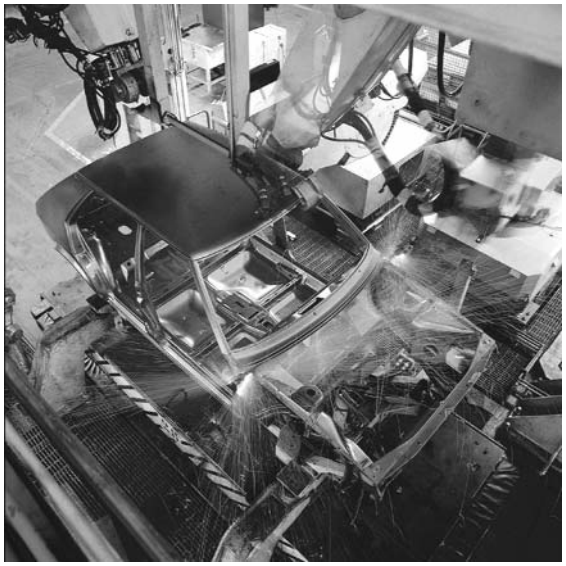
Applied Safety Solutions

Machine Safety Services

Overview



Risk assessments, risk reduction planning and project services allow companies to plan and implement safety programs for machine safeguarding applications to help reduce costs, improve compliance and enhance plant floor safety.

System Description

Rockwell Automation's Machine Safety Services include consulting, system integration and long-term support services for machines that must meet standards set forth by OSHA and ANSI in the United States. These services complement Rockwell Automation's expertise in metal forming and automation projects, including over 15 years of experience in automating mechanical and hydraulic stamping presses.

Rockwell Automation's Machine Safety Services include:

- Standards Training
  - Customer training on current standards and industry accepted interpretations
  - Standards updates as necessary
- Risk Assessment and Risk Reduction Planning
  - Coach/train client through procedures of risk assessment
  - Provide assistance with interpretation of standards and documentation of assessments
  - Facilitate an iterative process of mitigating each identified hazard by redesign or additional measures
- Technical Specification Development
  - Assist with the development of a machine safety standard that addresses safety solutions for an entire company, facility or machine
- Conformity Audits
  - Machine audits to verify and document compliance; a complete step-by-step assessment determines which standards are applicable and whether or not they have been satisfied
- Stop Time Measurements and Safety Distance Calculations
  - Help assess compliancy of light curtain and area guarding device installations
  - Help determine ergonomic and operational advantages of safeguarding options
- Safety Circuit Design
  - Including limited and sequential shutdown and applications
- Probability of Failure on Demand Calculations
  - Assist with obtaining a desired Safety Integrity Level (SIL) based on IEC 61508

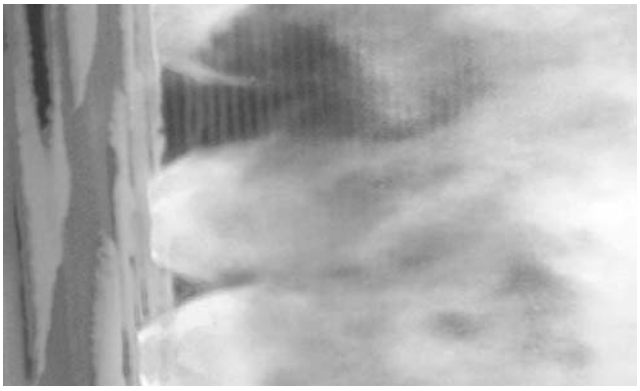
The implementation of a comprehensive machine safety program will involve many disciplines. Rockwell Automation has the entire spectrum covered. From the design and integration of safety critical circuits using the most advanced controls to the implementation of hard guarding. Rockwell Automation has the experience necessary to fulfill all your needs.

Typical machine system integration services can include:

- System Integration Services
- Project management
  - System architecture design
  - Panel design
  - Material procurement
  - RA products
  - Third party products (including hard guarding solutions)
  - Assembly
  - Software development
  - Hardware/software integration testing
  - Factory acceptance
  - Start-up assistance

Rockwell Automation's support and follow through are available at every stage and can include:

- On-Site Training
- Maintenance and operator training for our installed machine safety solutions
- Preventive Maintenance Programs
- Verify installed safety systems are operating within defined parameters
- Field Service
- Field work to be done on a contractual or as needed basis



System Description

Rockwell Automation burner management systems are engineered to provide igniter (pilot) and main flame detection, as well as control and monitoring of burner start-up and shutdown sequences including master fuel trip and purge.

