

Motor Winding Resistance Imbalance Calculator

Compare three measured motor phase-winding resistances as a preliminary test record before qualified interpretation.

Generated October 10, 2026

<https://www.elecatrix.com/testing-protection-grounding/motor-winding-resistance-imbalance-calculator/>

Inputs

Input	Value	Unit
Motor or asset label	Motor M-1	
Phase A resistance	0.42	ohm
Phase B resistance	0.43	ohm
Phase C resistance	0.41	ohm
Entered reference imbalance	5	%

Results

Result	Value	Unit
Average resistance	0.42	ohm
Minimum phase resistance	0.41	ohm
Maximum phase resistance	0.43	ohm
Maximum deviation	0.01	ohm
Resistance imbalance	2.381	%
Margin vs entered reference	2.619	%

Calculation details

Detail	Value	Unit
Calculation basis	The imbalance result uses the maximum absolute phase deviation from the three-phase average divided by that average.	
Test boundary	Measured phase-resistance comparison only; do not infer winding faults, insulation condition, rotor condition, replacement need, or motor acceptance.	

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Formulas

$$R_{avg} = (R_A + R_B + R_C / 3)$$

$$\Delta R_{max} = \max(|R_A - R_{avg}|, |R_B - R_{avg}|, |R_C - R_{avg}|)$$

$$\text{Imbalance\%} = \frac{\Delta R_{max}}{R_{avg}} \times 100$$

$$\text{Margin\%} = \text{Reference\%} - \text{Imbalance\%}$$

Warnings and limitations

This measured-resistance comparison does not diagnose an open winding, shorted turns, rotor condition, insulation failure, replacement need, or motor acceptance.