



Triad Controls, Inc.

Press Brake Guarding

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Press Brake Controls

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Safety Light Curtains

Introduction

The trend setting equipment contained within this machine control and guarding manual has been designed with trend setting state of the art technology that is substantially advanced when analyzed and compared.

Our products incorporate and utilize microprocessors, infrared technology, programmable controllers (PC's), programmable limit/cam switches, and advanced relay systems. With over twenty years of experience with OSHA standards and requirements, our products have enhanced our total capability to better understand our customers needs. These experiences along with extensive research and development have enabled us to supply you with the most cost efficient, energy efficient, and productive equipment available along with meeting current OSHA standards. Our total progressive policy is further evidenced by our extremely competitive pricing while at the same time giving our customers extended warranties as an assurance of our products' quality and versatility.

We appreciate this opportunity for our equipment and engineering services to come under review and consideration. We invite your inquiry so we may discuss further your machine control and guarding needs and to supply you the best possible products for your application.

Production with Protection; Triad Controls

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SUPERLIGHT VI

PROGRAMMABLE SAFETY LIGHT CURTAIN

Featuring the "QuickView Diagnostic Display"
For Increased Productivity and Maximum Operator Safety



AMERICA'S MACHINE GUARDING/MACHINE CONTROL COMPANY

TRIAD

Triad Controls, Inc.

SUPERLIGHT VI

The Ultimate in Safety–Quality–Value

Diverse Redundancy Design Concept

Triad safety light curtains utilize the diverse redundancy design concept. This gives the safety light system a higher level of redundancy and control reliability. The two microprocessors are of different design, and the microprocessor or parallel programs are run and made up from different instruction sets written by different programmers.

Self-Checking Circuitry

Triad safety light curtains self-check every 20 milliseconds. Self-checking is the ability to electronically verify that all of the system's critical internal circuit components and their redundant counterparts or back-ups are operating properly.

Extra Safe Design

Provides two methods of fail-safe design. One utilizes two microprocessors and two captive contact relays, and one uses four watchdog timers monitoring the system and the captive contact relays.

Redundant Captive Contact Safety Relays

Redundant relays assure safety if an output relay should fail. SuperLight VI utilizes safety relays which have force-guided contacts. The contacts are mechanically locked together so that if one set of contacts weld, the other contacts cannot change state.

External Diagnostic Display

Standard on all Triad safety light curtains is the "Quickview Diagnostic Display." The alphanumeric display shows status and fault codes of the unit. This is an excellent safety and maintenance feature.

Control Reliable System

Critical components of the SuperLight VI are duplicated so that a single component failure will not cause an unsafe condition. If a component does fail, the unit's self-checking circuitry recognizes the situation and initiates a safe stop of the machine.

Powerful Infrared Light Source

Triad safety light curtains utilize powerful, safe, and predictable infrared light as its sensing source. This gives the system greater reliability and enhances machine utilization by minimizing nuisance trips and shutdowns caused by dirt, coolants, lubrication mists, and machine oils. Triad safety light curtains are highly immune to EMI, RFI, and ambient light conditions, and are unaffected by strobe lights, and weld flash generated light sources.

Extensive Testing

Triad safety light curtains incorporate extensive testing and burn-in to establish a high degree of product reliability and safety.

Emitter

Receiver



Standard Features and Capabilities

- Cost competitive
- Very easy to align and install
- Three-Year warranty (industry leader)
- Heavy duty aluminum welded 14 gauge enclosure
- Dust and oil tight
- 3/4" infrared light beam spacing
- External status and diagnostic display on all light curtains
- Compact design
- Single/multiple floating beam blanking
- Single/multiple fixed beam blanking
- Auto-Blanking feature option
- PSDI-Presence Sensing Device Initiation capability option
- Alignment indicator light
- Shock mounts supplied standard
- Easy access for wiring
- Dual self-checking captive contact safety relays
- Fast reacting-Less than 30 ms all sizes
- Light curtain controller box not required
- Light curtain interconnections not required between pylons or a third box or controller
- Non-mated units, matched sets are not required
- 2-, 3-, 4- or 5-sided protection available with mirrors
- Extended scanning ranges available — 75' (22.8m) maximum
- Dual independent channel microprocessor design
- Self-checking circuitry
- Nine standard sizes — 12" (305mm) to 72" (1829mm) lengths
- Meets or exceeds OSHA, ANSI, CSA, and RIA standards
- Not affected by ambient light
- High immunity to EMI and RFI noise sources
- High immunity to strobe type and weld flash generated light sources
- Interfaces easily with all types of machine controllers and PLCs
- Made in the U.S.A

Quickview Diagnostic Display

Standard on all Triad safety light curtains is the revolutionary front panel diagnostic display. The bright red alphanumeric LED display shows the status of the safety light curtain along with various integral fault codes relating to the maintenance and operation of the system.

The diagnostic display monitors microprocessors, captive contact safety relays, bad grounds, external infrared sources, shorts, blanking, etc. Fault

conditions are easily read and displayed on the top front panel of the receiver pylon. These easy to read external diagnostic codes and status displays will enhance safety and machine utilization by minimizing machine downtime and set-up time measurably

The advanced design of the SuperLight VI diagnostics will also count and display the number of beams blanked out in the "Auto-Blank" mode. This is an important

feature when computing the depth penetration factor required for proper installation.

A detailed definition, status, reason(s), and cure listing is provided within the installation and operation manual of each Triad safety light curtain.

DECIMAL POINTS OFF

DECIMAL POINTS ON

DIAGNOSTIC DISPLAY

0 = Clear

1-4 = Blocked

5-6 = Relay Fault

AUTO Blank *

*7 = Active

*8 = Missing/too large

9 = Ram Failure

A = Master cannot talk to slave microprocessor

B = Data disagreement with slave unit

C = External infrared source detected

D = Internal short/open

E = Beam selection error

F = Bad computer clock

0

1

2

3

4

5

6

7

8

9

A

B

C

D

E

F

.0. = Clear

.1. = 1 beam blocked

.2. = 2 beams blocked

.3. = 3 beams blocked

.4. = 4 beams blocked

.5. = 5 beams blocked

.6. = 6 beams blocked

.7. = 7 beams blocked

.8. = 8 beams blocked

.9. = 9 beams blocked

.A. = 10 beams blocked

.B. = 11 beams blocked

.C. = 12 beams blocked

.D. = 13 beams blocked

.E. = 14 beams blocked

.F. = 15 beams blocked

Subject Machine Control Reliability Requirements

Control reliability control circuits shall be designed and constructed so that a single failure or fault within the system does not prevent the normal stopping action from being applied to the press when required or does not create an unintended stroking action but does prevent initiation of a

successive stroke until the failure is corrected (ANSI B11.1-2001). Always refer to the specific ANSI or OSHA code for the complete requirements of the subject machine.

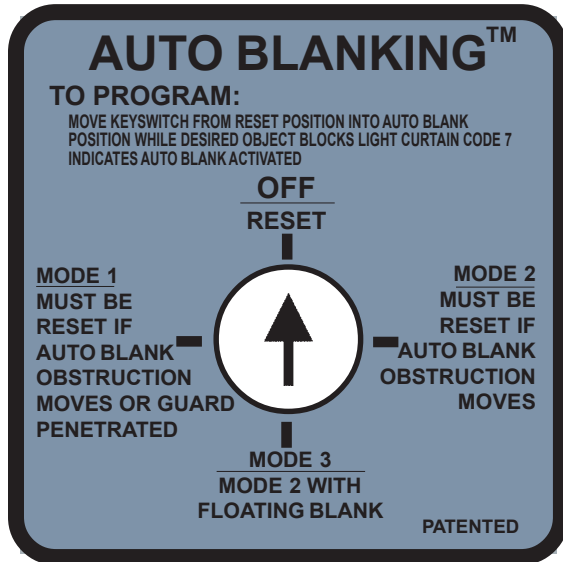
Applications

The Triad infrared safety light curtain is suited for air clutch, hydraulic, and pneumatic equipment such as punch presses, mechanical, pneumatic and hydraulic press brakes, injection molding machines, die casting operations, powered metal compacting presses, filter presses, automatic assembly equipment, bending rolls, robotic operations, FMS systems, slitting lines and food processing machinery.

Blanking Options

The most complete format of blanking options available in the industry
Select the style best suited for your applications

Auto-Blanking - (AB) Option



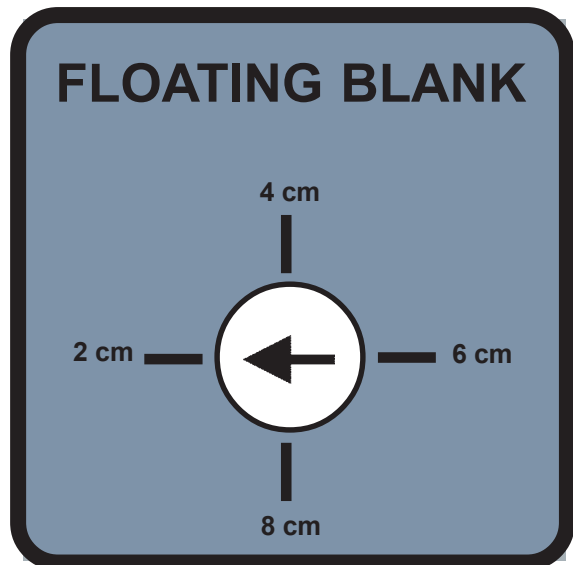
Triad's advanced "Auto-Blank" option is unique because it will automatically blank out only the required number of beams needed to accept an obstruction such as a conveyor, bracket or fixture. The unit is easily programmed by a supervisory controlled four position keyed selector switch located on the front panel of the receiver pylon (shown left). The "Auto-Blank" method of blanking is much safer than DIP switch or master/slave blanking systems because only the area of the obstruction will be blanked. This feature prohibits unsafe oversizing of the blanked area commonly found throughout industry on manually blanked systems. "Auto-Blank" also **eliminates the need** to count beams and to locate where and what beams are to be shut off to obtain the correct beam elevation to accept an obstruction. "Auto-Blank" will also watch the obstruction and, if it moves or is removed, will go into a "machine stop mode" to prevent further machine operation. This is an additional safety feature not available on manually blanked units. These features truly enhance production while providing the ultimate in safety.

