



INSTRUCTION MANUAL FOR STARTERS, DISCONNECTS, AND OPERATOR STATIONS



IMPORTANT: PLEASE REVIEW THIS ENTIRE PUBLICATION BEFORE OPERATING OR MAINTAINING STARTERS, DISCONNECTS, AND OPERATOR STATIONS.

5795 Logistics Parkway • Rockford, Illinois 61109 • Toll Free 1-800-922-7533 (USA only) • Phone (815) 874-7891
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Manual No. KSL-229

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SECTION 1—IN GENERAL

Starters and Disconnects

Safety Precautions

“ ⚠ DANGER ” Danger is used to indicate the presence of a hazard which WILL cause SEVERE personal injury if the warning is ignored.

“ ⚠ ” 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.

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 into your program include:

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

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



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



Never operate this machine if it is not working properly – stop operating 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 should 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 OEMs (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.

OSHA's 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. 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's 29 Code of Federal Regulations, Subpart O, that an employer (user) must comply with include:

Section 1910.211 Definitions

Section 1910.212 (a) General Requirements for all Machines

Section 1910.217 Mechanical Power Presses

Section 1910.219 (b)(1) Mechanical Power-Transmission Apparatus (Flywheel and Gear Covers)

3. OSHA's 29 Code of Federal Regulations, Subpart J, 1910.147 The Control of Hazardous Energy (Lockout / Tagout)

4. OSHA's 29 Code of Federal Regulations, Subpart S, Electrical, 1910.301 - 1910.399

5. OSHA's Publications

These publications can be acquired by contacting:

US Department of Labor
Occupational Safety and Health Administration
Washington, DC 20210
(202) 219-5257

NFPA 79 Electrical Standard for Industrial Machinery

The purpose of this electrical standard is to provide detailed information for the application of electrical/electronic equipment, apparatus, or systems supplied as part of industrial machines that will promote safety to life and property. Please refer to this standard to minimize the potential of electrical shock and electrical fire hazards.

NEC (National Electrical Code) Handbook

Refer to this handbook for additional safeguarding of persons and property to prevent hazards resulting from the use of electricity.

The NFPA 79 Electrical Standard and the NEC Handbook can be purchased by contacting:

National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02269-9101
1-800-344-3555

NEMA (National Electrical Manufacturers Association)

Refer to this handbook for additional safeguarding information when using electricity.

NEMA
1300 North 17th Street, Suite 1847
Rosslyn, VA 22209
(703) 841-3200

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.

- B11.1 Mechanical Power Presses
- B11.2 Hydraulic Presses
- B11.3 Power Press Brakes
- B11.4 Shears
- B11.5 Ironworkers
- B11.6 Lathes
- B11.7 Cold Headers and Cold Formers
- B11.8 Drilling, Milling and Boring
- B11.9 Grinding Machines
- B11.10 Sawing Machines
- B11.11 Gear Cutting Machines
- B11.12 Roll Forming and Roll Bending
- B11.13 Automatic Screw/Bar and Chucking
- B11.14 Coil Slitting Machines
- B11.15 Pipe, Tube and Shape Bending
- B11.16 Metal Powder Compacting Presses

(Continued on next page.)

SECTION 1—IN GENERAL

Starters and Disconnects

ANSI Safety Standards for Machines (continued)

- B11.17 Horizontal Hydraulic Extrusion Presses
- B11.18 Coil Processing Systems
- B11.19 Performance Criteria for the Design, Construction, Care and Operation of Safeguards as Referenced in the Other B11 Machine Tool Safety Standards
- B11.20 Safety Requirements for Manufacturing Systems/Cells
- B11.21 Lasers
- B11.22 CNC Turning Machines
- B11.23 Machining Centers
- B11/TR1 Ergonomic Considerations for the Design, Installation and Use of Machine Tools
- B11/TR2 Mist Control
- B11/TR3 Hazard ID and Control
- B11/TR4 Control Reliability

These standards can be purchased by contacting:

American National Standards Institute, Inc.
11 West 42nd Street
New York, New York 10036
(212) 642-4900

OR

AMT - The Association of Manufacturing Technology
7901 Westpark Drive
McLean, Virginia 22102-4269
(703) 827-5211

National Safety Council Safety Manuals and Data Sheets

Other good references for safety on machine tools are the National Safety Council's Safety Manuals and Data Sheets. These manuals and data sheets are written by various committees including the Power Press, Forging and Fabricating Executive Committee. The following publications are available for all types of machines:

MANUALS

- Power Press Safety Manual - 4th Edition
- Safeguarding Concept Illustrations - 6th Edition
- Forging Safety Manual

