HEALTHCAIR®

Selecting a Vacuum System

There are several considerations in selecting a Medical/Surgical Vacuum System. In addition to physical size, expense, and site limitations, capacity is the primary issue. The required capacity, or flow at a given vacuum level, most generally 19" Hg Gauge, is also referred to as Calculated Peak Demand. The worksheet on the following page is used to determine Calculated Peak Demand for a typical hospital.

You will notice that the categories on the worksheet coincide with various areas in the hospital. Because of the manner in which the space is used, the value given for flow is either per room, per bed, or per outlet. For example, in areas where only one procedure will be performed, such as surgery, we use a per room value. In areas where there may be several uses simultaneously and the possibility of vast fluctuations in use, such as a recovery suite, we calculate the demand per bed. You will also notice the term "Simultaneous Use Factor". This is a value given to the likelihood that the full demand will exist in a particular area at any given time. The most critical areas, such as surgery, will have the highest likelihood and therefore the greatest value.

To use the worksheet, start by filling in the quantities of each area in the left-hand column. Keep in mind to tally these figures correctly; either per room, bed or outlet. Also be certain to account for all of the outlets which are part of the proposed system. Some outlets may be easy to overlook and some departments in the facility may be known by a slightly different name. If you encounter an area in the facility that is not listed on the worksheet, categorize it based on what procedures are performed in that area.

With all of the areas accounted for, multiply each quantity by the given Design Flow value, and then multiply by the Simultaneous Use Factor. Write the value in the right hand column for each line. Finally, total the values for all of the lines at the bottom of the sheet. This value is the Calculated Peak Demand, expressed in Standard Cubic Feet per Minute at a vacuum level of 19"Hg Gauge.

Having tallied the Calculated Peak Demand, you must adjust for any abnormal conditions. High elevation, operation on 50 Cycle current or unusual ambient temperatures can affect performance. If considering future expansion, you may opt for a system with a control package which will allow for an additional pump to be added later.

When the Calculated Peak Demand exceeds the capacity of a 10 Horsepower pump, consider using a triplex or quadruplex system rather than duplex. For example, if you have chosen a 15Hp duplex system, also consider a 7.5 Hp triplex version where two of the three pumps will meet the Calculated Peak Demand. Demand for Medical/Surgical Vacuum in a typical facility varies widely in the course of a day, and in times of low demand, a 7.5 Hp pump will be required to operate as opposed to a 15 Hp pump. Each pump on the system is controlled by a separate vacuum switch, allowing more efficient operation and reducing current spikes caused by the in-rush as the larger motors start. In many cases, the initial expense of the multiplex system is also lower.

A dedicated Waste Anesthetic Gas Evacuation system is best served by use of a separate simplex or duplex vacuum system of either the Water Sealed Liquid Ring or Dry Running Rotary Vane style. Pumps lubricated or sealed with oil are not to be used for such a system.

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