

Punch Press Automation

PressCam 8

Design Features

- “Control Reliable” design, utilizing two 16-bit computers, provides ultimate pressroom safety in automation.
- Operator “full view” of system status means no getting lost during programming.
- PressCam 8’s two 16-bit computers are configured to cross check each other and the resolver.
- All safety function faults utilize three monitored captive contact safety relays for the outputs related to motion detection, brake monitoring, and system self-checking (Form B safety).
- Non-volatile job memory of 100 stored programs recalled by job die number for all system functions.
- Eleven programmable limit switch outputs with multiple ON/OFFs per press cycle.
- Outputs can be solid state (AC or DC) or mechanical relays.
- Supervisory controlled RUN/PROG keyswitch with password protection.
- Built-in time-based brake monitor can issue warnings or a stop command when actual stopping time exceeds programmed set points.
- Built-in motion detection fault output should the press not start moving within the timed set point after the brake signal is given.
- Built-in drift detection fault output if the press moves when it should not.
- Built-in 90° and 270° stop time tester.
- PressCam 8’s cloning feature allows multiple PressCam 8 units to link via RS-232 for job copying.
- Contrast adjustment of the LCD computer screen.
- Automatic offset programming.
- Built-in press tachometer (SPM).
- Optically isolated AC and/or DC inputs (sourcing or sinking).
- Parts counter which can be programmed from 1 - 4 parts per press cycle for multiple out dies.
- Large 8” (203mm) diagonal computer screen (LCD).
- Unique digital programming knob acts like a PC mouse and eliminates keypad programming.
- The “control reliable” PressCam 8 can be used to supply the timing signals for the clutch/brake press control.
- Complete system diagnostics with plain English fault messages on the operator screen enhances productivity.
- PressCam 8 programs can be field upgraded or customized using a PC computer with a standard serial port.
- Four programmable timed limit switch outputs that can be position based or timed from 0 to 9999 milliseconds.
- Four Counters: Strokes, Parts, Batch, and Quality.
- Built-in power supply for input sensors (+12VDC).
- Built-in servo feed interface.
- Crank shaft angle displayed in degrees with a graphic shaft angle clock.
- Utilizes surface mount technology.
- Job memory chips are socketed for easy transfer to other units if desired.
- Programmable minimum and maximum speed limits with captive contact safety relay output (Form B safety).
- Programmable variable speed compensation.
- Punch press clutch/brake timing signals protected from tampering.
- Optional peak tonnage monitoring up to 4 channels.
- Compact in size.





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Overview

PressCam 8 is a “control reliable” resolver-based programmable cam switch, time-based brake monitor, die protection system with multiple counters and much more in one package. The system contains two 16-bit computers that are configured to cross check each other and the resolver. The dual computers are interfaced with a full view 8" (203mm) diagonal LCD computer screen for viewing and programming ease. This large operator screen (shown on the next page) supplies operators and front line supervisors production data without the need of cumbersome menu and program access codes.

All system faults generate descriptive plain English error messages on the computer screen. This provides floor personnel fast and reliable information related to the machine stoppage. The system is also provided with special watchdogs that turn off fault outputs should either computer become erratic. The software and system customization in both computers can be upgraded in the field using a PC computer with a standard serial port.

Programming PressCam 8 is so easy that you do not need a keypad, keyboard, or cumbersome programming techniques.

Operator Screen

A large 8" (203mm) diagonal LCD computer screen is standard equipment on the PressCam 8. This single component brings the intelligence of the dual computer system to the punch press control panel providing positive system status interaction with the machine operator.

The screen brightness (contrast) is also adjustable so it can be easily read even when installed in dark areas.

Digital Programming Knob

This innovative device replaces keypads or keyboards for programming the PressCam 8. The programming knob works similar to a computer mouse. Simply turn the knob to the highlighted field or program you desire then push. Your program is accessed with no keystrokes. By turning the knob, the appropriate numbers or letters appear on the highlighted screen to program the specific function you desire. Push again, your programming is completed! Additionally, no information can be programmed if it is not applicable to the specific function or operation.



