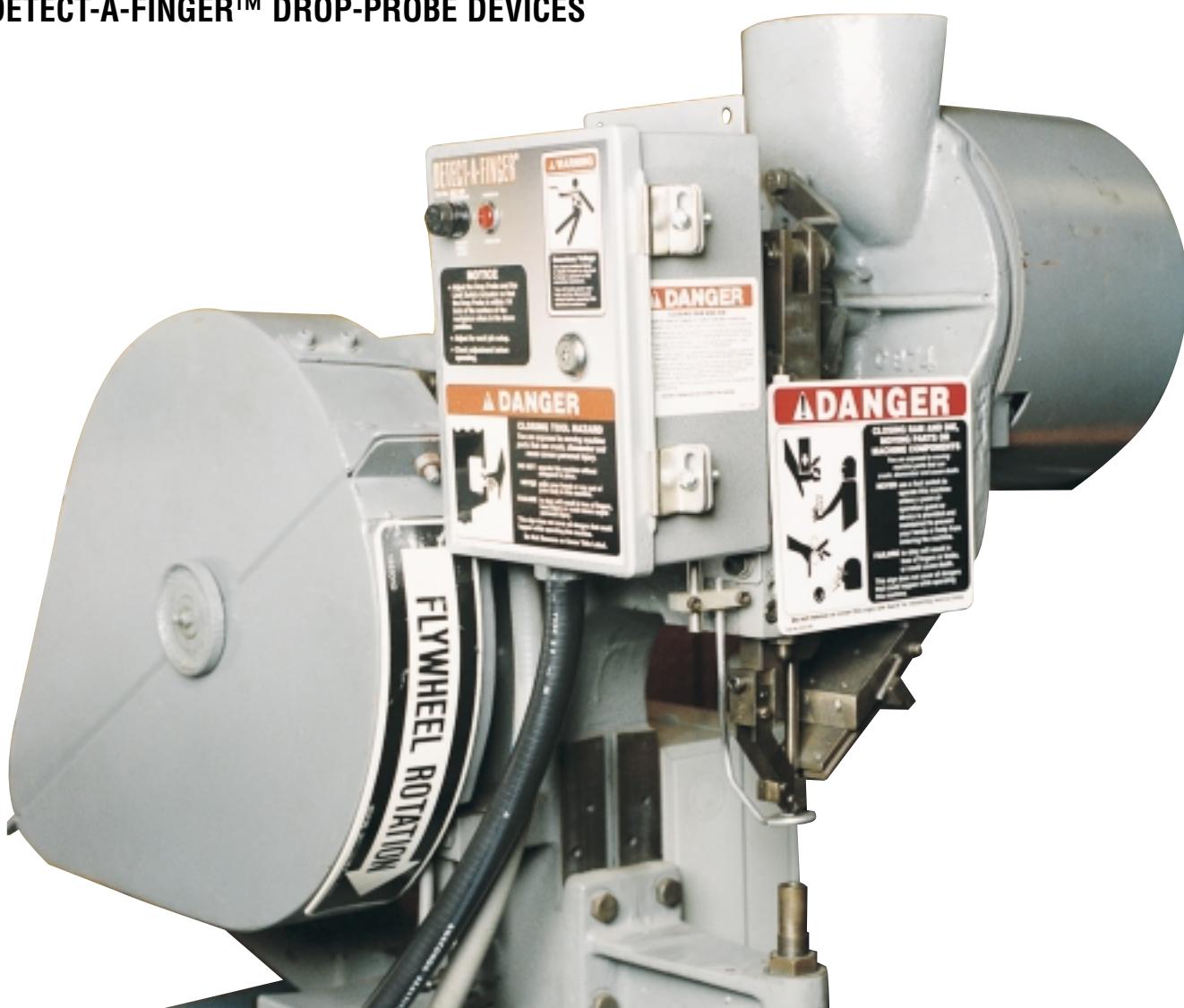


DETECT-A-FINGER™ DROP-PROBE DEVICES



The Detect-A-Finger™ drop-probe devices are used on small machines to protect the operator's fingers from point-of-operation hazards. The aluminum probe is shaped by the user to fit each application. Additional material, such as acrylic or polycarbonate clear plastic pieces or tube-type materials can be added to the probe to provide adequate protection. When doing this, care should be taken not to add too much additional weight to the probe. Light materials should be used.

