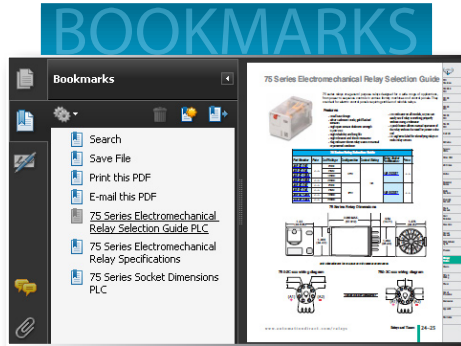


## Safety Components



In this interactive PDF you can:

- Use bookmarks to navigate by product category
- Use bookmarks to save, search, print or e-mail the catalog section
- Click on part #s to link directly to our online store for current pricing, specs, stocking information and more

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# A superb line of machine safety devices ... at incredible prices!



## Safety Relays

These dependable relays are designed to protect people and machines in applications requiring safety interlocks and controls. Prices start at \$88.00.

- Speed Monitor
- Standstill Monitor
- Single-channel E-Stop
- Dual-channel E-Stop/Safety Gate
- Dual-channel E-Stop/Safety Gate with Time Delay
- Safety mat and bumper controller
- Two-hand Controllers
- Light Curtain Controllers
- Extension Modules
- **All Models:** cULus, RoHS, CE, TUV\* approvals  
\*No TUV on BH5932 models

## Light Curtains

AutomationDirect offers Datalogic and Contrinex Brand light curtains in finger, hand and access control protection. Select between models with basic function, basic function with EDM and restart, and advanced function with EDM, restart, cascading, blanking and muting.

Prices start at \$471.00 for sender/receiver pair.

- Safety light curtain with 14mm resolution - Finger Safe protection
- Safety light curtain with 30mm resolution - Hand Safe protection
- Safety light curtain with 3 or 4 beams - Access Control protection
- **All models:** Double PNP outputs, M12 quick-disconnect models (order cable separately), Mounting brackets included with all light curtain units, IP65 rated



## IDEM Non-Contact Magnetic Locking RFID Switches



The MGL Series of safety switches combines magnetic locking and radio-frequency identification (RFID) sensing technology to provide non-contact operation and anti-tamper coding. In addition, an electromagnet is used to lock machine guards.

Prices start at \$273.00.

- Heavy duty or medium duty holding force models available
- Master coded or uniquely coded actuation
- RFID provides a high degree of anti-tamper, virtually impossible to override
- Flexible actuator for a high degree of misalignment tolerance
- Able to connect to most popular safety relays to achieve up to PLe and Cat.4 for ISO3849-1
- Ability to connect up to 20 switches and E-stops in series
- IP69K rating for food processing applications (stainless steel)

## IDEM Non-Contact Safety Switches

Non-contact safety switches are interlocking devices that are designed to protect both people and machines. They are preferred in certain applications where no physical contact (under normal conditions) takes place between the switch and actuator.

Prices start at \$70.00.

- Available in industry standard style plastic and stainless steel housings
- Styles: Non-contact magnetic and non-contact coded magnetic
- Wide (>10mm) sensing distance
- High tolerance to misalignment after sensing
- Enclosure protections: IP67, IP69K
- **All Models:** cULus, RoHS, CE approvals





## Interlock Switches

These safety switches are developed and manufactured according to IEC and EN European standards for Type 4 machine safety/ OSHA machine guarding. Prices start at \$13.00.

### IDEM Interlock Safety Switches

- **IDIS Series** - 22 mm safety interlock switches, tongue key or lever hinge operated, plastic only
- **KM/KM-SS Series** - 30 mm safety interlock switches, tongue key operated, die-cast aluminum and 316 stainless steel options
- **KP/K-SS and K-15 Series** - 40 mm safety interlock switches, tongue key operated, plastic and 316 stainless steel options
- **KLP/KLM/KL3-SS Series** - 30 mm safety solenoid interlock switches, solenoid locking, tongue key interlock operated, power to unlock, plastic, die-cast aluminum, and stainless steel 316 stainless steel options
- **KL1-P/KL1-SS Series** - 40 mm safety solenoid interlock switches, solenoid locking, tongue key interlock operated, power to unlock, plastic, and 316 stainless steel options
- **KLTM/KLT-SS Series** - 73 mm safety solenoid interlock switches, solenoid locking, tongue key interlock operated, power to unlock, die-cast aluminum and 316 stainless steel options
- **GLM and GLS Series Pull Cord Housings** - 57 mm, 63 mm, and 65 mm mounting profiles, 50m, 80m, and 100m length systems, die-cast aluminum and 316 stainless steel options
- **Interlock Safety Actuator Keys** - nine models available, all keys are 316 stainless steel

### Comepi Interlock Safety Switches

- **SP2 Series** - 30mm safety interlock switches with tongue keys, shaft hinge, or lever hinge
- **SDM Series** - 50mm safety interlock switches with tongue keys, shaft hinge, lever hinge or cable-pull
- **SBM Series** - 40mm safety interlock switches with tongue keys or cable-pull
- **CM Series** - 60mm safety interlock switches with tongue keys or cable-pull
- **AP2 Series** - 30mm safety limit switches with pull button reset
- **All models:** IEC 947-5-1, EN 60947-5-1, UL 508, CSA C22.2 No. 14 approvals



## Standard and Solenoid Trapped Key Gate Sets

Old Trapped Key System Gate Sets provide you with a full trapped key safety system, in **one- to five-gate sets**. They are available in either standard (SX) or solenoid-locking (ZRH) versions.

All keys and their corresponding 01 and 10 modules are identical within a set, but unique to any other set. We also offer tongue key actuators (purchased separately from the gate sets), and optional items such as door actuators, captive safety key sets, key modules for key exchange box setup, and mounting plates.

#### Warning: Machine safety products sold by AutomationDirect are Safety components only.

The purchaser/installer is solely responsible for the application of these components and ensuring all necessary steps have been taken to assure each application and use meets all performance and applicable safety requirements and/or local, national and/or international safety codes as required by the application. AutomationDirect cannot certify that our products used solely or in conjunction with other AutomationDirect or other vendors products will assure safety for any application.

Any person using or applying any safety products sold by AutomationDirect is responsible for learning the safety requirements for their individual application and applying them, and therefore assumes all risks, and accepts full and complete responsibility for the selection and suitability of the product for their respective application.

AutomationDirect does not provide design or consulting services, and cannot advise whether any specific application or use of our products would ensure compliance with the safety requirements for any application.

# If it's in your cabinet, it's online at: [www.AutomationDirect.com](http://www.AutomationDirect.com)



## Tens of thousands of in-stock quality items

### An Extensive Lineup of Products

Starting with the enclosure, we carry everything you need to build an electrical control system, right down to the wire and tools. And we have the devices that go in the panel, such as logic controllers, HMI, drives, relays, and motor controls. If you're maintaining existing systems, we've got great prices on MRO parts such as circuit breakers, fuses, motors, pneumatics and pilot devices. In addition to our catalog all our products are available to **order 24/7 at [www.automationdirect.com](http://www.automationdirect.com)**.

### Value Pricing

Our everyday prices on industrial control products are well below the list prices of more traditional automation companies because, with our direct business model and focus on high efficiency, AUTOMATIONDIRECT has the **lowest overhead in the industry**. We pass the savings on to you by offering high-quality products at low prices.

### FREE Award Winning Support

Almost 99% of AUTOMATIONDIRECT customers responding to surveys say they would recommend us to someone else, and they do! And we've been **voted tops in service by independent magazine surveys 14 years running**.

### FREE & Fast Shipping\*

The majority of our products are stocked for same-day shipping, when you place your order by 6 p.m. EST.

*\* Same day shipping with approved company credit or credit card. Free 2-day (transit) shipping for orders over \$49; other expedited services extra. See Web site or catalog Terms and Conditions for all details and exceptions.*

 **AUTOMATIONDIRECT**.com  
1-800-633-0405

# Datalogic Safety Light Curtains

Specification	SG4-14 Base Series	SG4-30 Base Series	SG4-14 Advanced Series	SG4-30 Advanced Series
<b>Description</b>	Finger Protection, 14mm resolution	Hand Protection, 30mm resolution	Finger Protection, 14mm resolution	Hand Protection, 30mm resolution
<b>Protected Height</b>	150 to 900mm (5.91 to 35.43 in)	300 to 1800mm (11.81 to 70.81 in)	300 to 750mm (11.81 to 29.52 in) (No Dead Zone)	300 to 1800mm (11.81 to 70.87 in) (No Dead Zone)
<b>Safety Level</b>	Cat.4, PLe (EN/ISO 13849-1) Type 4 (IEC 61496-1/2)	Cat.4, PLe (EN/ISO 13849-1) Type 4 (IEC 61496-1/2)	Cat.4, PLe (EN/ISO 13849-1) Type 4 (IEC 61496-1/2)	Cat.4, PLe (EN/ISO 13849-1) Type 4 (IEC 61496-1/2)
<b>Operating Range</b>	0.2 to 6m (0.66 to 19.68 ft)	0.2 to 19m (0.66 to 63.34 ft)	0.2 to 4m (0.66 to 13.12 ft) 0.2 to 7m (0.66 to 22.97 ft) (Selectable)	0.2 to 12m (0.66 to 39.32 ft) 0.2 to 20m (0.66 to 65.62 ft) (Selectable)
<b>Output State</b>	N.C.	N.C.	N.C.	N.C.
<b>Logic Output</b>	Dual PNP outputs, short-circuit protected	Dual PNP outputs, short-circuit protected	Dual PNP / NPN configurable outputs short-circuit protected	Dual PNP / NPN configurable outputs short-circuit protected
<b>Connection Type</b>	Sender: 4-pole, M12 connector Receiver: 8-pole, M12 connector	Sender: 4-pole, M12 connector Receiver: 8-pole, M12 connector	Sender: M12 5-pole connector Receiver: M12 12 poles + M12 5 poles for muting applications M12 12 poles for blanking applications	Sender: M12 5-pole connector Receiver: M12 12 poles + M12 5 poles for muting applications M12 12 poles for blanking applications
<b>Supply Voltage</b>	24VDC ± 20%	24VDC ± 20%	24VDC ± 20%	24VDC ± 20%
<b>Rating</b>	IEC IP65	IEC IP65	IEC IP65	IEC IP65



Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Datalogic Safety Light Curtains – Base Series, Finger-safe

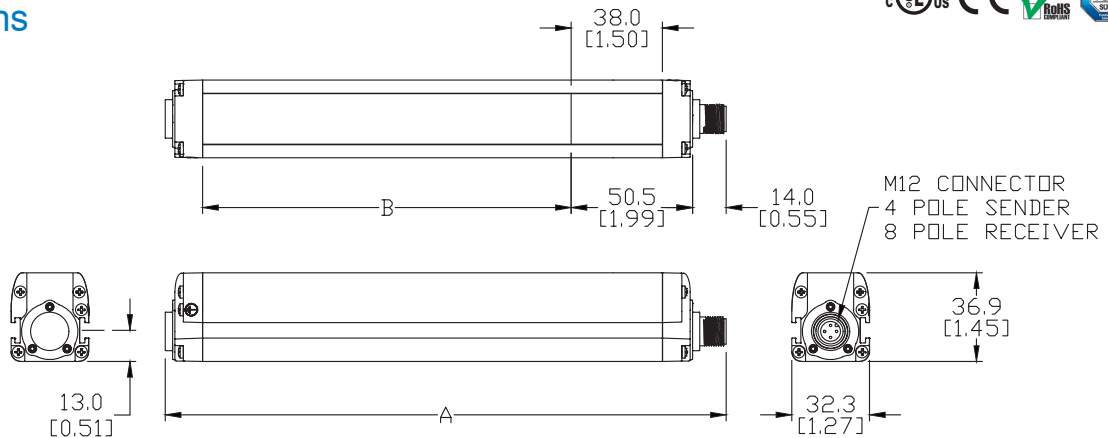


## Safety light curtain with 14mm resolution

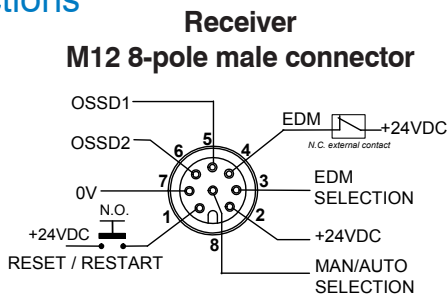
- Includes both sender and receiver
- Integrated light curtain for finger protection
- Operating distance up to 6m
- Protected heights ranging from 150 to 900 mm (5.91 to 35.43 in)
- Compact 32 x 37 mm (1.25 x 1.46 in) profile
- Selectable EDM (external device monitoring)
- Selectable manual / automatic restart
- IP65 rated
- Type 4, PLE, SIL3
- UL, CE, TUV and RoHS compliant

SG4-14 Base Series with EDM Selection Table						
Part Number	Price	Protected Height B mm[in]	Total Height A mm[in]	Number of Beams	Response Time [ms]	Approximate Product Weight per Unit - kg [lb]
SG4-14-015-00-E	\$471.00	150 [5.91]	233.3 [9.81]	16	11	1.40 [3.09]
SG4-14-030-00-E	\$624.00	300 [11.81]	383.2 [15.09]	32	15	2.10 [4.63]
SG4-14-045-00-E	\$810.00	450 [17.72]	533.2 [20.99]	48	18	2.60 [5.73]
SG4-14-060-00-E	\$993.00	600 [23.62]	683.2 [26.90]	64	22	3.00 [6.61]
SG4-14-075-00-E	\$1,158.00	750 [29.53]	833.2 [32.80]	80	25	4.00 [8.82]
SG4-14-090-00-E	\$1,350.00	900 [35.43]	983.2 [38.71]	96	29	4.30 [9.48]

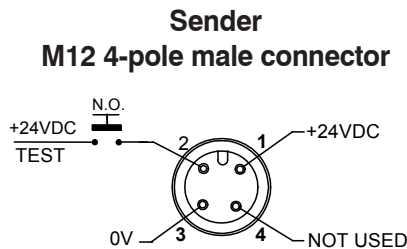
## Dimensions mm [in]



## Connections



Assignment	Function	Pins on Sender
		M12
Reset / Restart	Automatic / Manual reset / Restart	1
Supply Voltage	+24VDC	2
EDM	EDM Activation	3
EDM	EDM	4
Output	OSSD1 (Output Single Switching Device)	5
Output	OSSD2 (Output Single Switching Device)	6
0V	0V	7
Reset Selection	Select Automatic / Manual reset	8



Assignment	Function	Pins on Sender
		M12
Supply Voltage	+24VDC	1
Test	Test	2
0V	0V	3
N/A	Not Used	4



**Note:** Confirm the specific color to each pinout based on the cable used during installation.

# Datalogic Safety Light Curtains – Base Series, Hand-safe



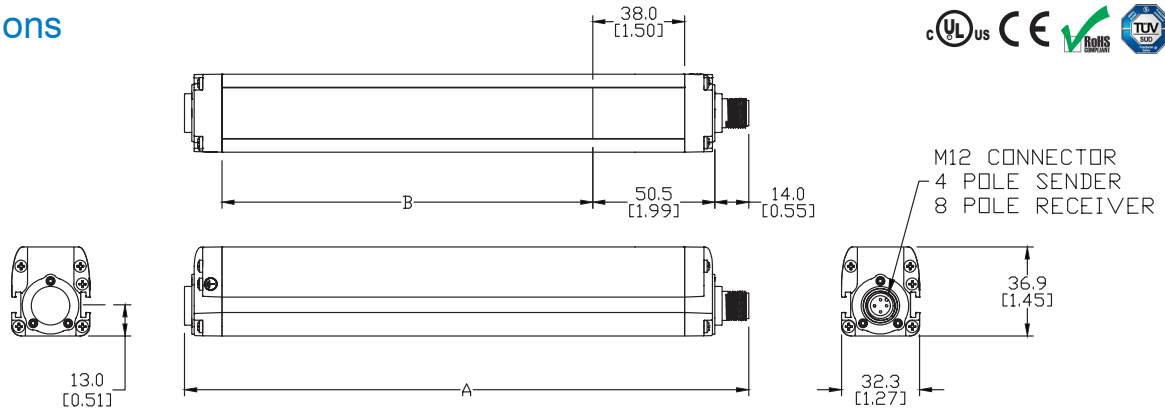
## Safety light curtain with 30mm resolution

- Includes both sender and receiver
- Integrated light curtain for hand protection
- Operating distance up to 19m
- Protected heights ranging from 300 to 1800 mm (11.81 to 70.87 in)
- Selectable EDM (external device monitoring)
- Selectable manual / automatic restart
- IP65 rated
- Type 4, Pe, SIL3
- UL, CE, TUV and RoHS compliant

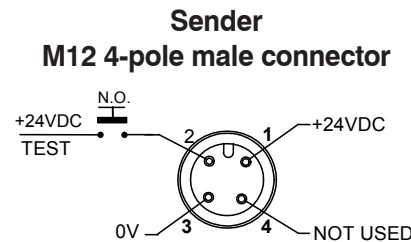
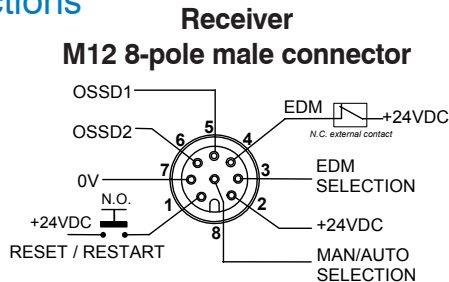
**SG4-30 Base Series with EDM Selection Table**

Part Number	Price	Protected Height B mm[in]	Total Height A mm[in]	Number of Beams	Response Time [ms]	Approximate Product Weight per Unit - kg [lb]
SG4-30-030-00-E	\$558.00	300 [11.81]	383.2 [15.09]	16	11	2.10 [4.63]
SG4-30-045-00-E	\$665.00	450 [17.72]	533.2 [20.99]	24	13	2.60 [5.73]
SG4-30-060-00-E	\$772.00	600 [23.62]	683.2 [26.90]	32	14	3.00 [6.61]
SG4-30-075-00-E	\$879.00	750 [29.53]	833.2 [32.80]	40	16	4.00 [8.82]
SG4-30-090-00-E	\$969.00	900 [35.43]	983.2 [38.71]	48	18	4.30 [9.48]
SG4-30-105-00-E	\$1,056.00	1050 [41.34]	1133.2 [44.61]	56	19	5.00 [11.02]
SG4-30-120-00-E	\$1,155.00	1200 [47.24]	1283.3 [50.52]	64	21	5.40 [11.91]
SG4-30-135-00-E	\$1,273.00	1350 [53.15]	1433.2 [56.43]	72	23	6.20 [13.67]
SG4-30-150-00-E	\$1,381.00	1500 [59.05]	1583.3 [62.33]	80	25	7.00 [15.43]
SG4-30-165-00-E	\$1,471.00	1650 [64.96]	1733.3 [68.24]	88	26	7.50 [16.54]
SG4-30-180-00-E	\$1,598.00	1800 [70.87]	1883.3 [74.15]	96	28	8.00 [17.64]

## Dimensions mm [in]



## Connections



Assignment	Function	Pins on Sender
		M12
Reset / Restart	Automatic / Manual reset / Restart	1
Supply Voltage	+24VDC	2
EDM	EDM Activation	3
EDM	EDM	4
Output	OSSD1 (Output Single Switching Device)	5
Output	OSSD2 (Output Single Switching Device)	6
0V	0V	7
Reset Selection	Select Automatic / Manual reset	8

Assignment	Function	Pins on Sender
		M12
Supply Voltage	+24VDC	1
Test	Test	2
0V	0V	3
N/A	Not Used	4

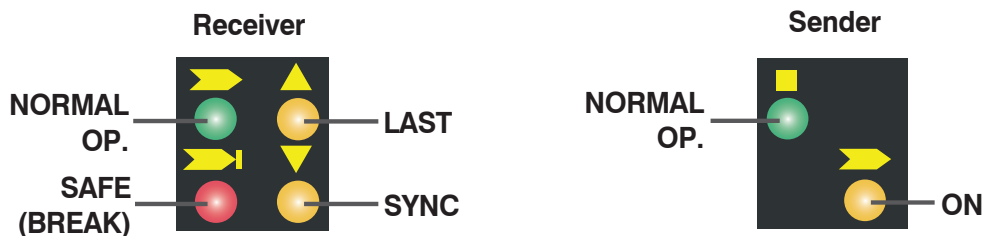
**Note: Confirm the specific color to each pinout based on the cable used during installation.**