Industrial Grade Brushless Resolver Transducer

The heavy duty brushless resolver transducer replaces the current mechanical rotary cam switch. This unit was designed for hostile industrial environments such as punch press mechanical shock and vibration, extreme temperature and humidity, oil, coolant and lubrication mists. The resolver transducer features excellent repeatability and gives absolute shaft position feedback. High speed operation along with long transducer cable (runs up to 600 feet/183m) give the resolver wide application ranges. The resolver is a passive device which contains no sensitive electronics and has superb noise immunity.

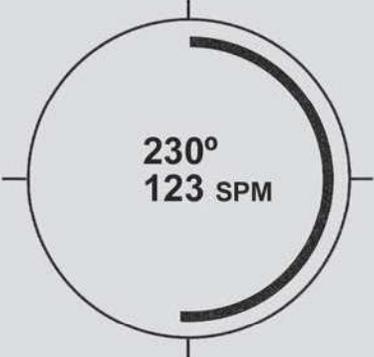
The resolver mounts easily to an end of a crankshaft and can rotate clockwise or counter-clockwise. Simple connector ended transducer cabling is supplied to connect the resolver to the PressCam 8 controller console. The PressCam's microprocessor-based control constantly monitors the resolver position and displays both the angular position of the shaft and speed of the machine (tachometer). 3/4" (19 mm) resolver shaft diameter.

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Programming Screen

JOB # 65		DIE No. 536		LS/OUTPUTS			DIE SENSORS			
Stroke Count	19	Batch Count	0	Quality Count	300	Part 4 Count	612	1	*	staticNO
Batch Size	190	Reset All Faults		Adjust Contrast		Running Time		2		staticNO
Die Sensor Setup		Limit Switch Setup		Servo Setup		Tonnage Setup		3		momen.
Press Utility		Speed Comp.	20°	Minimum Speed	4 SPM	Maximum Speed	129 SPM	4		FAULT
								5		
								6		
								7		
								8		
								9		
								10		
								11		
								12		
								13	*	COUNTER
								14	*	DIE FLT
								15	*	SPEED
								16	*	GF1
									*	GF2



230°
123 SPM

BRAKE MONITOR SETPOINTS				
WARN	FAIL	ACTUAL	MOTION	90° Stop Test
50msec	100msec	0msec	0.5sec	

Screen Actual Size

Shown above is the actual screen size and information available to the press operator on the PressCam 8 Programming Screen. No longer is it necessary to scroll through various menus and programming techniques to view data. The Programming Screen also provides an active “tool bar” for your press set-up personnel to quickly access the specific function they so desire. As one can see, a tremendous amount of production data can be obtained by simply viewing this single operator screen.

System simplicity is a dominant feature of the PressCam 8. By viewing the above screen, information can be obtained for four different counters, reset all faults, adjustment for screen contrast, die protection information, programmable limit switch information, shaft angle displayed in degrees, stroke per minute (SPM), and brake monitoring information.

Additionally, system fault messages are displayed in the area above the brake monitor setpoint section when they occur.

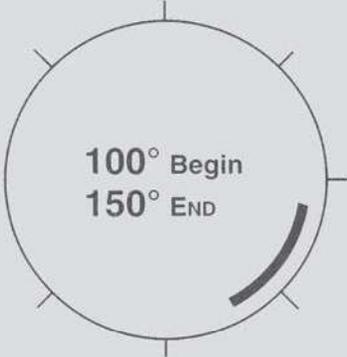
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Die Protection

Sensor			Event Window		Sensor			Event Window	
Name	Type	on	Begin	End	Name	Type	on	Begin	End
Sen 1	N.C.	*			Sen 9				
Sen 2	N.O.				Sen 10	Moment	*	20°	301°
Sen 3	Moment		100°	150°	Sen 11				
Sen 4	Maintain N.O.				Sen 12				
Sen 5	Maintain N.C.				Sen 13				
Sen 6					Sen 14				
Sen 7					Sen 15				
Sen 8					Sen 16				

EXIT (return back to main screen)



Crank Angle
300°

50° Dwell

DIE SENSOR SETUP

PRESSCAM 8



Screen Actual Size

The Die Protection Screen shown above is what your programmer will see when entering the die protection program. PressCam 8 provides sixteen different die protection sensor inputs that may be programmed for both cyclic and/or static function monitoring.

