

MAGNETICALLY-REGULATED CHARGING RECTIFIER

Type GR-3374 (1~) and GR-3375 (3~)

ePower



Important Advantages

- Insensitive against mains distortion
- Good current waveform factor
- Low feedback disturbance to the mains
- Very high input power factor
- Low inrush current
- Short circuit proof
- Low radio interference
- High MTBF
- Robust design
- No active electronic inside power circuit

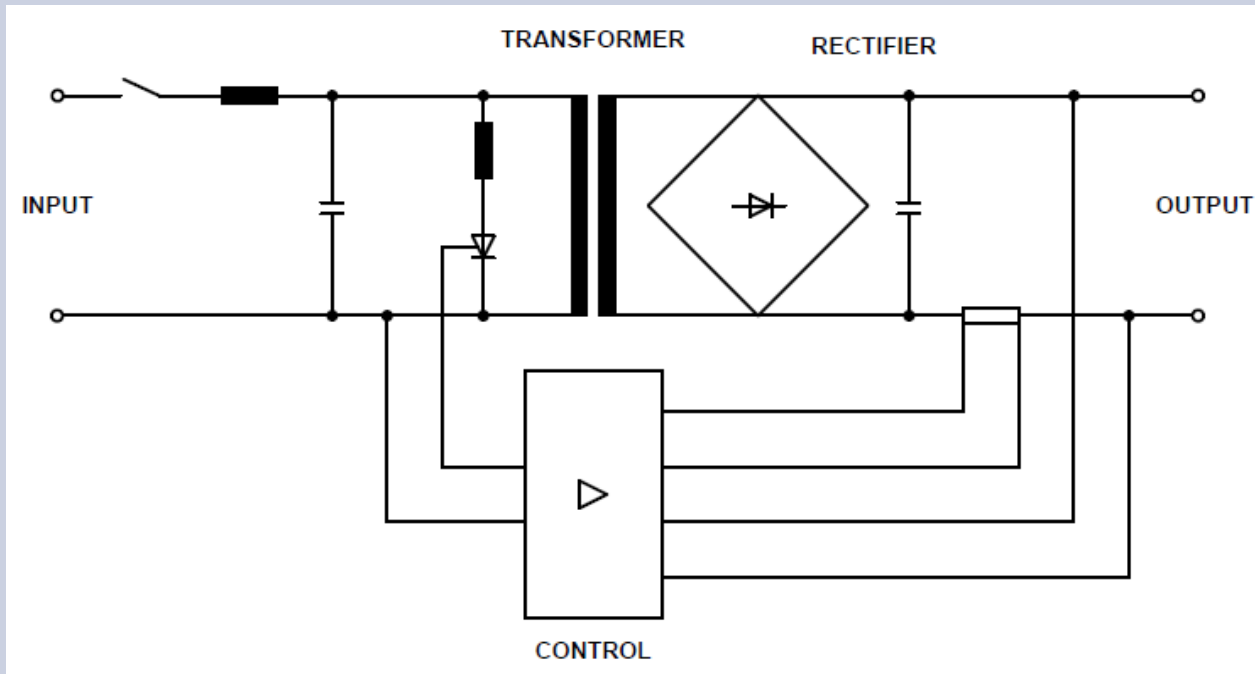


GUSTAV KLEIN
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General

This magnetically-regulated rectifier is designed for battery charging and for the supply of loads operating with a floating battery.

The magnetic regulation principle ensures a very high MTBF. The important advantages compared with other regulator control techniques are listed on page 1 of this data sheet.



Functional Description

The construction and dimensioning of the input is done in a way that the input power factor of the rectifier unit is higher than 0.95 over a very wide load range.

Together with the available inductance, a voltage divider is formed from (reactive) elements, allowing the secondary voltage, and therefore the rectifier DC output voltage, to be regulated almost without loss.

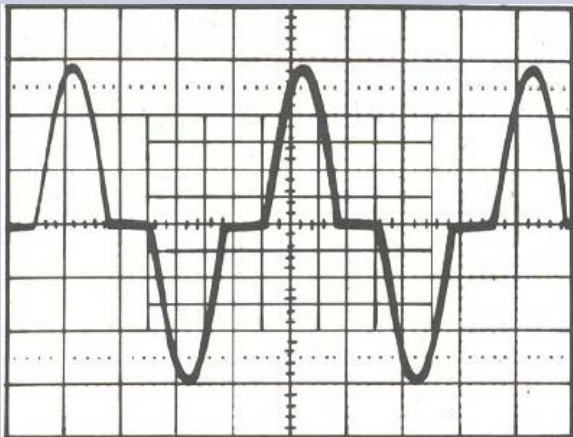
The control element is driven by the control circuit in such a way that a constant DC voltage, within $\pm 1\%$, is available at the output terminals. The AC input choke provides a good decoupling from the input supply line. Due to this fact a feedback disturbance from the rectifier diodes to the incoming mains is avoided, and a sinewave similar input current waveform is obtained.

The high attenuation in the other direction also protects the rectifier diodes from overvoltages on the AC input supply. The rectifier diodes are also unaffected by AC input voltages with undefined zero-crossings.

