

# DARRAH's Water Cooled Plating & Anodizing SCR Controlled Rectifiers



DARRAH ELECTRIC COMPANY, manufacturing plating rectifiers since 1960, announces their enhanced line of Continuous Duty **WATER COOLED** Power Supplies for the metal finishing industry.

New models range in size from 5,000 through 20,000 Amp output in all common voltages.

Darrah's Water Cooled Rectifiers are ideal for applications where **CONTINUOUS DUTY** is required and the rectifiers are located near **CORROSIVE ATMOSPHERES**.

**SOLID STATE SCR CONTROLLED RECTIFIERS** feature independent voltage and current adjustments and provide  $\pm 1\%$  DC voltage regulation with current limit and  $\pm 1\%$  DC current regulation with voltage limit.

**SOLID STATE CONTROLLED MODELS** can be connected to computers or process control systems. Rectifiers can be supplied to operate with inboard controls or from a remote controlled station.

## HIGH-EFFICIENT DESIGNS

- Primary SCR controlled, secondary full wave diode rectification.
- Six-phase star or 6 phase double WYE with interphase reactor.
- All conductors of electric current are copper.
- DC Output voltage adjustment taps.
- High-efficient power transformer with balanced primary and secondary circuits.
- Rectifier Copper Bus completely water cooled for highly efficient operation.



## POWER TRANSFORMER

Darrah's custom transformers featuring computer assisted design incorporate quality features that assure efficient performance and long life. All transformers are designed for continuous operation, 24 hours/day.

**WINDINGS:** 100% high conductivity copper primary and secondary windings.

**CORE MATERIAL:** Low loss, high quality silicon steel providing good flux transfer and low eddy current losses.

**INSULATION MATERIAL:** Class "F" insulation system. Transformers are fully epoxy encapsulated for environmental barrier against contamination and condensation.

**TRANSFORMERS ARE COMPACT:** Individual coils can be repaired/rewound without dismantling the entire transformer.



## Popular Darrah Rectifier Options

### PLC Interfacing and Controlling

Darrah offers a four channel PLC interface. Two channels control the DC output current and voltage. Two monitor the voltage and current. Use PLC or processes controllers to start or stop the rectifier; initiate ramp cycles, and timer functions. Monitor safety circuits and alarms.

### Digital LED Meters

.5" high display, available with NEMA rated clear sealed covers.

### Ampere Time Meters

Accurately record coating thickness over time. Available in preset or totalizing counters.

### Batch or Cycle Timers

Unlimited number of uses available in seconds, minutes or hours.

### Internal DC Polarity Reversing

Manual or automatic controls.

### PLC Programming

Control DC output current and voltages. Start processes or polarity reverse.

### Adjustable DC Voltage Ramp Control

Repeatable accuracy in processes requiring a preset DC voltage rise over an adjustable time period.

### Ripple Filtering

Available to maximum 5%, 2%, and 1% throughout entire DC output range.

### Adjustable Transformer Taps

Improve efficiency and electrical cost savings with selected voltage taps. Unlimited choices available.

### Custom Enclosures

Special enclosure shape or size. Multiple independent units in one cabinet.

### 12 Pulse Designs

High efficiency, ultra low output ripple, lower harmonics.

## Silicon Controlled Rectifiers (SCR)

Darrah incorporates high quality isolated modules in use for their water cooled rectifiers. The cooling water does not come in contact with any line voltages.

Primary SCR designs have the SCR's connected to the primary of the power transformer to perform the control function. Silicon diodes are used on the secondary of the power transformer to convert AC to DC power.



### Standard Protection and Safety Circuits

- AC Line Fuses
- Start and stop control circuits stepped down to 115 volts. Includes isolation transformer with primary and secondary fuses.
- AC Line phase loss and phase imbalance protection.
- AC Line Contactor
- Thermostats located in strategic areas as power transformer, SCR's, and diodes.
- DC current and DC voltage limit controls.
- Fast response electronic DC overload protection.
- Water flow rate switch with indicating fault lights.
- Timed controlled incoming water solenoid, shuts off water flow when rectifier is off.

### Input Line Requirements

208 through 600 volts, 3 phase, 50 or 60 hertz.

### Duty Cycle

All models are designed to be operated at 100% nameplate rating continuously at 40° C ambient.

### Warranty

Warranty on all components and workmanship is one year.

## Rectification

- Direct water cooled diode packs using 7000 amp hockey pucks with copper heat sinks. Typical rectifiers only require six diodes. Twelve are used in 15,000 amp and larger models.
- Easily replaceable, unique design. Allows quick exchange in the field. No special tools or torquing is required.



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