CATH-TECH™ Equipment Division of
Cathodic Technology Limited
10 McEwan Drive, Bolton, Ontario, Canada L7E 1H1
Phone 1 800 368-9907 or (905) 857-1050 Fax (905) 857-3499
Web Site www.corrosion-rust.com Email ctl@corrosion-rust.com

CATHODIC PROTECTION RECTIFIERS

OPERATING AND MAINTENANCE

INSTRUCTIONS

TAP CHANGER RECTIFIERS

SINGLE & THREE PHASE

CATH-TECH Rectifiers and Instruments
Manufactured by: Cathodic Technology Limited
10 McEwan Drive Bolton, Ontario, Canada
Ph (905) 857-1050 Fax (905) 857-3499

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INTRODUCTION:

Your CATH-TECH rectifier was fully inspected and tested and in top condition when it left the factory. Damage during shipping, handling or installation are rare, report all shipping damage to the carrier immediately.

INSPECTION AND CHECKS:

- Visually inspect the rectifier upon receipt, report all damage to the carrier immediately. Do not operate the rectifier if there is evidence of shipping damage until repairs have been undertaken.

- Check the AC supply to the rectifier; the supplied AC must match the AC supply specified on the manufacturer's label.

- If the unit is equipped with analogue meters, zero the meters before activating the rectifier.

- Make sure all connections in the rectifier are tight.

- Oil immersed units should be filled to the level indicated with clean transformer oil prior to operating the unit.

- Verify all field wiring to the unit; ensure that the DC positive output is connected to the anode system.

SITE SELECTION CONSIDERATIONS:

The following should be considered for site selection:

- The proximity of the structure to be protected.

- The proximity of the cathodic protection system ground bed.

- The proximity of AC power.

- Avoid congested areas and areas of high ambient temperature.

- Avoid areas of direct sunlight or use sun shields in tropical areas.

- Avoid areas where the general public will have access to the rectifier.

- Allow for access to the rectifier and room for the door to open fully.

MOUNTING:

- The rectifier must be mounted securely with a minimum of two 5/16ths " lag bolts, anchor bolts, or machine bolts to a pole, wall or rack.
- The rectifier should be mounted level and straight to provide proper door opening.
- When mounting to a wall or structure, check for concealed wiring or pipes.
- If supplied with legs, the legs should be securely bolted to a concrete pad or plinth.
- Oil immersed units should be mounted on a solid concrete pad or plinth. In areas of sever frost of permafrost consideration should be given to mounting the rectifier on a raft.

WIRING:

- All wiring must comply with National and local electrical codes.
- Provide a fussed disconnect means within 2 metres of the rectifier, which disconnects the AC power to the rectifier to allow servicing.
- Wire sizes must comply with National and local electrical codes.
- Wires should enter the rectifier through the knockouts provided in the bottom of the rectifier cabinet or through the entries at the top of oil immersed units.
- The rectifier cabinet must be grounded for lightning and surge protection. Connect a bare copper ground wire to the ground lug provided on the outside of the rectifier and a minimum of two driven ground rods 3 metres long and spaced a minimum of 6 metres apart. Failure to provide adequate grounding could void the warranty.
- The AC power must be connect to the terminal block provided and marked AC power. The rectifier must be supplied with the correct voltage and number of phases as indicated on the manufacturers label.
- Three phase units should connected for clockwise rotation.
- The structure, to be protected, must be connected to the terminal marked Negative.
- The positive terminal must be connected to the anode system.