When the key switch is turned to the "Auto-Blank" function, the "Quickview Diagnostic Display" will show the number of blocked beams for two seconds, then verify that the obstruction is being monitored. This is required information for the depth penetration factor and for proper installation of any safety light curtain.

The versatile "Auto-Blank" (AB) Blanking Series includes:

- Constant scan light curtain
- One Beam Floating Blank built-in plus "Auto-Blank" capability
- Two "Auto-Blank" Modes - up to 8 beams blanked but need not be sequential
 - A. One "Auto-Blank" mode with keyed reset when guarded zone is penetrated
 - B. One "Auto-Blank" mode with automatic reset when guarded zone is penetrated.

Floating Blank - (8K) Option



The "Floating Blank" option provides the flexibility necessary to effectively guard all types of equipment that require multiple floating beams. This is quite common in the fabricating industry where the workpiece moves.

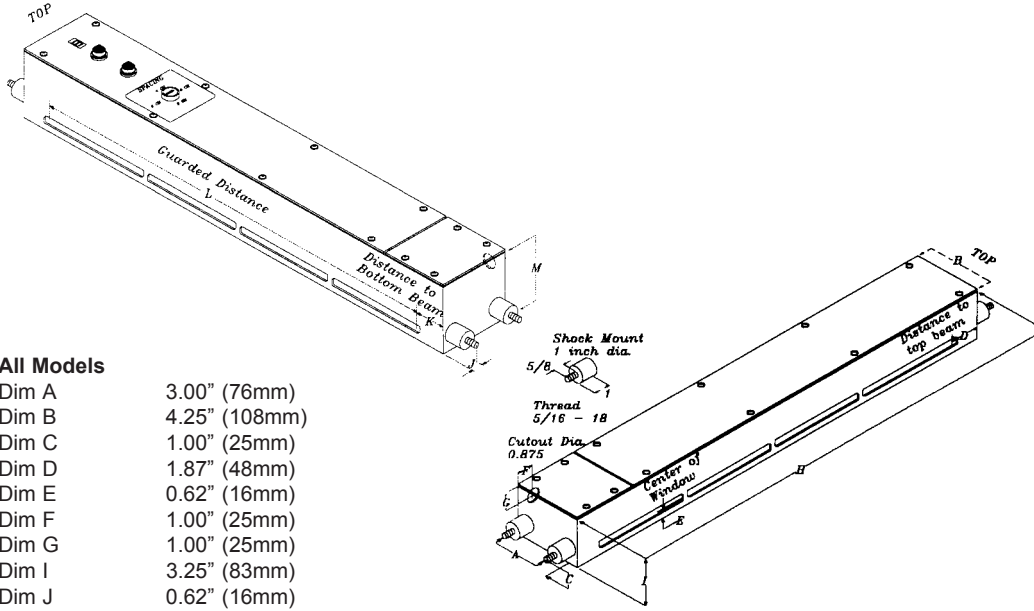
The "Floating Blank" permits work pieces to be formed vertically or horizontally through the guarded area without shutting down the machine. Entry into the protected area by the operator or passerby will prevent the start or, if the machine is in motion, will provide a signal to stop the machine.

The "Floating Blank" is controlled by a keyed selector switch that will allow a work opening of 8cm based on 2cm increments (shown left). Blanking adjustments required when die heights change are not necessary. The "Floating Blank" light curtain automatically adjusts to the various feed positions providing **production with protection**.

The "Floating Blank" (8K) Option includes:

- 2cm - Constant scan light curtain
- 4cm - One floating beam
- 6cm - Two floating beams
- 8cm - Three floating beams

Specifications-Dimensions-Ordering Procedure



All Models

Dim A	3.00" (76mm)
Dim B	4.25" (108mm)
Dim C	1.00" (25mm)
Dim D	1.87" (48mm)
Dim E	0.62" (16mm)
Dim F	1.00" (25mm)
Dim G	1.00" (25mm)
Dim I	3.25" (83mm)
Dim J	0.62" (16mm)
Dim M	4.25" (108mm) (TR-12 is 5.25" or 133mm)

Model	Dim H (box length)	Dim K (last to end)	Dim L (first to last beam)
TR/TPG-12	16.37" (416mm)	1.87" (48mm)	12.62" (321mm)
TR/TPG-18	22.62" (575mm)	1.87" (48mm)	18.92" (481mm)
TR/TPG-24	28.87" (733mm)	1.87" (48mm)	25.22" (641mm)
TR/TPG-30	36.25" (921mm)	2.87" (73mm)	31.52" (801mm)
TR/TPG-36	42.12" (1070mm)	2.87" (73mm)	37.82" (961mm)
TR/TPG-42	48.37" (1229mm)	2.87" (73mm)	44.12" (1121mm)
TR/TPG-48	54.75" (1391mm)	2.87" (73mm)	50.42" (1281mm)
TR/TPG-60	67.25" (1708mm)	2.87" (73mm)	63.02" (1601mm)
TR/TPG-72	79.75" (2026mm)	2.87" (73mm)	75.62" (1921mm)
TR/TPG-84	91.75" (2330mm)	2.87" (73mm)	88.22" (2241mm)
TR/TPG-96	103.75" (2635mm)	2.87" (73mm)	100.82" (2561mm)

Ordering Procedure

For 12" (305mm) to 36" (914mm) units with 3/4" (19mm) beam spacing

- Specify height of unit
- Type of unit 2F, 4F, 8K, AB
- Total distance to be scanned (must be specified)

TR	-	12	-	2F	-	00
SuperLight VI Prefix		Scanning Height in Inches		Type of Unit		Approximate distance light curtain is to scan in feet
				2F No Floating Blank or Blanking Beams constant scan		
				4F One beam built-in Floating Blank capability		
				8K Up to 3 beam Floating Blank adjustable by use of keyswitch removable in all positions on receiver pylon. Capable of constant scan, one, two or three floating beams.		
				AB Constant scan light curtain; One beam floating blank Two Auto-Blank Modes		

For 42" (1067mm) to 72" (1829mm) units with 1 1/2" (38mm) beam spacing

- Specify height of unit
- Type of unit 4CM, 4F, AB
- Total distance to be scanned (must be specified)

TR	-	42	-	4CM	-	00
SuperLight VI Prefix		Scanning Height in Inches		Type of Unit		Approximate distance light curtain is to Scan in Feet
				4cm 4cm spacing with constant scan		
				4F 4cm spacing with one floating blank		
				AB Constant scan Model 4cm; One beam floating blank built-in Two Auto-Blank modes		

Specifications

- Power Requirements:** 120VAC +/- 10% @ 50-60 Hz with fuse protection (24VDC units optional)
- Power Consumption:** 24 watts total
- Infrared Light Source:** Solid state light emitting diodes
- Beam Spacing:** 3/4" (19mm); 1-1/2" (38mm) for Models TR-48 through TR-72
- Response Time:** Less than 30 milliseconds (All sizes)
- Relay Contact Ratings:** 8 AMP rating @ 220VAC; 16 AMP rating @ 120VAC
- Relay Configuration:** Dual captive contact self-checking safety relays.
- Minimum Object Sensitivity:** 1-1/4" (32mm); 2" (51mm) for Models TR-48 through TR-72
- External Alphanumeric Diagnostic and Status Display**
- Temperature Range:** 32 degrees to 120 degrees F
- Scanning Frequency:** 3.6 KHz
- Shock:** Tested to withstand high vibration applications.
- Self-checking** every 20 milliseconds.
- Indicators:** Red obstruction light on receiver. Green non-obstruction light on receiver. Red alignment indicator light on emitter.
- Construction:** Heavy duty aluminum enclosure (all welded). 14 Gauge - Dust and oil tight. NEMA 12
- Scanning Distance:** All units are supplied standard with a 20' (6.1m) scanning capability. Extended range units are available, consult your representative or the factory. Scanning distances must be specified — 75' (23m) maximum.
- Specials:** Custom designed light curtains for special applications. Examples: L-shaped, stainless steel. Consult factory.
- CSA Approved, UL Pending**
- Three-Year Warranty**

Light Curtain Options

Auxiliary Output Contact: Provides an isolated (dry) contact output to be used as a signal line. Specify NO or NC output. Add suffix AO to light curtain Model Number.

Cincinnati Interface/Forced Interrupt: Allows an external device (i.e., Cincinnati Press or PLC) to initiate a Red Condition on the light curtain. This option is required on machines that feed a 24VDC signal back to the safety light curtain to assure that the safety control circuit can be shut down. Add suffix CI to light curtain Model Number.

External Relay Check: This option monitors the control relays of the guarded machine to assure that the machine control relays change state when the safety light curtain sends a stop signal. Add suffix ER to light curtain Model Number.

Resettable Latching Relays: Requires the light curtain to be manually reset every time the light curtain is penetrated. Add suffix LR to light curtain Model Number.

24VDC Power Source: Add suffix DC to light curtain Model Number.

