

## USER MANUAL OPERATION AND MAINTENANCE

Dear User,

**Neometrix is grateful for this opportunity provided to us to offer our products & services to you. We sincerely hope that you will be delighted to use our system and give us more opportunities to serve you.**

Neometrix is very focused on Aviation and Railway industries and offers complete range of systems & services which can be of immense use to you. We specialize in Hydraulic/ Servo Hydraulic Test Rigs, Fuel System Test Rigs, Pneumatic System Test Rigs, Oxygen/ Special Gases system Test Rigs, Very High Pressure Systems, Electronic & Electrical Test Rigs. Our services include among others, the followings:

- State of the art Test Rig Design, Development, Fabrication, Installation, Commissioning, Training & Support.
- Refurbishment/ Up gradation of the Existing Test Rigs.
- Maintenance (AMC) contracts of Existing Test Rigs.
- Operations Contract for the Test Rigs.
- Setting up of complete Testing Infrastructure including civil infrastructure.

The following pages talk about some of our systems in brief. Please feel free to contact us for details of any particular system of your interest.

Neometrix is committed to offer its best solutions & services to you all the times and **wish to become your preferred supplier for these services.**

With Best Regards,

**Shailendra Pratap Singh**  
**CEO**

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## Warnings:

1. Make sure that all electronic products are earth-grounded, to ensure Personal safety and proper operation.



2. All sensors are very sensitive; please never try to touch them.

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## 1. Neometrix Engineering Introduction:

Neometrix Engineering Pvt. Ltd. is a complete engineering solutions company based in New Delhi/ Noida.

**We specialize in CUSTOM BUILT Turnkey Engineering Solutions.**

**We have expertise in various engineering domains** like Hydraulics, Servo Hydraulics, ATF (Fuel), Mechanical, Pneumatic, Oxygen/ Helium (High Purity Gases), Electronics/ Electrical Test Benches, and Complete PC Based Automation Solutions.

We have experts in Mechanical Engineering, Chemical Engineering, Electrical/ Instrumentation Engineering, Software, Civil Engineering, Aeronautical engineering and other engineering fields.

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# NEOMETRIX

Complete Engineering Solutions Company

An ISO 9001 2008 Company

The company has a team of ~30 highly qualified engineers and has an experience of more than 75 successfully delivered projects. We are very closely working with **HAL, RDSO, Railways, Defense Establishments, Labs and Private Industries.**

The founders are graduates from IIT Kanpur and the company remains very closely linked with IITs. We utilize the expertise available there as and when required.

We have an exclusive relationship with Parker USA ([www.parker.com](http://www.parker.com)) for supplying Hydraulic Systems to HAL. Parker is world leader in Hydraulics (Fluid Motion & Control).

We have an exclusive relationship with Haskel USA ([www.haskel.com](http://www.haskel.com)) for supplying very high pressure systems. Haskel is world leader in very High Pressure products.

We are alliance partners of **National Instruments USA** ([www.ni.com](http://www.ni.com)), world leader in PC Based Test Measurement and Automation.

**With such alliances and our own engineering capabilities, we are in a position to deliver you state of the art world class Test Rig.**

**Neometrix is a member (as Industry Partner with ministry of HRD & Ministry of Railways) of TMRS (TECHNOLOGY MISSION FOR**

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**RAILWAY SAFETY) and we are working on several Railway Safety projects with IIT Kanpur & RDSO.**

**Neometrix values its association with RDSO and wishes to become its most preferred partner for such services.**

We are working very closely with Research Designs & Standards Organization (RDSO).

## **2. Introduction of the System:**

The system is designed to test the performance/Functional testing of the following 18 types of pneumatic valves of IRAB Brake system for electric locomotives.

The system is consisting Brake Pipe, Auxiliary Reservoir, Brake Cylinder Reservoir and Control Reservoir.

The test stand have a structure composed of SS –Section with pressure gauges construction housing with digital pressure gauges at front of the stand.

