

# CONTROL VALVE TEST BENCH

Model: NEA1811



**NEOMETRIX ENGINEERING (P) LIMITED.**

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Neometrix make **Control Valve Test Bench (Model: NEA1811)** is designed specially to cover almost all high pressure, high flow and high temperature precise testing requirements of both Industrial and Mobile Hydraulic application Industries. This test stand has been proved to enable test labs to test hydraulic valves at pressure up to 420 bar and with maximum flow up to 400 lpm at temperature up to 85 °C. Some of the tests that can be performed on both Mobile and Industrial Valves by this machine are:

- **Endurance Test**
- **Hysteresis Test**
- **Impulse Test**
- **Flow Compensation Test**
- **Flow Accuracy Test**
- **Response Time Test**
- **Pressure Drop Test**
- **Leakage Test**
- **Pull In & Drop Out Test**

This test stand is equipped with three supply lines from 3 main Pumps; These Pumps can be use separately to get desired flow, also two pumps can be combined to get 400 lpm flow. All main pumps are variable displacement axial piston pumps with maximum pressure cut off feature and electronic flow limitation feature itself on the pump controller to limit maximum flow. Valves with and without load sense features can be tested on this test stand by switching the pump LS connection from the user panel itself.

The test pressure and test flow of all supply lines on this test stand is controlled by servo proportional pressure relief and servo proportional flow control valves which are precisely and dedicatedly controlled by NI Veristand Software. Test bench has closed loop Oil temperature control to the set point specified before starting test.

#### **Technical Specifications:**

- Main Supply Line P1: 250 lpm up to 420 bar
- Main Supply Line P2: 150 lpm up to 420 bar
- Combined Supply Line P1 & P2: 400 lpm up to 420 bar
- Pilot Supply Line P3: 60 lpm up to 420 bar
- Return Line R1 & R2: Close loop bridge circuit for 250 lpm to generate load up to 420 bar
- Return Line R3 & R4: Close loop bridge circuit for 400 lpm to generate load up to 420 bar
- Return Line R5: Tank line for 100 lpm with back pressure up to 420 bar
- Temperature Range: 25- 85 deg C, Set point close loop control through Inertia Software
- Cleanliness Level: Up to ISO (17/15/12) / NAS Class 6.
- Test Bench Computer: HP Z Series Workstation with 27" IPS Display.

#### **Instrumentation:**

- Screw Flow Meter: Capacity 1 to 400 Lpm, 420 bar with  $\pm 0.05\%$  repeatability accuracy.
- Screw Flow Meter: Capacity 0.5 to 100 Lpm, 420 bar with  $\pm 0.05\%$  repeatability accuracy.
- Gear Flow Meter: Capacity 0.005 to 4 Lpm, 420 bar with  $\pm 0.05\%$  repeatability accuracy.
- Pressure Transmitters: Ranging from 0-10 Bar to 0-600 Bar
- Temperature Transmitter: Measuring Range 0-150°C
- Oil Level Transmitter
- High and Low Oil Level Switch
- High Temperature Switch
- Oil Fume Detector (Photo electric sensor)

### Dimensions and Weight:

- Test Stand Dimensions: 3700mm(L) X 2900mm(W) X 2200mm (L)
- Hydraulic Oil Tank Dimensions: 1700mm(L) X 1100mm(W) X 750mm (H)
- Hydraulic Oil Tank Capacity: 1200 liters
- Net Weight: 10 ton

### Power Supply:

- Max Power Consumption : 430 kW
- Main Power Supply: 3 Phase, 440 VAC
- DAQ Power Supply: Single Phase, 220 VA

### Safety Provisions:

- PILZ Door Lock Safety Switch
- Emergency push button
- Interlocks for High Temperature Safety
- Interlocks for Oil Level Safety
- Interlocks for High Pressure Safety
- Interlocks for Filter Clogging
- Interlocks for Valve Safety Switches
- Interlocks for High Oil Fumes

### Noise Level:

- Sound proof Canopy with Rockwool Filling is Installed in this system
- Separate Sound Proofing arrangement for VD Pumps.
- Noise level is within 75db at a distance of 1 meter.

### Machine Color:

- NE Grey RAL Code 7035
- NE BLUE RAL Code 5000

### Suggested Oil Specification

This test stand is recommended to operate with ISO VG oil grade 22 to grade 100. Oil viscosity should be higher than 15 cst in any working condition for better life and performance of the test stand. Additional features and other oil specification can be provided on Customer request.