Accessories

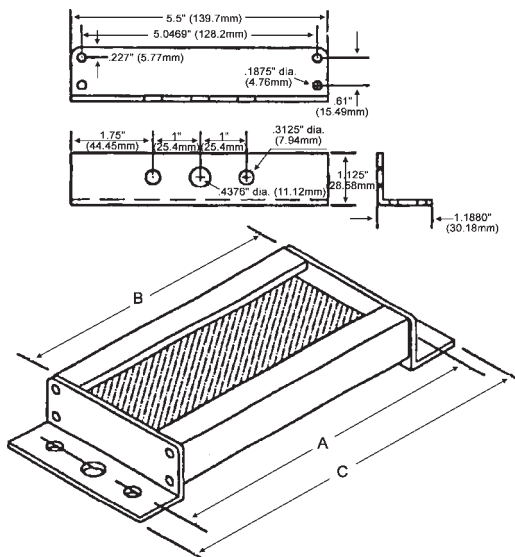
Cornering Mirror Dimensions

Through the use of cornering mirrors, multiple sides or work envelopes can be guarded which enhance safety and reduce down-time related to mechanical and electrical interlock systems.

Include a **5% reflectivity loss per mirror** when calculating total scanning distance of light curtain.

NOTE: Mirrors are surface coated. Wipe surface using only a damp, clean, soft 100% cotton cloth. To replace: remove the end bracket, slide out the mirror with the gasket.

Model	Dim A (hole to hole)	Dim B (mirror)	Dim C (total)
TRM-12	19.45" (494mm)	18.25" (464mm)	20.50" (521mm)
TRM-18	25.45" (646mm)	24.25" (616mm)	26.50" (673mm)
TRM-24	31.45" (799mm)	30.25" (768mm)	32.50" (825mm)
TRM-30	37.45" (951mm)	36.25" (921mm)	38.50" (978mm)
TRM-36	43.45" (1104mm)	42.25" (1073mm)	44.50" (1130mm)
TRM-42	49.45" (1256mm)	48.25" (1226mm)	50.50" (1282mm)
TRM-48	55.45" (1408mm)	54.25" (1378mm)	56.50" (1435mm)
TRM-60	67.45" (1713mm)	66.25" (1683mm)	68.50" (1739mm)
TRM-72	79.45" (2018mm)	78.25" (1988mm)	80.50" (2045mm)

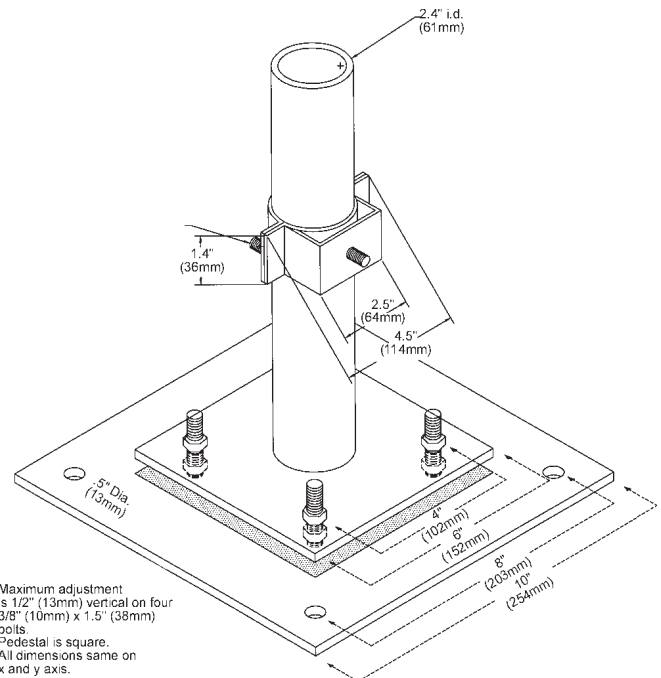


Pedestal Dimensions (Model 8000)

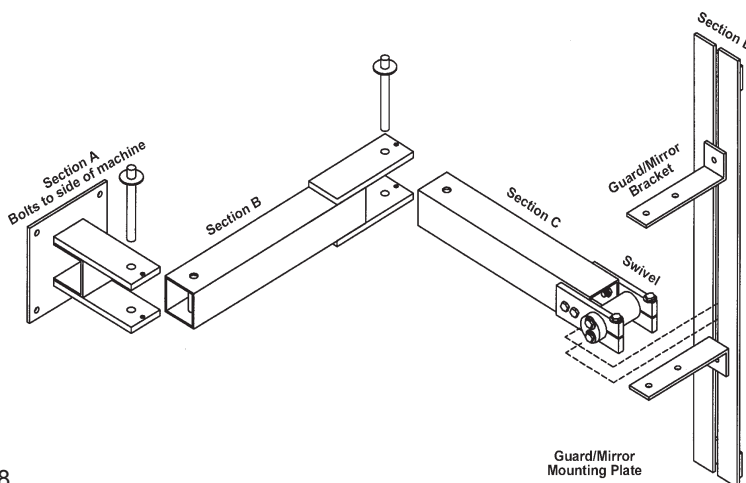
The heavy duty, all welded steel pedestal floor mounts can be used for mounting either the SuperLight VI system or cornering mirrors. Sliding mounts on the pedestal are of universal design and are supplied standard. Unique floating base on pedestal is designed to compensate for uneven floors.

Pedestals must be bolted to the floor, they must not be movable (ANSI B11.19-1990)

- 1) Sliding Mounts supplied
- 2) Standard height - 72" (1829mm) - Model 8000
Optional height - 96" (2438mm) - Model 8096
- 3) Painted OSHA yellow
- 4) Pedestal - 12 gauge steel
Base Plate - 1/4" (6mm) steel plate



Model 9000 Swing Mount Brackets



Excellent method of mounting light guard for press brakes or when light guard is to be moved for die setups or machine maintenance. Model 9000 consists of three 180° pivot points along with light guard diagonal movement capability for virtually unlimited light guard positioning. Two-inch square tubing 3/16" (5mm) thick painted OSHA yellow which mounts directly onto the machine housing and makes for a heavy duty yet versatile mounting bracket.

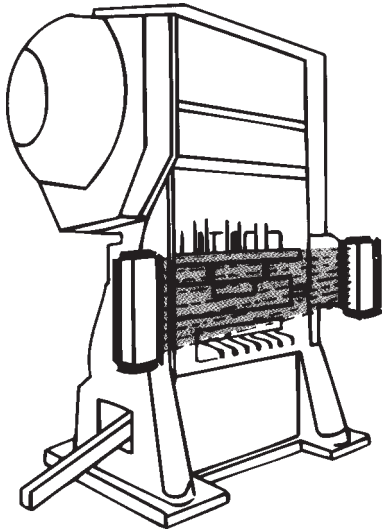
Specify dimensions "B" & "C"

Ordering Procedure:

Specify Pedestal Model # and Quantity.

- Specify Model 9000 Swing Mount Brackets and quantity.
- Specify B & C dimensions required.
- Specify light curtain or mirror size to be mounted.

Applications

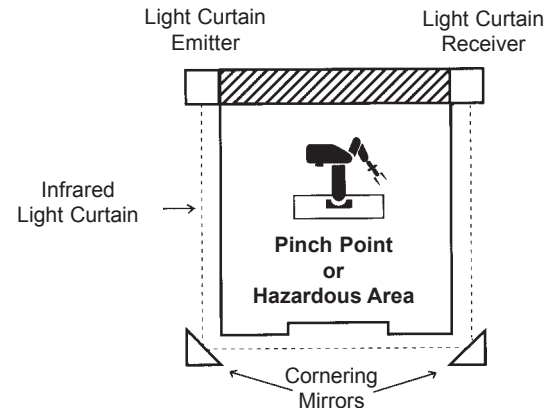


Punch Presses

The SuperLight VI is designed to accept coil stock movement with no press shutdowns or adjustments to light guard. No adjustments necessary to light guard for die height changes or changes from automatic to hand fed secondary operations.

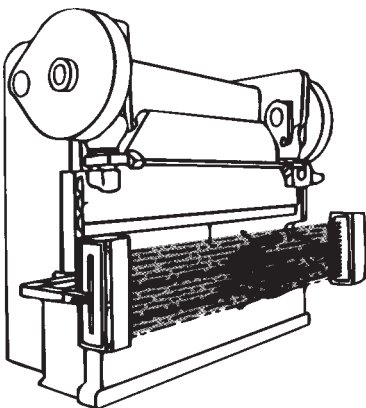
Robotic and Automation Multi-Sided Guarding System

Easily installed cornering mirrors combined with the easy alignment characteristics of the SuperLight VI provide multi-sided protection which allows complete visibility and access to the protected pinch point or hazardous zone for a fraction of the cost of physical barriers.



Press Brakes

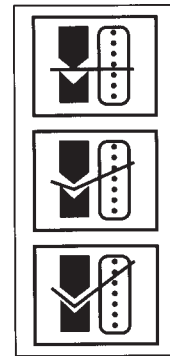
Triad SuperLight VI infrared light curtain now designed for power press brakes, utilizing the Floating Blank series.



How Floating Blank Works:

The Triad Floating Blank light curtain provides the flexibility necessary to effectively guard all types of power press brakes. The Floating Blank permits work pieces to be formed vertically or horizontally through the guarded area without shutting down the machine. Entry into the protected area by the operator or passerby will prevent the start or, if the machine is in motion, will provide a signal to stop the machine.

While other safety devices must be altered to allow materials to feed through, the Floating Blank is controlled by a keyed selector switch that will allow a work opening of up to 8cm based on 2cm increments.



Blanking adjustments required when die heights change are not necessary. The Floating Blank light curtain automatically adjusts to the various feed positions providing production with protection. The Floating Blank light curtain adapts to mechanical, air clutch, and hydraulic press brakes.

Triad Controls

Triad Controls manufactures a complete line of standard and customized machine guards and controls for safety and increased productivity. Control systems are control reliable and available in both solid state or relay logic. Controls meet or exceed OSHA regulation 1910.217 and ANSI standards B11.1-2001, B11.19-1990 for control reliability and component monitoring.

Muting Kit - Triad Package #130

Triad SuperLight VI barriers can be bypassed during non-hazardous portions of machine operation. Ideal for press operations where parts or scrap are being ejected or during hand removal of parts on the upstroke of the machine. Reference Triad Package #130 PB for Press Brakes. Always submit the machine electrical schematic for proper point of interface.