The systems can help you:

- Protect against damage to your combustion process equipment and surrounding areas due to explosion or other undesirable event
- Qualify for lower insurance premiums resulting from compliance with applicable industry standards such as NFPA, IRI and FM
- Reduce installation times because our systems are fully assembled, programmed, thoroughly tested, and designed for immediate field installation
- Simplify unit operation through alarm management and operator displays
- Reduce start-up time with advanced diagnostics and operator help messages
- Reduce critical troubleshooting time through the use of pinpoint diagnostic messaging
- Enhance communication and reporting capabilities to other systems in your facility

Our BurnerMaster™ concept of burner management systems are designed for single burner applications for boilers, process heaters, furnaces, kilns and natural gas.

In addition to our family of burner management systems, Rockwell Automation offers related systems for control of combustion related processing including:

- Combustion temperature/pressure control
- Coal handling
- Ash handling and emission control systems
- Soot blowing
- Demineralizer control

Keep your combustion process safe and minimize fuel usage on the same platform!

Overview

Rockwell Automation offers various systems, bundled packages, and kits for meeting the safety-related control standards for the clutch/brake of mechanical stamping presses. These solutions are designed to meet the safety requirements of ANSI B11.1, OSHA 1910.217, CAN/CSA Z142-M90, IEC-61508, EN-954 and EN-692.

The 6556 Clutch/Brake kits are bundled packages consisting of redundant PLC components with application software, wiring diagrams, relays and documentation. Each solution is designed with independent redundant programmable controllers with additional electromechanical components and the application software to provide the necessary monitoring, self testing, security, and verification that make up a control-reliable design.

The PLC-5/x6 based kits come with the clutch/brake software secured in program file #16, and the user can add other logic to other files. The PLC-5-based kits are designed for large presses with extensive automation.

The MicroLogix™ kits are pre-programmed with the ladder program locked in flash memory. Certain features in the fixed kits are configurable. The MicroLogix-based Compact PressMaster™ kit, for example, has a variety of standard features to control ancillary functions such as lube and programmable limit switch that can be configured through pre-programmed PanelView screens. The fixed kits are easy to use, require no programming, and are designed for small to medium-size presses retrofitted by the user.

The StamPro™ system is a complete, ready-to-install, Logix-based press control system that comes with controllers and hardware for controlling a stamping press. Ancillary control functions, which can be purchased from Rockwell Automation or supplied by the user, are integrated into the system hardware and software designs. The StamPro system is designed for end users, OEMs and integrators. The system can be purchased either with pre-programmed optional functions or can be programmed by the user.

Some press functions which can be integrated with our solutions include:

- **Clutch/Brake.** The Allen-Bradley controller designed system that controls the dual-valve clutch/brake mechanism as found on all mechanical stamping presses. This system includes dual redundant controllers with application software for monitoring and self-testing to achieve safety regulation compliance.
- **Programmable Limit Switch (PLS).** Ladder Logic for switching outputs according to crankshaft position. The PLS is often used to integrate and synchronize other press auxiliary functions such as feeders, grippers, blow-off and ejector valves. This feature requires a resolver position input for accuracy. The PLS is usually pre-programmed and configured by the user for each job or die.
- **Die Monitoring.** Logic that monitors a variety of in-die sensors to determine misalignment, double blanks, misfeeds, part positioning, plus other critical conditions. The die monitor function requires a resolver input and is generally pre-programmed and configured for each job or tool.

Modes of Operation

The following table lists the modes of operation for each Rockwell Automation press control solution.

Press Modes of Operation	MicroLogix™ Clutch Brake	Clutch Pro™	Compact Press Master™	StamPro™ System
Off	X	X	X	X
Inch	X	X	X	X
Micro Inch			X	X
Single	X	X	X	X
Continuous	X	X	X	X
Remote & Auto Single				X

Contact your local Rockwell Automation sales office or Allen-Bradley distributor for pricing and order information.

