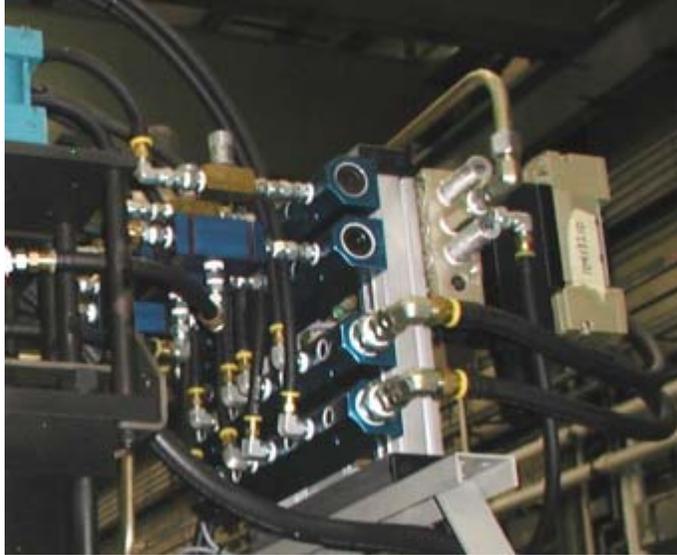


For all Uniloy and Liberty Reciprocating Screw Blow Molding Machines

Don't let your air system inflate your cycle times!



The Uniloy High Flow Air System Boosts Your Machine's Performance

The Uniloy High Flow Air System is a must for anyone interested in increasing production by reducing machine cycle times. This system provides optimized flow for both blow and exhaust through the use of our own quick flow manifolds, ½" ported shuttle valves, and flow enhanced blow pin adaptors.



Replace Old Obsolete Systems!

The Uniloy High Flow Air System replaces your existing air manifold system and provides you with:

- Faster inflation time
- Faster exhaust time
- The ability to either:
 - Reduce your cycle time, which increases your machine productivity,
 - Increase your blow set time, which translates to higher blow molded part quality,
 - Or achieve some combination of both of these benefits.

Ross components are standard with this system and it is available in either 110V AC or 24V DC in order to match your machine requirements.

Air System Design Factors

Two key factors in designing an air system for a blow molder are:

1.) Flow Capacity

The flow capacity must be optimized to deliver the required volume of air in the shortest possible time.

2.) Pressure Drop

The pressure drop of the air system is the pressure difference between the air supply and the blow pin tips, and must be as low as possible.

For example, if the machine is being supplied with 100 PSI, the high pressure regulator is set at 90 PSI, and the air system has a pressure drop of 30 PSI, when the blow cycle begins the bottles will be inflated to 60 PSI quickly, then the blow molded product, as well as the whole air system begins to pressurize the remaining 30 PSI. This last 30 PSI takes longer than the first 60 PSI because of the increased volume being pressurized. As the pressure drop is decreased, the inflation time is reduced because the amount of quickly provided pressure will increase.

The Uniloy High Flow Air System provides a two-pressure blow arrangement, with greater flow capacity and lower pressure drop than your existing air system. In fact, our tests show that our existing system exhibits pressure drops of roughly 25 - 30 PSI while the new system sustains approximately 10 - 15 PSI (depending upon blow stem diameter). This is due to our engineered design which features: two regulators, one for blow and one for pre-blow. Each regulator is plumbed to a 1-1/4" poppet valve. These valves in turn feed two separate aluminum manifold blocks, which are tied together through flow controls and shuttle valves. The shuttle valves select between pre-blow and high-pressure blow.

We recommend the following minimum air flow and pressure be delivered to your blow molding machine. Please consider 150 PSI to be the maximum allowable pressure:

Extruder HP	SCFM	PSI
30	20	100
50	25	100
75	40	100
100	60	100
125	80	100
150	100	100

Note: If when your machine goes into its blow cycle, there is any pressure drop on the high pressure regulator gauge (which should be set at 90 PSI), then the air line supplying the machine has too much pressure drop and each blow cycle is adversely affected. A surge tank can be added to the machine to supply each machine cycle with the correct volume of air at 100 PSI. This tank should be sized based on air usage and machine cycle time.



Pneumatic Surge Tank

Machine Cycle Time

The machine cycle time consists of several individual events which take place sequentially in order to process plastic resin into a production quality blow molded product. Each event has its own variables and limitations, which must be optimized to achieve the quickest machine cycle time possible. For the purpose of this discussion, we are assuming that Drop Time, Clamp Close, Clamp Open, and Stripper / Swinging Arm movements are fixed. We are also assuming that the machine has enough capacity in terms of plastic throughput, hydraulic system, mold cooling, and downstream equipment in order to run the reduced cycle time which the Uniloy High Flow Air System can make available.

The following cycle time events are affected by the Uniloy High Flow Air System:

Blow Time: The total blow time can be broken into two parts, inflation time, and set time. During the inflation period, the parison is stretched out against the inside of the mold. The set time is that portion of the total blow time when the parison is held against the inside mold surface to cool and take permanent shape. The inflation time is dependant on the volume of the container, the flow capacity, and the pressure drop of the air system (including the blow stems, air adapters, air manifolds, and hoses/fittings). The set time is critical to producing a quality blow molded product; therefore it should be as long as possible. In order to maximize set time without increasing the overall machine cycle time, the inflation time must be minimized.