Automatic Tripping - PSDI

Presence Sensing Device Initiation Certification must be obtained for proper application of this optional feature. Refer to the specific OSHA or ANSI standard related to the subject machine on which PSDI is to be applied.

Triad Mute-Out Package #130

Operational Description - Package #130

The Mute-Out Package #130 has been designed to allow the SuperLight VI or VII infrared light curtain to be muted out or bypassed during the non-hazardous portion of the machine cycle. The mute-out function is actuated by the No. 301 limit switch and the No. 300 adjustable calibrated switch actuator when the die is within 1/4" (6.35mm) of the pinch point and continues until the ram returns to top stop. At this point the infrared light curtain reactivates and gives protection during the hazardous portion of the downstroke.

Punch Presses - Reference Package #130 PP

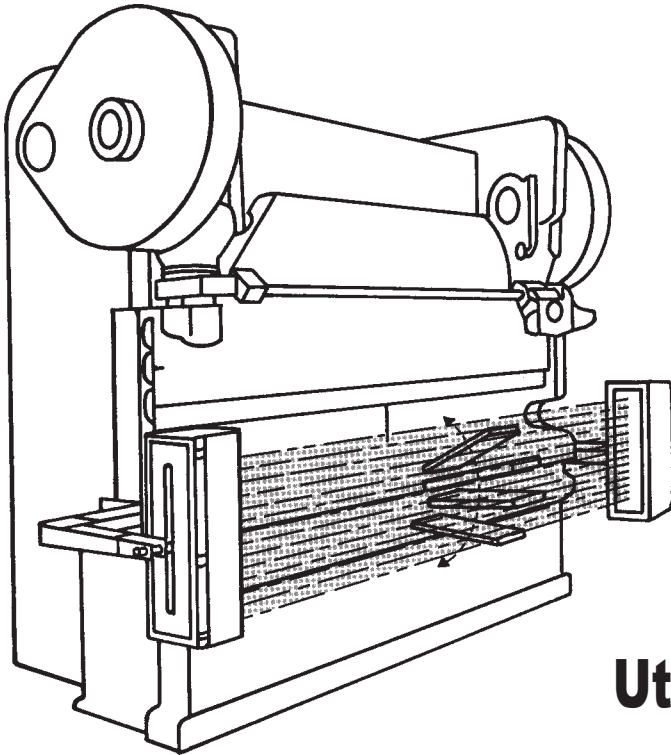
Package #130PP enhances productivity on punch presses because parts can be loaded or unloaded during the non hazardous upstroke or to be used when parts are ejected through the light curtain on the upstroke. Always submit machine electrical schematics to assure proper point of interface. Specify air clutch or hydraulic machine application.

Press Brakes - Reference Package #130 PB

Package #130PB interfaces directly on air clutch and hydraulic press brakes when these machines have control reliability and component monitoring. The mute out function is activated by the calibrated switch actuator No. 300 and gives the operator the capability to work with small parts and workpieces that have flanges. Always submit machine electrical schematics to assure proper point of interface. Specify air clutch or hydraulic machine application. Add suffix AC for air clutch press brake or suffix HV for hydraulic press brake.

Select-O-Stop (Option for Package #130PB)

Select-O-Stop is an option for Package #130PB. Select-O-Stop is a keyed function (on/off) that is activated by the calibrated switch actuator mounted on the side of the ram. Select-O-Stop will allow the operator to bring the ram down at a fast speed to a preset position which is 1/4" (6.35mm) above the material to be formed. At this point the ram will stop and then the light curtain mute out will begin. The Select-O-Stop function is ideal for small part forming or realignment of the work piece. Add suffix SOS to Package #130PB for this feature.

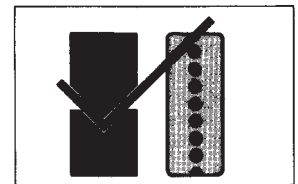
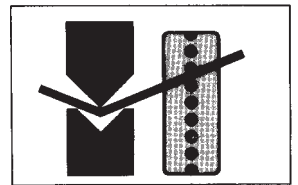
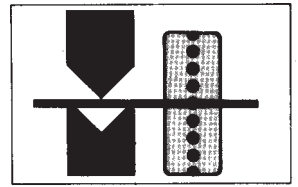


Triad SuperLight VI Infrared Light Curtain now designed for Power Press Brakes, Utilizing the Floating Blank series

How the Floating Blank Works:

The Triad Floating Blank light curtain provides the flexibility necessary to effectively guard all types of power press brakes. The Floating Blank permits work pieces to be formed vertically or horizontally through the guarded area without shutting the machine down. Entry into the protected area by the operator or passerby will prevent the start or, if the machine is in motion, will provide a signal to stop the machine.

While other safety devices must be altered to allow materials to be fed through, the Floating Blank is controlled by a keyed selector switch that will allow a work opening of 8 cm based on 2 cm increments. Blanking adjustments required when die heights change are not necessary. The Floating Blank automatically adjusts to the various feed positions providing production with protection. The Floating Blank light curtain adapts to mechanical, air clutch, and hydraulic press brakes.



Refer to Pages 13 through 26 for proper press brake controls.
Refer to pages 3 through 9 for complete SuperLight VI specifications.

Introduction - Due to the interaction required between the operator , workpiece, and the point of operation, press brake guarding requires versatility with both the press brake control system along with flexibility in the point of operation guarding device. Production can be had with the protection only when the guards and controls put on a machine are properly designed to match the operational procedures your shop may dictate; may it be a short run multiple die change job shop to the needs of a high volume long run production shop. The following packages incorporate features and functions to address the many needs of the industry based on our many years of experience in the metal stamping and metal forming industries.

OSHA & ANSI Standards:

OSHA (Occupational Safety & Health Act) - Federal Register Sub-Part O, 1910.212.

ANSI - American National Standard B11.1-2001.

Press Brake Classification	SELECT ONE Press Brake Control Options	SELECT ONE Point of Operation Guarding Options
Mechanical Partial revolution clutch-mechanical friction-currently uses mechanical pedal to actuate press brake	<i>Package #2100</i> -Converts to electric foot switch and incorporates automatic slow forming. When optional ram indexing modes are added, system is excellent for the high production shop. Updates controls for control reliability and component monitoring.	SuperLight VI Floating Blank infrared light curtain
	<i>Package #1</i> -Retains current mechanical foot treadle to retain operator feel for slow forming. Excellent for brakes working in the top end of the tonnage spectrum. Updates controls for control reliability and component monitoring.	SuperLight VI Floating Blank infrared light curtain only.
	<i>Package #2101</i> -Incorporates the two-hand/foot method of press brake control. Works well for the low volume job shop press brake. Updates the controls for control reliability and component monitoring.	Utilizes two hand controls included in package.
	<i>Package #2110</i> -Converts the mechanical press brake to electric foot switch and incorporates a single forming speed. This package is used for press brakes used as punch presses. Updates the controls to meet current OSHA standards for control reliability and component monitoring.	- SuperLight VI Floating Blank infrared light curtain. - Two Hand Controls
Air Clutch Partial revolution clutch-uses electric foot switch to actuate press With updated controls	<i>Package #2120</i> -Updates control to meet current OSHA standards for control reliability and component monitoring.	- SuperLight VI Floating Blank infrared light curtain. - Two Hand Controls
	<i>Package #3122</i> -Updates control to meet current OSHA standards for control reliability and component monitoring. This control incorporates the two-hand/foot method of control and guarding.	Utilizes two hand controls included in package.
	<i>Package #130 PB Mute-Out</i> -When an air clutch press brake meets current standards for control reliability and component monitoring, package #130 PB interfaces directly with the existing controls to mute-out the infrared light guard on the non-hazardous portion of the stroke.	SuperLight VI Floating Blank infrared light curtain.
Hydraulic/Hydro Mechanical	<i>Package #130 PB Mute-Out</i> -When a hydraulic press brake meets current standards for control reliability and component monitoring, package #130 PB interfaces directly with the existing controls to mute-out the infrared light guard on the non-hazardous portion of the stroke.	SuperLight VI Floating Blank infrared light curtain.
	<i>Package #4101</i> -Gives the hydraulic press brake the two-hand/foot method of guarding the point of operation. Same operational description as packages #2101 or #3122. Submit schematic for proper point of interface.	Two Hand Controls

Mechanical Press Brake Control with Automatic Slow Forming

Package 2100



Model 3400SS (Solid State) Control System

Package 2100 incorporates single stroke function with Select-O-Stop and ram control functions. This converts mechanically actuated press brakes to electrical foot switch actuation and gives the press brake automatic slow forming capability. Excellent for the long run and small piece part production shop where uniform piece part forming is required. Meets current OSHA standards for control reliability and component monitoring and also incorporates brake monitoring.

Package 2100 includes the following:

Model 3400SS (Solid State) Control System

- Control reliable design
- Diverse redundant design concept
- Quickview diagnostic message display
- Interrupted stroke provision
- System logic and component diagnostics
- Redundant captive contact safety relays
- Control incorporates cross-checking, self checking, and diverse redundancy
- Control transformer (reduces voltage from 480/260 to 120VAC)
- Power interlock
- NEMA 12 enclosure
- Brake monitor top stop indicator
- Ground fault indicator
- Keyed selector switch for two hand/foot mode of operation
- System on illuminated indicator light
- System start guarded push button
- System stop unguarded push button
- Keyed selector switch for Select-O-Stop Function on/off
- Control design writing
- Incorporates light curtain mute-out
- Light curtain interface (optional)

No. UL-102 UltraTouch Modules (optional)

No. 300 Calibrated Switch Actuator (Activates Select-O-Stop)

No. 301 Limit Switches (four)

No. 302 Guarded Foot Switch

No. 303 Dual Solenoid Valve with Muffler

No. 305 Ram Control Cylinder Assembly

No. 306 Heavy Duty Pressure Switch

No. 311 Filter, Regulator, Lubricator

A proper point of operation guarding device is required when using the electric foot switch as the activating device. Refer to Pages 3 through 9 for details.

