BENNING

World Class Power Solutions

Telecom-Power slimline Module Systems

- compact
- reliable
- flexible

SLIMLINE Module Systems
Compact, reliable and flexible

SLIMLINE Module Systems

The manufacturers of AC and DC power systems have increased the power density of their products a lot over the last few decades.
BENNING, as one of the leading DC power supply companies, was able to double the power density of their products every decade over the last 30 years (Fig. 1). This development continues, as the telecom-operators have less and less space in GSM and UMTS base stations and are asking for more compact power solutions.

With the newly designed *SLIMLINE* module systems (SMS) BENNING has the answer to this demand and can offer a more than 100 % higher power density compared to existing products.
This new development includes ultra compact rectifier and distribution modules which can be integrated into 1 U 19" sub-racks.

In contrast to the present vertical arrangement of DC power modules, the new slimline modules are arranged horizontally. This arangement allows the fitting of 3 rectifier SMS 1500 (48 V 30 A) across a 1 U 19" sub-rack (Fig. 4).

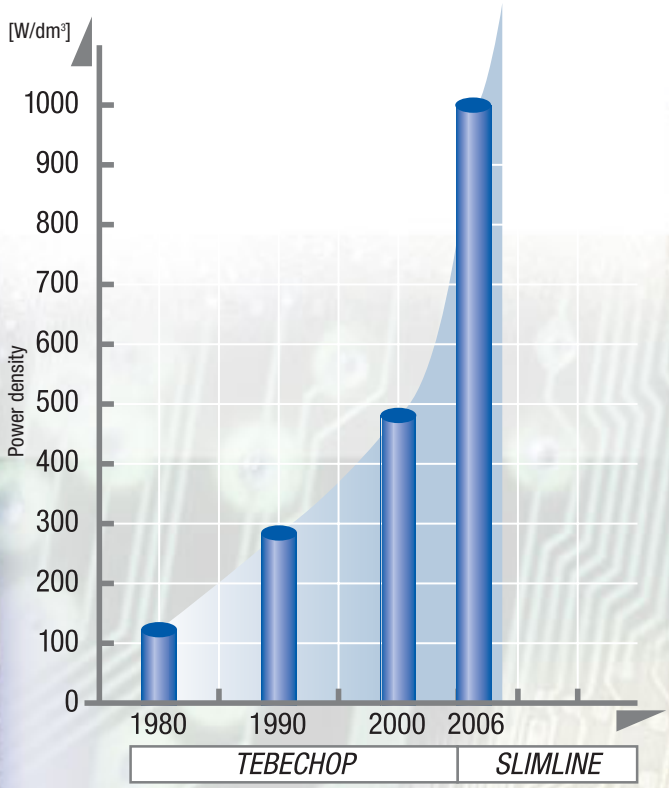


Fig. 1: Power density of single phase 48 V telecom rectifiers over the last decades.

Advantages of *SLIMLINE* Module Systems:

- **Extremely high power density reducing space demands.**
- **High efficiency >90 % between 30 % and 100 % load (Fig. 2).**
- **Wide range of input voltage (85 V – 275 V) allows the operation of *SLIMLINE* systems in nearly all countries in the world.**
- **Power constant DC output with temperature compensation.**
- **Real hot-plug connection.**
- **Automatic set-up of additional rectifiers.**
- **Ease of installation, operation and expansion.**
- **Tolerant of harsh environmental conditions- operational from -33 up to +75 °C ambient temperature.**
- **Systems status and alarm information with microprocessor controlled monitoring systems *SLIMLINE* MCU or MCU 2500.**
- **Remote control with modem, HTML, or SNMP (option).**

