

KNC Model 3510 Safety Test Chamber



Product Description

The Model 3510 by King Nutronics Corporation is a bench mounted safety test chamber designed for proof and burst testing small components, such as valves, pressure gauges, and transducers, up to 20,000 psi.

The 21" x 19.5" x 21" (W x H x D) interior dimensions allow ample room to work inside the chamber and a large acrylic window enables convenient observation of the unit under test. Simple controls, numerous passive and active safety features, and heavy 10-gauge welded steel construction make the Model 3510 Safety Test Chamber ideal for production line testing by unskilled personnel.

The Model 3510 Safety Test Chamber is completely self-contained and only requires an external supply of dry nitrogen (or other inert gas) and a 115 VAC power source for operation.

All operating controls and elements, including a regulator for the gas supply, 10:1 booster pump, source pressure gauge, regulated pressure gauge, test pressure gauge, control and vent valves, and a mechanical timer, are housed within the unit. The pneumatic and electrical wiring schematics below depict the various test chamber components.

To set-up for testing, the item undergoing evaluation is connected to the quick-disconnect discharge port inside the test chamber via a flexible braided stainless steel jumper hose. A nitrogen supply is also connected to the inlet fitting on the side of the chamber to facilitate testing. After the chamber door is closed and locked, the gas shutoff valve and regulator are opened, and pressure is metered to the test item using a precision soft seat control valve on the front panel. A 4.5-inch diameter test gauge mounted in the center of the front panel indicates the pressure being applied to the test item.

To increase the test pressure up to the 20,000 psi maximum operating range, the user turns a three way valve on the front panel to cycle the booster pump. Each time the booster cycling valve is opened, the source gas drives a differential area piston in the booster pump, which multiplies the pressure being supplied to the test item by a factor of 10. Check valves on the high pressure end of the booster pump prevent reverse gas flow. The operator continues to cycle the valve for the booster pump until the test gauge indicates the desired pressure.

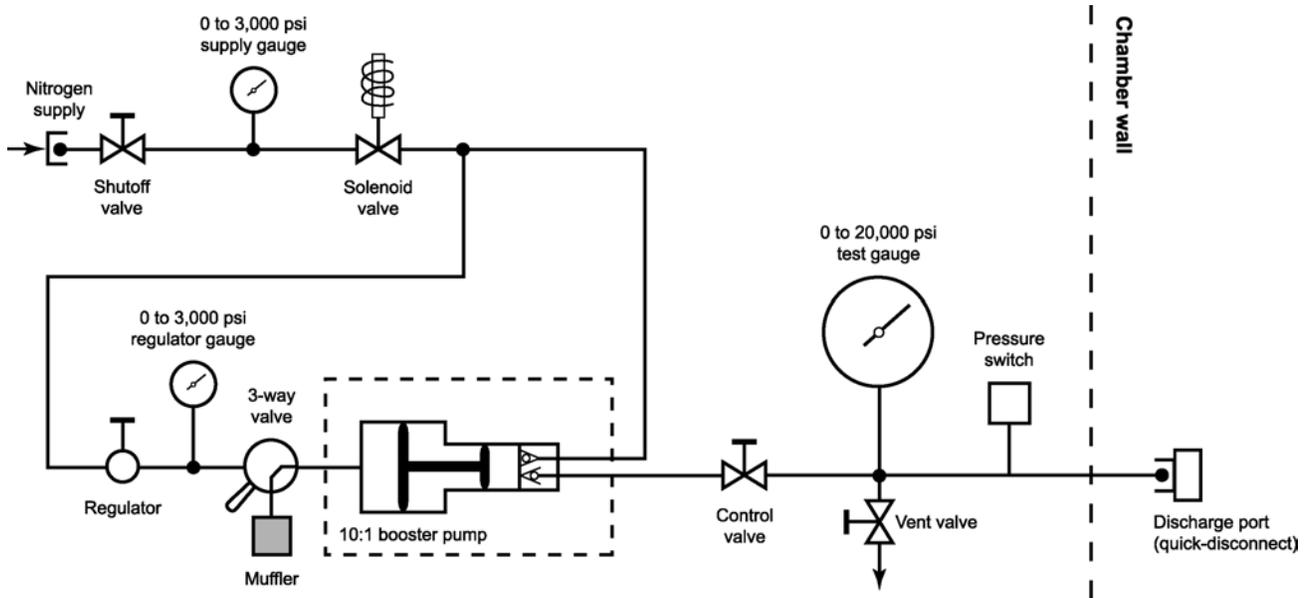
Once the desired proof or test pressure is reached, the built-in mechanical timer is used to count down the test duration; a bell will sound when the specified time has elapsed. To release the test pressure at a controlled rate, the operator simply closes the control valve and opens the vent valve on the front panel.

