SOUTH ASIA'S LARGEST
POWER CONTROL COMPANY

JINDAL'S

POWER TO YOU

SILICON POWER RECTIFIERS

- Electroplating
- Cleaning
- Etching
- Stripping
- Barrelling
- Anodising
- Hydrogenation
- Electrowinning
- Electroextraction
- Other Electrochemical Processes

DNV
AN ISO 9001 : 2015
CERTIFIED COMPANY

55 YEARS
EXCELLENCE

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Silicon Rectifier is an equipment that converts AC into DC supply. Silicon Rectifiers are widely used in Electroplating, Anodising, Hydrogenation and all other electrochemical processes. **JINDAL'S** Silicon Power Rectifiers are trusted for their energy efficiency and long life for numerous electrochemical aplications across the world.

Brief Specifications

JINDAL'S Silicon Power Rectifiers are designed for continuous rated current with adequate margin of safety and are capable of working at 100% load factor.

Input Voltage : 400/415 Volts, 3-Phase 50Hz., AC supply or any other voltage

Output Voltage : Fixed maximum rated DC voltage or variable from zero to maximum rated voltage

Output Current : From zero to rated maximum DC current

Temperature Rise : Designed for 30°- 35° C rise above ambient at full load (against IEC std. of 45°C)

Efficiency :
- 12 V Rectifier: 86-88%
- 24-50 V Rectifier: 92-94%
- 100 V Rectifier: 94%
- 200V Rectifier: 96%
- More than 250 V Rectifier : >97%

Ripple Content : Less than 5%. (optional feature of 1 to 1.5% Ripple Content also available)

Insulation : 'A' class for oil cooled

We also specialize in manufacturing bespoke design as per customer requirements / specifications

The standard equipment consists of :

- **Linear type continuously variable Rolling Contact type ON- LOAD Voltage Regulator** (with straight ± connection) operable electrically with the help of raise/lower push buttons/toggle switches and a step-synch motor or manually with the help of a 'T' handle
- Copper wound delta/double star (hexa-phase) step down transformer as per IS 2026
- Copper wound Inter phase transformer
- Junction Box for three phase Input terminals and aluminum Bus Bars for DC Output (Cu Bus Bars optional)
- Meter panel with DC Voltmeter and DC Ammeter and raise/lower push buttons/toggle switches
- Thermometer Pocket
- Oil fill plate
- Oil level gauge
- Oil drain out valve
- Lifting lugs
- Wheels for uni-directional movement
- Name plate with complete specs of the equipment
- Earthing terminals
- Indicator lamps for RYB input AC supply, as per IS-1248
- **First Filling of Oil**

JINDAL'S Rectifiers equipments come with an unmatched ONE YEAR GUARANTEE against any manufacturing defect from the date of supply. We do not charge any thing for the visits, spare parts and labour during the guarantee period.

Note: Diodes are not prone to ageing and get damaged only due to short circuit on the output side, hence the same are not covered under guarantee

JINDAL'S 1 Year Unconditional Guarantee against manufacturing defect

Inner View of Rectifier

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Starting Circuitry : JINDAL'S Rectifiers are designed for 3 phase, 50 Hz, 400/415 Volts, AC input supply. It is recommended that the input of the rectifier should be connected through a proper protective device, to provide positive protection to personnel and the system, in the event of maintenance or in case a fault occurs.

Note : Incoming protection switch gear (Contactors / MCCB etc.) can be provided as optional features, if required.

DC Output Control : The function of the variable output controls is to control the voltage or current or its operating range by varying input voltage to the main transformer primary. The DC output voltage variation is achieved steplessly 0-100% by means of an ON LOAD roller type **JINDAL'S** make Linear Voltage Regulator.

Special Features of JINDAL'S Rectifiers :

1. On Load Voltage Regulator: JINDAL'S Rectifiers are equipped with vertical Rolling contact type ON LOAD Voltage Regulators, which are manufactured by us in-house & is actually our forte across the country. Our Voltage Regulators are +/- type wound with heavy section of copper strip and fitted with carbon Rollers (As illustrated in our Corporate Brochure). The cross section of copper used in our regulators is 3-4 times than that used in the conventional dimmer/thyristor controlled rectifiers, and hence, losses are less than 1/6th compared to the latter. The efficiency of our Regulators is more than 99% (which is 4-5% better than conventional types) and they are designed to deliver 100% continuous duty cycle. These regulators have and economic life of about 20 years without trouble.

