Electrocoating Equipment

UFS

OPERATING AND MAINTENANCE MANUAL

Membrane Electrode & Electrode Control Panel

PN 221004

for

Ford Motor
Wayne Assembly Plant

Purchase Order No.

UFS Ref No. 2680

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I. INTRODUCTION

This manual provides general operating and maintenance instructions for PN 221004, Membrane Electrode Cell & Electrode Control Panel. In addition, it covers the other equipment normally used in conjunction with PN 221004.

In Section X of these general instructions, you will find drawings and specifications which apply to your system

Safety is something that can not be overlooked. Please observe all your appropriate safety regulations before and while the Cells, Electrodes and related electrical equipment is being worked on. As a general rule always use your own lock and key to lockout the DC rectifier before installing or working with any component of the anolyte system.

II. DESCRIPTION AND FUNCTION

The Membrane Electrode Cell & Electrode Control Panel will provide 'On - Off' control to TECTRON Membrane Electrode Cell & Electrodes. This control is desired to complement voltage changes in order to fully optimize the ED film build that is deposited on the ware.

The Membrane Electrode Cell & Electrode Control Panel provides a low voltage (5VDC), which in turn activates a solid state switch (I.E. PN 210013) that energizes a Cell or Electrode.

The solid state switch will 'turn on' when the Base receives a voltage signal approximately 2.5 VDC greater that what exists at the Emitter. A Trigger module (I.E. PN 210018) energizes the solid state switch when its appropriate switch (I.E. SW1, SW2, SW3…SW40) is turned on.

An appropriate sized diode is required between the Emitter (of the solid state switch) and the load is required to prevent reverse current when the solid state is turned off.

The solid state switch is rated at 100 amps. From a design viewpoint, the maximum design current should be no more than 50%, or 50 amps. This allows a safety factor and decreases the size of the heat sink.

III. SYSTEM REQUIREMENTS

10 Amps at 120 VAC is required for the low voltage power supply.

The solid state switch is not a dry contact type of relay, rather is has very high resistance in its off state and very little resistance when turned on. Thus it does have a significant amount of heat build up. An appropriate designed heat sink is required for continuous duty service. **The heat sinks installed in July of 1997 are only temporary, and the solid state switches should not be turned on for more than 5 minutes at a time and should be allowed at least 15 minutes between operation periods**.

Interconnection wires between the Membrane Electrode Cell & Electrode Control Panel and the Triggers need to conform with local Electrical Codes. Generally AWG #18 are fine.

Cabling between the bus bar and the Collector (solid state switch) and the Emitter (solid state switch) and the load (including the diode) needs to be at least AWG #8 (rated at 49 amps).

IV. INSTALLATION

The Membrane Electrode Cell & Electrode Control Panel should be installed so that an average height person can operate and service the panel.

Since the solid state switches contain silicone, they should be installed outside of the ED enclosure. UFS will advise on appropriate enclosure when the test phase of the Wayne Project is concluded and the plant wants to use the equipment on a continuous basis.

Diodes also require adequate heat sinking for long life operation.

Wire all the connections with the appropriate wire size and type in the appropriate conduit per code.

V. OPERATION

To turn on a Membrane Electrode Cell or Electrode, turn the appropriate switch number to the 'on' position, which is to press the switch down. **Note: Do not leave any switch turned on for 5 minutes.** An LED located underneath the switch will light up confirming the switch selection.

The voltage supplied to the Collector (of the solid state switch) must also be turned on for current to flow through to the Cell or Electrode.

Current Draw should be monitored on an individual basis for each of the 40 positions. In this manner the design limit of 50 amps per position can be confirmed.

VI. MAINTENANCE

The routine maintenance required for the Membrane Electrode Cell & Electrode Control Panel is minimal. This section will address these maintenance procedures.

A. Enclosure Door Opening

There are potential sources of electrical energy to PN 221004. The first is 120 VAC, which powers the low voltage power supply. The second is more critical - in the event a Trigger (PN 210018) fails or is damaged, it is possible that bus bar potential can be feed back through a damaged relay contact.

B. Inspect Fuse of Low Voltage Power Supply

C. Check PN 210013 for signs of heat stress

VIII. SPARE PARTS AND ACCESSORIES

Electrical components may eventually wear out or fail and need replaced. The usable life will vary with service conditions and maintenance practice. Spare or replacement parts are available from:

TECTRON International
330 N County Road 400 E
Valparaiso, Indiana 46383 USA
Phone: 219/464-2027 Fax: 219/464-8646

See the product drawing for spare part numbers, usually 6 digit part numbers.

IX. LIMITED WARRANTY AND LIABILITY

A. Warranty

We warrant all equipment manufactured by us to be free from defects in material and manufacture at the time of shipment for a period of one (1) year from the date of shipment. We will furnish without charge, but will not install, replacements for such parts as we find to have been defective.

This warranty shall not apply to any equipment which has been subjected to misuse, neglect or accident, or has been altered or tampered with, or if corrective work has been done thereon without our specific written consent. No allowances will be made for such corrective work done without such consent. Improper maintenance, deterioration by chemical action, and wear, do not constitute defects. Equipment manufactured by others,

and included in our offering, is not warranted in any way by us but carries only the manufacturer's warranty, if any. All electrodes (and or cathodes), of any material, are not warranted by us in any way since they by nature are sacrificial and will erode or corrode away with time.

All warranty claims must be submitted within ten (10) days of discovery of defects or shall be deemed waived. All parts returned for inspection must be sent prepaid. No representative of our company has any authority to waive, alter, vary or add to the terms hereof without prior approval in writing. The foregoing is in lieu of all other warranties (including that of merchantability), whether express or implied.

B. Liability

It is expressly understood that our liability, including that for breach of Contract, negligence, strict liability in tort, or otherwise, for our products is limited to the furnishing of such replacement parts, and that we will not be liable for any other expense, injury, loss or damage, whether direct or consequential, including but not limited to loss of profits, production, increased cost of operation, or spoilage of material, arising in connection with the sale or use of, or inability to use, our equipment or products for any purpose, except as herein provided.