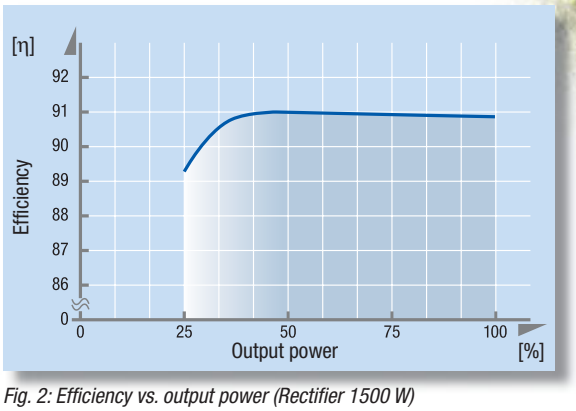


Fig. 2: Efficiency vs. output power (Rectifier 1500 W)

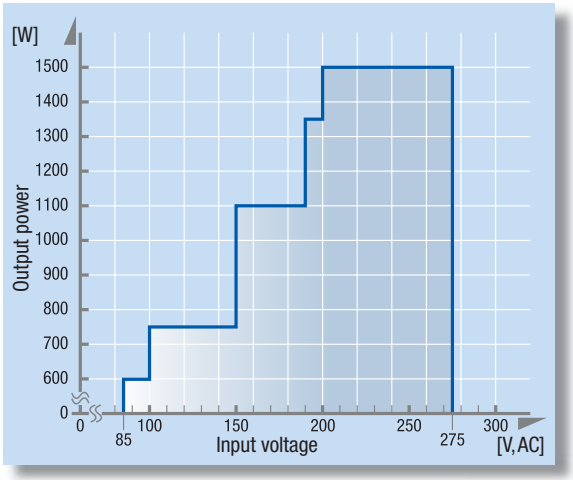


Fig. 3: Output power vs. input voltage (Rectifier 1500 W)

SLIMLINE Module Systems – Designed to operate in nearly all countries of the world