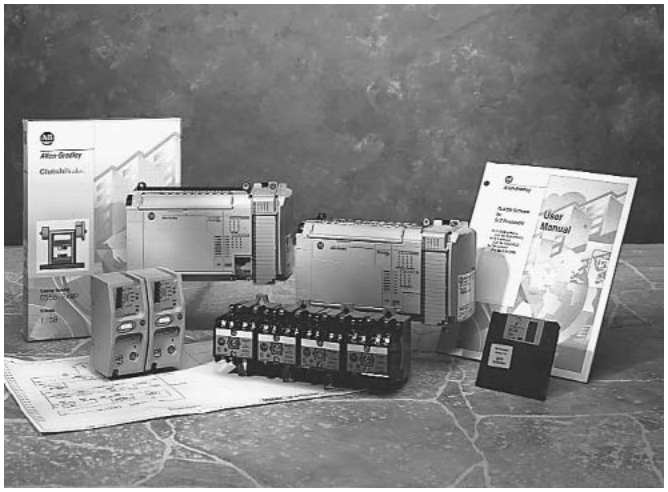
Press Features/Functions

The table below summarizes the various press control functions available for each press control solution.

(S = Standard, O = Optional, P = User Programmable, Blank table cell = Function not available).

Press Control Features	MicroLogix™ Clutch Brake	Clutch Pro™	Compact Press Master™	StamPro™ System
Clutch/Brake Control	S	S	S	S
Operator Interface	O	O	S/P	S/P
E-Stop & MCR Relays	S	S	S	S
Run Sta. Monitored	4	4	4	4+
Main Motor Control		S		S/P
RCLS Position Capable	S	S	S	S/P
Resolver Capable	O	O	O	O/P
Brake Time Monitor	S	S	S	S
Var. Speed Top Stop	S	S	S	S/P
Production Counters		S		S/P
Prog. Limit Switch			O	O/P
Die Protection Mon.			O	O/P
Recipe Storage			S/30	S/99
Var. Speed Comp.		S	S	S
Lubrication Control			S	S/P
Tonnage Monitoring			O	O/P
Auto Counterbalance			O	O/P
Shut Height Adjust			S	S/P
Var. Speed Drive Interf.			O	O/P
Servo Feed Interface			O	O/P
Robot Interface			O	O/P
Coil Feed Interface			O	O/P
Die Cushion Control			O	O/P
Die Clamp Control			O	O/P
Bolster/Die Cart Cntl.			O	O/P
Aux. Automation Intrf.			O	O/P
Prod. Monitoring/OEE			S	S/P
Hydric. Overload Cntl.			O	O/P
Light Curtain Interface			S	S
Disconnect/Starters			O	O
Open Net. Interface Capable‡	S	S	S	S
User Prog. Capable		S		S
Enclosure Assembled	O	O	O	O
Complete System	O	O	O	O

‡ Ethernet, DeviceNet, Controlnet, RS-232



Description

A MicroLogix™ 1500 processor-based Clutch/Brake Package is a bundle of hardware, software, and documentation that controls the basic clutch/brake mechanisms on mechanical stamping presses. This package requires no user programming. It can be interfaced with other controllers such as the ControlLogix system.

The package uses redundant MicroLogix 1500 processors with application software for self testing and verification to help meet the safety requirements of ANSI B11.1, OSHA 1910.217 and CAN/CSA Z142-M90 press safety regulations for mechanical stamping presses. Each MicroLogix 1500 processor has the basic clutch/brake functionality as well as the basic diagnostics to interface to several display options making it an easy-to-use cost-effective solution for small presses. Since you don't need programmable controller experience; you can just wire and mount the equipment.

For other press functions such as programmable limit switch, automation control, die protection monitoring and resolver based, consider using the Compact PressMaster system. If you require more automation flexibility or need a custom system, consider using the StamPro system.

Control Features

- Four sets of Run buttons monitored
- One set of Inch buttons monitored
- AC and DC versions
- Hard wired cross-checking
- Open communication for diagnostics

Modes of operation:
  – Off
  – Inch
  – Single
  – Continuous (Armed)
- Brake monitoring
- Top stop overrun and anti-repeat protection

System Requirements

- Rotary Cam Limit Switch or Allen-Bradley Encoder
- Motion detection device
- Self-checking valve

Ordering Information

The purchase of one kit includes the license to use this control on one stamping press.

- Contact your local Rockwell Automation Sales office or Allen-Bradley distributor.
- Email inquiries to: metalforming@ra.Rockwell.com
- FAX inquiries to: 440-646-4843
  Attention: Metalforming Group

The **HMI** option, which must be ordered in addition to the basic Clutch/Brake package, includes installed software, communication modules, and necessary cables.

