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Integrated Testing Method of Pumping Performance for Dry Vacuum Pump

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Traditional dry pump measurement devices usually only perform single performance measurements under fixed conditions. This paper presents a performance measurement method with highly integrated, high precision and high degree of automation for vacuum dry pump, realizing not only the measurement of the original performance indicators, but also directly measurement main performance in the process of real-time operation. Fully considering the integrated performance measurement method of the measurement object diversity, analyze and improve the structure of the object, put forward the integrated performance measurement method of a variety of functions. To realize the integrated measurement method, choose three basic physical quantities of flow, vacuum degree, temperature to measurement and control, to provide a theoretical basis and the concrete scheme for the integrated performance measurement method of dry vacuum pump. By calculating and comparing the basic principles of various flow measurement methods and the uncertainty, select a measurement method suitable for the integrated measurement system; By contrast to the principle of vacuum measurement and classification, determine the vacuum gauge options; Through the study in combination with the need of integration measurement temperature measuring method, choose the appropriate temperature measuring device. To design and calculate and determine the type and size of the vacuum chamber, optimize the internal structure of the vacuum chamber design and implement the uniformity of temperature and vacuum degree. At the same time, by the positive pressure balance method and in combination with mass flow meter and vortex flow meter and set the balance chamber, the method of implementation under vacuum conditions in wide range, the precise measurement of the small flow rate.

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