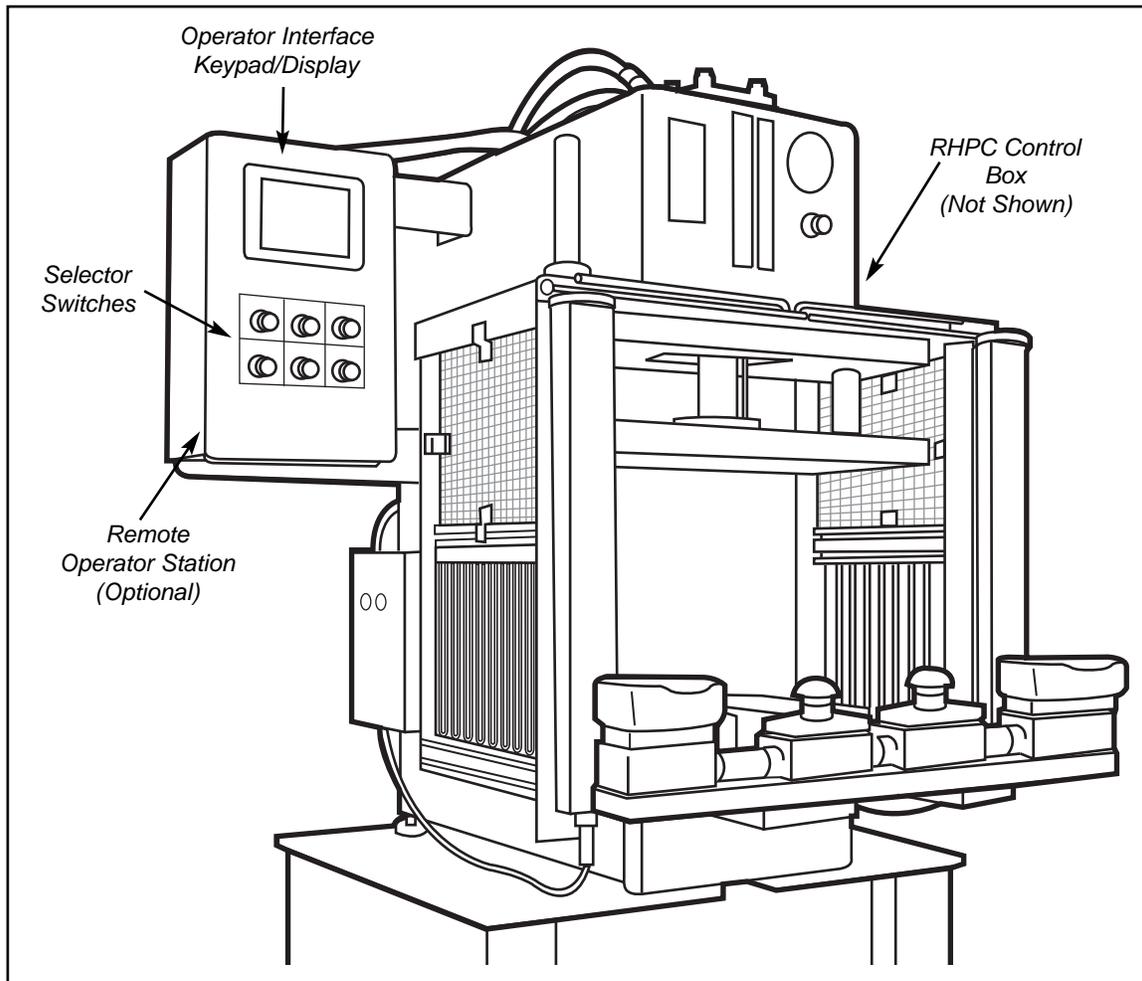




"The Machine Safeguarding People"

ROCKFORD
SYSTEMS, INC.

INSTALLATION MANUAL FOR RHPC SYSTEMS ON HYDRAULIC PRESSES



IMPORTANT: PLEASE REVIEW THIS ENTIRE PUBLICATION BEFORE INSTALLING, OPERATING OR MAINTAINING THE SOLID-STATE HYDRAULIC PRESS ELECTRICAL CONTROL SYSTEM.

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Manual No. KSL-279

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Safety Precautions

DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



This safety alert symbol identifies important safety messages in this manual. When you see this symbol, be alert to the possibility of personal injury, and carefully read the message that follows.

CAUTION

CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

Efficient and safe machine operation depends on the development, implementation and enforcement of a safety program. This program requires, among other things, the proper selection of point-of-operation guards and safety devices for each particular job or operation and a thorough safety training program for all machine personnel. This program should include instruction on the proper operation of the machine, instruction on the point-of-operation guards and safety devices on the machine, and a regularly scheduled inspection and maintenance program.

Rules and procedures covering each aspect of your safety program should be developed and published both in an operator's safety manual, as well as in prominent places throughout the plant and on each machine. Some rules or instructions which must be conveyed to your personnel and incorporated in to your program include:

 DANGER **Never** place your hands or any part of your body in this machine.



Never operate this machine without proper eye, face and body protection.



Never operate this machine unless you are fully trained and instructed and unless you have read the instruction manual.



Never operate this machine if it is not working properly—stop operating it and advise your supervisor immediately.



Never use a foot switch to operate this machine unless a point-of-operation guard or device is provided and properly maintained.



Never operate this machine unless two-hand trip, two-hand control or presence-sensing device is installed at the proper safety distance. Consult your supervisor if you have any questions regarding the proper safety distance.



Never tamper with, rewire or bypass any control or component on this machine.

A company's safety program must involve everyone in the company, from top management to operators, since only as a group can any operational problems be identified and resolved. It is everyone's responsibility to implement and communicate the information and material contained in catalogs and instruction manuals to all persons involved in machine operation. If a language barrier or insufficient education would prevent a person from reading and understanding various literature available, it should be translated, read or interpreted to the person, with assurance that it is understood.



FOR MAINTENANCE AND INSPECTION ALWAYS REFER TO THE OEM'S (ORIGINAL EQUIPMENT MANUFACTURER'S) MAINTENANCE MANUAL OR OWNER'S MANUAL. If you do not have an owner's manual, please contact the original equipment manufacturer.

SECTION 1—IN GENERAL

RHPC Hydraulic Press Solid-State Control

Safety References

OSH ACT AND FEDERAL REGULATIONS

Since the enclosed equipment can never overcome a mechanical deficiency, defect or malfunction in the machine itself, OSHA (Occupational Safety and Health Administration) has established certain safety regulations that the employers (users) must comply with so that the machines used in their plants, factories or facilities are thoroughly inspected and are in first-class operating condition before any of the enclosed equipment is installed.

1. U.S. Government—An Act—Public Law 91-596, 91st Congress, S. 2193, December 29, 1970:

Duties

SEC. 5. (a) Each employer—

(1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;

(2) shall comply with occupational safety and health standards promulgated under this Act.

(b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

2. OSHA 29 CFR Sections that an employer (user) must comply with include:

1910.211 Definitions.

1910.212 General requirements for all machines.

1910.217 Mechanical power presses.

1910.219 Mechanical power-transmission apparatus.

3. OSHA 29 CFR 1910.147 The control of hazardous energy (lockout/tagout).

4. OSHA Publication

“General Industry Safety and Health Regulations Part 1910,” Code of Federal Regulations, Subpart O

This publication can be obtained by contacting:

U.S. Government Printing Office
P.O. Box 371954
Pittsburgh, PA 15250-7954
Phone: (202) 512-1800
<http://bookstore.gpo.gov>

ANSI SAFETY STANDARDS FOR MACHINES

The most complete safety standards for machine tools are published in the ANSI (American National Standards Institute) B11 series. The following is a list of each ANSI B11 Standard available at the printing of this publication.

B11–2008	General Safety Requirements
B11.1	Mechanical Power Presses
B11.2	Hydraulic Power Presses
B11.3	Power Press Brakes
B11.4	Shears
B11.5	Iron Workers
B11.6	Lathes
B11.7	Cold Headers and Cold Formers
B11.8	Drilling, Milling, and Boring Machines
B11.9	Grinding Machines
B11.10	Metal Sawing Machines
B11.11	Gear and Spline Cutting Machines
B11.12	Roll Forming and Roll Bending Machines
B11.13	Automatic Screw/Bar and Chucking Machines
B11.14	Withdrawn (Now see ANSI B11.18)
B11.15	Pipe, Tube and Shape Bending Machines
B11.16	Metal Powder Compacting Presses
B11.17	Horizontal Hydraulic Extrusion Presses
B11.18	Coil Processing Systems
B11.19	Performance Criteria for Safeguarding
B11.20	Integrated Manufacturing Systems
B11.21	Lasers
B11.22	CNC Turning Machines
B11.23	Machining Centers
B11.24	Transfer Machines
B11.TR1	Ergonomic Guidelines
B11.TR2	Mist Control Considerations
B11.TR3	Risk Assessment
B11.TR4	Programmable Electronic Systems (PES/PLC)
B11.TR5	Sound Level Measurement Guidelines
B11.TR7	Risk Assessment
R15.06	Robotic Safeguarding
B15.1	Mechanical Power Transmission Apparatus
B56.5	Guided Industrial Vehicles and Automated Function of Manned Industrial Vehicles
B65.1	Printing Press Systems
B65.2	Binding and Finishing Systems
B65.5	Stand-Alone Patten Presses
B151.1	Horizontal (Plastic) Injection Molding Machines
B152.1	Hydraulic Die Casting Presses
B154.1	Rivet Setting Machines
B155.1	Packaging Machinery
01.1	Woodworking Machinery

These standards can be purchased by contacting:

ANSI—American National Standards Institute
25 West 43rd Street, 4th Floor
New York, New York 10036
Phone: (212) 642-4900
www.ansi.org

(Continued on next page.)

NATIONAL SAFETY COUNCIL SAFETY MANUALS

Other good references for safety on machine tools are the National Safety Council's Safety Manuals. These manuals are written by various committees including the Power Press, Forging and Fabricating Executive Committee. Copies of the following publications are available from their library:

- Power Press Safety Manual - 5th Edition
- Safeguarding Concepts Illustrated - 7th Edition
- Forging Safety Manual

These manuals can be obtained by contacting:

National Safety Council
1121 Spring Lake Drive
Itasca, IL 60143-3201
1-800-621-7615
www.nsc.org

OTHER SAFETY SOURCES

National Institute of Occupational Safety and Health (NIOSH)
4676 Columbia Parkway
Cincinnati, OH 45226
Toll-Free: 1-800-35-NIOSH (1-800-356-4674)
Phone: (513) 533-8328
www.cdc.gov/niosh

OTHER SAFETY SOURCES (continued)

Robotic Industries Association (RIA)
900 Victors Way, Suite 140
P.O. Box 3724
Ann Arbor, MI 48106
Phone: (734) 994-6088
www.roboticsonline.com

NEMA (National Electrical Manufacturers Association)
1300 North 17th Street, Suite 1847
Rosslyn, VA 22209
Phone: (703) 841-3200
www.nema.org

NFPA (National Fire Protection Association)
1 Batterymarch Park
Quincy, MA 02269-9101
Phone: (617) 770-3000
www.nfpa.org

For additional safety information and assistance in devising, implementing or revising your safety program, please contact the machine manufacturer, your state and local safety councils, insurance carriers, national trade associations and your state's occupational safety and health administration.

Warranty, Disclaimer and Limitation of Liability

WARRANTY

Rockford Systems, Inc. warrants that this product will be free from defects in material and workmanship for a period of 12 months from the date of shipment thereof. ROCKFORD SYSTEMS INC.'S OBLIGATION UNDER THIS WARRANTY IS EXPRESSLY AND EXCLUSIVELY LIMITED to repairing or replacing such products which are returned to it within the warranty period with shipping charges prepaid and which will be disclosed as defective upon examination by Rockford Systems, Inc. This warranty will not apply to any product which will have been subject to misuse, negligence, accident, restriction and use not in accordance with Rockford Systems, Inc.'s instructions or which will have been altered or repaired by persons other than the authorized agent or employees of Rockford Systems, Inc. Rockford Systems, Inc.'s warranties as to any component part is expressly limited to that of the manufacturer of the component part.

DISCLAIMER

The foregoing Warranty is made in lieu of all other warranties, expressed or implied, and of all other liabilities and obligations on the part of Rockford Systems, Inc., including any liability for negligence, strict liability, or otherwise, and any implied warranty of merchantability or fitness for a particular purpose is expressly disclaimed.

LIMITATION OF LIABILITY

Under no circumstances, including any claim of negligence, strict liability, or otherwise, shall Rockford Systems, Inc. be liable for any incidental or consequential damages, or any loss or damage resulting from a defect in the product of Rockford Systems, Inc.

SECTION 1—IN GENERAL

RHPC Hydraulic Press Solid-State Control

Danger Signs and Literature

OPERATOR SAFETY PRECAUTIONS SIGN—(ATTACHMENT FOR MACHINE OPERATORS)



Front



Back



Accompanying this equipment is an 8½" x 11" operator safety precautions sign, Part No. KSC-000, for anyone operating the machine where this equipment will be installed. These precautions are to be given to all operators, including setup people, maintenance personnel and supervisors.



This sign should also be attached to the machine, readily accessible and visible to the operator. (A hole in the corner of this sign is provided for attaching purposes.) Additional copies of these precautions are available. Please call, e-mail, write, fax, or use the order form found on a later page in this manual.



When a language barrier or insufficient education prevents a person from reading or understanding the contents of these operator safety precautions, you should either translate this information or have it read or interpreted to the person. Make sure that the person understands the information. To order this pamphlet in Spanish, use Part No. KSC-000S; in French, use Part No. KSC-000F.



These precautions must be reviewed daily.

Danger Sign(s) to be Mounted on Machine

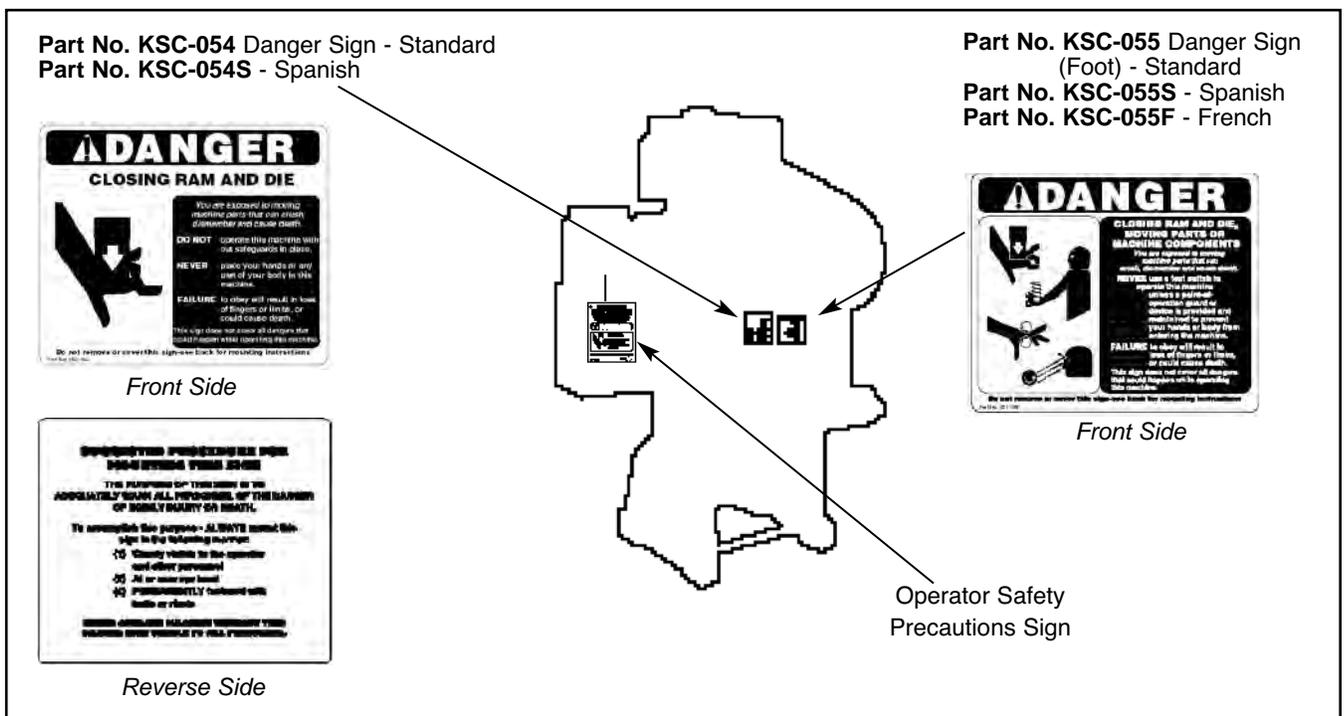


Accompanying this equipment is a 5" x 6" polyethylene danger sign, Part No. KSC-054. This sign **MUST BE PERMANENTLY MOUNTED IN A PROMINENT LOCATION** on the machine where this equipment is installed. This sign must be in a **LOCATION THAT IS EASILY VISIBLE** to the operator, setup person, or other personnel who work on or around this machine. **ALWAYS** mount this sign with screws or rivets when installing the enclosed equipment. If a foot switch is ordered, a 5" x 6" polyethylene danger sign, Part No. KSC-055 is provided. This sign must also be mounted according to the above instructions.

If any danger sign becomes destroyed or unreadable, the sign **must** be replaced immediately. Contact factory for replacement danger sign(s).



Never operate this machine unless the danger sign(s) is in place.



Mechanical Power Press Safety Booklet—Part No. KSL-051

A copy of the MPPS (*Mechanical Power Press Safety*) booklet is available upon request. This booklet is copied verbatim from the CFR (Code of Federal Regulations) and contains all relevant sections of the OSHA Regulations concerning power presses with which an employer (user) must comply. The enclosed equipment must be installed, used and maintained to meet these regulations. Specifically, any time a foot switch is used, a suitable **point-of-operation safeguard or device must be used** to prevent bodily injury. In addition, **every press must be provided with a point-of-operation safeguard!** Please review this booklet and the appropriate ANSI (American National Standards Institute) safety standard before installing the enclosed equipment. If you are unfamiliar with these detailed safety regulations, which include regulations on safeguarding the point of operation properly, you may want to attend our regularly scheduled machine safeguarding seminar. To obtain detailed information about this training seminar, please call, fax, write, or check our web site. Our address, telephone, fax number, and web site address are on the front cover of this manual.



SECTION 1—IN GENERAL

RHPC Hydraulic Press Solid-State Control

General Description of Components in the System

A complete control package for hydraulic machines includes the following:

1. Literature folder containing installation manuals, operator safety precautions, danger sign(s), electrical control schematics, and our latest catalog
2. Control box—standard (custom or special includes motor controls and/or disconnect switch) with danger and warning signs
3. Linear cam and limit switch (if furnished)—Includes two limit switches and two adjustable cams mounted on an extruded-aluminum bracket
4. Ethernet I/O card (optional)—Includes a circuit board with 8 programmable inputs and 8 programmable outputs, mounting bracket, and ethernet cable for connecting to the RHPC control
5. Encoder kit (optional)—Includes encoder, spring, sprocket, cable, eye bolt, and mounting bracket
6. Palm button assembly (Includes two black palm buttons, two palm button guards, one red emergency-stop button, and mounting boxes. When the automatic mode of operation is included, one yellow return/inch-up button with mounting box is furnished.) If multiple operator stations are on a machine, more than one assembly is furnished.
7. Foot switch (optional)—If multiple operator stations are on a machine, more than one foot switch is furnished
8. Prior-action station (Required when using the automatic mode of operation)
9. Supervisory control station (Required when multiple operator stations are used on the machine; one station is required for each operator.)
10. Multiple-operator junction box (When multiple operator stations are required, this junction box is furnished separately for wiring up to four operator stations.)
11. Other required components and safeguarding that may be necessary for machine (See packing list for details)

Individual packages may vary in contents. However, a packing list is always enclosed showing exactly what material was shipped on this order. Please check the components actually received against this packing list immediately. In most cases, this control package system includes two-hand control which can be used as a point-of-operation safeguarding device provided the palm buttons are mounted correctly and at the proper safety distance (see formula on page 22 of this manual). If the optional foot switch is provided, a safeguard must always be used. Examples of safeguards include barrier guards, presence-sensing devices, pullbacks, restraints, gates, or two-hand control. The hands or any other part of the body of an operator, maintenance person, setup person, etc., must **never** be put into the point-of-operation hazard for any reason, at any time.



These controls can neither cure nor overcome a malfunctioning machine. They cannot compensate for or prevent a mechanical defect or failure of a machine part. These controls cannot prevent a repeat or unintended stroke (cycle) resulting from a mechanical or hydraulic component malfunction, defect or failure of the machine itself.

Preliminary Steps Before Installation

Before proceeding with the installation of the enclosed equipment, you should undertake the following preliminary steps.

1. Read and make sure you understand this entire installation manual.
2. Refer to the front cover, other line drawings and photos, then make a rough sketch of your installation to plan the location of the enclosed equipment on the machine.
3. This may be an opportunity to strip down the entire machine by removing all components, piping, wire, etc. Clean, paint and check the entire electrical, hydraulic, and mechanical systems of the machine for proper adjustment and required replacement parts before proceeding with the installation of the furnished equipment.

(Continued on next page.)

Preliminary Steps Before Installation (continued)

4. Please make sure the machine is in first-class condition. Before starting any installation, it is essential that the machine is thoroughly inspected. Be sure that all mechanical components and all collateral equipment are in first-class operating condition. Your inspection should be done according to the machine manufacturer's installation and maintenance instruction manual. If you have any doubts or questions concerning the condition of the machine, contact the machine manufacturer for assistance. Repair or replace all parts not operating properly before proceeding.



Inspection and maintenance programs must be established and implemented to keep machines in first-class condition. Programs must include thorough inspections of each machine on a weekly basis and records kept of these inspections. Any part of the machine that is worn, damaged or is not operating properly must be replaced immediately or repaired before the machine is used.

5. Verify that the machine is in first-class condition and operating properly; shut off all power to the machine. All trapped hydraulic pressure must be released in areas of the systems that are being updated or retrofitted before proceeding. Padlock the disconnecting means in the *off* position and do not actuate the machine again until the installation of all package components has been completed. Lockout/tagout energy isolation procedures must always be practiced and enforced.

Safeguard Interlocks and Other Types Of Interlocks

SAFEGUARD INTERLOCKS

The machine will not operate or must not be operated until you either: (1) Electrically interlock or (2) Mechanically guard the machine's point of operation with a safeguarding system or device.

When an electrically interlocked method of safeguarding the point of operation is chosen, connect the interlock to the safeguard interlock terminals (P8-23 and P8-24) in the control box (see page 15), and as shown on the control wiring schematic.

