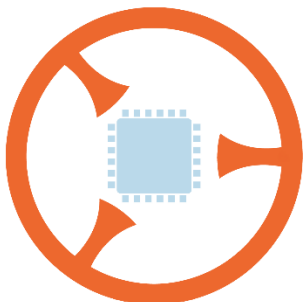
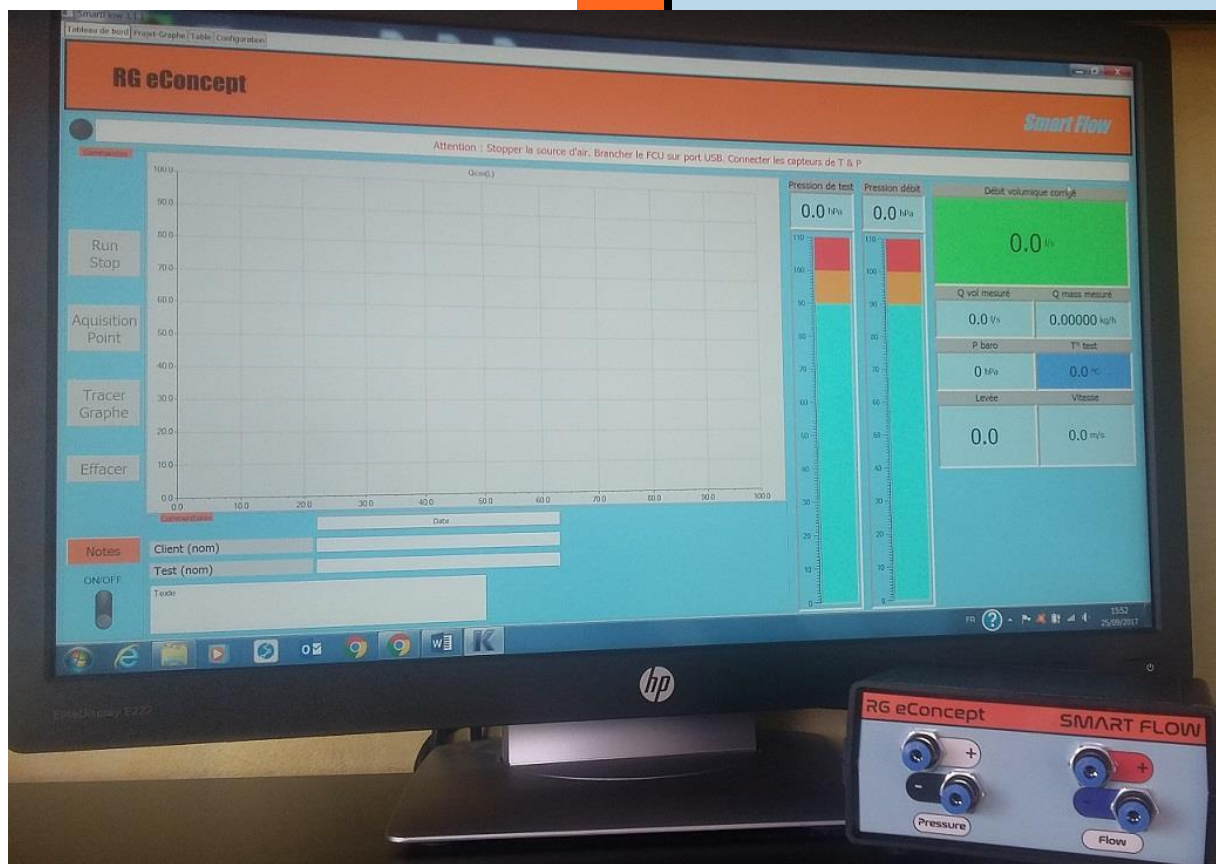


Flowbench

SmartFlow-SC1



RG eConcept
Smart Motorsport

rgeconcept.com

StFw-Pr

1. Key Benefits

- Easy to use measuring instrument.
- Complete kit assembly in minutes.
- Robust and sturdy construction.
- Bidirectional flow rate possible allowing both intake and exhaust measurements.
- Supplied with acquisition electronics for accuracy of up to 1%.
- Direct interface via USB and software control with Windows® 7 or 10.
- More relevant floating test pressure (see below) by using a workshop vacuum cleaner as an air source.
- Low price but high performance.

