

Safety Products

Detector™ 3 Series

Safety Light Curtain Detector™ 3

Blanking capability: fixed and floating

FEATURES

- Meets applicable parts of US OSHA 29CFR 1910.212, 1910.217 and ANSI B11.1, B11.2, B11.19, B11.20 and R15.06
- Independent testing and certification by Canadian Standards (NRTL/C) per CSA 22.2-0.8 and 22.2-14
- Safety outputs: two relays with force-guided contacts
- Floating blanking (1 beam)
- Fixed blanking capability using optional external blanking windows (up to 5 contiguous beams)
- Easy to install and mount
- Adaptable and versatile controller - one or two emitter/receiver pairs can share the same controller

APPLICATIONS

- Area guarding
- Automated assembly
- Automatic sand blasters
- Component insertion
- Die casting machines
- Encapsulated machines
- Filter presses
- Hydraulic presses
- Injection molding
- Load/unload stations
- Packaging/converting
- Robotic systems
- Special machine guarding
- Weld lines



Honeywell's Detector™3 safety light curtain is a compact, state-of-the-art, 3-box light curtain system used to protect personnel from hazardous equipment. It provides dependable personnel protection without the interference of mechanical guards. The light curtain produces an array of invisible infrared light beams between an emitter and a receiver. If a person or object interrupts the detection field, the Detector™3 controller activates its output relays, sending a stop signal.

Detector™3 complies with OSHA 29CFR 1910.212 "General Machine Guarding" and 1910.217 "Mechanical Power Presses", ANSI B11.1 "Mechanical Power Presses", B11.2 "Hydraulic Power Presses", B11.19 "Performance Criteria for Safeguarding"; B11.20 "Manufacturing Systems/Cells"; and R15.06 "Industrial Robots and Robot Systems".

WARNING

MISUSE OF DOCUMENTATION

- The information presented in this product sheet (or catalogue) is for reference only. DO NOT USE this document as system installation information
 - Complete installation, operation and maintenance information is to be referenced for each product.
- Failure to comply with these instructions could result in death or serious injury.

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Safety Light Curtain Detector™ 3



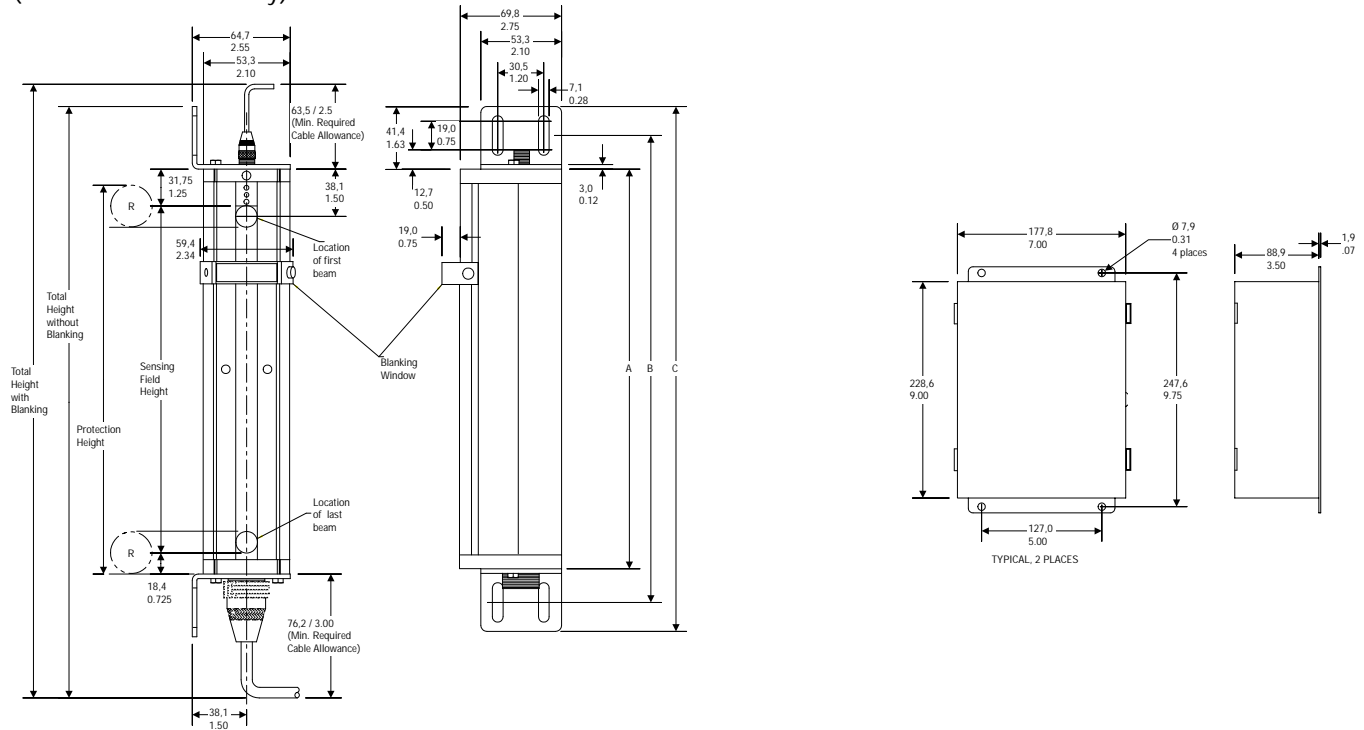
- Blanking capability: fixed and floating