# Datalogic Safety Light Curtains – Base Series

SG4-14 and SG4-30 Base Series with EDM Specifications		
Model	SG4-14 Base Series (finger protection)	SG4-30 Base Series (hand protection)
<b>Electrical Data</b>		
Supply Voltage	24VDC ± 20%	
Current Consumption (Sender)	2.5 W maximum	
Current Consumption (Receiver)	3.5 W maximum (without load)	
OSSD Outputs	2 PNP	
Short Circuit Protection	1.4 A maximum	
Output Current	0.5 amps maximum on each output	
Output Voltage – ON status:	Vdd-1V minimum	
Output Voltage – OFF status:	0.2 V maximum	
Leakage Current	< 1mA	
Capacitive Load	2.2 uF @ 24VDC (if a longer cable must be used, verify that the capacitive load specifications are respected)	
Protected Height	150 - 900 mm (5.91 - 35.43 in)	300 - 1800 mm (11.81 - 70.87 in)
Safety Category	Type 4, IEC 61496-1	
Auxiliary Functions	Reset / Test	
	Selectable Manual / Automatic Reset	
	Selectable EDM	
Electrical Protection	Class I / Class III	
Electrical Connections	M12 4-pole for sender	
	M12 8-pole for receiver	
Cable Length (for supply power)	50m (164ft) maximum (if a longer cable must be used, verify that the capacitive load specifications are respected)	
<b>Optical Data</b>		
Light Emission	Infared LED (950nm)	
Resolution	14mm	30mm
Operating Distance	0.2 - 6 m	0.2 - 19 m
Aperature Angle (EAA)	±2.5° maximum	
Ambient Light Rejection	IEC 61496-2	
<b>Mechanical and Environmental Data</b>		
Operating Temperature	0 to 55°C (32 to 131°F)	
Storage Temperature	-25 to 70°C (-13 to 158°F)	
Temperature Class	T6	
Humidity	15 - 95% (non-condensing)	
Mechanical Protection	IP65 (EN 60529)	
	Width 0.35 mm	
Vibrations	Frequency 10 - 55 Hz 20 sweep per axis	
	1 octave / min (EN 60068-2-6)	
Housing Material	Painted aluminum (yellow RAL 1003) front screen	
Protective Shield Material	PMMA (Polymethylmethacrylate (acrylic))	
Cap Material	PC MAKROLON	
Weight	1.3 Kg / m	
Agency Approvals	UL E226479, CE, TUV, RoHS	

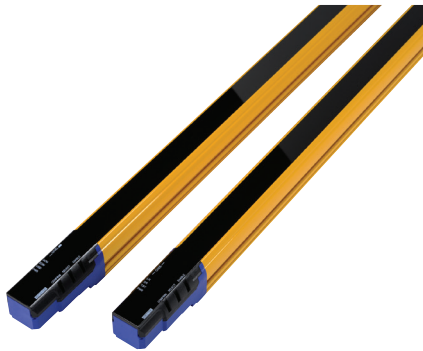
To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page at [www.AutomationDirect.com](http://www.AutomationDirect.com)

## Status Indicators





# Datalogic Safety Light Curtains – Advanced Series, Finger-safe



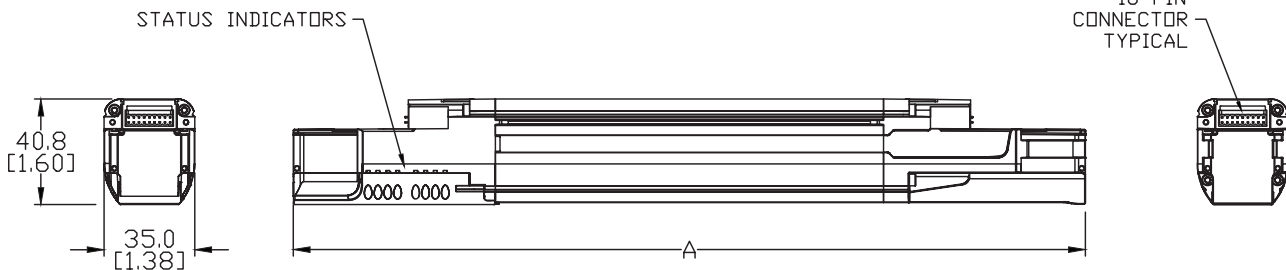
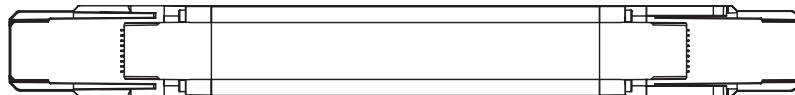
## Programmable safety light curtain with 14mm resolution

- Includes both sender and receiver
- Type 4, PLe, SIL3
- 14mm resolution integrated light curtain for finger protection
- Operating distance up to 7m (selectable)
- 300-900 mm protected height
- Zero dead zone
- Basic Configuration Mode (BCM) through pushbuttons
- Advanced Configuration Mode (ACM) through GUI (SG EXTENDED GUI software included)
- CASCADE (No differentiation between master and slave models)
- Integrated MUTING and BLANKING functions
- Compact housing
- Proprietary 18-pin to standard M12 connectors
- 2 PNP / NPN configurable OSSD outputs
- 8 signalling LEDs
- Alignment level bar graph on both TX and RX units
- IP65 rated
- UL, CE, TUV and RoHS compliant
- Accessory Dongle for:
  - Configuration cloning
  - Ethernet (TCP/IP connection)
  - Remote monitoring
  - Remote programming



SG4-14 Programmable Series Selection Table							
Part Number	Price	Protected Height mm[in]	Total Height A mm[in]	Number of Beams	Response Time [ms]	Response Time with Code [ms]	Approximate Product Weight per Unit kg [lb]
SG4-14-030-00-P	\$821.00	300 [11.81]	306.3 [12.06]	32	15	20	2.10 [4.63]
SG4-14-045-00-P	\$1,011.00	450 [17.72]	456.3 [17.96]	48	17	25	2.10 [4.63]
SG4-14-060-00-P	\$1,202.00	600 [23.62]	606.3 [23.87]	64	19	29	3.00 [6.61]
SG4-14-075-00-P	\$1,371.00	750 [29.53]	756.3 [29.78]	80	20	34	4.30 [9.48]
SG4-14-090-00-P	\$1,600.00	900 [35.43]	906.3 [35.68]	96	22	38	4.30 [9.48]

## Dimensions mm [in]



Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

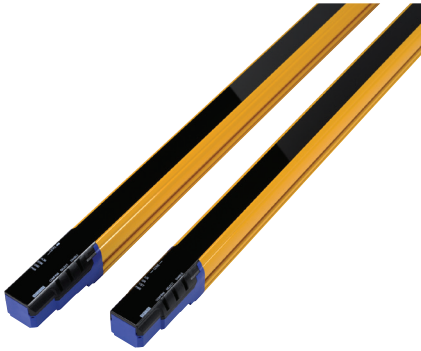
Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Datalogic Safety Light Curtains – Advanced Series, Hand-safe



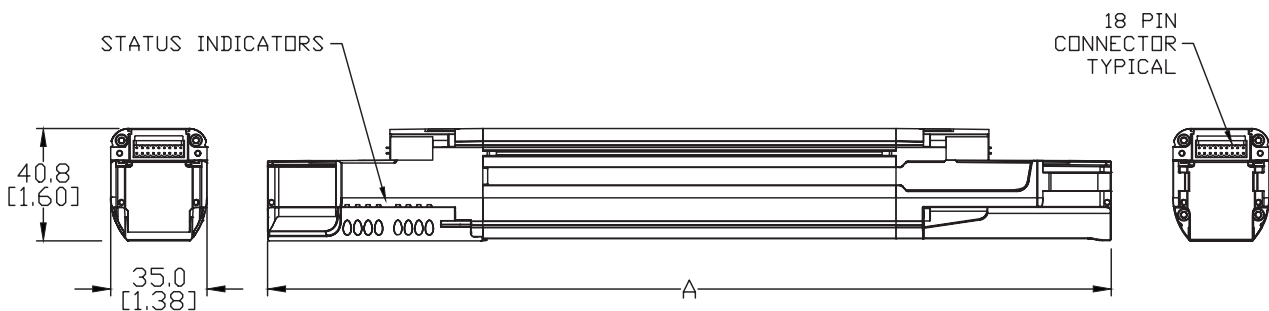
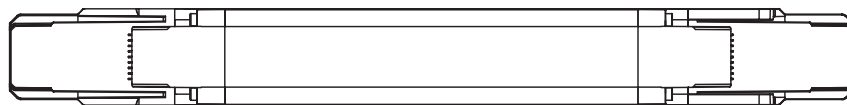
## Programmable safety light curtain with 30mm resolution

- Includes both sender and receiver
- Type 4, PLc, SIL3
- 30mm resolution integrated light curtain for hand protection
- Operating distance up to 20m (selectable)
- 300-1800 mm protected height
- Zero dead zone
- Basic Configuration Mode (BCM) through pushbuttons
- Advanced Configuration Mode (ACM) through GUI (SG EXTENDED GUI software included)
- CASCADE (No differentiation between master and slave models)
- Integrated MUTING and BLANKING functions
- Compact housing
- Proprietary 18-pin to standard M12 connectors
- 2 PNP / NPN configurable OSSD outputs
- 8 signalling LEDs
- Alignment level bar graph on both TX and RX units
- IP65 rated
- UL, CE, TUV and RoHS compliant
- Accessory Dongle for:
  - Configuration cloning
  - Ethernet (TCP/IP connection)
  - Remote monitoring
  - Remote programming



SG4-30 Programmable Series Selection Table							
Part Number	Price	Protected Height mm[in]	Total Height A mm[in]	Number of Beams	Response Time [ms]	Response Time with Code [ms]	Approximate Product Weight per Unit kg [lb]
SG4-30-030-00-P	\$752.00	300 [11.81]	306.3 [12.06]	16	13	16	2.10 [4.63]
SG4-30-045-00-P	\$863.00	450 [17.72]	456.3 [17.96]	24	14	18	2.50 [5.51]
SG4-30-060-00-P	\$973.00	600 [23.62]	606.3 [23.87]	32	15	20	3.00 [6.61]
SG4-30-075-00-P	\$1,083.00	750 [29.53]	756.3 [29.78]	40	16	23	4.00 [8.82]
SG4-30-090-00-P	\$1,150.00	900 [35.43]	906.3 [35.68]	48	17	25	4.30 [9.48]
SG4-30-105-00-P	\$1,275.00	1050 [41.34]	1056.3 [41.59]	56	18	27	4.80 [10.58]
SG4-30-120-00-P	\$1,377.00	1200 [47.24]	1206.3 [47.49]	64	19	29	5.40 [11.91]
SG4-30-135-00-P	\$1,497.00	1350 [53.15]	1356.3 [53.40]	72	19	32	6.20 [13.67]
SG4-30-150-00-P	\$1,644.00	1500 [59.06]	1506.3 [59.30]	80	20	24	7.00 [15.43]
SG4-30-165-00-P	\$1,778.00	1650 [64.96]	1656.3 [65.21]	88	21	36	7.50 [16.54]
SG4-30-180-00-P	\$1,897.00	1800 [70.87]	1806.3 [71.11]	96	22	38	8.00 [17.64]

## Dimensions mm [in]



# Datalogic Safety Light Curtains – Advanced Series

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

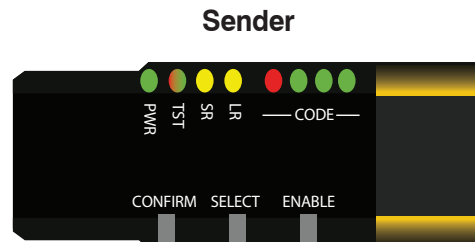
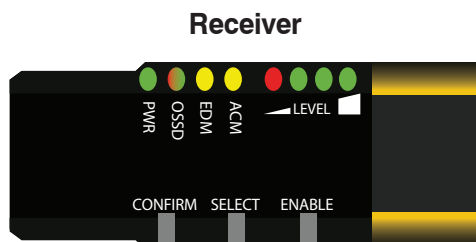
Safety: Protective Wear

Terms and Conditions

SG4-14 and SG4-30 Programmable Series Specifications	
<b>Electrical Data</b>	
<b>Supply Voltage</b>	24VDC ± 20%
<b>Current Consumption (Transmitter)</b>	3W maximum
<b>Current Consumption (Receiver)</b>	5W maximum (without load)
<b>Outputs</b>	2 PNP / NPN configurable outputs short circuit protection (1.4 A @ 55°C)
<b>Output Current</b>	0.5 amps maximum on each output
<b>Output Voltage – ON status:</b>	Vdd-1V
<b>Output Voltage – OFF status:</b>	0.2 V
<b>Leakage Current</b>	< 1mA
<b>Output Capacitive Load</b>	2.2 uF @ 24VDC
<b>Recovery Time</b>	100ms typical
<b>Protected Height</b>	300 - 1800 mm
<b>Safety Category</b>	Type 4 (ref. EN 61496-1)
<b>Auxiliary Functions</b>	Reset, Restart selection, Alignment, EDM, Test, Muting, Partial Muting, Override, Coding, Range reduction, Fixed Blanking, Floating Blanking, Cascade, PNP / NPN output, GUI programming
<b>Electrical Protection</b>	Class I / Class III
<b>Electrical Connections</b>	M12 5-pole for sender
	M12 12-pole + M12 5-pole for receiver muting applications
	M12 12-pole for receiver blanking applications
<b>Cable Length (for supply power)</b>	50m (164ft) maximum
<b>Pollution Degree</b>	2
<b>Optical Data</b>	
<b>Light Emission</b>	Infrared LED (950nm)
<b>Resolution</b>	14mm
	30mm
<b>Operating Distance</b>	0.2 - 7 m / 0.2 - 4 m (0.7 - 23 ft / 0.7 - 13 ft) for 14mm resolution 0.2 - 20 m / 0.2 - 12 m (0.7 - 66 ft / 0.7 - 39 ft) for 30mm resolution
<b>Ambient Light Rejection</b>	IEC 61496-2
<b>Mechanical and Environmental Data</b>	
<b>Operating Temperature</b>	0 to 55°C (32 to 131°F)
<b>Storage Temperature</b>	-25 to 70°C (-13 to 158°F)
<b>Temperature Class</b>	T6
<b>Humidity</b>	15 - 95% (non-condensing)
<b>Mechanical Protection</b>	IP65 (EN 60529)
<b>Vibrations</b>	Width 0.35 mm
	Frequency 10 - 55 Hz 20 sweep per axis 1 octave / min (EN 60068-2-6)
<b>Shock Resistance</b>	16ms (10g) 1000 shock for each axis (EN60068-2-29)
<b>Housing Material</b>	Painted aluminum (yellow RAL 1003) front screen
<b>Cap Material</b>	PBT Valox 508 (pantone 072-CVC)
<b>Front Glass Material</b>	PMMA (Polymethylmethacrylate [acrylic])
<b>Connectors</b>	Proprietary 18-pin to standard M12
<b>Agency Approvals</b>	UL E226479, CE, TUV, RoHS

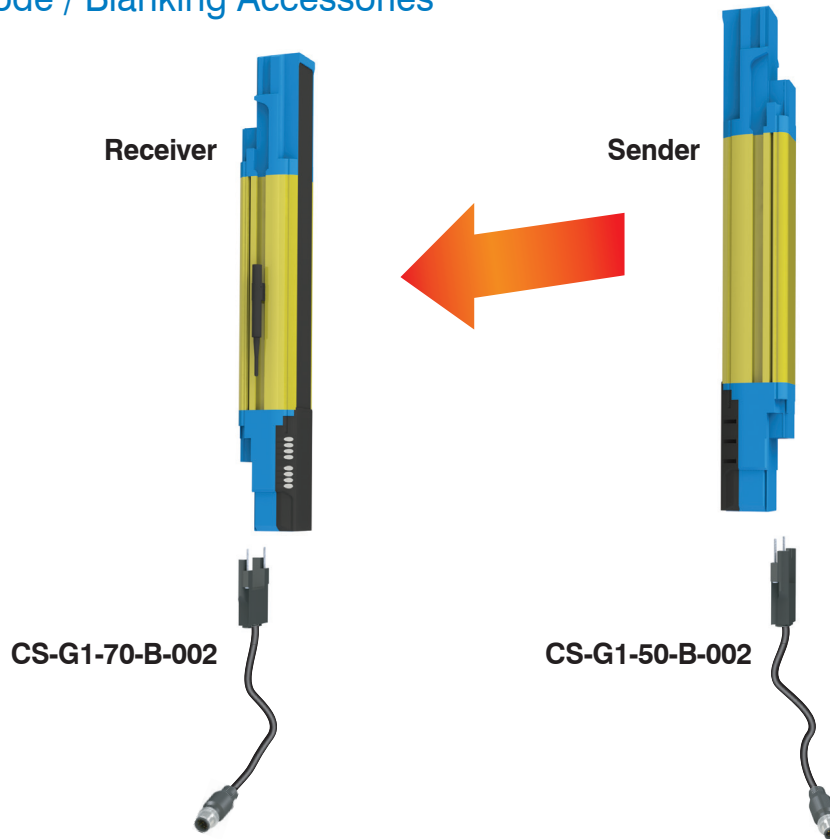
To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page at [www.AutomationDirect.com](http://www.AutomationDirect.com)

## Status Indicators



# Datalogic Safety Light Curtains – Advanced Series Accessories

## Basic Mode / Blanking Accessories



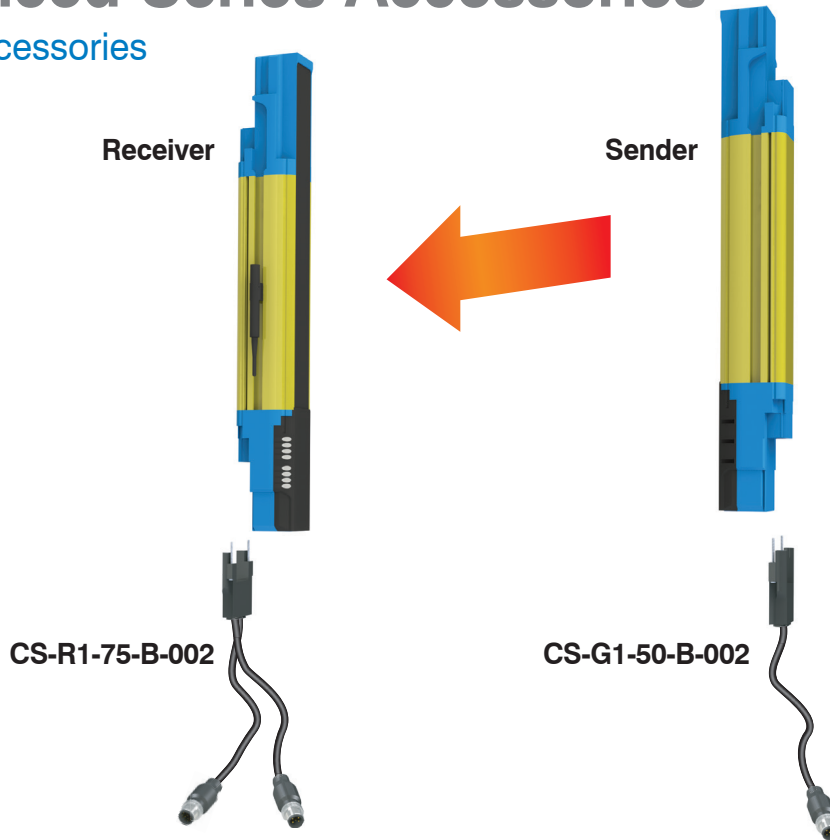
Pigtail Cable Blanking Configuration for Receiver (CS-G1-70-B-002)												
	<b>M12 12-pin:</b>											
	<table border="1"> <tr><td>1. 24V (brown)</td></tr> <tr><td>2. 0V (blue)</td></tr> <tr><td>3. Reset / Restart / Align (white)</td></tr> <tr><td>4. Teach In (green)</td></tr> <tr><td>5. OSSD2 (pink)</td></tr> <tr><td>6. EDM (yellow)</td></tr> <tr><td>7. N.C. (black)</td></tr> <tr><td>8. OSSD1 (gray)</td></tr> <tr><td>9. Tolerance (red)</td></tr> <tr><td>10. Lamp (violet)</td></tr> <tr><td>11. N.C. (gray / pink)</td></tr> <tr><td>12. Earth (red / blue)</td></tr> </table>	1. 24V (brown)	2. 0V (blue)	3. Reset / Restart / Align (white)	4. Teach In (green)	5. OSSD2 (pink)	6. EDM (yellow)	7. N.C. (black)	8. OSSD1 (gray)	9. Tolerance (red)	10. Lamp (violet)	11. N.C. (gray / pink)
1. 24V (brown)												
2. 0V (blue)												
3. Reset / Restart / Align (white)												
4. Teach In (green)												
5. OSSD2 (pink)												
6. EDM (yellow)												
7. N.C. (black)												
8. OSSD1 (gray)												
9. Tolerance (red)												
10. Lamp (violet)												
11. N.C. (gray / pink)												
12. Earth (red / blue)												

