



Horizontal Well Artificial Lift Project

2-in Inclinable Plunger Lift Experimental Facility

This facility is designed to study all the stages of plunger lift under various well deviations. The design allows running experiments for conventional and continuous plunger lift types.

Key Specifications

Fluids

Gas: Air

Oil: Mineral Oil (Isopar L)

Operating Conditions

Maximum Pressure: 30 psig

Temperature: Ambient

Gas Flow Rate: 0 to 340 MSCFD (Superficial Gas Velocity – 0 to 180 ft/s)

Oil Flow Rate 0 to 81 BPD (Superficial Liquid Velocity – 0 to 0.24 ft/s)

Test Section

Pipe Material: Polycarbonate (some elements of the system are made of acrylic)

Diameter of Pipe: 2 inch

Test Section: 25 ft (150 D)

Developing Region: 5 ft (30 D)

Exit Region: 5 ft (30 D)

Inclination Angles: 10 to 90 degree

Instrumentation and Flow Characteristics

Instrumentation	Measured Parameters
Quick Closing Valves	<ul style="list-style-type: none"> Liquid Fallback and Holdup
High-speed Visualization System	<ul style="list-style-type: none"> Visual Observation Flow Pattern Slug / Taylor bubble / Plunger Velocity
High-speed Pressure Sensors	<ul style="list-style-type: none"> Transient Pressure Profile Slug Velocity
High-speed Proximity Sensors	<ul style="list-style-type: none"> Plunger Velocity
High-speed Optical Sensors	<ul style="list-style-type: none"> Slug Velocity
Smart Plunger	<ul style="list-style-type: none"> Pressure Pressure Differential Plunger Acceleration

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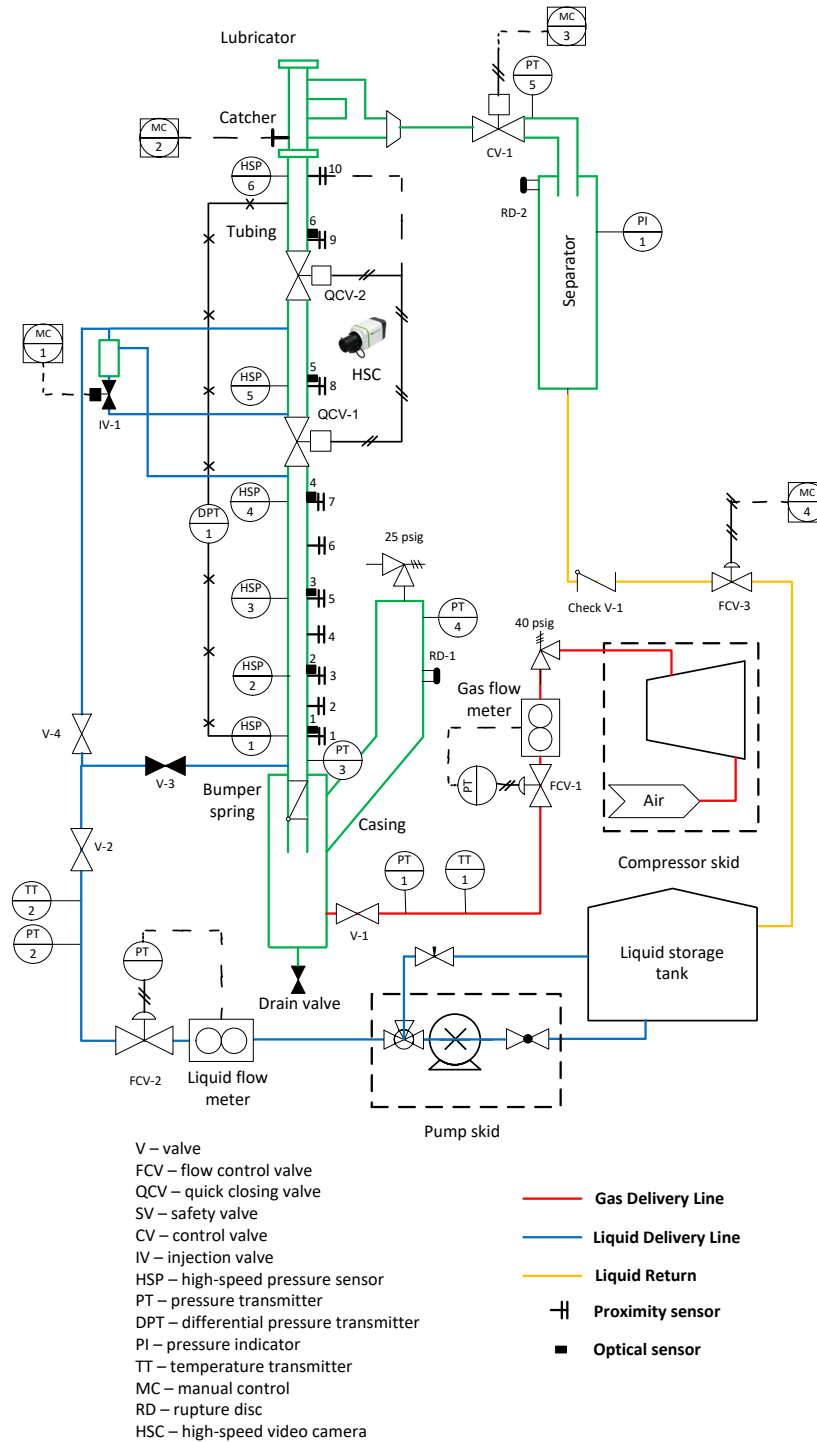