These devices are designed to drop by gravity. If a finger or piecepart is in the way of the probe and the probe is not allowed to complete its downward travel, the machine will not start a cycle or stroke. The rotary solenoid, in some units, is in the control box and when energized, after initiation of the cycle, allows the probe to drop. A spring returns the probe to its starting or up position. Another

drop-probe device uses interlocking cams in its operating mechanism.

On machines that are mechanically operated, an air cylinder or electric solenoid may have to be added to the operating linkage to trip the machine. On machines that are hydraulically or pneumatically operated, the drop-probe control can usually be interfaced with the existing control system.

When updating machines to meet safety standards, please make sure that each machine is looked at as an individual system that includes, but is not limited to, safeguarding (drop-probe device), machine control, disconnect switch, motor starter, covers for rotating components, auxiliary parts, lockout/tagout equipment, and feeding and retrieving of workpieces. These products are included in this catalog.

(Continued on next page.)

DETECT-A-FINGER™ DROP-PROBE DEVICES (continued)

FOR SAFEGUARDING RIVETERS, EYELETTERS, STAKERS, STAPLERS, CRIMPERS, FASTENING AND ASSEMBLY MACHINES

Many machines can easily be safeguarded with the Detect-A-Finger™ drop-probe device.

The control box consists of the probe arm, rotary electric solenoid, relay, limit switch, basic circuit with terminals and other mechanical mechanisms.

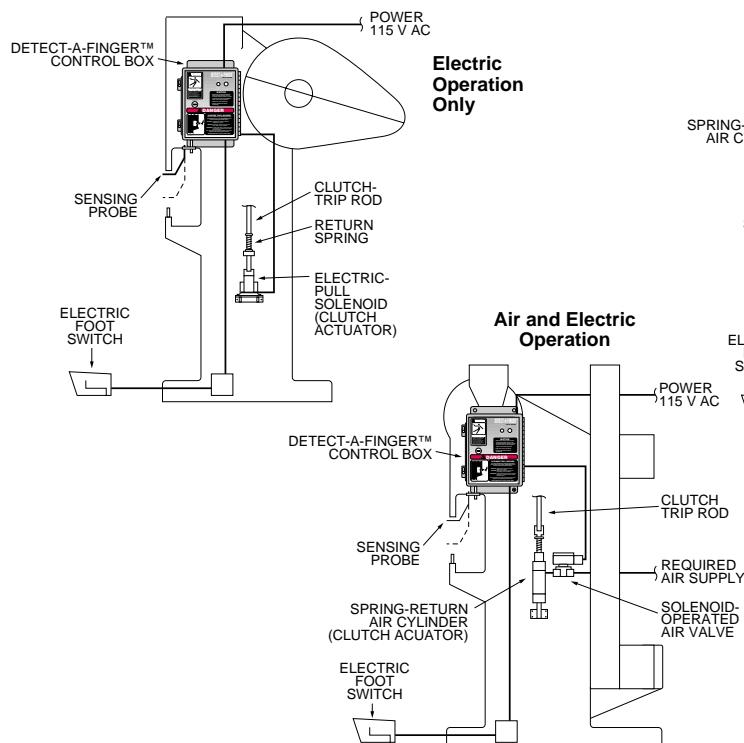
Two 18" aluminum drop-probe rods are furnished with each control box. These rods are shaped by the user to the workpiece or assembly requirements.

