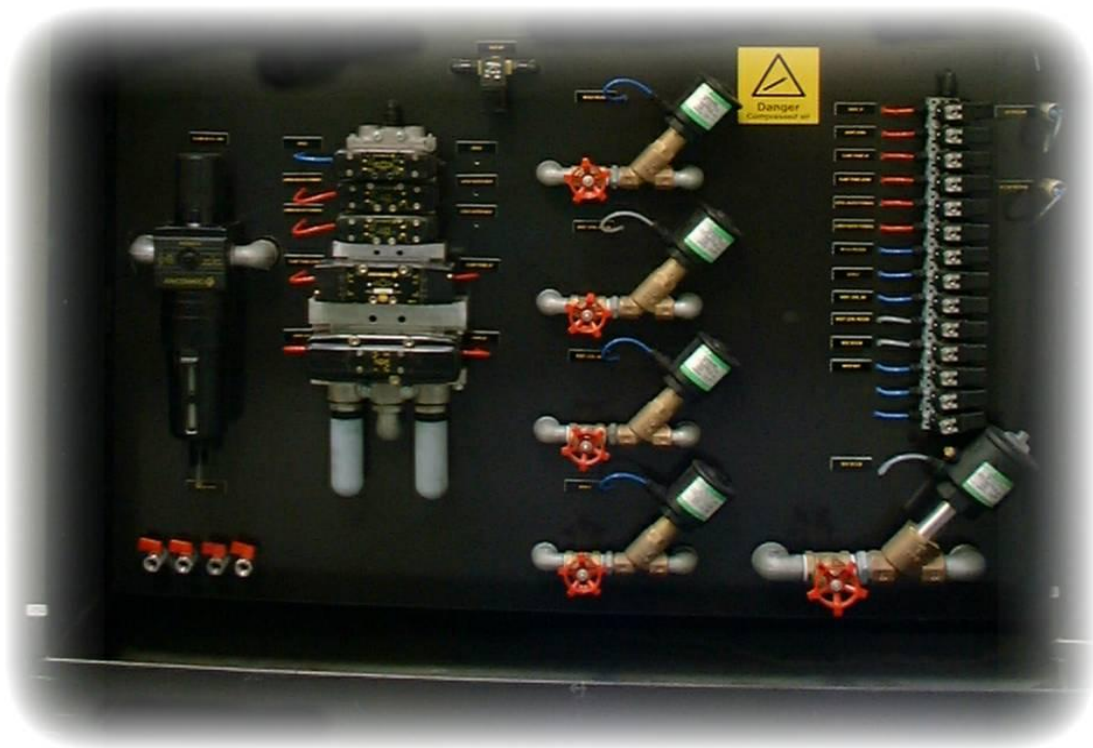


# Pneumatics Data sheet

## Standard pneumatic control

The standard control is mounted to a pair of hinged doors for easy access for maintenance. The system uses a non-lubricated dry air feed. The valve work and cylinders are sized to give you maximum speed with the minimum amount of air consumption. The heaters are controlled with isometric 5 port 2 position pilot/sprung return valves. In a power cut or emergency situation the heater chassis's return to the safe rear position. All the other movements on the machine are controlled via isometric 5 port 3 position pilot/pilot valves. These allow the machine movements to "freeze" if the guard is entered or emergency stop is pressed.

Health and safety requires us to double up on valves and cross pipe for clamp frame, upper and lower tool platens. This is so failures in the isometric pipe work will not cause the assemblies to free fall. Single cylinder assemblies are fitted with a guarded choking valve directly on the cylinder. The solenoid operating valves (S.O.V's) are mounted in a stack the 24vdc coil feeds are CAT 4 protected through the guarding circuit. The supply air feed to this stack is also isolated when the guard is broken, emergency stop is press or the power is switched off. Each of the valves is fitted with service drain taps for expelling the air during maintenance.