Point-of-operation electrically interlocked safeguards, when opened, prevent or stop normal machine operation during operator cycling modes. Examples of these types of interlocks are barrier guard interlocks and gate device interlocks.

When a mechanical guard or device (nonelectrically interlocked) is chosen, the safeguard interlock terminals (P8-23 and P8-24) are not used. In order for the machine to operate with the use of a mechanical guard or device, the safeguard interlock terminals must be connected.



The mechanical guard or device must be properly installed, used and maintained and must always prevent all personnel from bodily injury.



If the mechanical guard or device is not used, is removed, or is defeated, an electrically interlocked method of safeguarding must be used and connected to the safeguard interlock terminals (P8-23 and P8-24).



Never operate this machine without point-of-operation safeguarding.

OTHER ELECTRICAL INTERLOCKS

There are basically two types of electrical interlocks as applied to machine control circuitry:

- Interlocks for the purpose of personnel protection, as explained previously.
- Interlocks intended for the purpose of protecting the machine and its control components.

There are other locations for interlocks that, when opened, prevent all machine functions. Examples of these types of interlocks are safety block electrical cut-off systems, lubricating systems, die protection equipment, and tonnage monitoring systems.

Be sure to connect the various electrical interlocks to the proper terminals (in the control box) according to the machine wiring schematics. If your schematics do not include these electrical interlocks, please send this information to the factory and they can be added to your drawings. There is an additional charge for this service.

SECTION 2—FEATURES

RHPC Hydraulic Press Solid-State Control

General Features of the RHPC Control

- Meets and exceeds OSHA 29 CFR 1910.212, and ANSI B11.2 and B11.19
- Provides two-hand control safeguarding device
- Redundant and cross-checking microprocessors
- Redundant switching style DC power supplies
- Two monitored ram advance (up or down) 24-V force-guided output relays
- External relay monitoring (for use when external relays are used to energize the down valves)
- Block valve monitoring
- Press control operates on 85-135 V AC
- Provisions for optional light curtain interface with off/on supervised keyed selector switch
- Easy to read back-lit liquid crystal operator interface display having 4 lines x 20 characters
- One 24-V DC digital user inputs, programmable, selectable canned message
- One ram speed change (fast-slow) output, standard 120 V AC with a selector switch for high, high/low, low speed (to support machines with a speed change solenoid valve)
- One ram return (up or down) output, standard 120 V AC with a selector switch for pressure, pressure/distance, distance return
- Bottom dwell timer (0-600 seconds)
- Decompression timer (50-250 ms)
- 7-digit stroke counter
- 7-digit batch counter with preset
- Operator interface keypad and display text in English or Spanish
- Optional encoder interface
- Optional ethernet I/O card

Modes of Operation

- Off
- Two-hand inch
- Two-hand single stroke
- Foot single stroke
- Two-hand automatic
- Automatic single stroke

Optional Equipment Features

ENCODER INTERFACE

- Bottom dwell adjustment
- Top of stroke adjustment
- Bottom of stroke adjustment
- Speed change
- Mute position
- Low speed coast (downstroke and upstroke)
- High speed coast (downstroke and upstroke)

ETHERNET I/O CARD

- 8 additional user inputs
- 4 PLS (programmable limit switch) outputs

SECTION 2—FEATURES

RHPC Hydraulic Press Solid-State Control

Overview of Motion and Settings

The redundant inputs are used by both processors to control the operation of the press. When the actuating means are depressed and the primary safeguard interlock conditions are met, the processors turn on their appropriate relays (K1 & K2) and the down valve is energized thus allowing the ram to move. If the actuating means are released before the stroke is finished, the ram will hold position or return to top (based on programming options). The stroke can then be reinitiated by depressing the actuating means again.

When the ram reaches its bottom of stroke limit, it will turn off the DOWN outputs and turn on the UP output (K3) and energize the up valve, returning the ram to top. When the top of stroke limit is met, it will turn off the up output and stop.

SEQUENCE OF OPERATION

RUN MODE—INCH/SINGLE/AUTO

Inch—The inch mode is intended for machine setup only. In this mode of operation, pressing both palm buttons causes the ram to move in small increments—**inch**. The ram stops at the bottom of the stroke. Auto up (return) is not active in the inch mode. Press the yellow return palm button to inch the ram back to home. Hold the yellow palm button down to return the ram to the home position nonstop.



The Inch mode of operation is used for die setup, tool setup, and maintenance only. It is not intended for use during production operations.

Single—Pressing both palm buttons or pressing the foot switch causes ram movement to the bottom of the stroke and stops. The ram does not stop at sequence stop position. Auto up (return) of ram is active. After the ram reaches the bottom of the stroke, it automatically returns to home and stops—**single** stroke.

Auto—Pressing a prior-action button and then both palm buttons causes ram movement to the bottom of the stroke and then back to top automatically. This will continue until a return button or E-stop button has been pressed.

Auto Single Mode—(See pages 61-62 for programming the auto single mode.) **When on**, auto single will engage the ram when a signal is presented on the auto single input. The initial stroke requires a signal on the prior-action input before the actuation means are depressed.

SPEED CHANGE—HIGH-HIGH/LOW-LOW

High—The ram ignores the speed change position and moves to the bottom of the stroke at high speed.

High/Low—The ram moves to the speed change position at high speed, and then changes from high to low speed at the speed change position.

Low—The ram ignores the speed change position and moves to the bottom of the stroke at low speed.

RETURN—PRESS-PRESS/DIST-DIST (PRESSURE-PRESSURE/DISTANCE-DISTANCE)

Press (Pressure)—The ram is returned to home position when the hydraulic pressing pressure reaches the preset value and closes an internal normally open contact. The setting of the preset pressing pressure is set by the customer.

Press/Dist (Pressure/Distance)—The ram is returned to home position when the normally open contact of the pressure switch or the bottom of stroke limit switch closes.

Dist (Distance)—The ram is returned to home position when the normally open contact in the bottom of stroke limit switch closes.

NOTE: Pressing pressure may be relieved (dumped) prior to returning the ram to home position. The RHPC control module has a user programmable bottom of stroke dwell function. By enabling this function and setting the dwell time, pressing pressure is dumped prior to the ram returning to the home position. This dwell function helps in reducing hydraulic shock produced when hydraulic fluids are reversed under pressure.

(Continued on next page.)

SEQUENCE OF OPERATION (continued)

OFF/PROG/RUN

Off—The off selection prevents the machine from running production. This mode is intended only for temporary shutdown. **Do not use this mode for machine servicing or performing repairs.** Always use lockout/tagout procedures when servicing the hydraulic press.

Prog—The prog (program) selection enables changing user defined parameters within the control module.

Run—When run is selected, the hydraulic press is in the normal process run mode.

ACTUATING MEANS—HAND-FOOT

Hand—With the mode selector set to inch and both palm buttons pressed, the ram inches down (each time the palm buttons are pressed) and stops at the bottom of the stroke. With the mode selector set to single and both palm buttons pressed, the ram moves to the end of the stroke in one continuous motion and stops at the bottom of the stroke. After reaching the bottom of the stroke, release both palm buttons and the ram will automatically return to the home position. This operation is commonly referred to as hand down, hand through.

Foot—With the mode selector set to single, press the foot switch. The ram moves to the bottom of the stroke and then stops. After reaching the bottom of the stroke, release the foot switch and the ram will automatically return to the home position. This is commonly referred to as foot down, foot through.



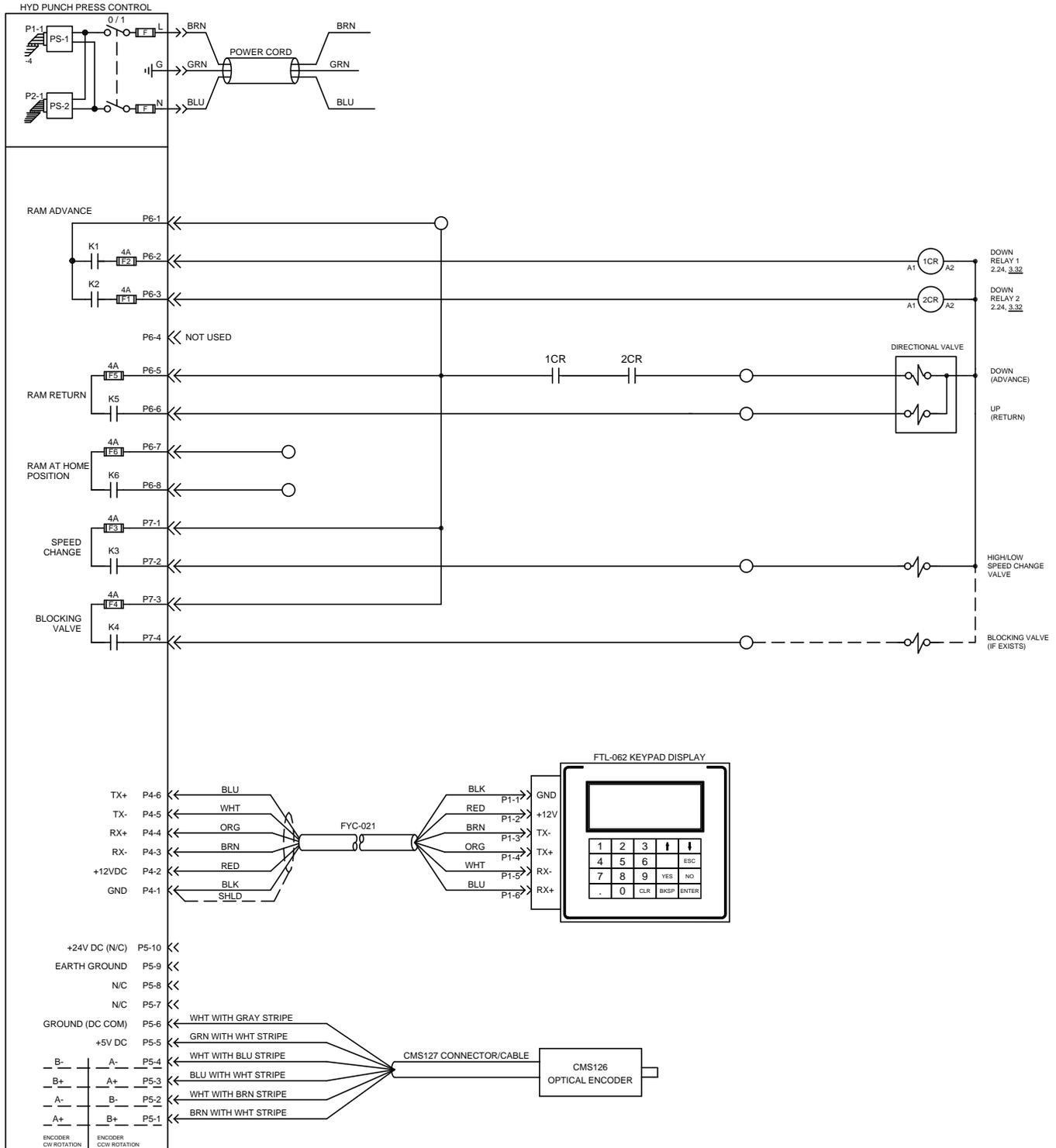
A point-of-operation safeguard must be used when selecting foot, single-stroke operation.

SECTION 2—FEATURES

RHPC Hydraulic Press Solid-State Control

RHPC Connection Diagram

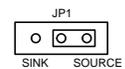
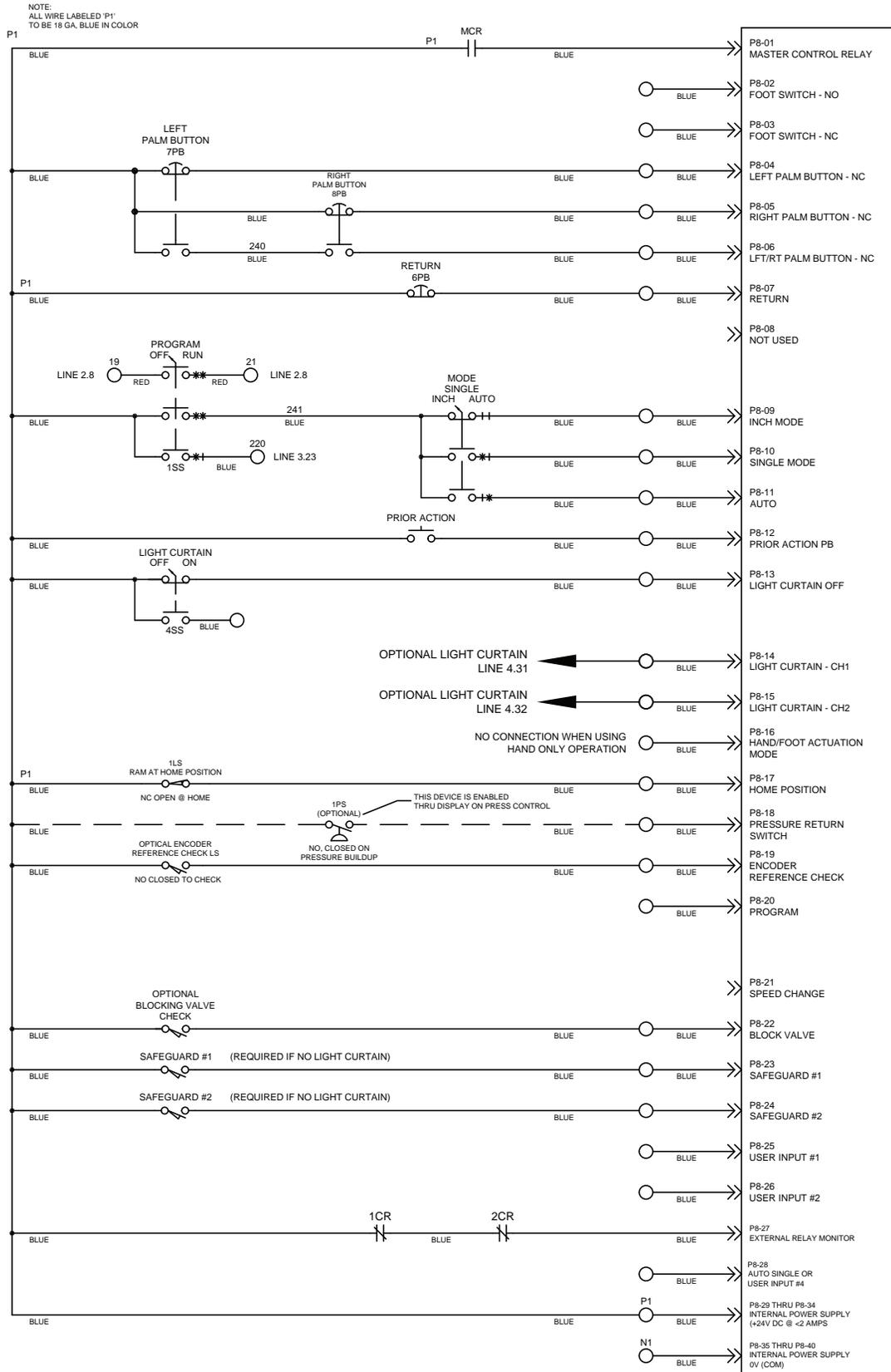
NOTE: This connection diagram is a convenient reference that shows some of the typical connections to the module. **It should not be used for reference during installation.** Please refer to the enclosed wiring schematics when installing the control system.



(Continued on next page.)

SECTION 2—FEATURES

RHPC Hydraulic Press Solid-State Control



SECTION 3—COMPONENTS AND INSTALLATION

RHPC Hydraulic Press Solid-State Control

Control Box

Danger and warning labels are affixed to all control boxes provided. All personnel operating or working around the machine where this control box is installed must be required to read, understand, and adhere to all dangers and warnings. If any of these labels become destroyed or unreadable, they **MUST** be replaced. Contact Rockford Systems immediately for replacement labels and do not operate the equipment until danger and warning labels are all in place.

**Standard Control Box With
Danger and Warning Labels**



The RHPC control is a solid-state control system designed for use on hydraulic power presses, and is designed and built to comply with **OSHA 29 CFR 1910.212**, and **ANSI B11.2** and **B11.19**. This control can update or replace existing control systems on hydraulic power presses found in users' plants or can be furnished for new or rebuilt hydraulic power presses.

This control can be supplied in a custom box with a motor starter(s) and a disconnect, or as a standard control to interface with existing hydraulic press motor controls. Enclosure systems for the control include a standard 20" x 20" x 8" box with the keypad/display mounted on the door of the enclosure. A plain-door enclosure with the keypad/display mounted in a remote operator station may have been furnished.

This is an economic, full-featured dual micro-processor-based control system. The system uses redundant inputs from devices such as palm buttons, foot switches, and light curtain(s). All inputs are 24 V DC and are optically isolated for noise immunity. Each output from the control module is accomplished through one force-guided relay that has one NO dry contact. Each output is fused for a maximum of four amps (4 A). All outputs come standard at 120 V AC. All 120 V AC controlled devices (relays and solenoids) must be suppressed across their coils. Each control is shipped with three suppressors. If controlled devices are other than standard voltage, outputs may be reconfigured for desired voltages. The RHPC hydraulic press control comes with redundant cross-checking microprocessors and redundant DC power supplies. This provides control reliable operation of all outputs in the event one microprocessor or one DC power supply fails.

SECTION 3—COMPONENTS AND INSTALLATION

RHPC Hydraulic Press Solid-State Control

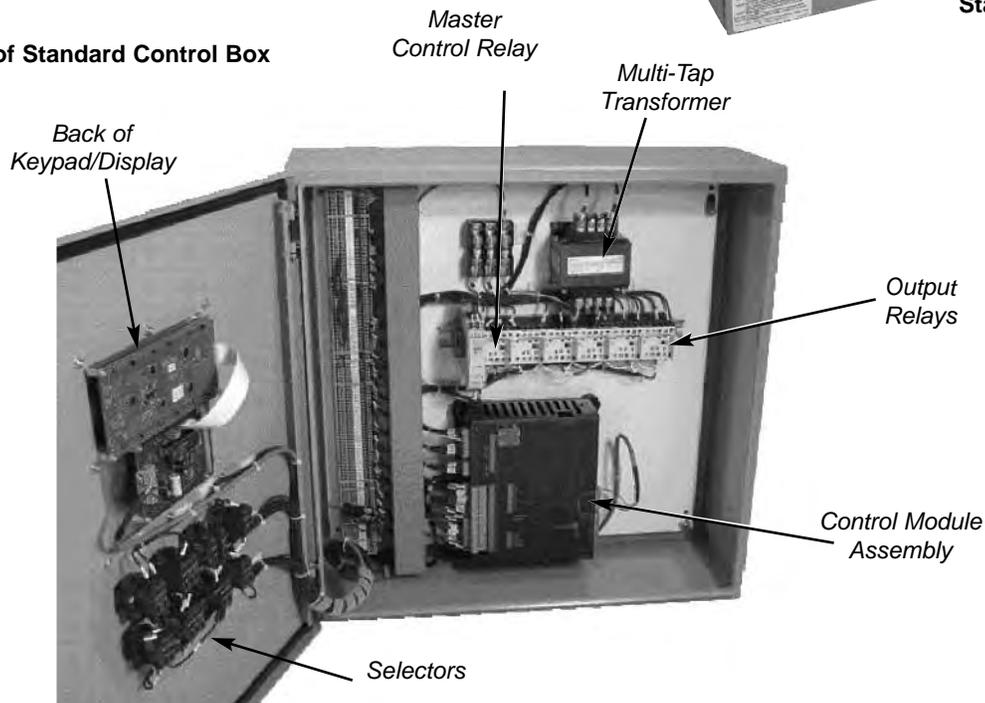
STANDARD CONTROL BOX

The standard control box (20" x 20" x 8") is furnished with the keypad/display, program off/on selector switch, and other selector switches on the front of the enclosure door. This NEMA 12 enclosure contains the control module assembly, master control relay, primary multi-tap transformer, output relays, and terminal strips. A standard box with a plain door is also available for use with a remote operator station.



Standard Control Box

Inside View of Standard Control Box



CUSTOM CONTROL BOX

A custom control box contains the standard control module and components described above plus the following:

- main power disconnect switch
- main hydraulic pump motor starter

The box will vary in size based on the disconnect switch and motor starter components. The box is furnished with an IEC through-the-door main power fused disconnect switch and an IEC hydraulic pump magnetic motor starter (with push buttons). They are prewired and built into a NEMA 12 enclosure.

Operator controls and the keypad/display are located on the front of the door, or a plain-door control or subpanel can be furnished. A remote operator station or keypad/display kit is required if a plain-door control or subpanel is ordered.



Remote Operator Station

Custom Plain Door Control Box

SECTION 3—COMPONENTS AND INSTALLATION

RHPC Hydraulic Press Solid-State Control

REMOTE OPERATOR-STYLE CONTROL BOXES

Remote operator-style control boxes include the same features and modes of operation as the standard control box described on the previous page. **However, they do not have a control transformer.** These controls are for applications where the machine's existing magnetic motor starter, fused disconnect switch, and control transformer meet the safety requirements and can be reused. If the existing control transformer cannot be reused or a new control transformer is required, contact the factory.

The three remote operator-style control boxes available have the keypad/display and all operators on the door of the enclosure. The remote operator-style control boxes available are:

- Style X**—Standard RHPC control box without the control transformer
- Style Y**—Standard RHPC control box without the control transformer, but with an e-stop button in the enclosure
- Style Z**—Standard RHPC control box without the control transformer, but with an e-stop button, and two (2) guarded run/inch buttons on the sides of the enclosure



Style Z Remote Operator Control Box

CONTROL MODULE KIT*

This control module kit includes the control module, control relays, shock mounts, fasteners, suppressors, danger labels, and electrical prints. The minimum area required to install this kit on an existing control panel is 18" x 18" x 6". The electrical prints supplied with this kit show typical wiring and all dimensions. A keypad/display kit is required unless a remote operator station is used.

When a control module kit is furnished, it is supplied **without** the control enclosure, panel, control transformer, control fuse, terminal strips, wire duct, and wiring.



KEYPAD/DISPLAY KIT*

PART NO. LLD-6011

When a keypad/display kit is furnished for use with any of the control boxes or control module kit, it includes the keypad/display, an off/program/run selector switch, a light curtain off/on selector switch, a hand/foot selector switch, an inch/single/automatic selector switch, a high/low speed selector switch, a pressure/pressure distance/distance return selector switch, and 25' of cable. Additional push buttons, nameplates, and selector switches for motor starters, etc., may have been furnished depending on the features required. The area needed to mount the keypad/display kit is 10" x 6 $\frac{1}{4}$ " x 3".



