APPLICATION NOTE
Battery Disconnector Options

1) INTRODUCTION:

Battery disconnection is an essential part of a solar PV system to ensure the safe interruption of the battery circuit. This will be necessary when an installer is planning to perform system maintenance, or when trouble-shooting a fault, and requires access to the various parts of the system in a safe way and in a manner which minimises the risk of damage to equipment.

SegenSolar offers a number of battery disconnector options including:

- Jean Muller NH-fuse-switch-disconnectors in Keto 00 and 01 Size rated at 35A, 40A, 50A, 80A, 100, 125A and 160A, 200A and 250A which are suitable for all battery types currently sold by SegenSolar: https://portal.segensolar.co.za/nav/pv/-brand-jean-muller

Figure 1: Jean Muller NH-fuse-switch-disconnector

- OmniPower switchable fuseholders, which are compatible with the Omnipower battery fuses only, currently rated at 80A, 100A and 125A:
  https://portal.segensolar.co.za/nav/pv/-brand-omnipower/-part-OPFHCH221D
  These fuseholders can be fitted to the Omnipower battery cabinets which are suitable for all Omnipower batteries currently sold by SegenSolar.

Figure 2: OmniPower switchable fuseholder

- All lithium ion batteries sold by SegenSolar, these being, Pylontech, Kodak and Freedomwon incorporate a built-in BMS which automatically disconnects the battery should any conditions exceed the set parameters. However, in order to allow a dedicated external point of disconnection, and to ensure disconnection of all batteries within a battery bank where applicable, a standalone battery disconnect is still recommended for lithium ion batteries.

The table below summarises the compatibility of each battery disconnect option currently available:

Manufacturer	Built-in protection	Compatible with Jean Muller NH-fuse-switch-disconnector (dependent on fuse rating)	Compatible with Omnipower switchable fuseholder (dependent on fuse rating)
Omnipower	no	yes	yes
Pylontech	yes	yes	no
Kodak	yes	Yes	no
Freedomwon	yes	Yes	no

Table 1: Battery Disconnect compatibility

2) SAFETY CONSIDERATIONS

To ensure a safe installation, it is essential to work according to the latest regulations and standards as well as the user manuals for each product. All systems should be installed and operated only by suitably trained personnel. When operating any of the battery disconnect options described in this application note, a safe system of work needs to be adhered to at all times. Switchable fuse holders are not considered “on-load” disconnecting devices, so please ensure to switch only under “no-load” conditions to avoid injury.

In most instances, a safe procedure to disconnect batteries is as follows:

- Disconnect and isolate the load from the inverter (where applicable)
- Power down the inverter (where applicable)
- Disconnect and isolate the AC grid from the inverter
- Disconnect and isolate the solar panel from the inverter
- Disconnect the batteries using the battery disconnect device

3) TECHNICAL ADVICE

Fuses can be connected in series to reduce arcs when switching, and this will not affect the protection in any way. The Jean Muller KETO range is a 3-pole fuse holder and one of the battery poles can easily be connected in series by utilising two fuse slots. By doing this, an extra fuse will be needed.

Available Jean Muller KETO Fuse ratings:

- 40A
- 80A
- 125A
- 160A
- 200A
- 250A

Available OmniPower Fuse ratings:

- 80A
- 100A
- 125A

The Jean Muller KETO range is a unit that needs to be wall-mounted and cannot be mounted in a distribution board. Lugs will be required when installing one of these units as it uses M8 bolts to fasten the battery leads.

The OmniPower fuse range mounts to DIN-rail and will fit into any DIN-rail-type distribution board provided that there is sufficient space. The OmniPower fuse holder uses a screw terminal to fasten the battery cable.

4) SEGENSOLAR PORTAL SERVICES

The SegenSolar portal has a System Designer tool which allows installers to create their own battery packages: http://portal.segensolar.co.za/Reseller/PVDesigner

Please speak to your account manager or technical support representative if you require training on how to use the System Design tool. The design tool will allow the user to create a quote quickly and easily with all the necessary components. All the available stock levels are shown as well as any incoming deliveries.

5) Battery Relevant Regulations

- The electrical machinery regulations
- General machinery regulations
- Installation regulations
- Wiring Code SANS10142-1

6) Further notes

About Jean Muller:

The company's headquarters and state of the art production facility is located in Eltville am Rhein, Germany. The company was founded in 1897 and started out producing fuses, and this has grown into a vast offering today including electronic monitoring and power management systems, low voltage switchgear, switchgear assemblies and many more components for the safe distribution of current. Jean Muller is respected worldwide for its safety and reliability in operation and handling. As a future-oriented commercial enterprise, they have consistently committed themselves to quality and innovation, with their products perfectly tailored to the needs of their customers.

Further info: http://www.jeanmueller.de/en/

About OmniPower:

Based on 20 years' experience in research and development, the OmniPower OPR range of batteries is specifically designed for Solar / Wind power applications. These batteries use gel technologies together with deep cycle technologies and use special components in the lead alloy as well as additional electrolyte, resulting in a much longer cycle life.

Further info: http://www.sinetech.co.za/solar-batteries.html#omnipower