

Abstract Submitted
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Design of Servo-Driven Actuators for Spanwise-Varying Control of a Backward-Facing Step Flow¹ MARC SCHOSTEK, LORENZ SIGURDSON, Vortex Fluid Dynamics Lab, University of Alberta — For an experimental study of a forced backward-facing step water flow the design of 16 piston actuators was necessary. The 16 actuators connect to manifolds to force the flow at the step edge through many more actuation ports. The 16 actuators allowed for variant forcing in the spanwise direction with a resolution of 0.5 times the step height h . They are capable of producing unique perturbation waveforms of forcing velocity amplitudes $0 < u'/U_\infty \leq 2$ and either single or multiple forcing Strouhal numbers in the range $0 < St_h \leq 1.0$. These forcing amplitudes are larger than ever used in any previous forced backward-facing step flow experiments. The process of designing the servo-motor driven actuator system will be discussed.

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