***A certified electrician is required for the installation of a control module kit and keypad/display kit. If you do not have access to a certified electrician, please contact Rockford Systems at 1-800-922-7533, and we will propose the cost of having our installation team provide the installation.**

SECTION 3—COMPONENTS AND INSTALLATION

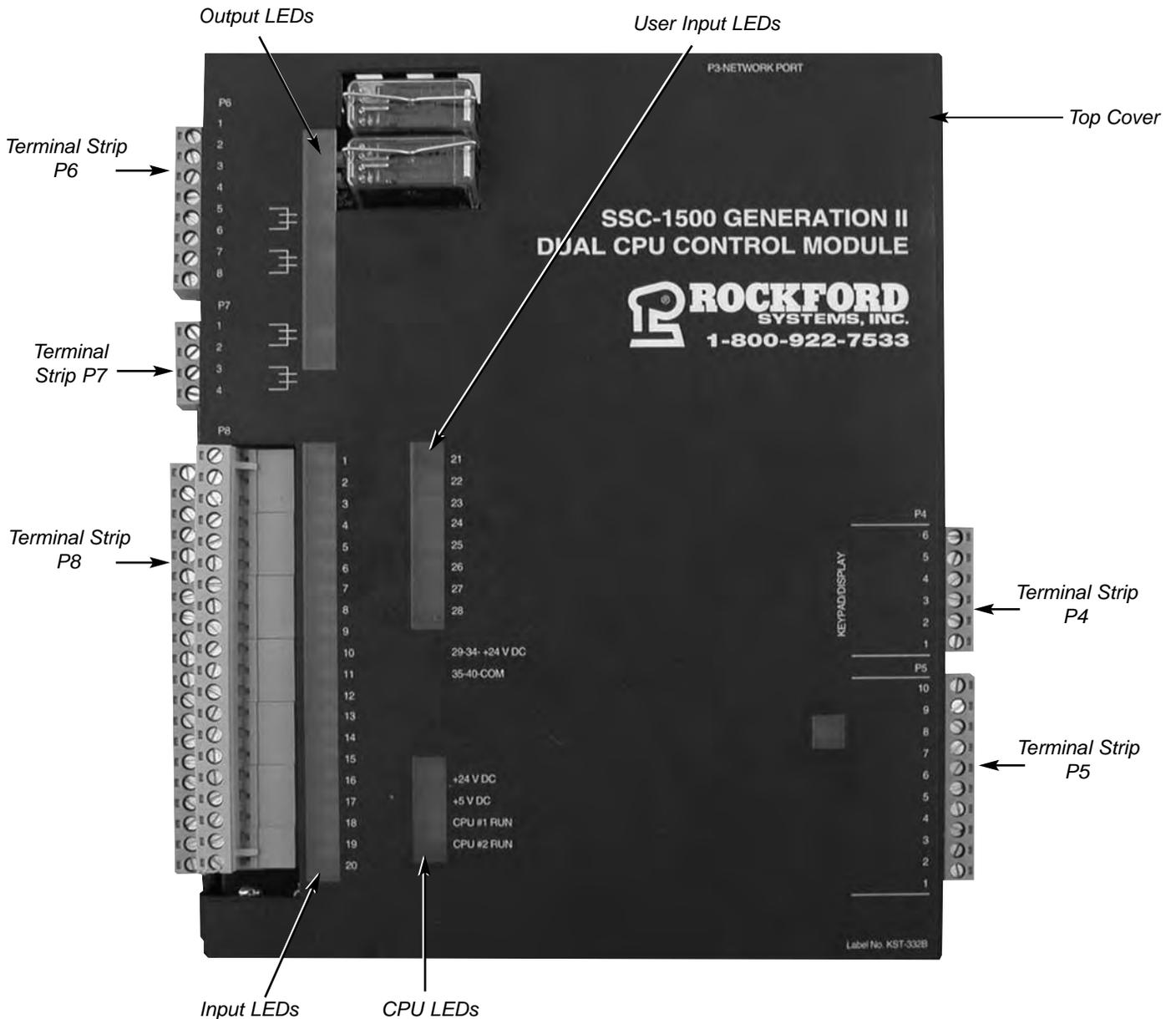
RHPC Hydraulic Press Solid-State Control

CONTROL MODULE ASSEMBLY

The solid-state control module assembly below, Part No. FTL-072, measures 8¼" W x 8¾" H x 3¾" D. It is mounted to the panel with four shock/vibration mounts and four ¼-20 x ½" Allen-head bolts. The module case has four keyhole mounting slots that allow for easy removal, without taking off the Allen-head mounting bolts.

Red and green LEDs allow for visual indication of control operation and the status of inputs and outputs. There are two green CPU (central processing unit) run indicator status lights. For reference, all LED names are indicated on the connection diagrams on pages 14 and 15, or refer to the enclosed schematics.

Top View of Control Module With Cover



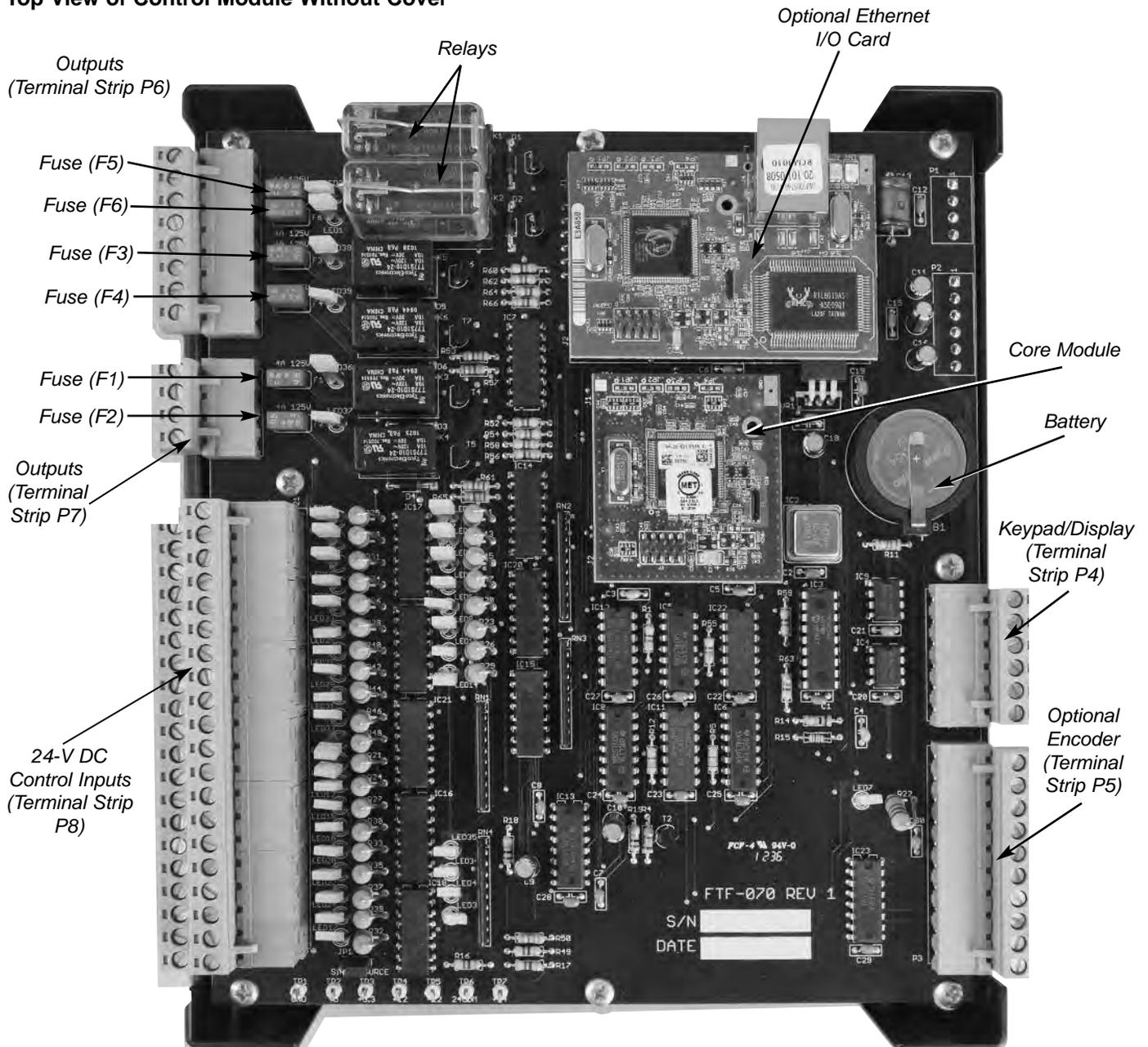
SECTION 3—COMPONENTS AND INSTALLATION

RHPC Hydraulic Press Solid-State Control

CONTROL MODULE ASSEMBLY (continued)

If necessary, the cover of the module can be taken off by removing the screws on the corners and pulling the top straight off. The dual-CPU circuit board is then exposed as shown in the photo below.

Top View of Control Module Without Cover



User-serviceable parts on the dual-CPU board are the core module, battery, fuses, and optional ethernet card. F1 and F2 fuses are for circuit protection of the outputs on P7. F3 and F4 fuses are for circuit protection for outputs on P6. F5 and F6 fuses are for circuit protection of K1 and K2. MPF1 and MPF2 fuses are the main power supply fuses.

If any changes to the circuit boards are required, instructions will be sent with the new parts. See Section 7—*Replacement Procedures* for instructions on replacing the core module, battery, fuses, and optional ethernet card.

SECTION 3—COMPONENTS AND INSTALLATION

RHPC Hydraulic Press Solid-State Control

KEYPAD/DISPLAY—PART NO. FTL-062



The keypad/display is used to enter setup information and to monitor machine operation. The keypad/display can be furnished in a remote enclosure up to a maximum of 150' from the control module. All programming is accessed by a keyed selector switch on the keypad/display unit.

If the keypad/display is supplied in a remote enclosure, please refer to the section on wiring and the electrical schematic prints that came with the control box for the proper wiring connection.

LINEAR CAM AND LIMIT SWITCH ASSEMBLY—PART NO. CMT-048

The linear cam and limit switch assembly consists of two limit switches and two adjustable cams mounted on an extruded-aluminum bracket. This assembly can provide the linear timing of the top and bottom limits of the machine cycle on a hydraulic machine. Refer to the wiring schematics for proper wiring connection.



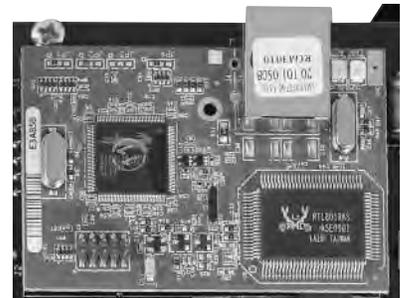
HIGH LOW LIMIT SWITCH ASSEMBLY—PART NO. CMT-049

An additional linear cam and limit switch assembly can be used for a high/low signal during the closing portion of the hydraulic stroke. This assembly consists of one limit switch and one adjustable cam mounted on an extruded-aluminum bracket. Refer to the wiring schematics for proper wiring connection.

ETHERNET I/O CARD—PART NO. FTL-074

An optional I/O (input/output) circuit board can be added to the existing control system and gives an additional 8 user inputs. Eight user outputs are added—the first 4 are available, and the last 4 are reserved for custom software if needed.

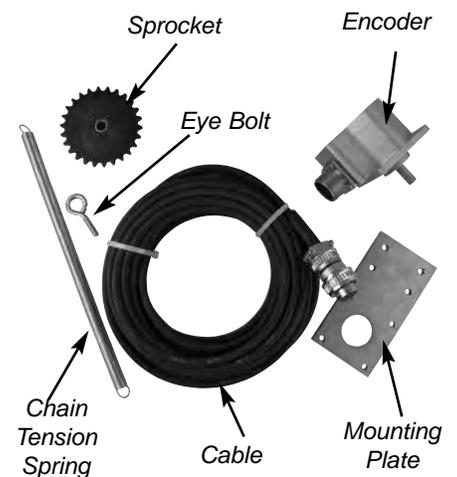
The I/O card can also be mounted remotely and uses Ethernet protocol for communication. This allows for a some automation with hydraulic controls.



ENCODER KIT—PART NO. FKT-296

A separate encoder is needed in order to use the extra functions that the encoder allows. The kit includes an encoder, spring, sprocket, cable, eye bolt, and mounting bracket. Refer to the wiring schematics for proper connection.

When the encoder is connected and ENCODER ENABLE is turned ON, you will have the ability to adjust all of your position settings from the keypad display (see p. 33 PRESS SETTINGS), thus eliminating the need to physically adjust limit switches. Remember, when this function is enabled, you will have to HOME the press whenever power is turned off to the control.



SECTION 3—COMPONENTS AND INSTALLATION

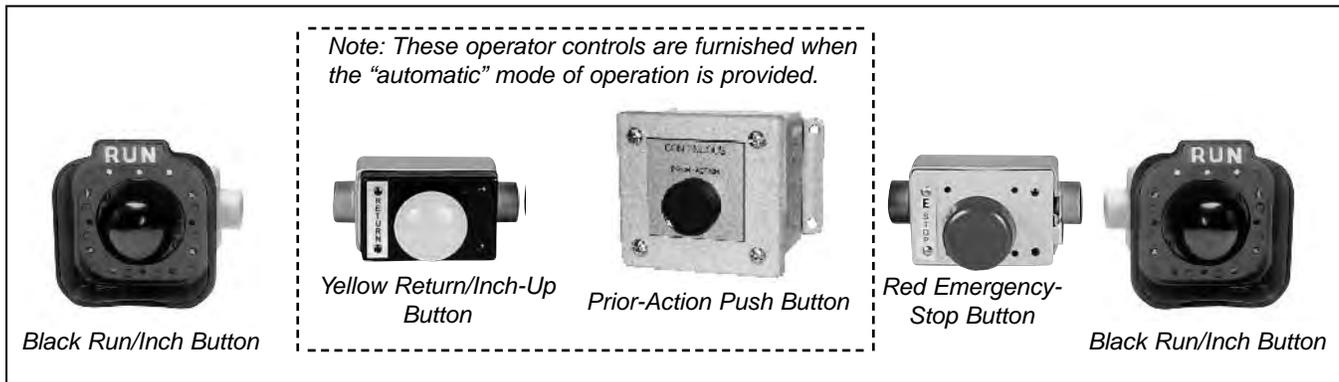
RHPC Hydraulic Press Solid-State Control

PALM BUTTON ASSEMBLY—PART NO. CTL-525 (IF FURNISHED, SEE INSTALLATION MANUAL NO. KSL-071 OR KSL-073)

When the standard modes of operation of off, inch, single stroke, automatic, and auto single are furnished, the palm button assembly will consist of four buttons (two run/inch buttons with ring guards, one red emergency-stop button, and one yellow return/inch-up button). Along with these buttons will be four mounting boxes (three double hub and one single hub). Optionally available are the Touchdown™ or chrome light push palm buttons. These may be furnished in place of the standard black run/inch palm buttons. The palm buttons can be assembled as shown below and mounted according to the requirements of the application. Nipples for connecting and running wire are not furnished.



Install the palm run buttons in such a way that it requires the use of both hands to cycle the machine.



The two run palm buttons, on hydraulic machines, can be used to initiate a machine cycle and as a method of safeguarding the point of operation. ANSI B11.2 has established certain requirements for these buttons when used as a safeguarding method. According to ANSI B11.2, the total stopping time of the press should include the total response time of the control system and the time it takes the press to cease slide motion. The following formula should be used when calculating the safety distance:

$D_s = K (T_s + T_c + T_r + T_{spm})$ where:

D_s = minimum safety distance between the device and the nearest point-of-operation hazard (inches)

K = the hand speed constant = 63 inches/second

T_s = the stop time of the machine tool measured at the final control element

T_c = the response time of the control system.

Note: $T_s + T_c$ are usually measured by a portable or built-in stop-time measuring device.

T_r = response time of any hand control device, if provided, including its interface

T_{spm} = the additional time allowed for the stopping performance monitor to compensate for variations in the normal stopping time



When applying the two palm run buttons to meet the requirements for a point-of-operation safeguarding device, make certain these buttons are located on the machine so they meet the minimum safety distance required by the ANSI formula.



Simply stated, safety distance is the mounting and location of the palm buttons at a distance where the operator cannot reach into the point-of-operation hazard before the ram has stopped or completed its downward travel.



To obtain the stopping time, a portable stop-time measurement unit can be used. (For a portable unit, please contact Rockford Systems, Inc.)

SECTION 3—COMPONENTS AND INSTALLATION

RHPC Hydraulic Press Solid-State Control

RED EMERGENCY-STOP PALM BUTTON (REQUIRED)



The red emergency-stop button is used to stop the machine anywhere in its cycle. When the operator depresses the button, it should stop the hazardous motion of the machine immediately by shutting off the hydraulic drive pump motor. This palm button assembly includes a double hub mounting box. It can be located between the two run palm buttons as part of the operator's control station. This button has a mechanical latch that must be reset after depressing the button.

Note: More than one emergency-stop button may be furnished for additional control stations or for convenience.

YELLOW RETURN/INCH-UP BUTTON



The yellow return/inch-up button is used to stop the machine when it is in the automatic mode of operation. When the operator depresses the button, almost anywhere in the stroke of the machine, it will return the ram to the up position. This palm button assembly includes a double hub mounting box. It can be located between the two run palm buttons, along with the red emergency-stop button, as part of the operator's control station.

AUTOMATIC PRIOR-ACTION PUSHBUTTON STATION—PART NO. LLD-6100 (AUTOMATIC AND AUTOMATIC SINGLE STROKE)



According to ANSI B11.2, control systems that include an automatic cycle mode shall require:

“Selection of the automatic mode; and a prior or deliberate action by the operator; and operation of the actuating means; and an intended action by the operator before an interrupted cycle may be resumed.”

These prior-action stations have a recessed push button that must be depressed and released by the operator before depressing the two palm buttons in order to initiate the continuous or automatic run type of press operation. This is sometimes referred to as “walk-away” continuous.

Mount the remote stations on the machine so that it is convenient for the operator to depress and release these push buttons prior to depressing the two palm buttons. These buttons may be mounted as part of the operator's control station. After releasing the button, the operator has a 5-second time period in which to depress the run buttons. If the operator should wait longer than this time setting, the prior action must be depressed and released again.

SECTION 3—COMPONENTS AND INSTALLATION

RHPC Hydraulic Press Solid-State Control

FOOT SWITCH—PART NO. CTD-011 (OPTIONAL—SEE ENCLOSED INSTALLATION MANUAL NO. KSL-001)



If a foot switch control is used, all personnel must be warned that it is **NOT** a point-of-operation safeguard. It is the responsibility of the employer (user) to always provide an appropriate guard and/or device to prevent bodily injury whenever a foot switch is used to initiate a machine cycle. (See ANSI B11.2 for safeguarding.)

When using a foot switch, please see page 9 for information on electrically interlocking or mechanically guarding the point of operation. When installing the optional foot switch, be sure that the wiring schematics are referenced for proper connections. Be sure to maintain the foot switch in first-class condition. It must always be wired properly and the protection on the top, sides, and front must always remain in place.



Never use a foot switch to operate this machine unless a point-of-operation guard or device is provided and properly maintained.



The mechanical guard or device must be properly installed, used and maintained. It must always prevent all personnel from bodily injury.



If the mechanical guard or device is not used, is removed or is defeated, an electrically interlocked method of safeguarding must be used and connected to the safeguard interlock terminals (P8-23 and P8-24).

SUPERVISORY CONTROL STATION—

PART NO. LLD-6101—REQUIRED FOR MULTIPLE OPERATOR STATIONS)

PART NO. LLD-283—REQUIRED FOR MULTIPLE OPERATOR STATIONS AND WHEN A USC-000 IS USED
(SEE BELOW)



Supervisory Control Station

When two or more palm button or foot switch operating stations are required on one machine, one supervisory control station is required at each operator station. This remote control station consists of one station on indicator light and an off/on keyed selector switch in an enclosure. The on position allows the operator to use that station and the off position deactivates only that station. If all the supervisory control stations are in the on position, the palm buttons or foot switches must be depressed within the timing period set in the anti-tie-down program (page 53) in order to initiate a machine stroke.

Note: If the USC-000 multiple-operator junction box is used, the anti-tie-down setting in the RHPC control becomes irrelevant, since the junction box has its own timers.

MULTIPLE OPERATOR JUNCTION BOX—PART NO. USC-000 (IF FURNISHED, SEE INSTALLATION MANUAL KSL-266)



Multiple-Operator Junction Box

When multiple operator stations are required, this junction box is furnished separately for wiring up to four (4) operator stations. This junction box interfaces palm button assemblies/control bars and foot switches, and will not allow the press to run if palm buttons or a foot switch is actuated without its supervisory control station on. Refer to the electrical schematic furnished with your order for proper wiring of each station.

Other Required Components (Not supplied as part of standard package unless specifically ordered)

MAIN POWER DISCONNECT SWITCH

A main power disconnect switch may have been supplied in this control package shipment, either in a custom control box or separately. This switch is designed to disconnect the primary voltage to the press and lock it out. Please refer to the enclosed wiring schematics for proper wiring of this switch, if furnished separately.

ANSI Standard B11.2 requires that:

1. A main power disconnect switch capable of being locked in the off position shall be provided with every power press control system.
2. If the machine already has a main power disconnect switch, it must be checked for the locking off and lockout feature. Some switches use construction which can be easily altered mechanically to comply with this requirement. If this is not possible, or an electrical disconnect switch is not provided, then you must obtain and install a proper disconnect switch. (For a proper disconnect switch, please contact Rockford Systems, Inc.)

MOTOR STARTER

A nonreversing motor starter may have been supplied with this control package. The main purpose of this starter is to drop out the main drive motor and the hard-wired emergency-stop relay when a power failure occurs. Please refer to the enclosed wiring schematics for proper wiring of this starter. If an existing starter is used, a 120 VAC coil is required.

ANSI Standard B11.2 requires that:

1. The motor start button shall be protected against accidental operation.
2. All mechanical power press controls shall incorporate a type of drive motor starter that disconnects the drive motor from the power source in the event of control voltage or power source failure. It shall also require operation of the motor start button to restart the motor when voltage conditions are restored to normal.

The above requirements are normally met by using a magnetic motor starter. This starter operates with a 120 VAC coil which is powered from the secondary of the control transformer on the control panel. Refer to the electrical schematics supplied to obtain details of how to wire the starter and associated motor start/stop push buttons. If a new magnetic motor starter is required, please contact Rockford Systems, Inc.

CUSTOM OR SPECIAL CONTROL BOX

Instead of the standard hydraulic control box, you may have ordered and received a custom or special control box. This box usually includes a magnetic motor starter and disconnect switch complying to the previous requirements. Be sure to wire in primary voltage and components to terminals as indicated on the enclosed wiring schematics. 120 volt electrical power to hydraulic controls, operator controls, solenoids, etc., must be obtained from the furnished transformer with isolated secondary.

COLLATERAL EQUIPMENT

All collateral press room and plant equipment such as spring or air-slide counterbalances, die cushions, feeding equipment, and robots must be safeguarded if they create hazards to personnel.