2. SmartFlow-SC1 presentation

SmartFlow-SC1 is a flowbench. It can be used to test and measure cylinder heads of the order of 100 HP per cylinder. This measuring instrument consists of four parts:

1.1. The flowmeter

The flowmeter is of the pressure differential device type. Its dimensioning follows the recommendations of the ISO 5167-2 standard. It incorporates the pressure tapings which are of the "push in" type to facilitate the connection of the pipes to the electronic box (Flow Control Unit). It also incorporates temperature measurements that allow the flow measurement to be corrected.

1.2. The FCU (flowrate control unit)

The flow controller is the box that allows the measurement of physical parameters such as pressures and temperatures. It also transfers data via USB to the host PC that controls the device. It is powered by the USB link so it does not require a specific power supply.

The 32-bit on-board microcontroller, with its 12-bit ADC converters, measures parameters with a theoretical resolution of 1/4096. A resolution of 1/1000 is considered for the calculation of the accuracy of the instrument.

The pressures measured are test pressure, pressure difference on each side of the diaphragm and atmospheric pressure.

The measured temperatures are measured upstream and downstream of the diaphragm to correct the measured flow rate in both intake and exhaust modes.

The front panel accommodates the hoses of the pressure ports and the rear panel allows the connection of temperature sensors and the USB cable (mini B socket).

1.3. The control software

The software under Windows® 7 or 10 is the simplest possible user interface for controlling a measuring instrument and not a computer.

This software calculates the actual flow rate, both mass and volume, and calculates the standard flow rate corrected to the desired constant pressure of 10 or 28 inches of water /

25.4 or 71.1 hPa (mbar) and the desired standard temperature. This allows comparisons with other measurements made under these conditions.

The "Dashboard" tab displays measurements in real time as a gauge similar to water level gauges and in digital form. There is also a real-time graph showing the measurements as a function of valve lift. The calculated gas velocity at the valve is displayed with the corresponding Mach value.

The "Project Graph" tab allows you to visualize the different curves obtained after measurements during a test session. Here you will find commands to save curves and commands to read and compare the old saved curves as well as the possibility of printing. Two sessions can be viewed.

The "Table" tab allows you to visualize the data of a curve among the curves of one or two sessions.

The "Configuration" tab allows you to choose the units of the physical quantities (USI/Imperial), to choose the language (FR/EN), to indicate the characteristics of the cylinder head under test, to change the dimensioning of the flowmeter if you wish to use your own (on diaphragm anyway).

The user configuration is saved each time you make a change to avoid returning to it.

1.4. The air source

The air source is a commercial shop vacuum cleaner found in all DIY stores. This makes it possible to obtain a low-cost but high-performance measuring device.

It is recommended to choose a blower model also for exhaust flow measurements.

The advantage of such a suction source is that the test pressure is not constant, it has the advantage of being higher than that which is recommended in the industry (10 or 28 inches of water / 25 or 70 hPa) during low valve lifts, which is more representative of the reality of the suction phenomenon of a combustion engine.

3. Features and performances

- Flow measurement
 - Uncertainty and accuracy: < 1% of measurement
 - Repeatability: < 0.5%.
- Test pressure measurement
 - 0-100 hPa (0-40 inches H₂O).
- Atmospheric pressure measurement
 - Allows for compensation of location and weather conditions.
- Temperature measurement
 - Two Silicon sensors at 1%.
- Type of flow
 - Choice between intake or exhaust.
- Maximum bore diameter: 104 mm.
- Software
 - Control by dedicated software running under WINDOWS® 7 or 10.