

Senior Design Project Description for FALL 2016

Project Title: Air Cycle Tester (DIXON_TEST)

Supporter: Dixon Quick Coupling

Supporter Technical Representative: ASSIGNED

Faculty Mentor: ASSIGNED TBD (check one)

Single Team Dual Team (check one)

Personnel (EN/ET): 1 E, 1 Cp, Cv, 6 M, SE

(Complete if the number of students required is known)

Expected person-hours: (250 per student)

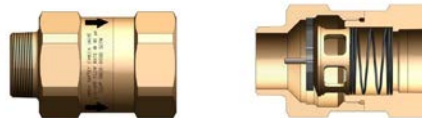
Description of Project:

Dixon Quick Coupling currently manufactures quick disconnect coupling and safety check valves for hose and piping systems. These devices are shown below. There currently is no testing device to measure the air flow through the quick disconnect couplings or the cut-off air flow through the safety valves. This project will design a test unit and fabricate a wording scale model.

Quick Disconnect Couplings



Safety Check Valves



Initial Project Requirements (e.g. weight, size, etc.):

Air tester unit shall be capable of the following:

- Operating across a pressure range of 0 to 300 psi
- Operating across a flow range of 0 to 3,200 scfm (@ 90 psi inlet pressure)
- Record air temperature and humidity
- Use Labview to program the system
- Test results must be capable of being exported to an Excel Report Template
- Assembly is to be drawn in Solidworks
- Bill of Materials and cost estimate are required for the test unit and pneumatic power source
- A functional scale model that uses Labview, CRIO and touch screen to operate
- Scale model should be transferable to the future full scale test unit



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Expected Deliverables/Results:

The deliverables for this project are:

1. Solidworks Assembly of the Test Unit and associated Bill-Of-Materials.
2. Budgetary Quotation outlining the associated costs of building the Test Unit.
3. Conceptual Bill-Of-Materials and Budgetary Quotation for the Pneumatic Power Source.
4. Scale model of the Primary Test Componentry. (Using 1/4" Couplings/Valves)
5. Functional Labview Program, Computer, CRIO, and Touch Screen operating the scale model, that is transferrable to a future full-scale Test Unit.
6. Evaluate the current methodology for sizing Safety Check Valves and develop a program that enables an intermediate user to easily select the right product for their application.

List here any specific skills or knowledge needed or suggested (If none please state none):

None