



## *3-in. High Pressure Large-Diameter Gas/Water/Oil Flow Loop*

This facility operates with gas/oil/water and has been designed to study the effect of pressure and oil viscosity on multiphase flow characteristics.

### Key Specifications

#### Fluids

Gas: Air, Nitrogen or Natural Gas

Water: Tap Water

Oil: Mineral Oil

#### Operating Conditions

Maximum Pressure: 800 psig  
 Temperature: Ambient  
 Gas Flow Rate: 0 to 0.6 MMSCFD (Superficial Gas Velocity – 0 to 17 ft/s)  
 Water Flow Rate: 0 to 4500 BPD (Superficial Liquid Velocity – 0 to 6 ft/s)  
 Oil Flow Rate: 0 to 4500 BPD (Superficial Liquid Velocity – 0 to 6 ft/s)

#### Test Section

Pipe Material: Stainless Steel  
 Diameter of Pipe: 3 inch  
 Test Section: 20 ft (80 D)  
 Developing Region: 40 ft (160 D)  
 Exit Region: 10 ft (40 D)  
 Inclination Angles: -90 to 90 degree

#### Instrumentation and Flow Characteristics

Instrumentation	Measured Parameters
Quick Closing Valves	<ul style="list-style-type: none"> <li>Liquid Holdup</li> <li>Water Fraction</li> </ul>
Sapphire Window	<ul style="list-style-type: none"> <li>Visual Observation</li> <li>Flow Pattern</li> </ul>
Capacitance and Conductivity Sensors	<ul style="list-style-type: none"> <li>Flow Pattern</li> <li>Slug Characteristics</li> </ul>