Sequence of Operation

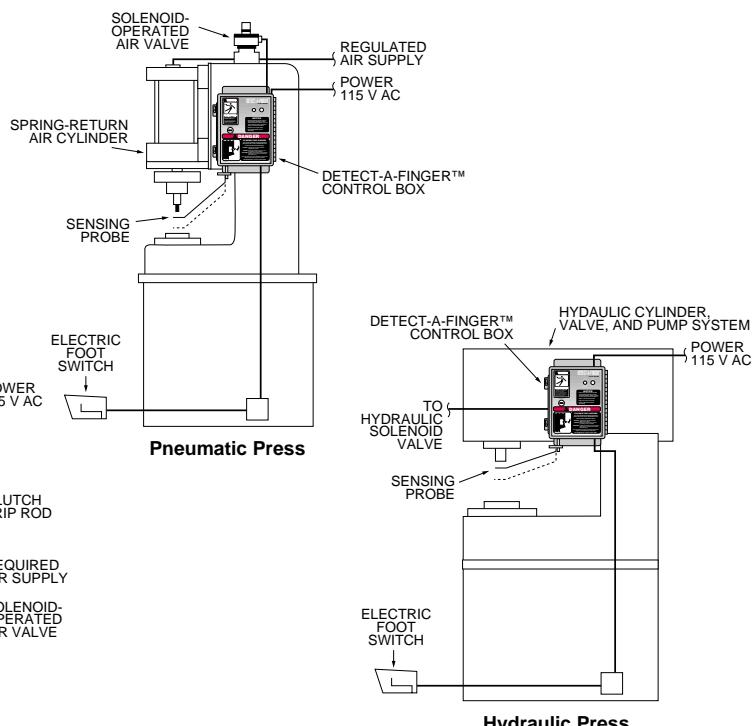
The operator initiates the cycle of the machine usually by an overt action on the foot switch. This energizes the rotary solenoid in the control box, which allows the drop probe to drop until it makes contact with a limit switch. If an obstruction, such as a finger, gets in the way of the probe, the limit switch is not contacted and the machine does not start its cycle. If nothing obstructs the probe and the limit switch is operated, a relay will signal the machine to start its cycle or cause it to trip. Next, the relay drops out, deenergizing the control box solenoid, allowing the probe to move up and out of the way. At this time, the machine completes its cycle and stops. The foot switch must be released and reinitiated to begin another cycle.

TYPICAL APPLICATIONS

Electrically or Electropneumatically Tripped Machines (Incorporating Mechanical Full-Revolution Clutch Typical on Riveting, Eyeletting and Staking Machines)



Electropneumatic or Electrohydraulic Machines

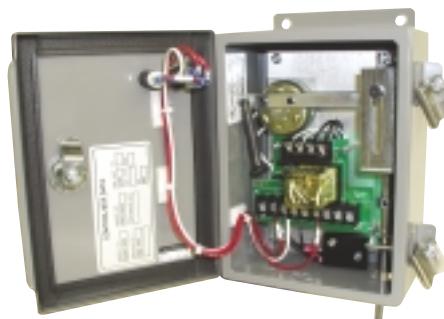


All mechanically operated full-revolution-clutch machines should incorporate single-stroke capability (mechanism).

See the bottom of page 253 for machines requiring single-stroke packages.

(Continued on next page.)

DETECT-A-FINGER™ DROP-PROBE DEVICES (continued)



The Detect-A-Finger™ drop-probe device is furnished in two models. Part No. RKC-000 is for mounting on the **right side** of a machine, and Part No. RKC-001 is for mounting on the **left side** of a machine.

Select the Detect-A-Finger device (right- or left-side mount) that allows the sensing probe to enter the point of operation, without obstructing the work area, and provides for as short and rigid of a sensing probe design as possible. The drop probe stroke is adjustable from 0" to 1 $\frac{1}{8}$ ". Also, select one of the foot switches, if needed. Complete installation instructions and a maintenance manual are furnished with each device.

This light-duty foot switch is guarded on the top and sides

Part No. CTD-066

Single-Stage

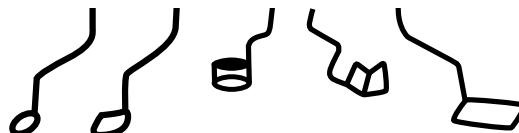
Part No. CTD-067

Two-Stage



For heavy-duty foot switches see page 255.

Here Are a Few Examples of How the Drop-Probe Rods Can Be Fabricated:



Other Components That May Be Required To Trip Or Cycle The Machine:

RCL-001	Air Cylinder Assembly	1 $\frac{1}{8}$ " Bore x 1" Stroke	50-lb Pull
RCL-002	Air Cylinder Assembly	1 $\frac{1}{8}$ " Bore x 1" Stroke	100-lb Pull
RCL-003	Air Cylinder Assembly	2" Bore x 2" Stroke	200-lb Pull

Note: For push-type or longer stroke air cylinders, please consult factory.

