PRACTICAL PRODUCT MATCHING | FOR DISTRIBUTORS, INSTALLERS AND BUYERS

# Home Backup Power Matching Guide

How to match portable power stations and all-in-one home energy storage with common household loads.

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| **The fast answer** | Choose from three numbers: W tells you whether the load can run, peak W tells you whether a motor can start, and Wh tells you how long the battery can run the load. |

Capacity alone does not tell you whether an appliance will start. Check running power, starting demand, simultaneous loads and the required backup time together.

## 1. Typical appliance reference values

| Appliance | Planning value | Matching point |
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| **Wi-Fi router** | 12 W adapter rating | Good for small backup loads; actual consumption can be lower. |
| **Fan** | 55 W | Use the nameplate; public specifications may show 50-55 W. |
| **215 L refrigerator** | 200 W input reference | Running input is different from compressor starting demand. |
| **1 HP water pump** | About 750 W motor class | Starting demand can be much higher than running power. |

Use the appliance nameplate or manual for the final quote. These values are practical planning figures for an initial match.

## 2. Which output class fits which load?

| Load or scene | Product direction |
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| **Router, phone charging, lights and small electronics** | 300 W class and above, sized by simultaneous load and desired runtime. |
| **Router + fan + refrigerator** | A 500 W class station can be considered when its peak output starts the compressor. |
| **Refrigerator + fan + router + 1 HP pump** | Do not use a 500 W station. Move to a higher-output system with motor-starting capability. |
| **Several circuits, long backup or future expansion** | Use a fixed all-in-one system with a correctly sized inverter, battery and backup-load panel. |

## 3. Worked example: portable power station

Reference load: refrigerator 200 W + fan 55 W + router 12 W = **267 W**.

A 1,000 Wh / 500 W portable power station such as the REVO MP reference platform has enough rated continuous output for the 267 W running load. Its pure-sine AC output suits common household appliances, while the refrigerator compressor start must fit the unit's peak-output capability.

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| **Runtime estimate** | Runtime = usable battery energy / average running load |

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| **Ideal calculation** | 1,000 Wh / 267 W = about 3.7 hours |
| **Planning example** | 850 Wh usable / 267 W = about 3.2 hours |

Actual runtime changes with refrigerator cycling, inverter loss, battery reserve and other connected loads.

## 4. Worked example: adding a pump

200 W + 55 W + 12 W + 750 W = **1,017 W**. This total is already above the 500 W continuous output of the reference portable station, before the pump starting surge is considered. Use a higher-output inverter system with a battery and BMS that can supply the required current.

## 5. Fixed all-in-one home storage check

• List the appliances that must stay on during an outage.

• Add the loads that may run at the same time.

• Separate resistive loads from motor loads such as refrigerators and pumps.

• Select inverter continuous power above the simultaneous running load and include motor-starting capability.

• Select usable battery energy from average critical load and required backup hours.

• Check battery voltage, continuous current, BMS communication, backup circuit and phase configuration.

## First-pass formulas

Required inverter power >= simultaneous running load + motor-starting margin

Required usable battery energy >= average critical load x backup hours

## 6. Three questions before recommending a product

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| 1 | What is the appliance's nameplate running power and starting power? |
| 2 | Which appliances must run together? |
| 3 | Is the customer buying short-term portable backup or multi-hour, multi-circuit home backup? |

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| **Need a product match?** | CVC can help match the product class, output, battery capacity and supply route to the customer's actual loads. |

Website: www.cvcenergy.com
WhatsApp phone / account: +66 99 581 9802
WhatsApp chat: wa.me/66995819802

Prepared as a practical product-matching reference. Confirm the appliance nameplate, exact model and local installation requirements for the final quotation.