Pigtail Cable for Sender (CS-G1-50-B-002)					
	<b>M12 5-pin:</b>				
	<table border="1"> <tr><td>1. 24V (brown)</td></tr> <tr><td>2. Test (white)</td></tr> <tr><td>3. 0V (blue)</td></tr> <tr><td>4. Earth (black)</td></tr> <tr><td>5. Not Used (gray)</td></tr> </table>	1. 24V (brown)	2. Test (white)	3. 0V (blue)	4. Earth (black)
1. 24V (brown)					
2. Test (white)					
3. 0V (blue)					
4. Earth (black)					
5. Not Used (gray)					

**Note:** Confirm the specific color to each pinout based on the cable used during installation.

# Datalogic Safety Light Curtains – Advanced Series Accessories

## Muting Accessories



### Pigtail Cable Muting Configuration for Receiver (CS-R1-75-B-002)



M12 12-pin:	
1.	24V (brown)
2.	0V (blue)
3.	Reset / Restart / Align (white)
4.	Teach In (green)
5.	OSSD2 (pink)
6.	EDM (yellow)
7.	N.C. (black)
8.	OSSD1 (gray)
9.	Tolerance (red)
10.	Lamp (violet)
11.	N.C. (gray / pink)
12.	Earth (red / blue)

M12 5-pin:	
1.	24V (brown)
2.	Muting2 (white)
3.	0V (blue)
4.	Muting1 (black)
5.	N.C. (gray)

### Pigtail Cable for Sender (CS-G1-50-B-002)



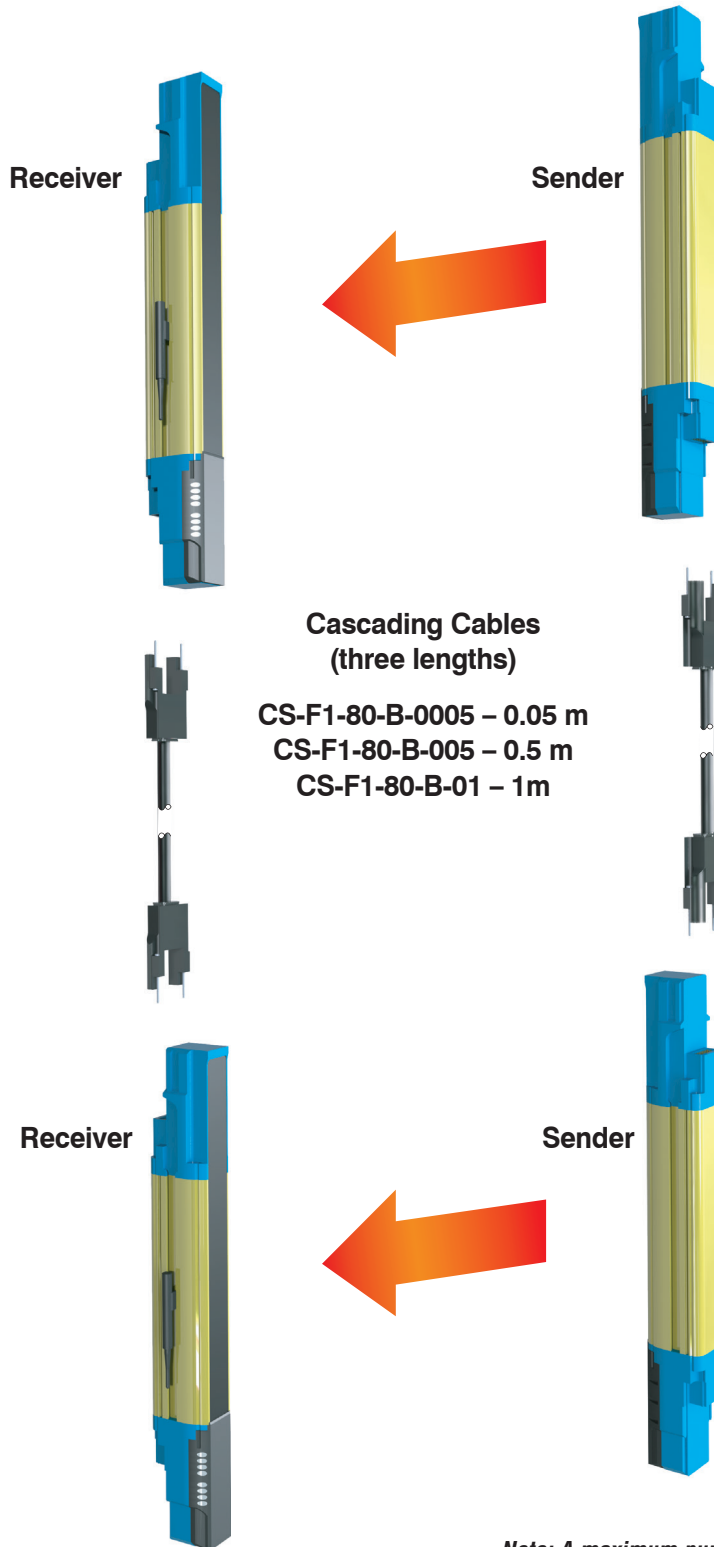
M12 5-pin:	
1.	24V (brown)
2.	Test (white)
3.	0V (blue)
4.	Earth (black)
5.	Not Used (gray)

**Note:** Confirm the specific color to each pinout based on the cable used during installation.

- Company Information
- Terminal Blocks
- Power Distribution Blocks
- Wiring Accessories
- ZIPLink Connection System
- Multi-wire Connectors
- Sensor Cables and Connectors
- M12 Junction Blocks
- Panel Interface Connectors
- Wiring Duct
- Cable Ties
- Wire
- Bulk Multi-conductor Cables
- Wire Management Products
- Power Supplies
- DC Converters
- Transformers and Filters
- Circuit Protection
- Tools
- Test Equipment
- Enclosures
- Enclosure Climate Control
- Safety: Electrical Components
- Safety: Protective Wear
- Terms and Conditions

# Datalogic Safety Light Curtains – Advanced Series Accessories

## Cascading Cables



*Note: A maximum number of three units, one master and two slaves, may be cascaded.*

# Datalogic Safety Light Curtains – Advanced Series Accessories

Safety Light Curtains Cables		
Part Number	Price	Description
<b>CS-R1-75-B-002</b>	\$26.00	Datalogic cable, muting, PVC jacket, 0.2 m cable length, 18-pin proprietary to 5-pin M12 male quick-disconnect to 12-pin M12 male quick-disconnect
<b>CS-G1-70-B-002</b>	\$20.00	Datalogic cable, blanking, PVC jacket, 0.2 m cable length, 18-pin proprietary to 12-pin M12 male quick-disconnect
<b>CS-G1-50-B-002</b>	\$17.00	Datalogic cable, emitter, PVC jacket, 0.2 m cable length, 18-pin proprietary to 5-pin M12 male quick-disconnect
<b>CS-F1-80-B-0005</b>	\$17.00	Datalogic cable, cascading, PVC jacket, 0.05 m cable length, 18-pin proprietary to 18-pin proprietary
<b>CS-F1-80-B-005</b>	\$17.00	Datalogic cable, cascading, PVC jacket, 0.5 m cable length, 18-pin proprietary to 18-pin proprietary
<b>CS-F1-80-B-01</b>	\$17.00	Datalogic cable, cascading, PVC jacket, 1m cable length, 18-pin proprietary to 18-pin proprietary



**CS-R1-75-B-002**



**CS-G1-70-B-002**



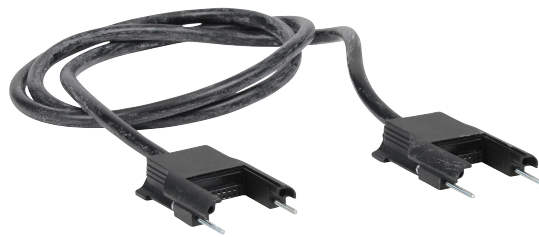
**CS-G1-50-B-002**



**CS-F1-80-B-0005**



**CS-F1-80-B-005**



**CS-F1-80-B-01**

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Datalogic Safety Light Curtains – Advanced Series Accessories

## L-Muting Arms

SG-L-ARMS L muting arms provide an optional method of achieving unidirectional muting.

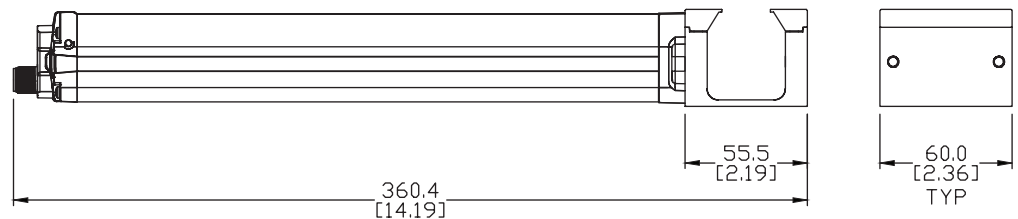
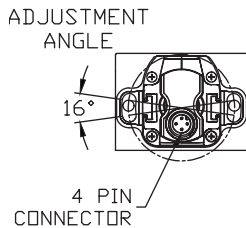
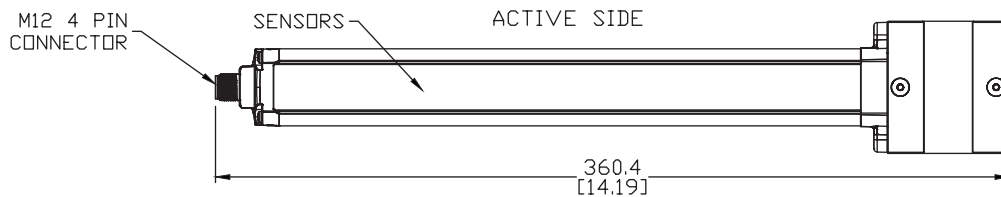
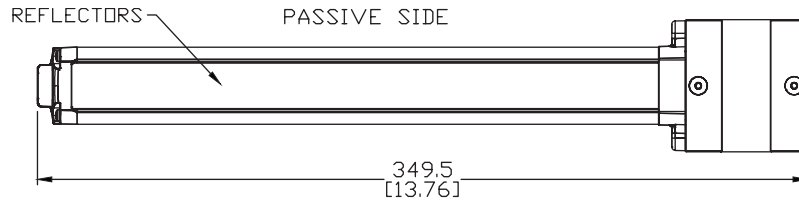
**Part No. SG-L-ARMS**

**\$335.00**

- Operating distance up to 3m
- Detectable objects down to 16.5 cm (6.5 in) in length. (See manual for exact formulas.)



### Dimensions mm [in]





# Datalogic Safety Light Curtains – Advanced Series Accessories

## T-Muting Arms

SG-T-ARMS T muting arms provide an optional method of achieving bidirectional muting.

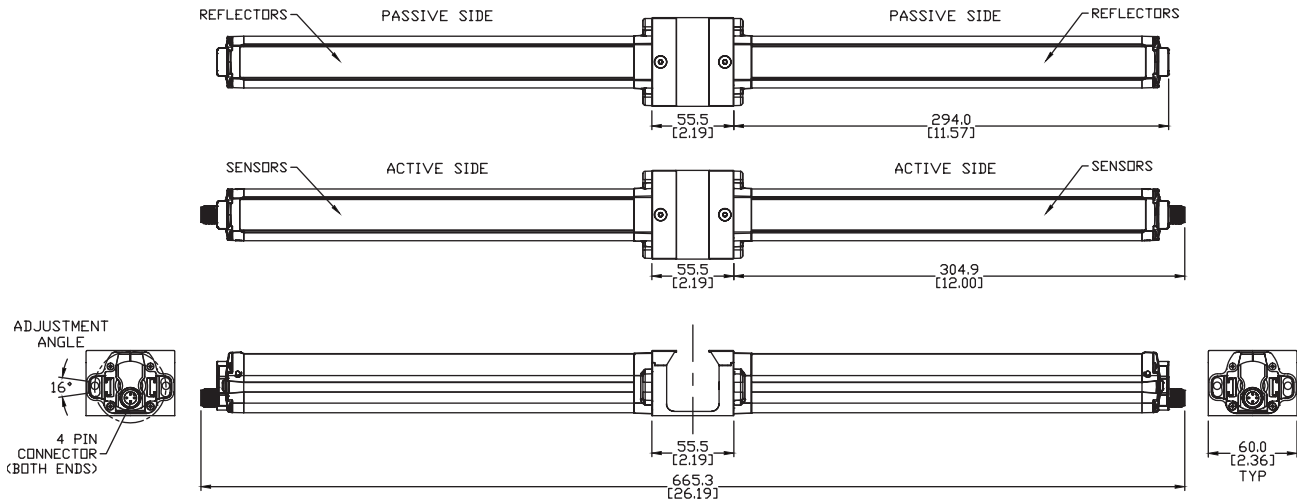
**Part No. SG-T-ARMS**

**\$580.00**

- Operating distance up to 3m
- Detectable objects down to 34.5 cm (13.6 in). (See manual for exact formulas.)



## Dimensions mm [in]



Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

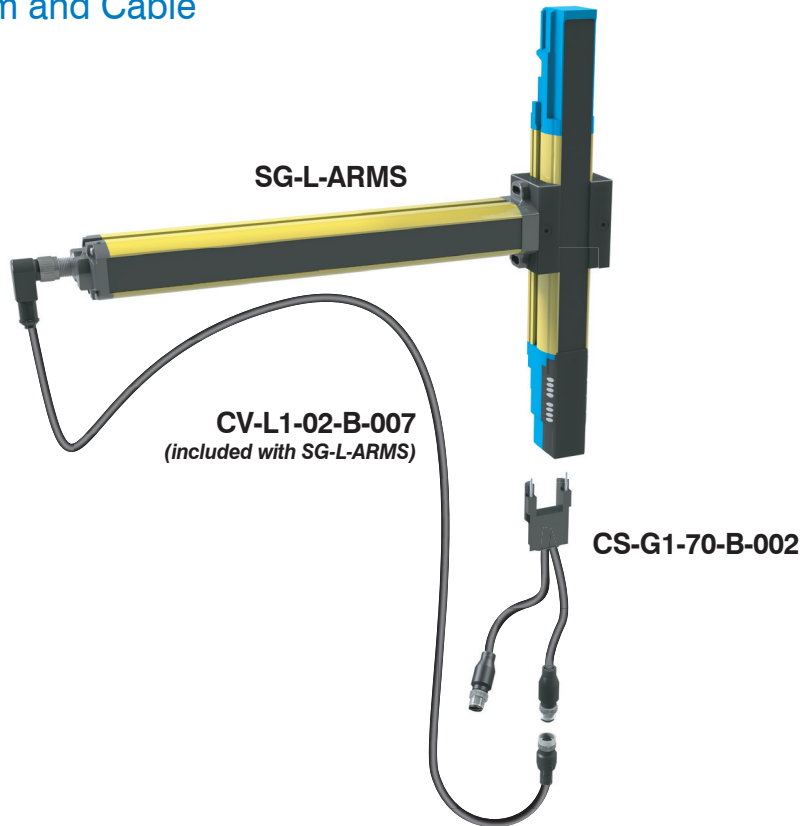
Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

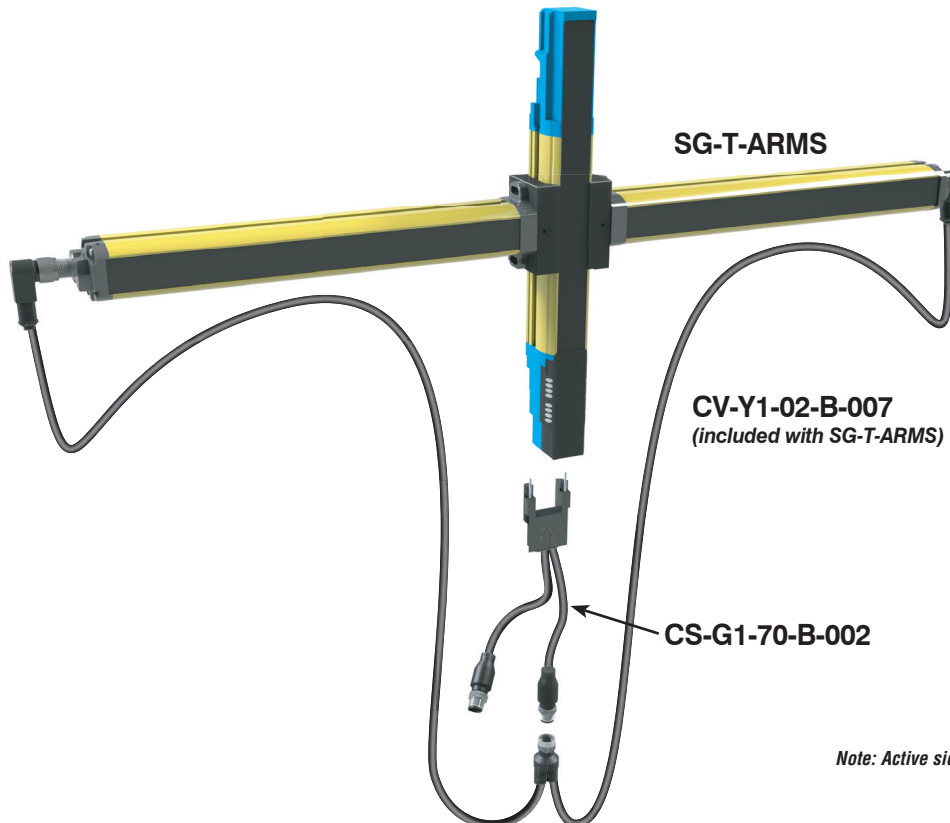
# Datalogic Safety Light Curtains – Advanced Series Accessories

## L-Muting Arm and Cable



*Note: Active side shown*

## T-Muting A



*Note: Active side shown*

# Datalogic Safety Light Curtains – Advanced Series Accessories

Safety Light Curtains Muting Arms and Cables		
Part Number	Price	Description
<b>SG-L-ARMS</b>	\$335.00	Muting arm pair, L-type, 4-pin M12 female quick-disconnect. For use with SG4 series (-P) light curtains.
<b>SG-T-ARMS</b>	\$580.00	Muting arm pair, T-type, 4-pin M12 female quick-disconnect. For use with SG4 series (-P) light curtains.
<b>CV-L1-02-B-007</b>	\$26.00	Datalogic cable, L-muting, PVC jacket, 0.5 m cable length, 5-pin M12 female quick-disconnect to 5-pin M12 female quick-disconnect
<b>CV-Y1-02-B-007</b>	\$30.00	Datalogic cable, T-muting, PVC jacket, 0.5 m cable length, 5-pin M12 female quick-disconnect to 5-pin M12 female quick-disconnect



**SG-L-ARMS**



**SG-T-ARMS**



**CV-L1-02-B-007**



**CV-Y1-02-B-007**

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Datalogic Safety Light Curtains – Advanced Series Accessories

## Communication Interface

SG4-DONGLE communication interface attaches to programmable Datalogic Safety Light Curtains and a PC through an Ethernet TCP/IP connection allowing remote monitoring and remote programming. Configuring, cloning, error logging and remote monitoring and programming are simplified through the free downloadable software.\*



*\*Note: To connect SG4-DONGLE directly to a PC, order Ethernet cable CAB-ETH-M01.*