Dimensions in inches / millimeters, feet / meters, weights in lbs / kg

Specifications	General
Protection heights (in/mm)	184 to 1860 mm / 7.25 to 73.25 in - See Table 1
Scanning range (ft/m)	Standard: 0 to 7,6 m / 0 to 25 ft Extended: 0 to 15,3 m / 0 to 50 ft
Resolution (min. object sensitivity)	31,75 mm / 1.25 in - See Table 2
Effective aperture angle	± 3.5° for emitter and receiver
Emission	Pulsed infrared light (880 nm)
Blanking/Floating	<i>Fixed:</i> external blanking window required (for first beam, master blanking window required; for each additional beam, 1 slave blanking window is required, up to 4 slaves) <i>Floating:</i> 1 beam floating capability standard via switch inside the controller
Response time	30 ms to 40 ms - See Table 1 75 ms max. - for the weld controllers
Outputs	2 stop relays with force-guided contacts; plus 1 auxiliary relay and 4 solid state indicator outputs
Switching capacity	4 A/240 Vac or DC resistive; selectable NO or NC contact available with all outputs relays
Indicator outputs	4 open collector NPN, opto-isolated 70 Vdc/2 mA maximum when "ON"
Inputs	
Supply voltage	24 Vdc +10%, -20%; 120/240 Vac ± 10% selectable 50/60 Hz
Power consumption	27 VA maximum, 27 watts maximum
Emitter/Receiver sets	2 sets (any height) can be connected to same control box
FSDs/MPCEs Monitoring input	Dry contacts rated 20 mA when contacts are closed and 20 Vdc when open;
Selectable restart interlock (reset required after detection field interruption)	Closure to ground. Max. on voltage 20 V/2 mA when "ON"
Selectable start interlock (reset required at power up)	Closure to ground. Max. on voltage 20 V/2 mA when "ON"
Indicators	<i>Emitter:</i> Amber (Power ON) <i>Receiver:</i> Green (unobstructed), Red (obstructed), and flashing amber (floating enabled) <i>Control box:</i> Green (unobstructed/output relays energized), Red (stop signaled/output relays de-energized), Yellow (reset required), flashing amber (floating enabled)
Material	
Emitter and receiver Housing	Extruded aluminium 0.12 in/3 mm wall minimum
End caps	Black nylon, glass reinforced
Window	Polymethyl methacrylate (PMMA)
Control box (dimensions)	14 gauge (0.075 in / 1.9 mm) welded steel with keylock included: enclosure 17,8 x 22,9 x 8,9 cm / 7 x 9 x 3.5 in
Cables (dimensions)	1,5; 4,6; 9,1; 15,2 and 30,5 m / 5, 15, 30, 50 and 100 ft / with connector on one end
Environmental	
Emitter, Receiver Sealing	NEMA 4 / IP 65
Control Box Sealing	(See Order Guide)
Cable Sealing	NEMA 4 / IP 65 connector; oil-resistant PVC cable
Operating temperature	0 to 50° C / 32° to 122° F
Humidity	30 - 95% relative humidity, non condensing
Vibration	10 g, 0.03 inch displacement, 10-150 Hz frequency (3 axes):
Shock testing	50 g, 11 ms pulse per MIL-STD-810 C, Method 516, Procedure 1 (applies to all 3 axes)
Weight	
Emitter or receiver	0,64 to 5,17 kg / From 1.4 to 11.3 lbs - See Table 1
Control box	4 kg / 9 lbs