Components



#300



#302



#303



#311



#301



#306



#305

Mechanical Press Brake Control with Automatic Slow Forming

Ram Control Cylinder Assembly—No. 305(Press Brake Applications)

The Triad Ram Control incorporates a No. 305 ram control cylinder assembly into the Model 3400 control system to provide a slow speed feature on mechanically actuated, friction clutch press brakes. This allows the operator to automatically slow-form a part to prevent damage to the part and to prevent potential injury due to part "whipping up" during the forming. When equipped with the Triad Ram Control, the ram advances to a predetermined position above the work with the clutch fully engaged (fast down). At this point, the ram will stop, allowing for realignment of the part before forming. The foot switch is then actuated a second time and the ram will advance slowly, forming the part and then return to the top of the stroke at a high speed (fast return). The Ram Control can be adjusted to provide the best speed for the part being formed.

Automatic Ram Cycling and Indexing Options

Auto Cycle — All systems are designed for single stroke only. Auto Cycle allows the press to continue past top stop as long as the operator has maintained foot pedal contact and stops at the Select-O-Stop position. AutoCycle may only be used with a light curtain, which will prevent the press from continuing past top stop, if the operator has his/her hand in the die area when the press reaches top stroke. Excellent for the production of small parts on press brakes and workpieces with flanges.

Auto Retrip — When Select-O-Stop has been turned on, the press will automatically stop at a preset point, which is normally set just above the piece part to be formed. The operator then has to release the pedal

and depress it to continue the forming cycle. The Auto Retrip function will automatically restart the press at that point, as long as the operator maintains foot pedal contact. Excellent for large sheet forming.

Auto Form — While controlling the forming speed of a piece part, it sometimes is necessary to fully engage the clutch, just prior to the bottom of the stroke, to obtain a desired radius with the die being used. Auto Form will bypass the feed cylinder at that point, allowing full engagement of the clutch and preventing the possibility of a stall at the bottom of the stroke. Excellent for top end tonnage forming on press brakes.

Auto Return — Press will automatically return to top of stroke after piece part has been formed (requires additional limit switch). This feature enhances ram cycling.

Select-O-Stop function is activated by the calibrated switch actuator which is mounted on the side of the ram. Select-O-Stop allows the operator to bring the ram down to a preset position which is 1/4" (6.35mm) above the material being formed and will automatically stop the ram. This gives the operator the opportunity to realign the work piece and then slow form the workpiece if desired. Select-O-Stop is a keyed function on/off on the main control panel.

Light Curtain Mute-Out automatically bypasses light curtain when die has reached piece part and point of operation hazard no longer exists. Light curtain is automatically reactivated when press reaches top of stroke to prevent operator from being in point of operation during the hazardous downstroke of the press. This feature is only used when a light curtain is used as the point of operation guarding device.

Ordering Procedure (Package 2100)

☐ Manufacturer of Press Brake _____ Model _____ Serial # _____
Bed Length _____

☐ Voltage _____ Cycle _____ Phase _____

OPTIONS

- ☐ Electro--mechanical relay system (RL) instead of solid state (SS) control.
- ☐ Motor H.P. if magnetic starter desired (Main Motor) ____ Full Load Amps ____ Rev. or Non-Rev.
- ☐ Motor H.P. if magnetic starter desired (Ram Motor) ____ Full Load Amps ____ Rev. or Non-Rev.
- ☐ Main Power fused electrical disconnect switch --- Yes ____ No ____
- ☐ Rotary cam, sprockets, and chain to replace two limit switches

PRODUCTION FUNCTIONS DESIRED

- ☐ Auto Cycle is a keyed function on control panel on/off (can only be used with a light curtain)
- ☐ Auto Retrip is a keyed function on control panel on/off
- ☐ Auto Form is a keyed function on control panel on/off
- ☐ Auto Return is a keyed function on control panel on/off (requires additional limit switch)
- ☐ SuperLight VI infrared light curtain model _____ (requires light curtain interface on control panel if light curtain is used)
- ☐ Light Curtain Mounting Brackets
 - ☐ Model 8000 Pedestal Mounts. Refer to Page 28 for details.
 - ☐ Model 9000 Swing Mounting Brackets. Refer to Page 28 for details.
- ☐ Model BM-1600 Time-Based Brake Monitor. Consult Factory.
- ☐ Specify any additional options desired but not shown.

Mechanical Press Brake Guarding

Retains Mechanical Pedal to Slow Form Parts and to Retain Operator Feel for Forming

Package 1



Model 3400SS (Solid State) Control System

Package 1 was designed to retain the existing mechanical foot pedal for machine actuation in conjunction with the use of a SuperLight VI Floating Blank infrared light curtain as the point of operation guard. Excellent for the long run and where versatility is needed during the forming cycle. Meets current OSHA standards for control reliability and component monitoring and also incorporates brake monitoring.

Package 1 includes the following:

Model 3400SS (Solid State) Control System

- Control reliable design
- Diverse redundant design concept
- Quickview diagnostic message display
- Interrupted stroke provision
- System logic and component diagnostics
- Redundant captive contact safety relays
- Control incorporates cross-checking, self checking, and diverse redundancy
- Control transformer (reduces voltage from 480/260 to 120VAC)
- Power interlock
- NEMA 12 enclosure
- Brake monitor top stop indicator
- Ground fault indicator
- System on illuminated indicator light
- System start guarded push button
- System stop unguarded push button
- Keyed selector switch for Select-O-Stop Function on/off
- Control design writing
- Incorporates light curtain mute-out
- Light curtain interface

No. 300 Calibrated Switch Actuator (Activates Select-O-Stop)

No. 301 Limit Switches (five)

No. 303 Dual Solenoid Valve with Muffler

No. 304 Air Cylinder Assembly

No. 306 Heavy Duty Pressure Switch

No. 311 Filter, Regulator, Lubricator

A proper point of operation guarding device is required when using the mechanical foot pedal as the press brake actuating device. Refer to Pages 3 through 9 for proper guarding device specifications.

Components



Mechanical Press Brake Guarding

Retains Mechanical Pedal to Slow Form Parts and to Retain Operator Feel for Forming

Package 1 allows an operator to engage and disengage the mechanical friction clutch on a mechanical press brake with the existing mechanical pedal. The light curtain is activated at the top of the stroke (Top Stop) when the operator depresses the mechanical foot treadle and the ram begins its downward travel. This is the hazardous portion of the stroke. The light curtain stays on and the machine cycles until the light curtain is interrupted by the operator or passerby. When interrupted, the solenoid valve is de-energized and the air is dumped from the air cylinder causing the press brake to stop and the mechanical foot pedal to fall to the floor. When the interruption is cleared, the SuperLight VI light curtain automatically resets and the foot pedal gently rises to continue the machine cycle. **The operator has total control on the machine cycling speed and the forming speed,** (slow-forming) as they currently do by retaining the mechanical pedal as the actuating device.

This system is excellent for the press brake that is working at the top end of the tonnage spectrum and that works with a wide range of products and where the operator must have control of the forming speed.

Select-O-Stop function is activated by the calibrated switch actuator which is mounted on the side of the ram. Select-O-Stop allows the operator to bring the ram down to a preset position which is 1/4" (6.35mm) above the material being formed and will automatically stop the ram. This gives the operator the opportunity to realign the work piece and then slow form the workpiece if desired. Select-O-Stop is a keyed function on/off on the main control panel.

Automatic Ram Cycling

(Package 1 is designed for single stroke only)

Auto Cycle allows the press to continue past top stop as long as the operator has maintained foot pedal contact and stop at the Select-O-Stop position. Auto Cycle may only be used with a light curtain, which will prevent the press from continuing past top stop, if the operator has his/her hand in the die area when the press reaches top of stroke. Auto-Cycle is controlled by a keyed selector switch on the control panel, on/off. Excellent for small part production and workpieces with flanges.

Light Curtain Mute-Out Automatically bypasses light curtain when die has reached piece part and point of operation hazard no longer exists. Light curtain is automatically reactivated when press reaches top of stroke to prevent operator from being in point of operation during the hazardous down stroke of the press. Light curtain mute-out is only supplied when a light curtain is used as the point of operation guarding device.

Package 1 Ordering Procedure

- Manufacturer of Press Brake _____ Model _____ Serial # _____
- Bed Length _____
- Voltage _____ Cycle _____ Phase _____

OPTIONS

- Electro--mechanical relay system (RL) instead of solid state (SS) control.
- SuperLight VI Floating Blank infrared light curtain model. Refer to Pages 3 through 9 for selecting model (requires light curtain interface on control panel when light curtain is used).
- Light curtain Mounting Bracket
- Model 8000 Pedestal Mounts. Refer to Page 28 for details.
- Model 9000 Swing Mounting Brackets. Refer to Page 28 for details.
- Motor H.P. if magnetic starter desired (Main Motor) ____ Full Load Amps ____ Rev. or Non-Rev.
- Motor H.P. if magnetic starter desired (Ram Motor) ____ Full Load Amps ____ Rev. or Non-Rev.
- Main Power fused electrical disconnect switch --- Yes ____ No ____
- Rotary cam, sprockets, and chain to replace two limit switches
- Model BM-1600 Time Based Brake Monitor. Consult Factory.
- Auto Cycle is a keyed function on the control panel on/off (can only be used with a light curtain)
- Specify any additional options desired but not shown

Mechanical Press Brake Guarding

Two-Hand/Foot Method of Guarding and Machine Control

Package 2101



Model 3400SS (Solid State) Control System

Package 2101 is for converting mechanical press brakes currently being actuated by a mechanical treadle.

