

Control Panel Heat Load Calculator

Totals control-panel component losses, duty factors, and external heat into watts, BTU/h, and estimated airflow for thermal review.

Generated October 10, 2026

<https://www.elecatrix.com/circuits-components/control-panel-heat-load-calculator/>

Inputs

Input	Value	Unit
Component heat rows		
Rows: 3		
Row 1 - Label	VFD	
Row 1 - Heat per component	120	W
Row 1 - Quantity	1	count
Row 1 - Average duty	100	%
Row 2 - Label	Power supply	
Row 2 - Heat per component	35	W
Row 2 - Quantity	1	count
Row 2 - Average duty	100	%
Row 3 - Label	Relay bank	
Row 3 - Heat per component	4	W
Row 3 - Quantity	6	count
Row 3 - Average duty	80	%
External heat gain	N/A	W
Allowable temperature rise	20	deg F

Results

Result	Value	Unit
Component heat	174.2	W
Total heat load (W)	174.2	W
Total heat load (BTU/h)	594.3951	BTU/h

Control Panel Heat Load Calculator

Totals control-panel component losses, duty factors, and external heat into watts, BTU/h, and estimated airflow for thermal review.

Generated October 10, 2026

<https://www.elecatrrix.com/circuits-components/control-panel-heat-load-calculator/>

Estimated airflow	27.5183	CFM
-------------------	---------	-----

Counted rows	3	rows
--------------	---	------

Calculation details

Detail	Value	Unit
Calculation basis	Component heat is the sum of watts multiplied by quantity and duty factor. External heat is added before conversion to BTU/h and an airflow estimate.	
Thermal boundary	Thermal estimate only; verify enclosure dimensions, surface area, ambient conditions, altitude, solar gain, component spacing, fan curves, HVAC capacity, NEMA/IP rating, and manufacturer limits.	

Formulas

$$W_{\text{component}} = \sum_i W_{iq_i}(d_i/100)$$

$$W_{\text{total}} = W_{\text{component}} + W_{\text{external}}$$

$$Q_{\text{BTU/h}} = 3.412141633W_{\text{total}}$$

$$\text{CFM} = \frac{Q_{\text{BTU/h}}}{1.08 \Delta T}$$

Warnings and limitations

This is an enclosure thermal estimate. It does not select a fan, air conditioner, heat exchanger, enclosure, or NEMA/IP solution and does not verify ambient, solar, altitude, component spacing, or manufacturer limits.