GUSTAV KLEIN
POWER SUPPLIES - since 1948

Made in Germany

Rectifier system GR5701 series

Equipped with the switched mode power supply (SMPS) Type WGS-U is a primary switched converter with pulse width modulation and galvanic isolation.

Main features:

- Industrial design
- Front access
- Modular with Hot swappable
- Parallel Redundant
- No cooling fan / Low maintenances
- Output short circuit proof
- Floating/Boosting/Equalizing charge mode
- Special Battery test mode
- Overall efficiency >92.5%
- Output ripple ≤ 1% rms
- Input voltage 3x 400 VAC, 3~, PE
- Communication port RS485/RS232
- Standard: 8 LED indicator status
- Option: 7" 60K Color resistive touch screen CPU ARM 9 Core 400 MHz
- Custom design available

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Tel: 02 902 6106 to 9 Fax: 02 9143009 email: info@cbcinter.com website: cbcinter.com

General features:

- Case for cabinet mounting
- High switching frequency – low noise
- Output voltage control to ±1%
- Constant current – constant voltage characteristic
- 4 voltage characteristics Float/Boost/ Equalize/Battery test
- 3 Steps Silicon diode dropper
- Continuous operation at nominal current
- Inrush current limited
- Parallel operation with multiple converters - without limitation of the number - electronic balancing of current / decoupling diode
- Signalizing with LED and relays
- Plug (female) for voltage and current measurement
- Forced air cooling with long life fans (60 V and 110 V version)
- Natural air cooling (24 V version)
- Rotation speed of the fans load and temperature dependent - enhanced life cycle (60 V and 110 V version)
- External fusing
- 2 x Dry contacts
- 2 x MCBs of battery

Descriptions:

Secure DC power supplies consist of rectifiers and batteries and are designed according to application.

Parallel standby operation

The rectifier must be dimensioned so that load is supplied and the battery is being charged out of the discharged condition simultaneously. At mains failure the battery takes over the load without interruption and any switching operation.

Buffer operation

To cover peak load a part of the energy can be drawn from the battery. This permits a reduction of the rated power of the rectifiers.

Depending on application and the customers requirements, either closed or valve regulated lead acid batteries may be used. For small rated powers, the batteries can be integrated into the rectifier cabinet. At greater powers the battery is housed in a separate cabinet or an open rack. For special applications NiCd batteries are also used.

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3 different charging voltages are applied to charge lead acid batteries:

Float charging

For float charging, the battery is charged with 2,23 to 2,27 V/cell, depending upon the type of battery. The float charging voltage is kept below the gassing limit of the battery so that a water loss of the batteries is avoided most largely. The recharging time of discharged batteries is about 10-20 hours at this charging voltage.

Boost charging (fast charging)

Lead-acid batteries are given a boost charge with up to 2,4 V/cell. In contrast to float charging, a discharged battery can be recharged up to the required capacity within a much shorter time. Because of the loss of water, the boost charge should be used only after a longer mains failure and if the charging period should be limited.

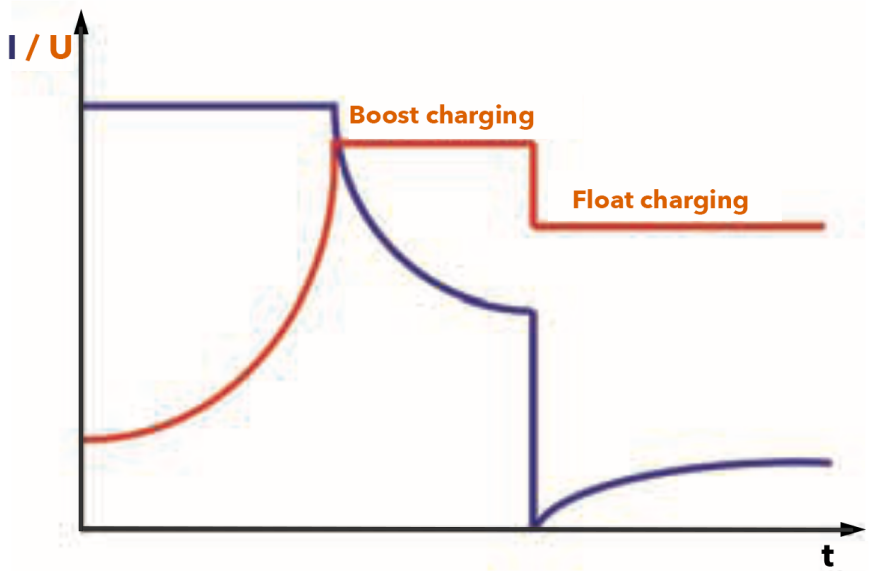
Equalizing charge (Forming)