Exhaust Time: The exhaust time is when the air is allowed to escape from the blown production part before the molds can be opened. This time is simply dependant on the flow capacity of the air system (including the blow stems, air adaptors, exhaust valves, and hoses/ fittings). Any time that can be saved during exhaust comes directly off of the total machine cycle time.

The following table is the result of testing which we have performed on a 350R2, 6 head machine making dairy gallon containers with 1/2" blow pin stems.

Machine Cycle Event	"Old" System	High Flow Air System	% Cycle Reduction
Drop Time	2.0	2.0	0%
Clamp Close/Pre-Blow	0.5	0.5	0%
Blow Time-Inflation	1.5	1.0	33%
Blow Time-Set	1.5	1.5	0%
Exhaust Time	1.5	1.0	33%
Clamp Open	0.5	0.5	0%
Stripper/Swing Arm	0.5	0.5	0%
Total Machine Cycle	8.0	7.0	13%

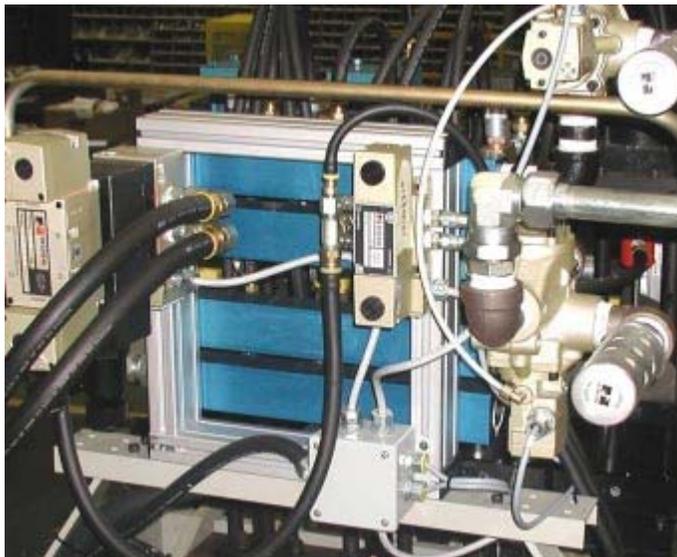
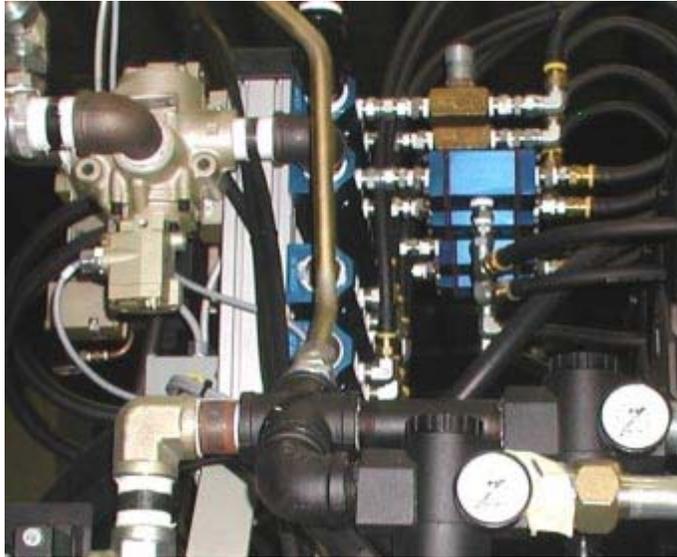
As you can see, the Uniloy High Flow Air System outperformed our existing air system by 33% in terms of inflation and exhaust times. This translated to an overall cycle time reduction of 13%. As was mentioned previously, this cycle time savings can either be taken in full or put into the set time in order to improve the quality of the blow molded product.

We ran the same test using 5/8" blow pin stems and we demonstrated a 50% reduction in terms of inflation and exhaust times. This translated to an overall cycle time reduction of almost 17% in that case.

Retrofit Package Description

The Uniloy High Flow Air System Includes:

- 1-1/4" Poppet Valves (2)
- Directional Valve (For Air Pre-Finish)
- Blow Air Manifolds (2)
- Air Pre-Finish Manifolds (2)
- 1/2" Needle Valves (1/head)
- ISO Valve (Stack For Stripper)
- 1/2" Shuttle Valves (1/head)
- Miscellaneous Piping, Tubing, And Hoses
- Brackets
- Complete Engineering With Documentation
- Partially Assembled At Uniloy



Air Preparation Assembly

This assembly is considered optional in that it simply replaces the assembly which is already standard for a recip machine. If your existing air prep assembly is in acceptable condition and is capable of trapping 100% of particles .08 Micron or larger, then this assembly is not required.

This assembly includes:

- Dual Pall Filter Assembly
- Lock Out Valve
- Replacement Filter Elements (2)
- Lubricator
- Regulators (2)
- Drain Line Valve
- Air Gauges (2)



Installation and Delivery

Trained Uniloy Service Technicians are available to install these packages at your facility. We estimate that it will take 12 hours of machine downtime in order to install this retrofit. These parts are typically in stock for immediate shipment. If we are temporarily out of stock, please allow 2 - 4 weeks for delivery. For more information on this upgrade, please contact your local Uniloy Parts Sales Representative.