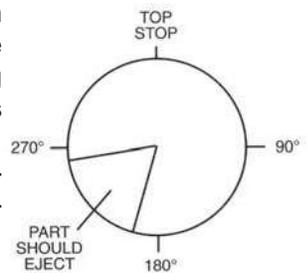
Cyclic function monitoring requires that an input sensor signal occur within a certain programmed shaft angle on each press cycle (e.g., part eject, part transfer).

Static monitoring is used for non-cyclic events such as end of material or stock buckle monitoring.

A fault output will occur if an input transition is not detected between the programmed limit set points (e.g., a part is to be ejected out of the die between 190° and 250° of the machine cycle). If the part is not detected within these parameters, a fault or stop signal is given to stop the machine.

To program, simply turn to “die-sensor set-up” and depress the programming knob. Now you are in the die protection program. Then put in the parameters in degrees when you would want to look for the part to eject or transfer. From 190° to 250° is when the sensor will be looking for the part. That is all there is to programming die protection. If a fault output occurs, simply view the screen and determine from what sensor the fault occurred.

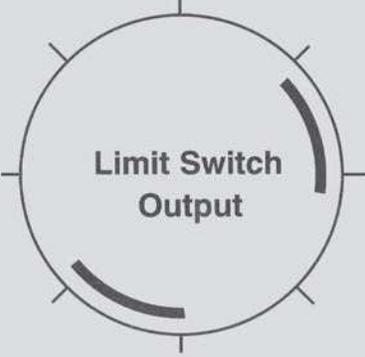
The die protection program can be fine tuned while the machine is in motion along with related peripheral signals such as feeds, lubrication, blowoffs, etc. This is an excellent method of increasing the machines efficiency.



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Programmable Limit Switch

Output	sp	First		Second		Third		Crank Angle 300°	
		Close	Open	Close	Open	Close	Open		
LS1	*	300°	320°						
LS2	*	200°	150°						
LS3		50°	100°	180°	230°				
LS4									
LS5									
LS6									
LS7									
						Delay Cycle	Hold Cycle	Start Angle	Hold Time
LS8									
LS9								100°	1000
LS10									
LS11									
EXIT	LIMIT SWITCH OUTPUT SETUP SCREEN								



Screen Actual Size

Limit switch programming simplicity is a PressCam 8 feature.

PressCam 8 crank angle position is generated by a heavy duty industrial resolver driven by the press crank shaft.

PressCam 8 provides the user with eleven programmable limit switch outputs used to initiate various peripheral equipment. These outputs can be programmed to turn on and off up to three times per press cycle.

The programmable limit switch outputs may be mechanical relay, solid state AC, or solid state DC. The solid state relays may be mixed on the same relay board.

The Delay and Hold cycle feature provides control for lubrication systems, scrap choppers, etc. This provides you with signals when you need events to occur on a pre-programmed intermittent (time) or multiple stroke basis.

Limit switches 1 – 7 can be programmed to turn ON and OFF up to three times per press cycle. Limit switches 8 – 11 can be programmed to turn ON and OFF up to two

times per press cycle or may be programmed to turn ON based on angle and OFF based on time. The timed outputs can be programmed from .001 to 10 seconds. Furthermore, these switches may be used with the Delay and Hold cycle feature which provides control for items that need not be initiated on every press cycle but a programmed number of press cycles. Or they can be held ON for a pre-programmed number of press cycles.

A minimum and maximum speed limit setting can be used to monitor optimum running speed versus actual. A deviation outside the programmed parameters will initiate a stop signal.

