WINTRISS®

Wintriss Controls Group

# WAVEFORMPAC™

Displays, monitors and stores tonnage waveform profiles for each tool.


WINTRISS®

## HELPS YOU DIAGNOSE PROBLEMS, PREVENT OVERLOADS

***WaveFormPAC™ monitors the tonnage waveform generated during each press stroke and stops the press if variations exceed preset limits.***

- Verify setups
- Check tool timing
- Monitor snap-through load
- Diagnose tooling problems
- Separately monitor clamping and forming forces
- Check tonnage and distance off bottom
- Verify part quality
- Analyze draw speed

***The WaveFormPAC tonnage monitor adds another valuable tool to the growing family of Wintriss SmartPAC modules.***

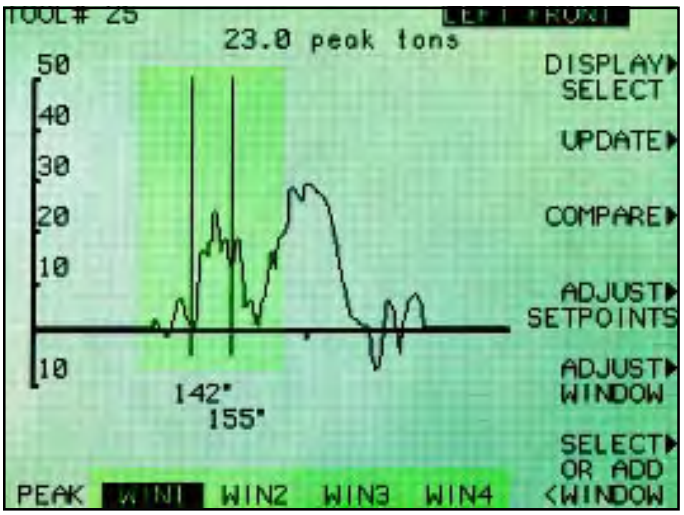
### WaveForm Displays

WaveFormPAC displays the tonnage waveform 'signature' for up to four inputs and total load. This graph of tonnage versus crankshaft angle gives die-makers a valuable tool for diagnosing problems and optimizing performance.

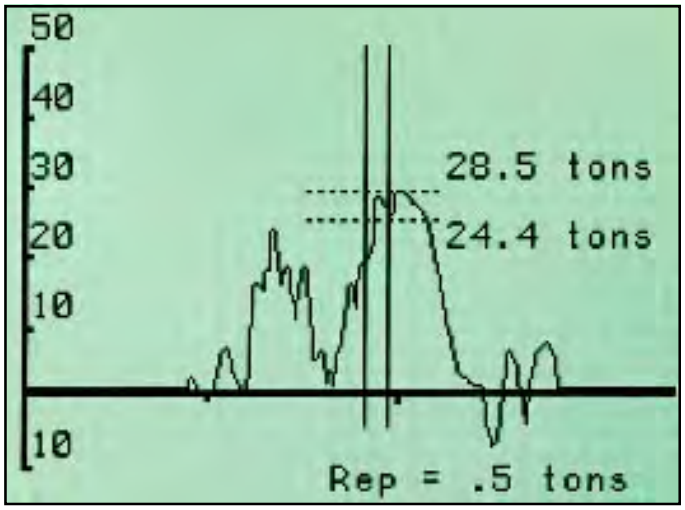
### Setpoint Windows

Traditional load monitors compare the peak load to preset tonnage limits. These 'peak' monitors can only detect problems that affect the peak tonnage. For many dies, simply monitoring the peak tonnage is not enough. Blanking dies with punches staggered to reduce snap-through, draw dies, and stretch-forming dies include critical forces off bottom that may not exceed the peak tonnage.

WaveFormPAC allows you to view the waveform and then set up to four timing 'windows' with their own setpoint limits to monitor specific forces which, by themselves, do not exceed the peak. Windows are easily set by using the cursor keys to drag indicator lines along the waveform to 'bracket' precise segments you want to track. Whether or not windows are used, WaveFormPAC continually monitors the peak tonnage generated during the press stroke.




