Thyristor

Elektronika
(TKE 4012)

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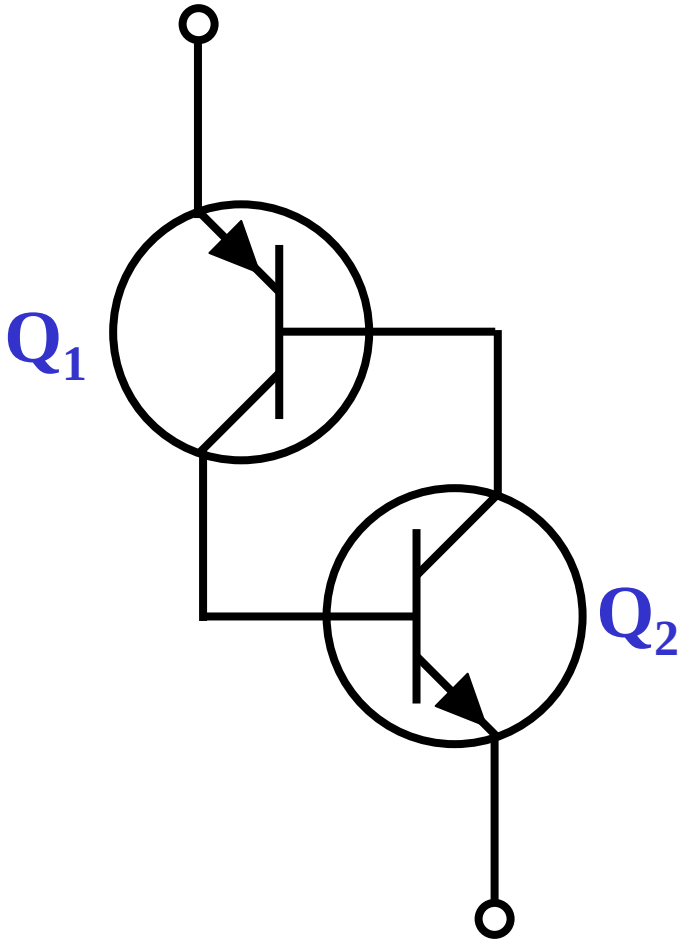
Thyristor

- **Thyristor**: devais semikonduktor solid state empat layer dari bahan type-n dan type-p yang berfungsi sebagai *Saklar Elektronik*

- **Jenis**: SCR, DIAC, TRIAC

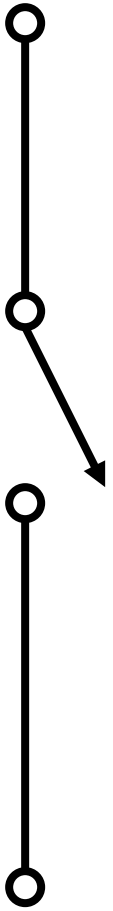
  photothyristor

This latch is stable in either of two states.



