

PROPORTION AIR

Fluid Power and
Fluid Control Solutions
For Tire Manufacturing



PRESSURE



FLOW



FORCE



TENSION



POSITION



TORQUE



VACUUM



TIRE UNIFORMITY TESTING

A strict set of measurement standards and test conditions are performed on every tire. Radial and lateral force variation, conicity, plysteer and sidewall bulge, just to name a few tests performed during this phase.

The **QB2 on a Volume Booster (RM or R-Series) with a DSY Pressure Transducer** is widely used during tire uniformity testing. Accuracy, repeatability and stability are very important for this test. With our high accuracy and repeatability, we also include an option to disengage the electronic pressure regulator's internal valves while the testing takes place. This allows for extremely stable and unadjusted pressure during the test.



QB2 with an R-Series Volume Booster and DSY Pressure Transducer
*shown with optional digital display

Full Vacuum to 175 psig (12 bar) • Accuracy/Repeatability: 0.2% F.S. / 0.02% F.S. • Max Forward Flow: 2000 scfm (944 lit/sec)

STEAM TIRE CURING

A green tire is placed into a mold and low pressure is injected into the bladder to create the final shape of the tire. High pressure steam is then used to cure the tire.



QB2 on a Steam Regulator and DSTY Pressure Transducer



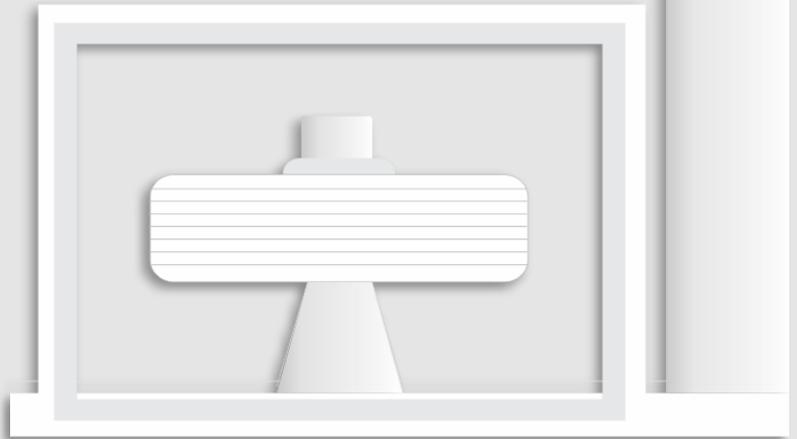
The **QB1 on a Steam Regulator** allows for tight pressure control of saturated steam for tire curing. This is possible because the pressure and temperature of saturated steam is directly proportional. For even higher accuracy, a QB2 and DSTY can be used. With the QB2, a PID loop controller is not needed because the QB2 closes the loop and ensures the correct pressure (temperature) is easily achieved and maintained.

*DSTY & QB must be remotely mounted for steam service

Up to 3000 psig (207 bar) • Accuracy/Repeatability: 0.5% F.S. / 0.02% F.S. • Ports: Up to 4" Flange

DYNAMIC BALANCER

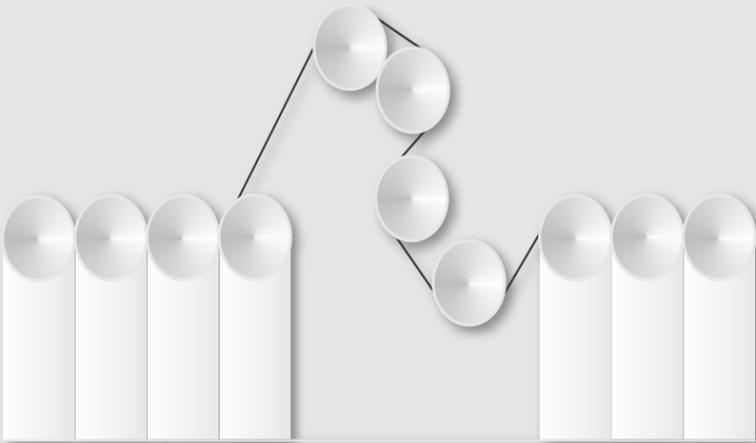
A tire is rapidly filled with stable and consistent pressure, then spun to measure and test for balance. The pressure provided is used to set the bead of the tire on the test rim and then to set test pressure.