○ Mounting dimensions

(mm/in for reference only)



○ Table 1: Safety light curtain characteristics

Dimensions in mm/in, weights in kg/lbs, response times in ms

Model	06	12	18	24	30	36	42	48	60	72
Protection height (mm/in) (1)	184,2 7.25	336,6 13.25	489 19.25	641,4 25.25	793,8 31.25	946,2 37.25	1098,6 43.25	1251 49.25	1555,8 61.25	1860,6 73.25
Sensing field height (mm/in)	146,1 5.75	298,5 11.75	450,9 17.75	603,3 23.75	755,7 29.75	908,1 35.75	1060,5 41.75	1212,9 47.75	1517,7 59.75	1822,5 71.75
Total height without blanking (in/mm) (2)	314,3 12.38	466,7 18.38	619,1 24.38	771,5 30.38	923,9 36.38	1076,3 42.38	1228,7 48.38	1381,1 54.38	1685,9 66.38	1990,7 78.38
Total height with blanking (mm/min) (3)	336,6 13.25	489 19.25	641,4 25.25	793,8 31.25	946,2 37.25	1076,3 43.25	1251 49.25	1403,4 55.25	1708,2 67.25	2013 79.25
Response time with stand. controller (ms)	30	30	30	30	35	35	35	35	40	40
Response time with weld controller (ms)	75	75	75	75	75	75	75	75	75	75
Weight per device (kg / lbs)	0,64 1.4	1,05 2.3	1,46 3.2	1,87 4.1	2,29 5	2,7 5.9	3,11 6.8	3,52 7.7	4,34 9.5	5,17 11.3
A	196,9 7.75	349,3 13.75	501,7 19.75	654,1 25.75	806,5 31.75	958,9 37.75	1111,3 43.75	1263,7 49.75	1568,5 61.75	1873,3 73.75
B	241,3 9.50	393,7 15.50	546,1 21.50	698,5 27.50	850,9 33.50	1003,3 39.50	1155,7 45.50	1308,1 51.50	1612,9 63.50	1917,7 75.50
C	279,4 11.00	431,8 17.00	584,2 23.00	736,6 29.00	889 35.00	1041,4 41.00	1193,8 47.00	1346,2 53.00	1651 65.00	1955,8 77.00

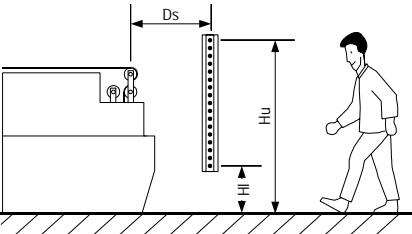
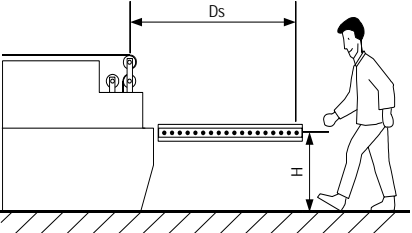
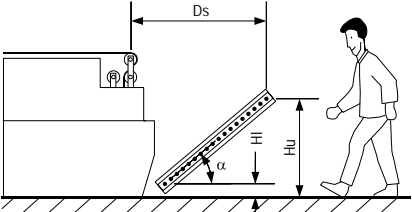
- (1) Protection height for the min. object sensitivity or resolution
- (2) Total height including bracket and connector
- (3) Total height including connectors when a blanking window is used

