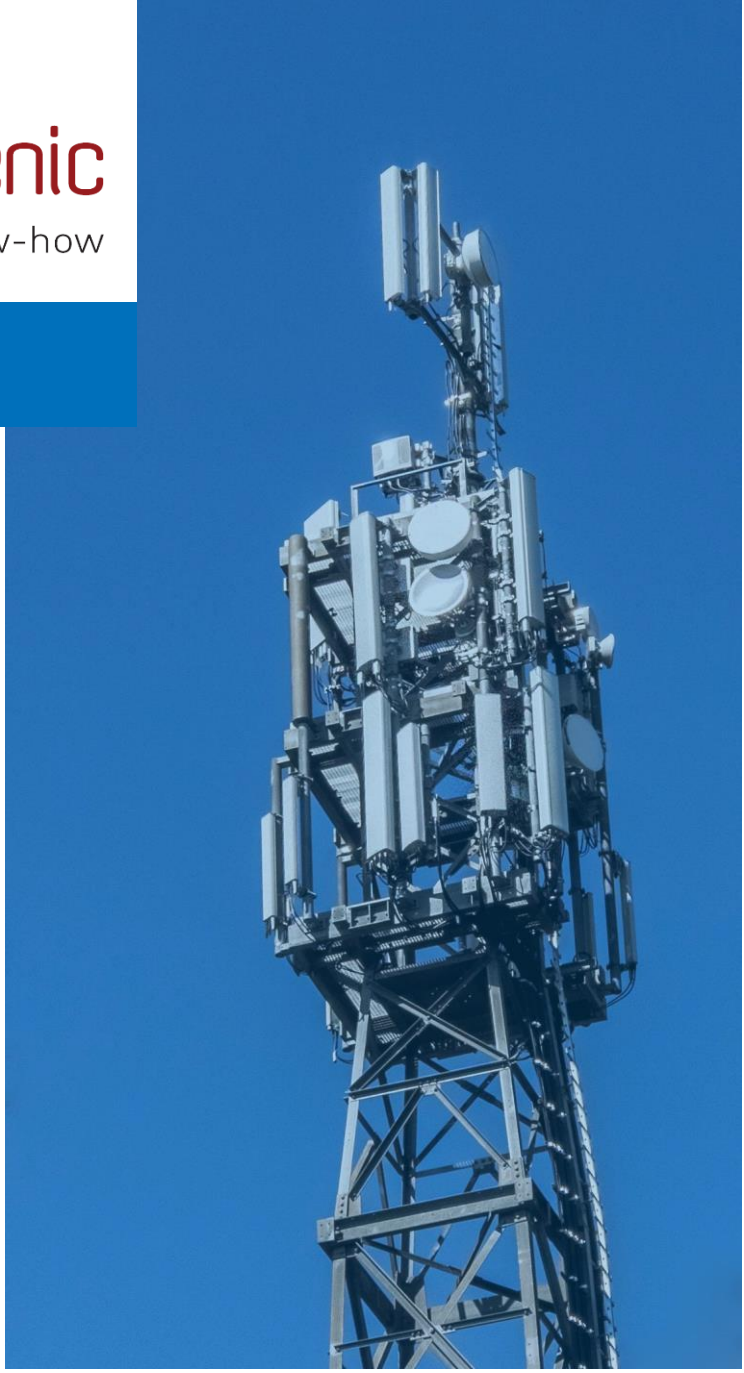
GFS ±Orogenic
Battery Know-how

GHFC

Modular battery charger

PWM controlled with Controller GMU



- Substations
- Rail and infrastructure
- Industry

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Modular battery charger

PWM controlled with Controller GMU

Battery-backed DC-power supplies providing safe power in case of mains failure are used in all areas of public life and industry.

The modular rectifier units of the series *FP2* have been developed to enable the customer to individually and flexibly design its power supply installations.

Combined with a state-of-the-art microprocessor monitoring unit GFS has designed a series of compact rectifiers that meets the highest requirements of nowadays DC-power supply solutions.

Advantages

Excellent industrial quality

Optimal price-performance ratio

High reliability through

- Solid industrial design
- Input overvoltage protection
- Active load sharing
- Integrated decoupling from the DC-bus bar
- Temperature controlled fan
- 100% power even during controller damage

Flexible Monitoring

- 4-lines LCD to indicate measured values and fault messages
- 8 LED‘s for the most important messages
- Simple menu navigation
- Real-time clock (RTC) with date
- Modular extendable via internal bus

Easy handling

- Single phase slide-in rectifier with sinusodial current input
- „Hot-plug-in“
- Self parameterization via internal bus

Applications

We offer you a perfect solution for a variety of applications:

- Complete power supply systems including chargers, DC/DC converters, inverters and AC/DC distribution boards
- High output power through parallel operation
- Redundant rectifier systems based on n+1 technology
- Linking into existing SCADA systems
- Available in the voltage range from 24V and 220V and suitable for the use in power substations and plants, railway, airports and traffic installations, chemical and heavy industries

Controller GMU

The Controller GMU (GFS Monitoring Unit) in the base version consists of two modules

Base module DMC

***D**evice-**M**anagement-**C**ontroller*

Central processor unit with digital inputs and relay outputs as well as voltage and current measuring inputs, extendable with more modules via the internal bus

Display module BAT

***B**edien– und **A**nzeige **T**erminal*

Enlighted LCD with 4 rows, ON/OFF switch, LED‘s to display the operational status and alarms, USB interface for programming

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Standard versions and options