POINT-OF-OPERATION SAFEGUARDS

For compliance to ANSI B11.2 safety standard, please refer to *Section 8—Methods of Safeguarding*, for examples of point-of-operation safeguards for presses.

SECTION 3—COMPONENTS AND INSTALLATION

RHPC Hydraulic Press Solid-State Control

Other Required Components (continued)

PRESENCE-SENSING DEVICE

According to ANSI B11.2, the total stopping time of the press (**for presence-sensing devices**) should include the total response time of the presence-sensing device, as stated by the manufacturer, the response time of the interface, the response time of the control system and the time it takes the press to cease slide motion. The following formula should be used when calculating the safety distance:

$$D_s = K (T_s + T_c + T_r + T_{spm}) + D_{pf} \text{ where:}$$

K = the hand speed constant = 63 inches/second.

T_s = the stop time of the press measured from the final deenergized control element

T_c = the response time of the press control

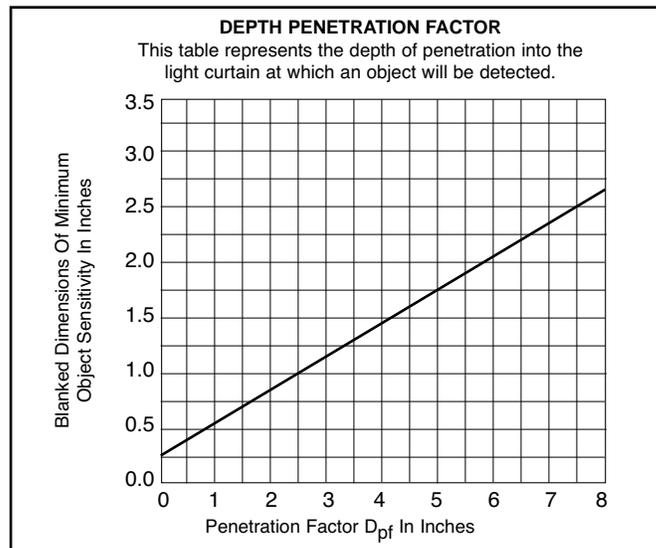
Note: $T_s + T_c$ are usually measured by a portable or built-in stop-time measuring device.

T_r = response time of the presence-sensing device and its interface, if any, as stated by the manufacturer or measured by the employer

T_{spm} = the additional time allowed for the stopping performance monitor to compensate for variations in the normal stopping time

D_{pf} = the added distance due to the penetration factor as recommended in Table 3.1. The minimum object sensitivity is stated by the manufacturer. If beam blankouts or floating window features are used, these figures should be added to the object sensitivity figure before using the chart

Table 3.1



Other Installation Considerations

WIRING

National Electrical Code practices, including NFPA-79, are usually followed for wiring the control system, especially color coding and the use of numbered wire markers on **both ends of every wire**. Color coding is black for line voltage and control at line voltage, red for 120 VAC control circuits, blue for 24 VDC control circuits, white for current carrying ground (commonly referred to as the neutral), and green for any equipment grounding conductor. All terminal blocks in the control cabinet are color coded for easy identification.

1. Install and wire the main disconnect switch (unless one already exists or is furnished in a custom control) using black wire. Follow wiring instructions shown on the electrical schematics. Make certain this switch is capable of being locked in the off position **only**.
2. Install and wire the motor starter (unless one already exists or is installed in a custom control box) using black wire for the power; red and white wires for the coil and interlock circuit; and blue for the motor forward connection to the RHPC control module.
3. All necessary outputs from the RHPC control module are wired from the green printed circuit board to the terminal block. All necessary inputs need to be wired to the green printed circuit board terminal strip P8 for installation.
4. Run two black power lines (any two lines) from the load side of the disconnect switch (or from the line side of the motor starter) to the control enclosure. Connect the two black wires to the proper terminals on the control transformer (see electrical schematic or transformer nameplate for proper connections for different primary voltages). *Note: If a custom control box with a disconnect has been provided, this step is not necessary.*
5. Run a green ground wire from the incoming system ground to the control panel.
6. Wire the motor starter and start/stop control according to the connection schematics. *Note: If a custom control box with a starter has been provided, this step is not necessary.*

KEYPAD/DISPLAY—REMOTE

If the keypad/display is furnished in a remote station, an optional seven-conductor shielded cable can be run in conduit or sealtite with other low voltage signal conductors. This cable carries low voltage signals and should not be located near or in the same conduit or raceway with conductors for main power feeds or motor leads. 25' of cable is supplied as standard and can be cut to length if required. Do not splice or interrupt signals. The cable should be wired directly into the RHPC control module terminal strip P4, as shown in the schematic prints that were sent with the control box. Please contact the factory if a longer cable is required.

PALM BUTTON ASSEMBLY

These palm buttons are normally wired as an assembly with the blue wires routed from the control box to the nearest palm button and then the others, as required, within the units. Wires between the two run/inch buttons are not connected back to the control box. If Touchdown™ (proximity) palm buttons are furnished, please refer to the enclosed Installation Manual No. KSL-073 and the connection print.

If the palm button assembly is not bolted directly to the machine frame, then a separate green ground wire should be run from the control box to all palm buttons. Attach one end of the wire to each mounting box by a lug under one of the mounting bolts and the other end of the wire to the GND terminal in the control box to assure proper grounding.

These operator controls should be mounted in a convenient location, keeping ergonomics in mind. To comply with ANSI standards for two-hand controls, the run/inch buttons must be located according to the minimum safety distance requirements of each individual machine as defined by the standard (see page 22 of this manual). A stop-time measurement unit is necessary for checking stopping time before installation begins. The palm button assembly must be fixed at the proper safety distance so that only a supervisor or safety engineer is capable of relocating them.

SECTION 3—COMPONENTS AND INSTALLATION

RHPC Hydraulic Press Solid-State Control

Other Installation Considerations (continued)

SUPERVISORY CONTROL STATION (SEE PAGE 24)

When two or more two-hand or foot switch operating stations are required on one machine, one supervisory control station is required at each operator station. This remote control station consists of one station on indicator light and a key-locked off/on selector switch in an enclosure. The on position allows the operator to use that station and the off position deactivates only that station. If all the supervisory control stations are in the on position, all two-hand palm buttons must be depressed within the timing period set in the anti-tie-down (page 53) program in order to initiate a machine stroke. These supervisory control stations must be wired to prevent actuation of the clutch if all operating stations are turned off and controls are operational. See wiring schematics for proper wiring of these supervisory control stations.



Do not operate the press if the ground indicator light does not illuminate when the station is turned on.

PRESS GROUND

The machine frame must always be firmly connected to ground in order to ensure that the control potential will never exceed 120 volts above ground. Run a green grounding wire from the control box to some convenient location directly on the machine frame. Connect one end solidly to the frame using a mounting bolt or other convenient means of attachment. Scrape any paint, rust, etc., from the area, to ensure an adequate ground connection. Connect the other end to the GND terminal in the control box.

Note: All exposed metal components, which may be touched by personnel during normal operation or adjustment, must be firmly grounded to the machine frame. The disconnect switch and motor starter should also be grounded if they are mounted separately.

Setup and Programming

Before programming this control, an understanding is required as to how this control monitors its inputs. It is also important to understand that certain settings in the control require the correct input variable to produce an output.

This control system can be used with limit switches (default) or an encoder (purchased separately) to monitor top of stroke, bottom of stroke, speed change, and muting. Depending on the method, these functions may need to be programmed accordingly.

Limit Switches (Default)—The logic (N.O. & N.C.) has been preset in the software and cannot be set in the control. Refer to the electrical schematic for the correct wiring.

Encoder—A separate encoder is needed in order to use the extra functions that the encoder allows. ENCODER ENABLE must be turned ON in order to use the encoder functions. See step #5 in the power-up procedures (pages 30-32) to turn the encoder ON and OFF. Also refer to pages 61-62 in the configuration menu in the SYSTEM SETUP section.

The flowchart in Figures 4.0 and 4.1 outline the order and method of setting up and programming the RHPC hydraulic press control system after installation. Use the keypad and display on the control box or remote operator station for viewing screens and for programming.

Figure 4.0—Programming Flowchart

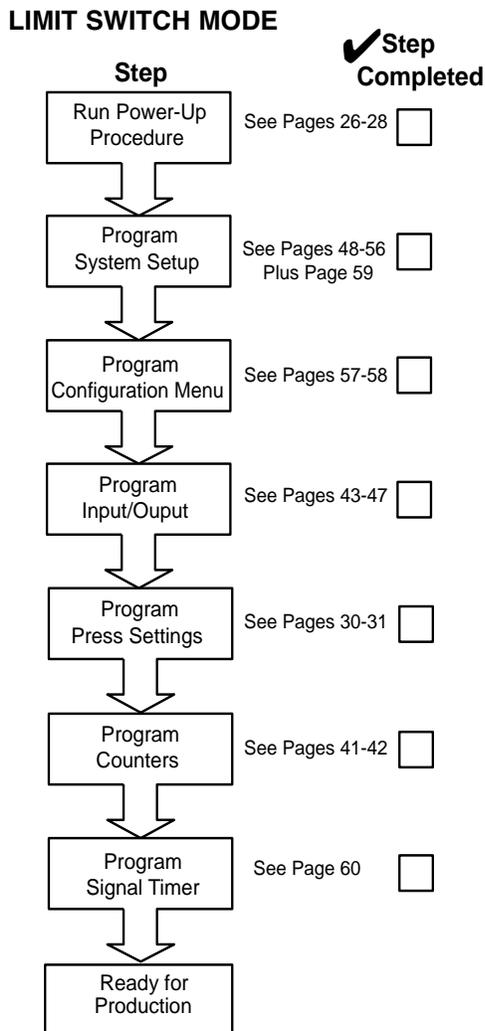
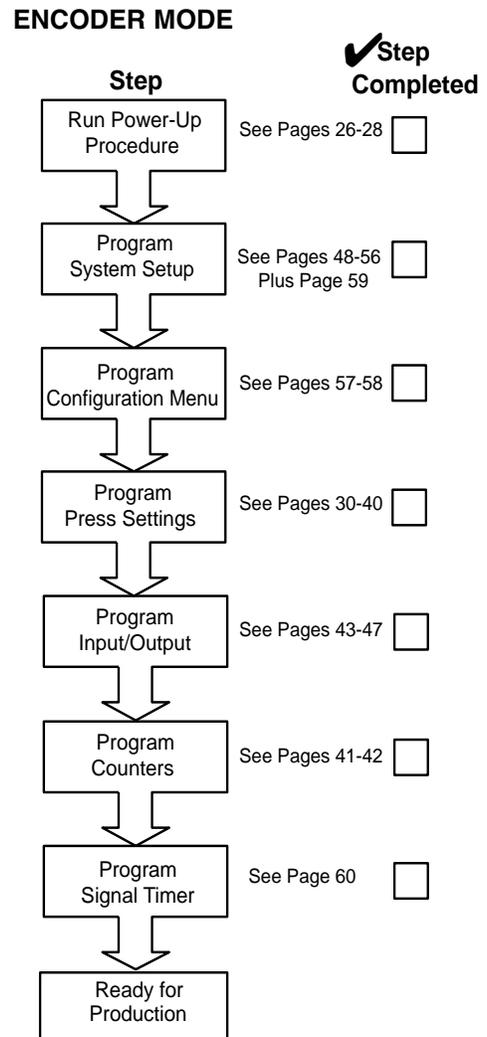


Figure 4.1—Programming Flowchart



SECTION 4—PROGRAMMING

RHPC Hydraulic Press Solid-State Control

Power-Up Procedure

1. Turn on the main power disconnect that supplies power to the machine and control module. The following screen will be displayed.

SSC-1500
RHPC PRESS CONTROL
Version-xxx
Safeguards in place?

NOTE: If you are receiving tech. support over the phone and are asked for the software version of your press control module, simply turn off the main disconnect to this machine and turn it back on. The above message appears every time the power is turned on to the control module.

2. Press YES on the keypad if safeguards are in place. The following message appears.

READY TO START

PRESS START

Start the motor. If this message does not clear once the motor has started, then the control's inputs are not receiving or are missing the correct signal. Check that the existing inputs are sinking (common). The default is set to sourcing inputs (24 V DC), and the JP1 jumper may need to be set to sinking. If the jumper is set to the wrong position, the above screen will be displayed and only CPU lights will be on the control.

3. The following screen is displayed when the Off/Prog/Run selector switch is in the OFF position.

	Current Program Position	
Mode	HAND	OFF (STOP)
Stroke Counter	TOTAL	000000
Batch Counter	BATCH	000000

4. Select the **PROG** position of the Off/Prog/Run selector switch. The two MAIN PROGRAM SCREENS will be displayed as shown.

#1. PRESS SETTINGS
2. COUNTERS
3. INPUT/OUTPUT
4. SYSTEM SETUP

5. SIGNAL TIMER

Use ↓ and ↑ on the keypad to scroll through the main program screens. See page 33 for more detailed information.

Go to step 6 on page 31 if limit switches (default) are being used, or continue on with step 5 below if an encoder device is being used.

5. **ENABLE THE ENCODER DEVICE**—When an encoder device is connected to the control module, ENCODER ENABLE must be turned ON in order to use the encoder functions. On the MAIN PROGRAM SCREEN, press **ENTER** when the pound symbol (#) is next to SYSTEM SETUP. The security code screen will be displayed as shown.

ENTER SECURITY CODE

_ CODE

Enter the security code (**ENTER** is the default setting).

The system setup screens will be displayed. Use ↓ and ↑ on the keypad to scroll through the system setup screens. Press **ENTER** when the arrow symbol (>) is next to CONFIGURATION. The supervisor code screen will be displayed as shown.

ENTER SUPRVSR CODE

_ CODE

(Continued on next page.)

Power-Up Procedure (cont.)

5. (continued)

Enter the supervisor code (1 is the default setting). Press **ENTER**.

The configuration screens will be displayed. Use ↓ and ↑ on the keypad to scroll through the configuration screens. Press **ENTER** when the double arrow symbol (>>) is next to ENCODER ENABLE. The encoder enable programming screen will be displayed as shown.

PROGRAMMING
Encoder Enable OFF

Use ↑ on the keypad to choose ON. Press **ENTER** to finish. The encoder is now enabled. Press **ESC** twice to return to the MAIN PROGRAM SCREEN.

HOME THE PRESS—Once the encoder is enabled or anytime hereafter that the power to the control has been turned off then on, you must HOME the press upon initial start up.

With power on to the control, and YES has been pressed on the keypad if safeguards are in place, select the **RUN** position of the Off/Prog/Run selector switch.

Select the **INCH** position of the Inch/Single/Auto mode selector switch. Simultaneously press and hold the right palm button and the yellow return button. At this point, if the press is already at TOS (top of stroke), the ram will start to move down for a preset amount of time and then will return to the home limit switch. The control will now be at 0 (HOME).

To program a new HOME time, see Home Off Time in SYSTEM SETUP under the configuration screen—pages 61-62.

Proceed to step 6, next column.

6. Safeguard parameters must be edited for control operations. On the MAIN PROGRAM SCREEN, press **ENTER** when the pound symbol (#) is next to SYSTEM SETUP. The security code screen will be displayed as shown.

ENTER SECURITY CODE
— CODE

Enter the security code (**ENTER** is the default setting).

The system setup screens will be displayed. Use ↓ and ↑ on the keypad to scroll through the system setup screens. Press **ENTER** when the arrow symbol (>) is next to CONFIGURATION. The supervisor code screen will be displayed as shown.

ENTER SUPRVSR CODE
— CODE

Enter the supervisor code (1 is the default setting). Press **ENTER**.

The configuration screens will be displayed. Use ↓ and ↑ on the keypad to scroll through the configuration screens. Press **ENTER** when the double arrow symbol (>>) is next to LIGHT CURTAIN TYPE. Use ↓ and ↑ on the keypad to reach the setting you desire for the light curtain type. **If light curtains are not used, verify that 2 N.O. is selected as the type and connect input 13 (Light Curtain Off) to the input signal (+24 or common).**

Press **ENTER** to finish. Go to step 7 on the next page.

(Continued on next page.)

SECTION 4—PROGRAMMING

RHPC Hydraulic Press Solid-State Control

Power-Up Procedure (cont.)

7. While in the configuration screen, use ↓ and ↑ on the keypad to scroll to SAFEGUARD FUNCTION. Press **ENTER** when the double arrow symbol (>>) symbol is next to SAFEGUARD FUNCTION. Use ↓ and ↑ on the keypad to choose the best option for your application from the two options available: *Always Required*—the light curtain will always be required unless it is not installed; or *Foot/Sing & Cont*—the light curtain will be required for those modes only.

Press **ENTER** to finish. Press **ESC** twice to return to the MAIN PROGRAM SCREEN.

8. If the control has been properly installed and the previous steps have been followed, then the **basic** control functions have been set and you are now ready for operation.

Turn the key switch to **RUN**. The screen will display the current operating configuration that has been selected.

To reprogram or verify a current setting, refer to pages 33 through 66 for detailed programming information.

Programming Overview

The following sections outline the programming of the RHPC press control on a hydraulic press after installation of all components has been completed, and the *Power-Up Procedure* and *Main Program Screens* sections of this manual have been read and understood.

MAIN PROGRAM SCREENS

The RHPC press control has two main programming screens from which you can access all of the programmable features of the control.

To program the control, select the **PROG** position of the Off/Prog/Run selector switch. The MAIN PROGRAM SCREENS will be displayed. A pound symbol (#) will be next to one of the following program options as shown.

<p>#1. PRESS SETTINGS 2. COUNTERS 3. INPUT/OUTPUT 4. SYSTEM SETUP</p>
<p>5. SIGNAL TIMER</p>

Use ↓ and ↑ on the keypad to scroll between the two main program screens.

When the pound symbol (#) is next to the program option you want to edit, press **ENTER**. Once the new information is input and **ESC** is pressed, the display returns to the MAIN PROGRAM SCREEN. If incorrect information has been entered, return to the setting and reenter the correct information.

Each main program option is described in detail on the following pages.

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SECTION 4—PROGRAMMING

RHPC Hydraulic Press Solid-State Control

PRESS SETTINGS

The press settings menu is for editing top of stroke, bottom of stroke, speed change, and muting.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to PRESS SETTINGS. The security code screen will be displayed. See Figure 4.2. Enter the security code. After the correct security code has been entered, the PRESS SETTINGS SCREEN(S) will be displayed.

The screen shown in Figure 4.3. is the screen that is displayed **without** the encoder enabled. The screens in Figures 4.4 through 4.6 are the screens that are displayed **with** the encoder enabled. Use ↓ and ↑ on the keypad to scroll between the press settings screens.

NOTE: Without the encoder enabled, BOTTOM DWELL is the only screen available to edit in PRESS SETTINGS.

Figure 4.2
Security Code Screen

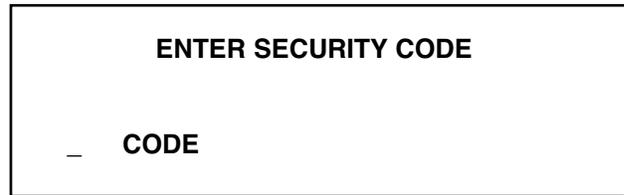


Figure 4.3
Press Settings Program Screen (Without Encoder Enabled)

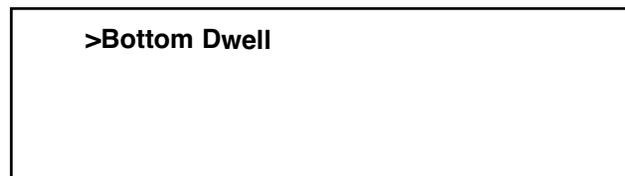


Figure 4.4
First Press Settings Program Screen (With Encoder Enabled)

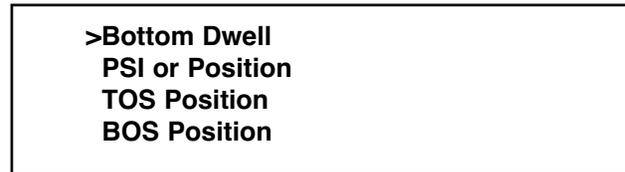


Figure 4.5
Second Press Settings Program Screen (With Encoder Enabled)

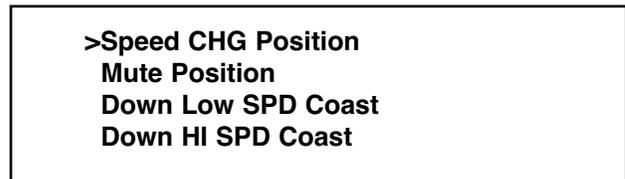


Figure 4.6
Third Press Settings Program Screen (With Encoder Enabled)



BOTTOM DWELL

This setting allows the press to stop or dwell at bottom of stroke under pressure for the selected amount of time up to 600 seconds. When the ram reaches the BOS (bottom of stroke) timing device, the down valve stays energized until the bottom dwell timer (if programmed) times out. Once the time runs out, the up valve will energize, returning the ram to the TOS (top of stroke) timing device.

NOTE: BOTTOM DWELL is the only screen available to edit in PRESS SETTINGS without the encoder enabled.

HOW TO PROGRAM BOTTOM DWELL

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to PRESS SETTINGS. The security code screen will be displayed. See Figure 4.7. Enter the security code. Use ↓ and ↑ on the keypad to scroll between the press settings screens. Press **ENTER** when the arrow symbol (>) is next to BOTTOM DWELL. The bottom dwell programming screen will be displayed. See Figure 4.8.

Enter the desired number of seconds up to 600 using the keypad. Press **ENTER** to finish.

If a mistake is made, press **BKSP** to backspace, or press **CLR** to delete the entry and start over, or press **ESC** to stop and return to the programming screen.

Press **ESC** to return to the MAIN PROGRAM SCREEN.

Figure 4.7
Security Code Screen

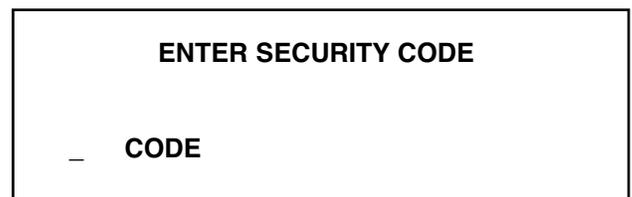
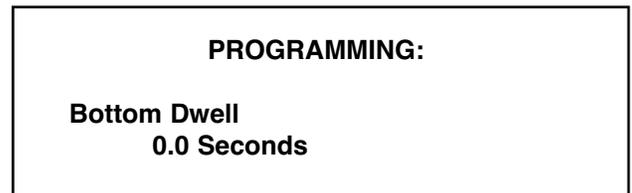


Figure 4.8
Bottom Dwell Screen



SECTION 4—PROGRAMMING

RHPC Hydraulic Press Solid-State Control

PSI or POSITION

This setting allows selection of returning under pressure or position.