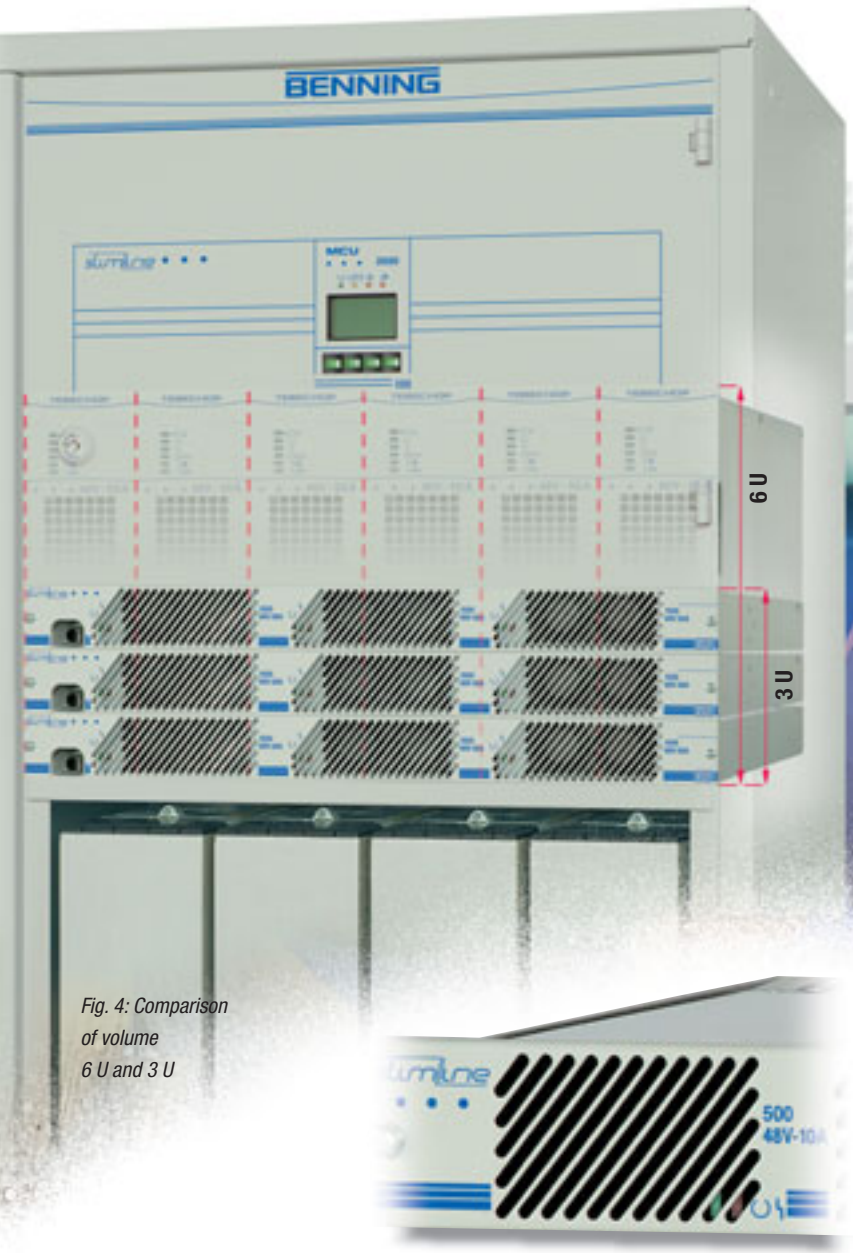
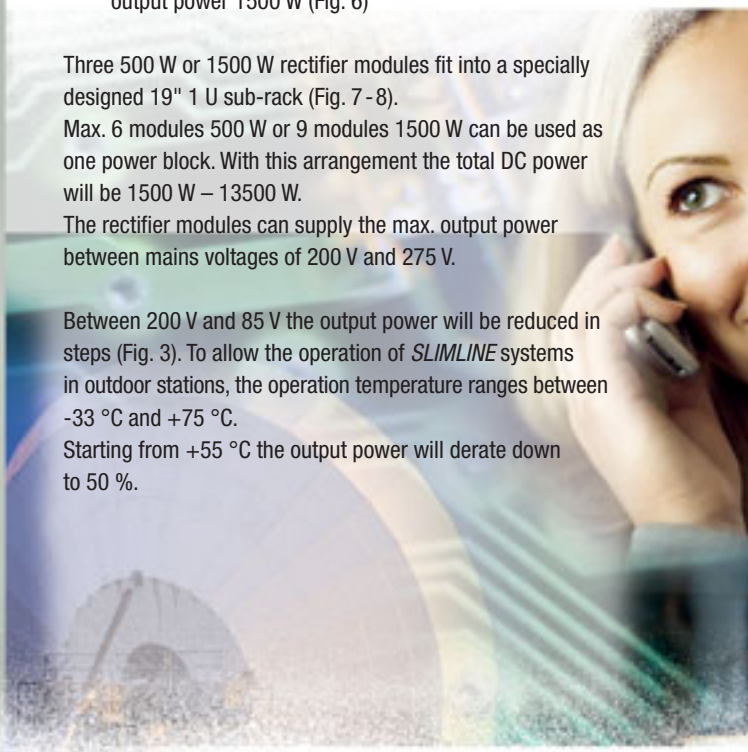


Fig. 4: Comparison of volume 6 U and 3 U

SLIMLINE modules for the creation of systems:
1. Rectifier modules 48 V DC

- **Rectifier module 500 W**
  output power 500 W (Fig. 5)
- **Rectifier module 1500 W**
  output power 1500 W (Fig. 6)



Three 500 W or 1500 W rectifier modules fit into a specially designed 19" 1 U sub-rack (Fig. 7 - 8).
Max. 6 modules 500 W or 9 modules 1500 W can be used as one power block. With this arrangement the total DC power will be 1500 W – 13500 W.
The rectifier modules can supply the max. output power between mains voltages of 200 V and 275 V.

Between 200 V and 85 V the output power will be reduced in steps (Fig. 3). To allow the operation of *SLIMLINE* systems in outdoor stations, the operation temperature ranges between -33 °C and +75 °C.
Starting from +55 °C the output power will derate down to 50 %.

