Operating Instruction

Stationary, valve regulated lead acid batteries
(VRLA/AGM)

Description / Type: RPower OGiV FT

Nominal Data:

• *Nominal voltage UN:*	*Cells 2V:*	*Cells 6V:*	*Cells 12V:*
• *Nominal capacity C20*	*20h discharge*		
• *Nominal temperature TN:*	*20°C*		
• *Factors of reduction:*	*According to EN 50272-2 Article 8*		
• *Nominal discharge current:*	*CN/20h*		

Battery Manufacturer: **RP (UBA Nr. 21000732)**	Type: **OGiV**
Assembly and CE marking by:	date:
Commissioning by:	date:
Security Signs attached by:	date:

	• Observe these Instructions and keep them located near the battery for future reference. • Work on the battery should be carried out by qualified personnel only.
	• Do not smoke. Do not use any naked flame or other sources of ignition. Risk of explosion and fire.
	• While working on batteries wear protective eye-glasses and clothing. • Observe the accident prevention rules as well as EN 50 272-2, DIN VDE 0510, VDE 0105 Part 1.
	• Any acid splashes on the skin or in the eyes must be flushed with plenty of clean water immediately. Then seek for medical assistance. Spillages on clothing should be rinsed out of water.
	• Explosion and fire hazard, avoid short circuits.
	• Electrolyte is very corrosive. In normal working conditions contact with the electrolyte is impossible. If the cell or monobloc container is damaged do not touch the exposed electrolyte because it is corrosive.
	• Cells/bloc batteries are heavy! Always use suitable handling equipment for transportation. Handle with care because bloc batteries are sensitive to mechanical shock.
	Non-compliance with operating instructions, repairs made with other than original parts, or repairs made without authorization (e. g. opening of valves) render the warranty void.
	**Disposal of batteries** Batteries marked with the recycling symbol should be processed via a recognized recycling agency. By agreement, they may be returned to the manufacturer. Batteries must not be mixed with domestic or industrial waste.

Valve-regulated lead acid batteries consist of cells which do not require water topping during the operation. For plugs there are used pressure control valves, which can not be opened without destruction.

1. Start up

Check all cells/blocks for mechanical damage, correct polarity and firmly seated connectors.
The following torques apply for screw connectors:

M5	M6	M8	M 10
2 - 3 Nm	4 - 5,5 Nm	5 - 6 Nm	14-22 Nm

If necessary the terminal cover are to be raised. Connect the battery with the correct polarity to the charger. The charger should not be switched on during this process, the load should not be connected (pos. pole to pos. terminal). Switch on charger and start charging following instruction no 2.2.

2. Operation

For the installation and operation of the batteries DIN VDE 0510 is mandatory. Battery installation should be made such that temperature difference between individual units does not exceed 3 degrees Celsius/Kelvin.

2.1 Discharge

Discharge must not be continued beyond the level specified for the specific discharge current. Deeper discharges must not occur unless specifically agreed with the manufacturer. Recharge immediately following complete or partial discharge.

2.2 Charging

Applicable are all charging procedures with their limit values according to DIN 41773 (IUU_0-characteristic). According to the charging equipment specification and characteristics, alternating currents (< 0,1C(A)) flow through the battery super-imposing into the direct current during charging operation. These alternating current and the reaction form the loads lead to an additional temperature increase of the battery, and strain the electrodes with possible damages (see 2.5). Depending on the installation, charging (acc. to DIN VDE 0510 part 1, draft) may be carried out in the following operations.

a) Standby Parallel Operation and Buffer Operation

Here the load, direct current source and battery are continuously in parallel. Thereby the charging voltage is the operation voltage and at the same time the battery installation voltage. With the standby parallel operation, the direct current source is at any time capable of supplying the maximum load current. The battery only supplies current when the direct current source fails. The charging voltage should be set at 2,275V ± 0,005V (20°C) x number of cells in series measured at the terminals of the battery.
With buffer operation, the direct current source is not able to supply the maximum load-current at all times. The load current intermittently exceeds the nominal current of the direct source. During this period the battery supplies power. The battery is not fully charged at all times but the float-charge of 2,275 V/cell ±0,005V (20°C) x number of cells in series provides a reasonable recharge duration under normal conditions. Dependent on load and number of cells in series, it is recommended to consult the battery manufacturer in any doubtful case.