NOTE: This **PRESS SETTING** screen is available to edit only when the encoder is enabled.

HOW TO PROGRAM PSI OR POSITION

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to PRESS SETTINGS. The security code screen will be displayed. See Figure 4.9. Enter the security code. Use ↓ and ↑ on the keypad to scroll between the press settings screens. Press **ENTER** when the arrow symbol (>) is next to PSI or POSITION. The PSI or position programming screen will be displayed. See Figure 4.10.

Toggle between ↓ and ↑ on the keypad to choose position or pressure. Press **ENTER** to finish.

Press **ESC** to return to the MAIN PROGRAM SCREEN.

Figure 4.9
Security Code Screen

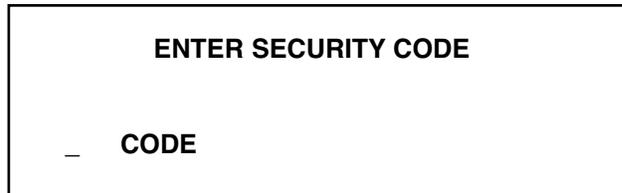
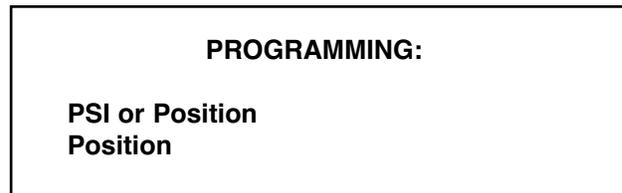


Figure 4.10
PSI or Position Screen



TOP OF STROKE POSITION

This setting determines the position of the TOS (top of stroke) from 0 to 30 inches.

NOTE: This PRESS SETTING screen is available to edit only when the encoder is enabled.

HOW TO PROGRAM TOS POSITION

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to PRESS SETTINGS. The security code screen will be displayed. See Figure 4.11. Enter the security code. Use ↓ and ↑ on the keypad to scroll between the press settings screens. Press **ENTER** when the arrow symbol (>) is next to TOS POSITION. The top of stroke position programming screen will be displayed. See Figure 4.12.

Enter the desired number of inches up to 30 using the keypad. Press **ENTER** to finish.

If a mistake is made, press **BKSP** to backspace, or press **CLR** to delete the entry and start over, or press **ESC** to stop and return to the programming screen.

Press **ESC** to return to the MAIN PROGRAM SCREEN.

Figure 4.11
Security Code Screen

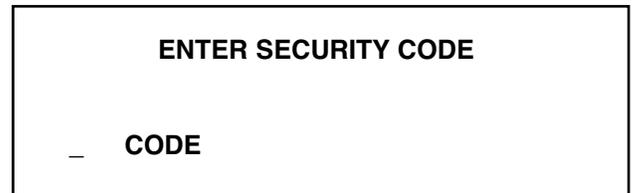
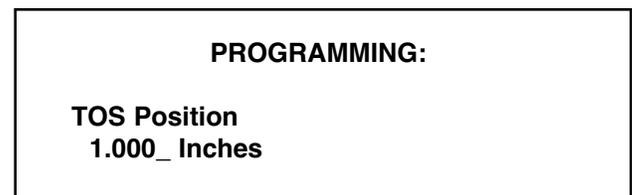


Figure 4.12
Top of Stroke Position Screen



SECTION 4—PROGRAMMING

RHPC Hydraulic Press Solid-State Control

BOTTOM OF STROKE POSITION

This setting determines the position of the BOS (bottom of stroke) from 0 to 30 inches.

NOTE: This PRESS SETTING screen is available to edit only when the encoder is enabled.

HOW TO PROGRAM BOS POSITION

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to PRESS SETTINGS. The security code screen will be displayed. See Figure 4.13. Enter the security code. Use ↓ and ↑ on the keypad to scroll between the press settings screens. Press **ENTER** when the arrow symbol (>) is next to BOS POSITION. The bottom of stroke position programming screen will be displayed. See Figure 4.14.

Enter the desired number of inches up to 30 using the keypad. Press **ENTER** to finish.

If a mistake is made, press **BKSP** to backspace, or press **CLR** to delete the entry and start over, or press **ESC** to stop and return to the programming screen.

Press **ESC** to return to the MAIN PROGRAM SCREEN.

Figure 4.13
Security Code Screen

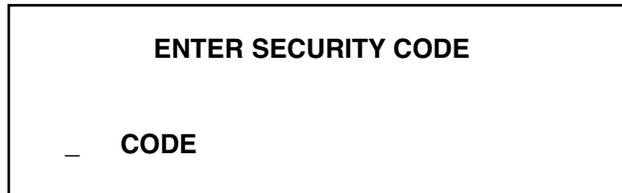
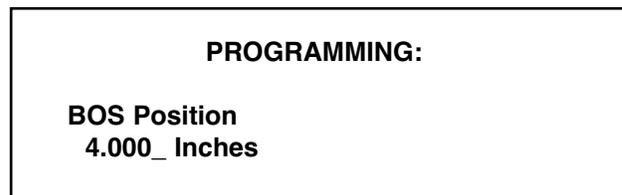


Figure 4.14
Bottom of Stroke Position Screen



SPEED CHANGE POSITION

This setting determines at what position the speed will change (from 0 to 30 inches).

NOTE: This PRESS SETTING screen is available to edit only when the encoder is enabled.

HOW TO PROGRAM SPEED CHANGE POSITION

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to PRESS SETTINGS. The security code screen will be displayed. See Figure 4.15. Enter the security code. Use ↓ and ↑ on the keypad to scroll between the press settings screens. Press **ENTER** when the arrow symbol (>) is next to SPEED CHG POSITION. The speed change position programming screen will be displayed. See Figure 4.16.

Enter the desired number of inches up to 30 using the keypad. Press **ENTER** to finish.

If a mistake is made, press **BKSP** to backspace, or press **CLR** to delete the entry and start over, or press **ESC** to stop and return to the programming screen.

Press **ESC** to return to the MAIN PROGRAM SCREEN.

Figure 4.15
Security Code Screen

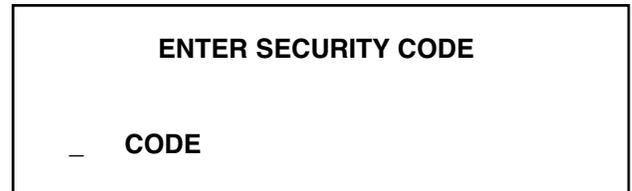
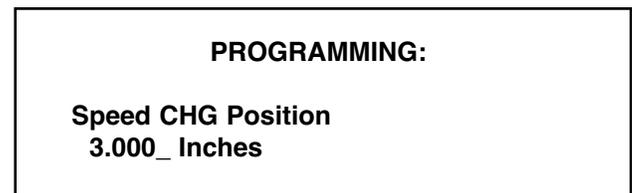


Figure 4.16
Speed Change Position Screen



SECTION 4—PROGRAMMING

RHPC Hydraulic Press Solid-State Control

MUTE POSITION

This setting determines at what position muting will occur (from 0 to 30 inches).

NOTE: This PRESS SETTING screen is available to edit only when the encoder is enabled.

HOW TO PROGRAM MUTE POSITION

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to PRESS SETTINGS. The security code screen will be displayed. See Figure 4.17. Enter the security code. Use ↓ and ↑ on the keypad to scroll between the press settings screens. Press **ENTER** when the arrow symbol (>) is next to MUTE POSITION. The mute position programming screen will be displayed. See Figure 4.18.

Enter the desired number of inches up to 30 using the keypad. Press **ENTER** to finish.

If a mistake is made, press **BKSP** to backspace, or press **CLR** to delete the entry and start over, or press **ESC** to stop and return to the programming screen.

Press **ESC** to return to the MAIN PROGRAM SCREEN.

Figure 4.17
Security Code Screen

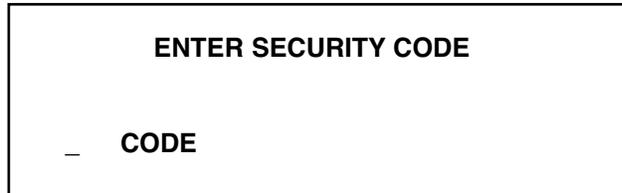
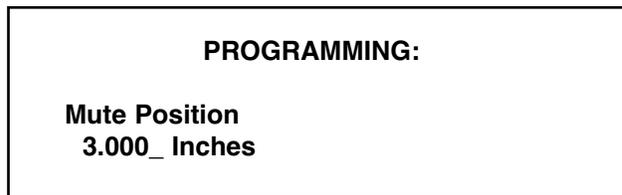


Figure 4.18
Mute Position Screen



DOWN LOW SPEED COAST

This setting allows selection of a low speed offset if the press is not stopping at its bottom of stroke position in low speed (up to 1 inch).

NOTE: This **PRESS SETTING** screen is available to edit only when the encoder is enabled.

HOW TO PROGRAM DOWN LOW SPEED COAST

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

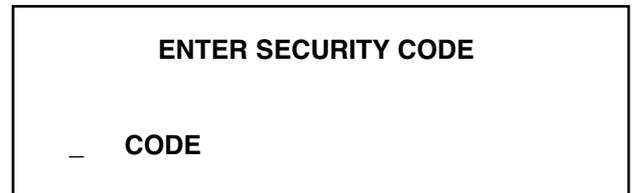
On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to **PRESS SETTINGS**. The security code screen will be displayed. See Figure 4.19. Enter the security code. Use ↓ and ↑ on the keypad to scroll between the press settings screens. Press **ENTER** when the arrow symbol (>) is next to **DOWN LOW SPD COAST**. The down low speed coast programming screen will be displayed. See Figure 4.20.

Enter the desired number up to 1 inch using the keypad. Press **ENTER** to finish.

If a mistake is made, press **BKSP** to backspace, or press **CLR** to delete the entry and start over, or press **ESC** to stop and return to the programming screen.

Press **ESC** to return to the MAIN PROGRAM SCREEN.

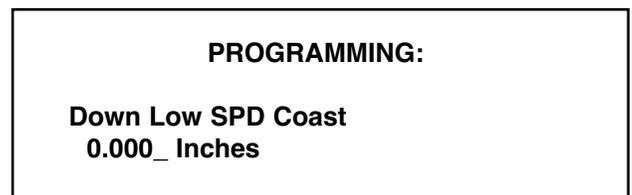
Figure 4.19
Security Code Screen



ENTER SECURITY CODE

_ CODE

Figure 4.20
Down Low Speed Coast Screen



PROGRAMMING:

Down Low SPD Coast
0.000_ Inches

SECTION 4—PROGRAMMING

RHPC Hydraulic Press Solid-State Control

DOWN HIGH SPEED COAST

This setting allows selection of a high speed offset if the press is not stopping at its bottom of stroke position in high speed (up to 1 inch).

NOTE: This **PRESS SETTING** screen is available to edit only when the encoder is enabled.

HOW TO PROGRAM DOWN HIGH SPEED COAST

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to PRESS SETTINGS. The security code screen will be displayed. See Figure 4.21. Enter the security code. Use ↓ and ↑ on the keypad to scroll between the press settings screens. Press **ENTER** when the arrow symbol (>) is next to DOWN HI SPD COAST. The down high speed coast programming screen will be displayed. See Figure 4.22.

Enter the desired number up to 1 inch using the keypad. Press **ENTER** to finish.

If a mistake is made, press **BKSP** to backspace, or press **CLR** to delete the entry and start over, or press **ESC** to stop and return to the programming screen.

Press **ESC** to return to the MAIN PROGRAM SCREEN.

Figure 4.21
Security Code Screen

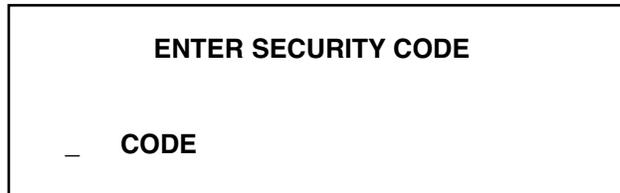
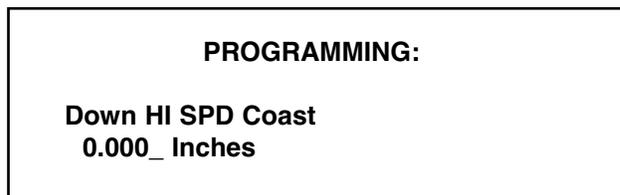


Figure 4.22
Down High Speed Coast Screen



UP LOW SPEED COAST

This setting allows selection of a low speed offset if the press is not stopping at its top of stroke position in low speed (up to 1 inch).

NOTE: This PRESS SETTING screen is available to edit only when the encoder is enabled.

HOW TO PROGRAM UP LOW SPEED COAST

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to PRESS SETTINGS. The security code screen will be displayed. See Figure 4.23. Enter the security code. Use ↓ and ↑ on the keypad to scroll between the press settings screens. Press **ENTER** when the arrow symbol (>) is next to UP LOW SPD COAST. The up low speed coast programming screen will be displayed. See Figure 4.24.

Enter the desired number up to 1 inch using the keypad. Press **ENTER** to finish.

If a mistake is made, press **BKSP** to backspace, or press **CLR** to delete the entry and start over, or press **ESC** to stop and return to the programming screen.

Press **ESC** to return to the MAIN PROGRAM SCREEN.

Figure 4.23
Security Code Screen

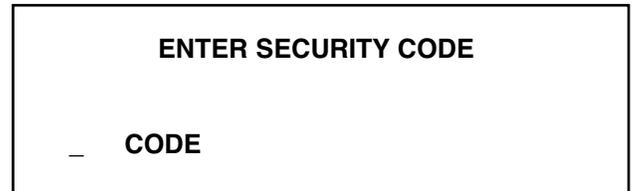


Figure 4.24
Up Low Speed Coast Screen



SECTION 4—PROGRAMMING

RHPC Hydraulic Press Solid-State Control

UP HIGH SPEED COAST

This setting allows selection of a high speed offset if the press is not stopping at its top of stroke position in high speed (up to 1 inch).

NOTE: This **PRESS SETTING** screen is available to edit only when the encoder is enabled.

HOW TO PROGRAM UP HIGH SPEED COAST

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to PRESS SETTINGS. The security code screen will be displayed. See Figure 4.25. Enter the security code. Use ↓ and ↑ on the keypad to scroll between the press settings screens. Press **ENTER** when the arrow symbol (>) is next to UP HI SPD COAST. The up high speed coast programming screen will be displayed. See Figure 4.26.

Enter the desired number up to 1 inch using the keypad. Press **ENTER** to finish.

If a mistake is made, press **BKSP** to backspace, or press **CLR** to delete the entry and start over, or press **ESC** to stop and return to the programming screen.

Press **ESC** to return to the MAIN PROGRAM SCREEN.

Figure 4.25
Security Code Screen

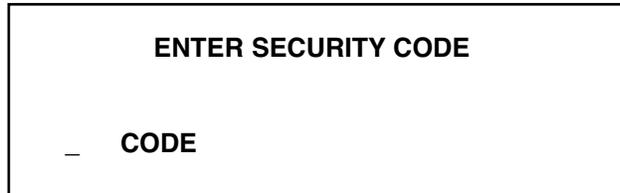
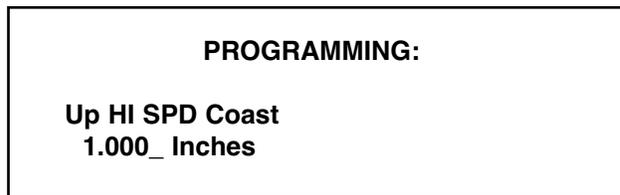


Figure 4.26
Up High Speed Coast Screen



COUNTERS

The RHPC hydraulic control has a batch counter that can be used for die maintenance, quality control checks, or part bin exchanges. These counters have a programmable preset that will signal the press to top stop when the preset is reached. There is also a total clear which has security code protection.

When the batch counter has reached its preset value and **BATCH COUNT EXPIRED** is displayed, the machine will not operate until the message has been acknowledged by the operator—press ENTER, CLR, or ESC on the keypad.

HOW TO PROGRAM THE COUNTERS

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to COUNTERS. The security code screen will be displayed. See Figure 4.27. You will be prompted to enter the security code.

After the correct security code has been entered, the COUNTER PROGRAM SCREEN will be displayed. See Figure 4.28.

To clear the batch counter:

Use ↓ and ↑ on the keypad to scroll up and down. Press **ENTER** when the arrow symbol (>) is next to BATCH CLEAR. You will see the clear batch counter screen. See Figure 4.30.

Press **YES** to confirm; the counter will be cleared and will return to the COUNTER PROGRAM SCREEN.

Press **NO** to return to the COUNTER PROGRAM SCREEN.

To enter a batch preset:

Use ↓ and ↑ on the keypad to scroll up and down. Press **ENTER** when the arrow symbol (>) is next to BATCH PRESET. You will see the batch preset programming screen. See Figure 4.29.

After you have entered a preset value, press **ENTER** to finish. This will bring you back to the COUNTER PROGRAM SCREEN.

Figure 4.27
Security Code Screen

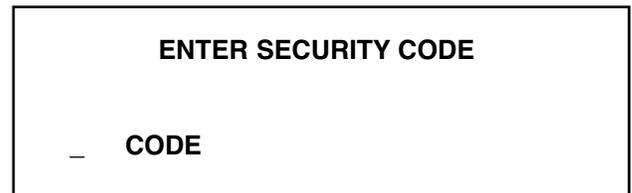


Figure 4.28
Counter Program Screen



Figure 4.29
Batch Preset Screen

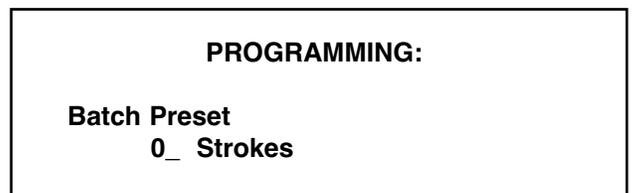
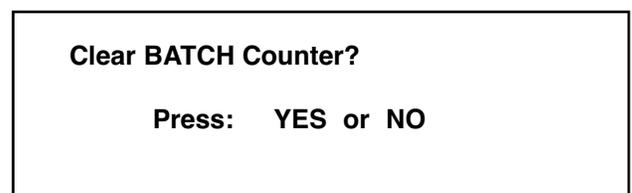


Figure 4.30
Clear Batch Counter Screen



(Continued on next page.)

SECTION 4—PROGRAMMING

RHPC Hydraulic Press Solid-State Control

HOW TO PROGRAM THE COUNTERS (continued)

To clear the total counter:

Use ↓ and ↑ on the keypad to scroll up and down. Press **ENTER** when the arrow symbol (>) is next to TOTAL CLEAR. The Security Code Screen will be displayed. See Figure 4.31. You will be prompted to enter the security code.

After the correct security code has been entered, you will see the CLEAR TOTAL COUNTER SCREEN which also displays the total counter. See Figure 4.32.

To only view the counter and not clear it, press **NO** to return to the COUNTER PROGRAM SCREEN.

To clear the total counter, press **YES** to confirm; the counter will be cleared and will return to the COUNTER PROGRAM SCREEN.

Press **ESC** when finished to return to the MAIN PROGRAM SCREEN.

Figure 4.31
Security Code Screen

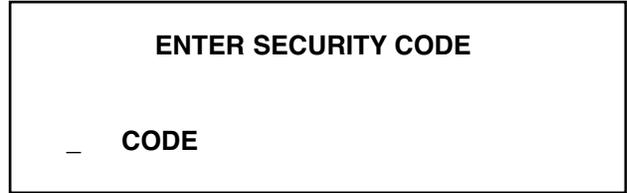
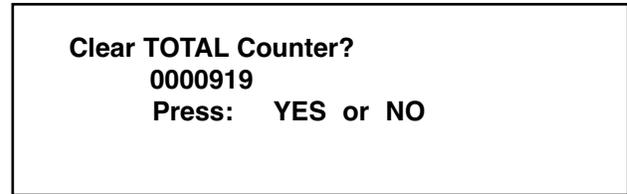


Figure 4.32
Clear Total Counter Screen



INPUT/OUTPUT

The RHPC press control has four (4) static-type programmable user inputs that can be programmed for equipment monitoring or other user-defined functions. See page 48 for programming information.

NOTE: If the optional ethernet I/O (Input/Output) card was added, there will be eight (8) additional programmable user inputs and four (4) PLS (programmable limit switch) outputs. See pages 49-51 for programming information.

Static-type means that when the inputs are set to be on, they are continuously monitoring for a change of state in the logic. When a change of state occurs, the input will go true, and the control will stop the machine. The static-type inputs are intended to diagnose fault conditions of auxiliary equipment specific to the machine, such as clutch/brake air pressure fault, counterbalance air pressure fault, and dual solenoid fault.

There are three (3) parameters that can be programmed for the three static-type inputs. All inputs are 24 V DC current-sinking (NPN) inputs.

PROGRAMMABLE PARAMETERS FOR USER INPUTS

- 1. Logic:** This setting is used to change the logic that activates the input. The programming choices are N.O. (normally open), N.C. (normally closed), and OFF (disabled). Select one setting for each input.
- 2. Stop Type:** When the input is activated or goes true, the press cycle will stop in one of two ways. E-STOP (emergency stop) will immediately stop the cycle in progress. T-STOP (top stop) will stop the cycle in progress at TDC (top dead center). Select the type of stop that is required for each input.
- 3. Message:** When the input is activated, a fault message is displayed. This fault message is assigned to the input according to its function. Figure 4.33 shows a list of fault messages that can be assigned to each input.

Figure 4.33
User Input Fault Messages

LUBE FAULT
HIGH LUBE PRESSURE
LOW LUBE PRESSURE
LOW LUBE LEVEL
MAIN MOTOR OVERLOAD
LUBE MOTOR OVERLOAD
AUX MOTOR OVERLOAD
GUARD INTERLOCK OPEN
FRONT GUARD OPEN
REAR GUARD OPEN
LEFT SIDE GUARD OPEN
RIGHT SIDE GRD OPEN
FEEDER FAULT
LOAD MONITOR FAULT
SAFETY BLK INTERLOCK
DIE PROTECTION FAULT
HYD OVERLOAD FAULT
HYD SYS OIL LEV LOW
SHORT FEED FAULT
PART EJECTION FAULT
STOCK BUCKLE FAULT
END OF STOCK FAULT
PILOT PIN FAULT

(Continued on next page.)

SECTION 4—PROGRAMMING

RHPC Hydraulic Press Solid-State Control

FOLLOW THESE STEPS *WITHOUT* THE OPTIONAL ETHERNET I/O CARD

HOW TO PROGRAM USER INPUTS 1-4

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to INPUT/OUTPUT. The security code screen will be displayed. See Figure 4.34. Enter the security code.