Part No. RCD-006 Solenoid Air Valve Assembly

Part No. RCL-043 ¼" Filter-Regulator-Lubricator Assembly

If the machine that is being safeguarded with a drop-probe device (detailed above and on page 252) obtains its force from a flywheel, but does not have a single-stroke mechanism, the following can be furnished:

Part No. FPF-000-F Control Box

Part No. FNF-001 Component Package

Appropriate-sized air cylinder (See chart at left and page 94 for other choices.)

Please see pages 84 through 96 for further details on the control systems available.

For fused disconnect switches or magnetic motor starters, please see pages 201 - 206. For lockout valves, please see page 112.

(Continued on next page.)

DETECT-A-FINGER™ DROP-PROBE DEVICES (continued)

FOR SAFEGUARDING RESISTANCE-TYPE SPOT WELDERS



Rocker-Arm Welder

The Detect-A-Finger™ drop-probe device reduces accidents at the point of operation where an operator's fingers can enter. The key components of this device are a sensing probe module with the rod shaped to fit over or around the workpiece, and a control module. When the operator initiates a machine cycle, the sensing probe is released and drops by gravity over or around the workpiece. If the



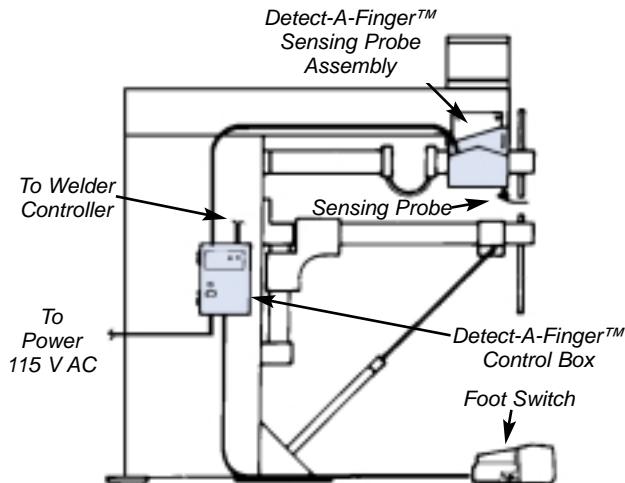
Air-Operated Welder

operator's fingers are still in the hazard area, the sensing probe will not reach its preset position and will not allow the spot welder to start its cycle. If there are no obstructions to prevent the sensing probe from dropping, when it reaches its preset position, the control unit will allow the machine to cycle.

The compact design of the sensing probe module allows it to be attached to the welder arm. The drop-probe stroke is $1\frac{1}{8}$ ".

Each unit is furnished with two plain 18" aluminum drop-probe rods. These rods are to be shaped by the user to specific requirements. To prevent welding splash, additional lightweight clear plastic shielding can be attached to the rod.

Press-Type Resistance Welder

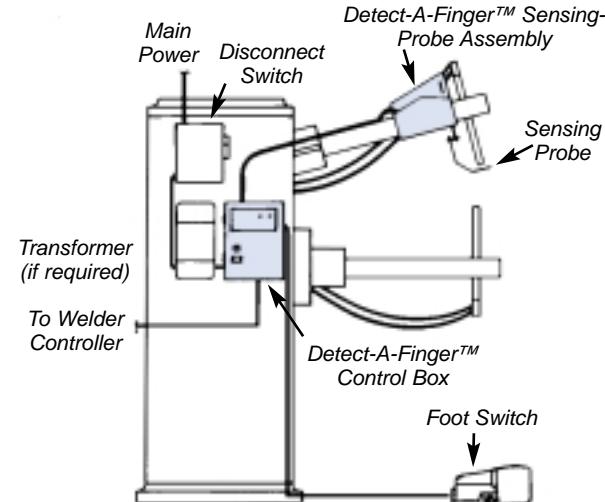


This Detect-A-Finger™ drop-probe assembly may be mounted either to the moving member of a welder (upper arm), like the rocker-arm type illustrated at right above, or may be mounted to a fixed part of a welder, like the press-type illustrated at left above. Depending on the type of welder, a single-stage or a two-stage foot switch may be required.