New—Enhanced Options for MicroLogix Clutch/Brake Controllers

Option Description	Option Number
HMI Option — Includes PanelView™ Plus 400, network hardware for Ethernet/IP and software for diagnostics, brake monitor setup, and encoder configuration.	PV400
Encoder, scanner module, and software to create a dual encoder feedback system for press position.	PF1
One operator run station on T-stand with run, top stop, and E-stop pushbuttons	RS1

Press Control Systems

PressMaster™

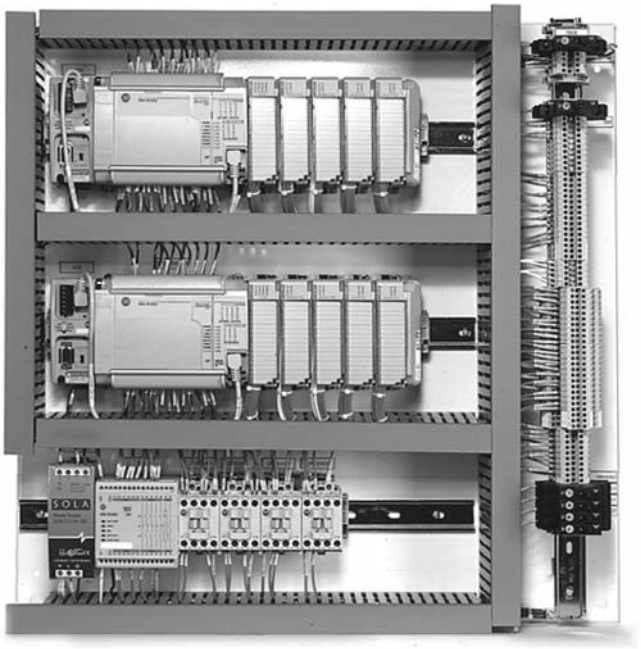
Help reduce operating costs and downtime with flexible press controls.

The Rockwell Automation Compact PressMaster™ System is a cost competitive, programmable controller-based system used for the control and monitoring of mechanical stamping presses. Help reduce cost and risk by purchasing a complete system, pre-wired and tested, ready for installation. The system is designed to modernize your press controls, increase control system reliability, and help reduce downtime by providing comprehensive operator diagnostics. Compact PressMaster provides press users, rebuilders, and OEMs a low cost PLC based control system to remain competitive and reduce risk.

System Description

The Compact PressMaster System is an expandible press control system based on standard Rockwell Automation components available locally and supported worldwide. Compact PressMaster Systems provide press control, operator interface with comprehensive diagnostics, expandability, and motor controls in a single integrated package. The system is provided, ready to install, with a complete set of documentation.

The Compact PressMaster System is based on the standard Bulletin 6556 clutch/brake control with dual processors and software designed by Rockwell Automation to help customers comply with ANSI B11.1, OSHA 1910.217, CSAZ142-2002, and EN 954. An Allen-Bradley PanelView operator interface is included to complete the system and provide maximum reliability.



Standard Features

Standard features include:

- Safety interlocks and light curtain interface
- Clutch/brake safety control with inch, single stroke, continuous, modes of operation
- Main motor control
- Lubrication control
- Slide adjust control
- Operator fault and prompt messages, alarm status operator screen
- One industrial absolute encoder
- Brake time monitoring and 90° stop test
- Interface for four run stations with anti-tiedown protection
- Press stroking anti-repeat and top stop overrun protection
- Clutch/brake and counterbalance air pressure monitoring
- User immediate and top stop control interlocks
- Production counters
- Variable speed compensation

Optional features available:

- Automatic slide adjust
- Sixteen channels of die protection
- Eight programmable limit switch outputs
- Hydraulic overload control
- Light curtains with muting
- OEM packages
- Automatic counterbalance control
- 6-inch color operator display terminal

Results

A Compact PressMaster System helps provide:

- Reduced downtime through advanced diagnostic messages, helpful operator prompts, and on-line control system troubleshooting.
- Improved system reliability through the use of standard Rockwell Automation industrial control hardware and software.
- Increased operational flexibility and expandability, while reducing costs and risk.
- Compliance with ANSI, OSHA, and CSA regulations.
- A press control that can grow with your stamping operations.

Ordering Information

- Contact your local Rockwell Automation sales office or Allen-Bradley distributor.
- Email inquiries to: metalforming@ra.Rockwell.com
- FAX inquiries to: 440-646-4843
  Attention: Metalforming Group

Help reduce operating costs and downtime with flexible programmable press controls.

The Rockwell Automation StamPro™ System is an advanced programmable controller-based system used for the control and monitoring of mechanical and hydraulic stamping presses. The StamPro control system is for customers who want to help reduce cost and risk by purchasing a complete pre-engineered system, ready for installation.