Press **ENTER** when the arrow symbol (>) is next to USER INPUTS. The user inputs screen will be displayed. See Figure 4.35.

Press **ENTER** when the arrow symbol (>) is next to the user input you want to program. The PROGRAMMABLE PARAMETERS SCREEN shown in Figure 4.36 will be displayed. **If EXTN RELAY MONITOR is turned on and/or AUTO SINGLE MODE is turned on, you will not be able to program user inputs #3 and #4 respectively.**

Use ↓ and ↑ on the keypad to scroll through the programmable parameters. Press **ENTER** when the double arrow symbol (>>) is next to the parameter you want to program. A screen similar to the one shown in Figure 4.37 will be displayed.

Once you are in the programming screen of the parameter you want to program, use ↓ and ↑ on the keypad to reach the setting you desire for that parameter. Press **ENTER** to finish.

Press **ESC** to return to the MAIN PROGRAM SCREEN.

Note: The appropriate user input terminals in the control box must be wired so they correspond to the assigned fault messages. If the order of the messages is changed or if other fault messages are assigned, the connections to the terminal strip must also be rearranged to reflect the changes.

Figure 4.34
Security Code Screen

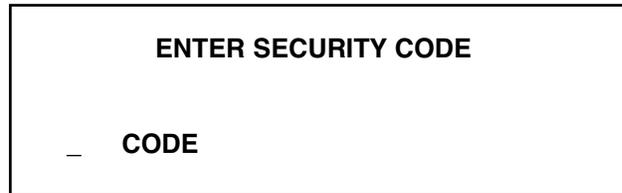


Figure 4.35
User Inputs Screen



Figure 4.36
Programmable Parameters

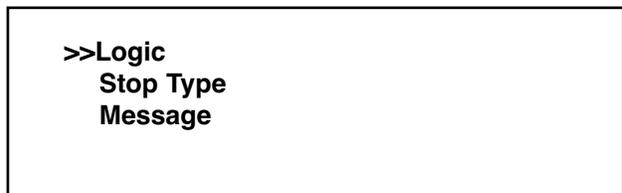
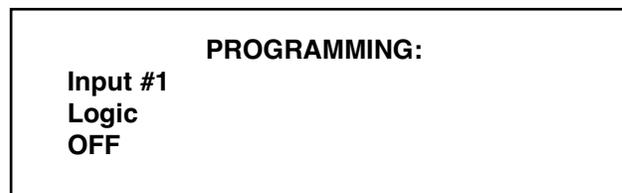


Figure 4.37
Example of a Programming Screen



FOLLOW THESE STEPS WITH THE OPTIONAL ETHERNET I/O CARD

HOW TO ENABLE OPTIONAL ETHERNET I/O CARD, AND HOW TO PROGRAM USER INPUTS 1-12 AND PLS OUTPUTS 1-4

To Enable Optional Ethernet I/O Card:

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to SYSTEM SETUP. The security code screen will be displayed. See Figure 4.38. Enter the security code.

Use ↓ and ↑ on the keypad to scroll through the system setup screens. Press **ENTER** when the arrow symbol (>) is next to CONFIGURATION. The supervisor code screen will be displayed. See Figure 4.39. Enter the supervisor code. The configuration screens will be displayed. See Figures 4.40 through 4.43. Use ↓ and ↑ on the keypad to scroll between the configuration screens.

Press **ENTER** when the arrow symbol (>>) is next to ETHERNET IO ENABLE. Toggle between ↓ and ↑ on the keypad to choose ON or OFF. Choose ON and press **ENTER** to finish.

Press **ESC** twice to return to the MAIN PROGRAM SCREEN. Proceed to programming user inputs and PLS outputs on the next two pages.

Figure 4.38
Security Code Screen

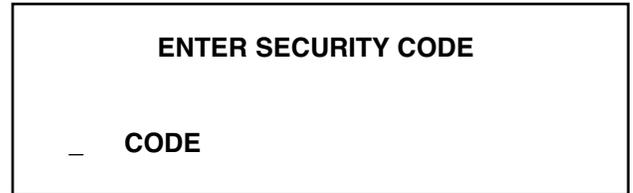


Figure 4.39
Supervisor Code Screen

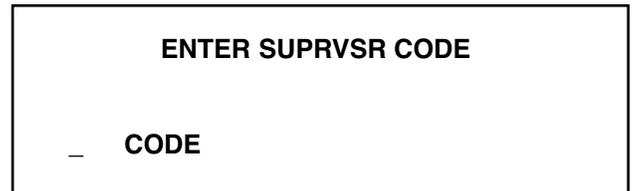


Figure 4.40
First Configuration Screen

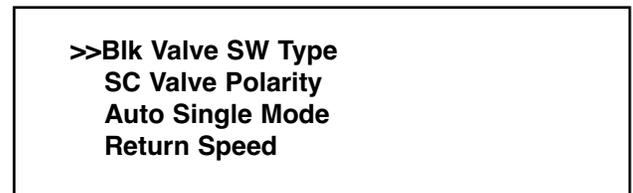


Figure 4.41
Second Configuration Screen



Figure 4.42
Third Configuration Screen

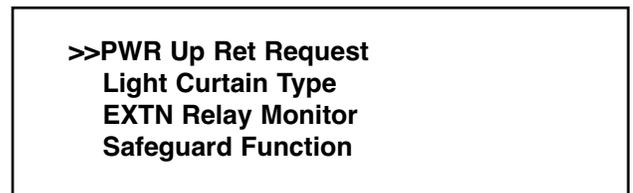
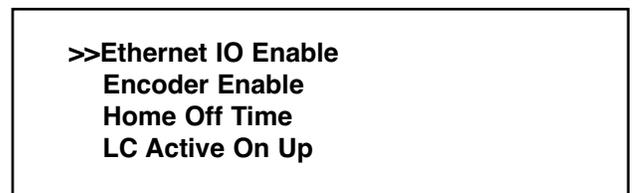


Figure 4.43
Fourth Configuration Screen



(Continued on next page.)

SECTION 4—PROGRAMMING

RHPC Hydraulic Press Solid-State Control

FOLLOW THESE STEPS WITH THE OPTIONAL ETHERNET I/O CARD (continued)

To Program User Inputs 1-12:

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to INPUT/OUTPUT. The security code screen will be displayed. See Figure 4.44. Enter the security code.

Press **ENTER** when the arrow symbol (>) is next to USER INPUTS. The user inputs screens will be displayed. See Figures 4.45. through 4.47. Use ↓ and ↑ on the keypad to scroll between the user input screens.

Press **ENTER** when the arrow symbol (>) is next to the user input you want to program. The PROGRAMMABLE PARAMETERS SCREEN shown in Figure 4.48 will be displayed. Use ↓ and ↑ on the keypad to scroll through the programmable parameters. **If EXTN RELAY MONITOR is turned on and/or AUTO SINGLE MODE is turned on, you will not be able to program user inputs #3 and #4 respectively.**

Press **ENTER** when the double arrow symbol (>>) is next to the parameter you want to program. A screen similar to the one shown in Figure 4.49 will be displayed.

Once you are in the programming screen of the parameter you want to program, use ↓ and ↑ on the keypad to reach the setting you desire for that parameter. Press **ENTER** to finish.

Press **ESC** until you return to the MAIN PROGRAM SCREEN.

Note: The appropriate user input terminals in the control box must be wired so they correspond to the assigned fault messages. If the order of the messages is changed or if other fault messages are assigned, the connections to the terminal strip must also be rearranged to reflect the changes.

Figure 4.44
Security Code Screen

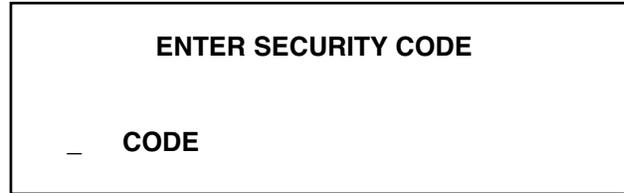


Figure 4.45
First User Inputs Screen



Figure 4.46
Second User Inputs Screen



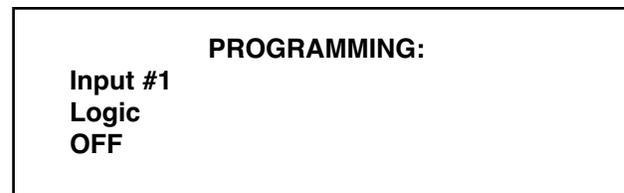
Figure 4.47
Third User Inputs Screen



Figure 4.48
Programmable Parameters



Figure 4.49
Example of a Programming Screen



(Continued on next page.)

FOLLOW THESE STEPS WITH THE OPTIONAL ETHERNET I/O CARD (continued)

PLS Outputs

The RHPC press control provides four (4) PLS (programmable limit switch) outputs which are fused at 4 amp 120 VAC. These user programmable outputs can be used to sequence events during the press stroke.

The PLS outputs can be used for automatic operations such as lube mist, air blowoff, or feed initiation. Each output can be programmed to turn on or off on the downstroke, upstroke, or both. The PLS outputs can be programmed by time if you are using limit switches, or by position if you are using an encoder.

LIMIT SWITCH—To activate a PLS, you must tell the control when to turn the PLS on by setting a down delay in milliseconds. Next, you must tell the control how long to keep the PLS on by setting a down duration in milliseconds. To turn a PLS on or off on the upstroke, you must set an up delay, up duration, and off delay.

ENCODER—To activate a PLS, you must tell the control when to turn the PLS on by setting a down on position. Next you must tell the control when to turn the PLS off by setting a down off position. To turn a PLS on or off for the upstroke, you must set an up on position and an up off position.

To turn a PLS on or off during the downstroke and upstroke, choose PLS TYPE as down, up, or both. You can also choose to keep the PLS on or off when the press is stopped. This applies to limit switch use and encoder use.

To Program PLS Outputs 1-4:

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to INPUT/OUTPUT. The security code screen will be displayed. See Figure 4.50. Enter the security code.

Press **ENTER** when the arrow symbol (>) is next to PLS OUTPUTS. The PLS output screen will be displayed. See Figure 4.51.

Press **ENTER** when the arrow symbol (>) is next to the PLS output you want to program. The PROGRAMMABLE PARAMETERS SCREENS shown in Figures 4.52 and 4.53 will be displayed (time screens when using limit switches, or position screens when using an encoder). Use ↓ and ↑ on the keypad to scroll through the programmable parameters screens.

Press **ENTER** when the double arrow symbol (>>) is next to the parameter you want to program. Use ↓ and ↑ on the keypad to reach the setting you desire for that parameter, or use the keypad to enter a numeric setting. Press **ENTER** to finish.

Press **ESC** until you return to the MAIN PROGRAM SCREEN.

Figure 4.50
Security Code Screen

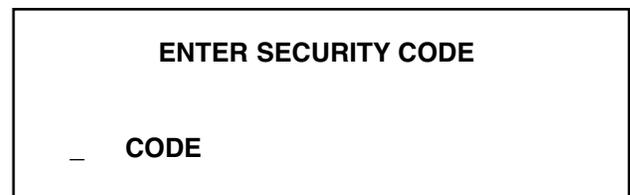


Figure 4.51
PLS Output Screen

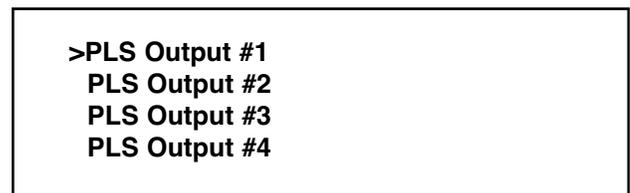


Figure 4.52—First Programmable Parameters Screen

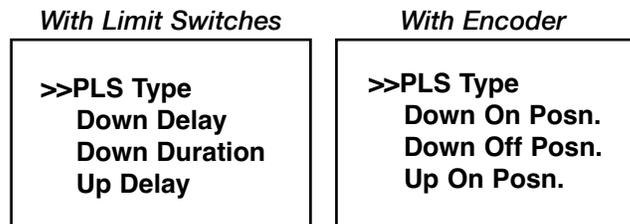
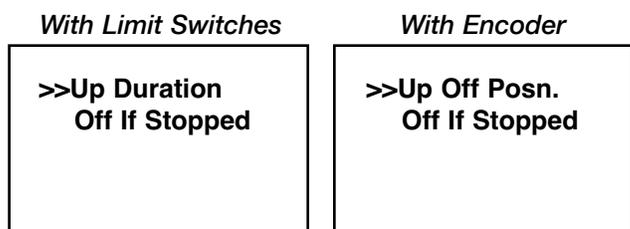


Figure 4.53—Second Programmable Parameters Screen



SECTION 4—PROGRAMMING

RHPC Hydraulic Press Solid-State Control

SYSTEM SETUP

The RHPC press control has system setup screens that are used to edit operating preferences and parameters.

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to SYSTEM SETUP. The security code screen will be displayed. See Figure 4.54. Enter the security code.

After the correct security code has been entered, one of the SYSTEM SETUP SCREENS will be displayed. See Figures 4.54 through 4.57.

Use ↓ and ↑ on the keypad to scroll through the system setup screens. Press **ENTER** when the arrow symbol (>) is next to the setting to be programmed.

Figure 4.54
Security Code Screen

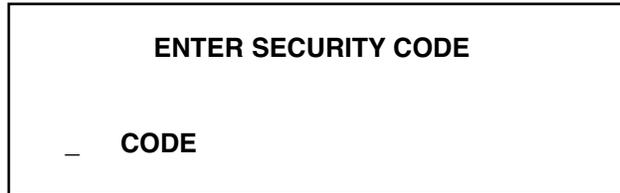


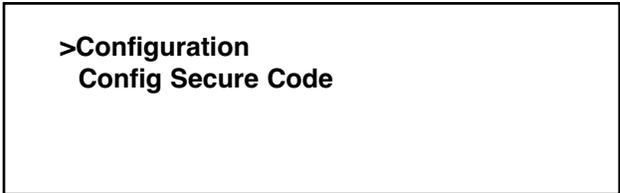
Figure 4.55
First System Setup Screen



Figure 4.56
Second System Setup Screen



Figure 4.57
Third System Setup Screen



ANTI-TIE-DOWN

When beginning a machine stroke, all actuating means [palm buttons or foot switch(es)] must be operated concurrently. This means that the operator(s) must depress all actuating means within the set time in order to start the machine stroke. As soon as any one of the actuating means is operated, the timer starts. The time for this setting depends on the number of operators. The range of 100-7000 ms allows enough time for single or multiple operators to operate all actuating means. The typical setting for one operator is 250 ms or $\frac{1}{4}$ of a second (factory setting).

HOW TO PROGRAM ANTI-TIE-DOWN

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to SYSTEM SETUP. The security code screen will be displayed. See Figure 4.58. Enter the security code.

After the correct security code has been entered, the SYSTEM SETUP SCREEN will be displayed. Use ↓ and ↑ on the keypad to scroll up and down. Press **ENTER** when the arrow symbol (>) is next to Anti-Tie-Down. The ANTI-TIE-DOWN SCREEN will be displayed. See Figure 4.59

Enter a number between 100-7000 ms for the desired time using the keypad. Press **ENTER** to confirm.

If a mistake is made, press **BKSP** to backspace, or press **CLR** to delete the entry and start over, or press **ESC** to stop and return to the programming screen.

Press **ESC** when finished to return to the MAIN PROGRAM SCREEN.

Figure 4.58
Security Code Screen

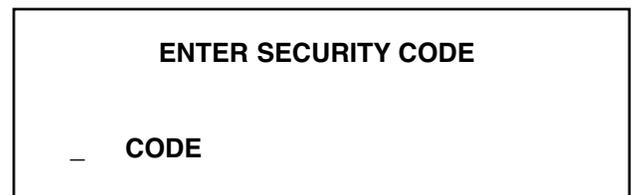
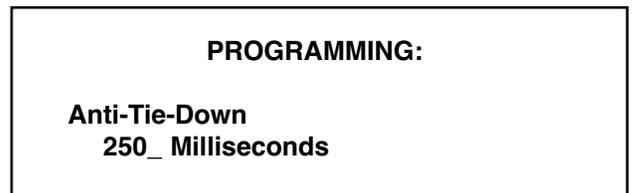


Figure 4.59
Anti-Tie-Down Screen



SECTION 4—PROGRAMMING

RHPC Hydraulic Press Solid-State Control

SECURITY CODE

The security code is user-programmable up to a 4-digit number which is required to edit certain control parameters that affect operation.

HOW TO PROGRAM THE SECURITY CODE

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to SYSTEM SETUP. The security code screen will be displayed. See Figure 4.60. Enter the security code (factory default is **ENTER** or 0),

After the correct security code has been entered, the SYSTEM SETUP SCREEN will be displayed. Use ↓ and ↑ on the keypad to scroll up and down. Press **ENTER** when the arrow symbol (>) is next to SECURITY CODE. The security code program screen will be displayed. See Figure 4.61.

Use the keypad to enter a new security code up to a 4-digit number. Press **ENTER** when finished.

If a mistake is made, press **BKSP** to backspace, or press **CLR** to delete the entry and start over, or press **ESC** to stop and return to the programming screen.

Press **ESC** when finished to return to the MAIN PROGRAM SCREEN.

Figure 4.60
Security Code Screen

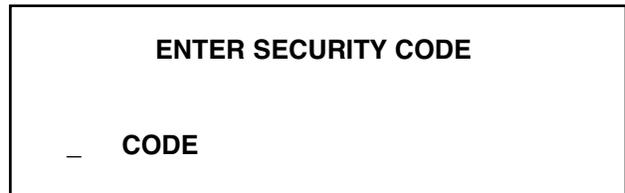
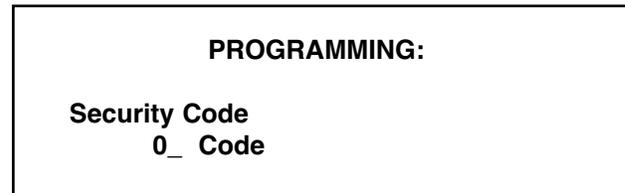


Figure 4.61 – Security Code Program Screen



FACTORY DEFAULT SETTING

The RHPC hydraulic control has factory default settings. The factory default settings can be restored in the Systems Setup screen. See pages 66-66 for the factory settings.

HOW TO RESTORE FACTORY DEFAULT SETTINGS

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to SYSTEM SETUP. The security code screen will be displayed. See Figure 4.62. Enter the security code.

After the correct security code has been entered, the SYSTEM SETUP SCREEN will be displayed. Use ↓ and ↑ on the keypad to scroll up and down. Press **ENTER** when the arrow symbol (>) is next to Restore Defaults. The RESTORE DEFAULTS SCREEN will be displayed. See Figure 4.63.

Press **YES** to confirm and the factory default settings will be restored.

Press **ESC** when finished to return to the MAIN PROGRAM SCREEN.

Figure 4.62
Security Code Screen

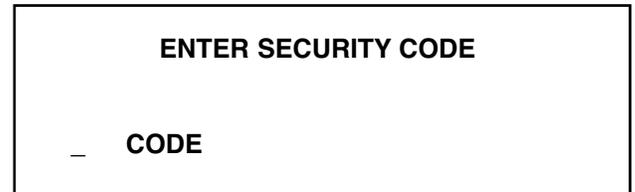
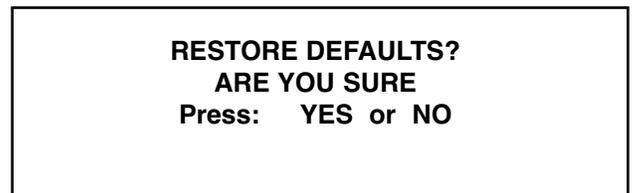


Figure 4.63
Restore Defaults Screen



SECTION 4—PROGRAMMING

RHPC Hydraulic Press Solid-State Control

MUTING

When muting is turned on, the control will ignore the light curtain inputs past the user-defined light curtain limit switch and on the upstroke.

HOW TO PROGRAM MUTING

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to SYSTEM SETUP. The security code screen will be displayed. See Figure 4.64. Enter the security code.

After the correct security code has been entered, the SYSTEM SETUP SCREEN will be displayed. Use ↓ and ↑ on the keypad to scroll up and down. Press **ENTER** when the arrow symbol (>) is next to Muting. The MUTING SCREEN will be displayed. See Figure 4.65.

Use ↓ and ↑ on the keypad to reach the setting you desire. Press **ENTER** to finish.

Press **ESC** when finished to return to the MAIN PROGRAM SCREEN.

Figure 4.64
Security Code Screen

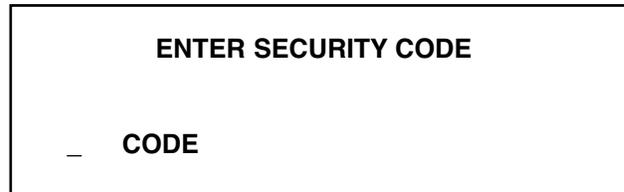
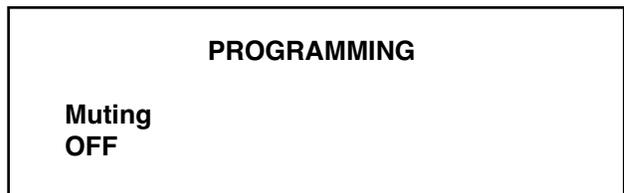


Figure 4.65
Muting Screen



AUTO RETURN

When auto return is enabled, the ram will automatically return to the top of the stroke once the light curtain has been broken or the operating means have been released.

HOW TO PROGRAM AUTO RETURN

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to SYSTEM SETUP. The security code screen will be displayed. See Figure 4.66. Enter the security code.

After the correct security code has been entered, the SYSTEM SETUP SCREEN will be displayed. Use ↓ and ↑ on the keypad to scroll up and down. Press **ENTER** when the arrow symbol (>) is next to Auto Return. The AUTO RETURN SCREEN will be displayed. See Figure 4.67.

Use ↓ and ↑ on the keypad to reach the setting you desire. Press **ENTER** to finish.

Press **ESC** when finished to return to the MAIN PROGRAM SCREEN.

Figure 4.66
Security Code Screen

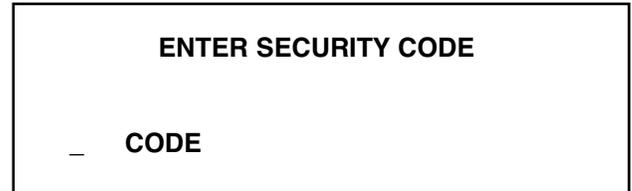
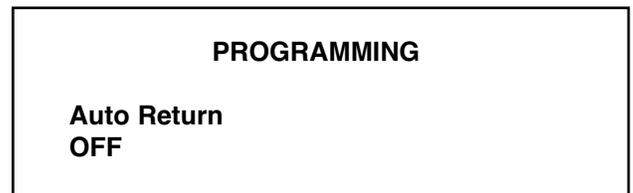


Figure 4.67
Auto Return Screen



SECTION 4—PROGRAMMING

RHPC Hydraulic Press Solid-State Control

DECOMPRESS TIMER

When the ram reaches the BOS (bottom of stroke) timing device, the down valve will de-energize causing the decompress timer (if programmed) to time out. Once the time runs out, the up valve will energize, returning the ram to the TOS (top of stroke) timing device. The range of time is between 50-250 ms.

