GENERAL DESCRIPTION

Inform PS8000 180A DC Supply has been designed for GSM stations and other communication applications. PS8000 system is used in DC energy required application areas together with charging facility. 180A DC energy distribution system creates the –48VDC energy for the related loads.

The system is composed of parallel redundant operating and forced current sharing RD2000 series rectifiers, AC distribution, DC distribution and Battery bank. PS8000 Power System can be supplied from both three or single phase mains.

Additionally depending on the request, PS8000 system is available to be connected in parallel systems.

Inform –48V DC Power Supply System is composed of following modules;

MODULE	DESCRIPTION
RD 2000 Rectifier	*Rectifier Module, *90-280 V AC sinusoidal input voltage, -48V DC nominal output voltage.
PS 8000 Distribution Frame	*Hot-swappable and redundant operation, *Modem for the availability of remote control on the unit(optional), *RS232 communication port, option of RS485 port for the communication with other DC frames, *Monitoring through friendly use intelligent LCD display, *Availability to locate 6 rectifiers in single frame and to connect 6 frames in parallel.

1. SPECIFICATIONS

1.1 RD2000 Rectifier Technical Specifications

RD2000 Rectifier Module

INPUT SPECIFICATIONS

INPUT VOLTAGE	: 90-280 V AC
WAVE FORM	: SINUSOIDAL
FREQUENCY	: 50 Hz. –10%, +30%
INRUSH CURRENT	: <10A

OUTPUT SPECIFICATIONS

NOMINAL OUTPUT VOLTAGE	: -48 V DC
VOLTAGE VARIATION RANGE	: -42 / -57 V
DYNAMIC REGULATION	: < 1 V DC
CURRENT SHARE	: ±%5
RIPPLE	: < 100 mV
PSOPHOMETRIC NOISE	: < 2 mV
NOISE (3.4-150 kHz)	: < 5 mV
ACUSTIC NOISE	: < 50 dB
EFFICIENCY	: > %91
CHARGE VOLTAGE	: -53 V DC nominal charge, -57 V DC Boost charge
OUTPUT LOW VOLTAGE CUT OFF LIMIT	: 42V
COOLING	: Forced

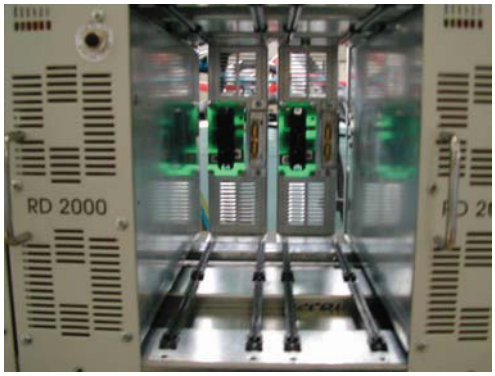
PS 8000 Rectifier Group and RD 2000 Rectifiers

INPUT

Input Voltage	136 to 280 VAC	Normal operation at nominal load
	90 to 135 VAC	Derating operation at 0,66 of the nominal load
Input Frequency	45-65 Hz.	
Input Inrush Current	<10A	@ 220 VAC
Input Current	<14A	@ 136 VAC ,Nominal load
	<14A	@ 90 VAC , 0.66 of the nominal load
AC Protection	External Fuse	16 (offered)
Power factor	0,99	@ 220 VAC ,Nominal load
Input THD	< 3	@ 220 VAC ,Nominal load
Efficiency	>0,91	@ 220 VAC ,Nominal load

OUTPUT

Output Voltage	48 VDC	48 VDC Nominal
	45-63 VDC	Clearing value
	53,5 VDC	Factory pre-set
Output Current	22A	@ 56 VDC
Short Circuit Current	25A	
Output Regulation	<200mV	0-100% static load variation
	< 1V	5-100% load variation
	<100mV	±20 % AC variation
	<200mV	0°C-50°C temperature variation
Output AC Ripple	<50mV AC	@ 100Hz.



RD 2000 Rectifier Shelve

GENERAL

Operating Temperature	0°C-55°C	Normal Operation
Electromagnetic Compatibility	EN 55022, Class A	
Electrical Safety	EN60950	
Cooling	Forced and Conventional	@ 56 VDC
Acoustic Noise	<50dB	@ 220 VAC ,Nominal Load
Humidity	5%-95%	Relative Humidity
(MTBF)	>20 years	@ 220 VAC ,Nominal Load ,25 °C
Dimensions	342mm.	Height
	132mm.	Width
	305mm.	Depth
Weight	11,5kg.	