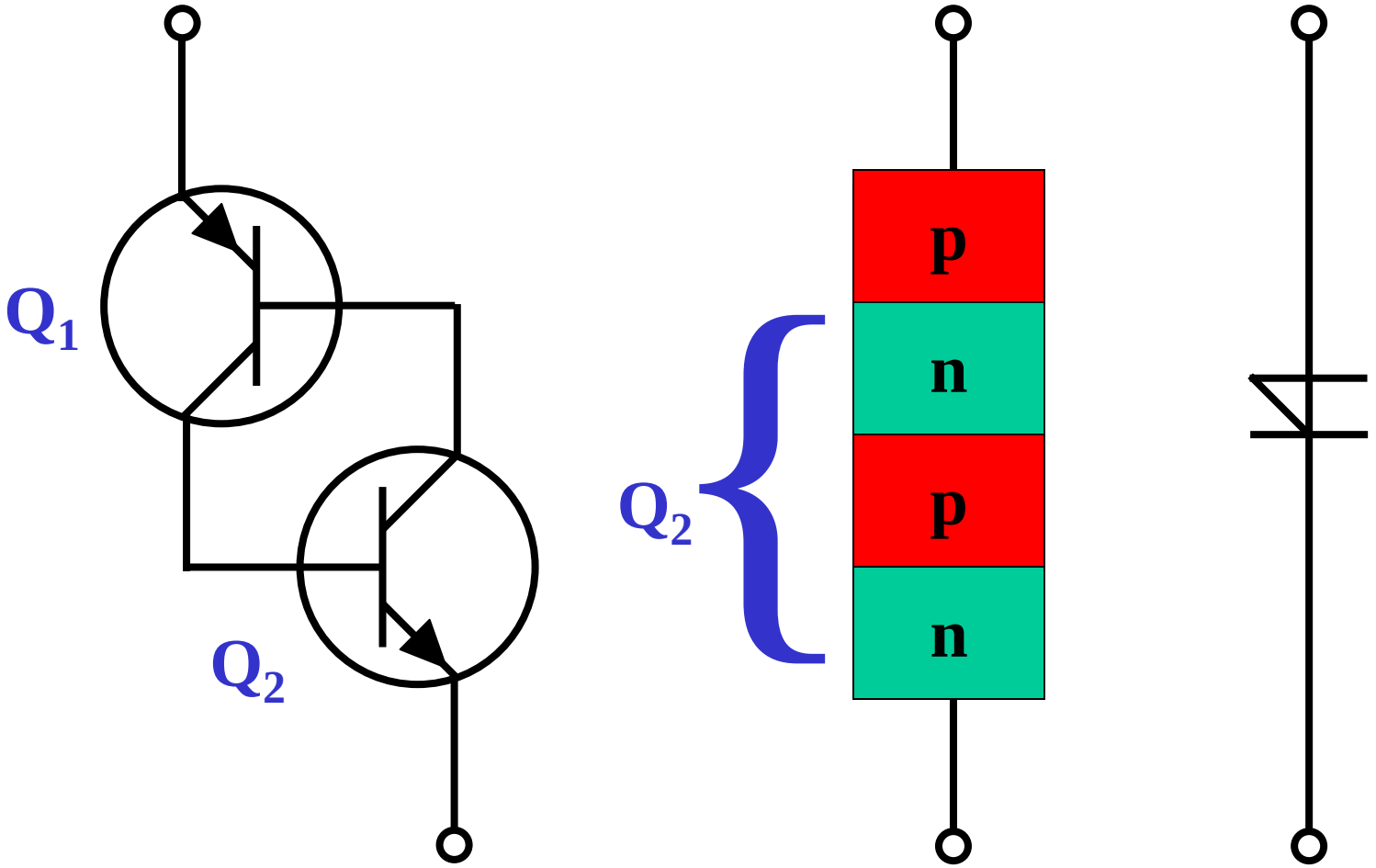
Latch

On state

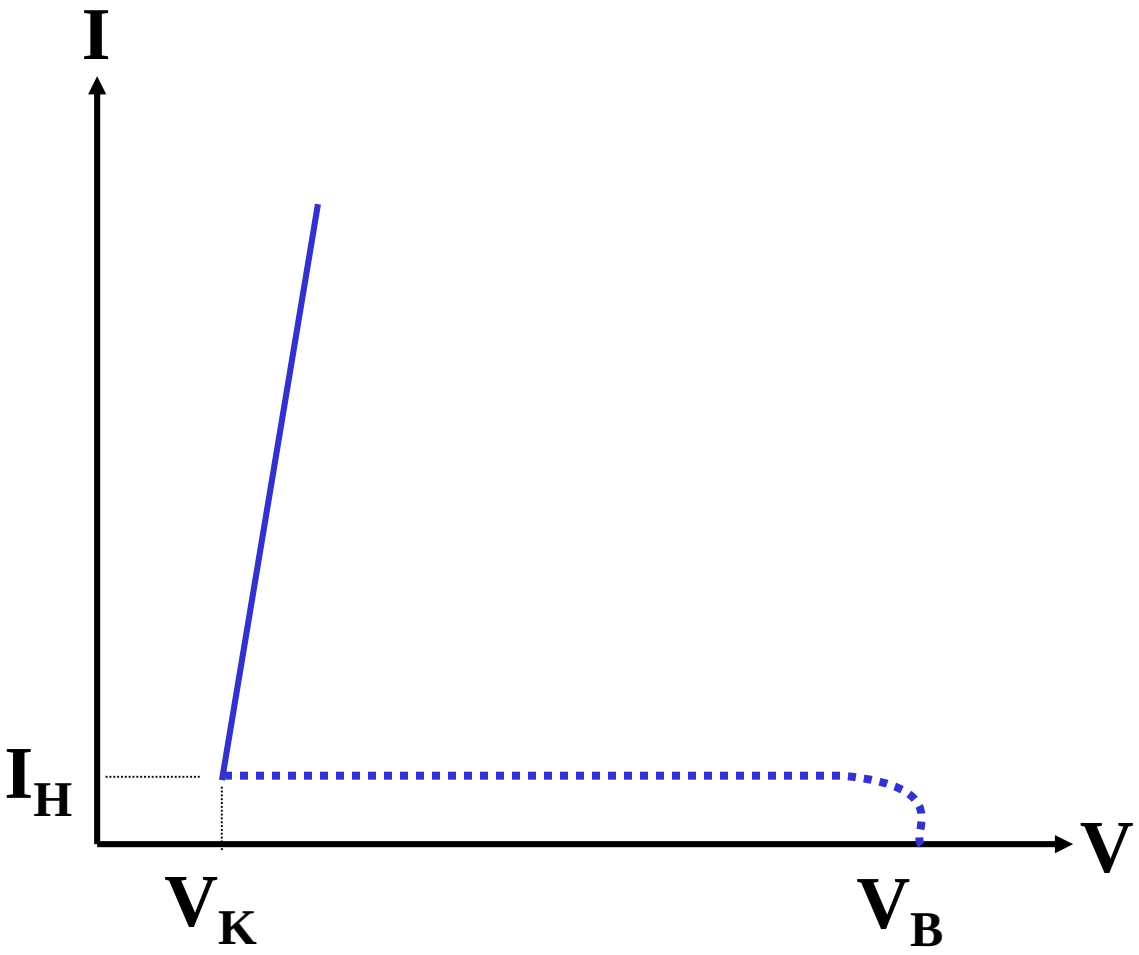


Off state

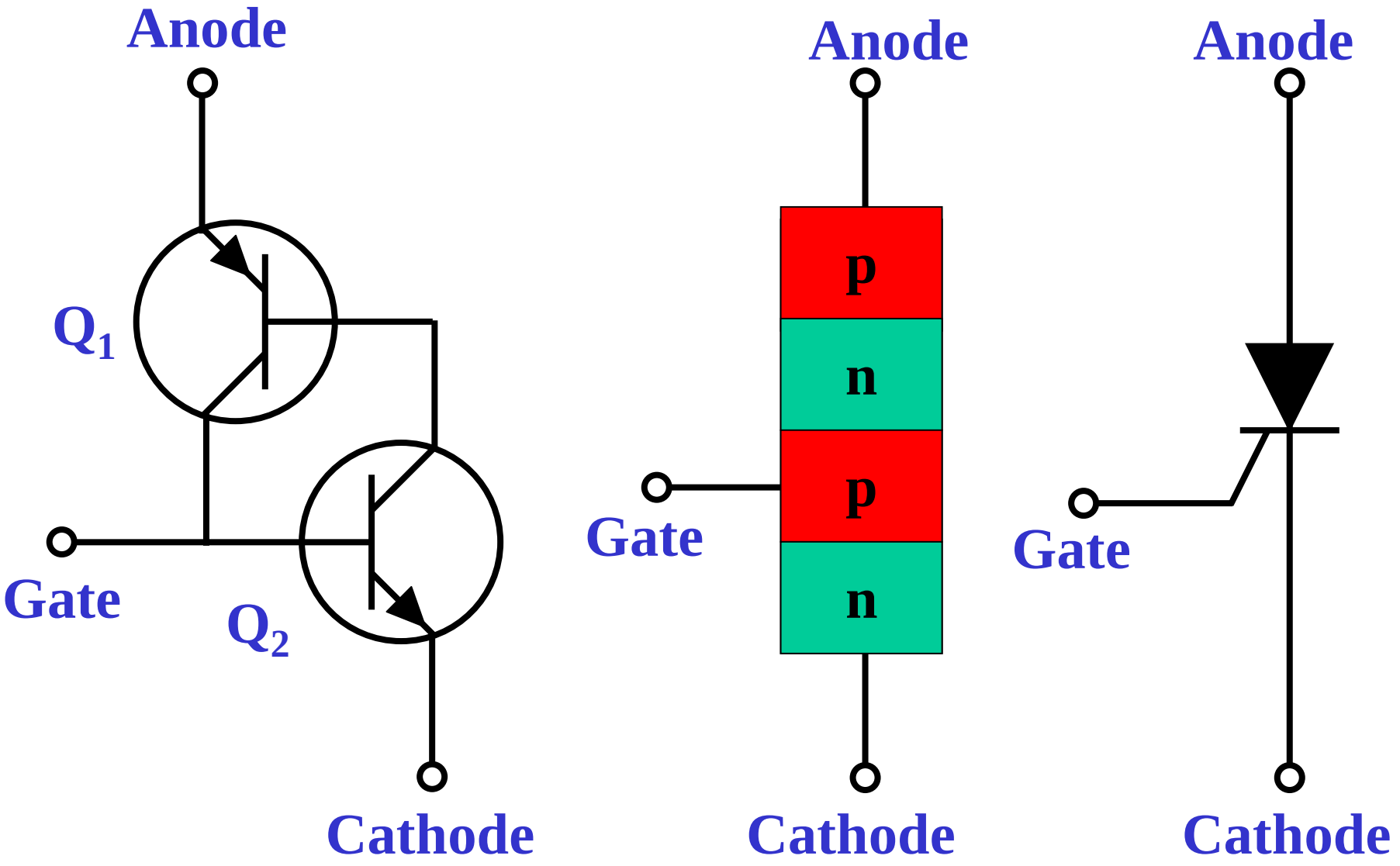
The four-layer diode



Four-layer diode breakover



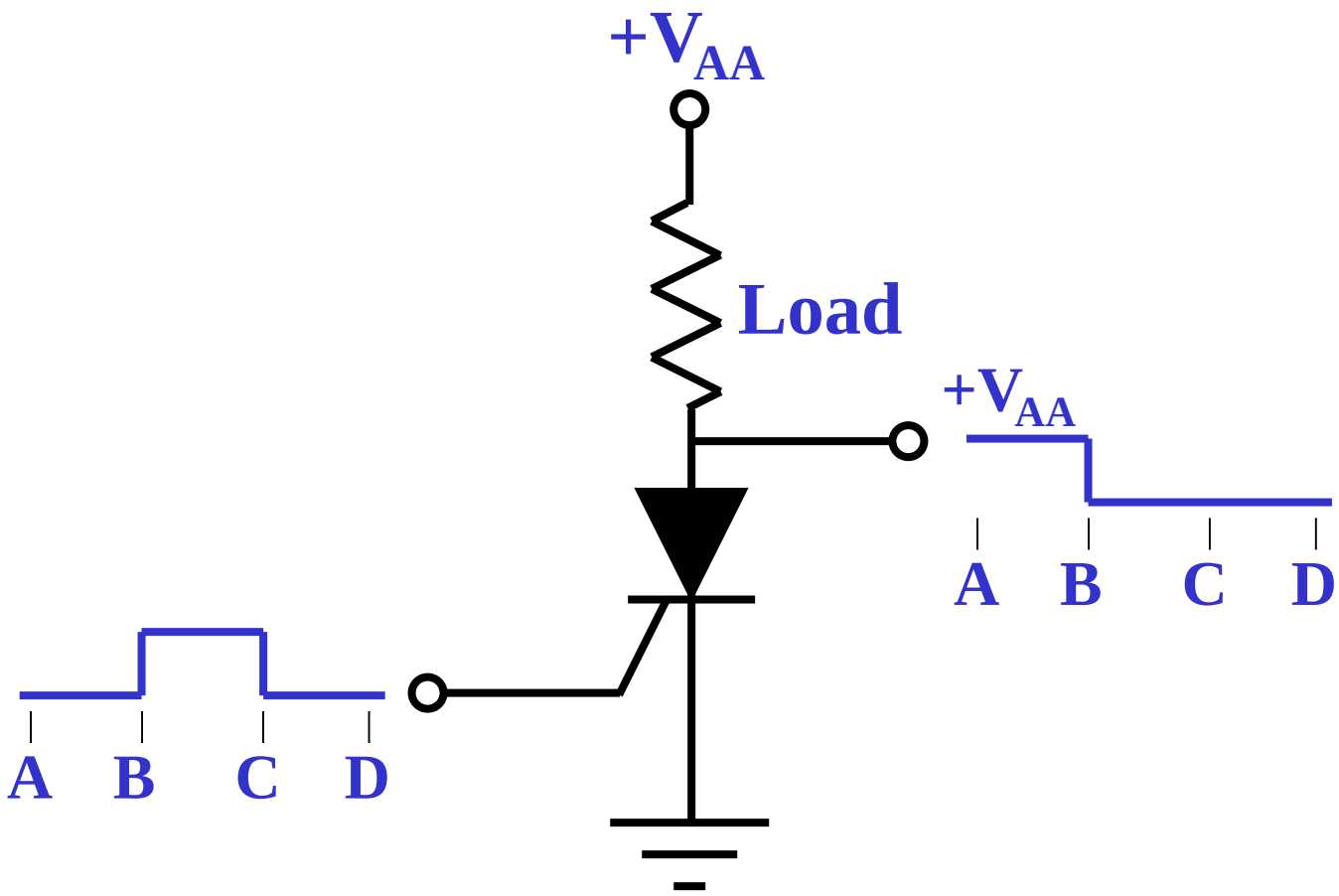
The silicon controlled rectifier (SCR)



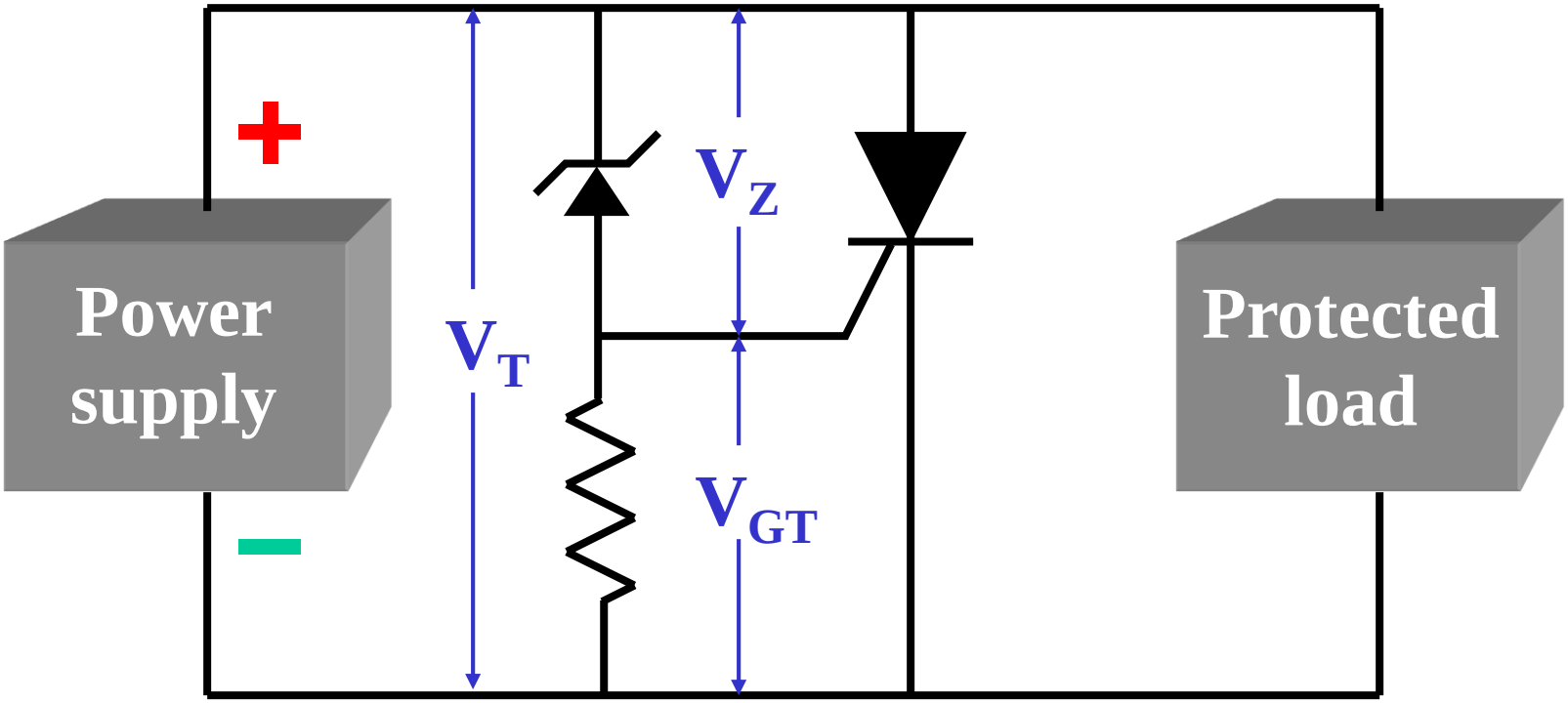
SCRs

- **The most widely used thyristors**
- **Use gate triggering for turn-on instead of breakover triggering**
- **Data sheets list the gate trigger voltage (V_{GT}) and the gate trigger current (I_{GT})**
- **Turn-off requires reducing the current to less than the holding current (I_H)**

An SCR does not turn off at the end of the trigger pulse.

