



## RECTIFIER INSTRUCTIONS

### IMPORTANT

Check immediately when Rectifier is received for possible damage. Report damage to the delivering carrier. Use care in uncrating to avoid damage.

Read this bulletin carefully before operating the Rectifier.

### DESCRIPTION

A Dings Rectifier is auxiliary equipment that supplies electric power to electromagnetic separators. It converts the alternating current from a local power source to the direct current needed by such separators.

The Dings Rectifier consists of a hinged door cabinet and an internal assembly of electrical components. Ratings and sizes of components in this solid state silicon diode design determine output in volts and watts.

Rectifiers are available in a range of wattages to handle the power requirement of any size electromagnetic separator. A Rectifier cabinet can be selected in a particular NEMA (National Electrical Manufacturers Association) enclosure according to environmental conditions at the installation.

### CAUTION

This Rectifier is designed for operation at elevations up to 5000 feet above sea level. For elevations exceeding 5000 feet, consult factory for proper derating information.

This Rectifier is designed for operation at temperatures up to 40°C (104°F). For higher temperatures, consult factory for proper derating information.

### INSTALLATION

Mount the Rectifier in a level position. Use mounting holes provided. Install it in a location that is suited to its NEMA rating. The NEMA rating of the Rectifier is usually coded at the end of the model number - after the dash. Do not install rectifier near heat generating equipment or in direct sunlight.

### ELECTRICAL CONNECTIONS

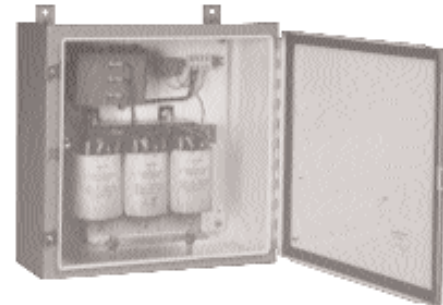
All wiring must conform to prevailing local and national electrical codes. If applicable, reconnect transformer taps to match your line voltage.

Line voltage must be within  $\pm 5\%$  of Rectifier voltage selected for continuous operation. For short periods of time,  $\pm 10\%$  is tolerable.

For 3 phase Rectifiers, check phase to phase voltages. They must be equal. Connect the AC line to terminals marked L1, L2, L3. Connect the DC load to terminals marked (-),(+).

Insert a fused disconnect switch in front of the Rectifier. Time delay line fuses should not be more than 1.75 times the AC input amps of Rectifier. If an inverse time circuit breaker is used, use 2.50 times the AC input amps of the rectifier. DC switching is not recommended, but if necessary, use switches which hold the maximum voltage to a value that's less than 2.5 times the rated output voltage.

Do not ground the DC circuit or the magnet will be damaged. Covers must be closed when Rectifier is operating.



### MAINTENANCE

Periodically inspect, and if necessary clean air inlets and outlets. Remove dust and debris from Rectifier components and bottom surface inside cabinet.

### TROUBLE SHOOTING

If the Rectifier fails to operate:

- 1) Check all overloads (bi-metallic components) to see if any have tripped. Wait a few minutes before resetting them.
- 2) Check to see if correct heaters for selected voltage are installed, and that load does not exceed nameplate rating.
- 3) Check all fuses.
- 4) Inspect all Rectifier components.
- 5) Check for equal phase to phase voltages at line connections and at secondary of transformer.
- 6) Disconnect Rectifier and check for open or shorted diodes. Check for loose connections.
- 7) After repairs have been made, switch on Rectifier with load disconnected, and:
  - a) Measure input voltage
  - b) Measure transformer secondary voltages
  - c) Measure DC output voltage
  - d) If all readings comply with nameplate data, reconnect load.

### REPLACEMENT PARTS

Rectifier parts can be purchased from Dings Company in Milwaukee. Call 414-672-7830 Please have nameplate information ready to supply while on the phone.

## RECTIFIER INPUT OVER-CURRENT PROTECTION

All rectifiers contain a transformer. The transformer has all the same component parts as a motor. Like a motor, the transformer exhibits a current inrush when energized. This inrush current is dependent upon where in the sine wave the transformer was when last turned off in relation to where in the sine wave the transformer is when energized. The transformer inrush could be up to 30 or 35 times full load current under a no load condition. Typically, it will be the same as a motor, about 6 to 8 times the full load current. For this reason, it is important to use a dual element time delay type fuse, the same type of fuse that is used with a motor. If using circuit breakers, select a breaker with a time delay, again the same as would be used with a motor. If the time delay is not sufficient, “nuisance tripping” may be experienced. This is a condition when the circuit breaker trips when energizing the transformer, but when tried again, it works.

### **Fuses**

Use a dual element time delay fuse with a maximum rating of 175 percent of the full load current to protect the input side of the rectifier. If 175% of full load amps does not correspond to a standard fuse size, select the next larger standard fuse size (but not exceeding 225%).

### **Circuit Breakers**

Use an inverse time circuit breaker with a maximum rating of 250% of the full load current. If 250% of full load amps does not correspond to a standard circuit breaker size, select the next larger size (but not exceeding 400%).

### Caution:

Always follow the latest edition of the National Electric Code and any other applicable codes for over-current protection of 600-volt class transformers.

### **EXAMPLE:**

Model 33 Electro Magnet  
5 kW, NEMA 12 Rectifier

A/C input: 460 volts-3 phase-60Hz, 6.7 amps

### Time Delay Fuses

$6.7 \text{ amps} \times 175\% = 11.73 \text{ amps}$

11.73 is a non-standard fuse size. The next standard fuse size is 12 amps. 12 amps is 179% of the full load amps, which is under the 225% maximum limit. USE A 12 AMP TIME DELAY FUSE.

### Circuit Breakers

$6.7 \text{ amps} \times 250\% = 16.75 \text{ amps}$

16.75 is a non-standard circuit breaker size. The next standard fuse size is 20 amps. 20 amps is 299% of the full load amps, which is under the 400% maximum limit. USE A 20 AMP INVERSE TIME CIRCUIT BREAKER.