

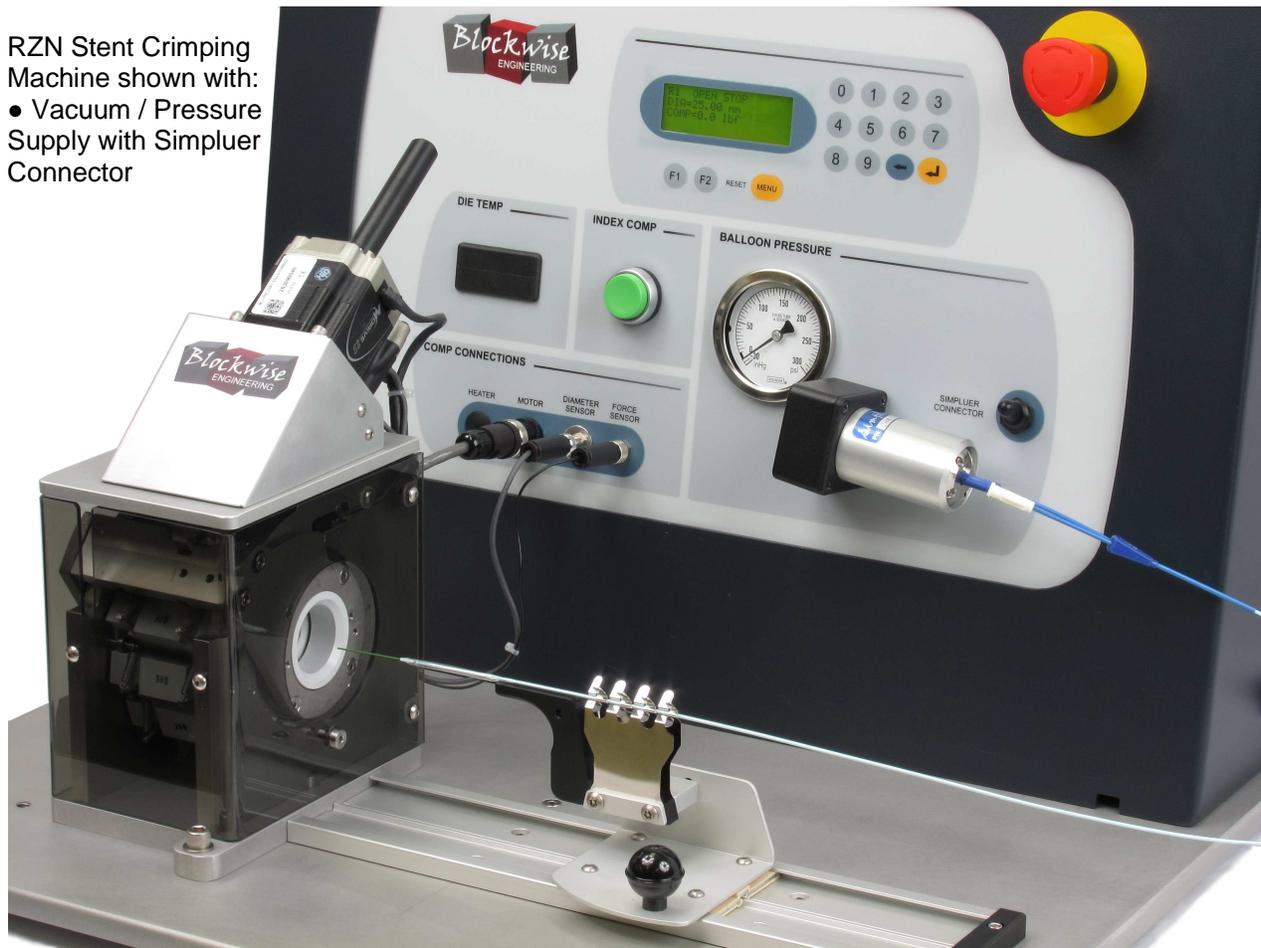
Stent Crimping Machine Model RZN



Blockwise Engineering, LLC
<http://www.blockwise.com>

The Blockwise **Zero-G™ Stent Crimping Machine Model RZN** is a full-featured radial compression machine suitable for use in the stent-attachment step in the assembly of balloon-expandable stent delivery catheters. The machine is also suitable for and widely used in many other radial compression applications in medical device manufacturing. The heart of the machine is a Zero-G™ (patent pending) radial compression station with Ertalyte TX dies that form a cylindrical opening ranging in diameter from 0 to 31 mm. The machine provides process flexibility by allowing a sequence of diameter- or force-controlled steps. The machine is well-suited for volume production because all process parameters are stored in PLC memory, avoiding operator mistakes.

RZN Stent Crimping Machine shown with:
• Vacuum / Pressure Supply with Simpluer Connector



A **stepper motor** provides power to open and close the compression station. An integrated encoder measures the diameter of the opening. A **force transducer** measures the actuating force, which is proportional to the radial compression force.

The machine is controlled by a **PLC**, which implements a closed-loop control of diameter or compression force. The PLC is programmed through the operator interface screen by entering parameters in "recipes" that specify a sequence "steps". Depending on the options installed, the PLC may also control pressurization or evacuation of the balloon, and temperature of the compression dies.

After loading the product, an operation sequence is initiated by pressing the INDEX button or the foot switch. The PLC sequences through a series of “steps” defined in the currently-selected recipe. The progression of the steps can be automatic with programmable delays, or set to wait for a press of the INDEX button or footswitch. After cycling through all of the steps in the sequence, the PLC returns to the open position. **The user defines each step to be either a force setting, diameter setting, or if the machine is so equipped, pressure on or off, or vacuum on or off.** There may be up to 20 steps in each recipe, and up to 50 recipes stored in the PLC. Force and diameter steps also have associated approach speeds. Pressure “on” steps have an associated pressure set-point.

A **product carrier** on a manually-powered linear slide holds the catheter and includes alignment features to allow the operator to control the axial extent of crimping on the product.

Available options include:

Vacuum / Pressure Supply The catheter or product is connected to the high-pressure Simpluer connector and may be evacuated before, during, or after compression according to the recipe settings. The product may be pressurized **up to 20.7 bar (300 psi)** at any point during the sequence, with the pressure level stored in and commanded by the PLC.

Specifications:

Compression Station Opening Diameter Range	0 to 31.0 mm
Die Lengths Available:	62 mm, 124 mm, 225 mm, 300 mm
Die Material	Ertalyte TX (PET with flouropolymer lubricant)
Die-to-Die Gap	Zero at all opening diameters
Compression Station Actuation Power	Electric (stepper motor)
Die Heating	Not Available
Balloon Inflation Pressure Range	0 to 20.7 bar (300 psi)
Maximum Total Radial Force Available	1120 N (250 lbf)
Number of Compression Dies	12
Machine Dimensions	61 cm deep x 61 cm high, 61cm width (24"x24"x24")
Sequence Control	Up to 20 crimp and/or pressure/vacuum control steps, commanded by PLC with LCD operator interface panel and storage for recipes
Service Connections	AC power 110 to 240 V, compressed air 5 to 7 bar, high pressure air or nitrogen for balloon inflation, 21.5 to 27 bar