The Detect-A-Finger™ may also be applied to mechanical foot pedal-type welders. To convert from a mechanical operation, the mechanical pedal must be removed and replaced with an air cylinder to oper-

Typical Applications

Press-Type Resistance Welder



ate the arm and foot switch. The cylinder bore and stroke (push- or pull-type) can be determined from actual machine measurements, and the method and location of attachment to the welder linkage. The air cylinder can be controlled by a three-way normally closed 115-V AC solenoid air valve. Adjustable flow control valves may be employed to smooth the welder arm movement, and an air filter-regulator-lubricator assembly may also be required. See bottom of page 253 for these components.

(Continued on next page.)

DETECT-A-FINGER™ DROP-PROBE DEVICES (continued)



Part No. RKC-500
Detect-A-Finger™
Drop-Probe Device for
Welders

As shown at left, the Detect-A-Finger™ device for spot welders consists of two components, the control box (mounted on the frame of the welder) and the drop-probe assembly (mounted on the upper arm).

The control box provides interface of the Detect-A-Finger™ device to the spot welder's control system.

If the drop-probe unit is never allowed to complete its preset downward travel, the welder will not start its stroke. Insulated mounting hardware for the probe unit is also included.

Complete installation instructions and a maintenance manual are provided with each assembly.

Select a foot switch which best meets your needs.

Determine if the welder controller requires a single- or two-stage foot switch. If a two-stage foot switch is required, please consult factory.

If a single-stage foot switch is required, select one of the following.

Part No. CTD-065 - Single-stage foot switch (orange)

Part No. CTD-077 - Single-stage foot switch (red)

Each heavy-duty foot switch has fully guarded top and sides.

CTD-065



CTD-077

Danger Signs Furnished With Detect-A-Finger Units

A danger sign and an operator safety precaution pamphlet are furnished with each drop-probe device. Please note that these signs are also available in Spanish and French.

OPERATOR SAFETY PRECAUTIONS

Handout for Anyone Operating This Machine
Before You Operate This Machine
You Must Read and Understand
These Safety Precautions

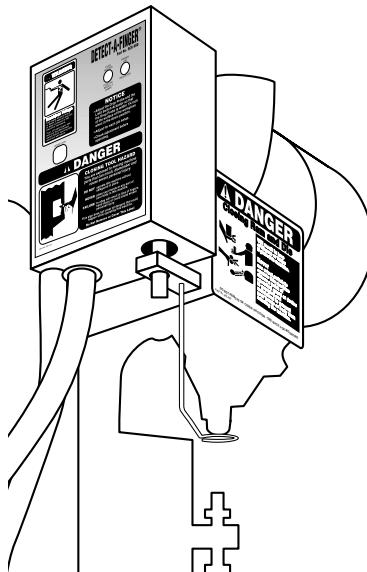
! DANGER

NEVER
Place Your Hands
or Any Part of
Your Body In This
Machine

See Reverse Side for Other Safety Precautions.

OVER

Part No. KSC-000



Operator Safety Precaution Pamphlet for Metal Forming Machinery

Size is 8½" x 11". A hole is provided in the upper corner for attaching purposes.

Part No. KSC-000 (English)

Part No. KSC-000S (Spanish)

Part No. KSC-000F (French)

Danger—Closing Ram and Die
Size is 5" x 6" x .055" thick

Part No. KSC-055
(English)

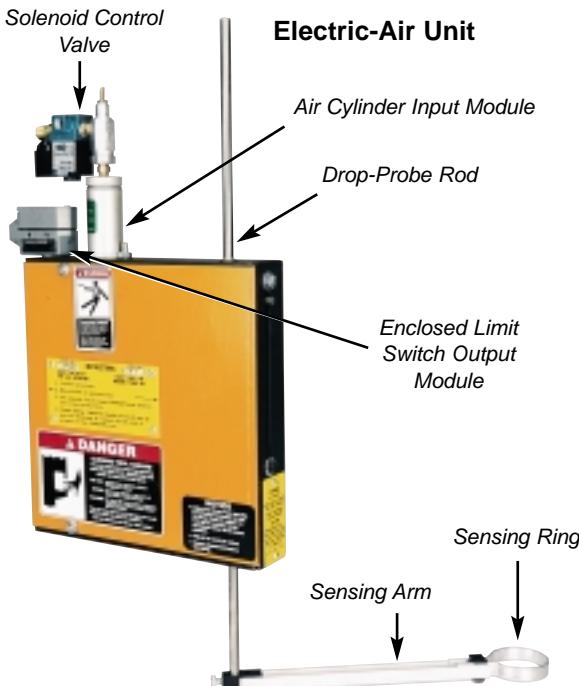
Part No. KSC-055S (Spanish)

Part No. KSC-055F (French)

(Continued on next page.)