The battery can be charged at 2.65 V/cell before being put into service and as equalization charge. This procedure enables the battery to be safely given a full charge.

Corresponding values apply to NiCd batteries.

Charging characteristics

Batteries for DC power supplies are charged in accordance with IU characteristic of DIN 41772. Deeply discharged batteries are first charged with a constant current (I) and then with constant voltage (U) having maintained the fully charged condition.



Applications

- Telecommunication systems
- Railway signaling
- Traffic control installations
- Remote control facilities for electricity supply utilities
- Control Equipment for Power Plant
- Process Control Equipment and Automation in manufacturing plant

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Technical data for Module 110V30A

Type	Rectifier module 110V30A			
Rated power	3960 W			
Input voltage	3x400 Vac, 3~, PE			
Input voltage range	± 10%			
Input frequency	45-63 Hz			
Input power with no load	300VA / 35W			
Input current nominal conditions:	6.6A with 132V 30A 7.7A			
Displacement factor cos phi	>0.95 (100-100% load)			
Power factor lambda	>0.93 (70-100% load)			
Crest factor	< 1.6			
Output voltage	110V			
Tolerance of output voltage	± 1%			
Output voltage control with load variations acc. EN61204 Load variation(%) Voltage variation(%) Recovery time(ms)	25-100 0.5 10	100-25 0.5 10	10-100 0.7 10	100-10 0.5 15
Adjustment range	72 … 132V			
Output ripple	≤ 1% rms.			
Output current	30A			
IV chracteristic	IV acc. DIN 41772			
Current limitation	Nominal current			
Short circuit performance	Short circuit proof			
Parallel operation	No limitation of number (inc. decoupling diode and electronic balancing of			
Overall efficiency with rated load	>92.5% with 132V30A			

General	
Safety	Protection class 1 acc. EN60950
Protection	IP20 acc. EN60529
EMC	Acc. EN 61000-6-2, EN 51000-6-4
Permissible environment conditions: Storage acc.EN60721-3-1 transport acc.EN60721-3-2 operation acc.EN 60721-3-3	2K2 / 2M2 2K2 2M2 3K3 / 3M2
Permissible ambient temperature	-5… +40ºC (no condensation)
Permissible storage and transport	-25… +60ºC
Permissible operating attitude with rated	1000 m a.m.s.l
Noise level	< 60 dBA
Cooling	"AF" reinforced cooling
Housing Dimensions	Slide in housing sheet steel / front panel anodized 132x355 mm(BxH) front panel 442 mm deep (incl.front panel) 482 mm(overall)
Weight	9.4kg