	Standard	Option
Measured values / Indications		
Charger output voltage	●	
Charger output current	●	
Battery voltage		●
Battery current (charge-/discharge)		●
Load voltage		●
Load current		●
Battery symmetry voltage		●
Insulation resistance in kΩ		●
Temperature in °C (max. 3 temperature probes)		●
Controls / Monitorings		
Charger in Operation / Power	●	
Automatic boost charge, voltage controlled	●	
Manual boost charge, Start/Stop via menu	●	
Manual commissioning charge (I-characteristic), Start/Stop via menu		●
Temperature controlled charge		●
Voltage too high (with interlocked shut down)	●	
Voltage too low (current-dependent)	●	
Module failure	●	
Alarm / collective fault (potential-free)	●	
Battery discharge / Battery operation		●
Battery test with Ah count		●
Cyclic battery circuit test		●
Battery symmetry monitoring		●
Earth leakage DC, two thresholds (warning, alarm), display of earth leakage to positive or negative		●
Battery low voltage (option with load disconnection LVD)		●
Mains monitoring		●
Rectifier failure		●
Current monitoring		●
Fuse monitoring		●
Cabinet temperature monitoring		●
Contact for fan control		●
Input for for fan fault		●
Silicon dropper diodes		●
Logic circuits (PLC)		●
Event recorder for up to 8000 events with date/time, definition as urgent, not urgent or event	●	

Controller modules

The controller GMU is extendable, fast and easy, with the following units to fit exactly to the required system

Monitoring module GKM

***G**leichspannung-**K**omparator-**M**odul*

Voltage monitoring with 4 relay outputs, easy integration into the GMU system via internal bus

LED display LAI

***L**ED-**A**nzeige-**I**nstrument*

Display 96x96mm with 8 additional LED's to show alarms and and operation status, colour of the LED's are selectable via jumpers

Temperature module GTM

***G**leichrichter-**T**emperatur-**M**odul*

Temperature module with up to three temperature probes for temperature indication via BAT and temperature controlled charge

Relay module GRM

***G**leichrichter-**R**elais-**M**odul*

Module with 8 additional relay outputs

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Technical data

	24 V	48 / 60 V	110 V	220 V
Mains input				
Input voltage	185 - 275 VAC			
Input current (max.)	11,3 A	11,9 A	18,7 A	17,0 A
Mains frequency	45 - 66 Hz			
Power factor	> 0,99			
Harmonics (THD)	< 5% at full load			
Efficiency	> 94%			
DC output				
Output voltage	1800 W	2000 W	3025 W	2800 W
Output current	75 A	41 / 33 A	20 A	10 A
Output voltage range	21,7 - 28,8 V	39,9 - 72,0 V	90,0 - 151,2 V	198,0 - 280,0 V
Output default voltage	26,7 V	53,5 / 67,0 V	122,5 V	245,3 V
Static voltage regulation	± 0,5% from 10 - 100% load			
Dynamic voltage regulation	± 5,0% for 10 - 80% load variation - regulation time <50ms			
Output ripple	< 250 mVpp	< 150 mVpp	< 500 mVpp	< 1000 mVpp
Output protection	Over voltage shutdown, high temperature protection, short circuit proof			
Current sharing	± 5% of maximum current from 10 - 100 % load			
Other specifications				
LED's	Green LED: module in operation, no faults Red LED: rectifier failure Yellow LED: recitifier warning			
Operating temperature	-40 bis +75°C, derating above +55°C relative humidity 5 - 95% non condensing			
Storage temperature	-40 bis +85 °C, relative humidity 0-99% non condensing			
Cooling	Self cooling by fan, temperature and load controlled			
Acoustic noise	< 40 dBA at nominal input and full load (ambient temp. < 25 °C) < 58 dBA at nominal input and full load (ambient temp. > 40 °C)			
Dimensions	109 x 41,5 x 327 mm (w x h x d)			
Weight	1,95 kg			
Electrical safety	IEC 60950-1, UL 60950-1, CSA 22.2			
EMC	EN 61000-6-1 (immunity, light industry) EN 61000-6-2 (immunity, industry) EN 61000-6-3 (emission, light industry) EN 61000-6-4 (emission, idustry) EN 61000-6-5 (immunity, power staions and substations)			
Mains harmonics	EN 61000-3-2			
Environment	ETSI EN 300 019-2-1 (Class 1.2) ETSI EN 300 019-2-2 (Class 2.3) ETSI EN 300 019-2-3 (Class 3.2)			

Cabinet dimensions

*more cabinets on request

Cabinet type	Height (mm)	Width (mm)	Depth (mm)
WS 2	750	550	410
WS 3	900	600	500
ST 14.06.06	1400	600	600
ST 14.08.06	1400	800	600
ST 18.06.06	1800	600	600
ST 18.08.06	1800	800	600
ST 18.08.08	1800	800	800
ST 20.06.06	2000	600	600
ST 20.08.06	2000	800	600
ST 20.08.08	2000	800	800
ST 20.10.08	2000	1000	800

General technical data GHFC

- Cabinets ST and STK with integrated transport and cable socket
- Protection class IP20 (higher protection on request)
- Colour RAL 7035 (other RAL colours on request)

Standards and regulations

- CE certified, manufactured acc. ISO9001
- EMC guideline 2014/35/EU
- Low-voltage directive 2014/30/EU
- Electrical isolation acc. EN 60742
- Precautions acc. VDE 0100 Teil 410
- Accident prevention regulation DGUV 3
- Low-voltage switchgear acc. EN 60439 - 1
- Semiconductor converters, general requirements and line commutated converters. Specification of basic requirements acc. EN 60146 Teil 1-1
- Electronic equipment for use in Power installations EN 50178

Options (selection)

- Mains fuses, battery fuses, load fuses
- Measuring converters for voltage/current
- AC- and DC-Distributions
- Battery cabinets and cabinets with battery compartment for charger and battery

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