DETECT-A-FINGER™ DROP-PROBE DEVICES (continued)

LONG STROKE DROP-PROBE DEVICES FOR SAFEGUARDING RIVETERS, SPOT WELDERS, EYELETTERS, STAKERS, AND SIMILAR MACHINES



This unit is available in two models. One model is for mounting on the right side of a machine, and the other model is for mounting on the left side of a machine. The location will be determined when facing the machine. It can also be located either above or below the point of operation. *Note: If it will be located below the point of operation, please consult the factory.*

Location of this unit should be determined by the availability of mounting surface, the size or shape of the workpieces, and the throat depth of the machine.

The standard-stroke unit can provide a probe stroke of up to 2¼". The long-stroke unit is designed and

Sequence of Operation

These units are air or electrically operated with a foot switch.

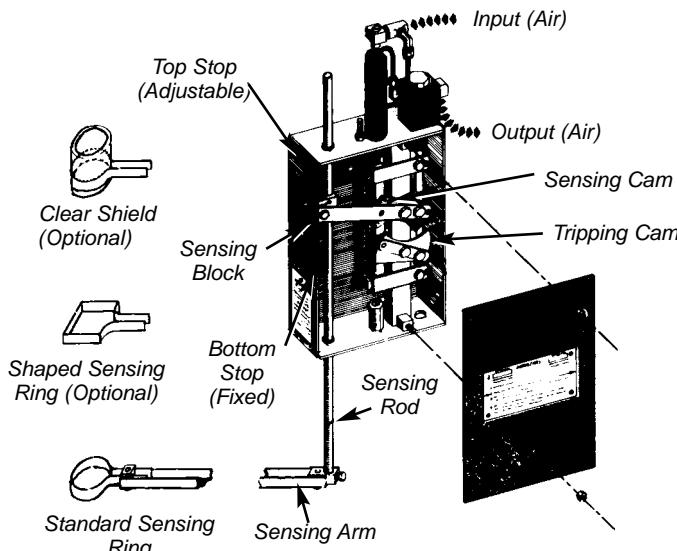
On the air-operated units, an air cylinder input module operates the unit. If the sensing ring drops to its preset point, the output module, which is a three-way valve, opens admitting air to the machine tripping mechanism.

An air foot switch is available if the machine is not already equipped with one. (See photo and part number on page 258.)

manufactured to provide up to a 4½" stroke of the sensing ring assembly.

This drop-probe device functions by allowing a mechanical sensing ring or probe to drop by gravity around the point-of-operation hazard prior to each intended machine stroke. If this sensing probe encounters the operator's fingers and fails to drop to a preset point, no tripping signal of the machine results. The unique design of this unit not only prevents the tripping signal, but also leaves the device mechanically locked out.

The internal mechanism has an exclusive interlock consisting of steel cams. When the unit is actuated, the sensor drops to its adjustable preset point moving the sensing cams out of the way of the tripping cams. The tripping cams continue on and actuate an air valve or limit switch; therefore, tripping the machine. If the sensor travel is obstructed, the sensing cams do not move out of the path of the tripping cams. The unit locks up at that point and no tripping signal results. This concept also provides for one universal device as opposed to separate designs for various machines cycled in different ways. (See drawing below.)



Electrically operated units are electric-air. The air cylinder input module is fitted with a 115-V AC solenoid control valve. The output module is an enclosed limit switch with capacity of 15 A, 125 V AC suitable for operating a tripping solenoid or solenoid air valve.

These units function the same way as the air-operated units and have the same air source requirements. An electric foot switch is available if the machine is not already equipped with one. (See photos and part numbers on pages 253 and 255 for electric foot switches.)

Note: If other inputs or outputs are required for your application, please consult factory for part numbers.