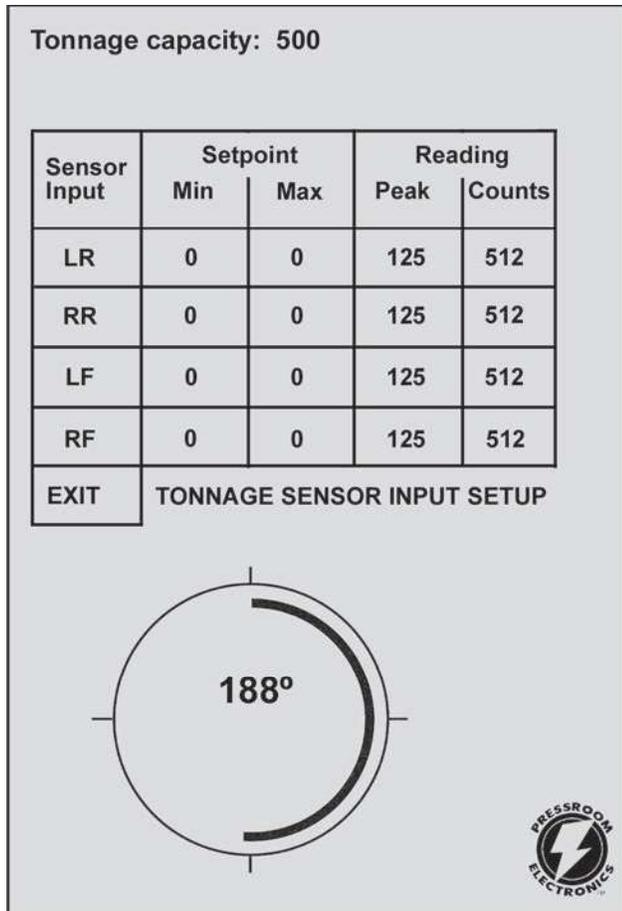
The system includes a true motion detection system that monitors the press cycle. If you tell the press cycle and it fails to move within the pre-programmed time (.001 to 4 seconds), a fault signal is issued. On the opposite side, if the press starts to cycle without initiation, a fault signal is issued to electrically disconnect all signals.

The clutch/brake timing signals can also be password-protected from inadvertent tampering by unauthorized personnel.

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Tonnage Screen



The TLM I/O load module is designed for critical force measurement applications where accuracy, extreme stability, and dependable noise rejection is essential. The module is a load measurement device without a display or alarms. The TLM is used as an input device to the PressCam 8 providing display and alarm control functions.

The TLM has high sensitivity levels that work well in an electrically “noisy” environment. It has two amplifier gain ranges (span ranges). Therefore, it can accept either weak or strong signals from the load sensor.

Features

- Signal conditioning module for strain gauge sensors and load cells
- Four independent channels for accommodating up to eight sensors
- For use with full-bridge sensors from 120 Ohms to 1,000 Ohms
- Plug-in connectors are used for the sensor inputs
- High/low sensitivity span ranges selected with front panel switch
- Automatic zero balance circuits assure accurate measurements
- Power input/output are plug-in connectors
- Built-in automatic peak load memory circuits
- Peak measurements are made with an external trigger device
- Built-in power supply for stable operation and noise rejection
- Compact size to fit almost any location
- Steel enclosure for maximum protection and noise rejection

Specifications

Transducers Full Bridge, 120 Ohms to 1,000 Ohms. One to four channel version available. Maximum of two 350 Ohms sensors per channel.

Dimensions 2" (51mm) x 3.1" (79mm) x 8.95" (227mm)

Balance Range +/- 1 mV/V of offset

Gain - Two Ranges Low = 100 to 1,100 adjustable
High = 1,000 to 11,000 adjustable

Output Range Approximately +/- 10VDC at 12VDC excitation

Circuit Accuracy Maximum inaccuracy of +/- 1% of full scale

Circuit Linearity Maximum non-linearity +/- .1% of full scale

Auto Zero Time Constant 10 seconds

Frequency Response Flat DC to 1 KHz

Peak Decay Less than 1% of full scale in 10 minutes

Calibration Shunts 1 Meg Ohm, .1%

Input Power 100 to 130VAC 50-60 Hz. Fused at .10 Amp.
200 to 260VAC 50-60 Hz. Fused at .05 Amp.
Input is jumper selectable. Fuses are 5mm x 20mm SLO-BLO.