The right and left side and the rear side of the test stand is provided with detachable covers and doors. All the air reservoirs and pneumatic piping are accommodated inside of the test stand.

The test stand operation is controlled by the computer system by means of predefined software.

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## TEST RIG FOR IRAB BRAKE SYSTEM Test the following Valves one by one:

|   |                           |    |  |    |                                   |
|---|---------------------------|----|--|----|-----------------------------------|
| 1 | A9 Automatic brake valves | 7  | N-1 Reducing Valve                     | 13 | Air Flow Measuring Valve          |
| 2 | A9 Automatic brake valves | 8  | Feed Valve C2N/FT1/Combined Feed Valve | 14 | R-6 Relay Valve                   |
| 3 | C2W Relay Valve           | 9  | C2W Distributor Valve                  | 15 | J-1 Safety Valve                  |
| 4 | C2W Relay Valve-6mm Chock | 10 | Duplex Check Valve                     | 16 | Emergency Brake Application Valve |
| 5 | MU-2B Valve               | 11 | GM Type Drain Valve                    | 17 | Pressure Switch                   |
| 6 | F-1 Selector Valve        | 12 | 24-A Double Check Valve                | 18 | Magnet Valve                      |

The system works on a predefined Test Sequence with an option to test the particular test.

### 3. System Major Specifications

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|                           |   |                                       |
|---------------------------|---|---------------------------------------|
| Medium                    | = | Compressed Air                        |
| Pressure Rating           | = | 10.5 Kg/cm <sup>2</sup>               |
| Air supply Pressure Range | = | 8-10 Kg/cm <sup>2</sup>               |
| Flow Rate                 | = | 70CFM (2000 LPM)                      |
| Temperature Range         | = | Ambient up to 48°C                    |
| Power Supply              | = | 230V + 10% -10% Single Phase<br>50 HZ |

## Contents:

### THE TEST RIG FOR IRAB BRAKE SYSTEM FOR ELECTRIC LOCOMOTIVES CONSIST OF:

- **Test Bench stand including Air reservoirs and pneumatic piping**
- **Measuring System (DAQ Panel)**
- **Computer**
- **Printer**
- **UPS**
- **Control Panel**
- **PLC Panel**
- **Air Dryer**

## 4. Do's & Don'ts for the System

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## Do's:

1. Read the User Manual fully before operating the System.
2. Read the Pneumatic Circuit and understand which Valve/ Component on Panel do what.
3. Check the proper closing of the Supply Valve of the system when it is not in operation.
4. Check the Source Pressure before operation.

## Don't:

1. Never touch the sensors or their mountings.
2. Touch any circuitry inside the panel.
3. "ON" the MCB before starting the computer.

## 5. Starting Of The System:

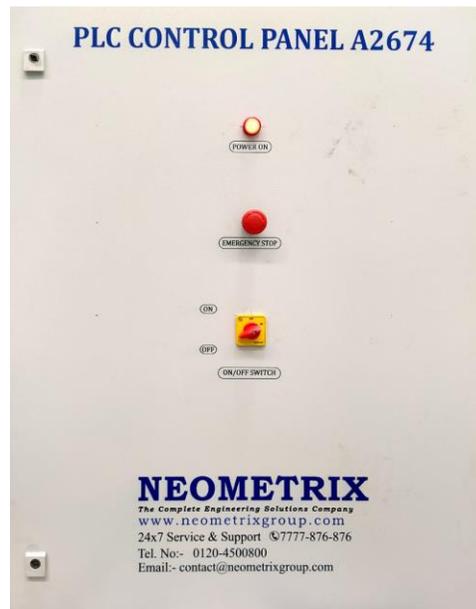
- Give the DAQ panel UPS to Power Supply 230V +10% - 10% Single Phase, 50 Hz.
- Turn ON the Computer CPU and Monitor
- Turn on the PLC panel on/off switch at "ON" Position.