b) Switch-mode-operation

When charging, the battery is separated from the load. To reduce the charging time, a three phase boost charge mode can be applied by charging the battery at 2,45 - 2,5 V/cell until the charging current drops to 0,07 C(A) (trip point for the first phase of charging t1). The duration of charging of the first phase is measured by a timer so that the second phase should be half of the first phase (t2 = 0,5t1) when the batteries are kept on charger at 2,45 2,5V/cell. After the total charging of t=t1+0,5t1 has elapsed, the charger reduces the voltage to a normal float-charge level of 2,275V/cell (±0,005V) at 20°C.

c) Battery operation (charge/discharge operation)

The load is only supplied by the battery. The charging process depends on the application and must be carried out in accordance with the recommendations of the battery manufacturer.

2.3 Maintaining the full charge (float charge)

Devices complying with the stipulations under DIN 41773 must be used. They are to be set so that the average cell voltage is 2.275V±0,005V.

2.4 Supplementary and Equalizing charge

To ensure maximum service life, a supplementary charge may be required prior to installation on condition that the batteries have been in storage for more than 6 months or more, latest after 9 months age from the date of production and that the open circuit voltage is less than 2,1 Volts per cell. A supplementary charge should be applied in accordance with figures shown in the table:

Storage Period	Charge V/Cell at 20° C	Charging Time
Less than 9 months	2,28 V/Cell	More than 72 hours
Up to 1 year	2,35 V/Cell	48-144 hours
1-2 years	2,35 V/Cell	72-144 hours

Batteries kept at normal float charge level within a string do not require any equalizing charge in case of partial replacement, in order to narrow the bandwidth of open-circuit voltages.

2.5 Alternating currents
On recharging up to 2,4 V/cell under operation modes 2.2 the actual value of the alternating current is for a very short time permitted to reach 0,1C(A) nominal capacity. In a fully charged state during float charge or standby parallel operation the actual value of the alternating current must not exceed 5 A/100 Ah nominal capacity.

2.6 Charging currents
During float charge or standby parallel operation without recharging state the charging currents are not limited. The charging current should range between 10 A to 20 A/100 Ah nominal capacity.

2.7 Temperature
The nominal operation temperature range for lead-batteries is 10°C to 30° C (best 20°C ± 5 K). Higher temperatures will seriously reduce service life. All technical data are produced for a nominal temperature of 20°C. Lower temperatures reduce the available capacity. The absolute maximum temperature is 50°C and should not permanently exceed 40°C in service.

2.8 Temperature-related float charge voltage and boost charge
The float charge voltage of 2,275V/cell ±0,005V/cell refers to a battery temperature of 20°C. Temperature compensated charging is required in order to avoid overcharge at high temperatures and undercharge at low temperatures. The recommended temperature compensation factor is -3m V/cell/°C for float charge operation. In order to avoid thermal runaway, it is mandatory to temperature compensate the float-charge voltage for temperatures above 40°C. The boost charge mode can be applied if a quick recharge is required on condition that the charging current does not exceed 0,25C(A) and constantly drops to 0,01C from where normal float charge voltage should be applied.

Temperature (°C)	Boost Charging Voltage (V/Cell)	Maintenance Charge Voltage (V/Cell)
- 10	2,58	2,36
0	2,53	2,33
10	2,48	2,30
20	2,45	2,28
30	2,40	2,24
40	2,34	2,21

2.9 Electrolyte
The electrolyte is diluted sulphuric acid and is absorbed in glass-matt separator.

3. Battery maintenance and control
Keep the battery clean and dry to avoid leakage currents. The cleaning of the battery should be carried out according to the ZVEI-leaflet “Cleaning of batteries”. Plastic parts of the battery must be cleaned with pure water without additives, any organic solvents are prohibited.

