

# Residential Well Pump Duty-Point Power Calculator

Enter flow, total dynamic head, and pump/motor efficiency for a duty-point power review. The result does not select a pump curve or guarantee pressure.

Generated October 10, 2026

<https://www.elecatrix.com/residential-load-service/residential-well-pump-duty-point-power-calculator/>

## Inputs

| Input                     | Value                                                               | Unit |
|---------------------------|---------------------------------------------------------------------|------|
| Flow                      | 10                                                                  | gpm  |
| Total dynamic head        | 100                                                                 | ft   |
| Pump efficiency           | 60                                                                  | %    |
| Motor or drive efficiency | 85                                                                  | %    |
| Supply voltage            | 240                                                                 | V    |
| Phase                     | Single-phase                                                        |      |
| Power factor              | 85                                                                  | %    |
| Pump curve note           | Record pump curve, water conditions, and model revision separately. |      |

## Results

| Result                          | Value  | Unit |
|---------------------------------|--------|------|
| Hydraulic power (hp)            | 0.2525 | hp   |
| Hydraulic power (kW)            | 0.1884 | kW   |
| Electrical input power          | 0.3694 | kW   |
| Electrical input apparent power | 0.4346 | kVA  |
| Estimated current               | 1.8107 | A    |

## Calculation details

| Detail | Value | Unit |
|--------|-------|------|
|--------|-------|------|

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|                   |                                                                                                                                                                                                            |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Calculation basis | Hydraulic horsepower uses entered flow and total dynamic head. Pump and motor efficiency convert hydraulic power into estimated electrical input, and power factor/phase convert input to kVA and current. |
| Pump boundary     | Duty-point power estimate only; verify pump curve, pressure/flow, water conditions, motor/controller data, voltage drop, starting, and installation requirements separately.                               |

## Formulas

$$P_{\text{hyd, hp}} = \frac{Q_{\text{gpm}} \times H_{\text{ft}}}{3960}$$

$$P_{\text{hyd, kW}} = P_{\text{hyd, hp}} \times 0.746$$

$$P_{\text{input, kW}} = \frac{P_{\text{hyd, kW}}}{\eta_{\text{pump}} \times \eta_{\text{motor}}}$$

$$S_{\text{kVA}} = \frac{P_{\text{input, kW}}}{\text{PF}}$$

$$I = \frac{S_{\text{kVA}} \times 1000}{M_{\text{phi}} \times V}$$

## Warnings and limitations

This is a duty-point power estimate. It does not select a pump, prove pressure or flow, infer a pump curve, select a circuit, or prove code compliance.