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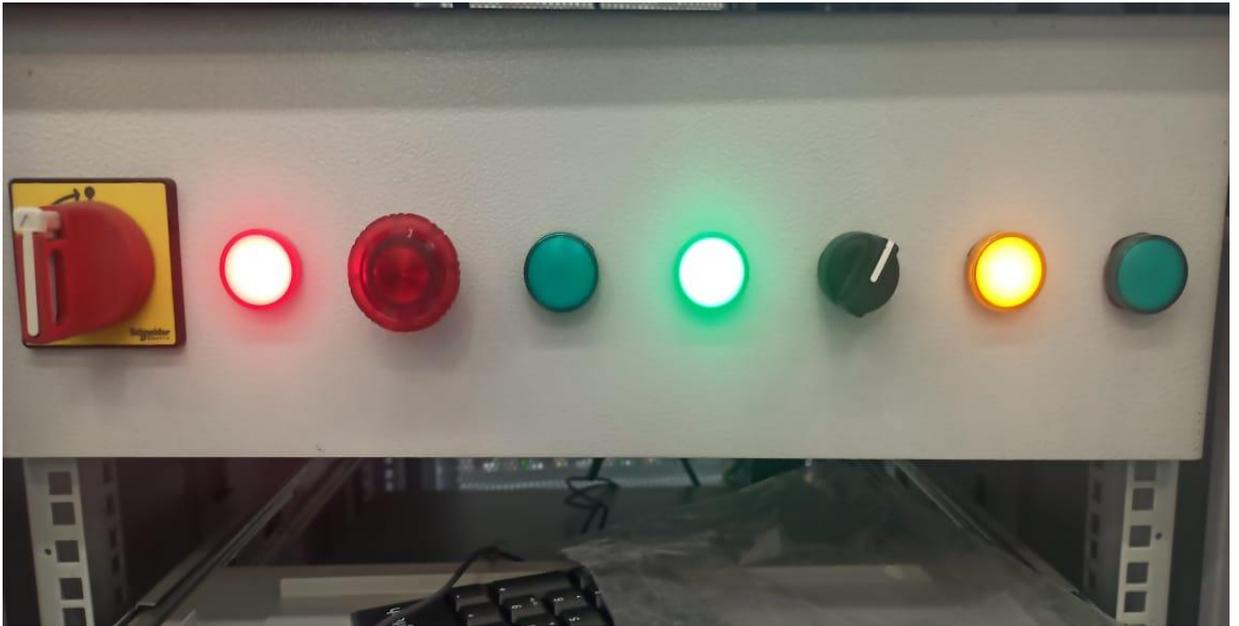
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- Turn “ON” the Main switch of control panel at DAQ panel.

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- Connect the compressed air inlet line to the air dryer inlet line and open the inlet ball valve of air dryer and test bench.
- Give Power Supply 230V, Single Phase, 50 Hz. To the Air dryer

## 6. Working Of The System:

The System is consisting dual working mode i.e. Automatic and manual

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In Automatic mode the Test will be perform according to the predefined sequence automatically and also with an option for a particular test according to the requirement.

In manual mode the test will be done with control Panel and Toggles Switch.

**Mode Selection-** The mode selection can be done with the Mode Selector with an option-

- 1- Automatic Mode.
- 2- Manual Mode.