### Test Results:

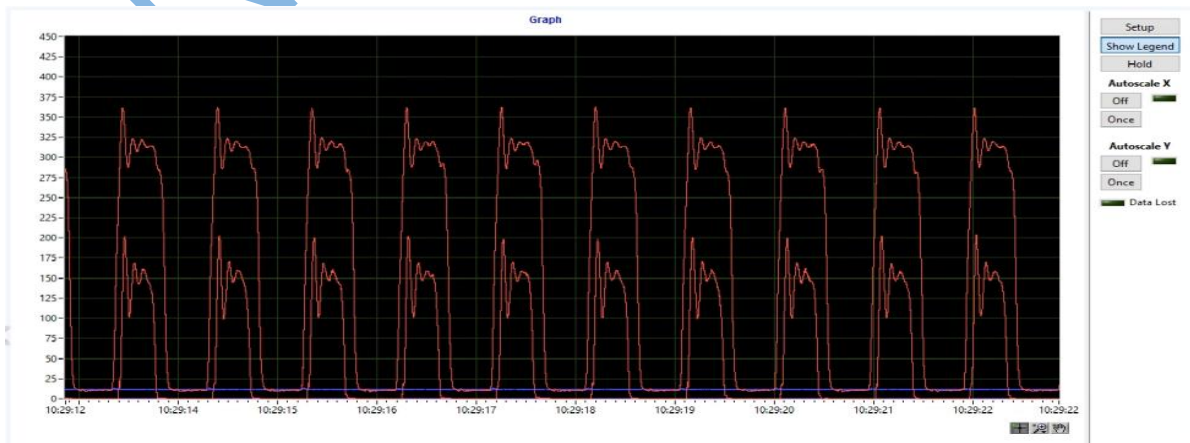


Figure 1: Mobile Valve Endurance Test at 350 Bar

The attached image (Fig 1) shows an example of Endurance test of Sectional mobile valve with both the sections simultaneously connected through machine bridge circuit with load of 350 bar in between work ports.

This represents flow and pressure graph on the user interface software screen which is hand-crafted with NI Inertia Software. The data can be acquired in data viewer in tdms. Format and graphs can be attain as well as represent in Fig 2.

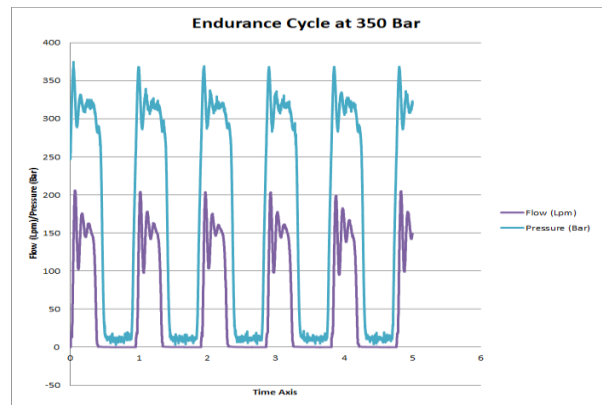


Fig 2: Mobile Valve Endurance Test Data at 350 Bar in data viewer

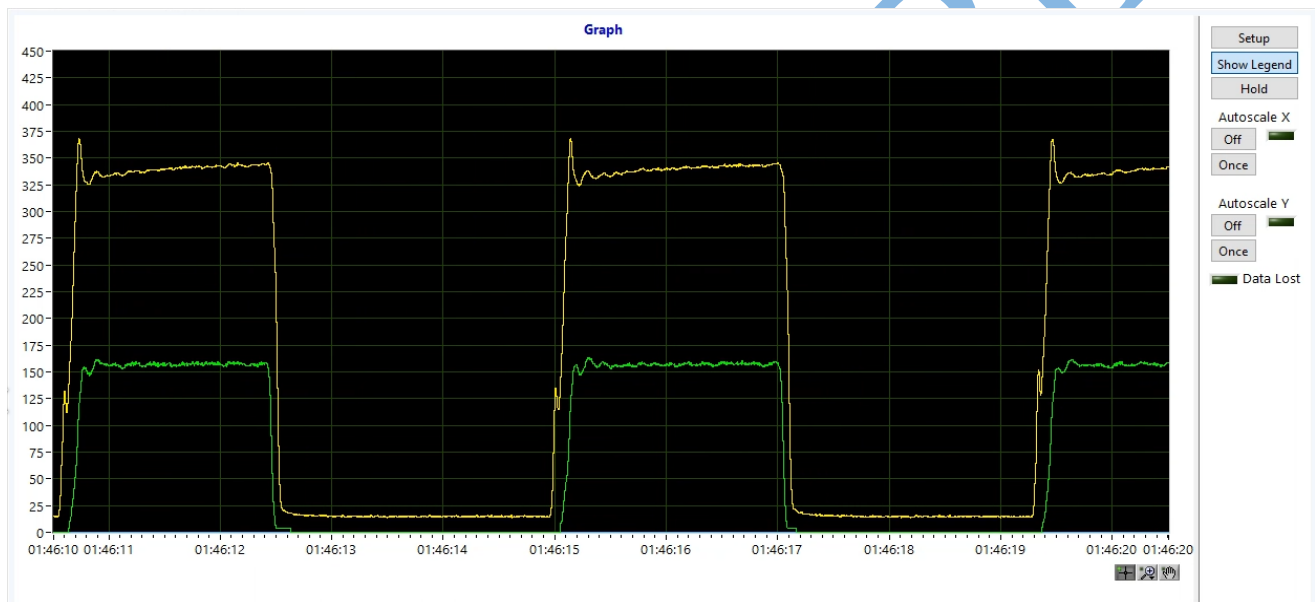


Fig 3: Mobile Valve Endurance Test Data at 350 Bar in data viewer

Similar kind of test graph is represented in Fig 3, Graph represents Pressure Impulse test graph of Industrial Cartridge Direction Valve at 350 bar Peak pressure at 150 lpm flow.

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