1.2 PS8000 Rectifier Group Protection and Control Features

PS 8000 Rectifier Groups

- Rectifiers can operate without main controller unit and batteries.
- Rectifiers operate according to N+1 redundancy principle. Also they operate 5% forced current share at 70% load till 1V voltage variation at the output.
- At the AC/DC Distribution Frame, in the inputs of the rectifiers, there are AC fuses(thermic, magnetic etc.) according to the appropriate current capacity.
- At the Distribution Frame, there is high voltage protection card after the input fuses for the protection of sudden voltage variations and lightning.
- In case of a failure on one of the rectifiers, The necessary precautions with an output fuse is obtained to prevent the failed rectifiers effecting the others.
- In case the AC supply is cut off or out of allowed limits, the unconditioned rectifiers automatically passes to boost charge mode whenever the AC mains recovers again.
- When the rectifier output reaches to the adjusted excessive voltage value, (between 100-1000 msn. as delayed) the system switch off itself.
- In the input of every rectifier, there is a protection having value of 2000V (1.2 µsn-50µsn) against lightning and sudden load changes effects.
- The rectifier output has short circuit protection. In case of a short circuit having value 110% of the nominal current, it still continues to supply DC current.
- The order of the rectifiers inside the frame is not important, the address of each rectifier can be identified by a manual terminal externally.
- RS232 and RS485 communication protocols are present on the frame for communication with another system or a computer.
- External battery cabinet can be connected to PS8000 rectifier group in order to increase the battery capacity.

ENVIRONMENTAL CONDITIONS:

OPERATING TEMPERATURE	: 0°C - 50°C
RELATIVE HUMIDITY	: %5-%95 RH (25°C)
STORAGE TEMPERATURE	: -30°C/+70°C
MAX. ALTITUDE	: <2500 m

2. PS8000 88A-350A DISTRIBUTION FRAME

2.1 General

Inform PS8000 DC Supply has been designed for GSM stations and other communication applications. PS8000 system is used in DC energy required application areas together with charging facility. 180A DC energy distribution system creates the –48VDC energy for the related loads.

The system is composed of parallel redundant operating and forced current sharing RD2000 series rectifiers, AC distribution, DC distribution and Battery bank. PS8000 Power System can be supplied from both three or single phase mains.

Additionally depending on the request, PS8000 system is available to be connected in parallel systems.

2.2 Specifications

Single cabinet until 350 ampere

Modular Rectifier

- Hot-swappable and redundant operation.

Modular Control

- Modem for the availability of remote control on the unit(optional).
- The System can be controlled through RS232 communication port with a pc or network.
- RS485 communication port is present as standard on every CU (Control Unit) of the System for the communication between the frames.

User Friendly Display

- Easy function of setting, monitoring, user friendly LCD Display menu, provides the user to reach the informations easily.

Modular Distribution Options

- Circuit Breaker or fuse connections can configurated according to the request.

Expanding

- Max. 6 Rectifiers can be located in single distribution frame.
- On condition that every frame has its own CU (main control unit) , max. 6 frame can be connected in parallel.

2.3 PS8000 AC/DC Distribution Power System

2.3.1 System Specifications

Frame	Total 6 rectifiers can be installed in one frame.(180 ampere)
Rectifiers	Modular RD2000 rectifiers (30 ampere)
Input	3 ∅ + N + PE or 1 ∅ + N + PE
Output	DC distribution panel is composed of 6pcs output fuse and can be expanded up to 240A. Depending on the customer request, the output distribution fuses can be configurated accordingly.
Display Options	System Position, Alarms can be monitored and adjustments can be done through LCD display on the Control Unit(CU).
Controller (CU)	All the adjustments and the calibrations are done through CU.
Alarm Contact Outputs	There are total 8 dry contact signals present on the frame for remote monitoring.

2.3.2 Protections

Input	One fuse for each rectifier module.
Output	For DC distribution, up to 350A, total 24pcs fuses can be installed on the frame.
Battery	Fuse according to the frame type for each battery bank
Battery low voltage Disconnect	Battery low voltage contactor for the protection of batteries from deep discharge.
High Voltage	High Voltage Protection Module protects the unit from lightning and sudden voltage fluctuations.

2.3.3 Electrical Performance

Efficiency	> 91 %
Power factor	99 %
Regulation	< 1V

2.3.4 Battery Management

Battery	At 180A frame, there are two group battery packs. Additionally external batteries can be connected to the frame. 8 x 19" 155Ah batteries can be installed to standard PS8000 frame.
Charge	Battery Charge options : Auto Charge Mode 49V Mode 53.5V Mode 57V Mode 63 V Mode especially for wet batteries If any adjustment is not made on the CU menu, then the system shall start to operate at auto charge mode when it is switched on.
Low Voltage Disconnect	Low voltage disconnect contactor, disconnects the circuit at the adjusted value between 42VDC to 46VDC from the CU(Control Unit) as s/w or h/w. Low Voltage Disconnect Contactor protects the batteries from deep discharge.
Heat Compensation	Heat Compensation is applied according to the heating profiles of batteries connected either internally or externally.