WARNING:

- The inside of the rectifier cabinet contains live parts with hazardous voltages; only authorised trained personnel should access the interior of the rectifier cabinet.
- Do not attempt to service the rectifier unless the AC power is disconnected and locked out.
- Do not attempt to change the taps with the AC power applied.
- Before activating the rectifier for the first time, check the tightness of all bolts and nuts.
- Verify the connection of all wiring and cabinet ground.
- Set the taps to Coarse taps to C1 and the Fine tap to F1 before applying the AC power; adjust the taps in small steps until the desired output is reached.
- Rectifiers with DC ratings above 50 volts have hazardous voltages on the taps on the front panel.
- Do not exceed the rated voltage or current operation at voltage or currents above the rated value as it will void the warranty.
- If the overload protection trips or the fuses blow, check for evidence of short circuits, component failure and verify tap settings.
- The DC positive terminal of the rectifier must be connected to the anode system.
- Oil immersed rectifiers must have the oil level maintained at the specified level to provide proper cooling of the components, and to meet the requirements of Class 1, Group D hazardous areas.
- Three phase units must be set such that the coarse and fine taps are set alike prior to application of the AC power failure to do so could result in damage to the transformer.
- Keep the operating Manual or a copy in the rectifier at all times.
- Keep the rectifier cabinet locked at all times.

ACTIVATING YOUR CATH-TECH TAP CHANGER RECTIFIER:

- Check all wiring and ensure that the correct AC voltage is supplied to your CATH-TECH rectifier.
- Set all voltage taps to lowest setting.
- Turn AC power ON.
- Observe output voltage and current.
- Increase tap settings slowly until desired output is reached. Do not forget to turn AC power OFF each time before adjusting the taps (See adjusting the DC voltage and Current).

ADJUSTING THE DC VOLTAGE AND CURRENT:

- With the coarse control and the lowest setting, increase the fine taps in progressive steps throughout its full range and observe the DC output voltage and current; turn the AC power OFF before adjusting the taps.
- Before increasing the coarse taps, return the fine tap to the lowest setting.
- Increase the coarse tap setting one position then increase the fine taps again one position at a time; repeat this procedure until the desired output current is achieved.
- Do not exceed the maximum DC voltage or current rating of the rectifier.

MAINTENANCE OF THE RECTIFIER:

- The voltage, current and ambient temperature rating of the rectifier should never be exceeded.
- Clean the rectifier on a regular basis. Dust and dirt build-up on the heat sinks and transformer can lead to overheating and failure. Ensure that the ventilation screens are not obstructed.
- Check tightness of all electrical connections.
- Replace any damaged lightning arrestors.

- For oil immersed units, ensure that the oil level is correct and that the oil is clean and not contaminated.

- Touch up any damaged paint. Colour matching touch up paint is available from Cathodic Technology Limited.

CURRENT AND VOLTAGE OUTPUT:

- The output voltage and current of tap changer rectifiers will vary with changes in the resistance of the soil; variance is to be expected with seasonal changes in the moisture content of the soil.

- Ensure that the voltage and current output are less than the maximum rated output of the rectifier.

TROUBLESHOOTING:

A schematic diagram is enclosed with this operating manual. Only trained personnel should attempt to troubleshoot a rectifier; hazardous voltages may be encountered in the rectifier.

SYMPTOM:	**POSSIBLE FAULT:**
NO DC OUTPUT VOLTAGE OR CURRENT	Check the AC supply. Check the AC breaker. Check DC fuse or breaker. Lightning damage to unit.
DC VOLTAGE BUT NO DC CURRENT OUTPUT	Check output fuse or circuit breaker. Broken anode or structure wire. Loose connection Broken or damaged ammeter.
NO DC OUTPUT VOLTAGE	AC power OFF Broken or damaged voltmeter.
Output fuse or circuit breaker	
MAXIMUM DC VOLTAGE CANNOT BE ACHIEVED	Check AC voltage. Does it correspond to name plate rating?
MAXIMUM DC CURRENT CANNOT BE ACHIEVED	Check circuit resistance.

LIMITED WARRANTY

This rectifier designed and manufactured by CATH-TECH™ is warranted against defects in design, workmanship or materials for one year from date of installation or 18 months from date of purchase, whichever comes first. The obligation of CATH-TECH™ is limited to the adjustment, repair, or replacement at its factory of the equipment, or part thereof which is found to be defective upon examination after being returned transportation charges prepaid. CATH-TECH™ warrants this product and its operation only. There is no warranty or liability implied or expressed for the use or miss-use of this equipment. This warranty expressly excludes damage due to acts of God, civil insurrection, war or damage due to lightning.