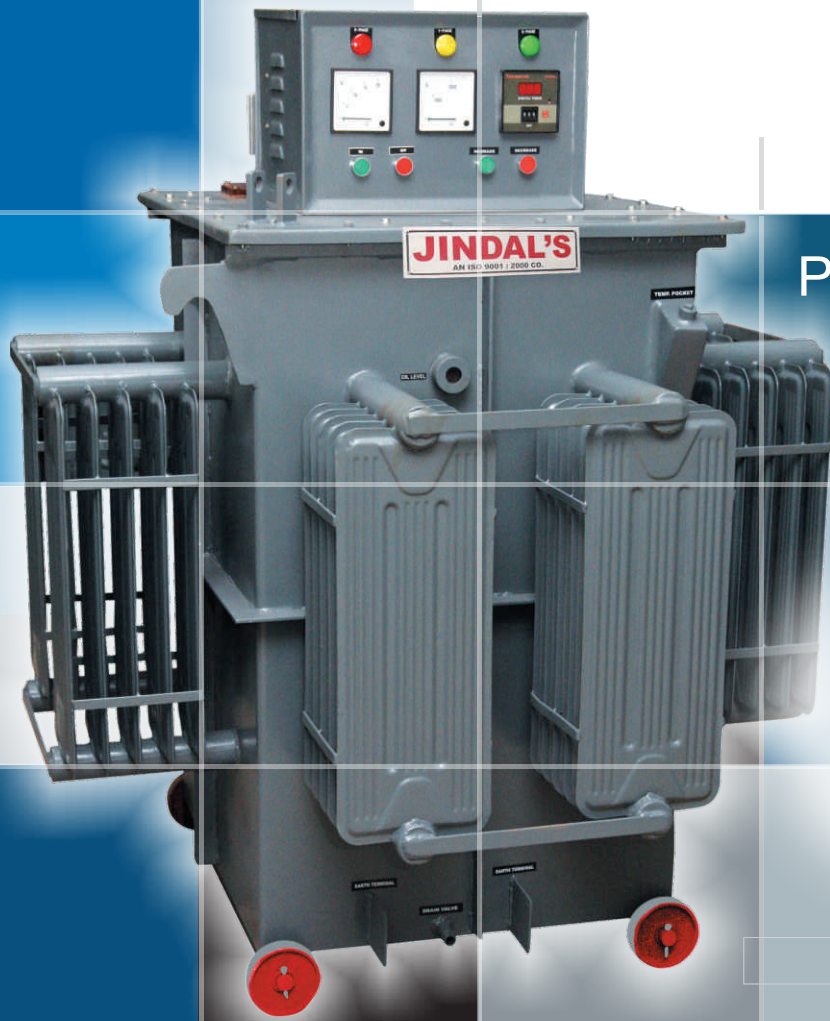




# Silicon Power **RECTIFIERS**

Power packed  
performance....



- Electroplating
- Cleaning
- Etching
- Stripping
- Barrelling
- Anodising
- Hydrogenation
- Electrowinning

Other Electrochemical Processes



# JINDAL'S

Widely acclaimed as South Asia's Largest Power Control Company, are Pioneers in the field of Industrial Voltage Stabilizers & Rectifiers



**49+** Years of Leadership

**174+** Sales & Service Centres across India & Abroad

**25000+** Installation across Industry

**JINDAL'S** Silicon Power Rectifiers are trusted for their high energy efficiency and long life for numerous electroplating applications across the country.

## Brief Specifications

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

The standard specifications are as follows:

**Input Voltage :** 400 Volts, 3-Phase, 50 Hz, AC supply

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

**Output current :** From Zero to rated maximum DC current

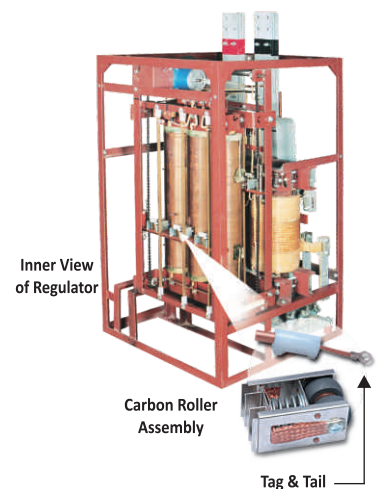
**Temperature Rise :** Less than 35 degrees Celsius above ambient at the top of the oil

**Efficiency:**

- 12 V Rectifier: 82%
- 24 V Rectifier: 90%
- 100 V Rectifier: 94%
- 200 V Rectifier: 96%
- More than 250 V Rectifier: >97%

**Ripple Content:** Less than 5% Optional feature of 1.5% Ripple Content also available

**Insulation:** 'A' class for oil cooled



## The standard equipment consists of:

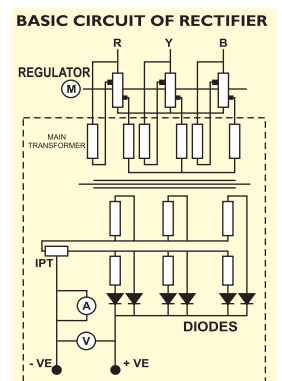
- Linear type continuously variable Rolling Contact type ON-LOAD Voltage Regulator (with straight  $\pm$  connection) operable electrically with the help of raise/lower push buttons and a step-synch motor or manually with the help of a 'T' handle
- Copper wound delta/double star (hexa-phase) step down 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
- 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

