

Sensor Resistor Calculator

Estimate ideal series-resistor headroom, resistance, and dissipation for a defined DC sensor interface.

Generated October 10, 2026

<https://www.elecatrix.com/circuits-components/sensor-resistor-calculator/>

Inputs

Input	Value	Unit
Supply voltage	24	V
Target sensor voltage	5	V
Sensor current	10	mA

Results

Result	Value	Unit
Resistor voltage headroom	19	V
Sensor current	0.01	A
Ideal resistance	1900	ohm
Resistor power	0.19	W

Status

Status	Value	Unit
Headroom note	Positive resistor headroom available	

Calculation details

Detail	Value	Unit
Calculation basis	Series-resistor voltage is supply voltage minus target sensor voltage. Resistance is that headroom divided by sensor current in amperes.	
Review boundary	Ideal arithmetic only; verify sensor interface behavior, tolerances, current range, resistor pulse and thermal ratings, supply variation, and manufacturer instructions.	

Formulas

Voltage headroom=Supply voltage-Target sensor voltage

Sensor current in A=Sensor current in mA/1000

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$R = \text{Voltage headroom} / I$

$P = \text{Voltage headroom} \times I$

Warnings and limitations

This is ideal sensor-interface resistor arithmetic. It does not validate the sensor circuit, choose a standard resistor, approve a power rating, or verify signal integrity.