○ Table 2: Safety light curtain blanking characteristics

	Without blanking		1 beam blanking		2 beam blanking		3 beam blanking		4 beam blanking		5 beam blanking	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
Resolution R*	31,75	1.25	50,80	2	69,85	2.75	88,90	3.50	107,95	4.25	127	5
Beam spacing	19,05	0.75	19,05	0.75	19,05	0.75	19,05	0.75	19,05	0.75	19,05	0.75
Beam diameter	12,70	0.50	12,70	0.50	12,70	0.50	12,70	0.50	12,70	0.50	12,70	0.50

*Minimum object sensitivity

○ Safety distances per USA's OSHA/ANSI requirements (in inches, 1 in = 25.4 mm)

$D_s = K \times (T_s + T_c + T_r) + D_{pf}$	Without blanking 1.25 in resolution (Minimum object sensitivity)	1-beam blanking* 2 in resolution Minimum object sensitivity
Normal approach 	$D_s = 63 \times (T_s + T_c + T_r) + 3.3$ Note: If H_u is less than 48", then $D_{pf} = 48"$ (reach over).	$D_s = 63 \times (T_s + T_c + T_r) + 5.9$ for 1 beam blanked (2.0" resolution) Note: If more than one contiguous beam is blanked, the resolution (minimum object sensitivity) becomes greater than 2.5", then : - $D_{pf} = 36"$ if H_u is greater or equal to 48" (reach through) or, - $D_{pf} = 48"$ if H_u is less than 48" (reach over).
Parallel approach 	$D_s = 63 \times (T_s + T_c + T_r) + 48$	$D_s = 63 \times (T_s + T_c + T_r) + 48$ Note: H is to be not greater than 39 inches. if the blanked area is not entirely obstructed, H is not to be less than : - 7" for 2 contiguous blanked beams (2.75" resolution) or, - 15" for 3 contiguous blanked beams (3.5" resolution) or, - 30" for 4 contiguous blanked beams (4.25" resolution) or, - 39" for 5 contiguous blanked beams (5" resolution).
Angled approach 	If $\alpha \geq 30^\circ$ then use a normal approach formula. If $\alpha \leq 30^\circ$ then use a parallel approach formula.	

Where:

