



Selecting The Right Rectifier And Batteries For Your Application

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The initial selection of the rectifier and batteries for your application may seem simply selecting the rectifier based on the current requirement of your system and the battery backup time for operation without facility power. Typically most initial designs will grow by at least 20% after implementation so it makes sense to plan for the additional current requirement up front and save later grief or reduced capability later on. The current requirements of the rectifier has to support two current requirements (1) provide current to operate the equipment (2) provide charging of the backup batteries. The current will flow from the highest voltage source and by design this is the rectifier. In a 48 volt system the rectifier is normally set to between 54 and 56 volts. As long as facility power is being provided to the rectifier the equipment will receive its power from the rectifier. When facility power is lost the equipment will receive its power from the battery bank. The rectifier output to the batteries is diode isolated so that vertically no current will be drained by the rectifier when the rectifier is not being powered.

Many rectifiers support Low voltage Drop Out (LDO) or an external module that typically is triggered by a voltage of 42 volts (may be adjustable) and shuts down the voltage to equipment. Some equipment also has an internal LDO to prevent unwanted responses of the equipment in the event of low voltage. Typically this only occurs during the operation of the equipment in battery backup operation.

Selecting the rectifier current requirements should include a safety margin of about 20% to allow for variations of equipment current due to variation in traffic flow and operation over the temperature extremes of the equipment. In addition to the equipment current requirement there is the charging of the battery bank that needs to be considered. Most rectifiers have a current limit for charging the batteries which is typically in the range of 10 to 20 amps. If the system is equipped with LDO then the lowest voltage of the battery bank would be 42 volts in a 48 volt system. Without the LDO the battery bank may require higher initial current due to lower voltage. This is based on the industry standard that the individual battery cell is at or less than 1.75 volts per cell is the definition of a fully discharged battery.