

Advel Application Note – AAN2008.1

New features of DZ1 power supplies series

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1. Introduction

Since January 2008, Advel power supplies **D1** series (SPSxxxD1 100W to 600W), have had a new development, becoming **DZ1** (SPSxxxDZ1 100W to 1000W).

While maintaining the same physical dimensions as well as full compatibility with the previous series (**D1**), the new power supplies **DZ1** offer many improvements, showed below in the detail.

2. Quality of internal components

In view of a trend to save energy, and a growing demand of power, have been "strengthened" all critical components into the **DZ1** power supplies:

- MOSFET: Si → SiC technology
- Rectifiers: Fast → Ultrafast Soft Recovery
- Electrolytic Cond: standard 85°C → 105°C, Long Life (moreover overbuilding VL).

These measures have increased **DZ1** power supply efficiency of 4.5% compared to **D1** (average), and lowered the MTBF of the power supply.

3. Higher maximum power

As a direct consequence of the preceding paragraph, the maximum power for single power supply is equal to 1000W (while for the **D1** series, the maximum power for single power supply was 600W).

4. More protection for the load

In addition to the standard overvoltage protection of V_{out} , in the **DZ1** power supplies (only between 200W and 1000W models) there is the possibility to add further a **CROWBAR** protection (optional): in case of failure of the standard overvoltage protection, the Crowbar protection ensures, however, that the output voltage never exceeds a certain threshold voltage. This protection is useful for use in the area SELV / PELV (see Figure 1).

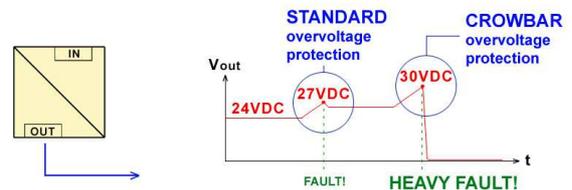


Figure1 – In figure is schematically showed the evolution of V_{out} for a power supply output rated 24V, in case of fault or "serious" fault.

In addition, for the more powerful models ($\geq 500W$) it's possible to add a **FOLDBACK** protection, which limits the I_{out} in case of prolonged output short circuit.

5. Greater ease of use

The active Current Sharing device was already present on the **D1** power supplies (500÷600W models), however it has been revised and made much more effective in the **DZ1** series, moreover it's available in the 150÷1000W models.

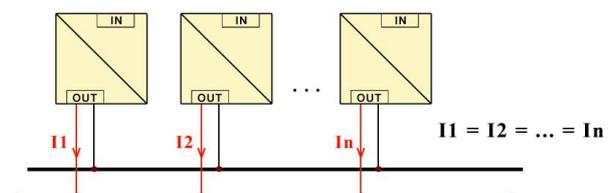


Figure2 – Power supplies in parallel which provide the same current, thanks to the active CS.

The active Current Sharing (not to be confused with the common passive Current Sharing) between power supplies in parallel to equally share the load current between the power supplies, thus avoiding an imbalance of power output and heat dissipation for the benefit of long-term reliability of system. In addition, this device "adjusts" actively any imbalance of the V_{out} of the power supplies (caused by wear and tolerances of the internal components, wiring not perfectly done, ...).

6. User friendly

The POWER ON LED: is blinking in case of overload, is off in case of failure or intervention of primary overvoltage protection or Crowbar protection.

This new feature makes the cause of alarm more evident for the customer.

7. Conclusions

Have been highlighted the improvements introduced in the new **DZ1** power supply series, compared to the previous **D1** series produced by Advel.

In particular:

- increased reliability (through improved efficiency and a careful selection of critical electronic components inside)
- better protection for the load and the power supply itself (clearer signaling, output crowbar protection).

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