Fig. 5: SMS 500, 48 V – 500 W

Fig. 6: SMS 1500, 48 V – 1500 W

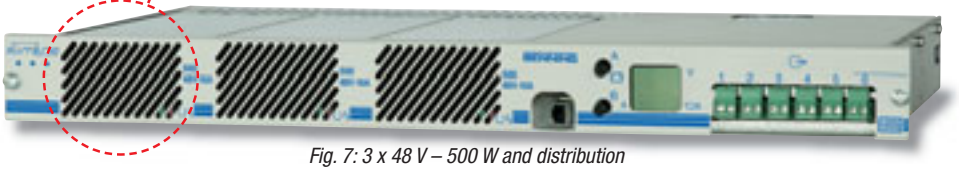


Fig. 7: 3 x 48 V – 500 W and distribution

Fig. 8: 6 x 48 V – 500 W and distribution

Flexible Distribution Modules
Individual choice of fuses/breakers

SLIMLINE modules for the creation of systems:
2. Distribution modules

- **Distribution SMS 4500**
  max. power 4500 W
- **Distribution SMS 13500**
  max. power 13500 W

Following the ultra compact design of the *SLIMLINE* rectifier modules, BENNING also offers 1 U and 3 U high battery and load distribution mondules. These modules include battery fuses or breakers, load fuses or breakers and battery and/or load disconnect units (Fig. 8 - 10).
The LC Display in the front plate indicates current, voltage and temperature.
For the control and monitoring of the system the *SLIMLINE* MCU can be used (optional).

Fig. 9: Rectifier,
Distribution SMS 4500:
2 x Battery breaker
3 x 48 V – 1500 W
6 x Load fuses

Fig. 10: Rectifier,
Distribution SMS 4500:
2 x Battery breaker
3 x 48 V – 1500 W
20 x Load fuses

Fig. 11: Rectifier,
Distribution SMS 13500:
2 x Battery breaker
9 x 48 V – 1500 W
16 x Load fuses

SLIMLINE Module
Specifications

Systems

SLIMLINE module systems are made up with 1 U sub-racks for the necessary number of plug-in rectifier modules needed, and BENNING wall or floor system cabinets with monitoring and control unit MCU 2500. These unit allows local monitoring via frontpanel keypads and LCD.

Remote monitoring and control can be done via modem, HTML or SNMP (option).
Software packages are available.

Wall cabinet 19"

Wall cabinet with batteries

Monitoring and control unit MCU 2500

Specifications

Rectifier Modules SMS		SMS 500	SMS 1500
AC Input			
Nominal	[V]	200 – 275	
De-rating	[V]	at 85 – 200	
Operation	[V]	85 – 275	
Cut off, Switch off	[V]	> 275	
Frenquency	[Hz]	47 – 63	
Input current (at 230 V)	[A]	2,5	6,3
Power factor		> 0,99	
DC Output			
Boost	[V]	2,4	
Float	[V]	2,23	
Output current max. at 50 V DC	[A]	10	30
Characteristic		IPU (Power constant)	
Static voltage regulation	[%]	0,5	
Dynamic voltage regulation (Load step 10-100-10)	[%]	± 5	
Response time	[ms]	< 5	
Noise voltage	[mV]	2	
Efficiency	[%]	typ. 91	

Rectifier Modules SMS			SMS 500	SMS 1500
Other specifications				
Ambient temperature		[°C]	-33 up to +75	
Power de-rating		[°C]	at 55	
Storage temperature		[°C]	-40 up to +85	
Emission			cl. B (EN 55022)	
Safety			IEC 60950	
Visual indications on the frontplate			Red LED = Fault Green LED = Operation	
Fan speed			Temperature controlled	
Dimensions	Width		1/6 19"	1/3 19"
	Height		1 U	
	Depth	[mm]	250	275
Weight		[kg]	1,0	1,7

Distribution Modules			SMS 4500	SMS 13500
Dimensions	Width		19"	
	Height		1 U	3 U
	Depth	[mm]	325	
Weight		[kg]	5,0	13,0

Subject to alterations.

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