels	11459.95	1
Digital multimeter 2010	07128.00	3
Rheostats, 330 Ω , 1.0 A	06116.02	1
Adapter, BNC plug/4 mm socket	07542.26	1
Connecting plug white 19 mm pitch	39170.00	3
Connecting cable, 4 mm plug, 32 A, red, $l = 25$ cm	07360.01	2
Connecting cable, 4 mm plug, 32 A, blue, $l = 25$ cm	07360.04	2
Connecting cable, 4 mm plug, 32 A, red, $l = 50$ cm	07361.01	4
Connecting cable, 4 mm plug, 32 A, blue, $l = 50$ cm	07361.04	4

Complete Equipment Set, Manual on CD-ROM included
Rectifier circuits P2440700



Ripple of the output voltage as a function of the charging current:
a) half-wave rectifier, b) bridge rectifier.

Tasks:

1. Using the half-wave rectifier:
 - a) to display the output voltage (without charging capacitor) on the oscilloscope
 - b) to measure the diode current I_D as a function of the output current strength I_o (with the charging capacitor)
 - c) to measure the ripple component U_{ACpp} of the output voltage as a function of the output current ($C = \text{constant}$)
 - d) to measure the ripple as a function of the capacitance ($I_o = \text{constant}$)
 - e) to measure the output voltage U_o as a function of the input voltage U_i ($I_o = 0$).
2. Using the bridge rectifier:
 - a) to display the output voltage (without charging capacitor) on the oscilloscope
 - b) to measure the current through one diode, I_D , as a function of the output current I_o (with the charging capacitor)
 - c) to measure the ripple of the output voltage as a function of the output current ($C = \text{constant}$)
 - d) to measure the ripple as a function of the capacitance ($I_o = \text{constant}$)
 - e) to measure the output voltage as a function of the input voltage.
3. To measure the voltage at the charging capacitor, U_C , and the output voltage of a stabilized voltage source as a function of the input voltage U_i .
4. To measure the output voltage of a voltage multiplier circuit as a function of the input voltage.