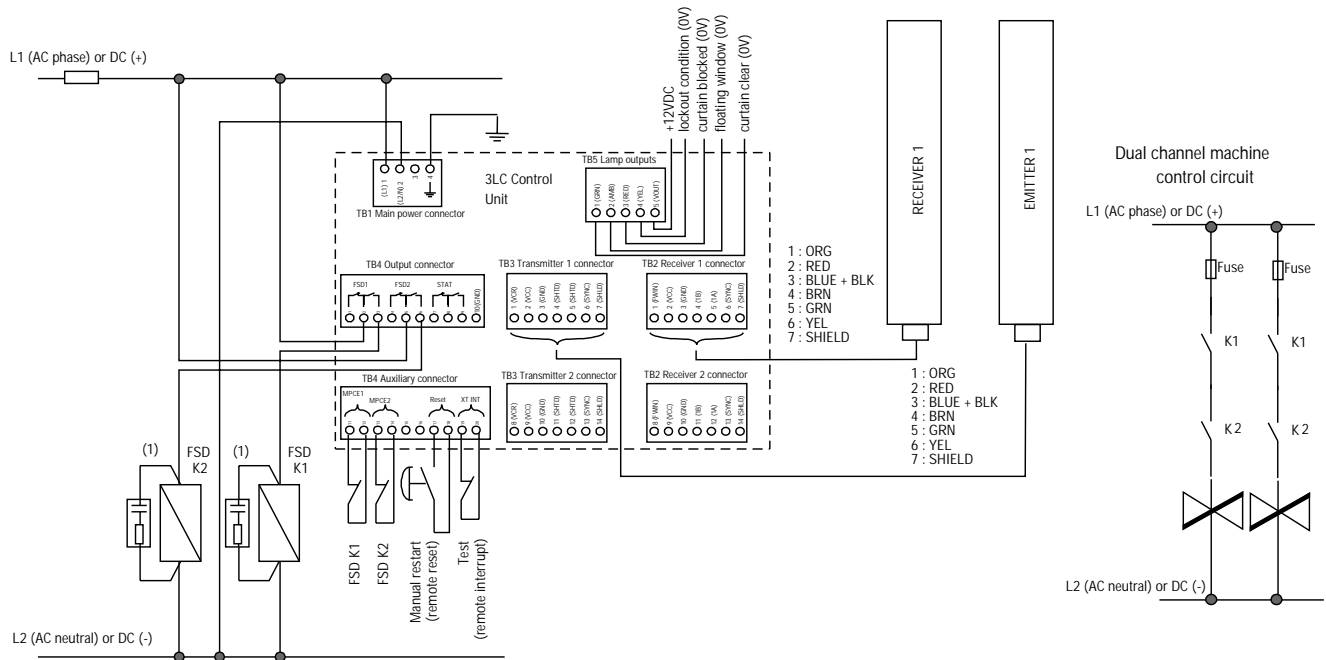
- D_s Minimum safety distance
- K Approach speed (called "hand speed") = 63 in/sec
- T_s Worst case stopping time of the machine (seconds)
- T_c Worst case response of the machine's control (seconds)
- T_r Response time of the safety devices (light curtain plus its interface – meaning the response time including the mechanical relay outputs in seconds)
- D_{pf} Depth penetration factor (inches)
- H height of the detection plane above the reference floor (inches)
- H_u height of the uppermost beam above the reference floor (inches)
- H_l height of the lowest beam above the reference floor (inches). For Normal approach, assumption is that H_l is not greater than 12 inches unless the application prevents access even with H_l at a distance greater than 12 inches)

(*) Floating or fixed blanking windows affect safety distance

USA's OSHA and ANSI safety distance formulas state that if the resolution (minimum object sensitivity) increases, the safety distance must also increase. If the blanked area is not completely physically obstructed, use of blanking windows requires moving the light curtain farther back from the hazardous area. The rule for increasing the safety distance is to add 2.6 in. to the safety distance for one beam blanked if the blanked area is not obstructed physically. If two or more contiguous beams are blanked then the Depth penetration factor (D_{pf}) is at least 36" when H_u is greater or equal to 48" (personnel are detected while reaching through the light curtain field). However D_{pf} is at least 48" if the H_u is less than 48" (personnel are detected reaching over the light curtain field). The light curtain must be sized and installed such that a stop would be signaled and the hazard cease prior to a person accessing the hazard. If the blanked area is entirely blocked by a fixture, the safety distance remains unchanged. Blanking two beams or more can create a large unprotected area through the light curtain. If this passageway is not completely filled by a fixture, personnel would be subject to a dangerous working environment.

For more information, refer to the US regulations and standards (OSHA 29 CFR 1910.212 and 1910.217, ANSI B11.1, B11.2, B11.19, B11.20 and R15.06).

○ Wiring diagram example using external relaying and manual restart (remote reset)



(1) RC (220 Ω + 0.22 mF) for ac interfaces, varistors (31 Vdc) for dc interfaces

For other configurations and capabilities, see the product installation manual.

