

**CNG Pressure Regulator:-**

A **pressure regulator** is a [valve](#) that automatically cuts off the flow of a liquid or gas at a certain pressure. Regulators are used to allow high-pressure fluid supply lines or tanks to be reduced to safe and/or usable pressures for various applications.

All CNG applications require the use of a regulator. Because pressures in CNG tanks can fluctuate significantly, regulators must be present to deliver a steady flow pressure to downstream appliances.

**CNG Regulator Testing:-**

For the testing of the CNG regulators ISO made some standards, The ISO 15500-9:2001(E) is the latest standard for the testing of the regulators, some of the requirements of the regulator testing are follows:

**CNG REGULATOR TESTER STANDARD REQUIREMENTS:**

**The regulator Should Be tested according to ISO 15500-9:2001(E).**

**There are two defined conditions for regulator test in the ISO standard. These conditions are following:**

**1. Leakage Test:**

**Test the pressure regulator at the temperatures and pressure given in the following table.**

Table: Test Temperature and Pressures

Temperature °C	Percentage	Inlet Test Pressure MPa (Bar)	
		First test	Second Test
-40	1	15 (150)	0,5(5)
20	1	0,5 (5)	30(300)
120	1	0,5 (5)	
-40	2, 3...	0.75xWorking Pressure	1
20	2, 3...	1	1.5xworking pressure
120	2, 3...	1	1.5xworking pressure

## 2. CONTINUED OPERATION:-

The regulator shall be able to withstand 50,000 cycles without any failure when tested according to the following procedure. Where the stages of pressure regulation are separate, the service pressure in a) to f) is considered to be the working pressure of the upstream edge.

- a) Recycle the regulator for 95% of the total number of cycles at room temperature and at the service pressure. Each cycle shall consist of flow until stable outlet pressure has been obtained. After which the gas flow shall be shut off by a downstream valve within 1 sec, until the downstream lock-up pressure has stabilized. Stabilized outlet pressures are defined as set pressure  $\pm 15\%$  for at least 15 sec. The regulator shall comply with 6.3 at room temperature at intervals of 20%, 40%, 60%, 80% and 100% of room temperature cycle.
- b) Cycle the inlet pressure of the regulator for 1% of the total number of cycles at room temperature from 100% to 50% of the service pressure. The duration of each cycle shall be no less than 10 sec. The regulator shall comply with 6.3 at room temperature at the completion of this test.
- c) Repeat the cycling procedure of a) at **120 °C at the service pressure** for 1% of the total number of cycles.
- d) Repeat the cycling procedure of b) at **120 °C at the service pressure** for 1% of the total number of cycles. The regulator shall comply with 6.3 at **120 °C** temperature at the completion of this test.
- e) Repeat the cycling procedure of a) at **-40 °C at the service pressure** for 1% of the total number of cycles.
- f) Repeat the cycling procedure of b) at **-40 °C** and 50% of the service pressure for 1% of the total number of cycles. The regulator shall comply with 6.3 at **-40 °C** temperature at the completion of this test.
- g) At the completion of the cycle, the lock-up pressure downstream of the regulator shall not exceed the lock-up pressure.

## SPECIFIC REQUIREMENT OF TEST RIG/CONTROL PANEL FOR CONTINUED OPERATION TEST RIG

- The control panel shall be movable with castor wheels i.e. it can be taken to any test area.
- The Test Rig and Control Panel should have the provision for the performing the test at temperature other than the ambient temperature i.e. sometimes the test samples will be kept in the environmental chamber [temp. range: -40<sup>®</sup> to +120<sup>®</sup>] with the help of long cable, hoses, port holes etc. Panel and Hardware will remain outside.
- The test rig shall have an enclosure with the glass window (which can withstand Bursting Accident) for the samples keeping in views of safety in case of bursting / incident at high pressure (if any).
- The control panel should have following safety interlocks:
  - Single Phase Preventer, Protection against over voltage etc.
  - Emergency stop.
  - Automatic switching OFF after the completion of set no. of cycles.
  - The control panel should capable of resuming the ongoing test in case of power comes back after failure. The test should be restarted at that point (no. of cycles) at which the power failure occurred.
  - Interlocking in Auto mode that if safety guards remains open, it will not start.

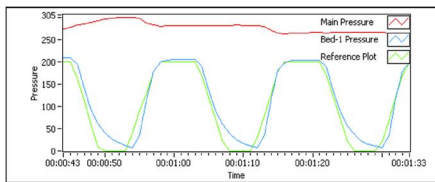
## OUR PRODUCT FOR REGULATOR TESTING: CNG REEGLATOR TESTER

Passion to build products to exactly fit in the customers' needs and budget with state of the art technology has allowed the engineers at Paskals to design and develop a range of Safe product for regulator testing, which follows the entire standard requirement.

The CNG regulators are used almost all the automotive industries because of the rising demand of the CNG vehicles.

### Attractive Features\*

- ❖ Design as per ISO 15500-9:2001 (E).



- ❖ User Friendly Software for entering the test schedule as per ISO standards/Data recording and Printing
  - ❖ PLC logic controlled operation
  - ❖ High Pressure Reservoir to 300 bar
  - ❖ High Pressure Safety interlocking
  - ❖ Fully Mobile
  - ❖ Ergonomic Panel
  - ❖ Trusted Performance
  - ❖ More Than One Test points
- Useful for OEMs CNG R&D

**CNG REGULATOR TESTER CURCUIT FOR DESIGN APPROVEL EQUIPMENT**