HOW TO PROGRAM THE DECOMPRESS TIMER

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to SYSTEM SETUP. The security code screen will be displayed. See Figure 4.68. Enter the security code.

After the correct security code has been entered, the SYSTEM SETUP SCREEN will be displayed. Use ↓ and ↑ on the keypad to scroll up and down. Press **ENTER** when the arrow symbol (>) is next to Decompress Timer. The DECOMPRESS TIMER SCREEN will be displayed. See Figure 4.69.

Enter a number between 50-250 ms for the desired time using the keypad. Press **ENTER** to confirm.

If a mistake is made, press **BKSP** to backspace, or press **CLR** to delete the entry and start over, or press **ESC** to stop and return to the programming screen.

Press **ESC** when finished to return to the MAIN PROGRAM SCREEN.

Figure 4.68
Security Code Screen

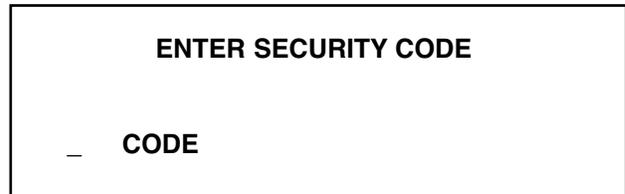
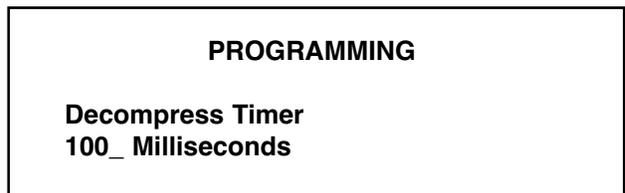


Figure 4.69
Decompress Timer Screen



BLOCK VALVE DELAY

When the ram reaches the BLK (block) valve timing device, the block valve will de-energize causing the timer (if programmed) to time out. Once the time runs out, the block valve will energize, returning hydraulic fluid back into the tank (0-500 ms).

HOW TO PROGRAM THE BLOCK VALVE DELAY

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to SYSTEM SETUP. The security code screen will be displayed. See Figure 4.70. Enter the security code.

After the correct security code has been entered, the SYSTEM SETUP SCREEN will be displayed. Use ↓ and ↑ on the keypad to scroll up and down. Press **ENTER** when the arrow symbol (>) is next to Blk Valve Dly ms. The BLK VALVE DLY SCREEN will be displayed. See Figure 4.71.

Enter a number between 0-500 ms for the desired time using the keypad. Press **ENTER** to confirm.

If a mistake is made, press **BKSP** to backspace, or press **CLR** to delete the entry and start over, or press **ESC** to stop and return to the programming screen.

Press **ESC** when finished to return to the MAIN PROGRAM SCREEN.

Figure 4.70
Security Code Screen

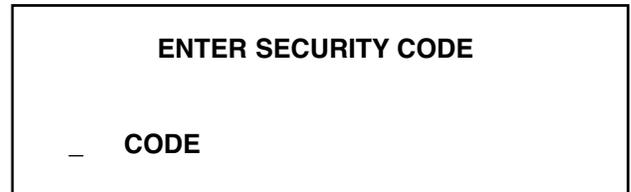


Figure 4.71
Blk Valve Delay Screen



SECTION 4—PROGRAMMING

RHPC Hydraulic Press Solid-State Control

SPANISH

When this setting is turned on, the display of text will be in Spanish.

HOW TO PROGRAM SPANISH TEXT DISPLAY

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to SYSTEM SETUP. The security code screen will be displayed. See Figure 4.72. Enter the security code.

After the correct security code has been entered, the SYSTEM SETUP SCREEN will be displayed. Use ↓ and ↑ on the keypad to scroll up and down. Press **ENTER** when the arrow symbol (>) is next to Spanish. The SPANISH SCREEN will be displayed. See Figure 4.73.

Use ↓ and ↑ on the keypad to reach the setting you desire. Press **ENTER** to finish.

Press **ESC** when finished to return to the MAIN PROGRAM SCREEN.

Figure 4.72
Security Code Screen

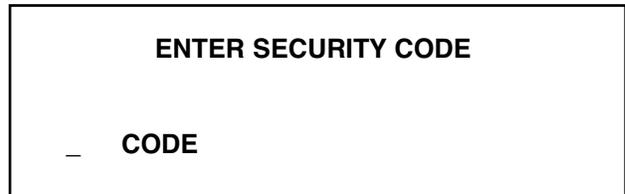
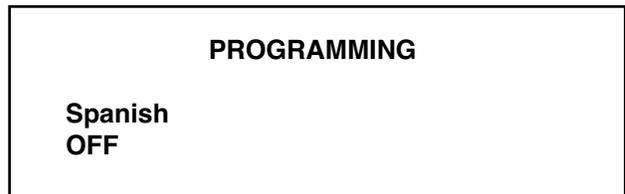


Figure 4.73
Spanish Screen



SECTION 4—PROGRAMMING

RHPC Hydraulic Press Solid-State Control

CONFIGURATION

The configuration menu is for editing logic setting to the valves, relays, switches, and for safeguard functions. It is important not to change any settings unless advised by tech. support and with a supervisor's permission. Wiring must reflect any changes to the programming otherwise injury and/or damage to the machine could occur.

CONFIGURATION MENU

BLK VALVE SW TYPE—This setting defines what logic the control will monitor the blocking valve switch. Choice of N.O. or N.C.

SC VALVE POLARITY—This setting defines what logic the control will monitor and energize the speed change if applicable. Choice of ON=Slow or OFF=Slow. If ON=Slow is selected, the press will energize the speed change output when the speed change input signal (P8-21) is supplied. If OFF=Slow is selected, the speed output will energize when the signal is removed from the input.

AUTO SINGLE MODE—When on, this setting will engage the ram when a signal is presented on the auto single input. The initial stroke requires a signal on the prior action input before the actuation means are depressed. Choice of ON or OFF.

RETURN SPEED—This setting allows selection of the speed at which the press will return to the top of stroke. Choice of LOW or HIGH speed.

FOOT TRIP—When on, this setting allows the press to be actuated by pressing and releasing a foot switch. Choice of ON or OFF.

FINISH STK ON MUTE—This setting mutes/disables the light curtains from stopping the press at the bottom of the stroke until the press reaches the top-of-stroke position. Choice of ON or OFF

BLK VALVE MONITOR—When on, this setting allows the control to monitor the blocking valve (if applicable). Choice of ON or OFF.

BLK VALVE ON UP—When on, this setting allows block valve input (if applicable). Choice of ON or OFF.

PWR UP RET REQUEST—When on, this setting allows the press to be returned to the top of stroke if the ram is stopped anywhere other than at the top of the stroke (during power up only). Choice of ON or OFF.

LIGHT CURTAIN TYPE—This setting is directly related to the light curtain CH1 and CH2 wiring on the inputs. The selection made defines how the light curtain is monitored by the control. If the inputs are connected 1 normally open and 1 normally closed, select 1 N.O. & 1 N.C. If the inputs are connected 2 normally open relays, then select 2 N.O. Choice of 1 N.O. & 1 N.C or 2 N.O.

EXTN RELAY MONITOR—When on, this setting allows the control to monitor external relay contacts for the down outputs in case of a relay failure. Choice of ON or OFF.

SAFEGUARD FUNCTION—This selection allows the choice of when the light curtains are activated. When *Always Required* is selected, the light curtains will be activated except when the light curtain is muted. When *Foot/Sing & Auto* is selected, the light curtains will only be required for operation in the foot/single or automatic mode of operation except when the light curtain is muted. Choice of ALWAYS REQUIRED or FOOT/SING & AUTO.

ETHERNET IO ENABLE—When on, this setting will recognize the **optional** ethernet I/O card. This will allow eight (8) additional inputs plus four (4) PLS outputs. Choice of ON or OFF.

ENCODER ENABLE—When on, this setting tells the control to use an encoder for positioning. Choice of ON or OFF.

HOME OFF TIME—When the encoder is enabled (ON), this setting tells the control how long to come off of the home position limit switch when homing the press. This setting is programmable only with the encoder enabled. Choice of time in seconds.

LC ACTIVE ON UP—When on, this setting makes the light curtain active on the up stroke of the press regardless of muting. Choice of ON or OFF.

(Continued on next page.)

SECTION 4—PROGRAMMING

RHPC Hydraulic Press Solid-State Control

HOW TO EDIT THE CONFIGURATION SCREEN

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to SYSTEM SETUP. The security code screen will be displayed. See Figure 4.74. Enter the security code (**ENTER** is the default setting).

After the correct security code has been entered, the SYSTEM SETUP SCREEN will be displayed. Use ↓ and ↑ on the keypad to scroll up and down. Press **ENTER** when the arrow symbol (>) is next to CONFIGURATION. The supervisor code screen will be displayed. See Figure 4.75. Enter the supervisor code (1 is the default setting). Press **ENTER**.

Use ↓ and ↑ on the keypad to scroll up and down through the configuration menu choices described on page 61 and shown in Figures 4.76 through 4.79. Press **ENTER** when the double-arrow symbol (>>) is next to the configuration you want to change. Use ↓ and ↑ on the keypad to reach the setting you desire for each menu choice. Press **ENTER** to finish.

Press **ESC** when finished to return to the MAIN PROGRAM SCREEN.

Figure 4.74
Security Code Screen



Figure 4.75
Supervisor Code Screen

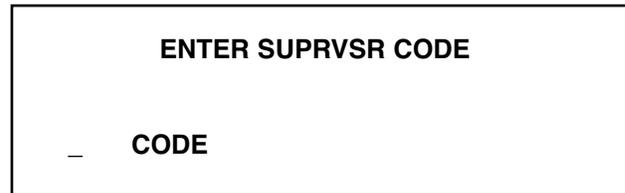


Figure 4.76
First Configuration Screen

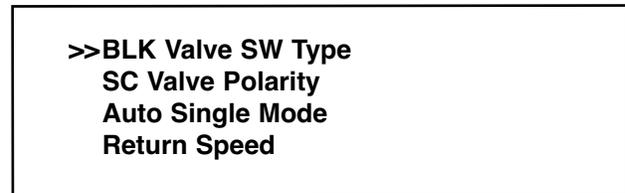


Figure 4.77
Second Configuration Screen

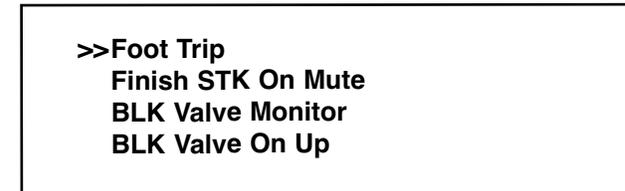


Figure 4.78
Third Configuration Screen

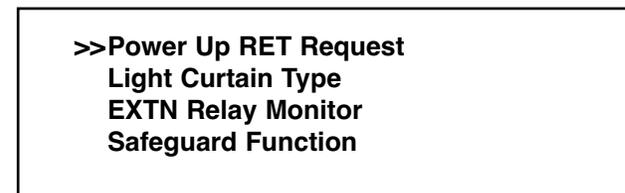
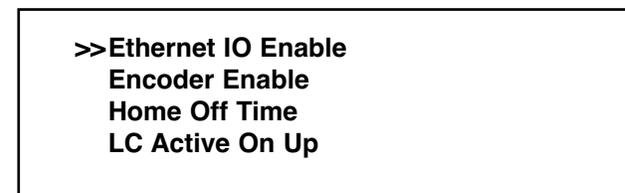


Figure 4.79
Third Configuration Screen



CONFIGURE SECURE CODE

This is the **supervisor code** which is required to edit certain control parameters that affect operation. The supervisor code is user-programmable up to a 4-digit number.

HOW TO PROGRAM THE CONFIGURE SECURE CODE SCREEN

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to SYSTEM SETUP. The security code screen will be displayed. See Figure 4.80. Enter the security code.

After the correct security code has been entered, the SYSTEM SETUP SCREEN will be displayed. Use ↓ and ↑ on the keypad to scroll up and down. Press **ENTER** when the arrow symbol (>) is next to CONFIG SECURE CODE. The supervisor code screen will be displayed. See Figure 4.81. Enter the supervisor code (1 is the default setting). Press **ENTER**. The CONFIG SECURE CODE SCREEN will be displayed. See Figure 4.82.

Use the keypad to enter a new secure code up to a 4-digit number. Press **ENTER** when finished.

If a mistake is made, press **BKSP** to backspace, or press **CLR** to delete the entry and start over, or press **ESC** to stop and return to the programming screen.

Press **ESC** when finished to return to the MAIN PROGRAM SCREEN.

Figure 4.80
Security Code Screen

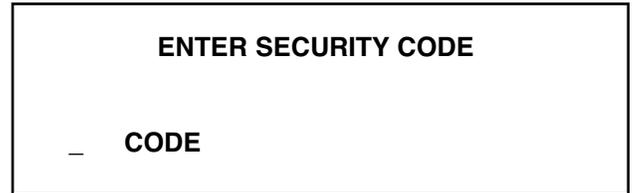


Figure 4.81
Supervisor Code Screen

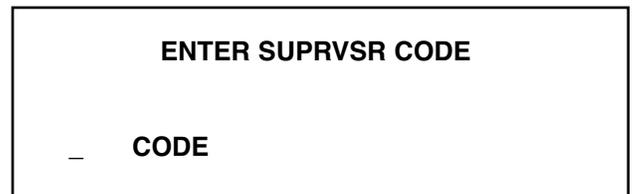
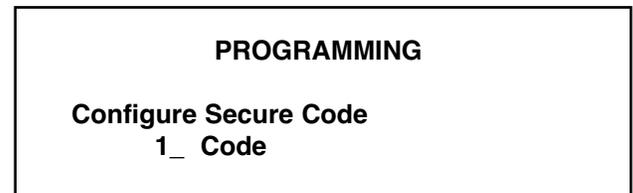


Figure 4.82
Configure Secure Code Screen



SECTION 4—PROGRAMMING

RHPC Hydraulic Press Solid-State Control

SIGNAL TIMER

This setting defines the amount of time the auto-single input will wait for its next signal before it times out and requires an operator action to restart from a range of 0-300 seconds.

HOW TO PROGRAM THE SIGNAL TIMER

Select the **PROG** position of the Off/Prog/Run selector switch. One of the MAIN PROGRAM SCREENS will be displayed.

On the MAIN PROGRAM SCREEN, use ↓ and ↑ on the keypad to scroll through the program options. Press **ENTER** when the pound symbol (#) is next to SIGNAL TIMER. The security code screen will be displayed. See Figure 4.83. Enter the security code.

After the correct security code has been entered, the SIGNAL TIMER SCREEN will be displayed. See Figure 4.84.

Use the keypad to enter the desired number of seconds up to 300. Press **ENTER** to finish and the MAIN PROGRAM SCREEN is displayed.

If a mistake is made, press **BKSP** to backspace, or press **CLR** to delete the entry and start over, or press **ESC** to stop and return to the MAIN PROGRAM SCREEN.

Figure 4.83
Security Code Screen

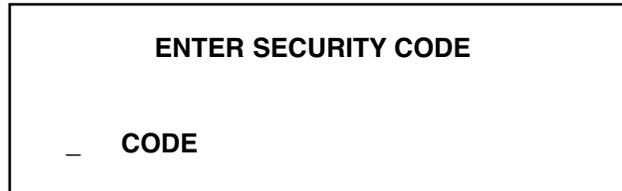
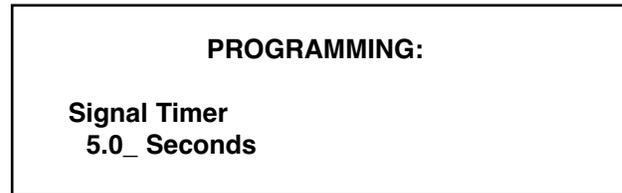


Figure 4.84
Signal Timer Screen



SECTION 4—PROGRAMMING

RHPC Hydraulic Press Solid-State Control

QUICK REFERENCE TABLE—FACTORY SETTINGS AND VALID RANGES

Table 4.1

Screen	Program Setting	Valid Entry Range	Factory Default Setting		
Press Settings	Bottom Dwell	0-600 seconds	Bottom Dwell	0 seconds	
	PSI or Position	Pressure or Position	PSI or Position	Position	
	TOS Position	0-30 inches	TOS Position	1.0 inch	
	BOS Position	0-30 inches	BOS Position	4.0 inches	
	Speed Change Position	0-30 inches	Speed Change Position	3.0 inches	
	Mute Position	0-30 inches	Mute Position	3.0 inches	
	Down Low Speed Coast	0-1 inch	Down Low Speed Coast	0.0 inches	
	Down High Speed Coast	0-1 inch	Down High Speed Coast	0.0 inches	
	Up Low Speed Coast	0-1 inch	Up Low Speed Coast	.780 inches	
Up High Speed Coast	0-1 inch	Up High Speed Coast	.900 inches		
Counters	Batch Clear	Yes or No	Batch Clear	N/A	
	Batch Preset	0-9,999,999 strokes	Batch Preset	0 strokes	
	Total Clear	Yes or No	Total Clear	N/A	
Input/Output (Without Ethernet Option)	User Inputs 1-4	Logic	Off, N.O., or N.C.	Logic	Off
		Stop Type	E-Stop or Top Stop	Stop Type	E-Stop
		Message	See list of user messages (p. 47)	Message	Lube Fault
	<p>Note: If external relay monitoring is turned on, you will not be able to make programming changes to Input #3.</p> <p>If auto single is turned on, you will not be able to make programming changes to Input #4.</p>				
Input/Output (With Ethernet Option)	User Inputs 1-9	Logic	Off, N.O., or N.C.	Logic	Off
		Stop Type	E-Stop or Top Stop	Stop Type	E-Stop
		Message	See list of user messages (p. 47)	Message	Lube Fault
	<p>Note: If external relay monitoring is turned on, you will not be able to make programming changes to Input #3.</p> <p>If auto single is turned on, you will not be able to make programming changes to Input #4.</p>				
	User Input #10 Part In Place	Logic	Off, N.O., or N.C.	Logic	Off
	User Inputs #11 & 12 Paired	Logic	On or Off	Logic	Off
	PLS Outputs 1-4 Using Limit Switches	PLS Type	Down, Up, or Both	PLS Type	Down
		Down Delay	0-60 seconds	Down Delay	0.0 seconds
		Down Duration	0-60 seconds	Down Duration	3.0 seconds
		Up Delay	0-60 seconds	Up Delay	0.0 seconds
		Up Duration	0-60 seconds	Up Duration	3.0 seconds
		Off If Stopped	Yes or No	Off If Stopped	Yes
	PLS Outputs 1-4 Using Encoder	PLS Type	Down, Up, or Both	PLS Type	Down
		Down On Posn.	0-30 inches	Down On Posn.	3.0 inches
		Down Off Posn.	0-30 inches	Down Off Posn.	6.0 inches
Up On Posn.		0-30 inches	Up On Posn.	2.0 inches	
Up Off Posn.		0-30 inches	Up Off Posn.	3.0 inches	
Off If Stopped		Yes or No	Off If Stopped	Yes	

(Continued on next page.)

SECTION 4—PROGRAMMING

RHPC Hydraulic Press Solid-State Control

QUICK REFERENCE TABLE - FACTORY SETTINGS AND VALID RANGES (Continued) Table 4.1 (continued)

Screen	Program Setting	Valid Entry Range	Factory Default Setting	
System Setup	Anti-Tie-Down	100-700 milliseconds	Anti-Tie-Down 250 ms	
	Security Code	User programmed up to a 4-digit #	Security Code 0	
	Factory Default	Restore: Yes or No	Factory Default N/A	
	Muting	On or Off	Muting Off	
	Auto Return	On or Off	Auto Return Off	
	Decompress Timer	50-250 milliseconds	Decompress Timer 100 ms	
	Block Valve Delay	0-500 milliseconds	Block Valve Delay 0 ms	
	Spanish	On or Off	Spanish Off	
	Configuration	Block Valve Switch Type	N.O. or N.C.	Block Valve Switch Type N.O.
		Speed Change Valve Polarity	On=Slow or Off=Slow	Speed Change Valve On=Slow
		Automatic Single Mode	On or Off	Automatic Single Mode Off
		Return Speed	Low, High, or Speed Selector	Return Speed Low Speed
		Foot Trip	On or Off	Foot Trip Off
		Finish Stroke On Mute	On or Off	Finish Stroke On Mute Off
		Block Valve Monitor	On or Off	Block Valve Monitor On
		Block Valve On Up	On or Off	Block Valve On Up Off
		Power-Up Return Request	On or Off	Power-Up Return Request Off
		Light Curtain Type	2 N.O. or 1 N.O. and 1 N.C.	Light Curtain Type 2 N.O.
		External Relay Monitor	On or Off	External Relay Monitor On
		Safeguard Function	Always Required or Foot/Sing. & Cont.	Safeguard Function Always Required
		Ethernet I/O Enable	On or Off	Ethernet I/O Enable Off
Encoder Enable		On or Off	Encoder Enable Off	
Home Off Time	0-2 seconds	Home Off Time 1.0 second		
Light Curtain Active On Up	On or Off	Light Curtain Active On Up On		
Configure Secure Code	User programmed up to a 4-digit #	Configure Secure Code 1		
Signal Timer	Signal Timer	Signal Timer	Signal Timer 5.0 seconds	

Troubleshooting



All troubleshooting, as well as installation, must be performed by qualified and properly trained personnel. Also, when a defective component is found, do not operate the machine until that component has been replaced with an exact replacement part.

1. This procedure is written as a general guide for troubleshooting most hydraulic control systems. In all cases, please refer to the individual control wiring schematic for particular test points and terminal numbers.
2. Each control system may be slightly different depending on the various functions provided. Be sure to follow the schematic and select the proper modes of operation when troubleshooting.

ABBREVIATIONS

SW—Switch

TOS—Top of Stroke

BOS—Bottom of Stroke

FLT—Fault

FAULTS

The control will alert you with a message either when a circuit failure has occurred, unsafe conditions are detected, or when certain logical conditions are not met.

BLOCKING VALVE FAULT

The TOS limit switch did not come on within ten seconds of the up output turning on. Check status LEDs on the control. Possible circuit failure; consult the factory.

BOS SW OFF FAULT

The bottom of stroke limit switch did not change state. Check the status of the BOS limit switch. Check status LEDs on the control. Possible circuit failure; consult the factory.