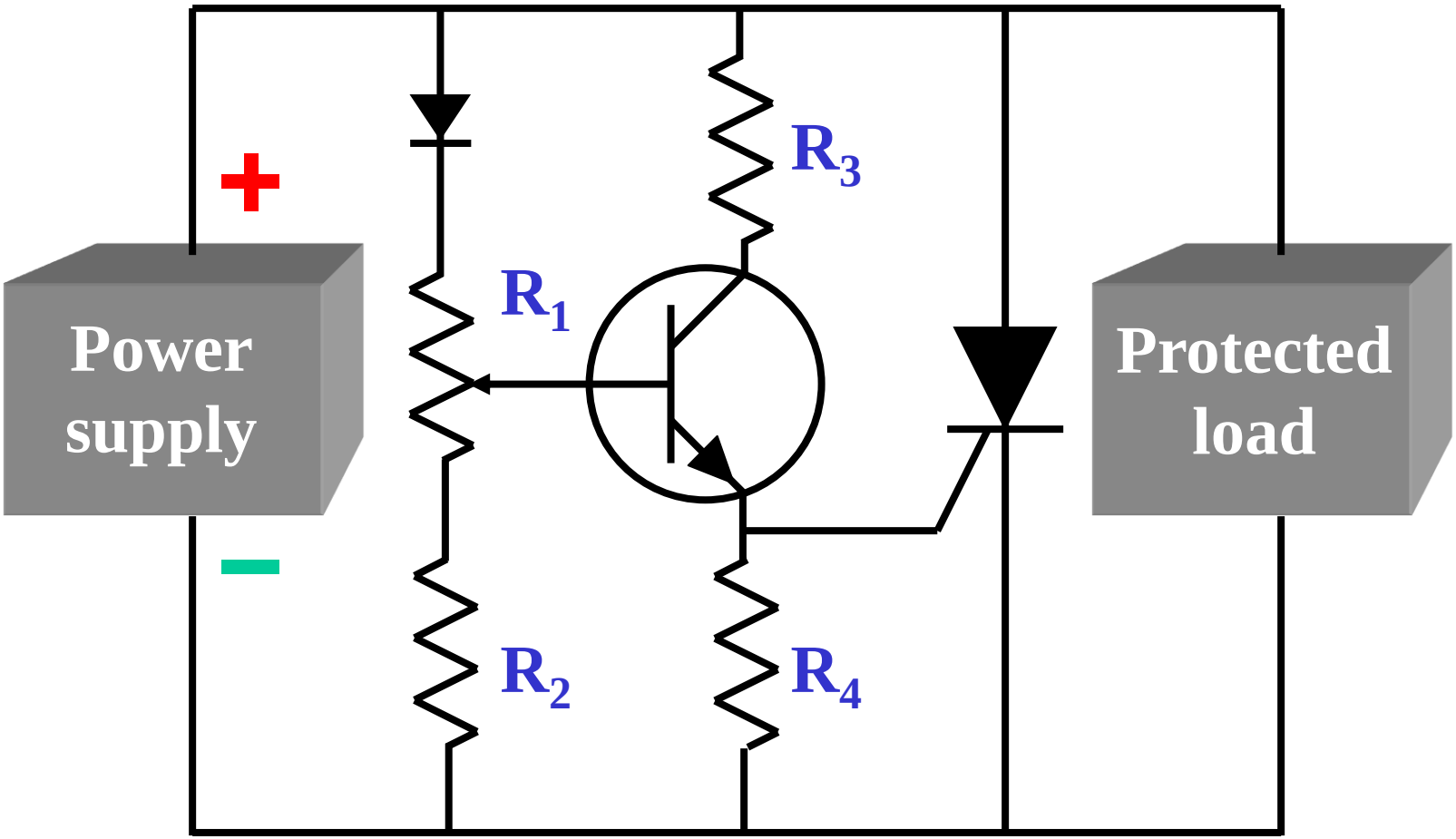


SCR crowbar to protect a load from overvoltage



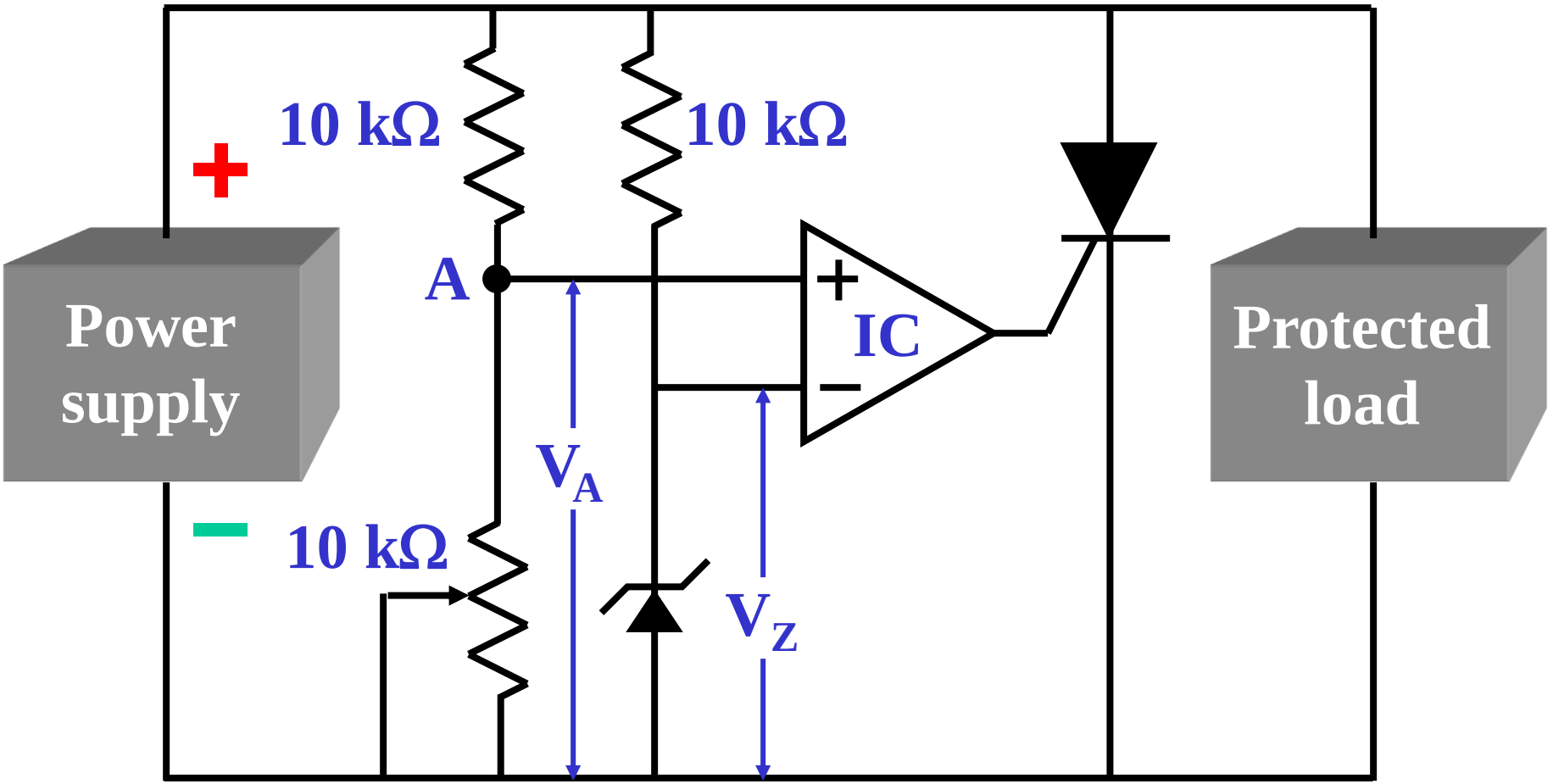
The overvoltage that triggers the crowbar: $V_T = V_Z + V_{GT}$

