Fluid Flow Projects

2-in. Gas/Oil/Water Flow Loop

Key Specifications

This experimental facility has been design to study gas/liquid, liquid/liquid or gas/oil/water flows. The facility is equipped with advanced instrumentation allowing the characterization of multiphase parameters such as: liquid holdup, in-situ phase fractions, droplet size distribution, pressure drop and flow pattern. This loop can be also utilized for multiphase flow meters evaluation. The flow loop operational conditions can be expanded as well as new instrumentation can be used to characterize additional multiphase parameters.

Fluids

Gas: Air
Water: Tap Water
Oil: Mineral Oil

Operating Conditions

Maximum Pressure:	30 psig
Temperature:	Ambient
Gas Flow Rate:	0 to 1.5 MMSCFD (Superficial Gas Velocity – 0 to 66 ft/s)
Water Flow Rate:	0 to 1600 BPD (Superficial Water Velocity – 0 to 4.8 ft/s)
Oil Flow Rate:	0 to 1600 BPD (Superficial Oil Velocity – 0 to 4.8 ft/s)

Test Section

Pipe Material:	R-4000 PVC
Diameter of Pipe:	2 inch
Test Section:	18.0 ft (108 D)
Developing Region:	45.6 ft (274 D)
Exit Region:	10.0 ft (60D)
Inclination Angles:	-90 to 90 degree

Instrumentation and Flow Characteristics

Parameter	Instrument
Flow Patterns	Visual Observation, High Speed Video System
Liquid Holdups	Quick Closing Valves
Pressure Gradient	Differential Pressure Transducer
Droplet Size	High Speed Video System
In-Situ Phase Fractions	Iso-kinetic Probe
Data Acquisition System	LabView System

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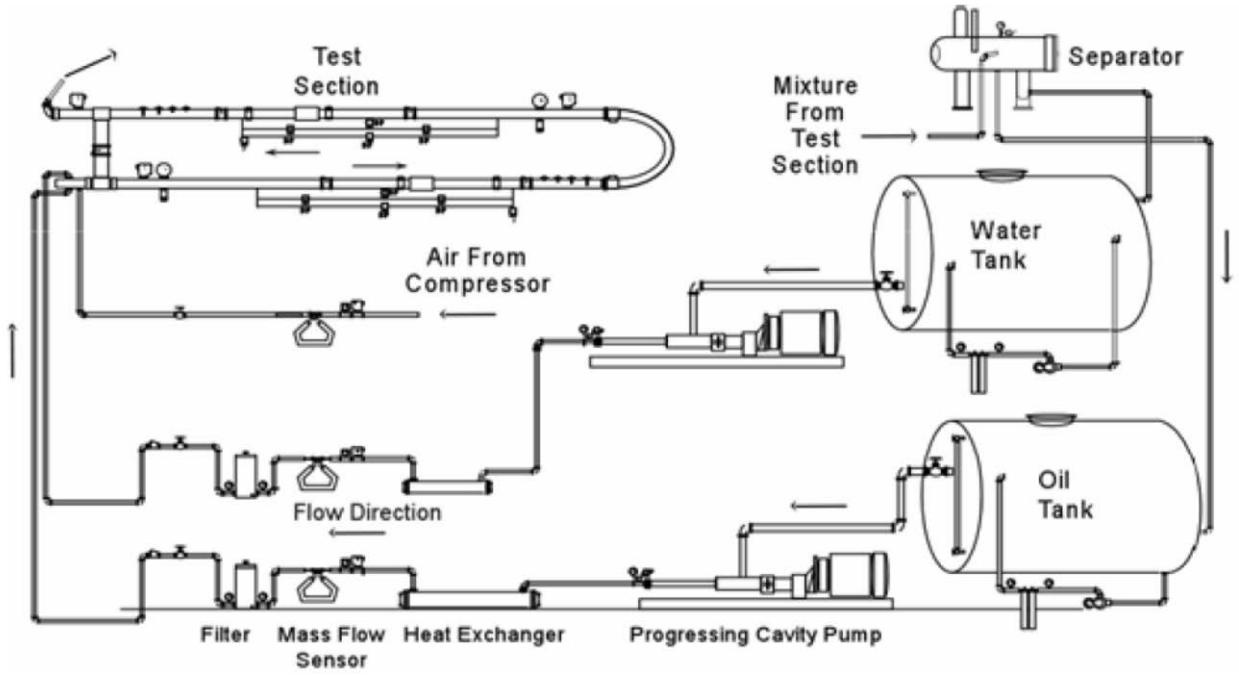

Figure 1. Schematic of Flow Loop

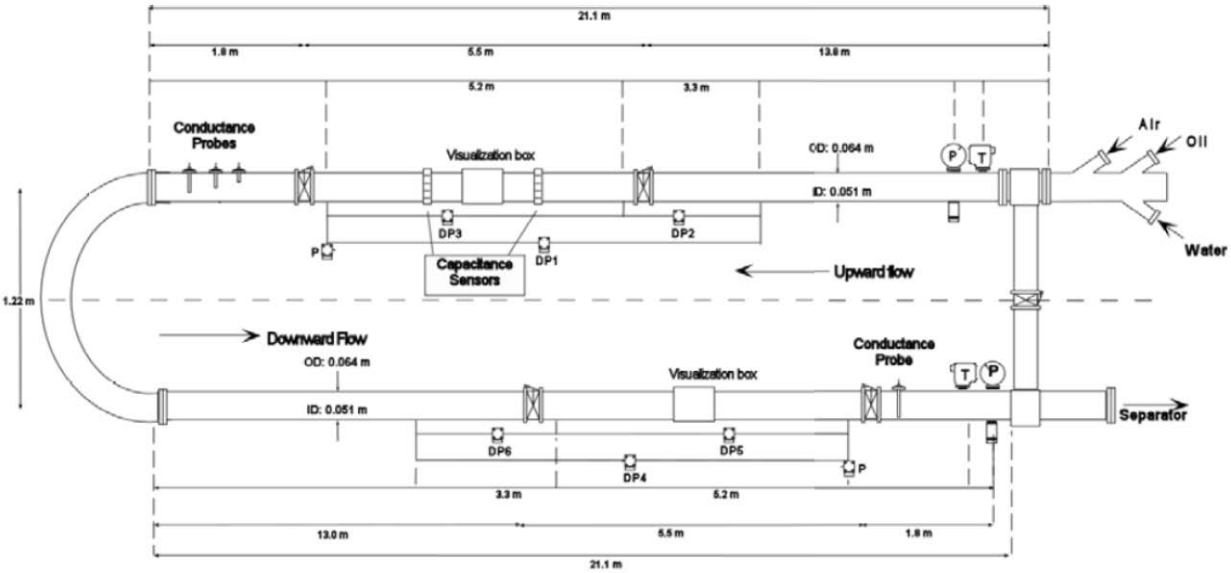

Figure 2. Schematic of Test Section

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Figure 3. View of 2-in. Gas/Oil/Water Flow Loop

Figure 4. Close up view of the instrumentations at 2-in. Gas/Oil/Water Flow Loop

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