At least every 6 months measure and record:
- battery voltage
- voltage of several cells/blocks
- surface temperature of several cells/blocks
- battery-room temperature

If the difference of the average float charge voltage/cell is exceeding ± 0,1 C/cell within a string or if the surface temperature-difference between cells/blocks is exceeding 5 K, the service-agent should be contacted.

Annual measurement and recording:
- voltage of all cells/blocks
- surface temperature of all cells/blocks
- battery-room temperature
- insulation-resistance according to DIN 43539 part 1

Annual visual check:
- screw connections, any screw connections without locking devices have to be checked for tightness
- battery installation and arrangement
- ventilation

4. Tests
Tests have to be carried out according to DIN 43539 part 1 and 100 (draft). Special instructions like DIN VDE 0107 and DIN VDE 0108 have to be observed. To make sure to have a confidential power supply, the whole battery should be exchanged after the utilization is finished. Take also into account the temperatures and the operating conditions.

5. Faults
Call the service agents immediately in case of faults in the battery or the charging unit. The availability of the recorded data described in point 3, will be very helpful to find the cause of failure. A maintenance contract simplifies trouble shooting.

6. Storage and taking out of operation
To store or decommission cells/batteries for a longer period of time, they should be fully charged and stored in a dry frost-free room. To avoid damage, batteries should be regularly subjected to supplementary charge cycles in accordance with 2.4.

7. Transport
VRLA batteries, which by no means show any kind of damage, are classified a non-dangerous goods for transportation via rail, lorry, sea freight or air (according to GGVS, GGVE, IATA (rule A67), ADR (rule 598), IMDG (rule 238.2) and UN 2800 special provisions) if they are safeguarded during transportation against short circuiting tossing about, slipping or any damage. Batteries to be classified under afore-mentioned paragraph must mandatorily not display any traces of electrolyte on the exterior of the battery container. As for VRLA batteries being damaged, assumed to be leaking of electrolyte and to be transported under warranty, or assumed not to be tight in any aspect anymore, they are to be handled in accordance with exception regulations of dangerous goods transportation rules concerned.

8. Technical Data

Typ	5min	10min	30min	1h	2h	3h	8h	10h	20h
RPower	C1/12	C1/6	C1/2	C1	C2	C3	C8	C10	C20
OGiV FT	1,60V/Z	1,60V/Z	1,70V/Z	1,80V/Z	1,80V/Z	1,80V/Z	1,80V/Z	1,80V/Z	1,80V/Z
OGiV 12400 FT	10,4	15,8	23,2	25,5	29,2	32,1	40,0	41,2	43,2
OGiV 12550 FT	13,6	21,5	30,6	33,9	39,4	42,9	53,0	55,0	58,2
OGiV 12800 FT	18,6	29,4	42,0	45,8	52,8	57,3	72,2	75,0	79,4
OGiV 12950 FT	22,3	33,3	50,1	56,9	65,6	71,7	90,4	94,4	100,0
OGiV 121000 FTS	24,8	35,9	53,2	60,3	70,4	77,1	95,2	100,0	106,0
OGiV 121000 FT	24,8	35,9	53,0	59,5	69,6	77,1	95,2	100,0	106,0
OGiV 121250 FT	31,0	44,9	66,7	75,1	87,8	96,6	119,2	125,0	132,4
OGiV 121500 FT	36,0	53,9	80,3	90,6	105,4	115,8	142,4	150,0	158,8
OGiV 121800 FT	42,2	61,0	91,8	103,5	119,6	131,1	161,6	170,0	180,0

Technical Data are subject to change.

RP-TECHNIK Notstromsysteme
Batterien · Leuchten-Kontrollsysteme · Einzelbatterieleuchten · Hinweisleuchten · Zentralbatterieleuchten · Anlagen

RP-Technik GmbH
Hermann-Staudinger-Str. 10-16
D-63110 Rodgau

Tel.: +49 (6106) 660 28 - 0
Fax: +49 (6106) 660 28 - 40
E-Mail: info@rptechnik.de
Internet: www.rptechnik.de