

Efficient DC converter covers an input range from 200 to 900 V

ECN Europe

[Siemens Industry Automation Division](#) is launching a rugged power supply unit onto the market with a high degree of efficiency of 96 %. The model [Sitop PSU400M](#) in the Sitop modular product range transforms high DC voltages in the especially wide input range from 200 to 900 volts extremely efficiently into a regulated 24 V DC voltage. Sitop PSU400M is suitable for drive applications ranging from conventional plant automation through machine tools and textile machines up to wind turbines.

The power supply range from Siemens Industry Automation Division is being expanded with a DC converter that efficiently transforms voltages in the range of 200 V to 900 V into 24 V. Sitop PSU400M is suitable both for connection to the DC link circuit of drive systems and for connection to battery networks. The output voltage can be set using a potentiometer to between 24 V and 28.8 V. At 24 V, the converter supplies a rated current of 20 A which, if required, can supply an additional 50 percent extra power over a period of five seconds. This 30 A current enables loads with high starting currents, such as capacitive loads, to be connected without any problems. The new device has a signalling contact for "24 V OK."



[1] **Picture: Siemens IA**

PSU 400M is, like all variants of the Sitop product series, designed for mounting on standard rails. The DC/DC converter is 90 mm wide and can be used at temperatures from minus 25 to plus 70 degrees Celsius. The rugged device in a metal enclosure is designed to withstand high levels of vibration and shock, so it can be mounted close to or directly in the machine. It is also characterized by a high level of electromagnetic compatibility (EMC) which is a particular requirement in the DC link circuits of drives. It offers special advantages when used with stored energy features based on capacitor technology. The wide input voltage range of 700 V means that, in comparison to conventional DC/DC converters, it is able to extract a larger amount of energy from capacitors. With DC voltage sources that are

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built up from several capacitors, the system can extract the same amount of useful energy from fewer capacitors.

The new power supply from Siemens is suitable for a broad range of different applications. PSU400M can be used with frequency converters, for example, to provide an efficient, low-cost power failure concept in which the energy saved in the DC link of the converter is used for the 24 V supply required to coast down the machine in a safe and controlled manner.

The output voltage of 24 V can be maintained longer using the converter when a high level of kinetic energy of the drives is available for electrical feedback into the DC link. This is the case in machines with large rotating masses or rapidly rotating spindles. In machine tools, the energy can be used to separate the tool from the workpiece in a controlled path for the purposes of emergency retraction. This prevents a tool break or rejected workpieces, and lowers the risk of injury to operating personnel. Further application areas include textile machines in which a controlled spindle stop can prevent faulty lengths of material and thread breakage; and printing and paper machines in which paper webs must be prevented from tearing in the event of a power failure.

An example for use of the shock and vibration proof DC/DC converter with batteries is in controlling the blade angles of wind turbines. For safety reasons, the energy for supplying this so-called pitch controller is supplied independently of the public grid.

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