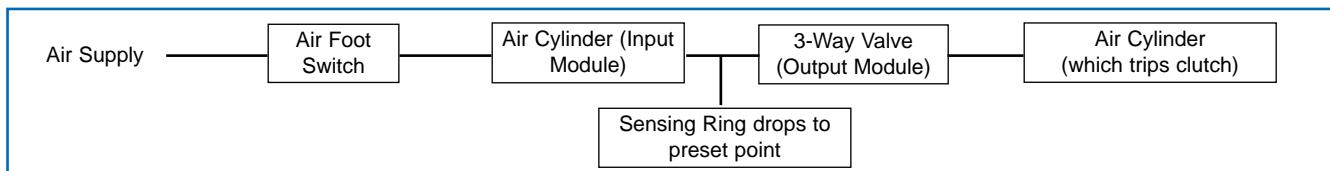
Detect-A-Finger™ Drop-Probe Devices (continued)

Sequence of Operation

These units are air or electrically operated with a foot switch. An air cylinder input module **always** operates the unit.

Air-Operated Devices - see page 258 (Part Nos. RKC-700, RKC-701, RKC-702, and RKC-703)

On air-operated devices, air is used to energize the air cylinder input module on the unit. This energizes an internal mechanism which in turn causes the sensing ring to drop to its preset point. The output module is a three-way valve which opens to admit air to the cylinder that trips the clutch of the machine. (See illustration.)



If a mechanical riveter is converted to a pneumatic riveter, in addition to the Detect-A-Finger™, the following components are required: (See page 258)

RCD-096 Air Foot Switch

RKC-715 Air Cylinder (Pull) (¾" bore x 1" stroke)

OR

RKC-716 Air Cylinder (Push) (¾" bore x 1" stroke)



Part No. RKC-715

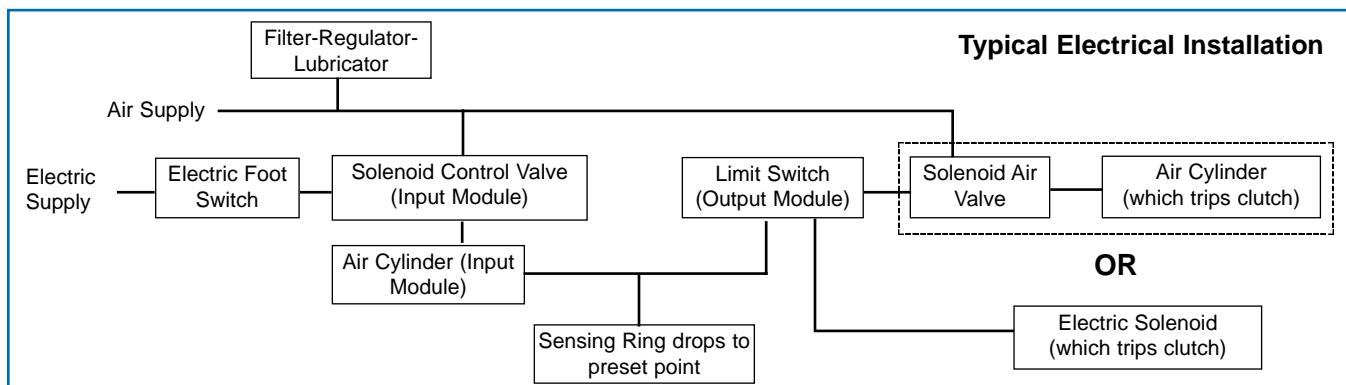


Part No. RKC-716

*Note: When installing a spring-return-type cylinder, the existing spring-return mechanism or mechanical return equipment must **not** be removed.*

Electrically Operated Devices - see page 258 (Part Nos. RKC-704, RKC-705, RKC-706, and RKC-707)

On electrically-operated devices, air is still required to energize the air cylinder input module on the unit. On standard units, a 115-V AC electric solenoid control valve is attached to the air cylinder. This valve is connected to the electric foot switch. Once this valve energizes the internal mechanism, the sensing ring will drop to its preset point. The output module is an enclosed limit switch with capacity of 15 A, 125 V AC suitable for operating a tripping solenoid or solenoid air valve. Special voltages for solenoid valves and limit switches are available. Please consult the factory. (See illustration.)