DATA SHEETS

- Bench and Pedestal Grinding Wheel Operations
12304-0705
- Boring Mills, Horizontal Metal 12304-0269
- Boring Mills, Vertical 12304-0347
- Coated Abrasives 12304-0452
- Cold Shearing Billets and Bars in the Forging Industry
12304-0739
- Degreasing (Liquid), Small Metal Parts 12304-0537
- Dies, Setup and Removal of Forging Hammer
12304-0716

- Drill Presses, Metalworking 12304-0335
- Drills, Portable Reamer 12304-0497
- Drop Hammers, Steam 12304-0720
- Electrical Controls for Mechanical Power Presses
12304-0624
- Forging Hammer Dies, Setup and Removal of
12304-0716
- Forging Presses, Mechanical 12304-0728
- Gear-Hobbing Machines 12304-0362
- Handling Materials in the Forging Industry 12304-0551
- Kick (Foot) Presses 12304-0363
- Lathes, Engine 12304-0264
- Milling Machines, Metalworking 12304-0364
- Planers, Metal 12304-0383
- Power Press (Mechanical) Point-of-Operation
Safeguarding, Concepts of 12304-0710
- Power Press Point-of-Operation
Safeguarding: Two-Hand Control and
Two-Hand Tripping Devices 12304-0714
- Power Press Point-of-Operation Safeguarding: Type A and B Movable
Barrier Devices 12304-0712
- Power Press Point-of-Operation Safeguarding:
Point-of-Operation Guards 12304-0715
- Power Press Point-of-Operation Safeguarding:
Presence Sensing Devices 12304-0711
- Power Press Point-of-Operation Safeguarding:
Pullbacks and Restraint Devices 12304-0713
- Power Presses (Mechanical), Inspection and
Maintenance of 12304-0603
- Power Presses (Mechanical), Removing Pieceparts
from Dies in 12304-0534
- Power Press, Setting Up and Removing Dies
12304-0211
- Press Brakes 12304-0419
- Robots 12304-0717
- Saws, Metal (Cold Working) 12304-0584
- Shapers, Metal 12304-0216
- Shears, Alligator 12304-0213
- Shears, Squaring, Metal 12304-0328
- Upsetters, 12304-0721

These manuals and data sheets can be purchased by contacting:

National Safety Council
1121 Spring Lake Drive
Itasca, IL 60143-3201
(708) 295-1121

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, LLC 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 LLC'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, LLC 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, LLC's instructions or which will have been altered or repaired by persons other than the authorized agent or employees of Rockford Systems, LLC Rockford Systems, LLC'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, LLC, 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, LLC be liable for any incidental or consequential damages, or any loss or damage resulting from a defect in the product of Rockford Systems, LLC

SECTION 2—INSTALLATION

Installation Manual

Included with every shipment of disconnects, starters, and operator stations is this installation manual with electrical schematics. This publication and electrical prints must be available and fully understood before installation begins. Please notify Rockford Systems, LLC immediately if there are any questions about this publication or the prints.

Installation

A packing list is always enclosed showing exactly what materials were shipped on this order. Please check the components actually received against this packing list immediately.

Open all boxes before proceeding and unpack the enclosed equipment. Make sure all fuses, overloads, and accessories are included.

Lay out the equipment on a workbench or on the floor. Make a rough sketch on page 6 of the mounting location of this equipment on the machine. If mounting both a starter and disconnect switch, when furnished separately, make sure they are mounted within sight of each other. Refer to the following publications for detailed information for the application of electrical equipment on machine tools:

- NEMA (National Electrical Manufacturers Association) Handbook
- OSHA's (Occupational Safety and Health Administration's)
- NEC (National Electrical Code) Handbook
- NFPA 79 Electrical Standard for Industrial Machinery Code of Federal Regulations Subpart

SECTION 3—FUSE AND OVERLOAD CHART

Starters and Disconnects

DISCONNECT SWITCH FUSE CHART

Fuse Part No.	Fuse Size (FLA)	Fuse Part No.	Fuse Size (FLA)
RTD-156	1	RTD-186	7-1/2
RTD-157	1-1/2	RTD-187	8
RTD-179	2	RTD-188	9
RTD-151	2-1/2	RTD-154	10
RTD-180	3	RTD-189	12
RTD-181	3-1/2	RTD-190	15
RTD-182	4	RTD-191	17-1/2
RTD-183	4-1/2	RTD-155	20
RTD-152	5	RTD-192	25
RTD-184	6	RTD-193	30
RTD-185	7		

*Note: When sizing fuses, use the FLA (full-load amps) of the motor(s). Always go to the next larger size fuse if the motor FLA is closer to the upper current range of the fuse.