QB2 with an RM Volume Booster and DSX Pressure Transducer

The QB2 on a Volume Booster (RM or R-Series) with a DSX Pressure Transducer is ideal for the balance testing application because of its repeatability, high flow and high pressure capabilities. The dual closed loop electronic regulator is teamed up with a 2-inch ported, air piloted rapid exhaust volume booster for unparalleled speed when both pressurizing and de-pressurizing.

Full Vacuum to 175 psig (12 bar) • Accuracy/Repeatability: 0.2% F.S. / 0.02% F.S. • Max Forward Flow: 550 scfm (260 lit/sec)



FABRIC PLY CUTTING

Large, thin sheets of rubber with nylon or polyester cord fabrics are cut to width, rolled and then transported to the assembly area where all of the components will eventually come together.

The **Ultra-Sonic Tension Control Package** is perfect for controlling the pneumatic drag brakes on the unwind station in the fabric ply cutting process. The UTC uses a tension control box, ultra-sonic sensor and a QB1 to allow tension to be the same from full roll to core diameter automatically as material is paid off the roll.



UTC Control Box, QB2 and Ultra-Sonic Sensor
*shown with optional digital display

Detects objects from 6.5 inches to 37 feet • Resolution of 0.030 inches • Simple Installation and Field Adjustable



BELT & PLY CALENDERING

Using force on calendar rolls, steel and fabric is rolled between two sheets of rubber in a process which combines all materials into one. Often, this process also requires precise temperature control of saturated steam.

The QB2 on a Volume Booster (PSR) with DSY pressure transducer provides plenty of control and flow (based on ram size and speed) to apply precise force to the calendar rolls. Using a DSTY (stainless steel) pressure transducer and a steam regulator, the QB2 can control the pressure of saturated steam which is directly proportional to the temperature of saturated steam.

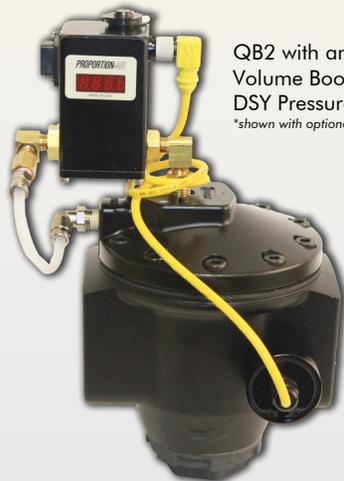


QB2 with a PSR
Volume Booster and
DSY Pressure Transducer

Full Vacuum to 175 psig (12 bar) • Accuracy/Repeatability: 0.2% F.S. / 0.02% F.S. • Max Forward Flow: 700 scfm (330 lit/sec)

TIRE BUILDING

During this process, six components (tread, ply, belts, sidewalls, liners and beads) come together and are assembled into an uncured or green tire.



QB2 with an R-Series
Volume Booster and
DSY Pressure Transducer
**shown with optional digital display*

The QB2 on a Volume Booster (R or RM-Series) with a DSY Pressure Transducer is used to inflate the drum and apply pressure to the different rubber components that make the assembled tire. This application requires speed and repeatability.

Full Vacuum to 175 psig (12 bar) • Accuracy/Repeatability: 0.2% F.S. / 0.02% F.S. • Max Forward Flow: 2000 scfm (944 lit/sec)

AIRCRAFT TIRE TESTING

During this process, aircraft tires are taken through a continuous simulation of landings under varying loads and forces. It is vital that a constant pressure is maintained in the aircraft tire throughout this test.



QB3H
Electro-Pneumatic
Pressure Regulator

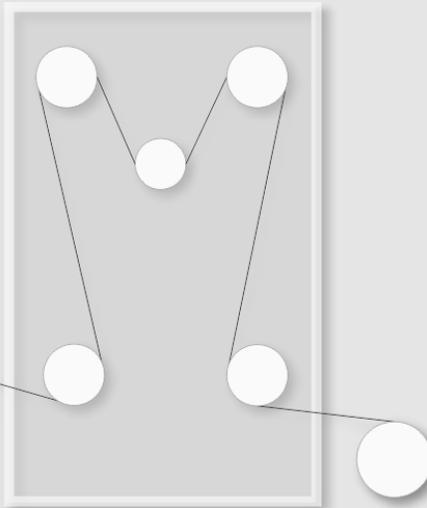


The **QB3H High Flow Electro-Pneumatic Pressure Regulator** is great for this application because of the high pressures and large volumes. The QB3H is used in conjunction with a rotary union to maintain a constant pressure in the tire throughout the duration of the test. This allows manufactures to perfect their product by helping them predict the behavioral characteristics of each tire under any and all plausible circumstances.