Adding gain to a crowbar circuit



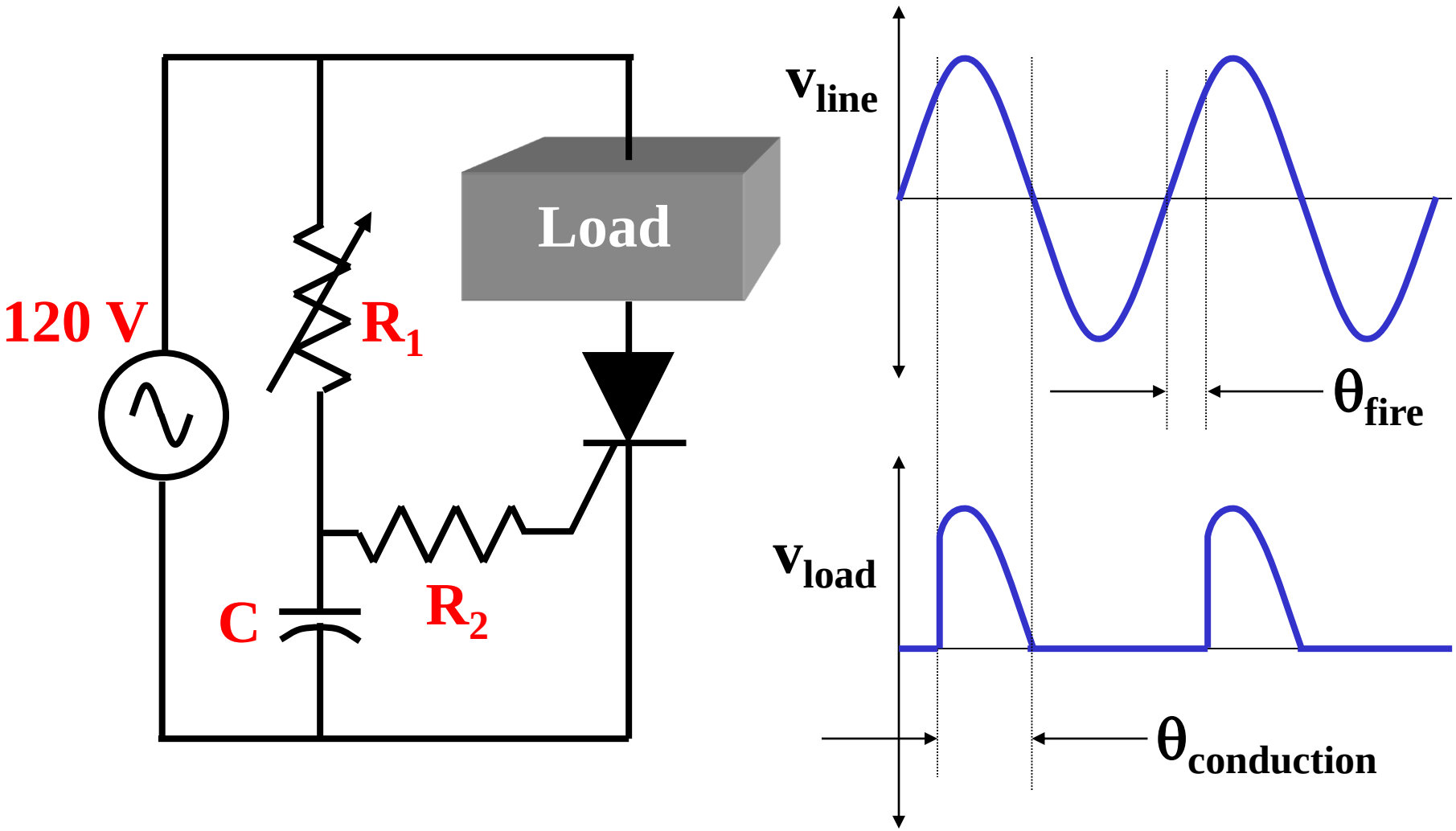
R_1 is the trigger adjust

Adding an IC amplifier to a crowbar circuit

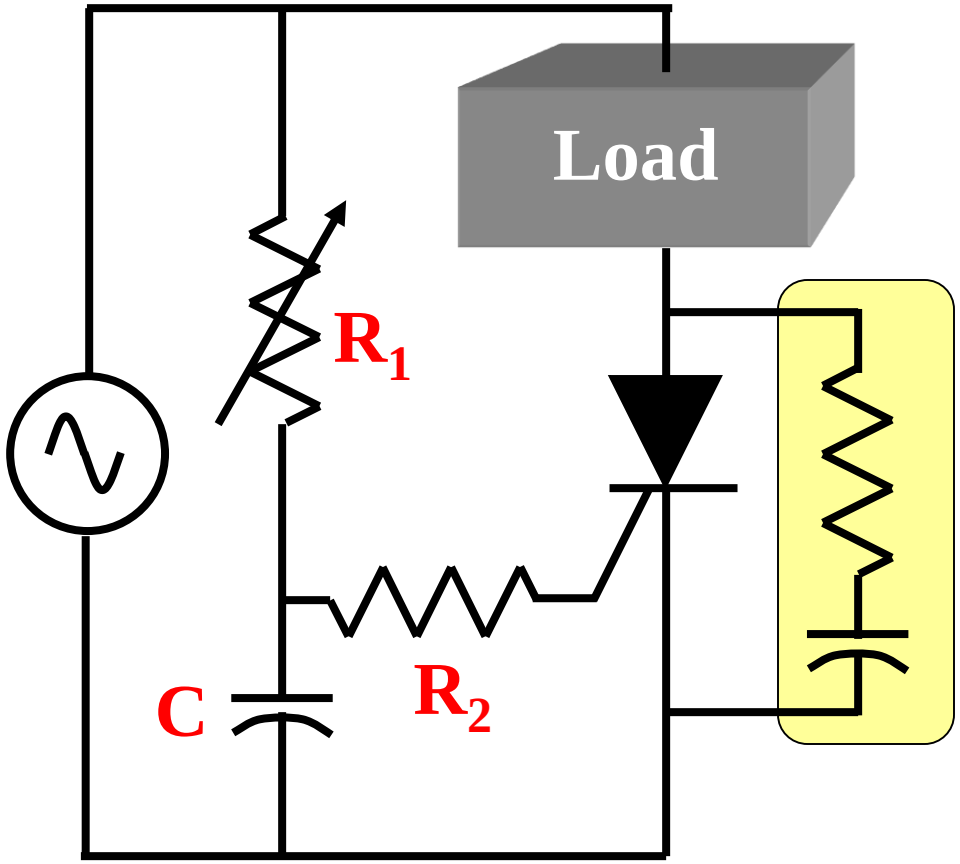


The circuit triggers when V_A exceeds V_Z.

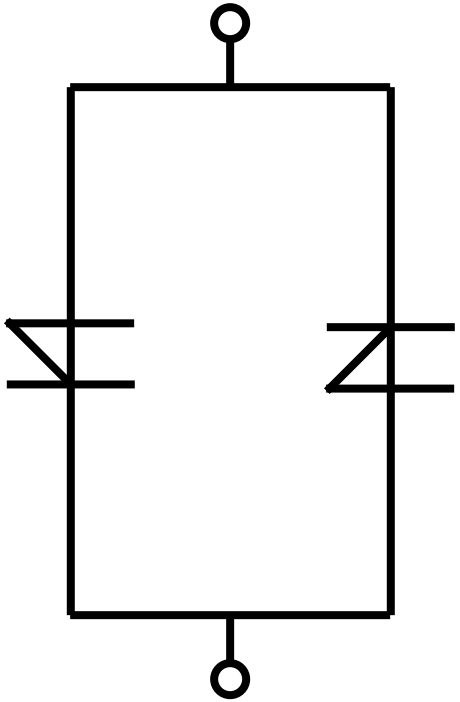
SCR phase control

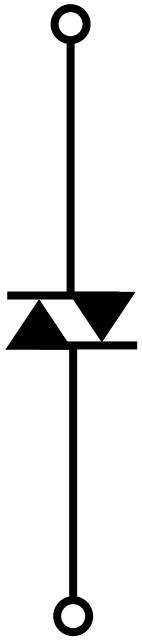


A snubber network can be used to limit the rate of voltage rise across the SCR.



Bidirectional thyristors can conduct in either direction.