This system provides a two-hand/foot method of guarding and machine control which converts the press to electric foot pedal operation. System has single stroke and is foot actuated with Select-O-Stop and automatic ram control. Excellent for the job shop for the versatility needed in short runs.

Meets current OSHA standards for control reliability and component monitoring and also incorporates brake monitoring.

Package 2101 includes the following:

Model 3400SS (Solid State) Control System

- Control reliable design
- Diverse redundant design concept
- Quickview diagnostic message display
- Interrupted stroke provision
- System logic and component diagnostics
- Redundant captive contact safety relays
- Control incorporates cross-checking, self checking, and diverse redundancy
- Control transformer (reduces voltage from 480/260 to 120VAC)
- Power interlock
- NEMA 12 enclosure
- Brake monitor top stop indicator
- Ground fault indicator
- Keyed selector switch for two hand/foot method of guarding and machine control (optional)
- System on illuminated indicator light
- System start guarded push button
- System stop unguarded push button
- Keyed selector switch for Select-O-Stop Function on/off
- Control design writing

No. UL-102 UltraTouch Modules (two)

No. 300 Calibrated Switch Actuator (Activates Select-O-Stop)

No. 301 Limit Switches (four)

No. 302 Guarded Foot Switch

No. 303 Dual Solenoid Valve with Muffler

No. 305 Ram Control Cylinder Assembly

No. 306 Heavy Duty Pressure Switch

No. 311 Filter, Regulator, Lubricator

Components



Mechanical Press Brake Guarding Two-Hand/Foot Method of Guarding and Machine Control

Two-Hand, Foot Control

The two-hand/foot method of guarding and machine control of press brake operation is unique in that it provides point of operation guarding, yet allows operator to form the part without interference from a guard. Unlike some systems, no additional setup time is required.

When the press stops at the top of the stroke, the foot switch is automatically deactivated, requiring the operator to use the palm buttons once again to bring the ram down to its preset position.

If the operator does not need to hold the part at any time during the stroke, the keyed selector switch may be turned to "hand only." Use of the hand buttons only enables the operator to cycle the press through one complete stroke without stopping. Similar to punch press work.

The press may be jogged at any time but will stop when either the palm buttons or foot pedal is released.

Many safety devices are bypassed for setup purposes. However, this system is ideal for setup since the operator must use the two-hand/foot method for setup as well as production. At the same time, it will not create any additional problems during set up.

Operational Description

- Operator depresses the two run buttons and initiates the press brake stroke.
- Operator must hold the buttons down and the ram descends at fast speed down to the 1/4" (6.35mm) position above the workpiece. If the operator releases one or both run buttons, the ram will stop automatically. If the control panel is keyed to "hand only," the ram will make one complete stroke. This is helpful if the press brake is used for punching, piercing, notching, or blanking.

- Select-O-Stop automatically stops ram 1/4" (6.35mm) above the workpiece.
- If the workpiece is not already in die, it may be inserted at this time.
- The two-hand control or the foot switch is now re-initiated and the press brake slow forms the workpiece and then returns to top stop at high speed. The press brake is then ready for the next stroke.

Ram Control Cylinder Assembly—No. 305 (Press Brake Applications) The Triad Ram Control incorporates a No. 305 ram control cylinder assembly into the Model 3400 control system to provide a slow speed feature on mechanically actuated, friction clutch press brakes. This allows the operator to automatically slow-form a part to prevent damage to the part and to prevent potential injury due to part "whipping up" during the forming. When equipped with the Triad Ram Control, the ram advances to a predetermined position above the work with the clutch fully engaged (fast down). At this point, the ram will stop, allowing for realignment of the part before forming. The foot switch is then actuated a second time and the ram will advance slowly, forming the part and then return to the top of the stroke at a high speed (fast return). The Ram Control can be adjusted to provide the best speed for the part being formed.

Select-O-Stop is a keyed function that is activated by the calibrated switch actuator which is mounted on the side of the ram. Select-O-Stop allows the operator to bring the ram down in fast speed to a preset position which is 1/4" (6.35mm) above the material being formed and will automatically stop the ram. This gives the operator the opportunity to realign the work piece and then slow form the workpiece if desired. Select-O-Stop is a keyed function on/off on main control panel.

Package 2101 Ordering Procedure

- Manufacturer of Press Brake _____ Model _____ Serial # _____
- Voltage _____ Cycle _____ Phase _____

OPTIONS:

- Electro--mechanical relay system (RL) instead of solid state (SS) control. Photo on Page D-6.
- Motor H.P. if magnetic starter desired (Main Motor) ____ Full Load Amps ____ Rev. or Non-Rev.
- Motor H.P. if magnetic starter desired (Ram Motor) ____ Full Load Amps ____ Rev. or Non-Rev.
- Main Power fused electrical disconnect switch --- Yes ____ No ____
- Rotary cam, sprockets, and chain to replace two limit switches
- Model BM-1600 Time-Based Brake Monitor. Consult Factory.
- Model 8500 pedestal mount for operator run buttons. Specify height from floor. Refer to Page 28 for specifications.
- Additional run buttons for multiple press operators, keyed switch controlled
- Auto-Return function is a keyed function on control panel on/off (requires additional limit switch)
- Specify any additional options desired but not shown

Mechanical Press Brake Control When Used as Punch Press

Package 2110



Model 3400SS (Solid State) Control System

Package 2110 Control converts mechanically actuated press brakes to electrical foot switch operation and gives the press brake single forming speed when used as a mechanical power press for punching, piercing, notching, or blanking operations. The control incorporates single stroke function with Select-O-Stop and utilizes an electric foot switch for machine actuation. Meets OSHA standards for control reliability and component monitoring and also incorporates brake monitoring.

Package 2110 includes the following:

Model 3400SS (Solid State) Control System

- Control reliable design
- Diverse redundant design concept
- Quickview diagnostic message display
- Interrupted stroke provision
- System logic and component diagnostics
- Redundant captive contact safety relays
- Control incorporates cross-checking, self checking, and diverse redundancy
- Control transformer (reduces voltage from 480/260 to 120VAC)
- Power interlock
- NEMA 12 enclosure
- Brake monitor top stop indicator
- Ground fault indicator
- Keyed selector switch for two hand/foot method of guarding and machine control
- System on illuminated indicator light
- System start guarded push button
- System stop unguarded push button
- Keyed selector switch for Select-O-Stop Function on/off
- Control design writing
- Incorporates light curtain mute-out
- Light curtain interface (optional)

No. UL-102 UltraTouch Modules (optional)

No. 300 Calibrated Switch Actuator (Activates Select-O-Stop)

No. 301 Limit Switches (four)

No. 302 Guarded Foot Switch

No. 303 Dual Solenoid Valve with Muffler

No. 304 Air Cylinder Assembly

No. 306 Heavy Duty Pressure Switch

No. 311 Filter, Regulator, Lubricator

A proper point of operation guarding device is required when using the electric foot switch as the activating device. Refer to SuperLight VI Programmable Safety Light Curtain for proper guarding device specifications.

Components



#300



#302



#303



#311



#301



#306



#304

Mechanical Press Brake Control When Used as Punch Press

Operational Description

Package 2110 allows the press brake to be operated as a partial revolution punch press. The controls meet all current standards for control reliability and component monitoring and also incorporates brake monitoring. The normal operating procedure is the same as a partial revolution punch press.

- Operator inserts workpiece into the die area
- Operator clears body parts from hazardous zone
- Operator initiates the ram cycle
- Ram cycles and stops at top stop
- Operator then removes workpiece from die area

Automatic Ram Cycling and Indexing Options

Auto Cycle — All systems are designed for single stroke only. Auto Cycle allows the press to continue past top stop as long as the operator has maintained foot pedal contact and stops at the Select-O-Stop position. Auto-Cycle may only be used with a light curtain, which will prevent the press from continuing past top stop, if the operator has his/her hand in the die area when the press reaches top stroke. Excellent for the production of small parts and workpieces with flanges.

Auto Return — Press will automatically return to top of stroke after piece part has been formed (requires additional limit switch). This feature enhances ram cycling.

Select-O-Stop function is activated by the calibrated switch actuator which is mounted on the side of the ram. Select-O-Stop allows the operator to bring the ram down to a preset position which is 1/4" (6.35mm) above the material being formed and will automatically stop the ram. This gives the operator the opportunity to realign the work piece and then slow form the workpiece if desired. Select-O-Stop is a keyed function on/off on the main control panel.

Light Curtain Mute-Out Automatically bypasses light curtain when die has reached piece part and point of operation hazard no longer exists. Light curtain is automatically reactivated when press reaches top of stroke to prevent operator from being in point of operation during the hazardous downstroke of the press. This feature is only used when the SuperLight VI infrared light curtain is used as the point of operation guarding device.

Package 2110 Ordering Procedure

- Manufacturer of Press Brake _____ Model _____ Serial # _____ Bed Length _____
 • Voltage _____ Cycle _____ Phase _____

OPTIONS

- Electro--mechanical relay system (RL) instead of solid state (SS) control.
- Main Power fused electrical disconnect switch --- Yes _____ No _____
- Motor H.P. if magnetic starter desired (Main Motor) _____ Full Load Amps _____ Rev. or Non-Rev.
- Motor H.P. if magnetic starter desired (Ram Motor) _____ Full Load Amps _____ Rev. or Non-Rev.
- Rotary cam, sprockets, and chain to replace two limit switches

PRODUCTION FUNCTIONS DESIRED

- Model BM-1600 Time Based Brake Monitor. Consult Factory.
- Auto cycle is a keyed function on control panel on/off (can only be used with a light curtain)
- Auto return is a keyed function on control panel on/off (requires additional limit switch)
- Light curtain Model. Refer to Pages 3 through 9 (requires light curtain interface on control panel if light curtain is used)
- Light curtain Mounting Brackets
 - Model 9000 Swing Mounting Brackets. Refer to Page 28 for specifications.
 - Model 8000 Pedestal Mounts. Refer to Page 28 for specifications.
- Palm button actuation; operator station UL-401.
- Specify any additional options desired but not shown

Air Clutch Press Brake Controls

Updates Controls to Obtain Control Reliability

Package 2120



Model 3400SS (Solid State) Control System

Package 2120 updates the controls on air clutch press brakes to meet current OSHA standards for control reliability and component monitoring and also incorporates brake monitoring.