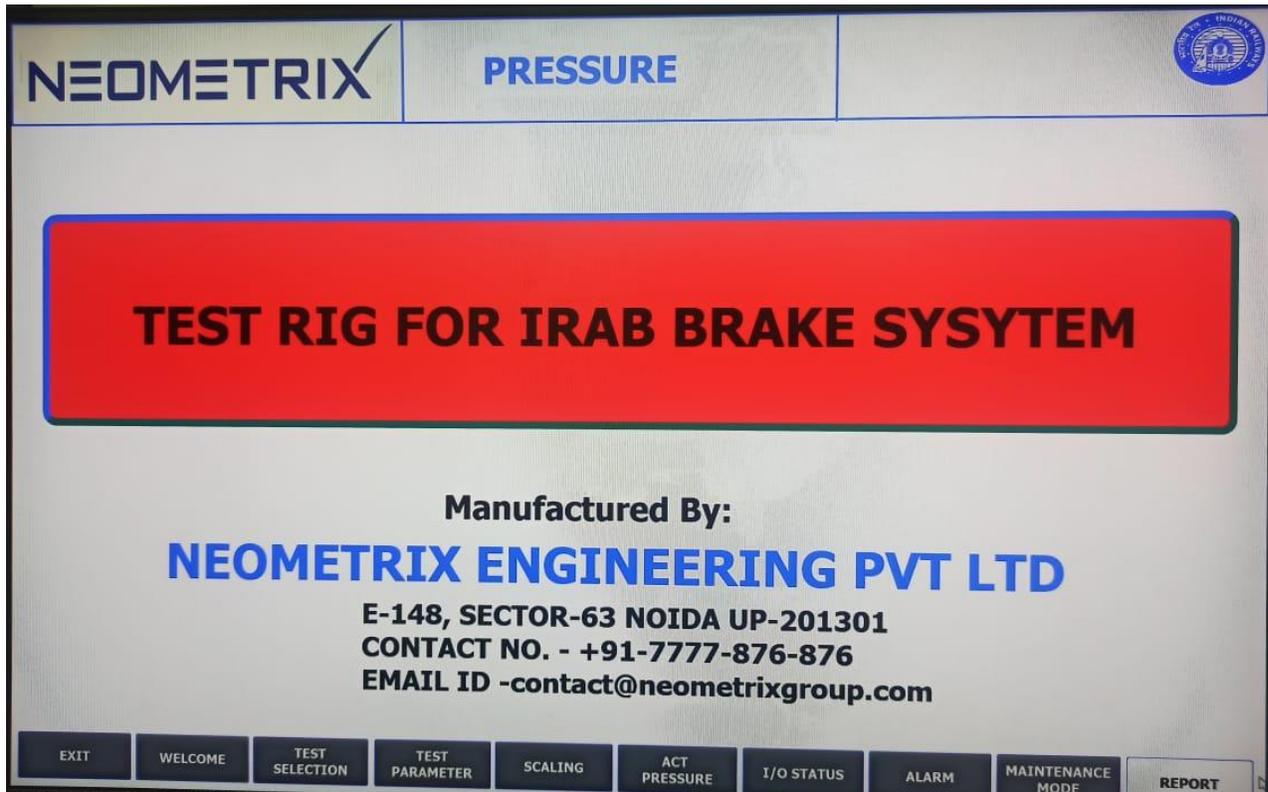
**Automatic Mode-**This mode can be selected from the Control Panel Selector Switch.

To start the testing follow following steps:

Switch on the computer and open the CCUBTB test Run File from the Desktop the Main Menu Window will appear as show below:

Click here once  

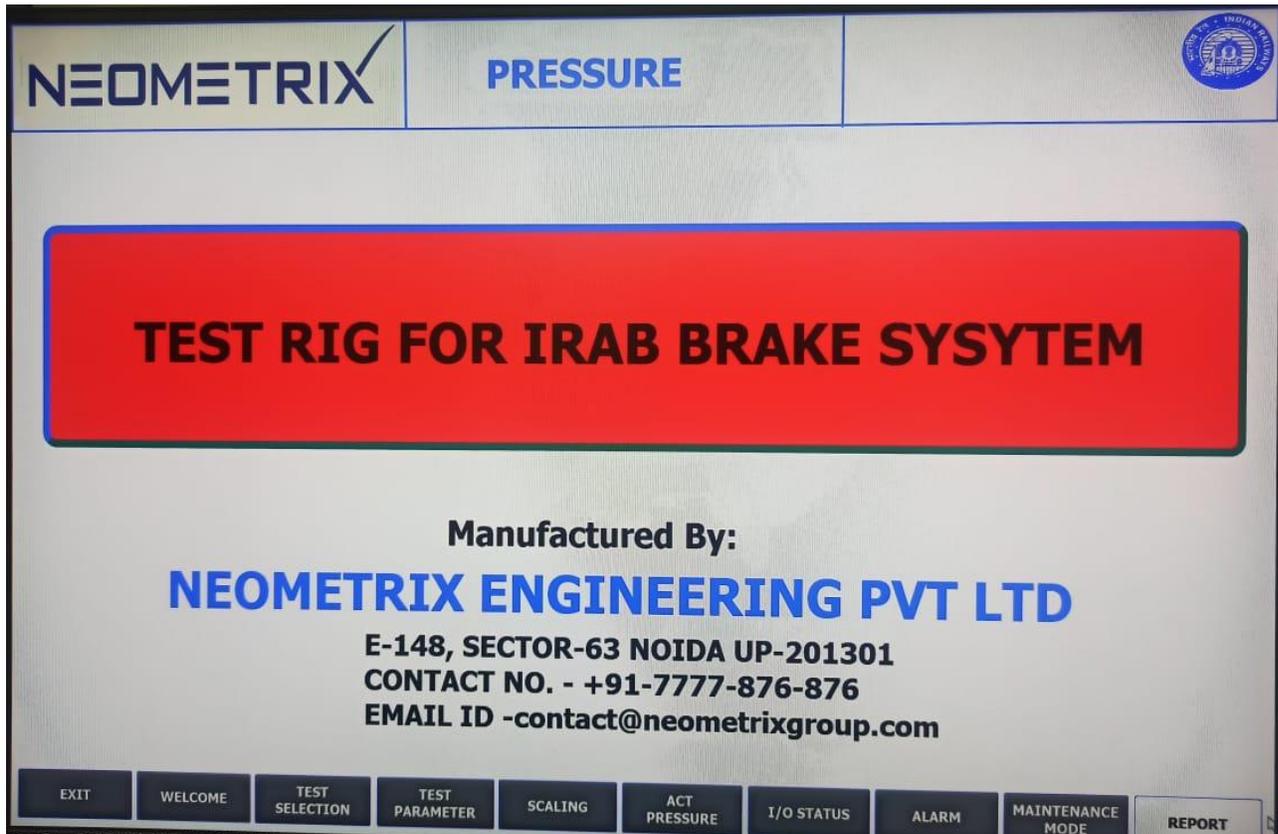

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Note: For first time Run file opening clicking on top left play button as indicated on above screen to run the software.