Full Vacuum to 500 psig (34.4bar) • Accuracy/Repeatability: 0.5% F.S. / 0.2% F.S. • Max Forward Flow: 50 scfm (24 lit/sec)

FABRIC CORD MANUFACTURING

When manufacturing steel and fabric cord, which strengthen the tire, controlling the tension to festoon cylinders is vital. Especially, once the rolls have paid their material and a new roll needs to be added.



The **QB4 High Flow Electro-Pneumatic Pressure Regulator** is the perfect solution for controlling tension to festoon cylinders because they are closed-loop and can sense and compensate for changes in tension automatically. The analog circuit allows for rapid pressure changes and precise control without over/under shooting.

QB4
Electro-Pneumatic
Pressure Regulator



Full Vacuum to 150 psig (10 bar) • Accuracy/Repeatability: 0.4% F.S. / 0.3% F.S. • Max Forward Flow: 200 scfm (94 lit/sec)



TREAD WEAR SIMULATION

This machine applies a combination of forces and loads to test tires for irregular wear and wear rate. It helps predict various road effects as well as identify potential problems related to suspension alignment and braking inputs.



QB2 with an RM Volume Booster and DSY Pressure Transducer

The QB2 on a Volume Booster (RM or R-Series) with a DSY Pressure Transducer is used in conjunction with a rotary union to maintain a precise pressure in the tire at all times. Some of these tread wear simulation machines have also used Proportion-Air products to precisely control the various forces applied to the tire during each test.

Full Vacuum to 175 psig (12 bar) • Accuracy/Repeatability: 0.2% F.S. / 0.02% F.S. • Max Forward Flow: 550 scfm (260 lit/sec)

BANBURY MIXER

A combination of rubber stock, carbon black and other chemical ingredients are mixed to create a homogeneous rubber material using pneumatic ram force control.



QB3
Electro-Pneumatic
Pressure Regulator
*shown with optional
digital display

The QB3 High Flow Electro-Pneumatic Pressure Regulator is excellent at ram force control on a Banbury Mixer. Generally, air around the Banbury is very dirty. The QB3 operates optimally in standard industrial air filtered to 40 micron. Many competitive products require filtration of less than 5 micron and dry (essentially) instrument air.

Full Vacuum to 150 psig (10 bar) • Accuracy/Repeatability: 0.25% F.S. / 0.2% F.S. • Max Forward Flow: 30 scfm (850 lit/min)

Why Proportion-Air?



**Closed loop electro-pneumatic controls is our only business.
Our competitors are making thousands of products one way.
We make one product thousands of ways.**

HISTORY

Proportion-Air, Inc. manufactures electronic air pressure regulators and air flow control valves. We were founded in 1985 by corporate President Daniel E. Cook to capitalize on the sales and marketing prospects of the unique invention of an electronic air pressure regulator. This air pressure device was designed to accept a variety of electronic analog and digital signals, in order to control pneumatic pressures with extreme accuracy while negating the effects of vibration, mounting position or environmental concerns.

THE PEOPLE

Proportion-Air's biggest asset has always been and will always be its people. Many companies offer similar products, but we understand how difficult it is to get a straight answer when you call them for help. We not only offer superior products, but we have the experienced people to back up those products. Our sole focus is electronic control of pressure and flow and this focus shows in every single product. Call us and find out for yourself.

WIDE VARIETY

Proportion-Air offers a large family of electronic air pressure regulators and air flow control valves that allow you to select the best product to match your exact application requirements. Whether you have specific package dimensions, housing requirements or an uncommon electrical interface, We have a product family to match your application.

WHERE OTHERS FEAR

Proportion-Air goes where others fear to tread; vacuum control, vacuum through positive pressure, absolute pressure, inches of water column, or direct control up to 1000psi. Our variety of outputs can be controlled by an equally diverse range of calibration electrical inputs including analog, digital and serial communications. All of our years of engineering and design experience gives us the confidence to take on the most problematic and exacting applications.

ADVANCED TECHNOLOGY

Proportion-Air handles these difficult requirements with unique advanced control technology resulting in products with superior accuracy, resolution and repeatability. This refinement of performance does not mean they are delicate. All of our products are built tough to handle the most adverse environments. Our advanced "dual loop" technology allows closed loop control using many different downstream sensors in order to control many different processes and applications.

**Proportion-Air has Become the Future of Control
by Setting the Benchmark in Advanced Pneumatic Control Technology**

PROPORTION-AIR





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ONE PRODUCT THOUSANDS OF WAYS

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