Detector safety light curtain

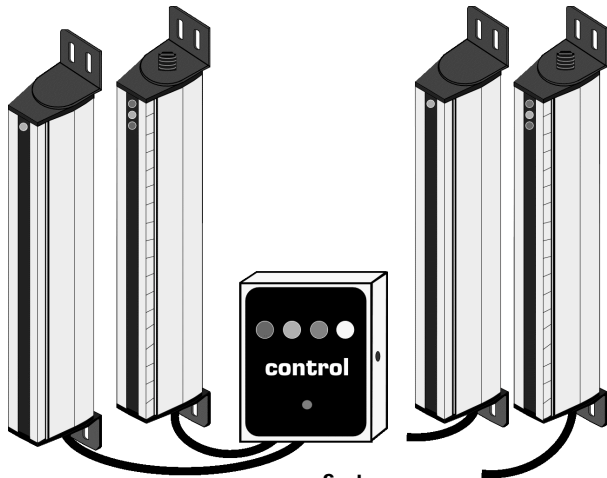
Detector™3 provides excellent protection. Once properly installed, Detector does not require additional adjustment, and no maintenance is required.

Detector™3's controller is both adaptable and versatile. One or two emitter/receiver pairs can use the same controller. The controller contains a power supply, light curtain logic, relays outputs, and configuration switches. These switches are used to configure the system: one or two sets of emitter/receiver pairs and other options.

After installation, access to the controller interior is not necessary. To secure the installation and configuration, close and lock the controller.

For added security and to comply with supervisory control requirements, the controller is equipped with a keyed reset switch. To reset, turn the keyed reset switch to the right (clockwise).

○ Ordering a system



System:
1 or 2 emitter / receiver pairs,
2 or 4 cables and control box

1. Select the appropriate control box.
2. Determine the protected height requirements.
3. Select the appropriate emitter/receiver pair to match the application requirements.
4. Select the appropriate cable length(s) to match the installation requirements.

○ Control box order guide

Catalog Listing	Description
3LC-B	NEMA 2 and IP 52 enclosure, 120/240 Vac (selectable)
3LC-BW	NEMA 2 and IP 52 enclosure with 75 ms response for welding applications, 120/240 Vac (selectable)
3LC-B24	NEMA 2 and IP 52 enclosure, 24 Vdc
3LC-B4	NEMA 4 and IP 65 enclosure with 120/240 Vac (selectable)

Note: cable glands are not included (customer supplied)

○ Emitter/receiver pair order guide

Standard Range - up to 25 ft (7.6 m) scanning range

Catalog Listing	Protection Height	
	(mm)	(in)
3LC06	184,2	7.25
3LC12	336,6	13.25
3LC18	489	19.25
3LC24	641,4	25.25
3LC30	793,8	31.25
3LC36	946,2	37.25
3LC42	1098,6	43.25
3LC48	1251	49.25
3LC60	1555,8	61.25
3LC72	1860,6	73.25

Extended Range - up to 50 ft (15.3 m) scanning range

Catalog Listing	Protection Height	
	(mm)	(in)
3LC06X	184,2	7.25
3LC12X	336,6	13.25
3LC18X	489	19.25
3LC24X	641,4	25.25
3LC30X	793,8	31.25
3LC36X	946,2	37.25
3LC42X	1098,6	43.25
3LC48X	1251	49.25
3LC60X	1555,8	61.25
3LC72X	1860,6	73.25

○ Cables* order guide

Catalog Listing	Description	
	(m)	(ft)
3LC-C05	1,52	5
3LC-C15	4,57	15
3LC-C30	9,14	30
3LC-C50	15,24	50
3LC-C100	30,48	100

*Order two cables for a complete emitter and receiver pair.

○ **Blanking window* order guide**

Catalog Listing	Description
3DBWM-24	Master, 0,61 m / 24 in cable length
3DBWM-48	Master, 1,22 m / 48 in cable length
3DBWM-72	Master, 1,83 m / 72 in cable length
3DBW-S	Slave for any size
*Order 1 master and up to 4 slaves	

Maximum of five beams may be blanked; this does not include the floating blanking window.