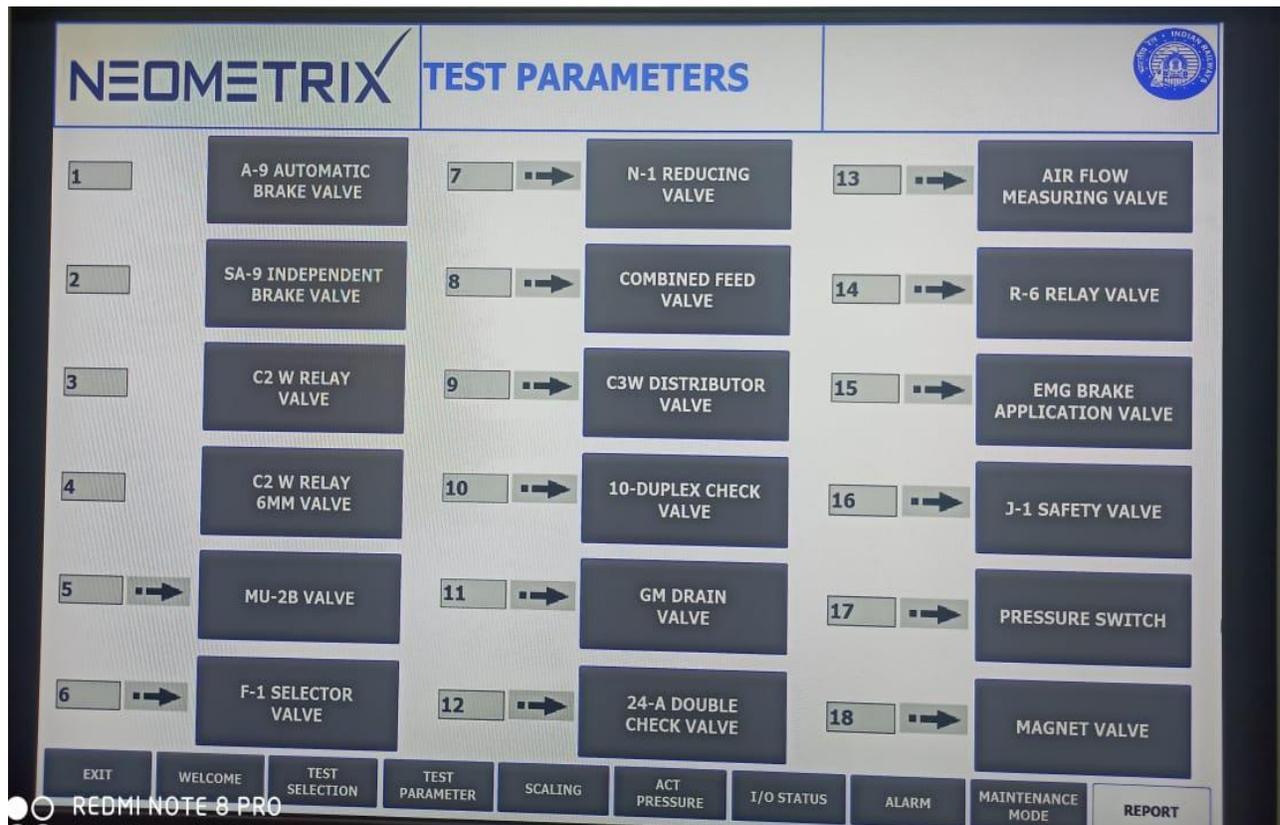
**PARAMETER-** To insert the test parameter(if required) click on PARAMETER icon as per below

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After clicking the **PARAMETER** icon the **CCUBTB** detail window will appear as shown-

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**Click on Particular Valve for Parameter setting if applicable**

**START TEST: Click on TEST SELECTION from main Menu**

**After clicking the TEST SELECTION icon the CCUBTB detail window will appear as shown-**

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To start a test click on a particular valve as per test setup ready for testing. Now Test can be started by clicking on START button, Test will automatically run for define time and report will be save in PDF format.

To start the other valve testing follows the same procedure from Test Selection Screen after Test setup.

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**Manual Mode**-This mode can be selected from the Control Panel Selector Switch. All the operation of valve control will be done by toggle switch as per test requirement of testing units.