2.3.5 Mechanical & Environmental Specifications

Environmental Temperature	
Operating :	0˚C / + 50˚C
Storage :	- 30˚C / + 70˚C
Mechanical Dimensions	Depth : 395mm Height : 490mm Width : 525mm
Weight(kg/cabinet)	121 -frame- (excluding the rectifiers and batteries)
Operating altitude (m)	< 2500
Relative Humidity	5 % - 95 %
Audible Noise	< 50dB
Cooling	Natural and Forced

2.4 Handling

PS8000 DC Frame is being packed in 3 main groups due to its weight ;

- Battery Bank
- RD2000 Rectifier Group
- Frame

Before installation and switch on procedure, these 3 groups should be checked whether they are complete and available for installation.

If any damage on the packing or cartoon box of the unit is observed, then the transporter company should be informed about this situation.

2.4.1 Frame

For easy and secure handling, the frame is packed with wooden box and raised with wooden legs from bottom.
The packed frame dimensions are as follows;
(width x length x height) : 930mm x 2300mm x 760mm

- Frame keys (door keys)
- User manual
- Battery connection link cables

2.4.2 Rectifiers

Rectifiers are packed with cartoon boxes and stroke and shock emitter devices decreasing the possibility of any damage and harm on the units.

Rectifiers should be checked after the receive of consignment confirming all the devices are in fine condition before installation.

2.4.3 Batteries

2 pcs battery bank , each composed of 4pcs batteries, total 8pcs batteries can be connected to a 180Ampere rectifier frame. Batteries are 12V sealed maintenance free type unless others are not requested. The capacity of the batteries are selected according to the back up time requested by the customer. 19” 155Ah 8 pcs batteries can be installed inside a standard cabinet.

8 pcs batteries should be same as brand , capacity, voltage .. etc. vise.

2.5 Installation (AC / DC Distribution and Cross-sections of cables)

Before the connection of the distribution cables, all the fuses of the frame should be brought to (OFF) Zero position.

2.5.1 Cables within the frame and cable connections

2.5.1.1 Cables and Cable Connections

- Energy cables are according to the European standards.
- Cables are assembled with protection bands against mechanical frays.
- Cable cross-sections and types are selected according assembly locations.
- All flexible conductors' connections are used according to the European standards.
- The bending of the conductors from their input locations are prevented protecting them from any harm.

2.5.1.2 Battery- DC Energy Connection

- The connection cables between batteries and DC energy are selected with the cross-sections of min 16 mm^2.
- During the connection of the battery-DC energy, The terminals of the batteries should be linked properly and covered with a protection gel in order to provide protection against corrosion.
- Battery- DC energy connection should be done with an appropriate contactor.
- External additional battery bank can be connected to the existing battery group in the frame for capacity expanding purposes.
- The cabinet dimensions are 595mm x 395mm x 1270mm.(width x depth x height). Two battery groups (each having 4pcs batteries) can be installed within this frame.

2.5.1.3 Ground Connection

- The connection between the grounding unit of the power supply and the ground can be made with 10 mm^2 cross-sectioned cables.

2.5.2 Energy and Load cables connection of the Frame

2.5.2.1 Load Connection

DC distribution and load distribution fuses are located just below the load Clemens. As shown above load fuses and clemens' are connected as one corresponding to other. Therefore during the connection of load, the current value that is absorbed by the load should be considered and proper cross-sectioned cable should be connected to the proper Clemens.

The below table shows the suggested cable cross-sections depending on the current values of the connected loads to the frame.

Cross-section of the cable Connected to the frame (mm2)	The current value absorbed by the load Connected to the frame (Amp)
1,5	10
4	20
6	30
10	40
16	60
25	83
35	103
50	132

NOTE: It is suggested to select the cable cross-section value from the above table which is at the same or close value to the absorbed current amount by the load that's connected to the frame.

2.5.2.2 Mains Connection

The connection between PS8000 DC Frame and the mains should be done with multi-vein cable. The cables inside the frame should be connected according to the defined and stated mains, fuse and Clemens entries. When 3 ∅ mains is connected to the frame, the cable cross-sections that shall be used for R, S, T, Neutral, and ground are explained below;

3 ∅ ⟶ 4 x 6mm2 (R, S, T, N) , 1 x 10mm2 (PE)
This example is for 88 A frame.

If there is no three phase at the installation location of the PS8000 frame or the frame is obliged to be supplied from single phase for any kind of reason then the cable cross-sections should be as follows;

1∅ ⟶ 3 x 6mm2 (R, S, T) , 2 x 10mm2 (N, PE)
This example is for 88 A frame.

!!! CAUTION : It is important to use correct cable cross-sections both at mains connection and load connection.

2.5.3 Battery bank Connection

Total 8pcs batteries can be installed and connected inside the PS8000 DC Frame. These batteries can be located on two trays as two separate groups.

+ and – points should be connected to the related terminals present on the shelves with respect to the correct polarity. The battery group cables, present on the shelves, contain polarity (+ and -) labels on, and the battery connection cables among each other are present inside the frame.

!!! During the connection of batteries among each other, the polarities of them should be considered on priority basis.