The Model 3510 chamber incorporates numerous features designed to ensure the safety of the operator. Passive safety features include a chamber door constructed from double-walled 10-gauge steel, and a 6" x 10" viewing window consisting of 2" thick acrylic plastic. The back, sides, floor, and roof of the chamber are also constructed using welded 10-gauge steel, with a 1" thick polyethylene plastic liner. Should a test item burst, labyrinth baffles in the back wall of the chamber, shown in the photo above, allow pressure to vent rearward while preventing the release of dangerous fragments.

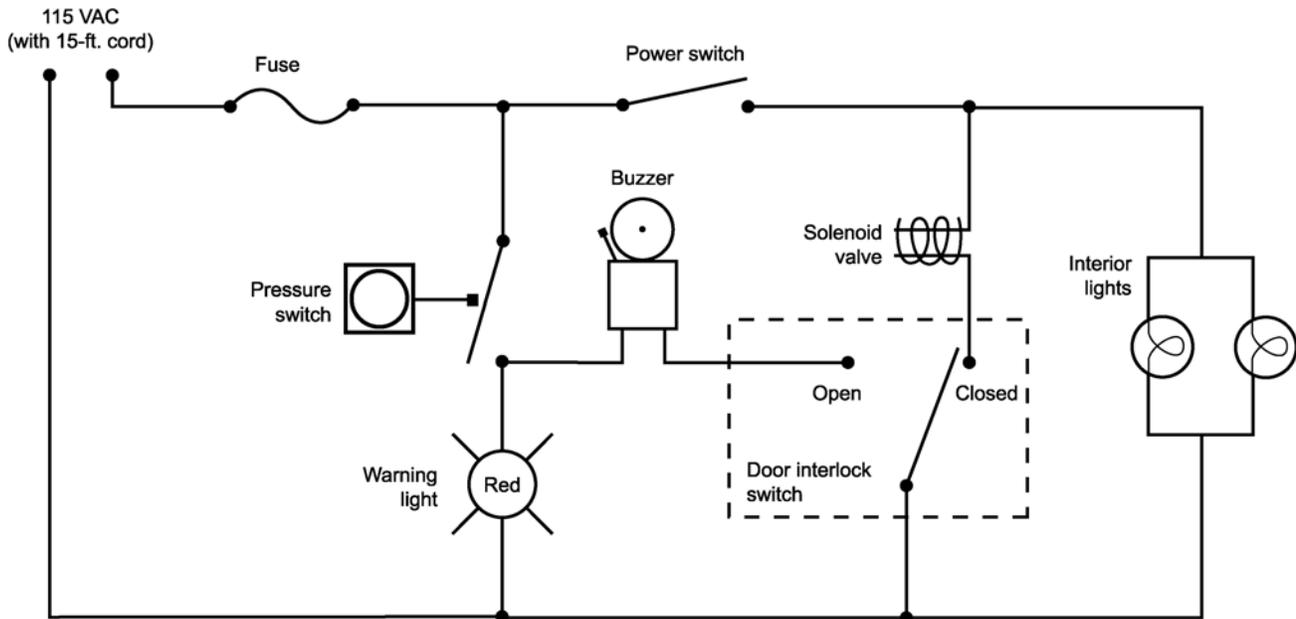


Active safety features include an interlocking device that prevents test pressure from being applied until the door is closed, a red top-mounted warning light that flashes while an item inside the chamber is pressurized, and a warning buzzer that sounds if the door is opened while the system is under pressure.

Pneumatic System Block Diagram



Electrical System Block Diagram



General Specifications

Characteristics	Specifications
Fluid media	Gaseous nitrogen or other inert gas
Exterior dimensions, inches (W x H x D)	24 x 28 x 32, excluding top-mounted safety light
Weight	245 lbs.
Electrical requirements	115 VAC, 60 Hz, 10 Amps
Finish	Beige exterior and white interior

Test Chamber Specifications

Characteristics	Specifications
Interior dimensions, inches (W x H x D)	21 x 19.5 x 21
Interior volume	8,599.5 cubic inches
Chamber construction	10-gauge welded steel with 1" thick polyethylene liner
Door construction	Double-walled 10-gauge steel with safety latch
Door opening dimensions, inches (W x H)	20 x 14.25
Viewing window (W x H)	10" x 6" acrylic plastic, 2" thick
Chamber venting	Rear facing labyrinth baffles
Interior lighting	120 Watts (two 60 Watt incandescent bulbs)

Pressure System Specifications

Characteristics	Specifications
Booster pump	Differential area piston type, manually cycled
Amplification ratio	10:1
Inlet pressure	3,000 psi max
Discharge pressure	20,000 psi max
Lubrication	None required
Control and vent valves	Low torque metering type with replaceable nylon seat
Test gauge: Type Scale range Accuracy	4.5" diameter, mirrored dial, solid front 0 to 20,000 psi 0.5%
Tubing and fittings	Stainless steel tubing throughout. Aminco type superpressure fittings in high pressure circuit.
Supply port	AN 10056-4
Discharge port	High pressure quick-disconnect
Test connection	Flexible braided stainless steel capillary jumper hose, 24" long, with 1/4" AN swivel fitting for test item and male quick disconnect fitting for discharge port inside chamber.