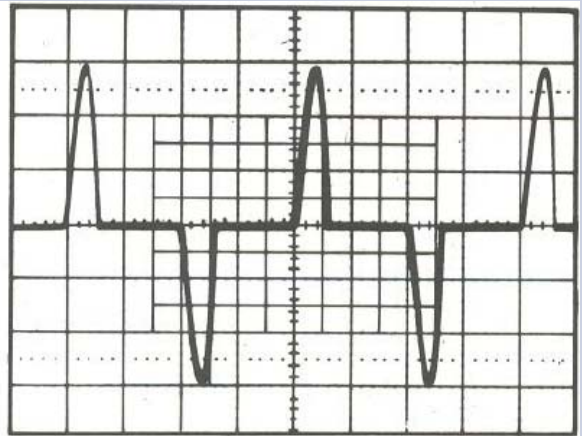
The optimal primary current waveform enables the rectifier to be fed from a Gen-Set power supply without any restriction or additional equipment.

The option of a redundant control logic (internal redundancy) leads to a similar MTBF as redundant rectifier systems.

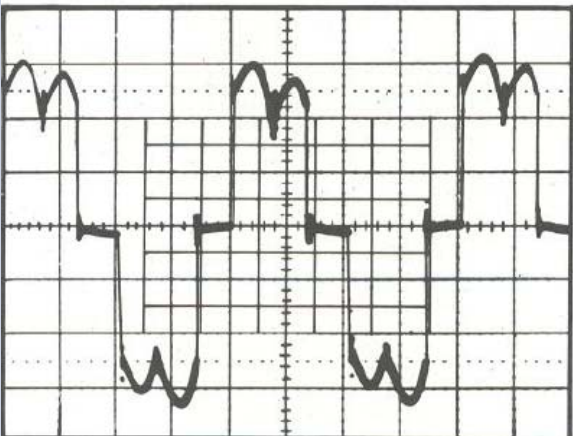
Since the requirements for low disturbance feedback into the AC supply line are producing an increasing number of problems, the AC input current waveforms for the most used equipment techniques are shown here as oscillograms for comparison.



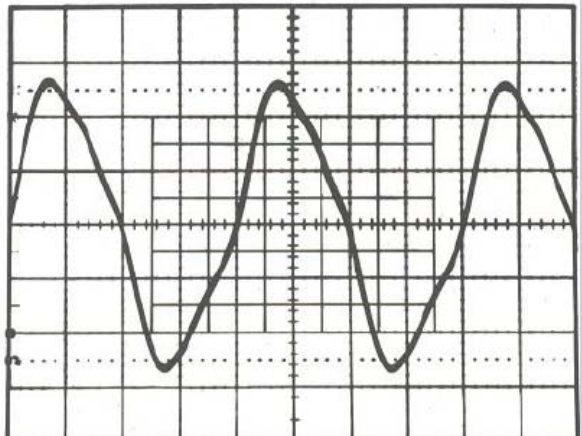
Series-regulated rectifier unit



Rectifier unit with switch mode operation. Regulation without PFC



Thyristor-controlled rectifier unit



Magnetically-controlled rectifier unit

Advantages of magnetic regulation

- Simpler regulator
- Proven and simple circuitry
- Few components
- High power factor
- Low power line disturbance
- Reliable operation in industrial grids
- Low current waveform distortion
- High attenuation between the input and the rectifier diodes
- low spare parts costs
- easy maintenance
- high MTBF
- low reactive input power
- Insensitive to input waveform distortion
- No input compensation
- full use of Gen-Set equipments
- robustness against lightnings
- can be operated from mains-standby

Technical Details

Type	GR-3374 (1~) GR-3375 (3~)
AC input voltage	230 V \pm 10%, 1~, PE 230/400 V \pm 10%, 3~, PE
AC input frequency	50 Hz + 5%
Adjustment range of DC voltage	100 – 120 % U _{Nom}
Nominal DC current	10 – 800 A
Constant voltage	2,23 ... 2,40 V/cell (lead acid) 1,40 ... 1,65 V/cell (nickel-cadmium)
Output voltage regulation	\pm 1 %
Current limiting	At nominal current adjustable 50 – 100 %
Overload / Short circuit	Short-circuit proof / 2xI _{Nom} for 5 sec
Output voltage regulation with current limiting	\pm 2 % in voltage range 80 – 100 %
Output ripple voltage (rms)	< 3 % (without battery)
EMC	According to EN 61000-6-2 / EN 61000-6-4
Permissible ambient temperature	0 ... + 40 °C
Permissible climatic conditions	3K3 according to IEC 60721-3-3 (85 % humidity, no condensation)
Permissible maximum altitude	1000 m a.m.s.l.
Rectifier	Uncontrolled B6 bridge circuit
Fittings	Input and output switches Volt and ampere meters Display module LCD-Display (optional)
Protection class	IP 20 according to EN 60529
Finish	Textured paint RAL 7035

Special configurations and higher power versions can be produced to meet customer's specification on request.

01/2014

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