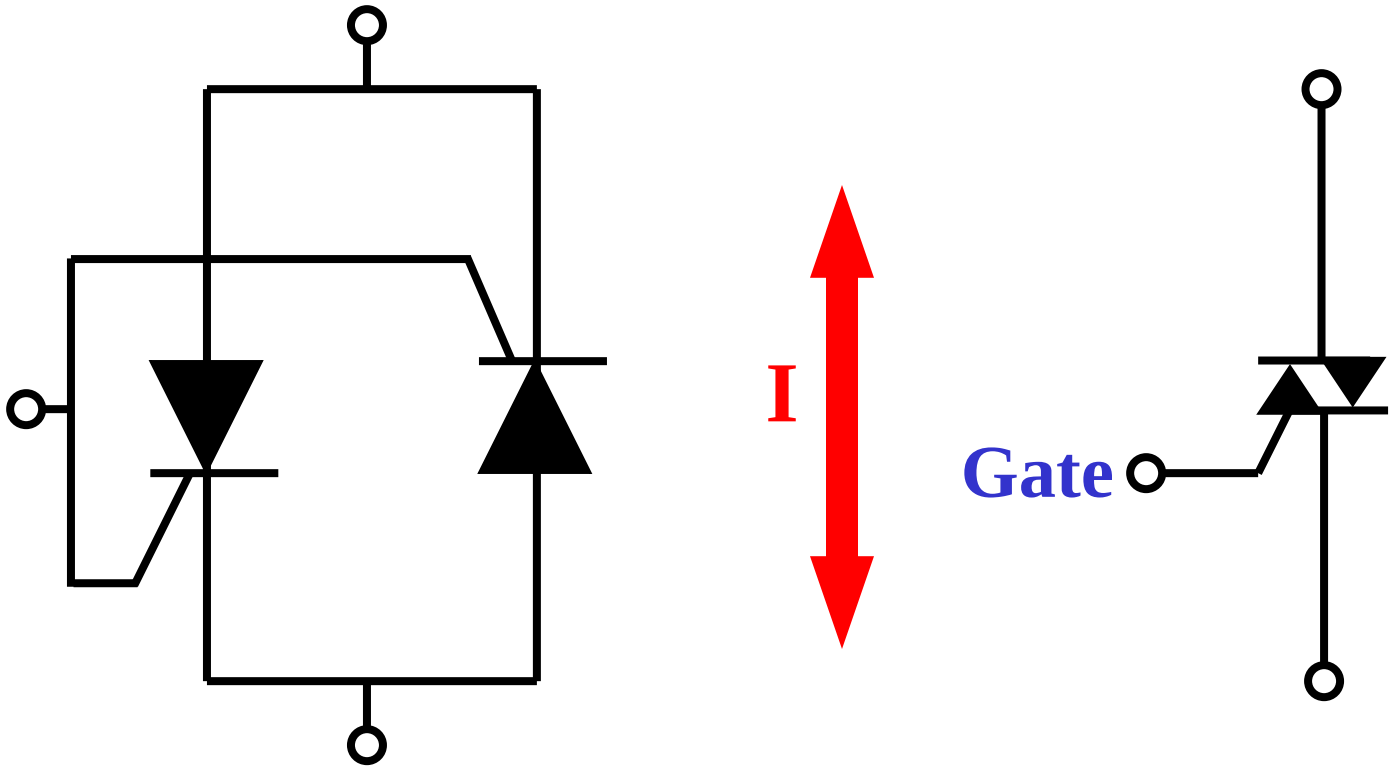




Four-layer diodes in reverse parallel

Diac

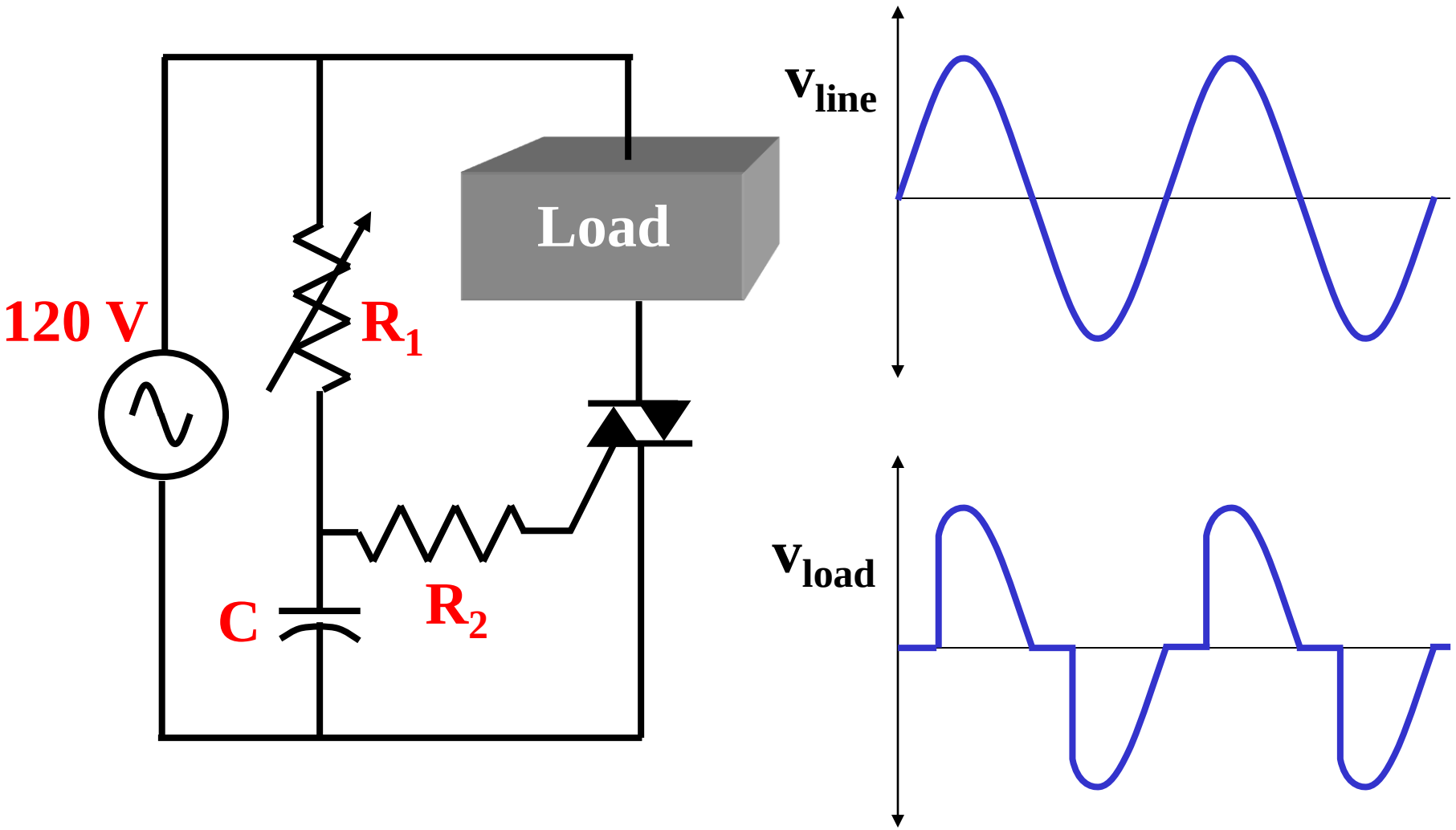
The triac is a popular bidirectional thyristor.