2. DESIGN: JINDAL'S Rectifiers equipments are wound with electrolytic prime grade copper strip to minimize power losses, in comparison to Aluminium conductor used by many other manufacturers. Our equipments are designed liberally as per capacity and are also suitable for marginal over load conditions.

3. BUSBARS: Aluminium Bus Bars / annealed copper bus bars of electrolytic grade with conductivity greater than 99.99% as per IS:613-1984 are used.

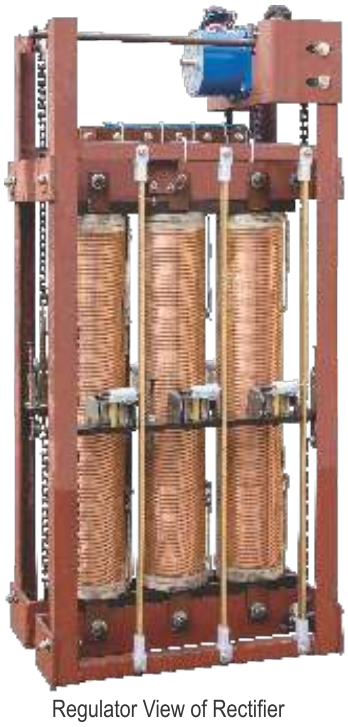
4 DIODES: Silicon diodes are tested in house. similar PIV batch and same forward drop diodes are used in the equipment for equal load sharing and reducing the power losses of diodes. The diodes in the rectifiers are fitted with suitable heat sink whenever necessary.

5. IPT: Inter phase Transformer-IPT is connected between two stars points of the secondary of the main transformer. The IPT improves the commutation, thereby increasing the rating of Rectifier.

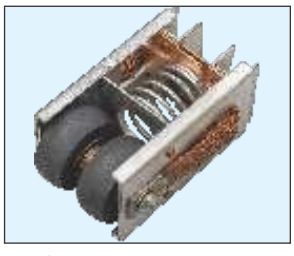
6. Lamination Core: We use imported CRGO Lamination of grade M3 or M4 which has minimum power losses and result in better efficiency of equipment and savings in energy bills.

7. PAINTS: We paint the equipment with epoxy paint after two coats of epoxy primer (ROP), which resistant to acidic environment of plating process and enhances the life of the equipment by preventing it from corrosion.

8. METER: We use high quality DC meters only (Digital /Analog), which are very accurate & durable.


Regulator View of Rectifier

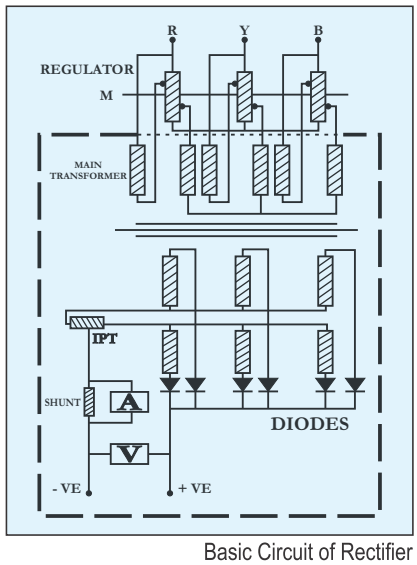
9. SERVICING: JINDAL'S have maintained a enviable reputation in after sale & Service right since its inception. Our service engineers, stationed across the sub continent, deliver prompt pre sales and post sales support to our clients.


Carbon Roller Assembly


CVC Module


Tag & Tail


CCC Module



Basic Circuit of Rectifier

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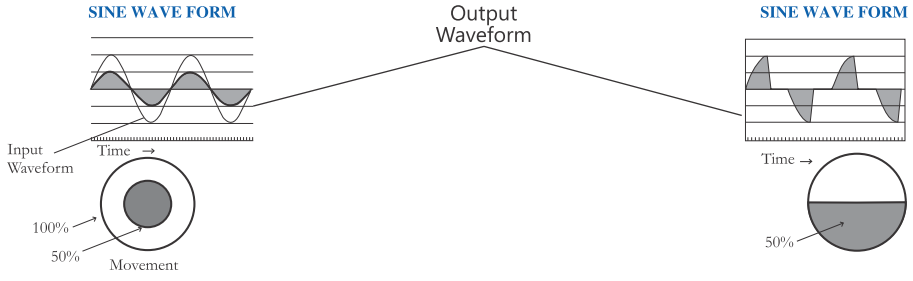
Optional Features: JINDAL'S offer following optional features with rectifier equipment

