

## AC Variable Frequency Drive Retrofit Package For IBS Machines Featuring Two Speed Settings

Packages are available for IBS Models: 75, 88, 122, and 189



*AC Variable Frequency Drive Package Installed on an IBS-122 Machine*

### Save up to 30% on your electricity bill while helping the environment!

This enhancement package changes the standard constant speed (1750 rpm) motor on your machine to a two speed motor. The two speeds can be set and adjusted by your machine operator based upon your specific application in order to maximize the effectiveness of this package.

The Benefits of This Package Include:

- Significant electrical cost savings
- Noticeable machine sound level reduction
- Hydraulic system heat reduction
- Hydraulic shock reduction
- Protects the motor from maximum amperage draw

### How the Two Speed Drive Works:

The "**LOW SPEED**" setting (typically 52% to 55% of full speed) is used for the majority of the cycle and is active when the machine is moving the:

- Head Index
- Stripper
- Tipper
- Extruder Forward (Injection)
- Extruder Back (Pullback only)
- Clamps

(Note: For IBS models 75 and 88, the Head Index and Clamp movements occur under the High Speed Setting.)

To determine the optimum Low Speed setting:

- Dry cycle the machine and note the cycle time.
- Start decreasing the Low Speed setting from 100% until the cycle time increases.
- Start opening the flow controls for the Clamps and Index and lower the VFD in 2% increments.
- When any flow control is turned fully open, then you have arrived at the optimum Low Speed setting.

Typical times are:

- Clamp Open .9 seconds
- Index (for a 122/189) 1.0 seconds
- Index (for a 75/88) .7 seconds
- Clamp Close 1.1 seconds

Note:

1.) Closing the clamps too fast will result in the Clamp Tonnage coming up too slow due to the decreased output of Pump #4.

2.) **Low Speed should not be set below 50% because the motor has an integral fan to keep it cooled.**

The "**HIGH SPEED**" setting (typically 85% of full speed) is used only during the Screw Recovery time of the machine cycle. It directly controls the screw speed (screw rpm). Keeping this as low as possible while not increasing cycle time will maximize the benefits of this package. Any higher percentage is not adding any value to the product being made. To manually adjust, start with a low number and increase it until the machine is running at the desired cycle time.

### **Retrofit Package Includes:**

- Yaskawa AC/VF Drive
- NEMA Type 12 Electrical Enclosure
- Interlock
- Fan & Filter Kit
- Terminal Strip
- Mounting Bracket
- Safety & Sequence Control Relays
- Conduit, Wire, Connectors, and Fittings
- Complete Engineering With Documentation



## **Financial Justification**

As the example below shows, we have developed a cost savings calculator which will provide you with a close approximation of the savings you can expect based upon your actual application. In order to receive this customized report for any or all of your applications, please provide the following information to your Uniloy Parts Sales Representative:

- Machine Serial Number
- Application Description
- Machine Model
- Total Cycle Time
- Screw Recovery Time Only (if your machine is a 122 or 189)
- Screw Recovery Time + Head Index Time + Clamp Movement Time Only (if your machine is a 75 or 88)
- Your Electricity Cost (in \$/kw)
- Your Hours of Operation Per Year

**\*\*See below for an example VFD Justification\*\***

## **Get Paid For Saving Energy!**

You may be able to receive more than 50% off the installed cost of this package through rebates, credits, and incentives that are available in your area through various state energy incentive plans. Check out [www.dsireusa.org](http://www.dsireusa.org) for more information on your specific state, or contact your Uniloy Aftermarket Parts Representative for more information and assistance.

## **Delivery and Installation**

Typical lead times for these packages range from 6 to 8 weeks. Uniloy Milacron Service Technicians are available to install these packages. We estimate that package installation will require 1 – 2 days of machine downtime.



Uniloy Milacron  
 IBS Machine VFD Cost Savings Calculator For 460V Applications  
 As of October 12, 2011

Input data into the yellow "base information needed" section only, the rest of the sheet auto calculates.

The green cells are typical settings, they can be changed, if necessary, to match actual experience

Note: The savings represented are a close approximation based on the assumption that your application uses average amps equal to 60% of full load amps.

Base Information Needed		Charted Information		
Customer	You	VFD % of Full Speed Settings		
Machine Serial Number	Your Machine	During Screw Recovery	85%	
Application Description	Your Application	During the Rest of Cycle	52%	
Machine Model	IBS - 189	Motor Full Load Amps		
Full Load Amps - From Charted Information	145	Machine Model	Main Motor Size	Full Load Amps
VFD Efficiency - From Charted Information	93.0%	IBS - 75/88	75 HP	87
Full Load Motor KW	104	IBS - 122	100 HP	116
		IBS - 189	125 HP	145
Total Application Cycle Time (seconds)	15.65	VFD Efficiency		
*Screw Recovery Time Only (seconds)	2.36	Machine Model	Main Motor Size	VFD Efficiency
Note: For IBS Models 75 and 88, include Head Index and Clamp movement times with Screw Recovery time.		IBS - 75/88	75 HP	92.1%
Cost of Electricity (\$/KW)	\$0.08	IBS - 122	100 HP	92.6%
Hours of Operation per Year	6,000	IBS - 189	125 HP	93.0%
Calculations				
Average Motor Speed		Motor Full Load KW		
Without VFD (rpm)	1,488	Machine Model	Main Motor Size	KW
With VFD (rpm)	997	IBS - 75/88	75 HP	62
Average Motor Speed Reduction	33%	IBS - 122	100 HP	83
		IBS - 189	125 HP	104
Average Amps				
Without VFD (amps)	87			
With VFD (amps)	63			
Average Amp Reduction	28%			
Average KW				
Without VFD (kw)	62			
With VFD (kw)	45			
Average KW Reduction	28%			
Annual Savings				
Annual Electrical Cost Without VFD	\$29,942			
Annual Electrical Cost With VFD	\$21,581			
<b>Annual Electrical Savings</b>	<b>\$8,361</b>			
<b>Annual Electrical Savings Percentage</b>	<b>28%</b>			