# TU Fluid Flow Projects

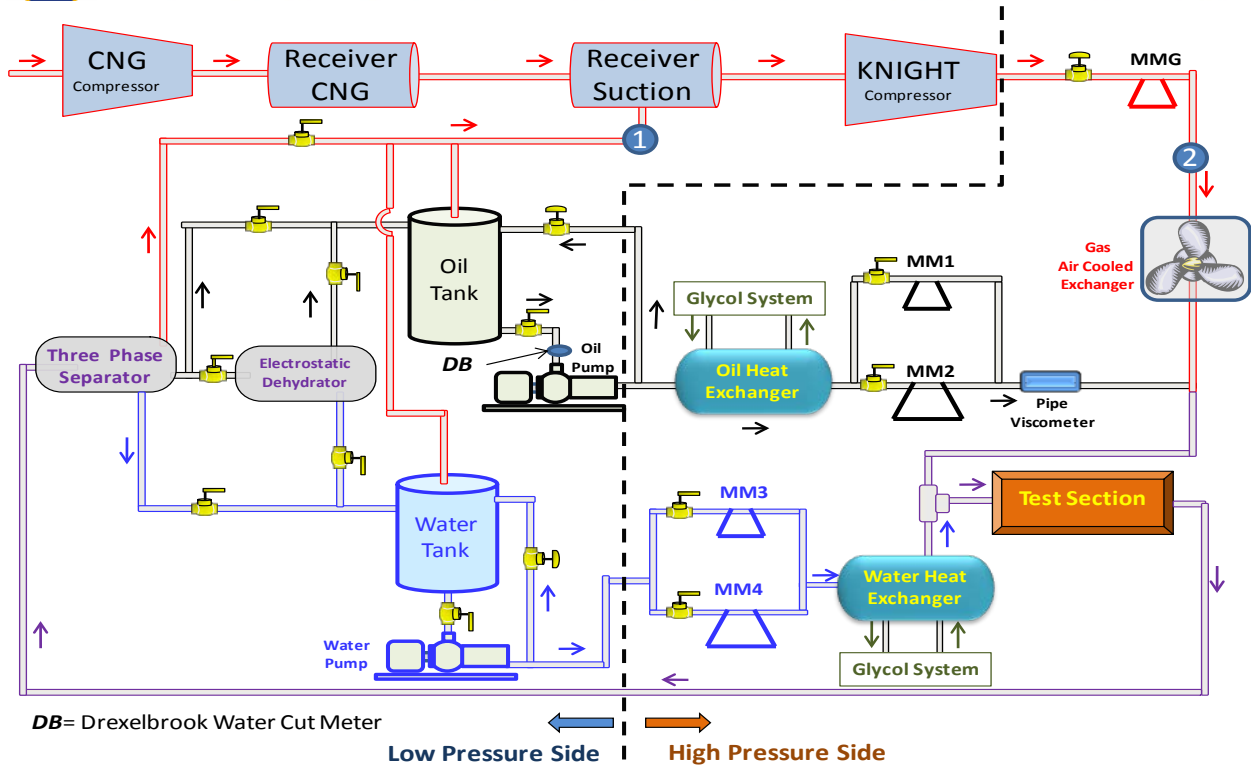


Figure 1. Schematic of Modified Flow Loop

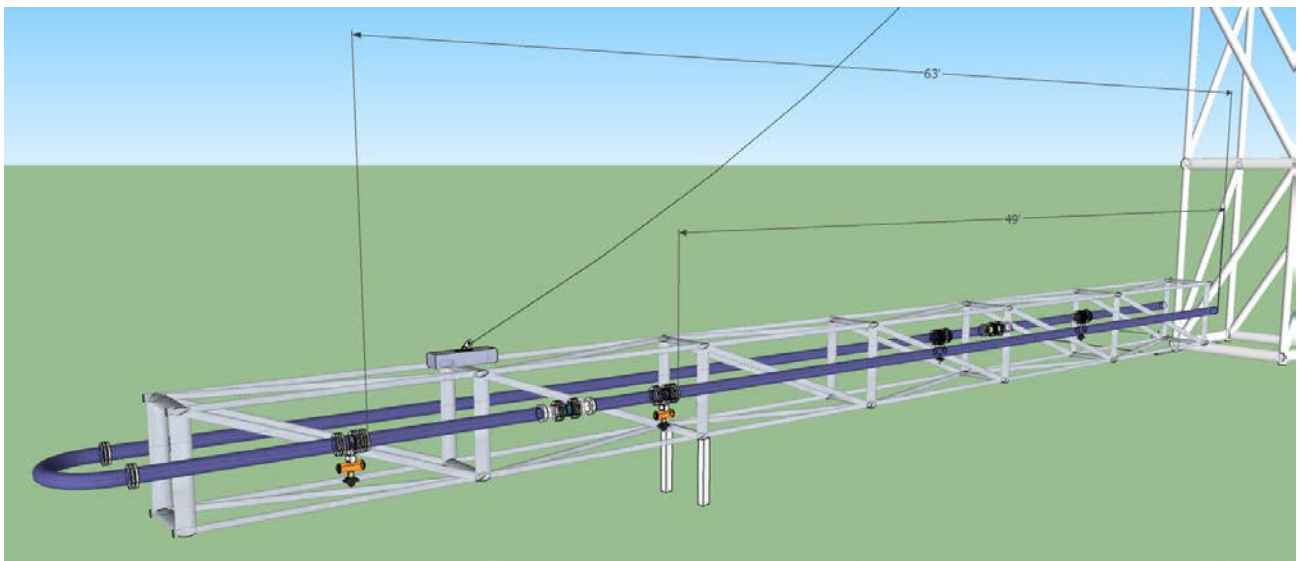


Figure 2. Schematic of Test Section



**Figure 3. View of 3-in. High Pressure Large-Diameter Gas/Water/Oil Flow Loop**

TU Fluid Flow Projects  
The University of Tulsa  
2450 East Marshall  
Tulsa, Oklahoma 74110

[www.tuffp.utulsa.edu](http://www.tuffp.utulsa.edu)  
Phone: (918) 631-5110  
E-Mail: [kelley@utulsa.edu](mailto:kelley@utulsa.edu)