ENCODER FAULT

The encoder signal is not being detected by the control. Check encoder wiring for loose or broken connections or correct wiring. Possible circuit failure; consult the factory.

ENCODER SYNC FAULT

The control did not detect the encoder sync switch (with muting enabled). Check encoder sync switch or disable muting if not used. Possible circuit failure; consult the factory.

ETHERNET CARD FAULT

The control does not detect an Ethernet card. Check for correct connection to the Ethernet card or disable the Ethernet card function. Possible circuit failure; consult the factory.

EXTERNAL RELAY OFF FAULT

The external relay input did not turn off. Check status of the external relays for the down output. Check status LEDs on the control. Possible circuit failure; consult the factory.

EXTERNAL RELAY ON FAULT

The external relay input did not turn on. Check status of the external relays for the down output. Check status LEDs on the control.

GATE DOWN FAULT

The gate down input did not turn on within the required amount of time. Check that the gate is dropping or the switch is changing state. Possible circuit failure; consult the factory.

(Continued on next page.)

SECTION 5—TROUBLESHOOTING

RHPC Hydraulic Press Solid-State Control

FAULTS (continued)

GATE UP FAULT

The gate down input did not turn off when the gate up output turned on. Check that the gate is raising or the switch is changing state. Possible circuit failure; consult the factory.

INVALID PAIR SIGNALS

User inputs 11 and 12 are paired together, but they did not change state within 500 milliseconds of each other. Check the equipment tied in to inputs 11 and 12 for possible failure. Must have optional Ethernet card for paired inputs. Possible circuit failure; consult the factory.

MOTION NO RUN

The control detected motion prior to starting a press cycle. Check for correct wiring to the encoder connection on the RHPC control module. Verify the chain is on the sprocket for the encoder and is tight. Verify the encoder cable is not run near high-voltage lines (motor leads). Possible circuit failure; consult the factory.

MUTE SW OFF FAULT

The mute limit switch did not turn off. Check the status of the mute limit switch. Check status LEDs on the control. Possible circuit failure; consult the factory.

MUTE SW ON FAULT

The mute limit switch did not turn on. Check the status of the mute limit switch. Check status LEDs on the control. Possible circuit failure; consult the factory.

PART IN PLACE FAULT

User input 10 did not stay true during the press cycle or did not change state at top of stroke. Check equipment tied in to user input 10. Must have Ethernet card for part in place. Possible circuit failure; consult the factory.

RAM UP RETURN FAULT

The TOS limit switch did not dome on within 10 seconds of the up output turning on. Check status LEDs on the control to make sure up valve is energizing. Possible circuit failure; consult the factory.

SYNC SWITCH NOT SEEN

The sync switch did not change state or changed state outside of the original window when the press was **homed** (only valid when muting is enabled). Check wiring to sync switch or resolver and chain connection. Possible circuit failure; consult the factory.

SECTION 6—MAINTENANCE AND INSPECTION

RHPC Hydraulic Press Solid-State Control

This control system can never cure nor overcome a misadjusted, worn, broken or malfunctioning part, or mechanical failure. Inspect all parts for adjustment, excessive wear, looseness, or breakage. Do not operate this machine until all parts are adjusted, repaired, or replaced.

Visual inspections and examinations of the entire machine must be made at least once per shift by qualified personnel.

Machines must always be inspected and tested on a weekly basis to determine the condition of the mechanical, hydraulic, and electrical system. Necessary maintenance and repair must be done before the machine is operated again, and the employer must maintain records of both the inspections and the maintenance work performed.



After any maintenance, always operate the machine numerous times in all modes before allowing the operator to start production. Always make sure all point-of-operation safeguarding is in place, adjusted and operating properly for the job and the operator.

ANSI Regulations for Inspections

ANSI B11.2 Inspection and Maintenance

7.3 The employer shall have the responsibility to establish and follow a systematic program of periodic and regular inspection of production systems utilizing presses to ensure that all their parts, auxiliary equipment, and safeguarding are in safe operating condition and adjustment.

E7.3 The employer should consider the manufacturer's instructions and recommendations in determining maintenance programs.

The employer should determine the period between inspections based on their use and the manufacturer's recommendations.

ANSI Regulations for Operator Training

ANSI B11.2 Instructions to Operators

10.2 The employer shall instruct operators in the proper care and use of the press production system.

E10.2 The instructions should include but not be limited to:

1. A description of the assigned task;
2. The function of controls to be encountered in performing the assigned task;
3. The hazards associated with the assigned task;
4. The designated method of feeding;
5. The designated method of safeguarding;
6. The methods of function-testing or otherwise assuring the proper function of safeguarding means.

Operators should be instructed to report inconsistent or unpredictable performance of the press production system.

Electrical Controls

Switch the main power disconnect to the off position and lockout before inspecting or maintaining electrical controls. Make a periodic inspection of the control box and electrical machine components for loose or broken wires. Relays and switches must be examined for burned or worn contacts. Look for loose or broken conduit and cable fittings. The control box and other components must be kept closed and locked. Keys must be removed to prevent someone from opening and tampering with the control box, and to prevent exposure to the dirt, chips and oil present in most plants.

SECTION 7—REPLACEMENT PROCEDURES

SSC-1500 Part-Revolution Solid-State Control

Replacing the Core Module

Photo 7.1



Photo 7.2

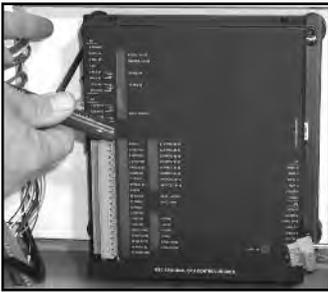


Photo 7.3

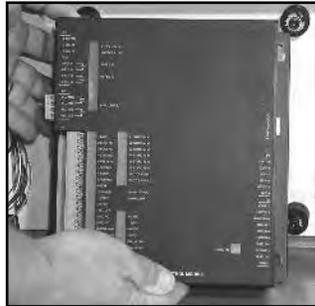


Photo 7.4

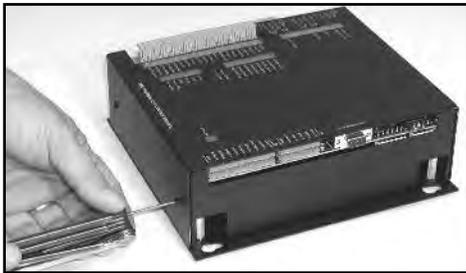
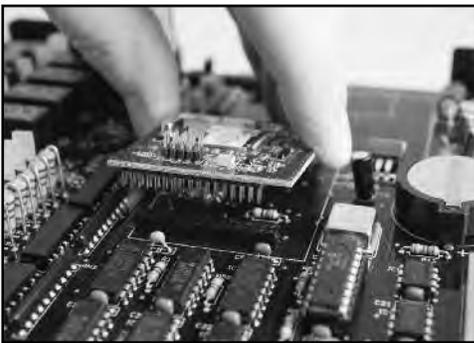


Photo 7.5



All power to the machine must be off before replacing the control module or any other parts.

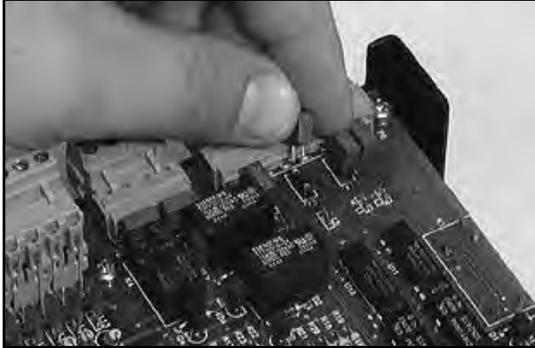
1. Locate the control module inside the control box.
2. Remove all terminal strips from the left and right sides of the circuit board. Unplug the main power cord from the left side of the module. See Photo 7.1.
3. Loosen the four Allen-head bolts (Photo 7.2) and lift up on the control module. Pull the unit straight out. See Photo 7.3.
4. Remove the four small screws from the cover of the control module (Photo 7.4) and lift the cover straight up.
6. Locate the core module in the center of the circuit board and remove it by gently wiggling it back and forth.
7. Insert the new core module onto the circuit board making sure all the pins are lined up and fully seated (Photo 7.5).
8. Place the cover back on the control module and secure it with the four screws.
9. Put the control module back in place, tighten the Allen-head bolts, plug in the main power cord, and insert all terminal strips.

SECTION 7—REPLACEMENT PROCEDURES

SSC-1500 Part-Revolution Solid-State Control

Replacing Fuses F1-F6

Photo 7.6

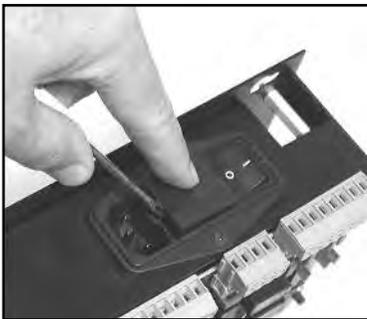


All power to the machine must be off before replacing the control module or any other parts.

1. Remove the control module from the control box (steps 1-3 on page 70).
2. Remove the top cover plate from the SSC-1500 control module by removing the four small screws.
3. Locate fuses F1-F6. Grasp the faulty fuse and pull straight up. (Fuses are Wickman 4-A/250-V slow-blow Part No. 3961400044.)
4. Insert the new fuse by lining up the pins with the holes on the circuit board. See Photo 7.6.
5. Replace the cover plate back on the control module and secure it with the four screws.
6. Put the control module back in place, tighten the Allen-head bolts, plug in the main power cord, and insert all terminal strips.

Replacing the Main Power Fuses

Photo 7.7



All power to the machine must be off before replacing the control module or any other parts.

1. Remove the control module from the control box (steps 1-3 on page 70).
2. Locate the main power on/off switch on the left side of the control module. Insert a small screwdriver in the slot just above the three prongs and lift up (see Photo 7.7). The fuse holder should pop out.
3. Locate and unclip the faulty fuse(s). Insert a new fuse. See Photo 7.8. Snap the fuse holder back into the main power on/off switch. (Fuses are Bussman 4-A/250-V slow-blow Part No. 6DC-4A.)
4. Put the control module back in place, tighten the Allen-head bolts, plug in the main power cord, and insert all terminal strips.

Photo 7.8

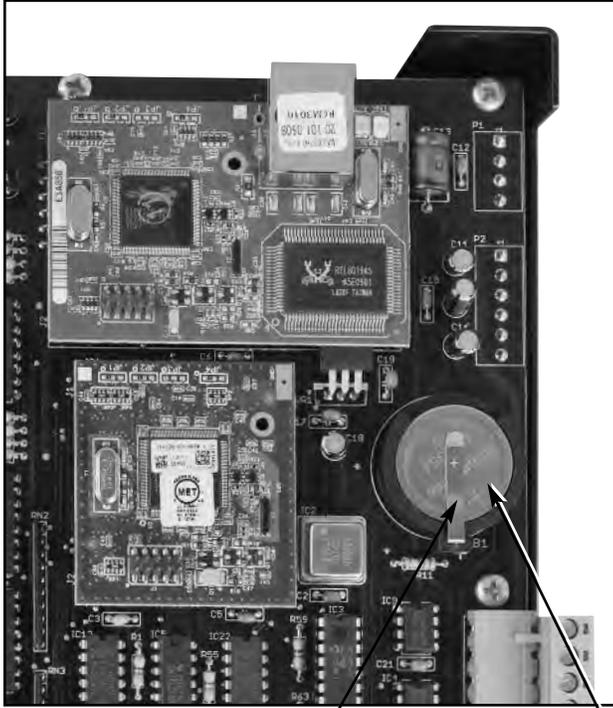


SECTION 7—REPLACEMENT PROCEDURES

SSC-1500 Part-Revolution Solid-State Control

Replacing the Battery

Photo 7.9



Battery Clip

Battery



All power to the machine must be off before replacing the control module or any other parts.

1. Remove the control module from the control box (steps 1-3 on page 70).
2. Remove the top cover plate from the SSC-1500 control module by removing the four screws.
3. Locate the battery on the control module. See Photo 7.9. Carefully lift the battery clip up and remove the battery.
4. Insert the new battery.
5. Put the cover plate back onto the control module and secure it with the four screws.
6. Put the control module back in place, tighten the Allen-head bolts, plug in the main power cord, and insert all terminal strips.

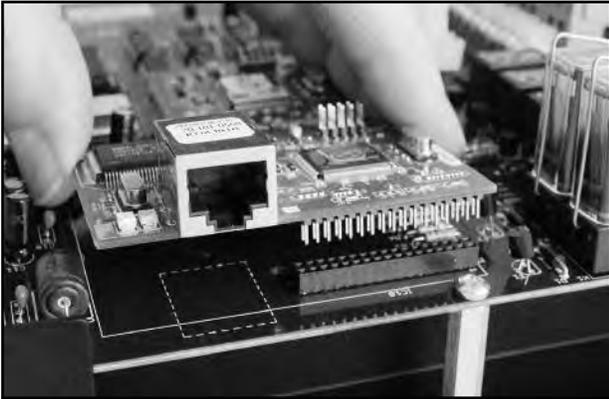
Note: When the battery fails or has been removed, all programmable information will return to factory defaults (see pages 65-66). All user inputs will need to be reprogrammed.

SECTION 7—REPLACEMENT PROCEDURES

SSC-1500 Part-Revolution Solid-State Control

Replacing the Optional Ethernet Card

Photo 7.10



All power to the machine must be off before replacing the control module or any other parts.

1. Remove the control module from the control box (steps 1-3 on page 70).
2. Remove the top cover plate from the SSC-1500 control module by removing the four small screws.
3. Locate the ethernet card on the circuit board and remove it by gently wiggling it back and forth.
4. Insert the new ethernet card onto the circuit board making sure all the pins are lined up and fully seated (Photo 7.10).
5. Place the cover back on the control module and secure it with the four screws.
6. Put the control module back in place, tighten the Allen-head bolts, plug in the main power cord, and insert all terminal strips.

SECTION 8—METHODS OF SAFEGUARDING MACHINES

RHPC Hydraulic Press Solid-State Control

OSHA 1910.217 Section (c) under General Requirements states:

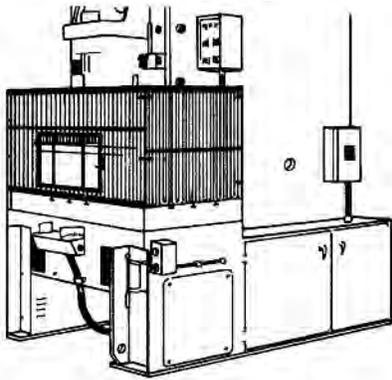
- (i) It shall be the responsibility of the employer to provide and insure the usage of “point-of-operation guards” or properly applied and adjusted point-of-operation devices on every operation performed on a mechanical power press.

This means that for every mechanical power press that is being used in United States industry, there must be protection for the operator by a guard or a device (safeguard). This protection may also be accomplished by the use of a combination of guards and devices.

When updating a power press, the most important decision is the selection of the proper guard or device. The following are methods of safeguarding part revolution power presses.

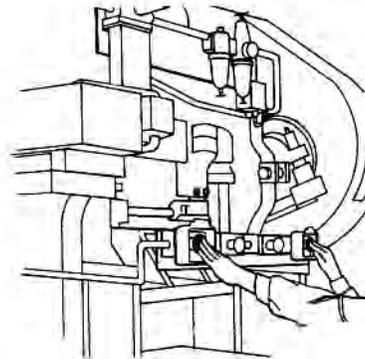
Barrier Guards on Power Presses

OSHA 1910.217 Section (c), General Requirements, (c)(2) Point of Operation Guards and Table O-10 and reference MPPS



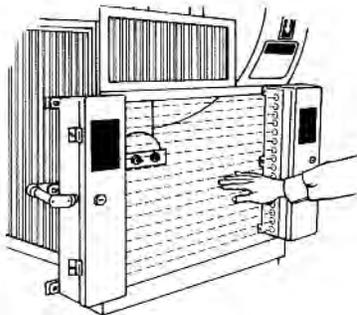
Two-Hand Control on Power Presses

OSHA 1910.217 Section (c)(3)(vii) Two-Hand Control and reference MPPS



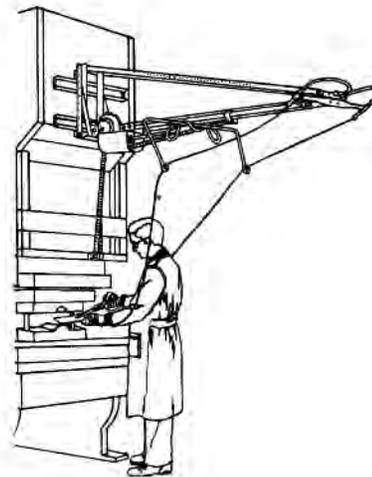
Light Curtain Presence-Sensing Devices on Power Presses

Light Curtain or Radio Frequency
OSHA 1910.217 Section (c)(3)(iii)(a)
Presence Sensing and reference MPPS



Pullback (Pull-out) on Power Presses

OSHA 1910.217 Section (c)(3)(iv)(b) Pull-out
and reference MPPS

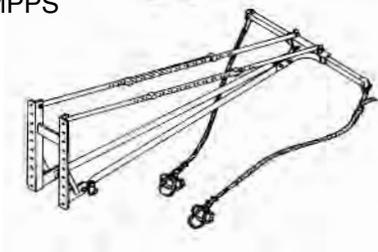


SECTION 8—METHODS OF SAFEGUARDING MACHINES

RHPC Hydraulic Press Solid-State Control

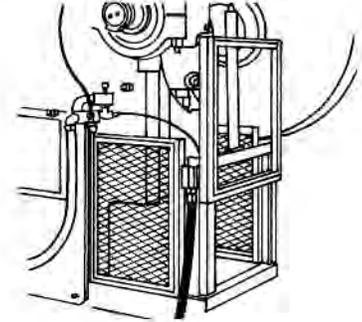
Restraint (Holdout) on Power Presses

OSHA 1910.217 Section (c)(3)(vi)
Restraint or Holdout
and reference MPPS



Type A or B Gate on Power Presses

OSHA 1910.217 Section (c)(3)(ii)(c)
Gate or Movable Barrier Device
and reference MPPS



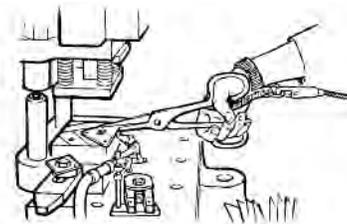
Auxiliary Safeguarding on Power Presses

Auxiliary safeguarding is additional protection from injuries for all personnel in the machine area. It is used in conjunction with primary safeguarding devices. Auxiliary safeguarding also involves the guarding of other components or hazardous openings on machines.

Auxiliary safeguards include such items as point-of-operation side end barriers when light curtains are used, pressure sensitive floor mats, workpiece tables or horizontal light curtains. Light curtains can be used horizontally to prevent an operator or other persons from standing between the vertical plane of light and the point-of-operation hazard.

Danger signs, used for warning, can be mounted on the machine in a position that is readily visible to the operator, setup person or other personnel. Hand tools can be used as auxiliary safeguarding. They are often used when feeding and retrieving small pieceparts. Hand tools themselves are NOT a point-of-operation safeguarding device.

OSHA 1910.217 Section (c)
(4) Hand feeding tools. Hand feeding tools are intended for placing and removing material in and from the press. Hand feeding tools are not a point-of-operation guard or protection device and shall not be used in lieu of the guards or devices required.



Hand Feeding Tool used for
Feeding Parts

Other Safety Considerations

Other areas of machine safety must be considered in order to comply to the OSHA regulations and ANSI standards as we know them. This includes, but is not limited to, items such as a main power disconnect switch, which must be provided for each machine, and a magnetic type motor starter for the main drive motor and slideadjust motor. Mechanical power-transmission apparatus of the machine, such as rotating flywheels, gears, sprockets, chains, and shafts, must be covered in accordance with OSHA 1910.219. As with all machinery, best safety practices must be a continuing program. The operator, die setter and all personnel must be fully trained and instructed on all safety procedures and have full knowledge of the safeguarding device being used.

Note: The preceding point-of-operation safeguarding options are explained in OSHA's 1910.217 standard for Mechanical Power Presses, and ANSI's B11.2 Hydraulic Power Presses. Also see Rockford Systems' booklet Mechanical Power Press Safety (MPPS).

When using the devices described, for point-of-operation protection, sides and rear of hazardous area must be guarded to protect the operator and other employees in the machine area (OSHA Section 1910.212).

SECTION 9—RETURN MATERIALS AUTHORIZATION FORM

RHPC Hydraulic Press Solid-State Control

To return material for any reason contact the sales department in our organization at 1-800-922-7533 for an RMA number. All returned materials shipments must be prepaid. Complete this form and send with material to 4620 Hydraulic Road, Rockford, IL 61109-2695. Make sure the RMA number is plainly identified on the outside of the shipping container.

Company _____

Address _____

City _____ State _____ Zip _____

Phone _____ Fax _____

Contact Name _____ Representative _____

Items Authorized To Return on R.M.A. No. _____ Original Invoice No. _____ Date _____

Part No.	Serial No.	Description
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Service Requested Full Credit 25% Restocking Repair & Return Warranty Replacement

Reason for return (describe in detail):

Return Materials Authorized by _____ Date _____

SECTION 10—ORDER FORM

RHPC Hydraulic Press Solid-State Control

This instruction manual references signs and literature available for your machines. This order form is for your convenience to order additional signs and/or literature as needed. (This order form is part of your installation manual so please make a copy of it when ordering.)

Company _____

Address _____

City _____ State _____ Zip _____

Phone _____ Fax _____

Name _____ Purchase Order No. _____ Date _____

Part No.	Description	Quantity Required
KSL-279	RHPC Hydraulic Press Solid State Control Manual	_____
KSC-000	Operator Safety Precautions Sign (English)	_____
KSC-000S	Operator Safety Precautions Sign (Spanish)	_____
KSC-000F	Operator Safety Precautions Sign (French)	_____
KSC-054	Danger Sign 5" x 6" (English)	_____
KSC-054S	Danger Sign 5" x 6" (Spanish)	_____
KSC-055	Danger Sign (Foot Switch) 5" x 6" (English)	_____
KSC-055S	Danger Sign (Foot Switch) 5" x 6" (Spanish)	_____
KSC-055F	Danger Sign (Foot Switch) 5" x 6" (French)	_____
KSL-051	<i>Mechanical Power Press Safety (MPPS) Booklet</i>	_____
CNTRLS	<i>Press and Press Brake Control Systems Catalog</i>	_____
SFM	<i>Shields for Machinery Catalog</i>	_____

For prices and delivery, please use address, phone or fax number listed on the front cover of this manual.

Your Signature _____ Date _____