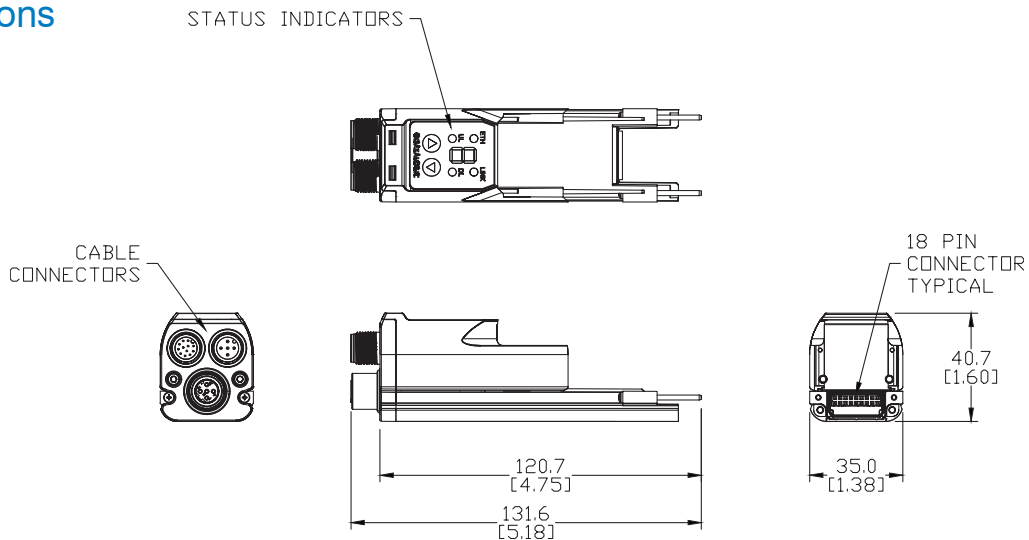
**Part No. SG4-DONGLE**

**\$120.00**

- Configuration cloning
- Ethernet TCP/IP connection
- Remote monitoring
- Remote programming using SG EXTENDED GUI software
- CE compliant



## Dimensions mm [in]





# Datalogic Safety Light Curtains – Advanced Series Accessories

## Communication Software

**SG-EXTENDED-GUI communication software is available for download free of charge at [www.automationdirect.com](http://www.automationdirect.com).**

Remote monitoring and programming are simplified through the software.\*

*\*Note: To connect directly to a PC, order Ethernet cable CAB-ETH-M01.*

**Part No. SG-EXTENDED-GUI**

**\$20.00**

**software CD**

- Remote monitoring
- Remote configuration
- Tested and verified with Windows XP, Windows 7 also runs on Vista and Windows 8

Datalogic Parameters		
Function	Parameters with BCM (Basic Configuration Mode): Without GUI	Parameters with ACM (Advanced Configuration Mode): With GUI
<b>OSSDs type</b>	only PNP	PNP / NPN
<b>Coding</b>	None / Code 1 / Code 2	None / Code 1 / Code 2
<b>Restart Mode</b>	Auto / Manual Restart	Auto / Manual Restart
<b>Override Restart</b>	Manual	Manual / Auto
<b>EDM</b>	Enable / Disable	Enable / Disable
<b>Range Reduction</b>	Long / Short	Long / Short
<b>Muting Type</b>	T-muting / L-muting	T-muting / L-muting For L-muting: T12 time interval selection, T12 multiplier selection
<b>Muting Timeout</b>	10 minute / infinite	Selectable length in steps of 1 minute from 10min to 1080 minutes
<b>Muting Filter</b>	None	ON (100ms) or OFF
<b>Muting Delay</b>	None	Selectable in steps of 100ms up to 1000ms
<b>Partial Muting</b>	None	Possible to define up to 5 zones each defined in position and dimension
<b>Override Mode</b>	Level / Edge	Level / Edge
<b>Override Timeout</b>	120 seconds	Selectable in steps of 1 minute from 1 to 256 minutes
<b>Fixed Blanking</b>	Two zones can be configured	5 zones can be configured, also with increased tolerance ( top or bottom)
<b>Floating Blanking</b>	1 or 2 beams floating blanking with partial surveillance selectable	**5 zones can be configured, total or partial surveillance without limit of number of beams
<b>Reduced Resolution</b>	4 beams	1 / 2 / 3 / 4 beams selectable
<b>**Note - Blocking the two beams on both ends at the same time is not permitted.</b>		

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZiPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

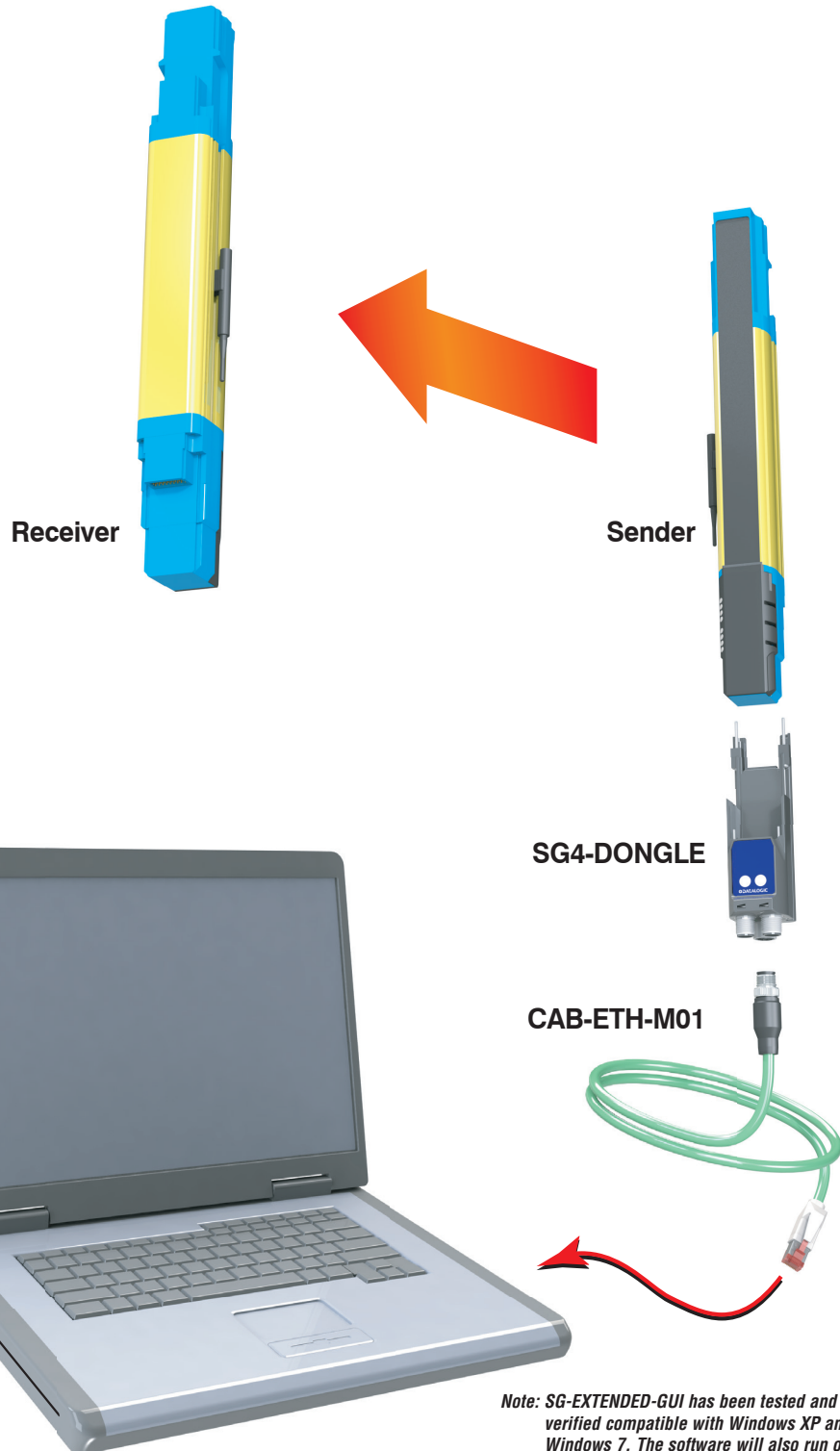
Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Datalogic Safety Light Curtains – Accessories

## Communication Interface



*Note: SG-EXTENDED-GUI has been tested and verified compatible with Windows XP and Windows 7. The software will also run on Vista and Windows 8, but hasn't been verified.*

# Datalogic Safety Light Curtains – Accessories

Safety Light Curtains Communication Interface and Cables		
Part Number	Price	Description
<b>SG4-DONGLE</b>	\$120.00	Programming dongle. Requires programming software included with SG4 (-P) light curtains.
<b>SG-EXTENDED-GUI</b>	\$20.00	Programming software for SG4 series (-P) on CD; software also available for free download from Automationdirect.com
<b>CAB-ETH-M01</b>	\$45.00	Datalogic cable, Ethernet, PVC jacket, 1m cable length, M12 4-pin male D-coded to RJ45
<b>CAB-ETH-M03</b>	\$55.00	Datalogic cable, Ethernet, PVC jacket, 3m cable length, M12 4-pin male D-coded to RJ45
<b>CAB-ETH-M05</b>	\$63.00	Datalogic cable, Ethernet, PVC jacket, 5m cable length, M12 4-pin male D-coded to RJ45



**SG4-DONGLE**



**CAB-ETH-M01**



**CAB-ETH-M03**



**CAB-ETH-M05**

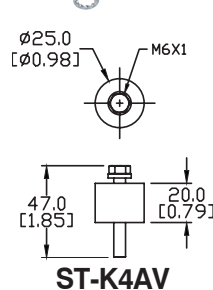
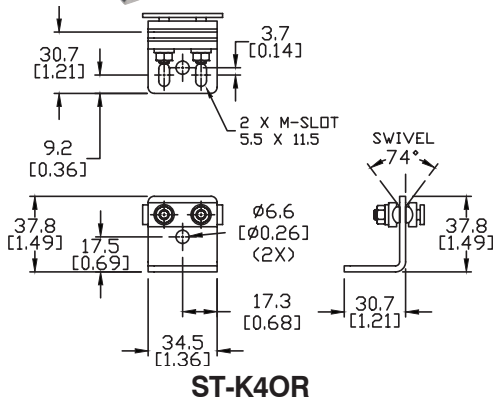
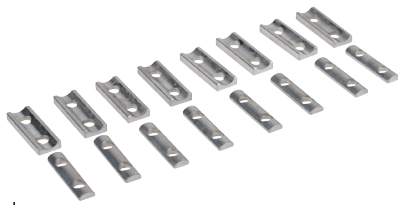
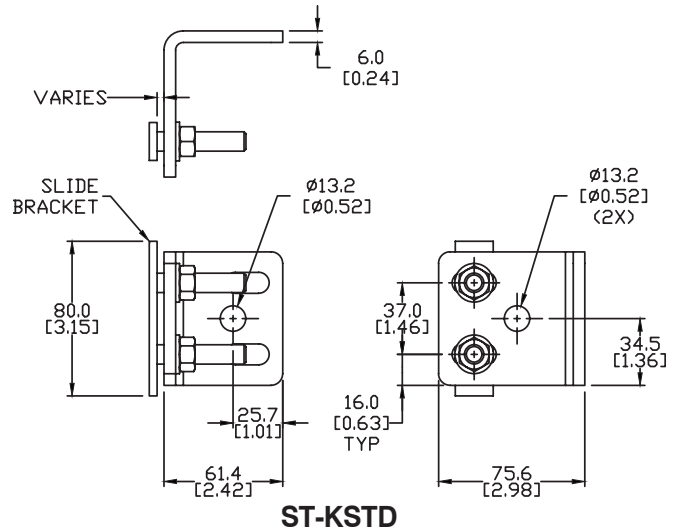
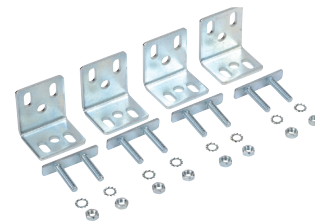
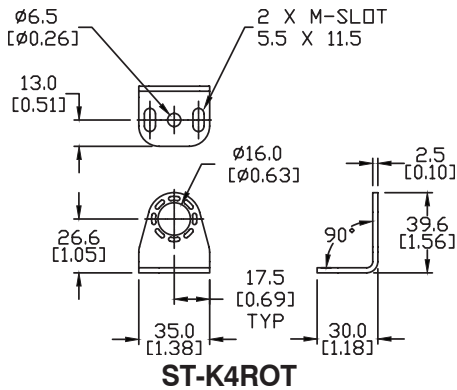
- Company Information
- Terminal Blocks
- Power Distribution Blocks
- Wiring Accessories
- ZIPLink Connection System
- Multi-wire Connectors
- Sensor Cables and Connectors
- M12 Junction Blocks
- Panel Interface Connectors
- Wiring Duct
- Cable Ties
- Wire
- Bulk Multi-conductor Cables
- Wire Management Products
- Power Supplies
- DC Converters
- Transformers and Filters
- Circuit Protection
- Tools
- Test Equipment
- Enclosures
- Enclosure Climate Control
- Safety: Electrical Components
- Safety: Protective Wear
- Terms and Conditions

# Datalogic Safety Light Curtains – Accessories

## Mounting Brackets

Datalogic Safety Light Curtains Mounting Accessories			
Part Number	Price	Description	Qty Per Package
ST-K4ROT	\$17.00	Mounting brackets, rotational, metal, package of 4. For use with SG4 base series (-E) light curtains.	4
ST-KSTD	\$8.50	Mounting brackets, standard, metal, replacement, package of 4. For use with all SG4 series light curtains.	4
ST-K4OR	\$40.00	Mounting brackets, lateral orientable, metal, package of 4. For use with all SG4 series light curtains.	4
ST-K4AV	\$17.00	Mounting brackets, anti-vibration, metal, package of 4. For use with all SG4 series light curtains.	4

## Dimensions mm [in]





# Datalogic Safety Light Curtains – Accessories

## Test Pieces

TP-14 and TP-30 test pieces are used to verify if the resolution of safety light curtains is maintained inside the entire detection field. TP-14 has a diameter of 14mm (0.55”) and TP-30 has a diameter of 30mm (1.18”). Both models have an overall length of 300mm (11.81”).

Safety Light Curtains Test Pieces		
Part Number	Price	Description
<b>TP-14</b>	\$20.00	Test rod for 14mm resolution finger detection light curtains, plastic, 14mm diameter
<b>TP-30</b>	\$22.00	Test rod for 30mm resolution hand detection light curtains, plastic, 30mm diameter



**TP-14**



**TP-30**

- Company Information
- Terminal Blocks
- Power Distribution Blocks
- Wiring Accessories
- ZIPLink Connection System
- Multi-wire Connectors
- Sensor Cables and Connectors
- M12 Junction Blocks
- Panel Interface Connectors
- Wiring Duct
- Cable Ties
- Wire
- Bulk Multi-conductor Cables
- Wire Management Products
- Power Supplies
- DC Converters
- Transformers and Filters
- Circuit Protection
- Tools
- Test Equipment
- Enclosures
- Enclosure Climate Control
- Safety: Electrical Components
- Safety: Protective Wear
- Terms and Conditions

# Get it fast AND with FREE shipping on orders over \$49.

Free standard 2-day (transit)\* shipping is available for orders over \$49, within the U.S. and Puerto Rico. We use our choice of carrier and a combination of ground and air services that allow us to reach any U.S. destination within 2 days transit time (or less). (Canadian orders use the same method, but may take longer based on destination.)

Orders placed by 6 p.m. EST will ship the same day (with approved company credit or credit card; LTL items require 5 p.m. order cutoff).

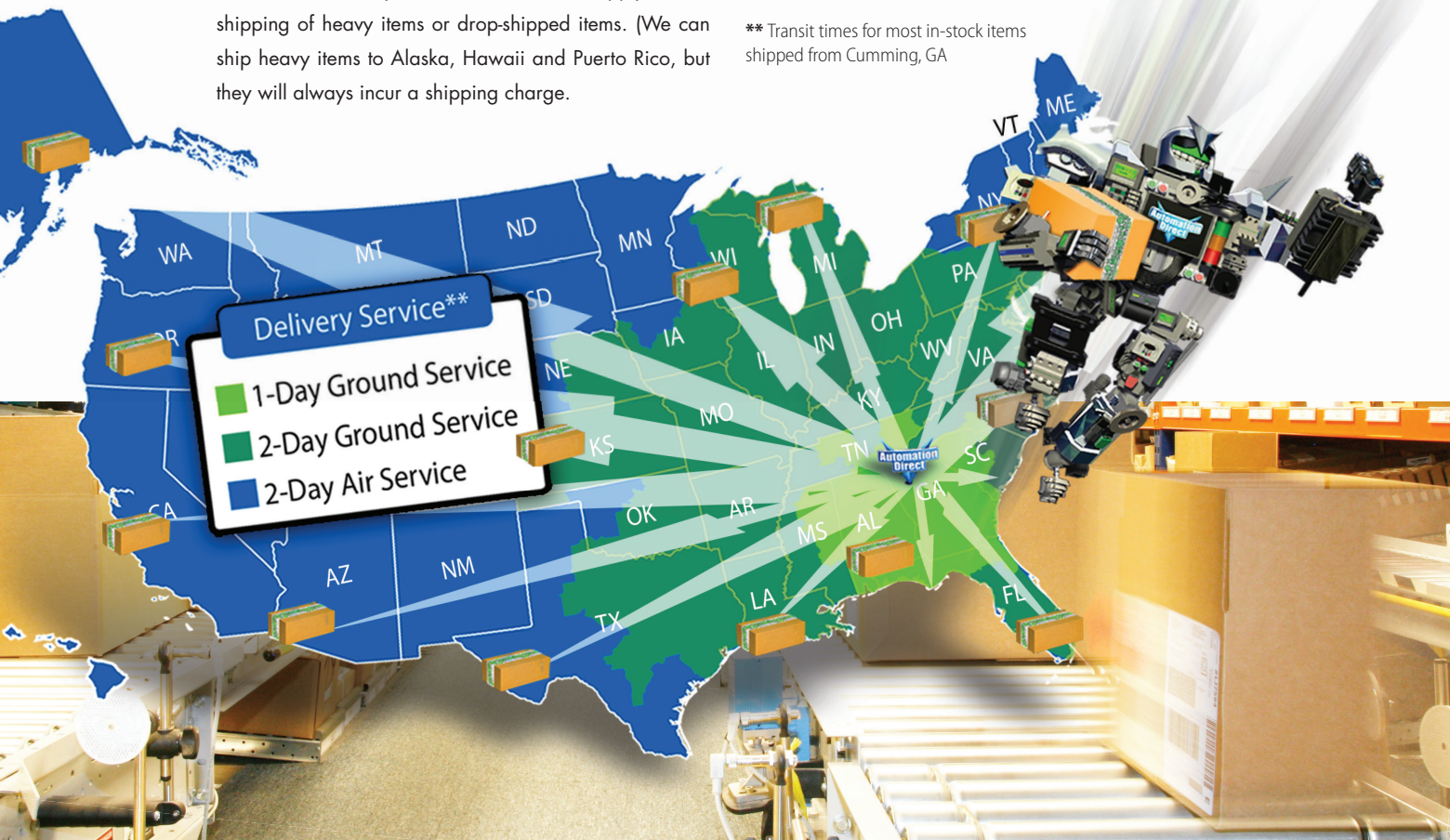
Note that the 2-day transit time does not apply for LTL shipping of heavy items or drop-shipped items. (We can ship heavy items to Alaska, Hawaii and Puerto Rico, but they will always incur a shipping charge.)

To determine if an item must ship LTL, check the part's shipping notes on our store Web site.)

For orders under \$49, a flat \$6 shipping charge is applied. Or, you may request that your order ship via the 2-day (transit) method; shipping charges will be added to invoice. For complete details on shipping methods and charges, see Terms and Conditions online on our Web site for the most up-to-date information.

**\*We do not guarantee delivery times of the carriers.**  
AutomationDirect is not responsible for carrier delays due to weather, mechanical failures or other issues.

