DEVELOPMENT OF A TECHNIQUE TO MEASURE PERIODIC STATIC PRESSURE ON DIFFUSER HUB OF A CENTRIFUGAL COMPRESSOR

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Abstract

Details of a measurement technique to measure periodic variation of static pressure on the vaneless diffuser hub of a centrifugal compressor are reported. Experiments were carried out in a low speed centrifugal compressor with unshrouded rotor. Twelve holes were provided on the hub in which adapters were attached, where the transducer was inserted. The output voltage from the transducer was amplified and converted to digital values for further processing of data. Sample results are presented and interpreted. From the measured static pressure distribution, it is found that the static pressure becomes uniform at downstream locations. Time averaged static pressures agree reasonably well with steady state static pressures. The reasons for the difference between the time averaged static pressures and steady state static pressures are provided.

Keywords: Centrifugal Compressor, Fast Response Pressure Transducer, Hub Static Pressure, Vaneless Diffuser