***WaveFormPAC** allows you to set up to four (4) timing windows with their setpoint limits.*




***WaveFormPAC** applies three different setpoint limits: High, Low and Repeatability.*

### Setpoint Limits

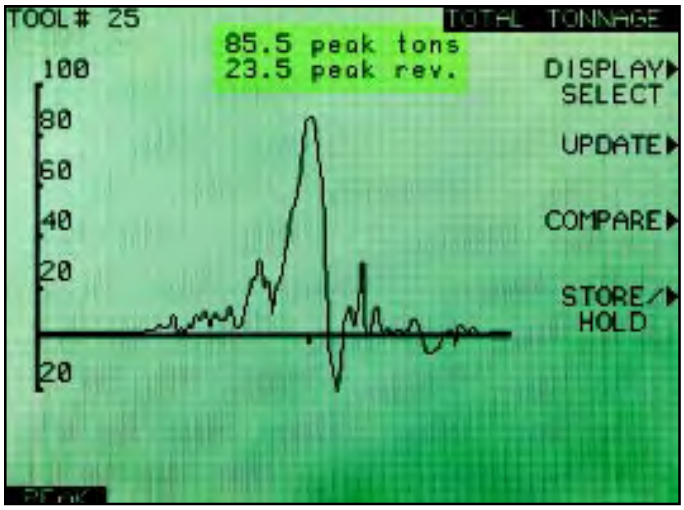
WaveFormPAC samples the tonnage and automatically creates setpoint limits for each of the windows and peak loads. WaveFormPAC stops the press when a variation in the process causes the tonnage to exceed these limits. WaveFormPAC applies three different setpoint types: high, low and repeatability. High and low limits are used to ensure that the peak tonnage and forces in each monitoring window stay within a range that is acceptable for good parts.

The repeatability limit is an additional setpiont that establishes the maximum allowable variation in tonnage from one stroke to the next. Repeatability enables you to detect the very small, abrupt changes in the process that signal problems, at the same time avoiding 'nuisance' stops that can be generated when the high and low limits are set too tight to allow normal variations.

### Reverse Load Monitoring

WaveFormPAC simultaneously monitors both forward and reverse loads. Excessive reverse load, also called snap-through or stripping force, can cause major damage to the press. WaveFormPAC allows you to set a reverse load limit based on

## HELPS YOU ANALYZE AND OPTIMIZE PERFORMANCE




***WaveFormPAC** monitors both forward and reverse, or 'snap-through' force.*

machine capacity. When dies with excessive reverse load are reworked by staggering or adding shear to punches, or by adjusting die clearances, die-makers can use the waveform to ensure that the tooling modifications produce desired results.

### WaveForm Storage

WaveFormPAC stores 'benchmark' (theoretically, known 'good') waveforms for each corner of the press and the total load for up to 200 dies. Each time a die is reloaded, new waveforms can be compared to the stored benchmark waveforms to verify that the setup is accurate.

WaveFormPAC can also hold an additional waveform for the currently running tool. This feature allows you to compare a waveform from a stroke that exceeds the setpoint limits to both known good waveform and subsequent waveforms to ensure that tooling or material problems have been corrected.

### Waveform Comparison

WaveFormPAC allows you to overlay and compare waveforms for detailed analysis. A cursor is moved across the comparison screen in precise increments, while a table on the screen shows the tonnage under the cursor for each waveform, the difference in tonnage between the waveform off bottom to help identify specific events in the die.

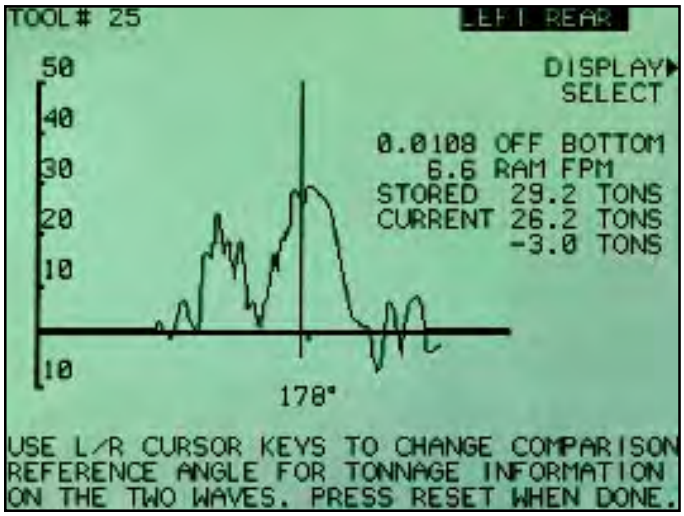
### Distance Off-Bottom and Ram Velocity

WaveFormPAC also displays the ram distance off bottom and the ram velocity in feet-per-minute for every 2/3° of crankshaft rotation for eccentric motion presses. By comparing the ram distance off bottom to the tonnage, you can quickly identify areas where the tonnage exceeds the press's off-bottom capacity. The ram velocity display helps you make sure the die is running within the material's drawing speed limit.

