연료전지 블로어 4기종 국산화 개발

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Development of 4 Types of Fuel Cell's Blower

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This paper describes development procedure of the four types of fuel cell's blowers: pressurized fuel blower, selective oxidation air blower, cathode air blower, and burner air blower. Diaphragm blowers having two heads are selected to maintain force balance when the rotating arms are moving by the driving motor. Dimensions of a diaphragm cavity is designed according to the optimal design procedure using numerical simulation and experimental measurement. Experimental apparatus is designed by considering the bower characteristics having low flow rate and high pressure. Test blower is operated by a diaphragm, which has suction and discharge port on the top of the blower. For analyzing the internal flow of the blower, three-dimensional Navier-Stokes analysis is introduced in the present study. Throughout the optimal design of the blowers, blower performance is enhanced by reducing the unbalance motion of the rotating arm and loss region in the diaphragm cavity.

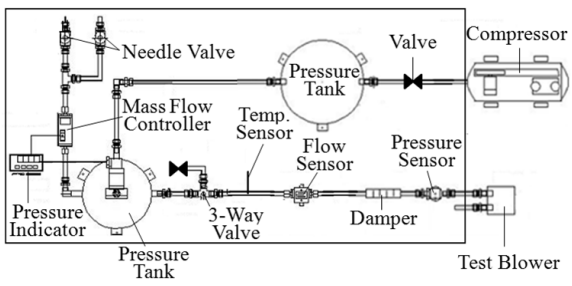

Fig. 1 Experimental apparatus of fuel cell's blower

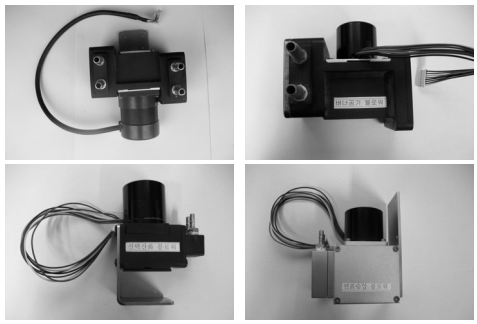

Fig. 2 Four typed blowers

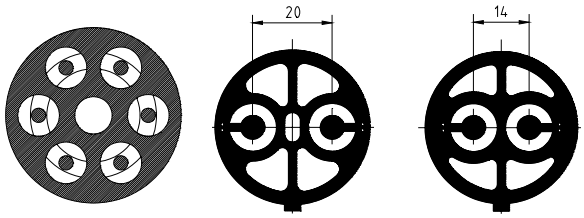

Fig. 3 Optimal design of check valves

후기 : 본 연구는 한국에너지자원기술기획평가원(지식경제부) 신재생에너지기술개발사업의 지원을 받아 수행하였습니다.

Key words : Fuel cell Blower(연료전지 블로어), Fuel cell(연료전지), Experimental Apparatus(실험장치), Blower design (블로어 설계)

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