\*\* Transit times for most in-stock items shipped from Cumming, GA



# Contrinex Safety Light Curtains Selection Guide



Specification	YBB-14x4 Series	YBB-30x4 Series	YCA-50x4 Series
<b>Description</b>	Finger Protection, 14mm resolution	Hand Protection, 30mm resolution	Access Control, 300, 400mm beam gap
<b>Protective Height</b>	142 to 1045mm (5.59 to 41.14 in)	279 to 1827mm (10.98 to 71.65 in)	832 to 1232mm (32.76 to 48.50 in)
<b>Safety Level</b>	Cat.4, PL <sub>e</sub> (EN/ISO 13849-1) Type 4 (IEC 61496-1/2)	Cat.4, PL <sub>e</sub> (EN/ISO 13849-1) Type 4 (IEC 61496-1/2)	Cat.4, PL <sub>e</sub> (EN/ISO 13849-1) Type 4 (IEC 61496-1/2)
<b>Operating Range</b>	0.25 to 3.5m (0.82 to 11.48 ft)	0.25 to 12m. (0.82 to 39.37 ft)	1.0 to 15m (3.3 to 39.37 ft) / 10 to 50m (32.8 to 164 ft)**
<b>Output State</b>	N.C.	N.C.	N.C.
<b>Logic Output</b>	Dual PNP outputs, short-circuit protected	Dual PNP outputs, short-circuit protected	Dual PNP outputs, short-circuit protected
<b>Connection Type</b>	M12 5-pole connector	M12 connector	M12 connector
<b>Supply Voltage</b>	24VDC ± 20%	24VDC ± 20%	24VDC ± 15%
<b>Rating</b>	IEC IP65, IP67 (EN60529)	IEC IP65, IP67 (EN60529)	IEC IP65, IP67 (EN60529)

**\*\*Configurable**



Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Contrinex Safety Light Curtains – Finger-safe



## Safety light curtain with 14mm resolution

- Available as a set, or order sender and receiver to make a complete sensor.
- Protective height from 142mm to 1045mm
- Operating distance up to 3.5 m
- M12 quick-disconnect (order cable separately)
- Dual PNP outputs
- Mounting brackets included with all units
- Instruction manual and testing rod included with sender unit
- IP65, IP67 rated
- Type 4 and Category 4 PLe

**YBB-14 Series Safety Light Curtain Selection Table**

Part Number		Price	Protective Height Hs mm[in]	Housing Height Hb mm[in]	Total Height Ht mm[in]	Number of Beams	Current Consumption [mA]	Response Time [ms]	MTTF <sub>d</sub> (years)	DC <sub>avg</sub>	Product Weight per Unit
<b>YBB-14S4-0150-G012</b>	<b>Sender</b>	\$287.00	142 [5.59]	221 [8.70]	251 [9.81]	17	50	5.2	142	96%	470g 1.04 lbs
<b>YBB-14R4-0150-G012</b>	<b>Receiver</b>	\$322.00					90				
<b>YBB-14K4-0150-G012</b>	<b>Set</b>	\$525.00					See above				
<b>YBB-14S4-0250-G012</b>	<b>Sender</b>	\$354.00	271 [10.67]	350 [13.78]	380 [23.94]	33	50	8.4	114	96%	740g 1.63 lbs
<b>YBB-14R4-0250-G012</b>	<b>Receiver</b>	\$406.00					95				
<b>YBB-14K4-0250-G012</b>	<b>Set</b>	\$655.00					See above				
<b>YBB-14S4-0400-G012</b>	<b>Sender</b>	\$420.00	400 [15.75]	479 [18.86]	509 [20.04]	49	50	11.6	96	95%	1000g 2.20 lbs
<b>YBB-14R4-0400-G012</b>	<b>Receiver</b>	\$488.00					100				
<b>YBB-14K4-0400-G012</b>	<b>Set</b>	\$785.00					See above				
<b>YBB-14S4-0500-G012</b>	<b>Sender</b>	\$487.00	529 [20.83]	608 [23.94]	638 [25.12]	65	50	14.8	83	95%	1270g 2.80 lbs
<b>YBB-14R4-0500-G012</b>	<b>Receiver</b>	\$577.00					110				
<b>YBB-14K4-0500-G012</b>	<b>Set</b>	\$915.00					See above				
<b>YBB-14S4-0700-G012</b>	<b>Sender</b>	\$553.00	658 [25.91]	737 [29.02]	767 [30.20]	81	50	18	73	95%	1540g 3.40 lbs
<b>YBB-14R4-0700-G012</b>	<b>Receiver</b>	\$662.00					115				
<b>YBB-14K4-0700-G012</b>	<b>Set</b>	\$1,050.00					See above				
<b>YBB-14S4-0800-G012</b>	<b>Sender</b>	\$620.00	787 [30.98]	866 [34.09]	896 [35.28]	97	50	21.2	65	94%	1800g 3.97 lbs
<b>YBB-14R4-0800-G012</b>	<b>Receiver</b>	\$753.00					120				
<b>YBB-14K4-0800-G012</b>	<b>Set</b>	\$1,180.00					See above				

Note: AutomationDirect does not recommend using these light curtains with any device other than our Safety Relay Light Curtain Controllers.

# Contrinex Safety Light Curtains – Finger-safe

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

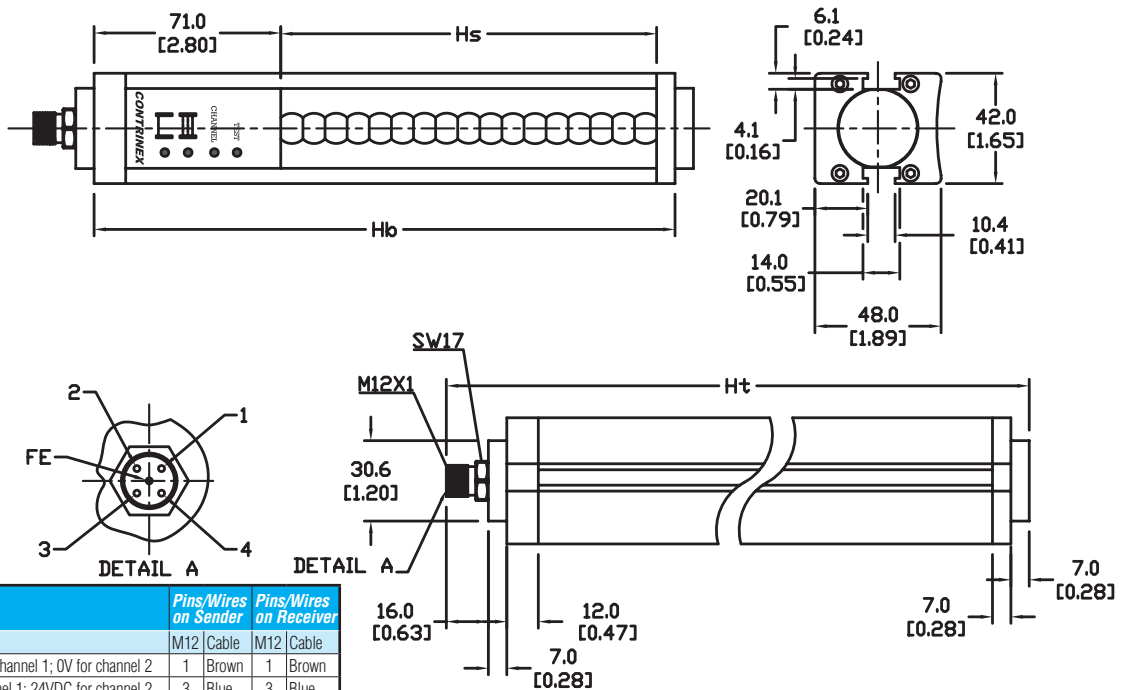
Safety: Protective Wear

Terms and Conditions

YBB-14 Series Safety Light Curtain Selection Table										
Part Number	Price	Protective Height Hs mm[in]	Housing Height Hb mm[in]	Total Height Ht mm[in]	Number of Beams	Current Consumption [mA]	Response Time [ms]	MTTF <sub>d</sub> (years)	DC <sub>avg</sub>	Product Weight per Unit
YBB-14S4-0900-G012	Sender	\$686.00	916 [36.06]	995 [39.17]	1025 [40.35]	113	24.4	59	94%	2070g 4.56 lbs
YBB-14R4-0900-G012	Receiver	\$837.00								
YBB-14K4-0900-G012	Set	\$1,310.00								
YBB-14S4-1000-G012	Sender	\$754.00	1045 [41.14]	1124 [44.25]	1154[45.43]	129	27.6	53	94%	2340g 5.16 lbs
YBB-14R4-1000-G012	Receiver	\$930.00								
YBB-14K4-1000-G012	Set	\$1,450.00								

Note: AutomationDirect does not recommend using these light curtains with any device other than our Safety Relay Light Curtain Controllers.

## Dimensions mm [in]



## Pin outs

Assignment	Function	Pins/Wires on Sender	Pins/Wires on Receiver
		M12 Cable	M12 Cable
Supply Voltage	24VDC for channel 1; 0V for channel 2	1 Brown	1 Brown
Supply Voltage	0V for channel 1; 24VDC for channel 2	3 Blue	3 Blue
Test Mode	0V test active; 24 V test inactive	4 Black	—
Output	OSSD1 (Output Single Switching Device)	—	2 White
Output	OSSD2 (Output Single Switching Device)	—	4 Black
Functional Earth	Shield (Ground)	FE Gray	FE Gray

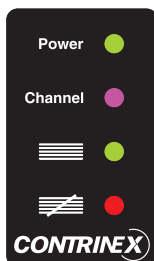
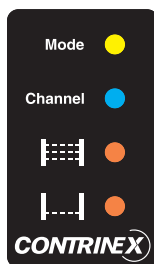
Note: Cable color represents standard industrial pinout. Confirm the specific color and pinout during installation.

# Contrinex Safety Light Curtains – Finger-safe

YBB-14 Series Safety Light Curtain Specifications	
<b>Resolution</b>	14mm
<b>Safety Level</b>	Category 4, PL <sub>e</sub> (EN/ISO 13849-1). Type 4 (IEC 61496-1/2)
<b>Beam Axis Interval</b>	8mm
<b>Supply Voltage</b>	24VDC ± 20%
<b>Current Consumption</b>	See Selection Table
<b>Outputs</b>	2 PNP outputs, short-circuit protected
<b>Output Current</b>	Maximum 0.2 amps per output (@ 50°C/122°F)
<b>Output Voltage ON minimum</b>	1.0 V less than the supplied operating voltage at 25°C (77°F)
<b>Output Voltage OFF</b>	<1.0 V
<b>Leakage Current</b>	< 1mA
<b>Maximum Load Inductance</b>	100mH
<b>Response Time</b>	See Selection Table
<b>Sender Wavelength</b>	IR 950nm
<b>Operating Range</b>	0.25 to 3.5 m
<b>Protection Class</b>	Class III (IEC 61140)
<b>Startup Delay</b>	< 0.5 seconds
<b>Vibration Resistance</b>	10 to 55Hz, 0.35 mm amplitude, 1 octave/min., 20 sweeps for each axis
<b>Shock Resistance</b>	10g during 16ms, 1000 times for each axis
<b>Light Immunity</b>	Incandescent lamp: 3000lx max. (light intensity on receiver surface) Xenon flash tube: flash duration 1.2 ms max. with a frequency of 2Hz max. (TS 61496-2)
<b>Operating Temperature</b>	0 to 50°C (32 to 122°F)
<b>Storage Temperature</b>	-25 to 70°C (-13 to 158°F)
<b>Humidity</b>	15 to 95% (non-condensing)
<b>Degree of Protection (EN 60529)</b>	IP65
<b>Ambient Brightness</b>	TS 61496-2
<b>Reference Standards</b>	IEC 61496-1: 2004, IEC 61496-2
<b>Housing Material</b>	Aluminum, PMMA (Polymethylmethacrylate [acrylic]) front screen
<b>Material of Upper and Lower Cover</b>	PA (Polyamide [nylon]) + 30% fiberglass
<b>Material of Optics</b>	PMMA (Polymethylmethacrylate [acrylic])
<b>Cable Runs</b>	10m maximum (at 10nF capacitive load)
<b>Approvals</b>	CE, UL file #E321951, RoHS, TUV

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page at [www.AutomationDirect.com](http://www.AutomationDirect.com)

## LED Status Indicators



Sender	
<b>LED</b>	<b>Finger &amp; hand protection (YBB)</b>
<b>Mode</b>	Yellow when test mode is active
<b>Channel</b>	Blue when channel 1 is selected Purple when channel 2 is selected
<b>Alignment</b>	Steady orange when the screen is not fully aligned Flashing orange when the first third of the screen is aligned Off when screen is fully aligned
<b>Alignment</b>	Steady orange when the lowest beam is not aligned Flashing orange when the lowest beam is aligned Off when screen is fully aligned

Receiver	
<b>LED</b>	<b>Finger &amp; hand protection (YBB)</b>
<b>Power</b>	Green when power is ON
<b>Channel</b>	Blue when channel 1 is selected Purple when channel 2 is selected
<b>Status</b>	Green when OSSD outputs are ON Red when OSSD outputs are OFF

# Contrinex Safety Light Curtains – Hand-safe



## Safety light curtain with 30 mm resolution

- Available as a set, or order sender and receiver to make a complete sensor
- Protective height from 279mm to 1827mm
- Operating distance up to 12m
- M12 quick-disconnect (order cable separately)
- Dual PNP outputs
- Mounting brackets included with all units
- Instruction manual and testing rod included with sender unit
- IP65, IP67 rated
- Type 4 and Category 4 PLe

**YBB-30 Series Safety Light Curtain Selection Table**

Part Number	Price	Protective Height Hs mm [in]	Housing Height Hb mm [in]	Total Height Ht mm [in]	Number of Beams	Current Consumption [mA]	Response Time [ms]	MTTF <sub>d</sub> (years)	DC <sub>avg</sub>	Product Weight per Unit
<b>YBB-30S4-0250-G012</b>	<b>Sender</b>	\$277.00	279 [10.98]	350 [13.78]	380 [23.94]	17	5.2	142	96%	750g 1.65 lbs
<b>YBB-30R4-0250-G012</b>	<b>Receiver</b>	\$305.00								
<b>YBB-30K4-0250-G012</b>	<b>Set</b>	\$485.00								
<b>YBB-30S4-0400-G012</b>	<b>Sender</b>	\$331.00	408 [16.06]	479 [18.86]	509 [20.04]	25	6.8	126	96%	1020g 2.25 lbs
<b>YBB-30R4-0400-G012</b>	<b>Receiver</b>	\$372.00								
<b>YBB-30K4-0400-G012</b>	<b>Set</b>	\$600.00								
<b>YBB-30S4-0500-G012</b>	<b>Sender</b>	\$383.00	537 [21.14]	608 [23.94]	638 [25.12]	33	8.4	114	96%	1300g 2.87 lbs
<b>YBB-30R4-0500-G012</b>	<b>Receiver</b>	\$426.00								
<b>YBB-30K4-0500-G012</b>	<b>Set</b>	\$695.00								
<b>YBB-30S4-0700-G012</b>	<b>Sender</b>	\$428.00	666 [26.22]	737 [29.02]	767 [30.20]	41	10	104	95%	1580g 3.48 lbs
<b>YBB-30R4-0700-G012</b>	<b>Receiver</b>	\$487.00								
<b>YBB-30K4-0700-G012</b>	<b>Set</b>	\$790.00								
<b>YBB-30S4-0800-G012</b>	<b>Sender</b>	\$476.00	795 [31.30]	866 [34.09]	896 [35.28]	49	11.6	96	95%	1850g 4.08 lbs
<b>YBB-30R4-0800-G012</b>	<b>Receiver</b>	\$542.00								
<b>YBB-30K4-0800-G012</b>	<b>Set</b>	\$880.00								
<b>YBB-30S4-0900-G012</b>	<b>Sender</b>	\$526.00	924 [36.38]	995 [39.17]	1025 [40.35]	57	13.2	89	95%	2130g 4.70 lbs
<b>YBB-30R4-0900-G012</b>	<b>Receiver</b>	\$605.00								
<b>YBB-30K4-0900-G012</b>	<b>Set</b>	\$975.00								
<b>YBB-30S4-1000-G012</b>	<b>Sender</b>	\$582.00	1053 [41.46]	1124 [44.25]	1154 [45.43]	65	14.8	83	95%	2400g 5.29 lbs
<b>YBB-30R4-1000-G012</b>	<b>Receiver</b>	\$664.00								
<b>YBB-30K4-1000-G012</b>	<b>Set</b>	\$1,075.00								

Note: AutomationDirect does not recommend using these light curtains with any device other than our Safety Relay Light Curtain Controllers.

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

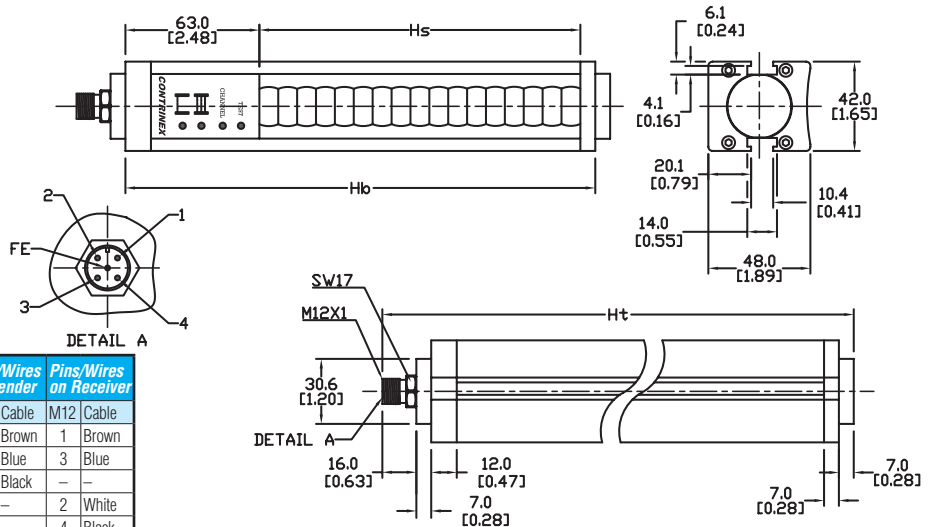
Terms and Conditions

# Contrinex Safety Light Curtains – Hand-safe

YBB-30 Series Safety Light Curtain Selection Table											
Part Number		Price	Protective Height Hs mm [in]	Housing Height Hb mm [in]	Total Height Ht mm [in]	Number of Beams	Current Consumption [mA]	Response Time [ms]	MTTF <sub>d</sub> (years)	DC <sub>avg</sub>	Product Weight per Unit
<b>YBB-30S4-1200-G012</b>	<b>Sender</b>	\$627.00	1182 [46.54]	1253 [49.33]	1283 [50.51]	73	45	16.4	77	95%	2680g 5.91 lbs
<b>YBB-30R4-1200-G012</b>	<b>Receiver</b>	\$727.00					110				
<b>YBB-30S4-1300-G012</b>	<b>Sender</b>	\$615.00	1311 [51.61]	1382 [54.41]	1412 [55.59]	81	45	18	73	95%	2960g 6.53 lbs
<b>YBB-30R4-1300-G012</b>	<b>Receiver</b>	\$715.00					110				
<b>YBB-30S4-1400-G012</b>	<b>Sender</b>	\$660.00	1440 [56.69]	1511 [59.49]	1541 [60.67]	89	45	19.6	69	95%	3230g 7.12 lbs
<b>YBB-30R4-1400-G012</b>	<b>Receiver</b>	\$773.00					115				
<b>YBB-30S4-1600-G012</b>	<b>Sender</b>	\$773.00	1569 [61.77]	1640 [64.57]	1670 [65.75]	97	45	21.2	65	94%	3510g 7.74 lbs
<b>YBB-30R4-1600-G012</b>	<b>Receiver</b>	\$908.00					120				
<b>YBB-30S4-1700-G012</b>	<b>Sender</b>	\$765.00	1698 [66.85]	1769 [69.65]	1799 [70.83]	105	45	22.8	62	94%	3780g 8.33 lbs
<b>YBB-30R4-1700-G012</b>	<b>Receiver</b>	\$886.00					125				
<b>YBB-30S4-1800-G012</b>	<b>Sender</b>	\$795.00	1827 [71.93]	1898 [74.72]	1928 [75.91]	113	45	24.4	59	94%	4060g 8.95 lbs
<b>YBB-30R4-1800-G012</b>	<b>Receiver</b>	\$942.00					130				

Note: AutomationDirect does not recommend using these light curtains with any device other than our Safety Relay Light Curtain Controllers.

## Dimensions mm [in]



## Pin outs

Assignment	Function	Pins/Wires on Sender		Pins/Wires on Receiver	
		M12	Cable	M12	Cable
Supply Voltage	24VDC for channel 1; 0V for channel 2	1	Brown	1	Brown
Supply Voltage	0V for channel 1; 24VDC for channel 2	3	Blue	3	Blue
Test Mode	0V test active; 24 V test inactive	4	Black	-	-
Output	OSSD1 (Output Single Switching Device)	-	-	2	White
Output	OSSD2 (Output Single Switching Device)	-	-	4	Black
Functional Earth	Shield (Ground)	FE	Gray	FE	Gray

Note: Cable color represents standard industrial pinout. Confirm the specific color and pinout during installation.



