

Functional Safety Construction.

We,

Company	N.V. Nederlandsche Apparatenfabriek „Nedap“
Address	Parallelweg 2, 7141 DC Groenlo, The Netherlands

declare that the “Local Out” output of the following products:

Product description / Intended use	- Grid connected Inverter with optional backup functionality; - Retrofit battery manager				
Manufacturer	N.V. Nederlandsche Apparatenfabriek “Nedap”				
Brand	Nedap				
Model / Model No.	PowerRouter, Models				
	Solar Battery			Unifit	Solar + Connect
	PR30SB	PR30SBd			PR30S + PRE-Bi
	PR37SB	PR37SBd	PR37SBi	PR37Bi	PR37S + PRE-Bi
	PR50SB	PR50SBd	PR50SBi	PR50Bi	PR50S + PRE-Bi

complies with the requirements of EN 62040-1 “Uninterruptable Power Supply Systems (UPS) Part 1: General Requirements and Safety requirements”.

PowerRouter Safety Schematic

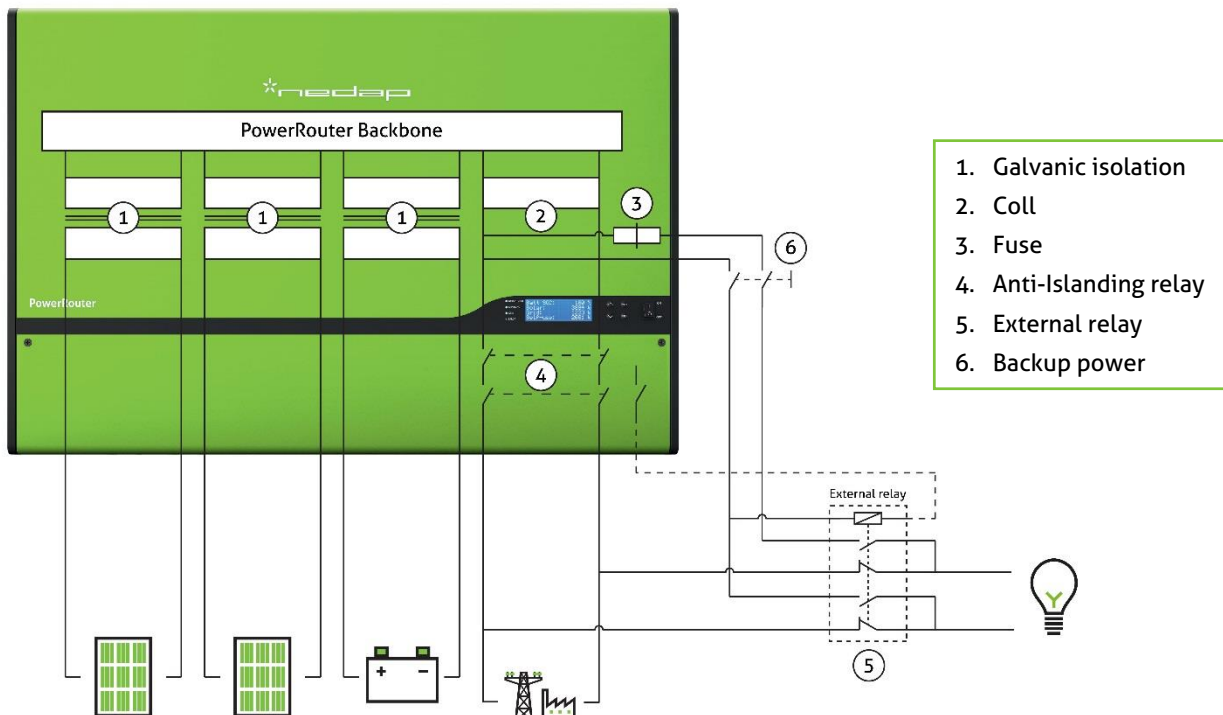


Fig. 1: PowerRouter with load on “local out” via an external relay.

PowerRouter

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Application

The „Local out“ output of the PowerRouter is not provided with anti-islanding measures. And is therefore only suitable for off-grid application. By applying an external relay (5), you may switch your load from grid connected to inverter connected in case of breakdown of the grid. This document provides a background of the safety principles of the PowerRouter, to substantiate the above mentioned application of the PowerRouter.

Safety Principal

As a general safety measure, galvanic isolation is provided between the solar inputs and grid /Local out (1) and between the battery connections and solar input/grid/local out (1). (galvanic isolation: air gap and creepage distances according to EN60950 for reinforced (double) insulation, up to insulation voltages of 3000Vac). The battery connections are at SELV potential (<60Vdc). For this reason, the battery connections are not connected to a dangerous potential and are allowed to be accessible.

Grid monitoring (4) (2x) complies with VDE 0126-1-1 (2006). This is considered acceptable as replacement in kind for relays with an isolating function accessible to the utilities at any time. The relevant Certificate of Compliance, issued by the testing and certification agency is available.

Failure analyses external relay (5)

Back-feed protection (control scheme that reduces the risk of electric shock due to back feed from the “local out” to the grid) is provided by double pole relay(5a+5b) and relays (4) (2x). Contact clearances > 3.2 mm between open contacts meets Overvoltage category 2 according to EN 60664-1.

The transformers (1) and relays (4) and (5) provide reinforced (double) insulation between the “Local out” and the battery/grid/solar. The output of the “Local out” is therefore considered to be fully floating and ensures the “local out” to remain safe even in the event of a single failure per EN 62040-1.

The external relay (5) is “normally open” i.e. connected to the “Local out”. When grid is available, the load is connected directly to the grid. Due to its construction, it is not possible that only one line of external relay will switch over. In the unlikely event that due to an internal relay failure, only one of the contacts would close, the grid voltage is measured too low and the PowerRouter will not re-connect.

Therefore, no additional external RCD is required in the “Local Out” output. As an additional safety measure, an insulation monitor device may be considered.