System Description

The StamPro System is a flexible, pre-engineered press control system based on standard Rockwell Automation components available locally and supported worldwide. StamPro Systems provide press control, operator interface, and magnetics in an integrated package with a complete set of documentation. The use of field-proven hardware and software helps users minimize cost and risk, while also helping to comply with the necessary ANSI, OSHA and CSA standards.

System Architecture

The StamPro System uses the Allen-Bradley Logix family of processors. The safety kernel, executed in dual Logix processors, is based on the standard Bulletin 6556 clutch/brake control with dual processors and software designed by Rockwell Automation to help customers comply with ANSI B11.1/B11.2, OSHA 1910.217, CSAZ142-2002, and EN 954.

This safety kernel is coupled with optional application software that provides all other press automation control, monitoring, information and network requirements. The Logix programming environment allows the user to add their own additional custom software into the same processors where the safety kernel resides, to help minimize control hardware costs. The standard operator interface is a pre-programmed color PanelView™ Plus 1000. The system is available in a freestanding console or an upright enclosure with a press mounted operator station.

Features

The StamPro System is modular, which allows each system to be configured to the requirements of each specific application and easily accommodates control expansion for future needs.

Standard features include:

- Stop time monitoring for hands in die
- Safety Interlocks and Light Curtain interface
- Main Motor/Pump control
- Lubrication control
- Manual Slide Adjust/ Ram Profile Control
- A 10-in. color operator interface terminal with Alarm Status/History and Fault/Prompt
- Clutch/Brake Safety Control
- Interface for four run stations with anti-tiedown protection

Optional features include:

- Fully assembled and mounted in a NEMA 12 rated industrial enclosure with one set of operator run palm-buttons
- Automatic Slide Adjust Control
- Die Protection Monitoring
- Programmable Limit Switch
- Tonnage Monitoring
- Die Clamp Control
- Die Cushion Control
- Bolster Control
- Light Curtain with muting
- Hydraulic Overload Control
- Recipe Management
- Automatic Die Change
- Automatic Counterbalance Air Pressure Control

Results

A StamPro System will help provide:

- Reduced downtime through comprehensive operator diagnostic messages, on-line control system troubleshooting and replaceable modular components available worldwide.
- Increased flexibility through open integration of press control functions and industry-standard connectivity to other equipment including coil feeds, computers, drives, robots and servo transfer feeds.
- Improved quality through recipe-based control of process parameters such as shut height, counterbalance air pressure, motor speed, die protection and programmable limit switch.
- Reduced costs through the use of standard Rockwell Automation industrial control hardware, field-proven application software, and a comprehensive documentation package.

Ordering Information

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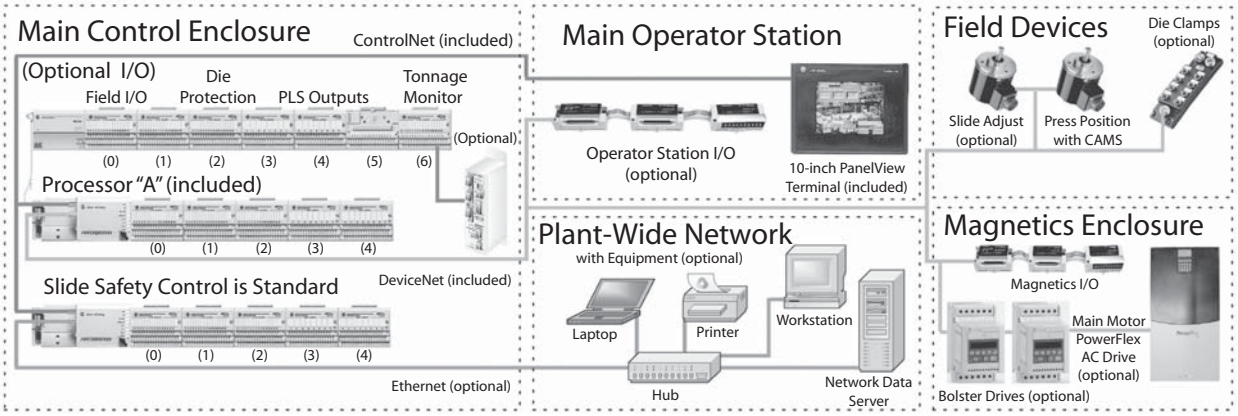

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