# Contrinex Safety Light Curtains – Hand-safe

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

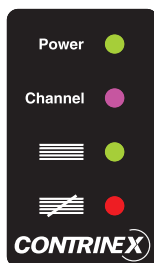
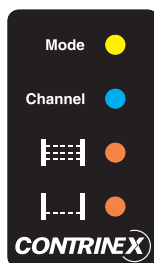
Safety: Protective Wear

Terms and Conditions

YBB-30 Series Safety Light Curtain Specifications	
<b>Resolution</b>	30mm
<b>Safety Level</b>	Category 4, PL <sub>e</sub> (EN/ISO 13849-1). Type 4 (IEC 61496-1/2)
<b>Beam Axis Interval</b>	16mm
<b>Supply Voltage</b>	24VDC ± 20%
<b>Current Consumption</b>	See Selection Table
<b>Outputs</b>	2 PNP outputs, short-circuit protected
<b>Output Current</b>	Maximum 0.2 amps per output (@ 50°C/122°F)
<b>Output Voltage ON minimum</b>	1.0 V less than the supplied operating voltage at 25°C (77°F)
<b>Output Voltage OFF</b>	<1.0 V
<b>Leakage Current</b>	< 1mA
<b>Maximum Load Inductance</b>	100mH
<b>Response Time</b>	See Selection Table
<b>Sender Wavelength</b>	IR 880nm
<b>Operating Range</b>	0.25 to 12m
<b>Protection Class</b>	Class III (IEC 61140)
<b>Startup Delay</b>	< 0.5 seconds
<b>Vibration Resistance</b>	10 to 55Hz, 0.35 mm amplitude, 1 octave/min., 20 sweeps for each axis
<b>Shock Resistance</b>	10g during 16ms, 1000 times for each axis
<b>Light Immunity</b>	Incandescent lamp: 3000lx max. (light intensity on receiver surface) Xenon flash tube: flash duration 1.2 ms max. with a frequency of 2Hz max. (TS 61496-2)
<b>Operating Temperature</b>	0 to 50°C (32 to 122°F)
<b>Storage Temperature</b>	-25 to 70°C (-13 to 158°F)
<b>Humidity</b>	15 to 95% (non-condensing)
<b>Degree of Protection (EN 60529)</b>	IP65
<b>Ambient Brightness</b>	TS 61496-2: 2006
<b>Reference Standards</b>	IEC 61496-1, IEC 61496-2
<b>Housing Material</b>	Aluminum, PMMA (Polymethylmethacrylate [acrylic]) front screen
<b>Material of Upper and Lower Cover</b>	PA (Polyamide [nylon])+ 30% fiberglass
<b>Material of Optics</b>	PMMA (Polymethylmethacrylate [acrylic])
<b>Cable Runs</b>	10m maximum (at 10nF capacitive load)
<b>Approvals</b>	CE, UL file #E321951, RoHS, TUV

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page at [www.AutomationDirect.com](http://www.AutomationDirect.com)

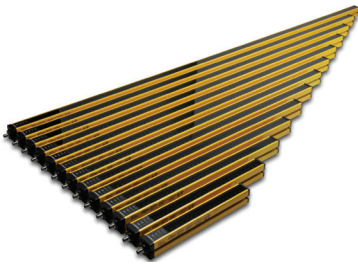
## LED Status Indicators



Sender	
<b>LED</b>	<b>Finger &amp; hand protection (YBB)</b>
<b>Mode</b>	Yellow when test mode is active
<b>Channel</b>	Blue when channel 1 is selected
	Purple when channel 2 is selected
<b>Alignment</b>	Steady orange when the screen is not fully aligned
	Flashing orange when the first third of the screen is aligned
	Off when screen is fully aligned
<b>Alignment</b>	Steady orange when the lowest beam is not aligned
	Flashing orange when the lowest beam is aligned
	Off when screen is fully aligned

Receiver	
<b>LED</b>	<b>Finger &amp; hand protection (YBB)</b>
<b>Power</b>	Green when power is ON
<b>Channel</b>	Blue when channel 1 is selected
	Purple when channel 2 is selected
<b>Status</b>	Green when OSSD outputs are ON
<b>Status</b>	Red when OSSD outputs are OFF

# Contrinex Safety Light Curtains – Access Control



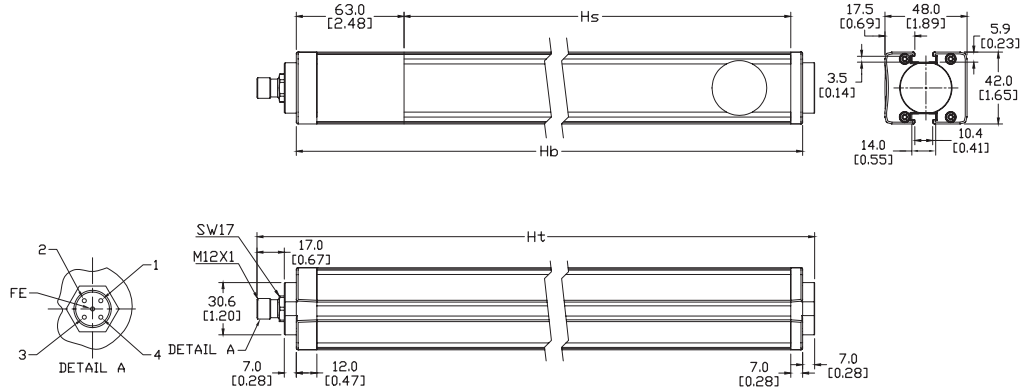
## Safety light curtain with 300 or 400mm beam gap

- Order sender and receiver to make a complete sensor.
- Protective height from 832mm to 1232mm
- Operating distance from 1 to 15m, 10 to 50m - configurable
- M12 quick-disconnect (order cable separately)
- Dual PNP outputs
- Mounting brackets included with all units.
- Instruction manual and testing rod included with sender unit.
- IP65, IP67 rated
- Type 4 and Category 4 PLe

YCA-50 Series Safety Light Curtain Selection Table												
Part Number	Price	Protective Height Hs mm [in]	Housing Height Hb mm [in]	Total Height Ht mm [in]	Number of Beams	Current Consumption [mA]	Response Time [ms]	MTTF <sub>d</sub> (years)	DC <sub>avg</sub>	Product Weight per Unit	Resolution	
<b>YCA-50S4-3400-G012</b> <i>Sender</i>	\$350.00	832 [32.76]	995 [39.17]	1025 [40.35]	3	35	4.2	112	97%	3039g 6.70 lbs	400	
<b>YCA-50R4-3400-G012</b> <i>Receiver</i>	\$415.00					75						
<b>YCA-50S4-4300-G012</b> <i>Sender</i>	\$380.00	932 [36.69]	1124 [44.25]	1154 [45.43]	4	35	5.0	105	97%	3221g 7.10 lbs	300	
<b>YCA-50R4-4300-G012</b> <i>Receiver</i>	\$450.00					75						
<b>YCA-50S4-4400-G012</b> <i>Sender</i>	\$410.00	1232 [48.50]	1382 [54.41]	1412 [55.59]	4	35	5.0	105	97%	3946g 8.70 lbs	400	
<b>YCA-50R4-4400-G012</b> <i>Receiver</i>	\$480.00					75						

Note: AutomationDirect does not recommend using these light curtains with any device other than our Safety Relay Light Curtain Controllers.

## Dimensions mm [in]



## Pin outs

Assignment	Function	Pins/Wires on Sender	Pins/Wires on Receiver
		M12 Cable	M12 Cable
Supply Voltage	24VDC for channel 1; 0V for channel 2	1 Brown	1 Brown
Supply Voltage	0V for channel 1; 24VDC for channel 2	3 Blue	3 Blue
Sensing Range Selection	24V: 1..15m 0V: 10..50m	2 White	–
Sensing Range Selection	24V: 10..50m 0V: 1..15m	4 Black	–
Output	OSSD1 (Output Single Switching Device)	–	2 White
Output	OSSD2 (Output Single Switching Device)	–	4 Black
Functional Earth	Shield (Ground)	FE Gray	FE Gray

Note: Cable color represents standard industrial pinout. Confirm the specific color and pinout during installation

# Contrinex Safety Light Curtains – Access Control

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

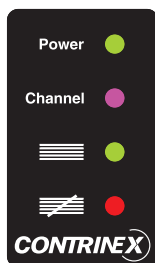
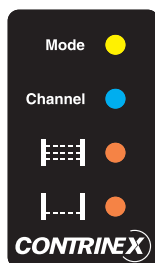
Safety: Protective Wear

Terms and Conditions

YCA-50 Series Safety Light Curtain Specifications	
<b>Beam Gap</b>	300 or 400mm
<b>Safety Level</b>	Category 4, PL e (EN/ISO 13849-1). Type 4 (IEC 61496-1/2)
<b>Supply Voltage</b>	24VDC ± 15%
<b>Current Consumption</b>	See Selection Table
<b>Outputs</b>	2 PNP outputs, short-circuit protected
<b>Output Current</b>	Maximum 0.2 amps per output (@ 50°C/122°F)
<b>Output Voltage ON minimum</b>	1.0 V less than the supplied operating voltage at 25°C (77°F)
<b>Output Voltage OFF</b>	<1.0 V
<b>Leakage Current</b>	< 1mA
<b>Maximum Load Inductance</b>	100mH
<b>Response Time</b>	See Selection Table
<b>Sender Wavelength</b>	IR 880nm
<b>Operating Range</b>	1 to 15m / 10 to 50m (configurable)
<b>Protection Class</b>	Class III (IEC 61140)
<b>Startup Delay</b>	< 0.5 seconds
<b>Vibration Resistance</b>	10 to 55Hz, 0.35 mm amplitude, 1 octave/min., 20 sweeps for each axis
<b>Shock Resistance</b>	10g during 16ms, 1000 times for each axis
<b>Light Immunity</b>	Incandescent lamp: 3000lx max. (light intensity on receiver surface) Xenon flash tube: flash duration 1.2 ms max. with a frequency of 2Hz max. (TS 61496)
<b>Operating Temperature</b>	0 to 50°C (32 to 122°F)
<b>Storage Temperature</b>	-25 to 70°C (-13 to 158°F)
<b>Humidity</b>	15 to 95% (non-condensing)
<b>Degree of Protection (EN 60529)</b>	IP65, IP67
<b>Ambient Brightness</b>	TS 61496-2
<b>Reference Standards</b>	IEC 61496-1, IEC 61496-2
<b>Housing Material</b>	Aluminum, PMMA (Polymethylmethacrylate [acrylic]) front screen
<b>Material of Upper and Lower Cover</b>	PA (Polyamide [nylon])+ 30% fiberglass
<b>Material of Optics</b>	PMMA (Polymethylmethacrylate [acrylic])
<b>Cable Runs</b>	10m maximum (at 10 nF capacitive load)
<b>Approvals</b>	CE, UL file #E321951, RoHS, TUV

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page at [www.AutomationDirect.com](http://www.AutomationDirect.com)

## LED Status Indicators



Sender	
<b>LED</b>	<b>Access protection (YCA)</b>
<b>Mode</b>	Off when maximum operating range 15m Blue when maximum operating range 50m Red or Purple in case of wiring error
<b>Channel</b>	Blue when channel 1 is selected Purple when channel 2 is selected
<b>Alignment</b>	Steady orange when the screen is not fully aligned Flashing orange when the first third of the screen is aligned Off when screen is fully aligned
<b>Alignment</b>	Steady orange when the lowest beam is not aligned Flashing orange when the lowest beam is aligned Off when screen is fully aligned

Receiver	
<b>LED</b>	<b>Access protection (YCA)</b>
<b>Power</b>	Green when power is ON
<b>Channel</b>	Blue when channel 1 is selected Purple when channel 2 is selected
<b>Status</b>	Green when OSSD outputs are ON
<b>Status</b>	Red when OSSD outputs are OFF

# Contrinex Safety Light Curtains Accessories

Safety Light Curtains Accessories Overview			
Part Number	Price	Description	Use With
<b>Mirror Columns</b>			
<b>YXC-1060-M11</b>	\$640.00	Safety light curtain mirror column. 1060mm housing height, 974mm mirror length aluminum profile with steel floor plates. Powder-varnished yellow (RAL1021) finish. Mounting hardware included.	YBB-xxxx-0150-xxx to YBB-xxxx-0800-xxx units
<b>YXC-1360-M11</b>	\$755.00	Safety light curtain mirror column. 1360mm housing height, 1274mm mirror length aluminum profile with steel floor plates. Powder-varnished yellow (RAL1021) finish. Mounting hardware included.	YBB-xxxx-0900-xxx to YBB-xxxx-1000-xxxx units YCA-xxxx-3400-xxx and YCA-xxxx-4300-xxx units
<b>YXC-1660-M11</b>	\$875.00	Safety light curtain mirror column. 1660mm housing height, 1574mm mirror length aluminum profile with steel floor plates. Powder-varnished yellow (RAL1021) finish. Mounting hardware included.	YBB-xxxx-1200-xxx to YBB-xxxx-1400-xxxx units YCA-xxxx-4400-xxx units
<b>YXC-1960-M11</b>	\$995.00	Safety light curtain mirror column. 1960mm housing height, 1874mm mirror length aluminum profile with steel floor plates. Powder-varnished yellow (RAL1021) finish. Mounting hardware included.	YBB-xxxx-1600-xxx to YBB-xxxx-1700-xxxx units
<b>YXC-1360-M23</b>	\$390.00	Safety light curtain mirror column. 1360mm housing height, 2 x 400 beam gap aluminum profile with steel floor plates. Powder-varnished yellow (RAL1021) finish. Mounting hardware included.	YCA-xxxx-3400-xxx units
<b>YXC-1360-M24</b>	\$465.00	Safety light curtain mirror column. 1360mm housing height, 3 x 300 beam gap aluminum profile with steel floor plates. Powder-varnished yellow (RAL1021) finish. Mounting hardware included.	YCA-xxxx-4300-xxx units
<b>Protective Columns</b>			
<b>YXC-1060-F00</b>	\$362.00	Safety light curtain protective column. 997mm housing height, aluminum profile with steel floor plates. Powder-varnished yellow (RAL1021) finish. Mounting hardware included. Two required to protect sender and receiver. 1/pk.	YBB-xxxx-0150-xxx to YBB-xxxx-0800-xxx units
<b>YXC-1360-F00</b>	\$400.00	Safety light curtain protective column. 1297mm housing height, aluminum profile with steel floor plates. Powder-varnished yellow (RAL1021) finish. Mounting hardware included. Two required to protect sender and receiver. 1/pk.	YBB-xxxx-0900-xxx to YBB-xxxx-1000-xxxx units YCA-xxxx-3400-xxxx to YCA-xxxx-4300-xxxx units
<b>YXC-1660-F00</b>	\$432.00	Safety light curtain protective column. 1597mm housing height, aluminum profile with steel floor plates. Powder-varnished yellow (RAL1021) finish. Mounting hardware included. Two required to protect sender and receiver. 1/pk.	YBB-xxxx-1200-xxx to YBB-xxxx-1400-xxxx units YCA-xxxx-4400-xxxx units
<b>YXC-1960-F00</b>	\$451.00	Safety light curtain protective column. 1897mm housing height, aluminum profile with steel floor plates. Powder-varnished yellow (RAL1021) finish. Mounting hardware included. Two required to protect sender and receiver. 1/pk.	YBB-xxxx-1600-xxx to YBB-xxxx-1800-xxxx units
<b>Other</b>			
<b>YXL-0001-000</b>	\$240.00	Laser alignment tool for safety light curtains, class 2 laser, range up to 50 meters, useable and clippable to YBB and YCA light curtains models, 2 AAA batteries included.	All
<b>YXW-0001-000</b>	\$6.00	Safety light curtain mounting brackets for top and bottom mounting. Plastic. 2/pk.	
<b>YXW-0003-000</b>	\$6.00	Safety light curtain sliding T-nuts for side mounting. Metal. 2/pk. Ideal torque from M5x0.8 thread is 6 Nm (4.42 lb-ft, 53.1 lb-in.).	



**Light Curtain Mirror Columns**

- Multi-sided safe guarding of danger zones
- Robust protective profile
- 10% reduction of operating distance for mirror

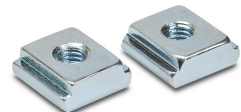


**Light Curtain Protective Column**

- Automatically bounces back after physical shock or vibration.
- Robust baseplate allows radial and vertical alignment.
- Solid aluminum profile



**YXW-0001-000**



**YXW-0003-000**

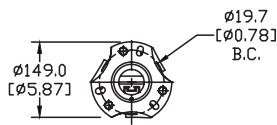
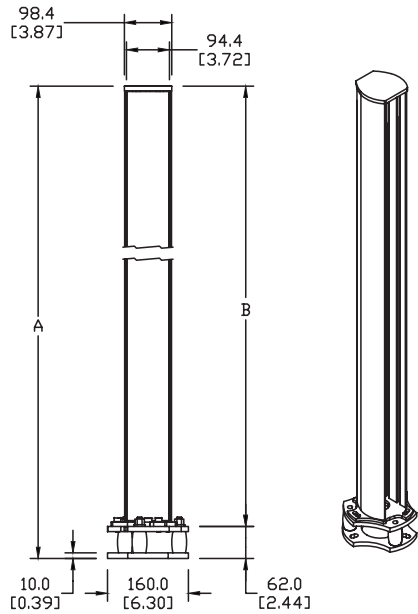


**YXL-0001-000**

# Contrinex Safety Light Curtains Accessories

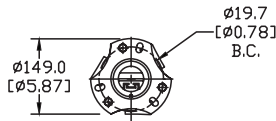
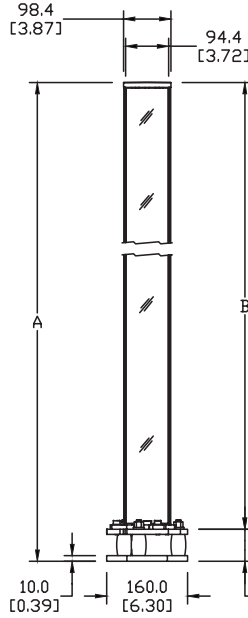
Dimensions mm [in]

## Protective column

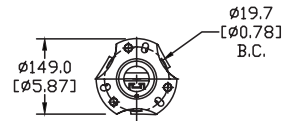
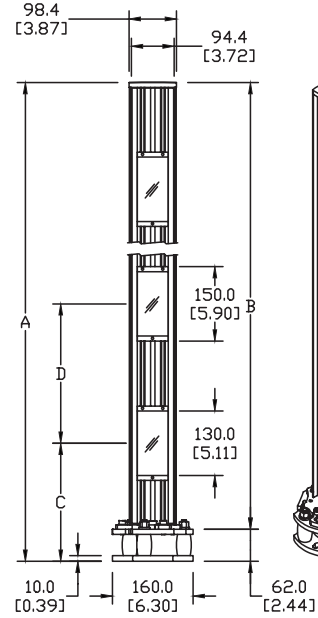


## Mirror column

CONTINUOUS MIRROR



SEGMENTED MIRRORS



### Safety Light Curtains Protective Columns Dimensions

Part Number	Total Height A mm [in]	Housing Height B mm [in]
YXC-1060-F00	1060 [41.73]	997 [39.25]
YXC-1360-F00	1360 [53.54]	1297 [51.06]
YXC-1660-F00	1660 [65.35]	1597 [62.87]
YXC-1960-F00	1960 [77.17]	1897 [74.69]

Note: Full and open top caps are provided to accommodate taller units.

