Customer Satisfaction Pledge

The employees of UFS Corporation are looking forward to serving the needs of your company & customers in a professional and courteous manner. Here is our Mission. . .

◊ We ***add value*** to our customer's products
◊ We ***listen*** to our customers
◊ We ***deliver*** on time
◊ We ***act*** in a safe manner
◊ We ***recognize*** each person's individuality
◊ We ***believe*** the future is important to us
◊ We ***build*** our reputation one step at a time

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UFS Corporation

Getting Started

Base Cell Circulation System 850l Model

Base Cell Circulation Systems

- 850l Model

Mission Statement

UFS Corporation is dedicated to providing quality, innovative solutions to the electrocoating industry. We have over 20 years experience and leadership in finishing system consultation, Membrane Electrode Cell manufacturing, Membrane Electrode System design, on-site service and installation assistance.

SAFETY

Safety is something that cannot be overlooked!

Please observe all appropriate safety regulations before and during work on the Cell Circulation System and related electrical equipment. 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.

This quick start provides general installation instructions for the Cell Circulation System. Please read the entire quick start before performing any installation steps.

ASSEMBLY PHASE

D. Electrical Connections to Facility

- Make electrical connections from main power source to circulation pump and control panel.
- Connect both drains to a suitable drain pipe with no pipe reduction.
- Connect supply piping.
- Connect return piping.

System Requirements

System Requirements

The necessary requirements that enable the BCCS to function properly are: D.I. water , electrical power (motor and starter, conductivity monitor/controller, and Solenoid Valve), proper drain, suitable location, and siphon breaker. Most of these items are the responsibility of the user.

A. D.I. Water - The incoming flow rate of the D.I. water should be in the range of 40-60% of the electrolyte pump capacity. This will ensure an orderly mixing of the D.I. water and the electrolyte solution, such that the conductivity can be lowered at a predictable rate. The incoming pressure of the D.I. water should ***not exceed 80 psi***, which is the upper limit for the Solenoid Valve.

B. Electrical - An electrical line of the power voltage and number of phases should be brought to the BCCS. The user must supply the appropriate starter, start switch, and disconnect switch at a location of their choosing. Likewise, line power must be supplied to the conductivity monitor/controller and to its relay contacts. The Solenoid valve cable harness has been attached, but must be connected to the conductivity monitor/controller after the unit has been installed at the site. Lastly, the grounding stud on the tank should be connected to the local ground.

C. Proper Drain - There is a TEE fitting that has a Valve are two drain connections: the gravity overflow and the bottom tank drain. Both of these should be connected to a suitable local drain pipe. It is important that there be no reduction in pipe size of the overflow drain line to avoid unnecessary piping restrictions that could cause the tank to overflow out the top of the tank.

D. Suitable Location - A close and level location should be identified near the ED paint tank. The BCCS should be placed as close as possible to the paint tank to minimize the friction loss in the local piping . It is important to note that the liquid level in the electrolyte tank should be at least 8-18" below the bottom of the return manifolds (measured at the last ME Cell on the low end of the return manifold). This differential is necessary because the electrolyte return flow depends on gravity to propel it back to the tank. Also, the BCCS must be located so that the BCCS tank level is ***no more than 10 feet*** below the ED paint tank level. This is usually the maximum level differential allowed for in the BCCS pump design.

E. Siphon Breaker - A siphon breaker must be provided to ensure that the ME Cells are not drained of their electrolyte fluid because the fluid inside them has been siphoned if the pump is turned off. If the ME Cells are drained, it is likely that the draw-down inside the electrolyte tank will trip the low level alarm switch after the pump is restarted and then more D.I. water and acid will have to be added to refill the tank. If UFS Corporation supplied the Supply and Return Manifold, these siphon breakers are already included in the kit. See Drawing Number S-000-072 for more details.

Table of Contents

Introduction

Welcome to UFS Corporation

This manual is intended to be an overview of a typical Base Cell Circulation System (BCCS) and how it works. It is presented to the owners, system designers, installers, and members of the paint-finishing department where the equipment is to be used. Included are drawings that are specific to your system. It is important that you keep this documentation in an easily accessible place for future reference.

Product Support and Customer Service

For customers in the United States and Canada:

You may call or fax our office during normal business hours (7:30 a.m.—5:00 p.m., CST). An automated answering service will provide emergency contact information during the message.

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Introduction

This manual provided the user with general information needed to install, operate, and maintain the BCCS. For experienced end users you may refer to the BCCS Quick Start Guide. The Description, Function and Installation Sections describe the function of the BCCS and the various system input requirements. Installation and operation of the BCCS are discussed in the following sections. Finally, the remaining sections describe the servicing of the BCCS. It is recommended that the user also carefully review the TECTRON™ Membrane Electrode (ME) Cell “Getting Started Manual,” as well as the major component manuals that can be found at the end of this manual.

While every BCCS contains the same basic components and embodies a similar design, the physical dimensions and component selection depend upon the user’s paint system. This particular model has been designed to operate efficiently with ME Cells. The user will find at the end of this manual drawings and specifications that apply to their particular system.

Description and Function

Description and Function

The function of the BCCS is to provide a flow of electrolyte to each TECTRON Membrane Electrode (ME) Cell, which automatically purges excess neutralizer (for cathodic ED Paint—its acid and for anodic ED Paint—its amine) from the system and also cooling the electrode. The former is achieved by adding D.I. water to the BCCS tank when the conductivity level rises above a preset level. This dilutes the electrolyte concentration in the BCCS tank and causes the tank to overflow to drain, thereby removing the excess electrolyte form the system. The Pump Discharge Design Flow Rate is designed to provide adequate cooling for the electrodes. Flow rates below the Pump Discharge Design Flow Rate will most likely result in faster electrode corrosion rates. Generally the more flow there is, the longer the electrodes will perform satisfactorily.

Refer to the BCCS Flow Diagram (Drawing Number 997127) in the Appendix for aid in understanding the system operation. After leaving the discharge of the pump, the electrolyte then flow through a check valve. From this point, the electrolyte flows through local piping to the electrolyte supply manifold on the sides of the paint tank.

Each ME Cell has an individual supply valve. The electrolyte fluid is delivered to the bottom of the ME Cell by the electrolyte supply tubing attached to the electrode. Electrolyte overflows by gravity back into the electrolyte return manifold through the overflow nozzle and electrolyte return tubing. There should be an air gap between the overflow tubing and the hole in the electrolyte return manifold or a vent in the return manifold to let air escape. The electrolyte then returns by local piping back to the BCCS. The electrolyte conductivity is monitored by a sensor that is located in the tank.

Whenever the conductivity level in the tank rises above the present level, relay contacts in the conductivity monitor/controller sends a signal to a Solenoid valve to open and let D.I. water into the electrolyte tank. The tank level is maintained by an overflow, and, thus, the conductivity level is reduced by the addition of the D.I. Water. When the conductivity level has fallen below the set point , the D.I. water turns off. A bottom tank drain valve is provided when manual draining of the tank is required. A low liquid level alarm switch in the tank provides a means to detect a loss of electrolyte fluid.

The D.I. water circuit includes two manual valves. One valve (referred to as manual D.I. water valve) is used to by-pass the Solenoid valve and for initial charging of the electrolyte tank. The other valve is used to isolate the Solenoid valve, in the event servicing is required.

The composition of the electrolyte is mostly neutralyzer and water. This is so because the ion-selective membrane that is part of the ME Cell allows the charged ions to pass from the paint bath into the electrolyte solution, thus removing the excess neutralizer or solubilizer from the paint bath.