If a mechanical riveter is converted to an electrically-operated riveter, in addition to the Detect-A-Finger™, the following components may be required: **RCL-043** ¼" Filter-Regulator-Lubricator

Air Cylinder (Push or Pull) (Please consult factory for part number.)

OR

Electric Solenoid (Push or Pull) (Please consult factory for part number.)

CTD-065 or CTD-077 Heavy-Duty Electric Foot Switch (See page 255)

OR

CTD-066 Light-Duty Electric Foot Switch (See page 253)

(Continued on next page.)

SAFEGUARDING OTHER METAL-FABRICATING MACHINES

*Add W to the end of the part number when ordering for a welder

DETECT-A-FINGER™ DROP-PROBE DEVICES (continued)

ORDERING INFORMATION

Air-Operated Devices Complete with Standard Drop Probe:

Part No.	Description
RKC-700*	2½" Stroke—Right-Side Mount
RKC-701*	2½" Stroke—Left-Side Mount
RKC-702*	4½" Stroke—Right-Side Mount
RKC-703*	4½" Stroke—Left-Side Mount

* Add W to the end of the part number when ordering for a welder.

Electrically-Operated Devices Complete with Standard Drop Probe:

Part No.	Description
RKC-704*	2½" Stroke—Right-Side Mount
RKC-705*	2½" Stroke—Left-Side Mount
RKC-706*	4½" Stroke—Right-Side Mount
RKC-707*	4½" Stroke—Left-Side Mount

* Add W to the end of the part number when ordering for a welder.

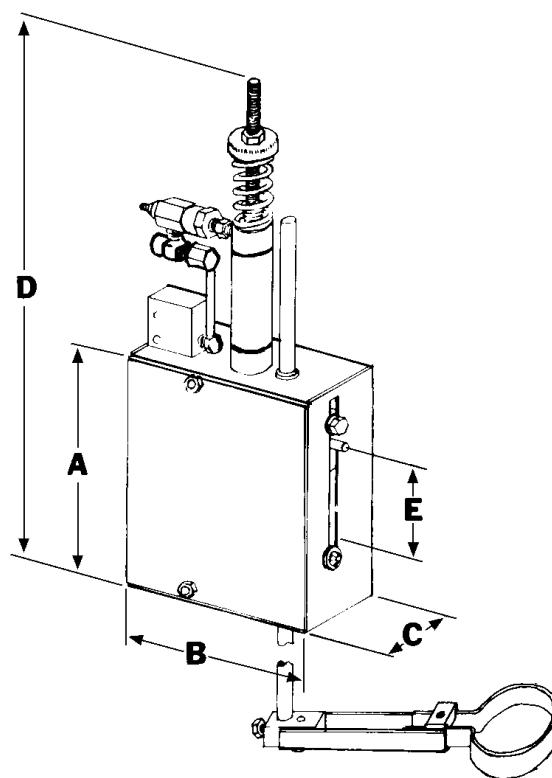
Components that may be Required to Trip or Cycle Machine:

Part No.	Description
RKC-715	Air Cylinder (Pull) (¾" Bore x 1" Stroke)
RKC-716	Air Cylinder (Push) (¾" Bore x 1" Stroke)
RCD-096	Air Foot Switch (see photo below)
CTD-065	Heavy-Duty Electric Foot Switch
CTD-066	Light-Duty Electric Foot Switch

Note: See page 233 for part numbers of air cylinders or other components that may be required.

Part No. RCD-096

Air Foot Switch



MODEL	BOX DIMENSIONS			APPLICATION DIMENSIONS	
	HEIGHT A	WIDTH B	DEPTH C	O.A. HEIGHT (APPROX.) D	STROKE (UP TO) E
STANDARD	10¼"	7"	2½"	16 VARIABLE	2½"
LONG STROKE	10¼"	9¾"	2½"	16 VARIABLE	4½"

OPTIONAL POLYCARBONATE SHIELDS:

Part No.	Description
NEP-103	Flanged Shield—2½" x 2¾" Rectangular Top
NEP-104	Round—1" I.D. (state height when ordering)
NEP-107	Round—1¾" I.D. (state height when ordering)
NEP-108	Round—2" I.D. (state height when ordering)

Special configuration of shields is available upon request. Please consult the factory.