

HIGH PRESSURE FLOW TEST FACILITY

OVERVIEW

BHR's high pressure flow test facility is designed to test components or systems with air under high pressure and high flow conditions. It can also be used for testing with water under high pressure and flow conditions using the HP air as a driver. The facility is adaptable to suit a wide variety of test applications and is instrumented to enable high speed measurement of pressures, temperatures and flow rates.

APPLICATIONS

The facility can be used for product development, qualification testing / type approval and Factory Acceptance Testing (FAT).

Typical Components:

- Manifold blocks, comprising various valves and filters
- Pressure regulators
- Safety relief valves
- Flow surge reliever valves
- Flow control devices

Typical Tests:

- Pressure relief devices performance tests to ASME PTC 25-2001, e.g. set and reseating pressure & relieving capacity, with and without backpressure
- Valve Kdr tests
- Regulator valve accuracy of regulation testing
- Flow characterisation tests
- Cyclic testing
- Operational testing
- Functional testing
- Flow Surge test
- Filter Element test
- Relief Valve Accumulation tests
- Pressurisation Rate tests





CASE STUDY

Test Type: Factory Acceptance Test

Component: High pressure gas reducing manifold

A large pressure reducing station to be used in a safety critical application required FAT testing to demonstrate it met specified satisfactory performance criteria. Tests required an air supply to 400 bar and flow rates of up to 8 kg/s.

Tests included:

- Functionality tests
- Cyclic tests
- Operational tests
- Flow surge tests
- Regulator accuracy of regulation
- Manoeuvring torque tests

Instrumentation

The test facility was instrumented to measure supply and exhaust pressures, temperatures and the flow rate. Instrumentation was calibrated traceable to national standards. Instrumentation input to a data acquisition computer operating NI LabVIEW software.

Performance exceptions

The FAT programme enabled demonstrated the test item met satisfactory performance criteria. It also enabled identification of areas where design changes could be made to the test item to further improve its operational performance.

TECHNICAL SPECIFICATIONS

Flow Operating Conditions:

Max. Pressure: 414 bar (6000 psi)

Max. Flow Rate: 23,500 Nm³/h
(14,000 scfm), 8 kg/s

Air Storage Capacity: 375 kg at 414 bar

Air quality: Dry, clean air in accordance with EN12021

Incompressible Flow (Water) Operating Conditions:

Max. Pressure: 35 bar (510 psi)

Max. Flow Rate: 110 L/s

Fluid Storage Capacity: 1000 L

Instrumentation:

Measured Parameters: Temperature, pressure, flow rate

Data Acquisition: NI LabVIEW Software

Data Sampling Rate: Up to 10,000's Hz

Calibration: Traceable to National Standards