Sensor Excitation Internally excited at +12VDC, .30 Amps maximum

Sensor Input Connections Four pin .2" (5mm) centers Phoenix connector

Peak Output Connections Six pin .2" (5mm) centers Phoenix connector

Proximity Probe 12VDC internally supplied to drive NPN or PNP probes, 50mA max. Input also supports dry relay contacts.

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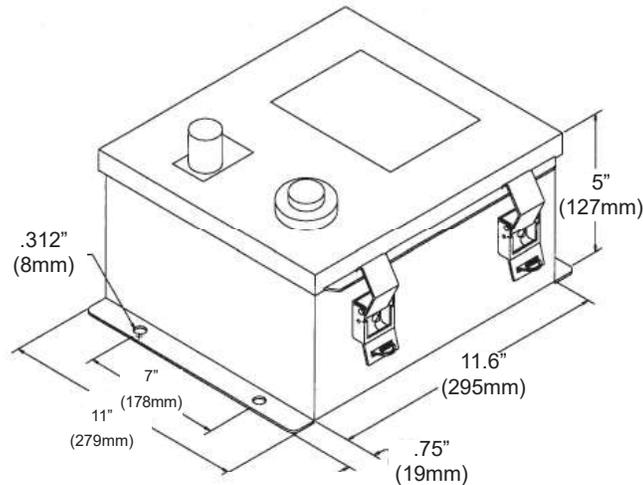
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Specifications