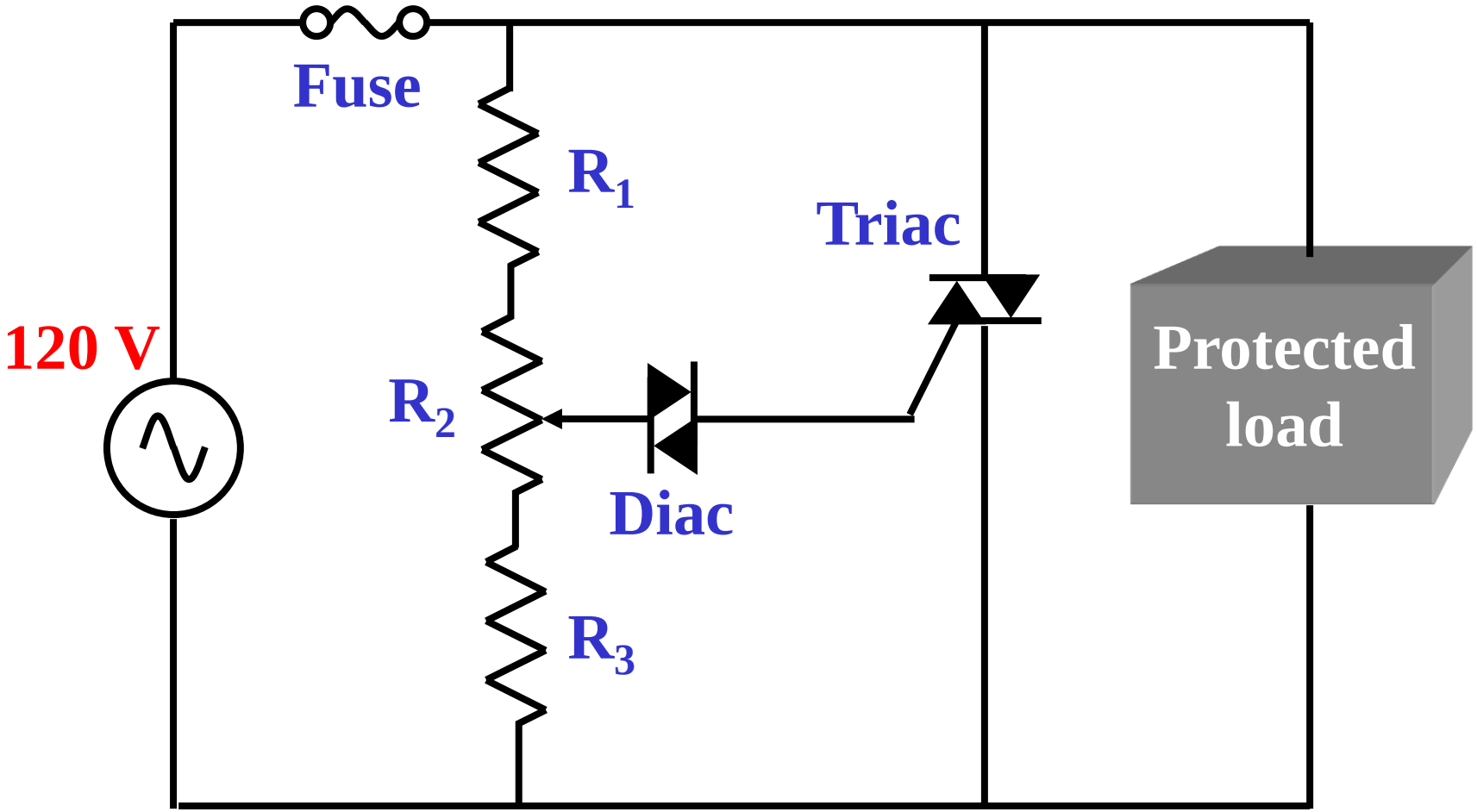
SCRs in reverse parallel

Triac

Triac phase control

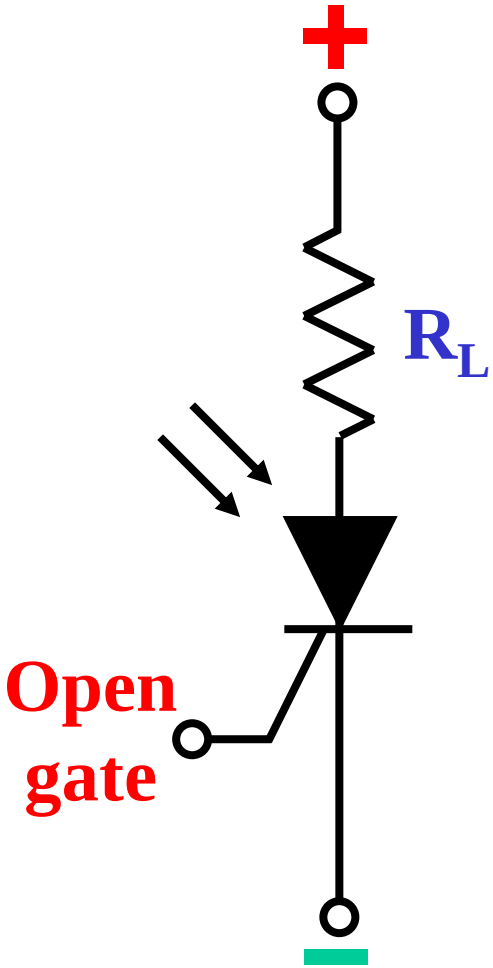


Triac crowbar

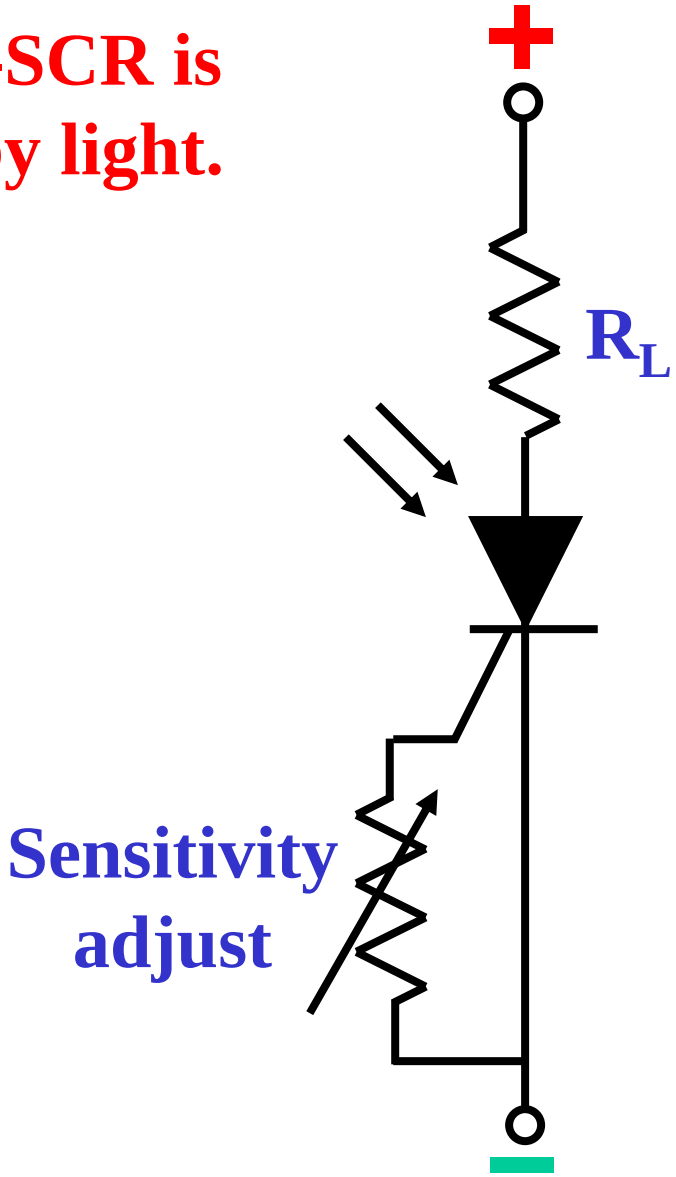


R_2 is the trigger adjust

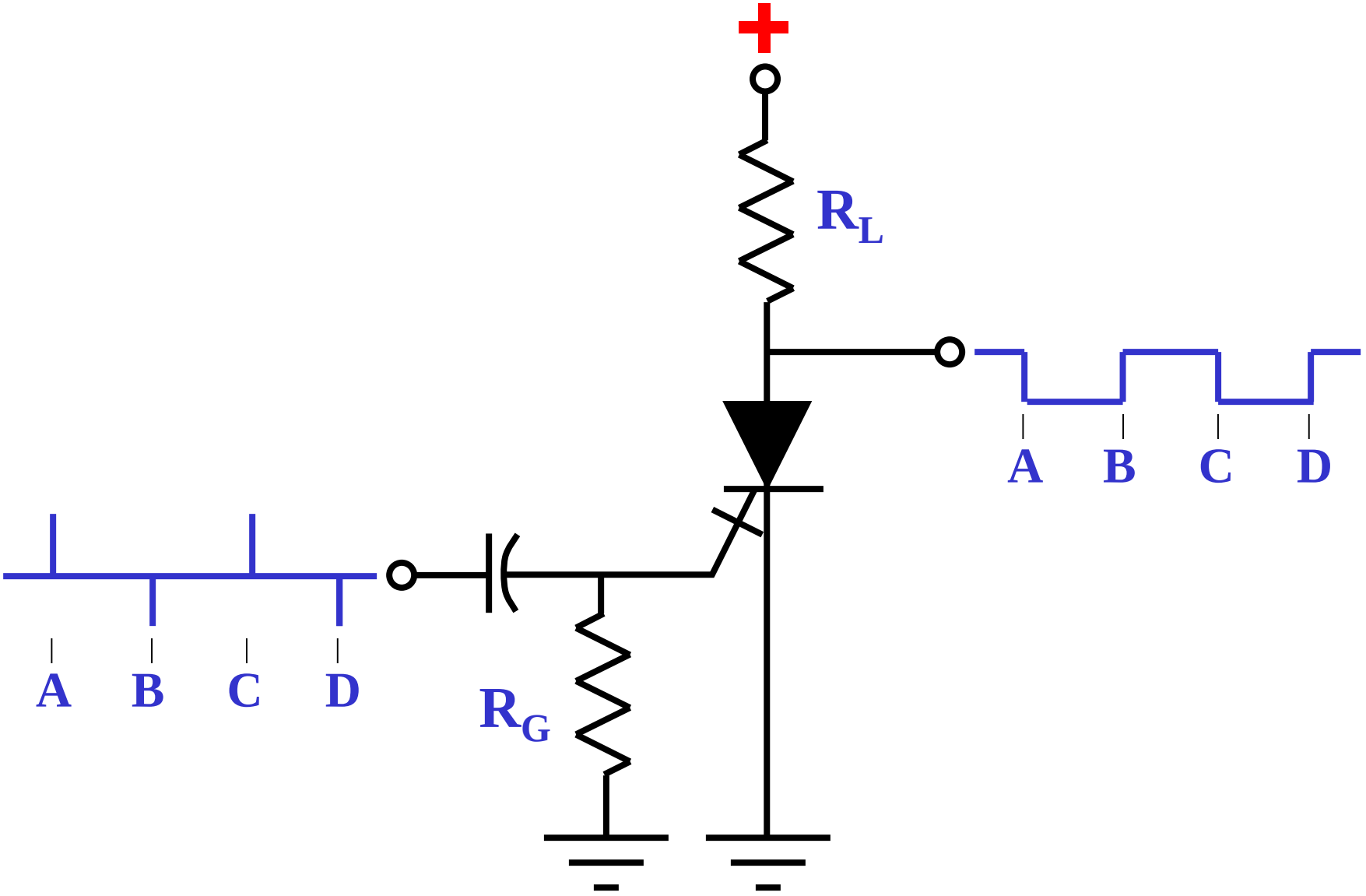
The photo-SCR is triggered by light.