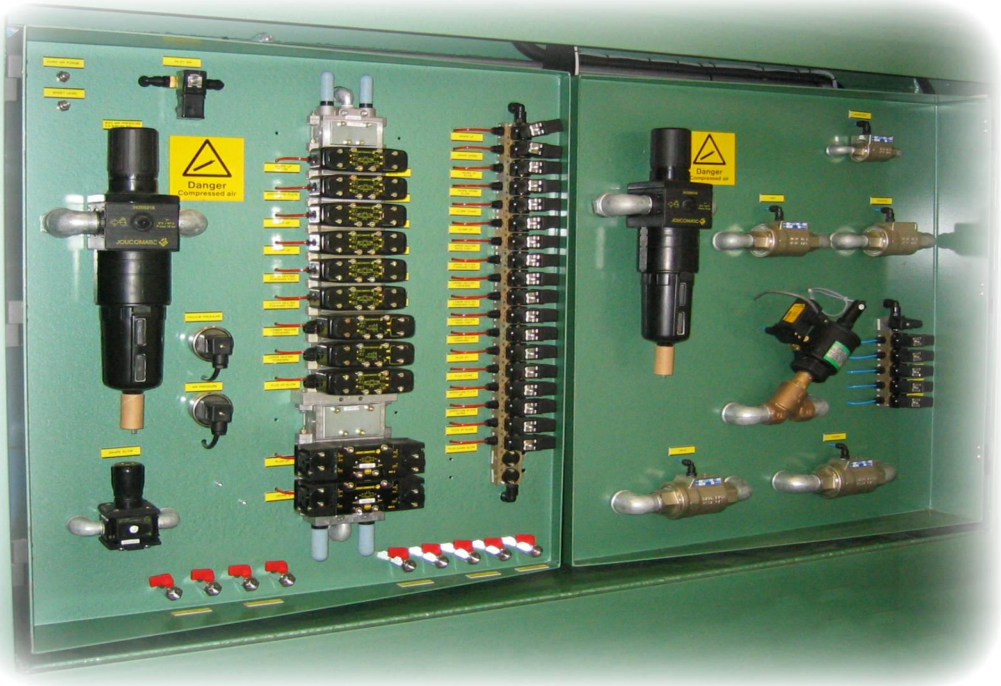


The process controls bubble, mould release, vacuum and sheet level are adjustable via gate valves. The vacuum system is filtered from the table to capture any debris that may get drawn into the system. The incoming air is filtered and regulated to 6 bar. Air silencers are fitted to all exhaust ports to limit the noise levels in operation.

## Servo Pneumatic control

What is servo pneumatic control? This is the ability to adjust the percentage settings of the process valves via the M.M.I (see M.M.I data sheet) and record these along with the delay and on times. It removes the traditionally used gate valves for controlling flow which can be

manually moved and upset the critical times that are set. M.B if you have 3 seconds bubble on one product and the valve is adjusted for another job, the same 3 seconds will not have the same desired effect.



The vacuum and air pressure is monitored and displayed digitally on the screen.

**Regenerative control**

Regenerative control was developed for efficiency. The cost of compressed air is considerable. The regenerative control works on the clamp frame, upper platen and lower platen. It works by using gravity instead of compressed air to move the assemblies. By open a valve that joins the top of the cylinder to the bottom it allows a controlled free fall descent of the assembly. When the assembly reaches the down position the valve is closed and the main valve fired, topping up the cylinder, and filling the pipe work to operating pressure.

Below is an example of air savings on a regenerative system for a clamp frame

Aperture size (Mt)	Cylinders @ 800 St.	Ram out	Ram in	Cycle volume	Savings / cycle
Competitor 1.5x1.2	4 off @ 80 bore	4024 cm <sup>3</sup>	3632 cm <sup>3</sup>	7656 cm <sup>3</sup>	0 cm <sup>3</sup>
I.T.S 1.5x1.2	4 off @ 63 bore	2496 cm <sup>3</sup>	2248 cm <sup>3</sup>	4744 cm <sup>3</sup>	2912 cm <sup>3</sup>
<b>Regenerative 1.5x1.2</b>	<b>4 off @ 63 bore</b>	<b>248 cm<sup>3</sup></b>	<b>2248 cm<sup>3</sup></b>	<b>2496 cm<sup>3</sup></b>	<b>5160 cm<sup>3</sup></b>

The regenerative system is selectable for the lower platen over its slow speed. This is encase you have a particularly tight tool to de-mould and require more than the table and tool weight to extract the tool.