MOTOR OVERLOAD CHART

Overload Part No.	Range	230 VAC	460 VAC
CST-776	2 - 3A	½ - ¾ HP	1 - 1½ HP
CST-777	2.8 - 4.2A	¾ - 1 HP	1½ - 2 HP
CST-778	4 - 6A	1 - 1½ HP	2 - 3 HP
CST-779	5.5 - 8A	1½ - 2 HP	3 - 5 HP
CST-767	6 - 10A	2 - 3 HP	5 HP
CST-768	10 - 16A	3 - 5 HP	7½ - 10 HP
CST-769	16 - 24A	5 - 7½ HP	10 - 15 HP



Control voltage for the motor starter is 120 VAC only. 120 VAC control power must be supplied for this unit.

SECTION 4—REPLACEMENT PARTS

Starters and Disconnects

FUSED DISCONNECT SWITCH



CFL-014 600 volt, 30 amp	
Part No.	Description
CFF-050	Fused disconnect switch
CFT-073	Disconnect switch handle/shaft

SINGLE-PHASE COMBINATIONS



CSF-082 (120 volt, 3/4 horsepower max.) CSF-083 (240 volt, 2 horsepower max.) (Nonreversing starter with E-stop)	
Part No.	Description
CTC-110	"Start" push button
CTC-527	Emergency-stop button

THREE-PHASE COMBINATIONS



CSF-084 (600 volt, 24 amp) (Nonreversing starter w/E-stop & transformer)	
Part No.	Description
CTC-110	"Start" push button
CTC-527	Emergency-stop button
CSC-064	Starter
RSC-261	Transformer

CSS-055 (120 volt, 3/4 horsepower max) CSS-056 (240 volt, 2 horsepower max) Nonreversing disconnect/starter	
Part No.	Description
CFT-057	Disconnect handle
CFT-075	Disconnect shaft
CFF-028	Disconnect base
CTC-110	"Start" push button
CTC-527	Emergency-stop button

SECTION 4—REPLACEMENT PARTS

Starters and Disconnects

COMBINATION 30-AMP DISCONNECTS AND 24-AMP STARTERS

CSS-057 and CSS-058* (Nonreversing)	
Part No.	Description
CFF-050	Fused disconnect switch
CFT-073	Disconnect switch handle/shaft
CSC-064	Starter
CTC-110	"Start" push button
CTC-526	"Stop" push button
RSC-261	Transformer

CSS-065 (Nonreversing with E-stop)	
Part No.	Description
CTC-110	"Start" push button
CTC-527	Emergency-stop button
CSC-064	Starter
RSC-261	Transformer

CSS-061 and CSS-062* (Plain door, nonreversing)	
Part No.	Description
CFF-050	Fused disconnect switch
CFT-073	Disconnect switch handle/shaft
CSC-064	Starter
RSC-261	Transformer

CSS-059 and CSS-060* (Reversing)	
Part No.	Description
CFF-050	Fused disconnect switch
CFT-073	Disconnect switch handle/shaft
CSC-067	Starter
CTC-110	"Start" push button
CTC-526	"Stop" push button
CTF-091	Fwd/Rev selector switch
RSC-261	Transformer

CSS-063 and CSS-064* (Plain door, reversing)	
Part No.	Description
CFF-050	Fused disconnect switch
CFT-073	Disconnect switch handle/shaft
CSC-067	Starter
RSC-261	Transformer

*Includes RSC-261 Transformer



(Continued on next page.)

SECTION 4—REPLACEMENT PARTS

Starters and Disconnects

REMOTE STATIONS



LLD-800 4-1/2" x 3-1/2" x 3"	
Part No.	Description
CTC-527	Emergency-stop button



LLD-801 6-3/4" x 3-1/2" x 3"	
Part No.	Description
CTC-110	"Start" push button
CTC-527	Emergency-stop button



LLD-802 8-3/4" x 3-1/2" x 3"	
Part No.	Description
CTC-110	"Start" push button
CTC-526	"Stop" push button
CTC-527	Emergency-stop button



LLD-803 3-1/2" x 8-3/4" x 3"	
Part No.	Description
CTC-527	Emergency-stop button
CTC-528	Reverse push button
CTC-529	Forward push button



LLD-804 6-3/4" x 3-1/2" x 3"	
Part No.	Description
CTC-110	"Start" push button
CTC-526	"Stop" push button



LLD-805 8-3/4" x 3-1/2" x 3"	
Part No.	Description
CTC-110	"Start" push button
CTC-526	"Stop" push button
CTF-091	Two-position selector switch

(Continued on next page.)