Figure 1: Schematic of the Flow Loop

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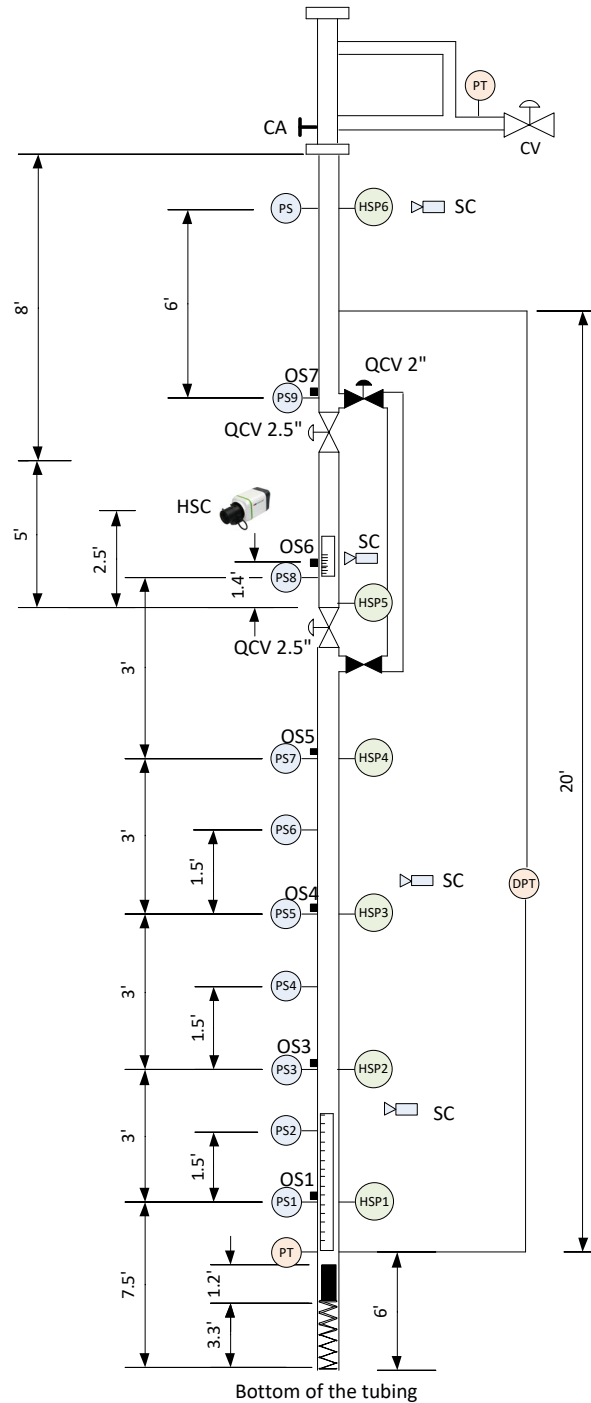


Figure 2: Schematic of the Test Section

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