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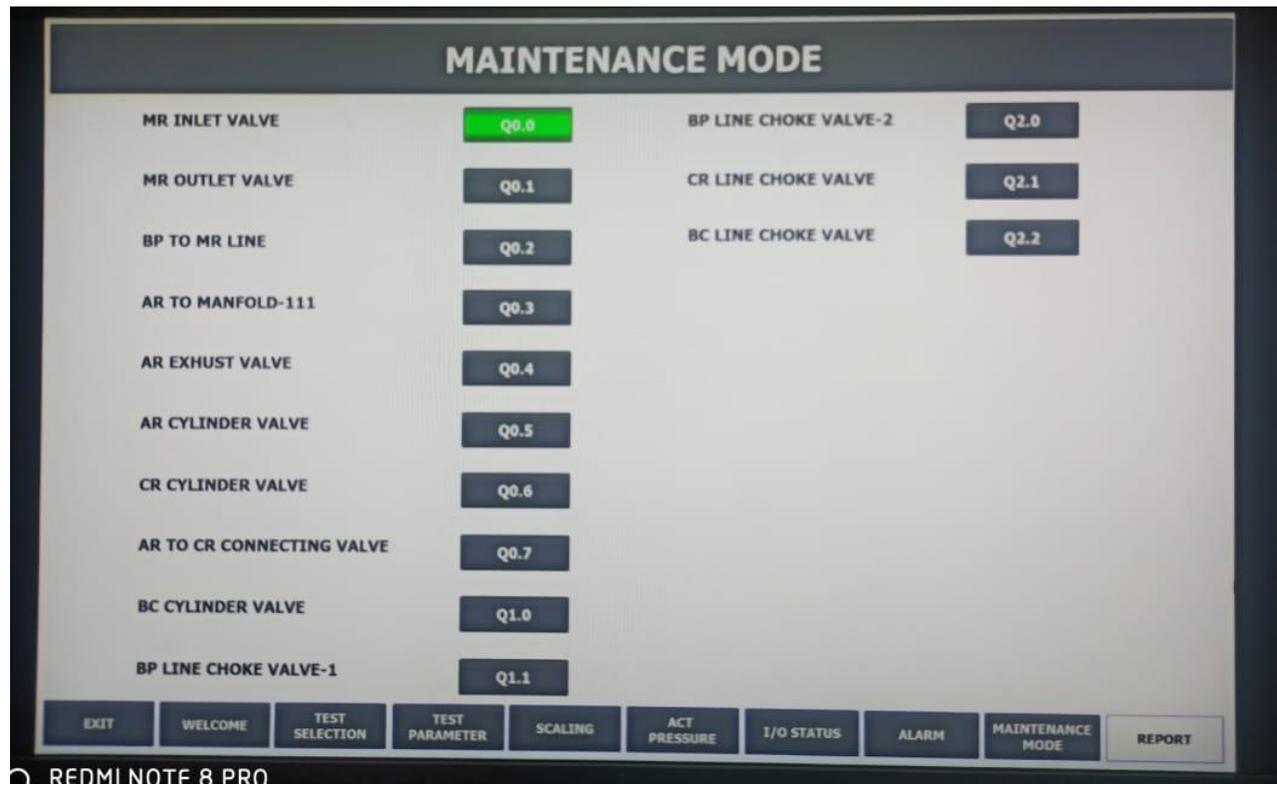
Tel: +91-120-4500800, Fax: +91-120-4500888, contact@neometrix.in



## 7. Maintenance of the Test Stand

From the Main menu Click on the MAINTENANCE icon, after clicking on maintenance icon following windows will appear

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On above screen select the selector switch on maintenance mode.  
After this particular valve proper functioning can be monitored by switching on from the screen.

### ❖ Weekly Maintenance

- Closed the air dryer inlet and outlet valve.
- Closed the air compressor outlet valve
- Exhaust the air from main reservoir by opening the drain valve of reservoir from inside the test stand panel.
- Now check the seals for fittings if any leakage observed during testing and tight it properly.
- Check the air dryer function as per air dryer maintenance manual.

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- Check the Air filter drainage and drain the moisture.
- ❖ **Monthly Maintenance**
  - Check the pressure gauge calibration certificate if the calibration of pressure gauges and pressure transmitter is over dated then remove and do the needful for calibration.
  - After calibration of pressure gauges and pressure transmitter mount on its place as per circuit.
  - Now closed the main reservoir drain valve
  - Open the air dryer inlet valve and outlet valve and supply on compressor air supply line
  - Now observed if any leakage on circuit
  - If not then click on auto mode from maintenance screen.
  - Now select on TEST SCREEN icon and do the testing of unit as per requirement.

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