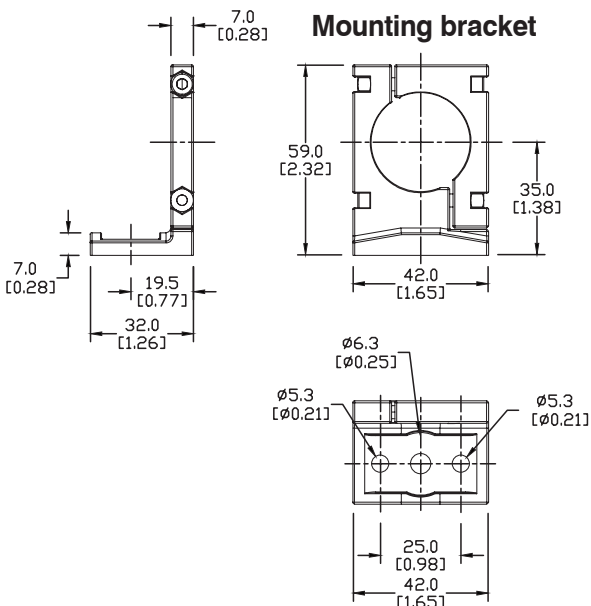
## YXC-xxxx-M11

## YXC-1360-Mxx

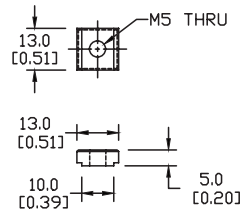
### Safety Light Curtains Mirror Columns Dimensions

Part Number	Total Height A mm [in]	Mirror Height B mm [in]	Height to Lowest Beam C mm [in]	Beam Gap D mm [in]
YXC-1060-M11	1060 [41.73]	974 [38.35]	n/a	n/a
YXC-1360-M11	1360 [53.54]	1274 [50.16]	n/a	n/a
YXC-1660-M11	1660 [65.35]	1574 [61.97]	n/a	n/a
YXC-1960-M11	1960 [77.17]	1874 [73.78]	n/a	n/a
YXC-1360-M23	1360 [53.54]	n/a	2 x 400 [2 x 15.75]	300 [11.81]
YXC-1360-M24	1360 [53.54]	n/a	3 x 300 [2 x 11.81]	300 [11.81]

## Mounting bracket



## T-Nuts for side mounting



# Contrinex Safety Light Curtains Accessories

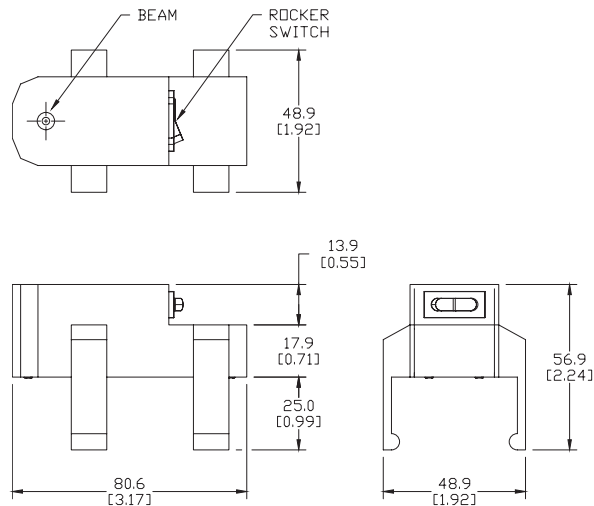


## Laser Alignment Tool

- Clips on YBB and YCA Curtains / Barriers
- High quality lens for narrow output beam
- Up to 50m [164ft] range
- <1mW output power
- Standard AA batteries included

Laser Alignment Tool YXL-0001-000 Specifications	
Supply Voltage Range	2.5 – 3.3 VDC
Laser Module Optical Output Power	<1mW (Class 2)
Range	50m (164ft)
Ambient Temperature Range	0 – 40°C (32 – 104°F)
Storage Temperature Range	0 – 60°C (32 – 140°F)
Wavelength	655nm ± 1%
Laser Beam Spot Size at 10m	< 10mm
Divergence Angle	1.1 mrad
Housing Material	PA with 30% fiberglass
Mounting	clippable onto YBB / YCA devices
Weight	95g (.21 lbs)

## Dimensions mm [in]



**Warning: Safety products sold by AutomationDirect are Safety components only.**

**The purchaser/installer is solely responsible for the application of these components and ensuring all necessary steps have been taken to assure each application and use meets all performance and applicable safety requirements and/or local, national and/or international safety codes as required by the application. AutomationDirect cannot certify that our products used solely or in conjunction with other AutomationDirect or other vendors' products will assure safety for any application.**

**Any person using or applying any products sold by AutomationDirect is responsible for learning the safety requirements for their individual application and applying them, and therefore assumes all risks, and accepts full and complete responsibility for the selection and suitability of the product for their respective application. AutomationDirect does not provide design or consulting services, and cannot advise whether any specific application or use of our products would ensure compliance with the safety requirements for any application.**

# Get it fast AND with FREE shipping on orders over \$49.

Free standard 2-day (transit)\* shipping is available for orders over \$49, within the U.S. and Puerto Rico. We use our choice of carrier and a combination of ground and air services that allow us to reach any U.S. destination within 2 days transit time (or less). (Canadian orders use the same method, but may take longer based on destination.)

Orders placed by 6 p.m. EST will ship the same day (with approved company credit or credit card; LTL items require 5 p.m. order cutoff).

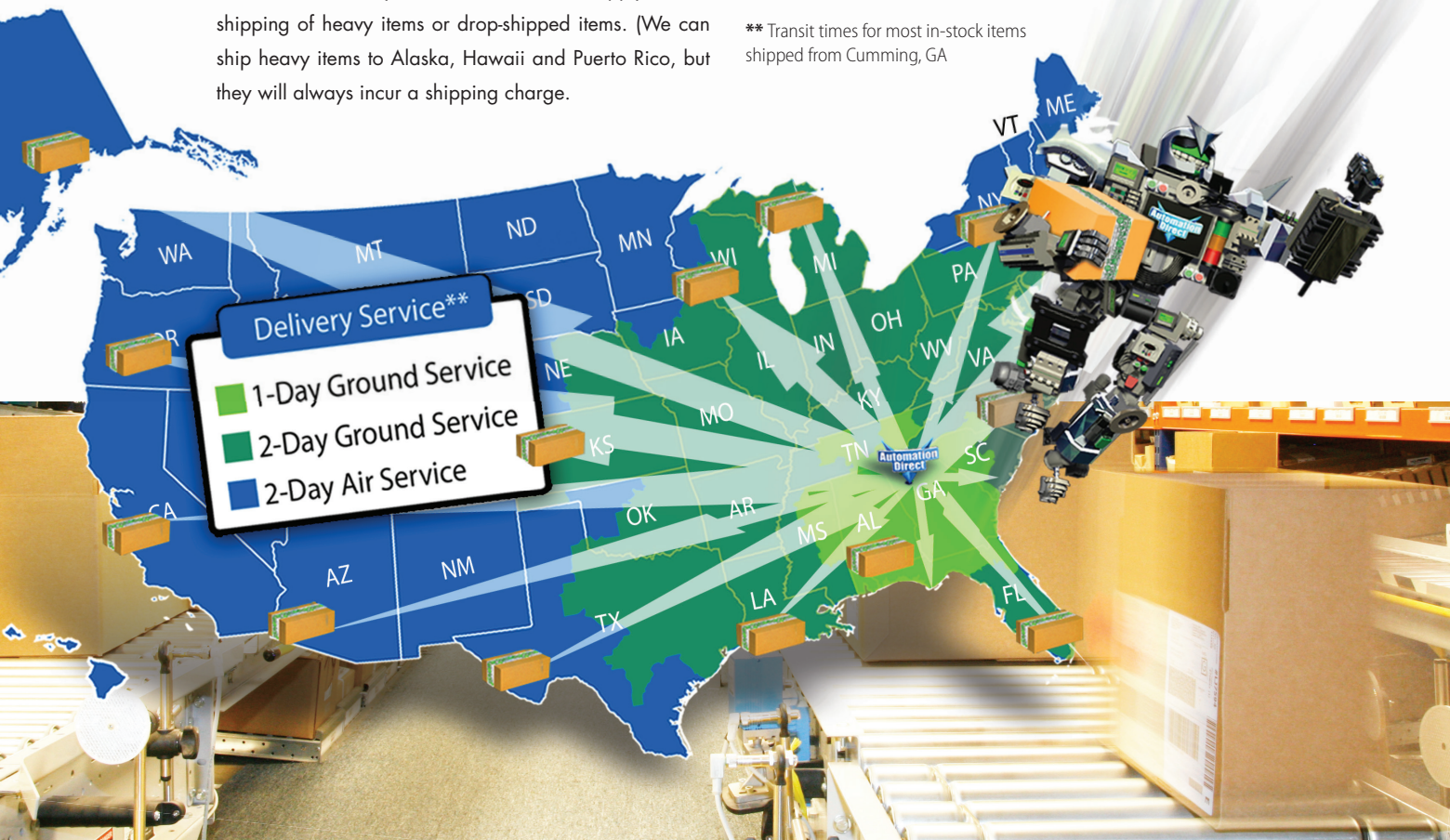
Note that the 2-day transit time does not apply for LTL shipping of heavy items or drop-shipped items. (We can ship heavy items to Alaska, Hawaii and Puerto Rico, but they will always incur a shipping charge.)

To determine if an item must ship LTL, check the part's shipping notes on our store Web site.)

For orders under \$49, a flat \$6 shipping charge is applied. Or, you may request that your order ship via the 2-day (transit) method; shipping charges will be added to invoice. For complete details on shipping methods and charges, see Terms and Conditions online on our Web site for the most up-to-date information.

**\*We do not guarantee delivery times of the carriers.** AutomationDirect is not responsible for carrier delays due to weather, mechanical failures or other issues.

\*\* Transit times for most in-stock items shipped from Cumming, GA



# IDEM Non-Contact RFID Locking Safety Switches

## MGL Series – Stainless Steel Housing



- Heavy duty or medium duty holding force models available
- Master coded or uniquely coded actuation
- RFID provides a high degree of anti-tamper, virtually impossible to override
- Flexible actuator for a high degree of misalignment tolerance.
- Able to connect to most popular safety relays to achieve up to PLe and Cat.4 for ISO3849-1
- Ability to connect up to 20 switches and E-stops in series
- IP69K rating for food processing applications
- Choice of 8-wire cable or M12 quick connect (purchase cables separately for the M12 QC)
- Remanence magnetization acts as a light magnetic latch after unlocking.
- (2) N.C. (door closed - lock energized) Safety outputs, overload protected
- (1) N.O. Auxiliary output for indication of door open
- Includes both switch and actuator

IDEM Non-Contact RFID Locking Switch Sets - Stainless Steel									
Part Number	Price	Body Material	Weight (lbs)	Holding Force	Operating Voltage	Operating Current	Coding	Connection Type	Dimensions
<b>Heavy Duty Holding Force</b>									
<b>MGL-1SS-U-462001</b>	\$433.00	316 stainless steel	5.73	1200N (269.8 lbf)	24VDC ± 10%	Nominal ≈ 50mA  Locked ≈ 500mA	Uniquely Coded	5-meter (16.48 ft.) cable	Figure 1
<b>MGL-1SS-U-462002</b>	\$445.00		6.32					10-meter (32.8 ft.) cable	
<b>MGL-1SS-U-462003</b>	\$450.00		5.20					8-pin M12 quick-disconnect	
<b>MGL-1SS-M-462004</b>	\$433.00		5.73					5-meter (16.48 ft.) cable	
<b>MGL-1SS-M-462005</b>	\$445.00		6.32					10-meter (32.8 ft.) cable	
<b>MGL-1SS-M-462006</b>	\$450.00		5.20					8-pin M12 quick-disconnect	
<b>Medium Duty Holding Force</b>									
<b>MGL-2SS-U-460001</b>	\$363.00	316 stainless steel	3.84	600N (134.9 lbf)	24VDC ± 10%	Nominal ≈ 50mA  Locked ≈ 500mA	Uniquely Coded	5-meter (16.48 ft.) cable	Figure 2
<b>MGL-2SS-U-460002</b>	\$375.00		4.42					10-meter (32.8 ft.) cable	
<b>MGL-2SS-U-460003</b>	\$380.00		3.31					8-pin M12 quick-disconnect	
<b>MGL-2SS-M-460004</b>	\$363.00		3.84					5-meter (16.48 ft.) cable	
<b>MGL-2SS-M-460005</b>	\$375.00		4.42					10-meter (32.8 ft.) cable	
<b>MGL-2SS-M-460006</b>	\$380.00		3.31					8-pin M12 quick-disconnect	

IDEM Non-Contact RFID Locking Switches Replacement Actuators - Stainless Steel						
Part Number	Price	Body Material	Weight (lbs)	Holding Force	Coding	Dimensions
<b>MGL-1SS-M-462102*</b>	\$81.00	316 stainless steel	1.87	1200N (269.8 lbf) - Heavy Duty	Master Coded	Figure 1
<b>MGL-2SS-M-460102*</b>	\$66.00		1.21	600N (134.9 lbf) - Medium Duty		Figure 2

\* For use with Stainless Steel Master Coded models only



# IDEM Non-Contact RFID Locking Safety Switches

Dimensions mm[in]

Figure 1

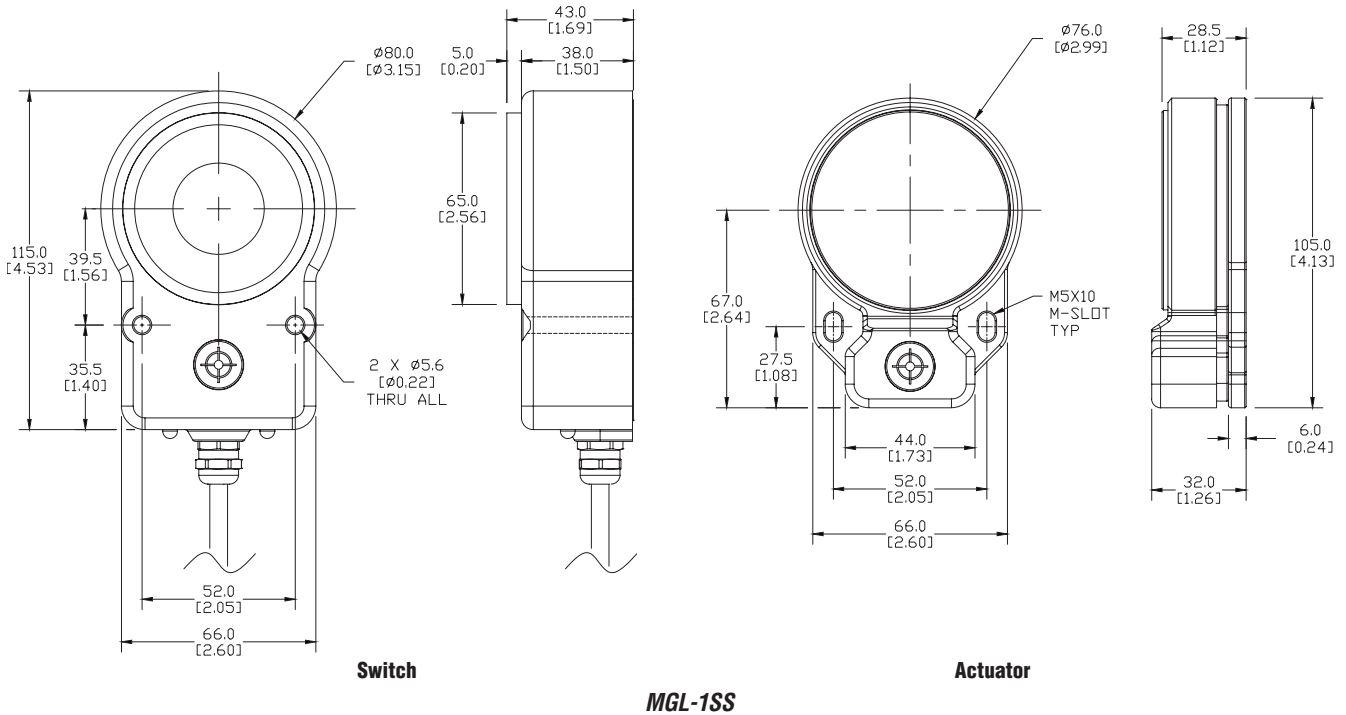
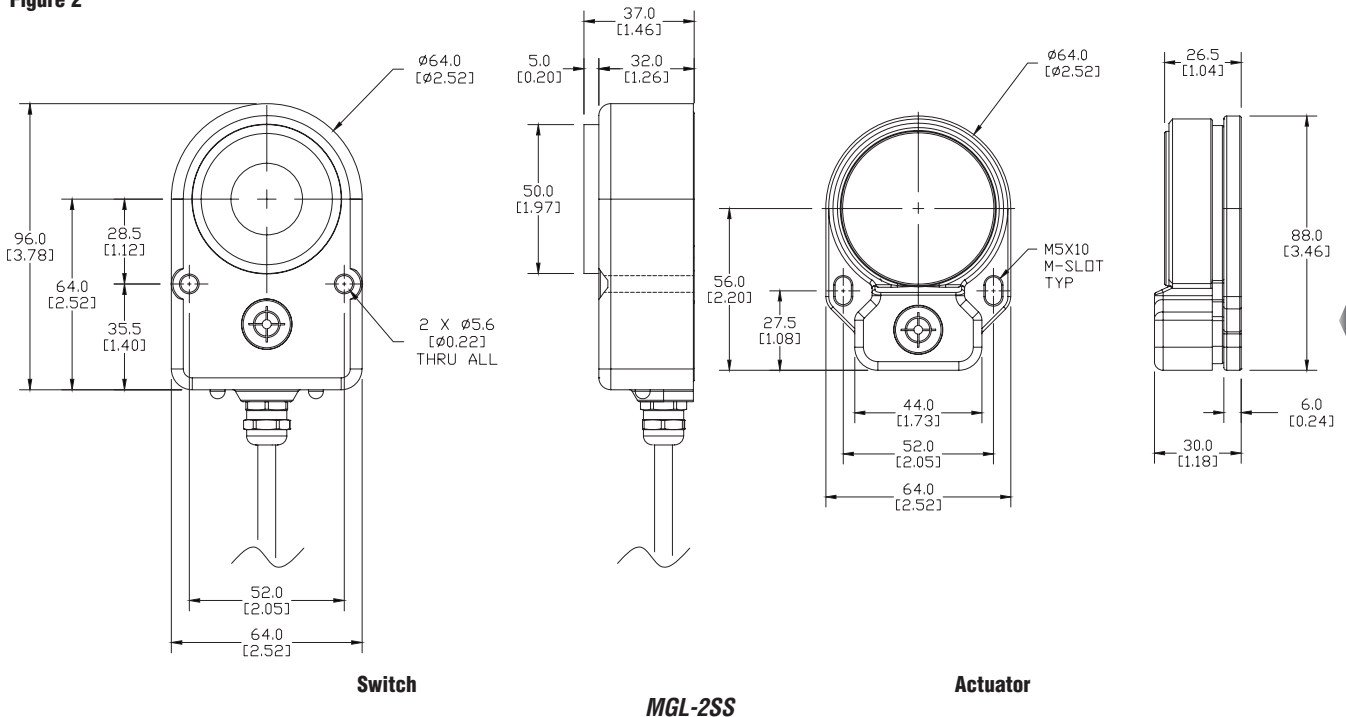


Figure 2



Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# IDEM Non-Contact RFID Locking Safety Switches

## MGL Series – Die Cast Metal Housing



- Heavy duty or medium duty holding force models available
- Master coded or uniquely coded actuation
- RFID provides a high degree of anti-tamper, virtually impossible to override
- Flexible actuator for a high degree of misalignment tolerance.
- Able to connect to most popular safety relays to achieve up to PLe and Cat.4 for ISO3849-1
- Ability to connect up to 20 switches and E-stops in series
- Choice of 8-wire cable or M12 quick connect (purchase cables separately for the M12 QC)
- Remanence magnetization acts as a light magnetic latch after unlocking.
- (2) N.C. (door closed - lock energized) Safety outputs, overload protected
- (1) N.O. Auxiliary output for indication of door open
- Includes both switch and actuator

IDEM Non-Contact RFID Locking Switch Sets - Die Cast Metal									
Part Number	Price	Body Material	Weight (lbs)	Holding Force	Operating Voltage	Operating Current	Coding	Connection Type	Dimensions
<b>Heavy Duty Holding Force</b>									
MGL-1M-U-464001	\$356.00	Die cast metal	4.68	1500N (337.2 lbf)	24VDC ± 10%	Nominal ≈ 50mA	Uniquely Coded	5-meter (16.48 ft.) cable	Figure 3
MGL-1M-U-464002	\$367.00		5.27					10-meter (32.8 ft.) cable	
MGL-1M-U-464003	\$372.00		4.17					8-pin M12 quick-disconnect	
MGL-1M-M-464004	\$356.00		4.68				Master Coded	5-meter (16.48 ft.) cable	
MGL-1M-M-464005	\$367.00		5.27					10-meter (32.8 ft.) cable	
MGL-1M-M-464006	\$372.00		4.17					8-pin M12 quick-disconnect	
<b>Medium Duty Holding Force</b>									
MGL-2M-U-465001	\$292.00	Die cast metal	3.06	1000N (224.8 lbf)	24VDC ± 10%	Nominal ≈ 50mA	Uniquely Coded	5-meter (16.48 ft.) cable	Figure 4
MGL-2M-U-465002	\$303.00		3.65					10-meter (32.8 ft.) cable	
MGL-2M-U-465003	\$307.00		2.54					8-pin M12 quick-disconnect	
MGL-2M-M-465004	\$292.00		3.06				Master Coded	5-meter (16.48 ft.) cable	
MGL-2M-M-465005	\$303.00		3.65					10-meter (32.8 ft.) cable	
MGL-2M-M-465006	\$307.00		2.54					8-pin M12 quick-disconnect	