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Signalizing	
LED	Input voltage o.k.
	Operation
	Overvoltage output
	Alarm
Remote	Operation / alarm
	Floating charge over contact f. Over. / alarm each
	Max switched current:8A
	Max switched power:2000VA/50...270W
High voltage test	
Input/Output/Signal –> PE	2kV AC
Input/Output/–> PE	3.75kV AC
Input–> PE	3.75kV AC
Supervision	
Undervoltage input	Stop module
Overvoltage input	Stop module
Overvoltage output	Stop module (latching)
Undervoltage output (current dependent)	Signal
Short circuit	Current limit nominal current Option: stop
Overtemperature - warning	Signal
Overtemperature - stop	Stop module (latching)
Functional units in the front panel	
Potentiometer	Output voltage(characteristic 1-4)
	Current limit
	Temperature control alternatively Charging current limit
	Undervoltage output
	Overvoltage output
	Parallel operation
	Reduce current limit
Test sockets 2 mm	Output voltage
	Output current
Front connections	
Input	Plug in connection 4pole type Phoenix PC 4/4-STF-7,62 Recommended cross section: L,N,PE: 4mm² Part numberKlein:622 01 534
Output	Plug in connection 3pole type Phoenix PC 16/3-STF-10,16 Recommended cross section: L+,L,PE: 16mm² Part number Klein:622 02 046
Signalizing	1xPlug in connection X5 8pole type Phoenix MC 1.5/8-STF-5,08 0,08-1.5mm² Part number Klein:622 02 061 1 x Plus in connection X6 7pole Type Phoenix MC
External protection input	NH-fuse 3x gG (gL) 10A or Motor circuit breaker 3x 8A

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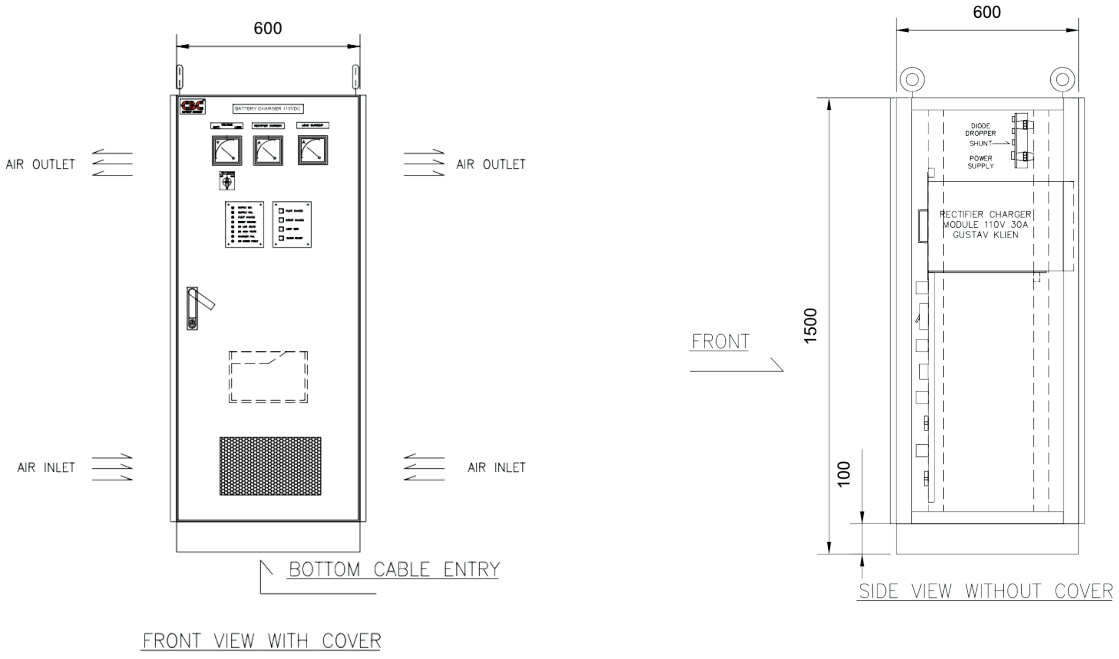
Dimensions & Weight	
Standard Model	W x D X H : 600 x 600 x 1500 mm
	Net Weight: 130kgs
	Steel sheet : 1.2mm
Built-in Battery Model 12V55Ah*9pcs	W x D X H : 600 x 700 x 2000 mm
	Net Weight: 164kgs
	Steel sheet : 1.2mm

Drawing of Standard model



Product code:	
Standard Model	Model: CGR-110-30-3-Option
	DC output: 110-127Vdc 30A
	Input: 400V 3Ph 50Hz
Options:	LCD: 7" 60K Color resistive touch screen
	Built-in: Built-in battery 12V55Ah-120Ah*9pcs

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