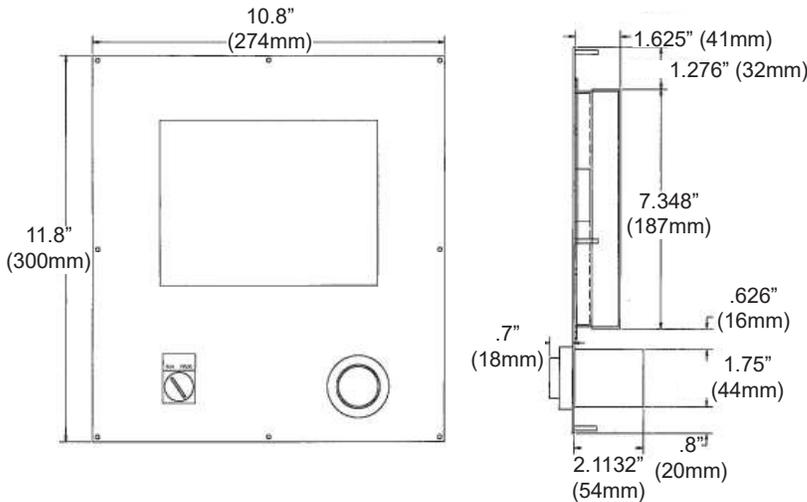
Input Power:	3 Voltage Ranges: 1) 24VDC (optional) 2) 120VAC (standard) 50 or 60 Hz 3) 240VAC (optional) 50 or 60 Hz	24 watts with all relays
Input Control Unit:	Monochrome LCD 8" (203mm) Diagonal Display	
Display	<ul style="list-style-type: none"> • LCD BIAS (GRN) D16 • Vpp (YEL) D8 • 5VDC (GRN) D14 	
I/O Board:	+12 VDC (RED) D2 17 Optically Coupled Inputs 13 Solid-State or Mechanical Relay Outputs 3 Force-Guided Monitored Safety Relay Outputs (Form B)	
Relays:	Mechanical - SPDT Form C 10 AMP @ 260VAC 10 AMP @ 30VDC Mechanical Captive Contact - Form B 8 AMPS @250VAC	AC Solid State - SP N.O. 3 AMP @ 140VAC 12-14VAC 25-70 Hz DC Solid State - SP N.O. 3 AMP @ 60VDC 12-60 VDC
Set Points:	Stroke Count: 0 to 999,999 strokes Batch Count: 0 to 999,999 strokes Quality Count: 0 to 999,999 parts Part Count: 1 to 4 parts/strokes (programmable) 0 to 999,999 parts total Batch Size: 0 to 999,999 parts Limit Switch Angle: 0 to 359 degrees Limit Switch Timers: 0 to 9999 milliseconds Die Sensor Angle: 0 to 359 degrees Minimum Speed: 0 to 300 SPM Maximum Speed: 0 to 300 SPM Brake Warning: 1 to 999 milliseconds Brake Failure: 1 to 999 milliseconds Brake Actual: 1 to 999 milliseconds (+/- 1 ms accuracy) Start Motion: 0 to 5.9 seconds (1/10 sec increments) Crank Angle: 0 to 359 degrees (1 degree increments) SPM: 0 to 300 strokes/minute (+/- 1 SPM accuracy)	
Components:	<ul style="list-style-type: none"> • PressCam 8 Master Controller Panel Mount 10.8" (274mm) W x 11.8" (300mm) H x 2.5" (64mm) D • PressCam 8 Master Controller mounted in a Stand Alone NEMA 12 Enclosure 11" (279mm) W x 13.1" (333mm) H x 5" (127mm) D • Resolver Transducer +/- 1° Resolution up to 700 RPM +/- 2° Resolution from 701-1000 RPM 3/4" (19mm) keyed shaft <i>Rated shaft loading:</i> 200 lbs. axial 400 lbs. radial <i>Weight:</i> 4 lbs. <i>Vibration:</i> 20g to 2000 Hz <i>Enclosure:</i> NEMA 13 <i>Rotation:</i> CW or CCW 	
Diagnostics:	Complete system diagnostics on LCD screen	
Enclosure Construction:	18 gauge painted steel NEMA 12 lockable enclosure with sealed front panel or open frame for panel mounting.	
		<i>Shock:</i> 200 G for 11 msec <i>Operating Temp:</i> -20° to 125°C <i>Transducer to master controller:</i> 600' (183m) max <i>Resolver Cable:</i> 30' (9m) supplied standard with connectors

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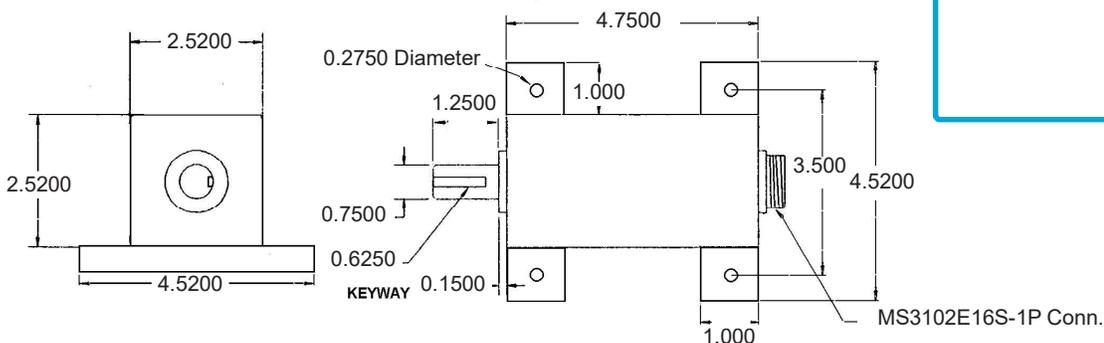
Dimensions



PressCam 8 shown installed in a stand alone NEMA 12 (IP64) lockable enclosure
 Dimensions for the Tonnage version of the PressCam 8 are 14.5" (368mm) W x 13.1" (333mm) H



PressCam 8
 Front Panel Mount



Resolver Transducer