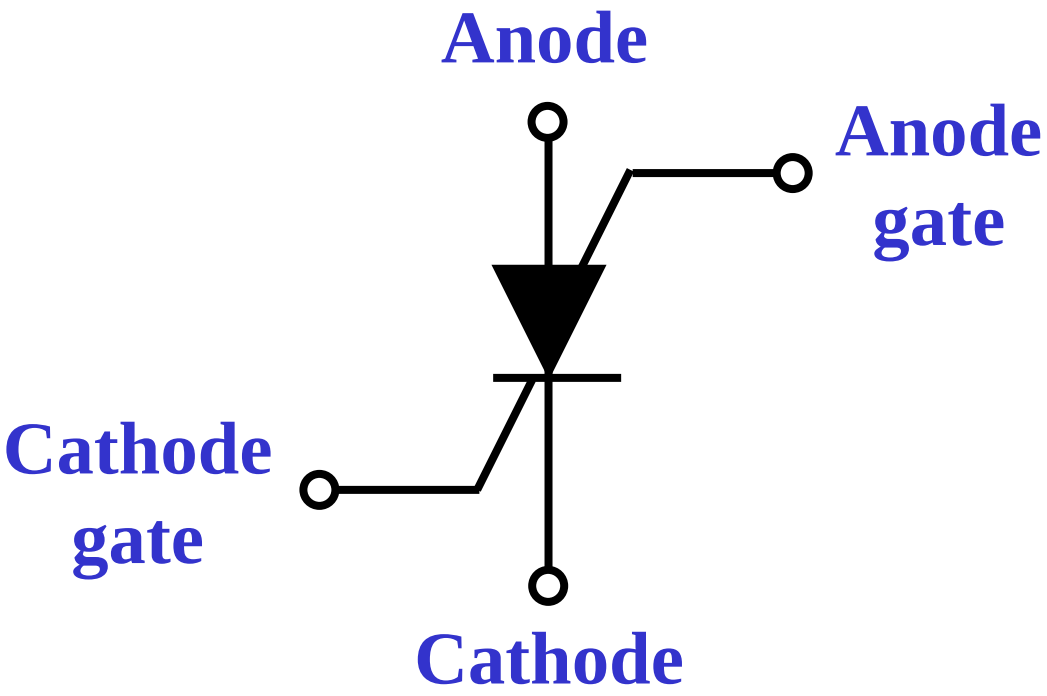
Maximum sensitivity



The gate-controlled switch is turned off with a reverse-biased trigger.

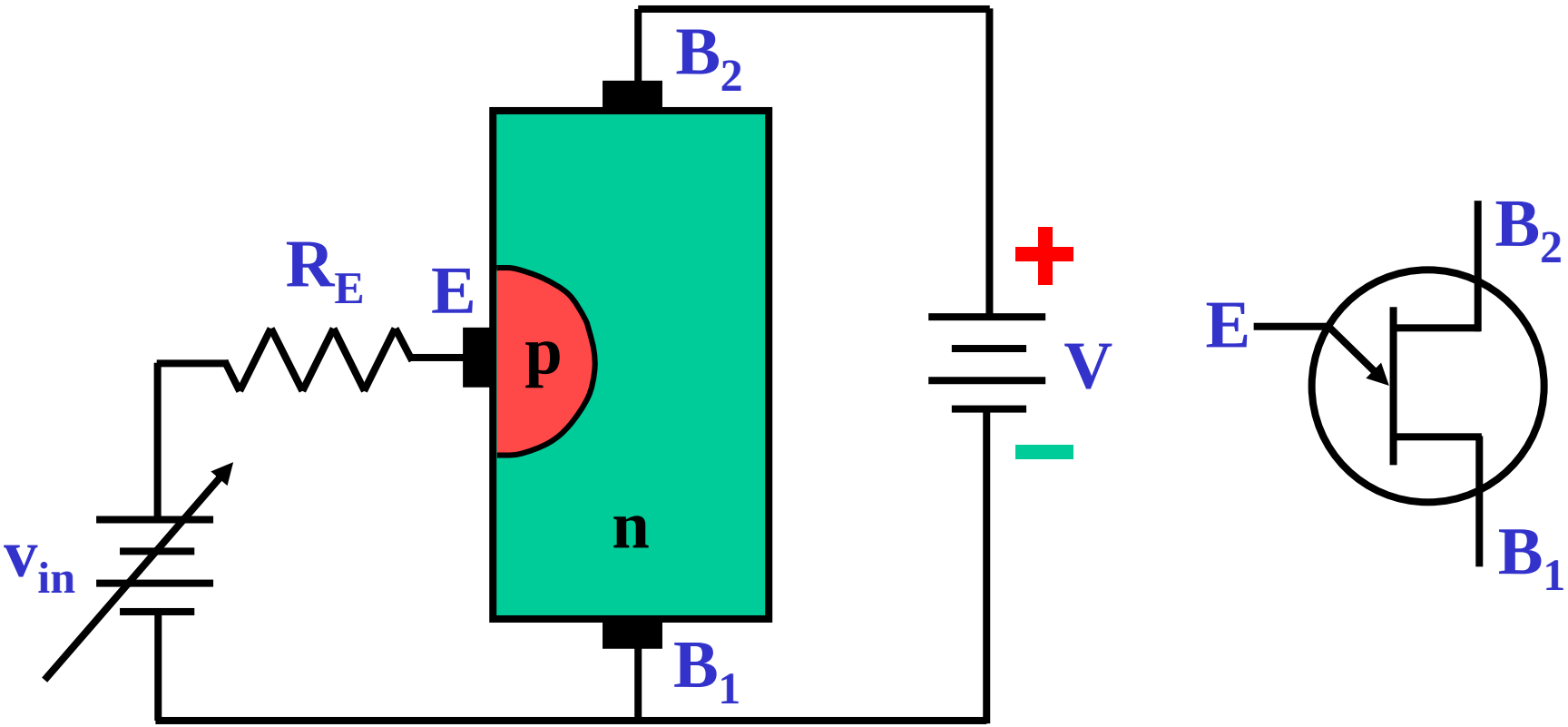


The silicon-controlled switch is a low-current device.



Either gate can be used to trigger or open this device.

Unijunction transistor (UJT)



When v_{in} reaches the standoff voltage, the resistance between the emitter and B_1 drops dramatically.