Fixed blanking windows can be used with floating blanking window.

Master fixed blanking windows have cables that connect to the top of the receiver.

Slave fixed blanking windows look like a master window, but have no cable.

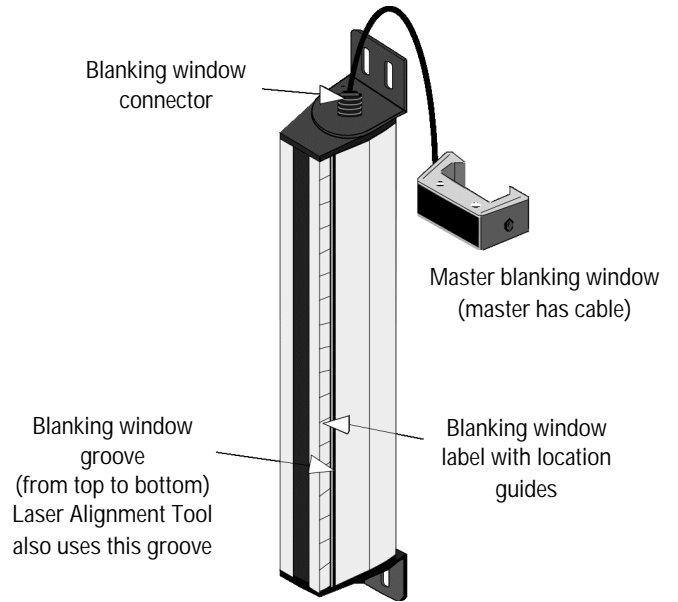
Slave fixed blanking windows snap on top of Master – no jumpers are required.

○ **Weld shield kits** order guide**

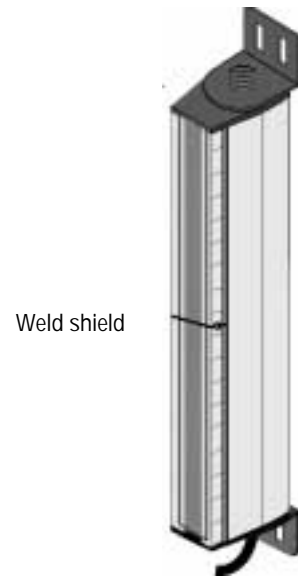
Catalog Listing	Protection Heights	
	(mm)	(in)
3WS06	184,2	7.25
3WS12	336,6	13.25
3WS18	489	19.25
3WS24	641,4	25.25
3WS30	793,8	31.25
3WS36	946,2	37.25
3WS42	1098,6	43.25
3WS48	1251	49.25
3WS60	1555,8	61.25
3WS72	1860,6	73.25
**Weld shield kit; 1 clear acrylic (plastic) shield with mechanical clips that attach to blanking window grooves		

○ **Other accessories order guide**

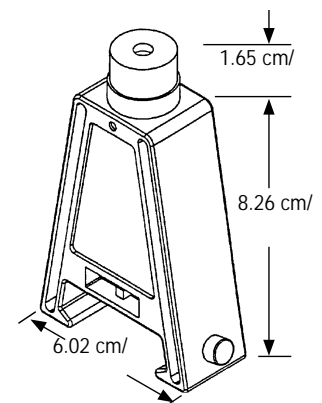
Catalog Listing	Description
3LC-LAT	Laser alignment tool, 3V lithium battery, 20-hour life



○ **Weld shields (external)**



○ **Laser alignment tool**



Safety Light Curtain Detector™ 3

Detector™ 3 Series

WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Contact your local sales office for warranty information. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace without charge those items it finds defective. The foregoing is Buyer's sole remedy and is **in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose.**

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

For application assistance, current specifications, or name of the nearest Authorized Distributor, contact a nearby sales office. Or call:

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1-800-737-3360 Canada
1-815-235-6847 International

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