Rockford Systems, LLC
Call: 1-800-922-7533

SECTION 4—REPLACEMENT PARTS

Starters and Disconnects

REMOTE STATIONS (continued)



LLD-806 8-3/4" x 6-1/4" x 3"	
Part No.	Description
CTC-110	"Start" push button
CTC-111	Black push button
CTC-526	"Stop" push button
CTF-091	Two-position selector switch



LLD-807 8-3/4" x 6-1/4" x 3-3/4"	
Part No.	Description
CTC-110	"Start" push button
CTC-111	Black push button
CTC-526	"Stop" push button
CTF-091	Two-position selector switch



LLD-808 8-3/4" x 3-1/2" x 3"	
Part No.	Description
CTC-111	Black push button
CTF-091	Two-position selector switch

BAR/RUN STATIONS



LLD-093 (Relay logic)	
Part No.	Description
CTC-003	Black push button
CTF-350	Three-position selector switch

LLD-191 (Full revolution)	
Part No.	Description
CTC-003	Black push button
CTF-350	Three-position selector switch

LLD-708 (SSC-1000)	
Part No.	Description
CTC-111	Black push button
CTF-092	Three-position selector switch

LLD-193 (SSC-2000T)	
Part No.	Description
CTC-003	Black push button
CTF-349	Three-position selector switch

SECTION 5—RETURN AUTHORIZATION AND ORDER FORM

Starters and Disconnects

RETURN MATERIALS AUTHORIZATION REQUEST FORM

To return material for any reason contact the sales department in our organization at 1-800-922-7533 for an R.M.A. number. All returned materials shipments must be prepaid. Complete this form and send with material to 5795 Logistics Parkway, Rockford, Illinois 61109. Make sure the R.M.A. 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

A. Full Credit _____ B. 25% Restocking _____ C. Repair & Return _____ D. Replacement _____

Reason for return (describe in detail):

Return Materials Authorized By _____ Date _____

ORDER FORM FOR SIGNS AND LITERATURE

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 _____

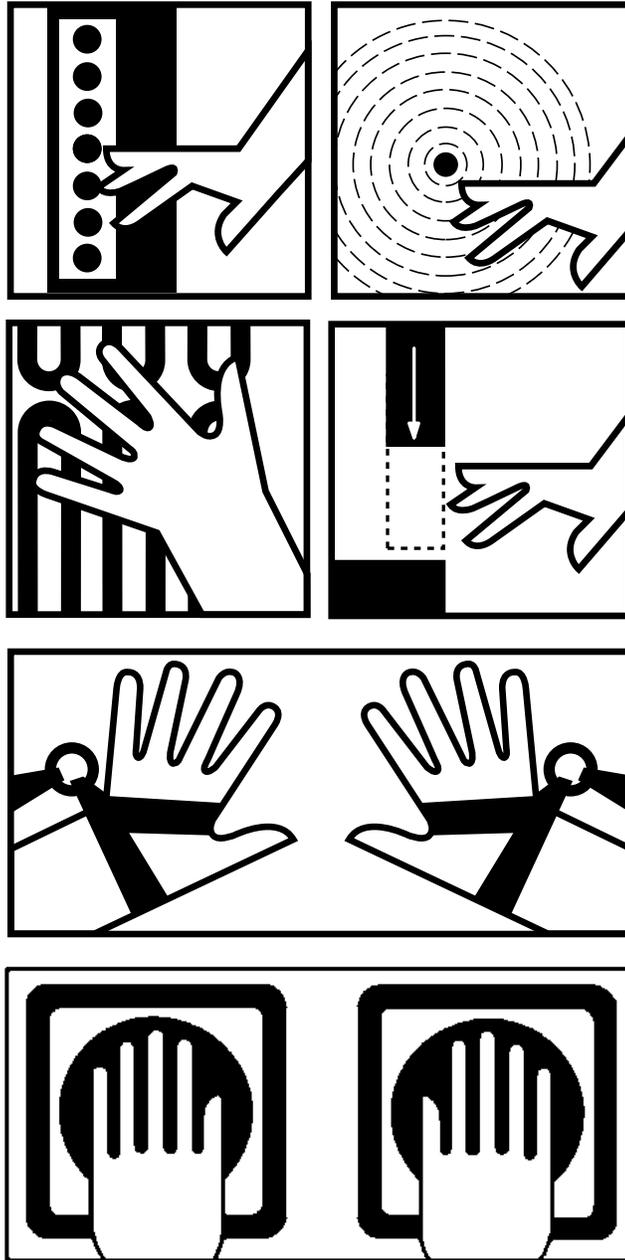
Phone _____ Fax _____

Name _____ Purchase Order No. _____ Date _____

Part No.	Description	Quantity Required
KSL-229	Installation Manual	_____
KST-151	Label - Warning/Hazardous Voltage 1-1/2" x 2-1/2"	_____
KST-152	Label - Warning/Hazardous Voltage 2-1/2" x 1-1/2"	_____
KST-260	Label - Disconnect Switch	_____
KST-261	Label - Motor Starter	_____
FAB	Catalog - "Safeguarding Fabricating Machines"	_____

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

Your Signature _____ Date _____



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