Single-stroke, foot-actuated function with Select-O-Stop.

Package 2120 includes the following:

Model 3400SS (Solid State) Control System

- Control reliable design
- Diverse redundant design concept
- Quickview diagnostic message display
- Interrupted stroke provision
- System logic and component diagnostics
- Redundant captive contact safety relays
- Control incorporates cross-checking, self checking, and diverse redundancy
- Control transformer (reduces voltage from 480/260 to 120VAC)
- Power interlock
- NEMA 12 enclosure
- Brake monitor top stop indicator
- Ground fault indicator
- Keyed selector switch for two-hand/foot method of guarding and machine control (optional)
- System on illuminated indicator light
- System start guarded push button
- System stop unguarded push button
- Keyed selector switch for Select-O-Stop Function on/off
- Control design writing
- Incorporates light curtain mute-out
- Light curtain interface (optional)

No. UL-102 UltraTouch Modules (optional)

No. 300 Calibrated Switch Actuator (Activates Select-O-Stop)

No. 301 Limit Switches (four)

No. 302 Guarded Foot Switch

No. 303 Dual Solenoid Valve with Muffler

No. 306 Heavy Duty Pressure Switch

No. 311 Filter, Regulator, Lubricator

A proper point of operation guarding device is required when using the electric foot switch as the activating device. Refer to SuperLight VI Safety Light Curtain for proper guarding device applications.

Components



#300



#306



#311



#302



#303



#301

Air Clutch Press Brake Controls

Updates Controls to Obtain Control Reliability

Package 2120 is designed for the air clutch press brake that requires the controls to be updated to meet current control reliability standards. The controls are designed to meet these standards for forming operations and also for air clutch press brakes which are used for punching, piercing, or notching operations. SuperLight VI safety light curtains can be added to this control to obtain proper point of operation guarding. Refer to Pages 3 through 9.

Operational Description

- Operator depresses foot switch and ram descends at fast speed to Select-O-Stop position 1/4" (6.35mm) above the workpiece.
- Work piece is realigned or slow-forming mode of the press brake is actuated. At this time the point of operation guard is muted-out until ram returns to top stop position.
- This control is designed to retain current press brake functions and to incorporate control reliability and component monitoring.

Select-O-Stop is a keyed function that is activated by the calibrated switch actuator which is mounted on the side of the ram. Select-O-Stop allows the operator to bring the ram down in fast speed to a preset position which is 1/4" (6.35mm) above the material being formed and will automatically stop the ram. This gives the operator the opportunity to realign the work piece and then slow form the workpiece if desired. Select-O-Stop is a keyed function on/off on main control panel.

Automatic Ram Cycling and Indexing Options

Auto Cycle — All systems are designed for single stroke only. Auto Cycle allows the press to continue past top stop as long as the operator has maintained foot pedal contact and stops at the Select-O-Stop position. Auto Cycle may only be used with a light curtain, which will prevent the press from continuing past top stop, if the operator has his/her hand in the die area when the press reaches top stroke. Excellent for the production of small parts on press brakes and workpieces with flanges.

Auto Return — Press will automatically return to top of stroke after piece part has been formed (requires additional limit switch). This feature enhances ram cycling.

Light Curtain Mute-Out — Automatically bypasses light curtain when die has reached piece part and point of operation hazard no longer exists. Light curtain is automatically reactivated when press reaches top of stroke to prevent operator from being in point of operation during the hazardous downstroke of the press. Light curtain mute out only is supplied when a light curtain is used as the point of operation guarding device.

Package 2120 Ordering Procedure

- Manufacturer of Press Brake _____ Model _____ Serial # _____
- Voltage _____ Cycle _____ Phase _____ Specify: Single Speed Twin Speed

OPTIONS

- Electro--mechanical relay system (RL) instead of solid state (SS) control.
- Motor H.P. if magnetic starter desired (Main Motor) ____ Full Load Amps ____ Rev. or Non-Rev.
- Motor H.P. if magnetic starter desired (Ram Motor) ____ Full Load Amps ____ Rev. or Non-Rev.
- Main Power fused electrical disconnect switch --- Yes ____ No ____
- Rotary cam, sprockets, and chain to replace two limit switches
- Model BM-1600 Time-Based Brake Monitor. Consult Factory.

PRODUCTION FUNCTIONS DESIRED:

- Auto Cycle is a keyed function on control panel on/off (can only be used with light curtain)
- Auto Return is a keyed function on control panel on/off (requires additional limit switch)

POINT OF OPERATION GUARD OPTIONS:

- SuperLight VI infrared light curtain model. Refer to Pages 3 through 9 for selecting model (requires light curtain interface on control panel if light curtain is used)
- Light curtain mounting brackets
 - Model 8000 Pedestal Mounts. Refer to Page 28 for specifications.
 - Model 9000 Swing Mounts. Refer to Page 28 for specifications.

Air Clutch Press Brake Controls

Updates Controls to Obtain Control Reliability for Two-Hand/Foot Method of Guarding and Machine Control

Package 3122



Model 3400SS (Solid State) Control System

Package 3122 updates the controls on air clutch press brakes to meet current OSHA standards for control reliability and component monitoring. It also incorporates the two-hand/foot method of guarding the point of operation. The control also incorporates brake monitoring.

Package 3122 includes the following:

Model 3400SS (Solid State) Control System

- Control reliable design
- Diverse redundant design concept
- Quickview diagnostic message display
- Interrupted stroke provision
- System logic and component diagnostics
- Redundant captive contact safety relays
- Control incorporates cross-checking, self checking, and diverse redundancy
- Control transformer (reduces voltage from 480/260 to 120VAC)
- Power interlock
- NEMA 12 enclosure
- Brake monitor top stop indicator
- Ground fault indicator
- Keyed selector switch for two-hand/foot method of guarding and machine control (optional)
- System on illuminated indicator light
- System start guarded push button
- System stop unguarded push button
- Keyed selector switch for Select-O-Stop Function on/off
- Control design writing

Components



No. UL-102 UltraTouch Modules (two)

No. 300 Calibrated Switch Actuator (Activates Select-O-Stop)

No. 301 Limit Switches (four)

No. 302 Guarded Foot Switch

No. 303 Dual Solenoid Valve with Muffler

No. 306 Heavy Duty Pressure Switch

No. 311 Filter, Regulator, Lubricator

A proper point of operation guarding device is required when using the electric foot switch as the activating device. Refer to SuperLight VI Safety Light Curtain for proper guarding device applications.

Air Clutch Press Brake Controls

Updates Controls to Obtain Control Reliability for Two Hand/Foot Method of Guarding and Machine Control

Two-Hand, Foot Control

The two-hand/foot method of press brake operation is unique in that it provides point of operation guarding, yet allows operator to form the part without interference from a guard. Unlike some systems, no additional setup time is required.

When the press stops at the top of the stroke, the foot switch is automatically deactivated, requiring the operator to use the palm buttons once again to bring the ram down to its preset position.

If the operator does not need to hold the part at any time during the stroke, the keyed selector switch may be turned to "hand only." Use of the hand buttons only enables the operator to cycle the press through one complete stroke without stopping. Similar to punch press work.

The press may be jogged at any time but will stop when either the palm buttons or foot pedal is released.

Many safety devices are bypassed for setup purposes. However, this system is ideal for setup since the operator must use the two-hand/foot method for setup as well as production. At the same time, it will not create any additional problems during set up.

Operational Description

- Operator depresses the two run buttons and initiates the press brake stroke.
- Operator must hold the buttons down and the ram descends at fast speed down to the 1/4" (6.35m) position above the workpiece. If the operator releases one or both run buttons, the ram will stop automatically. If the control panel is keyed to "hand only," the ram will make one complete stroke. This is helpful if the press brake is used for punching, piercing, notching, or blanking.
- Select-O-Stop automatically stops ram 1/4" (6.35m) above the workpiece.
- If the workpiece is not already in die, it may be inserted at this time.
- The two-hand/foot method or the foot switch is now re-initiated and the press brake slow forms the workpiece and then returns to top stop at high speed. The press brake is then ready for the next stroke.

Select-O-Stop is a keyed function that is activated by the calibrated switch actuator which is mounted on the side of the ram. Select-O-Stop allows the operator to bring the ram down in fast speed to a preset position which is 1/4" (6.35m) above the material being formed and will automatically stop the ram. This gives the operator the opportunity to realign the work piece and then slow form the workpiece if desired. Select-O-Stop is a keyed function on/of f on main control panel.

Automatic Ram Cycling and Indexing Options

Auto Return — Press will automatically return to top of stroke after piece part has been formed (requires additional limit switch). This feature enhances ram cycling.