S.No.	Item	Application	Advantage
1	Constant Voltage Controller (CVC)	The CVC will automatically maintain a constant Output voltage as per setting, irrespective of input voltage variation.	By using CVC, uniform quality of plating can be maintained, thereby controlling excessive consumption of plating raw material at high voltage.
2	Constant Current Controller (CCC)	The CCC will automatically maintain a constant output current as per setting, irrespective of input voltage variation.	By using CCC, uniform quality of plating can be maintained, thereby controlling excessive consumption of plating raw material at high current
3	DC Overload Trip System	The DC Overload Trip instrument will sense the signal from the output of the Rectifier and trip the main contactor in case of overshooting the set range.	By using the DC Over Load Trip system, the diodes will be saved during any accidental short circuit in the bus bars or in the tank.
4	Signal Isolators	The Signal Isolators can be used to avoid the milli-volt drop of the Ammeter/Voltmeter signals. The Isolators can give output in milli-Volts/milli-Amps.	Ideal for use when the Voltmeter/Ammeter panel is kept too far from the Rectifier. These Signal Isolators are also necessary for the input signals to the PLC panel, i.e. to make the Rectifiers PLC-compatible.
5	Zero Run Down System	With the help of Zero Run Down System, once the Rectifier trips or is switched off while working, it will automatically start from 0 Volts when restarted.	This saves the diodes from sudden load current, thus increases the life of the equipment.

Note: Protection switch gear (Contractors / MCCB etc) can also be provide as optional feature.

Advantages of Linear Type Regulator as compared Thyristorised Control



1. No wave form distortion at any load. Electrical wave form is like a moving wheel. For 50% Rated Voltage the dia of wheel is reduced accordingly i.e. magnitude for a wave is decreased.
2. Higher power factor of more than 0.95 is achieved.
3. The system is simple and can be repaired and maintained even by simple mechanic/electrician.
4. Virtually maintenance free, cost of spares is very negligible.
5. Proven extra long life of 30+ years.
6. Over all losses are less.
7. One year guarantee.

1. Wave form distortion in thyristorised type. It is like cutting the wheel by 50% and then moving the wheel i.e. wave form is cut as shown at full magnitude.
2. The power factor is lower between 0.5 to 0.9 .
3. The system is specialized and needs specially trained electronic engineer to repair and maintain.
4. The cost of replacement is very high.
5. Life of electronic cards/thyristors is very short and unpredictable
6. Over all losses are more.
7. One year warranty.

Some of our Valuable Clients using JINDAL'S Silicon Power Rectifiers

Today, JINDAL'S has become a name to reckon with in the field of Rectifiers, all bearing JINDAL'S stamp of Reliability and Trust that it shares with some of the top Indian and Multi National Companies.

ABB	Brakes India	Hero Cycles	LML	Omax Auto	Ronuk Metafin	TI Cycles Ancilliaries
Atlas Cycles	Chettinad Quartz	Hidalco Industries	L&T	Ordnance Factories	Rubamin	Uflex
Attero Recycling	Endurance Systems	Hero Honda Motors	Minda	Oswal Vanaspati	ShriRam Pistons	Usha Amorphous
Avon Cycles	Escorts	Hitachi Metglas	Nicomet	Paper Products	Sterling Tools	Vijay Electricals
Bajaj Auto	Federal Mogul Goertz	Jindal Oils & Fats	Munjal Showa	Railways (DLW Varanasi & Patiala)	Stovec Industries	Yamaha Motors, etc.
Bhartia Cutler-Hammer	Gharda Chemicals	Jaquar	Mascot Metal Mfrs	RMI Cycles	Thapar Group	

Also Manufacturer of Oil Cooled Automatic Voltage Controller upto 3500 KVA & Special Purpose Transformers

For any Further Details or Enquiries, Please Call or Contact:

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