Horizontal Well Artificial Lift Project

Medium Pressure – 4 Inch Diameter Multiphase Flow Loop

This facility operates with gas/water and was originally designed to study characteristics of slug flow. Currently, it is being modified to study heat transfer characteristics in two-phase flow.

Key Specifications

Fluids

Gas: Air
Water: Tap Water

Operating Conditions

Maximum Pressure:	70 psig
Temperature:	50 to 120 °F
Gas Flow Rate:	0 to 1030 SCFM (Superficial Gas Velocity – 0 to 32 ft/s)
Water Flow Rate:	0 to 250 lbm/min (Superficial Liquid Velocity – 0 to 0.7 ft/s)

Test Section

Pipe Material:	Polycarbonate
Diameter of Pipe:	4 inch
Test Section:	29.2 ft (88 D)
Developing Region:	37.8 ft (113 D)
Exit Region:	6.07 ft (18 D)
Inclination Angles:	0 to 90 degree

Instrumentation and Flow Characteristics

Instrumentation	Measured Parameters
Quick Closing Valves	• Liquid Holdup
Tubular Visualization System	• Visual Observation • Flow Pattern
Wire Mesh Sensor	• Flow Pattern • Wave Characteristics
Pressure sensors	• Pressure drop
Capacitance sensors	• Liquid Holdup

TU Horizontal Well Artificial Lift Project
The University of Tulsa
2450 East Marshall
Tulsa, Oklahoma 74110

www.tuhalp.utulsa.edu
Phone: (918) 631-5110
Fax: (918) 631-5112
E-Mail: kelley-friedberg@utulsa.edu@utulsa.edu

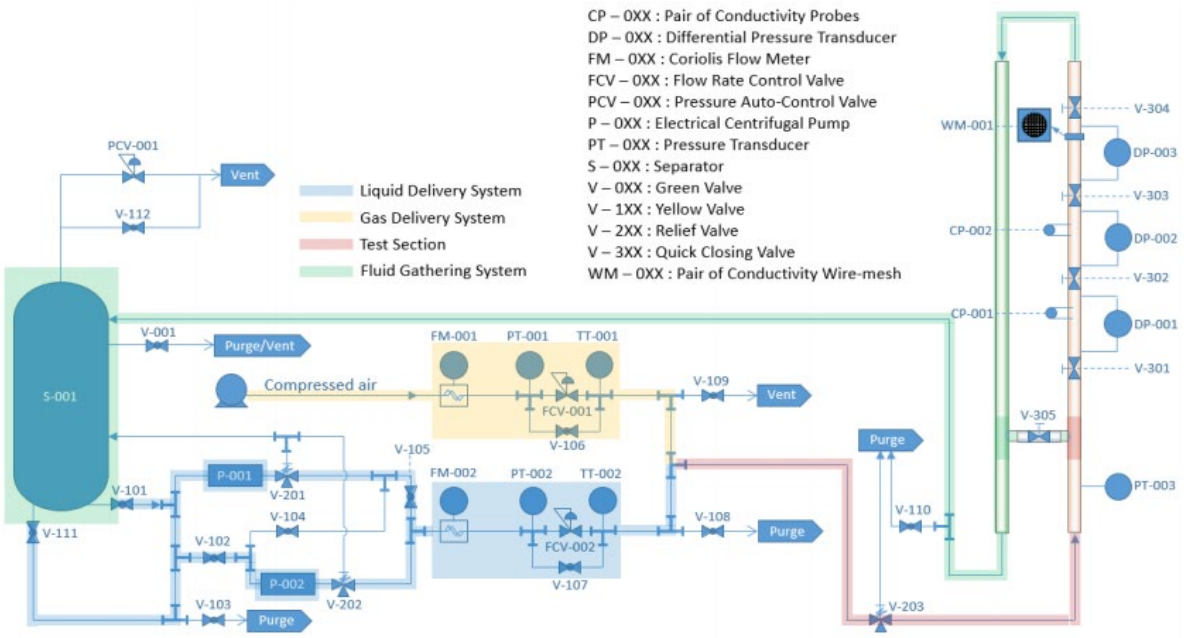

Figure 1: Schematic of Modified Flow Loop

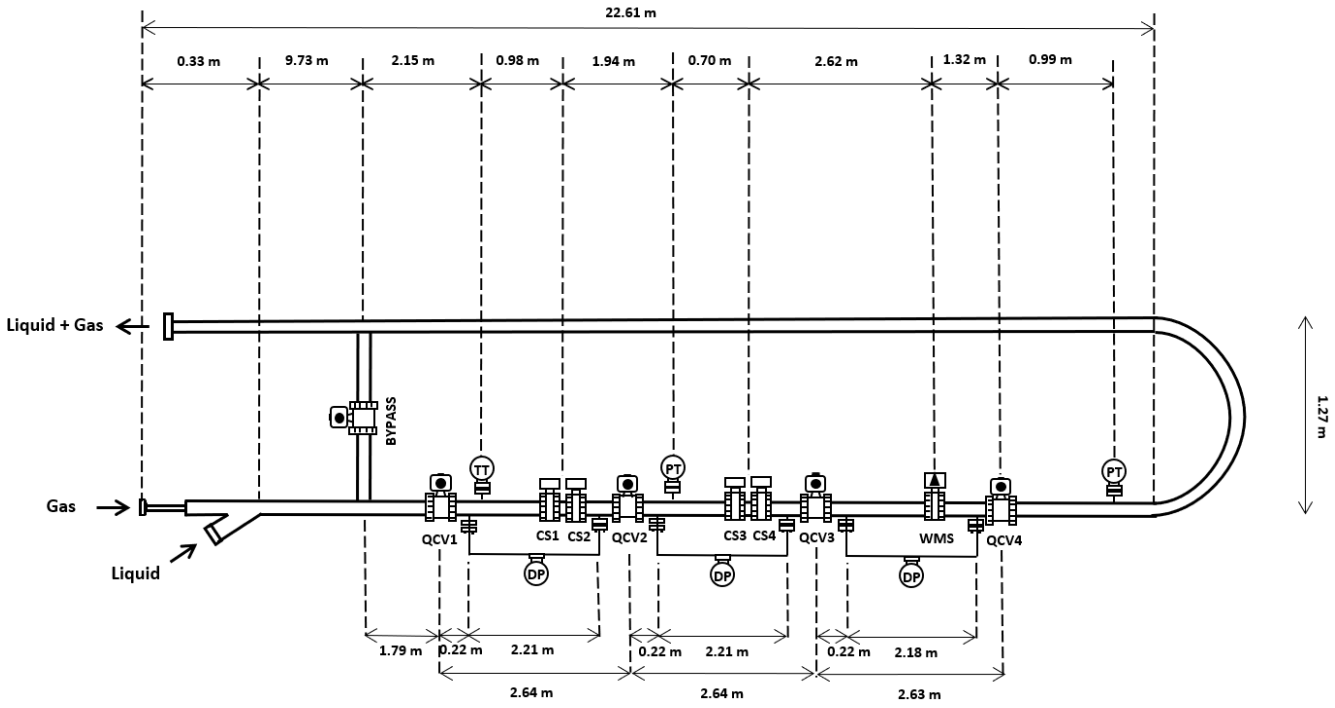

Figure 2: Schematic of Test Section

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