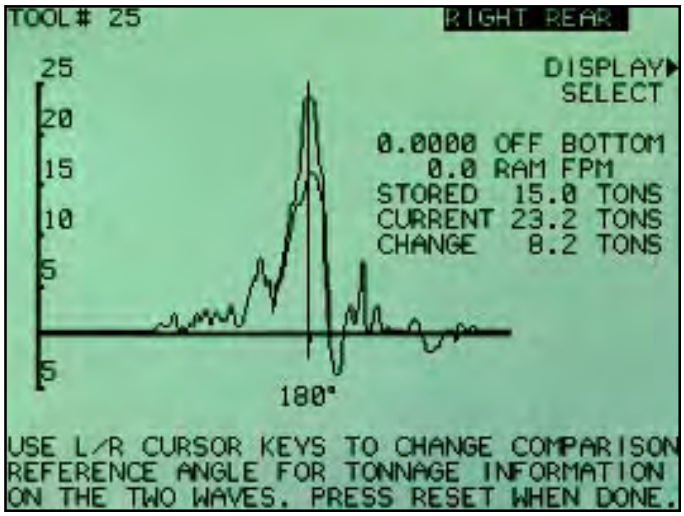

***WaveFormPAC** displays the ram distance off-bottom & the ram velocity*

*Benchmark waveforms are stored for up to 200 dies*


*Waveform comparison can uncover even very subtle precess variations that might otherwise go undetected.*




*New waveforms can be overlayed on stored benchmark waveforms for detailed comparison.*



# SPECIFICATIONS

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|---|---|
| **EQUIPMENT** | **System Enclosure**: 10.25 x 12 x 4 in. (26 x 30.5 x 10.2 cm), NEMA 12, shock-mounted. |
| **POWER** | **Input**: 120/240 VAC, 50/60Hz, 15W (switch selectable) |
| **INPUTS** | **2 or 4 sensors**: 0 to ±0.1V min - 2.5V max differential signal, resolver, communications. |
| **OUTPUTS** | **1 stop relay**: Rating 5A @ 120/240 VAC (N/O, held closed) |
| | **Sensor excitation**: 5 Vdc |
| | **Chart recorder**: ±5 V Full Scale with respect to ground |
| **SPEED** | Up to 300 strokes per minute |
| **DISPLAY** | **SmartPAC Screen:** 4.88 X 3.69 in. (10.91 X 9.37 cm) 20 lines X 40 characters backlit LCD |
| **STRAIN LINKS** | 3.75 x 1.19 x 0.75 in. (9.5 x 3.0 x 1.9 cm) |
| | **Cable length**: 30 ft. (9.1 m) standard or 100 ft. (30.5 m) optional Hirschmann in-line connector available |
| | **Excitation**: 4 to 6 Vdc |
| | **Full scale signal**: ±240 mV/V differential |
| | **Full scale capacity**: ±250 microstrain |
| **SETPOINTS** | **Types**: High, low, repeatability, reverse, 120% of press capacity. |
| | **Maximum**: 64 individual setpoints for every stroke. Calculated automatically with user defined percentages of load. All setpoints stored with tool number in SmartPAC. |
| **SETPOINT MONITORING WINDOWS** | **Maximum 5**: Up to 4 user defined, one automatically set on peak load. User defined, Min. = 4°, Max. = 158° for forward load. |
| **WAVEFORM STORAGE** | Store one set of waveforms permanently with each tool.<br>Hold one set of waveforms temporarily during each job. |
| **ON-SCREEN WAVEFORM COMPARISON*** | Current to Stored<br>Current to Held<br>Held to Stored |

* Comparison shows crank angle, tonnage of each waveform, tonnage differential and for eccentric motion presses, distance off bottom and ram speed.

## BUILT TO LAST

A WaveFormPAC monitoring system is built for rugged dependability. But if it ever needs service, you'll be pleased to know that we back it with excellent spare parts inventories, training programs, and prompt repair service. Field service by trained technicians is also available. Call us for more information about our AutoSet family of products and how they can improve your operation.

## ABOUT OUR COMPANY

Wintriss Controls supplies automation and safety controls to the metal stamping and forming industries, including: SmartPAC programmable press automation system; die protection controls; load analyzers for machine and tool protection; optical proximity and displacement sensors to detect various process conditions; and Shadow® Safety Light Curtains.

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