## Starting Circuitry

JINDAL'S Rectifiers are designed for 3 phase, 50 Hz, 400 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. Incoming protection switch gear (Contactors / MCCB etc.) can be provided as optional features, if required

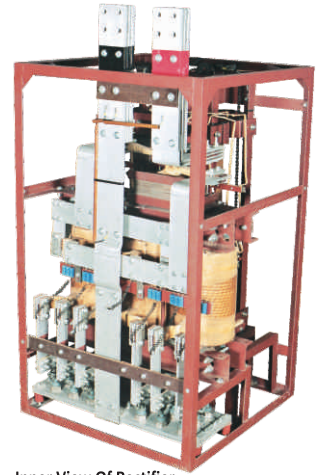
## DC Output Control

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 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 brochure enclosed). The copper section is 3 times than that in conventional dimmer/thyristor controlled rectifiers, and hence, losses are less than 20% compared to the latter. The efficiency of our Regulators is more than 99% (which is 4 – 5% better than conventional dimmer types) and they are designed to deliver 100% continuous duty cycle. These regulators have an economic life of about 20 years without any trouble.



Inner View Of Rectifier

2. **JINDAL'S:** Rectifier equipments are wound with electrolytic prime grade copper strip to minimise 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 loading 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 star points of the secondary of the main transformer. The IPT improves the commutation, thereby increasing the rating of the Rectifier.

6. **LAMINATION CORE:** We use imported CRGO Lamination of grade M3 or M4 which has minimum power losses and results in better efficiency of equipment and savings in energy bill.

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

8. **METER:** We use reputed make (AE / RISHABH / CONZERV or equivalent) DC meters only, which are very accurate and durable

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



JINDAL'S Rectifier equipments come with an unmatched FIVE YEARS GUARANTEE against any manufacturing defect from the date of supply. We do not charge anything for the visits and spare parts and 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.



## Optional Features

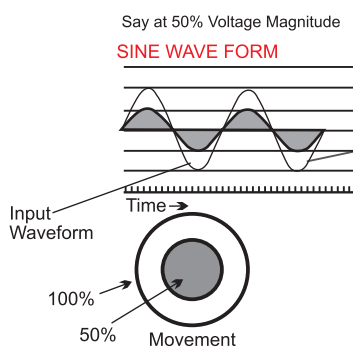
JINDAL'S offer following optional features with rectifier equipment

| 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 voltage   |
| 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  |



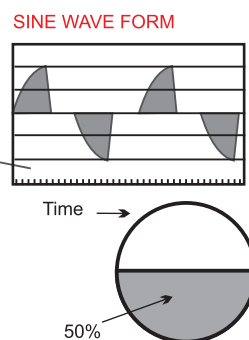
# Advantage of Linear Type Regulator as Compared to Thyristorised Control

## LINEAR TYPE REGULATOR



## THYRISTORISED CONTROL

Output Waveform



- 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
- Higher power factor of more than 0.95 is achieved.
- The system is simple and can be repaired and maintained even by ordinary mechanic / electrician.
- Virtually maintenance free. Cost of spares is negligible
- Proven extra long life of 30+ years.
- Overall losses are less.
- Five years guarantee

- Wave form distortion. It is like cutting the wheel by 50% and then moving the wheel i.e. wave form is cut as shown at full magnitude.
- The power factor is lower between 0.5 to 0.9
- The system is specialized and needs specially trained Electronic Engineer to repair and maintain.
- The cost of replacement is very high.
- Life of electronic cards / thyristors is very short and unpredictable
- Over all losses are more.
- One year warantee

## Some of our Valuable Clients for 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 Honda Motors  | Minda              | Railways (DLW       | Sterling Tools        |
| Atlas Cycles          | Chettinad Quartz  | Hitachi Metglas    | Munjil Showa       | Varanasi & Patiala) | Thapar Group          |
| Attero Recycling      | Endurance Systems | Jindal Oils & Fats | Omax Auto          | RMI Cycles          | TI Cycles ancillaries |
| Avon Cycles           | Escorts           | Jaquar             | Ordnance Factories | Ronuk Metafin       | Uflex                 |
| Bajaj Auto            | Gharda Chemicals  | LML                | Oswal Vanaspati    | Rubamin             | Usha Amorphous        |
| Bhartia Cutler-Hammer | Hero Cycles       | L&T                | Paper Products     | ShriRam Pistons     | Yamaha Motors, etc.   |

“ The trust of our customers has made them our best sales force. ”

## Other JINDAL'S Products

We also Manufacture Air Cooled AVC upto 4000 KVA , in collaboration with IREM

Step Up/Down Transformers

A.C. Variable Supply

Automatic Voltage Controller

Isolation Transformers

**JINDAL'S**

SOUTH ASIA'S LARGEST POWER CONTROL COMPANY

**Corporate Marketing:**

Plot # 195, Sector - 24, Faridabad - 121 005 (Haryana), INDIA  
 Tel: +91-129-4318001 to 05, 4063165, Fax: +91-129-2234165  
 Mobile: +91-9810086280, +91-991099 3162 / 3163 / 6599  
 +91-852754 99 00 / 11 / 22 / 33 / 44 / 55 / 66 / 77 / 88  
 Email: sales@jindalrectifiers.com, exports@jindalrectifiers.com  
 Website: www.jindalpowercontrol.com / www.jindalrectifiers.com



**JINDAL ELECTRIC  
& MACHINERY CORP.**  
Ludhiana (India)



**JINDAL RECTIFIERS**  
Faridabad (India)