Package 3122 Ordering Procedure

- Manufacturer of Press Brake _____ Model _____ Serial # _____
- Voltage _____ Cycle _____ Phase _____

OPTIONS

- Electro--mechanical relay system (RL) instead of solid state (SS) control.
- Motor H.P. if magnetic starter desired (Main Motor) ____ Full Load Amps ____ Rev. or Non-Rev.
- Motor H.P. if magnetic starter desired (Ram Motor) ____ Full Load Amps ____ Rev. or Non-Rev.
- Main Power fused electrical disconnect switch --- Yes ____ No ____
- Rotary cam, sprockets, and chain to replace two limit switches
- Model BM-1600 Time-Based Brake Monitor Description. Consult Factory.
- Model 8500 Pedestal mount for operator run buttons. Refer to Page 28 for details.
- Additional run buttons for multiple press operators
- Auto-return function--Press will return to top of stroke after part has been formed (requires additional limit switch)
- Specify any additional options desired but not shown

Press Brake Classification

Air Clutch, Hydraulic, Hydro-Mechanical



These designs of press brakes usually incorporate twin forming speeds and are normally actuated by an electric foot switch. Due to their more recent date of manufacture, the controls normally have control reliability but verification of this should be done prior to machine guarding. If the controls meet current standards, the following is needed:

- Mute-Out Package #130 PB (see Page 10)
- SuperLight VI Safety Light Curtain (see Pages 3 through 9)
- Mounting Brackets for light curtain (see below)

NOTE: Always submit the machine electrical schematic to assure proper point of interface.

Pedestal Mounts

Painted OSHA yellow and made of heavy angle construction. Both models are supplied with a floor mounting plate that can be lagged to the floor.

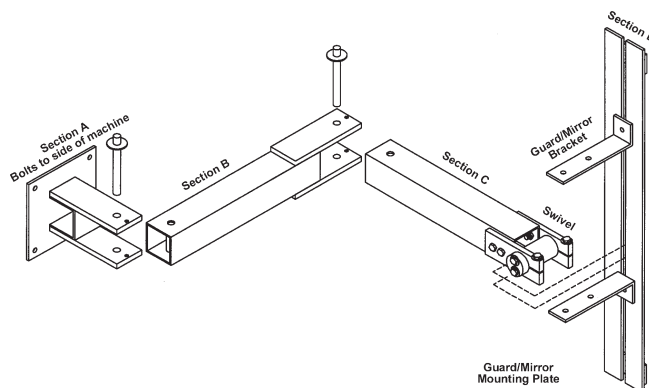
Model 8000: used to mount cornering mirrors or safety light curtains off of a machine.

Model 8500: used to mount an operator station or palm buttons off of a machine and includes a top plate for mounting.



Swing Mount Brackets

Model 9000: Excellent method of mounting light curtain for press brakes or when light curtain is to be moved for die set-ups or machine maintenance. Model 9000 consists of three 180 degree pivot points along with light curtain diagonal movement capability for virtually unlimited light curtain positioning. Model 9000 is a two-inch square tubing painted OSHA yellow which mounts directly onto the machine housing making it a heavy duty yet versatile mounting bracket.



B and C Dimensions are Required

1. Pivot Point (1) will rotate 90 degrees in either direction from position shown.
2. Pivot Point (2) will rotate 180 degrees to the right from position shown.
3. Pivot Point (3) will rotate 90 degrees in any direction from position shown.
4. Light curtain mounting plate is slotted to allow adjustment up or down.



**Air Cylinder Assembly
No. 304**
A 1 1/2" (38mm) bore, 1" (25mm) stroke air cylinder, complete mounting bracket, and clevis.



**Automatic Ram Control
Cylinder
No. 305**
(Press Brake Applications)
Provides a slow speed feature on mechanically actuated, friction clutch press brakes allowing the operator to automatically slow-form a part preventing damage and potential injury due to part "whipping up" during the forming. When used, the ram advances to a predetermined position above the work with the clutch fully engaged (fast down). At this point, the ram will stop allowing for realignment of the part before forming. The foot switch is then actuated a second time and the ram will advance slowly forming the part and then return to the top of the stroke at a high speed (fast return). The Ram Control can be adjusted to provide the best speed for the part being formed.



**Calibrated Switch Actuator
No. 300**
Used for all press brake guards for actuating Select-O-Stop.



**Dual Solenoid Valve
No. 303**
A most important aspect of double valve design is the incorporation of two separate 3/2 normally closed valve elements which are interconnected within a common valve body assembly. Each of the two valve elements is operated by its own 3/2 normally closed solenoid pilot valve. When simultaneously energized, both main valve elements are operated simultaneously. The probability of both valve elements malfunctioning on the same cycle is

extremely remote.

A mechanical power press or other hazardous machine using a pneumatically controlled clutch and brake mechanism should use a double valve with a self-contained monitoring device and/or external monitoring system which inhibits further operation of the valve and machine in the event of a failure within the valve. Of course, a double valve is just one of the components in a press control system and any other elements of the system should be planned with safety as a primary consideration.



**Electric Foot Pedal
No. 302**
An oil-tight foot switch. Contains one set, normally-open contacts, and one set normally-closed contacts. Includes a treadle guard to protect against accidental tripping. "Requires a point of operation guard when used for machine actuation," such as safety light curtains or safety interlock systems.



**Filter, Regulator, Lubricator
No. 311**

Heavy Duty Pressure Switch

No. 306

NEMA 12 oil-tight and dust-tight switch is adjustable from 1 to 115 PSI.



Pedestal Mounts

Painted OSHA yellow and made of heavy angle construction.

Model 8000: used to mount cornering mirrors or safety light curtains off of a machine.

Model 8500: used to mount an operator station or palm buttons off of a machine and includes a top plate for mounting. Both models are supplied with a floor mounting plate that can be lagged to the floor.



Limit Switch

No. 301

Oil-tight limit switch contains one set normally-open contacts and one set normally-closed contacts.



Rotary Cam Switch with Drive Check

No. 310A

The primary components which make up the Rotating Cam Limit Switch are Snap Action Switches and the Micro-Adjust Cams. The Micro-Adjust Cam Block consists of two cams with 180 degree lobes which can be adjusted relative to the cam shaft by simply rotating the adjusting disc. No tools are required to make this adjustment. The adjusting disc can be manually rotated as shown in the photograph. The cam block has a self-locking polyurethane gear which automatically locks the cams relative to the cam shaft, when the required contact setting has been obtained.



Miniature Regulator, Oiler, Filter

No. 311A



Operation Station

No. UL-501

Includes two run palm buttons and one emergency stop palm button, internally wired.



Palm Button

No. 318

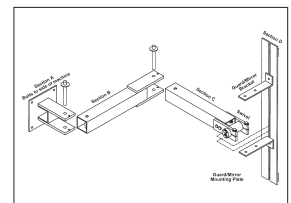
Includes ring guard and mounting enclosure. See ergonomic palm buttons to control carpal tunnel syndrome.



Swing Mount Brackets

Model 9000

Consists of three 180 degree pivot points along with light guard diagonal movement capability for virtually unlimited light guard positioning. Two inch square tubing painted OSHA yellow which mounts directly onto the machine housing making it a heavy duty yet versatile mounting bracket.



Control of Hazardous Energy Sources (Lockout / Tagout)

Dept. of Labor Occupational Safety & Health Admin. 29CFR Part 1910

Shut-Off Valve



TO8 Shut-Off Valves, typically attached to the inlet end of a combination unit, are manually operated, slide type valves that open and close with a short one-inch movement of the slide. The valve slide can be locked in the closed position with a customer supplied padlock. The standard valve is a three-way valve that exhausts downstream air in the closed position.

Ordering Procedure

Part Size PTF

1/4" (6mm)
3/8" (10mm)
1/2" (13mm)

Three-Way Valves Exhaust Downstream Air in Closed Position

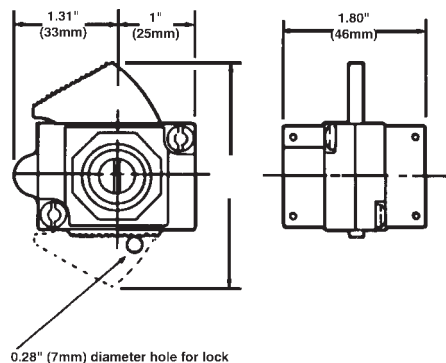
Part #TO8-200-E1PA
Part #TO8-300-E1PA
Part #TO8-400-E1PA

Materials of Construction

Body: Zinc
Slide: Acetal Plastic
Elastomers: Nitrile

Dimensions

All dimensions in inches (millimeters)



Copies of the actual OSHA standard may be obtained from:
U.S. Department of Labor
Occupational Safety & Health Administration
Office of Public Affairs - Room N3647
200 Constitution Avenue
Washington, D.C. 20210
(202) 693-1999

International Inquires:
Jacquelyn DeMesme-Gray
OSHA Coordinator for International Affairs
U.S. Department of Labor
Occupational Safety & Health Administration
Division of International Affairs - Room N3641
200 Constitution Avenue
Washington, D.C. 20210
(202) 693-2400

www.osha.gov

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WARRANTY

Manufacturer warrants that this product will be free from defects in material and workmanship for a period of one year from the date of shipment thereof. Within the warranty period, manufacturer will repair or replace such products which are returned to it with shipping charges prepaid and which will be disclosed as defective upon examination by the manufacturer. This warranty will not apply to any product which will have been subject to misuse, negligence, accident, restriction, and use not in accordance with manufacturer's instructions or which will have been altered or repaired by persons other than the authorized agent or employees of the manufacturer.

DISCLAIMER

The provisions of the paragraph "Warranty" are the sole obligations of the manufacturer and exclude all other warranties of merchantability, expressed or implied.

Further, there are no warranties which extend beyond the above warranty

LIMITATION OF LIABILITY

In the event of any claim or breach of any obligations of manufacturer under any order, whether expressed or implied, and particularly in the event of any claim or a breach of the warranty or warranties contained in the paragraph "Warranty" or of any other warranties, expressed or implied which might, despite the paragraph entitled "Disclaimer," be determined to be incorporated in any order, the company shall under no circumstances be liable for any consequential or special damages, either in law or in equity, or for losses or expenses or claims for the same arising from the use of, or inability to use, the products of the manufacturer for any purpose whatsoever.



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We cannot and do not accept responsibility for any overall system performance when factors, such as these, are beyond our control.

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