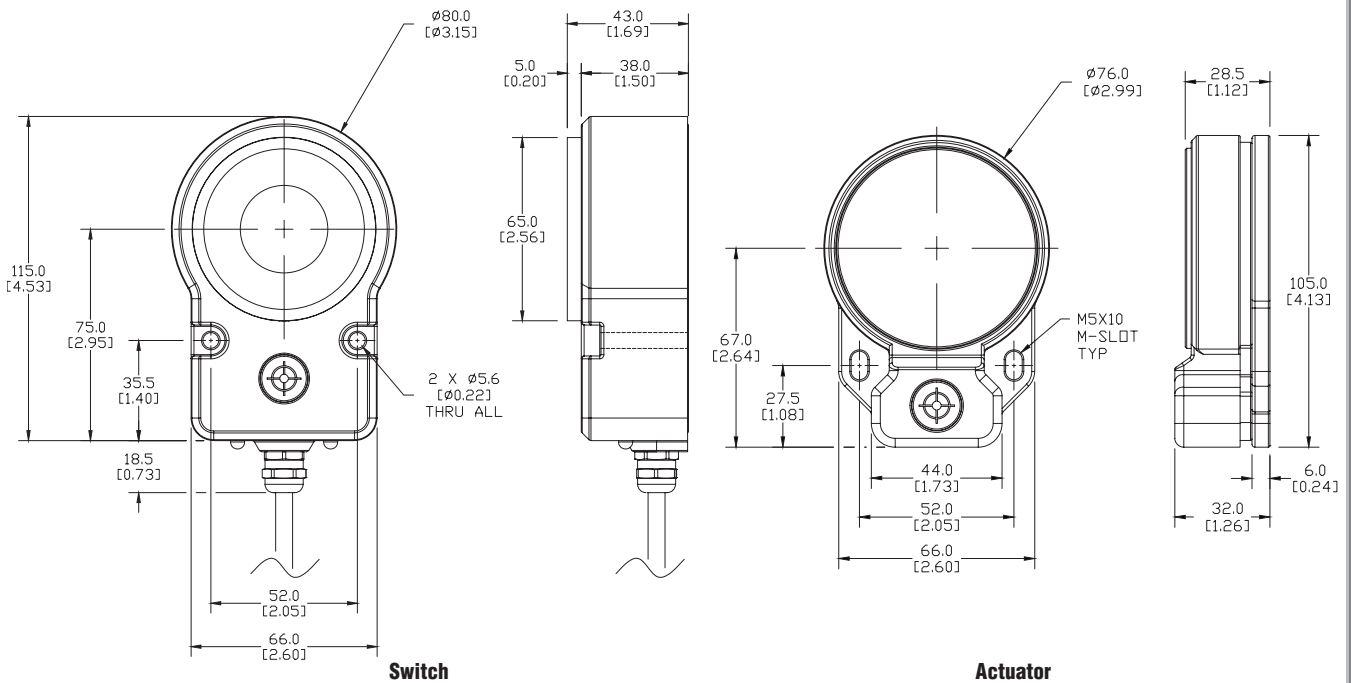
IDEM Non-Contact RFID Locking Switches Replacement Actuators - Die Cast Metal						
Part Number	Price	Body Material	Weight (lbs)	Holding Force	Coding	Dimensions
MGL-1M-M-464102*	\$73.00	Die cast metal	1.54	1500N (337.2 lbf) - Heavy Duty	Master Coded	Figure 3
MGL-2M-M-465102*	\$61.00		0.99	1000N (224.8 lbf) - Medium Duty		Figure 4

\* For use with Die Cast Metal Master Coded models only

# IDEM Non-Contact RFID Locking Safety Switches

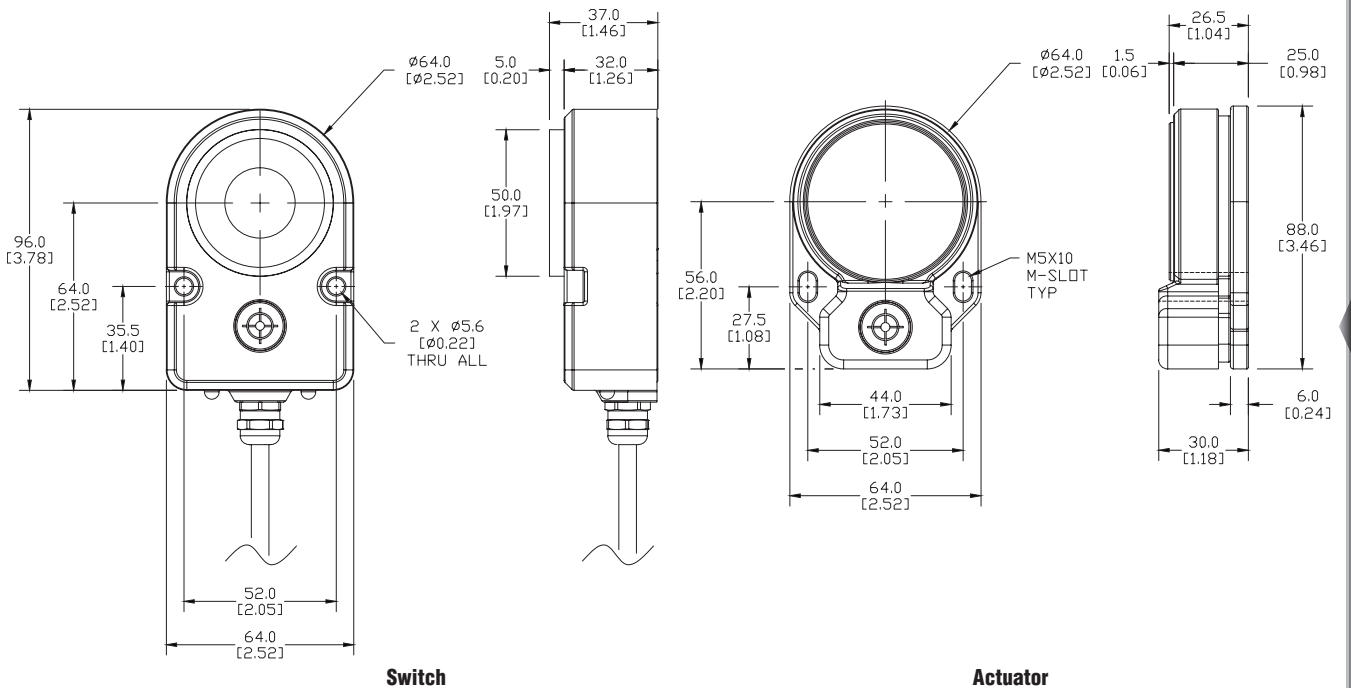
## Dimensions mm[in]

Figure 3



MGL-1M

Figure 4



MGL-2M

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# IDEM Non-Contact RFID Locking Safety Switches

## MGL Series – Plastic Housing



- Heavy duty or medium duty holding force models available
- Master coded or uniquely coded actuation
- RFID provides a high degree of anti-tamper, virtually impossible to override
- Flexible actuator for a high degree of misalignment tolerance.
- Able to connect to most popular safety relays to achieve up to PLe and Cat.4 for ISO3849-1
- Ability to connect up to 20 switches and E-stops in series
- Choice of 8-wire cable or M12 quick connect (purchase cables separately for the M12 QC)
- Remanence magnetization acts as a light magnetic latch after unlocking.
- (2) N.C. (door closed - lock energized) Safety outputs, overload protected
- (1) N.O. Auxiliary output for indication of door open
- Includes both switch and actuator

IDEM Non-Contact RFID Locking Switch Sets - Plastic									
Part Number	Price	Body Material**	Weight (lbs)	Holding Force	Operating Voltage	Operating Current	Coding	Connection Type	Dimensions
<b>Heavy Duty Holding Force</b>									
<b>MGL-1P-U-463001</b>	\$338.00	High Specification Polyester Plastic	4.35	1500N (337.2 lbf)	24VDC ± 10%	Nominal ≈ 50mA  Locked ≈ 500mA	Uniquely Coded	5-meter (16.48 ft.) cable	Figure 5
<b>MGL-1P-U-463002</b>	\$350.00		4.94					10-meter (32.8 ft.) cable	
<b>MGL-1P-U-463003</b>	\$353.00		3.84					8-pin M12 quick-disconnect	
<b>MGL-1P-M-463004</b>	\$338.00		4.35					5-meter (16.48 ft.) cable	
<b>MGL-1P-M-463005</b>	\$350.00		4.94					10-meter (32.8 ft.) cable	
<b>MGL-1P-M-463006</b>	\$353.00		3.84					8-pin M12 quick-disconnect	
<b>Medium Duty Holding Force</b>									
<b>MGL-2P-U-461001</b>	\$273.00	High Specification Polyester Plastic	2.78	1000N (224.8 lbf)	24VDC ± 10%	Nominal ≈ 50mA  Locked ≈ 500mA	Uniquely Coded	5-meter (16.48 ft.) cable	Figure 6
<b>MGL-2P-U-461002</b>	\$285.00		3.36					10-meter (32.8 ft.) cable	
<b>MGL-2P-U-461003</b>	\$290.00		2.25					8-pin M12 quick-disconnect	
<b>MGL-2P-M-461004</b>	\$273.00		2.78					5-meter (16.48 ft.) cable	
<b>MGL-2P-M-461005</b>	\$285.00		3.36					10-meter (32.8 ft.) cable	
<b>MGL-2P-M-461006</b>	\$290.00		2.25					8-pin M12 quick-disconnect	

IDEM Non-Contact RFID Locking Switches Replacement Actuators - Plastic						
Part Number	Price	Body Material**	Weight (lbs)	Holding Force	Coding	Dimensions
<b>MGL-1P-M-463102*</b>	\$58.00	High Specification Polyester Plastic	1.54	1500N (337.2 lbf) - Heavy Duty	Master Coded	Figure 5
<b>MGL-2P-M-461102*</b>	\$51.00		0.66	1000N (224.8 lbf) - Medium Duty		Figure 6

\* For use with Plastic Master Coded models only

\*\*Body Material: A polyester base material considered High Specification in terms of ambient temperature and resistant to many modern chemicals and cleaning solutions used in industrial applications.

# IDEM Non-Contact RFID Locking Safety Switches

## Dimensions mm[in]

Figure 5

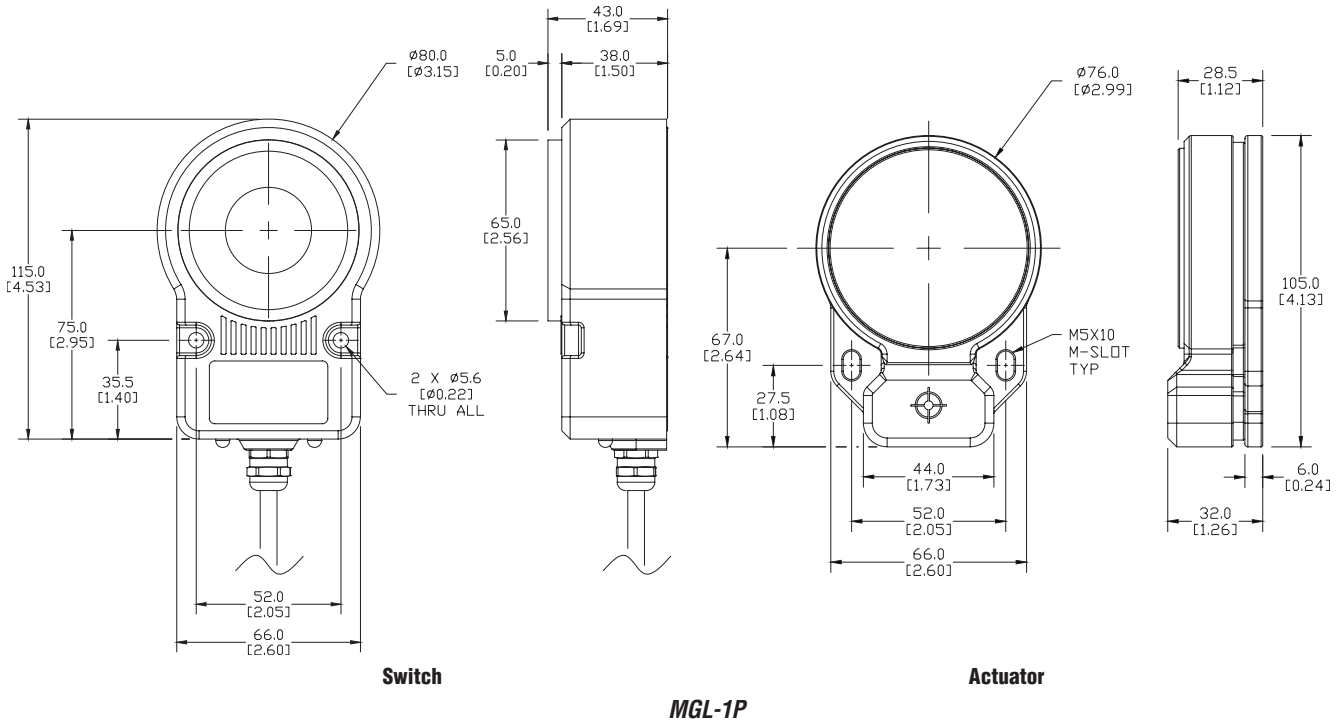
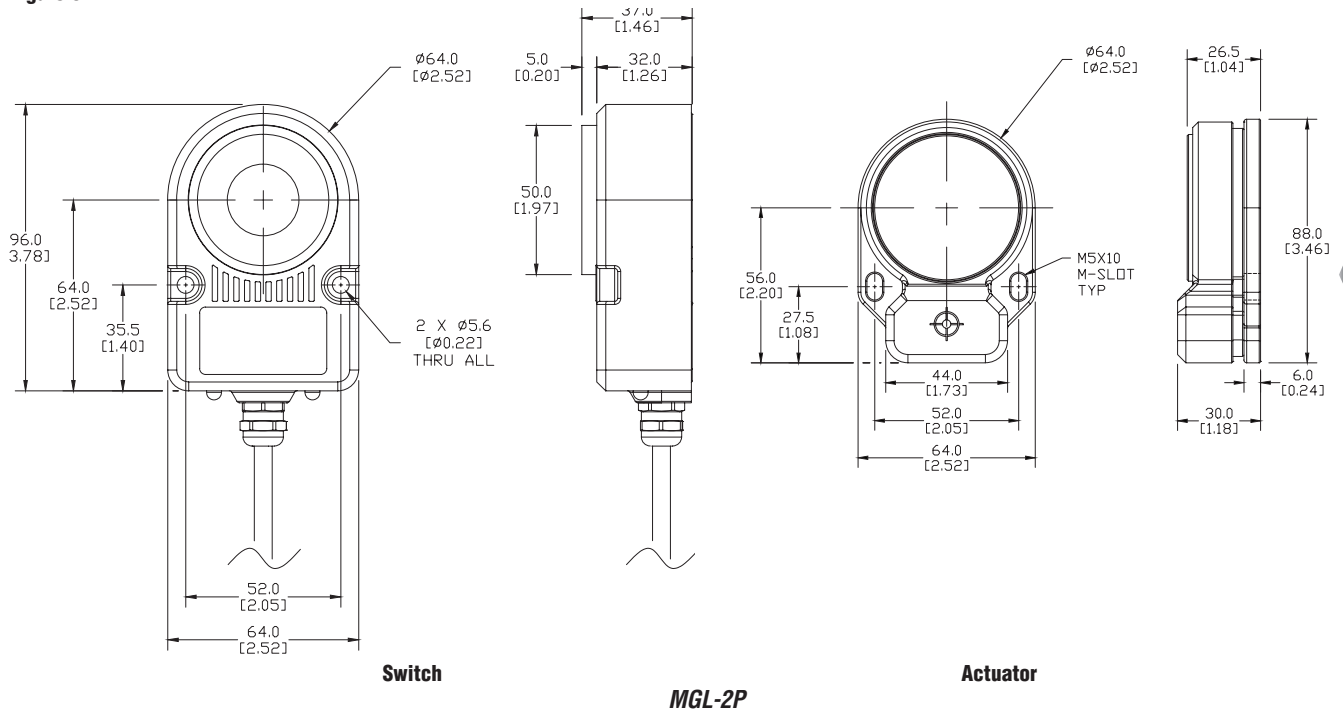


Figure 6



Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

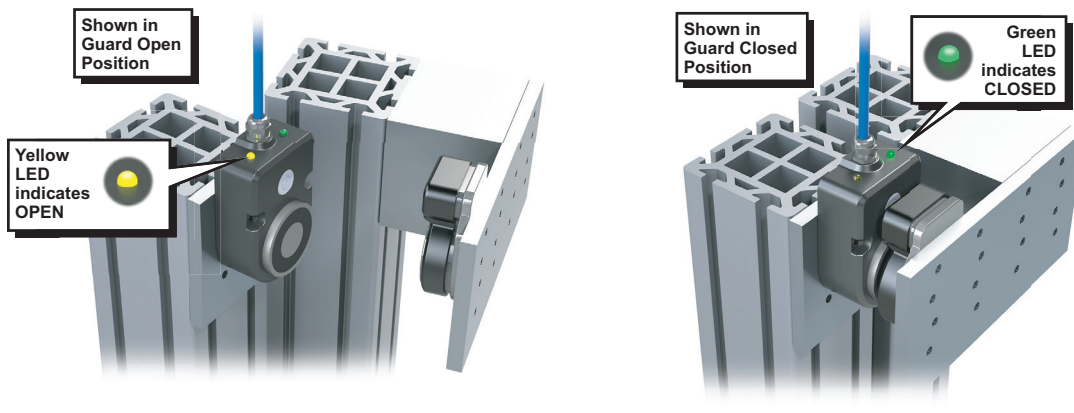
# IDEM Non-Contact RFID Locking Safety Switches Specifications

IDEM Non-Contact RFID Locking Switches Specifications			
	<i>MGL-1SS / MGL-2SS</i>	<i>MGL-1M / MGL-2M</i>	<i>MGL-1P / MGL-2P</i>
<b>Body Material</b>	316 Stainless Steel	Die Cast Metal	High Specification Polyester Plastic
<b>Safety Classification and Reliability Data</b>			
<b>Minimum Switched Current</b>	1mA @ 10VDC		
<b>Dielectric Withstand</b>	250VAC		
<b>Insulation Resistance</b>	100 Mohms		
<b>Switching Distance</b>	Sao – 1mm close Sar – 10mm open		
<b>Tolerance to Misalignment</b>	5mm in any direction from 5mm setting gap		
<b>Switching Frequency</b>	1.0 Hz maximum		
<b>Approach speed</b>	200 mm/s to 1000 mm/s		
<b>Temperature Range</b>	-25°C to 40°C (-13°F to 104°F)		
<b>Enclosure Protection</b>	IP69K	IP67	
<b>Cable Type</b>	PVC, 8-wire, 6mm OD		
<b>Mounting Screws</b>	2 x M5 – Tightening torque 1Nm (0.74 lb-ft)		
<b>Mounting Position</b>	Any		
<b>Characteristic Data According to IEC62061 (used as a sub system)</b>			
<b>Safety Integrity Level</b>	SIL3		
<b>PFH (1/h)</b>	4.77E-10 Corresponds to 4.8% of SIL3		
<b>PFD</b>	4.18E-05 Corresponds to 4.2% of SIL3		
<b>Proof Test Interval T<sub>1</sub></b>	20 years		
<b>Characteristic Data according to EN ISO13849-1*</b>			
<b>Performance Level</b>	<b>e</b> If both channels are used in combination with a SIL3/PLe control device		
<b>Category</b>	Cat4		
<b>MTTF<sub>d</sub></b>	1100 years		
<b>Diagnostic Coverage DC</b>	99% (high)		
<b>Number of operating days per year</b>	d <sub>op</sub> = 365d		
<b>Number of operating hours per day</b>	h <sub>op</sub> = 24h		
<b>B10d</b>	not mechanical parts implemented		
<b>*Note: When the product is used differently from these assumptions (different load, operating frequency, etc.) the values must be adjusted accordingly.</b>			

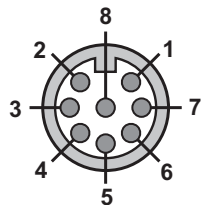
# IDEM Non-Contact RFID Locking Safety Switches

The MGL series RFID locking switches use two LEDs to indicate all the possible switch states. The LEDs are in a clearly visible location on either side of the cable exit point.

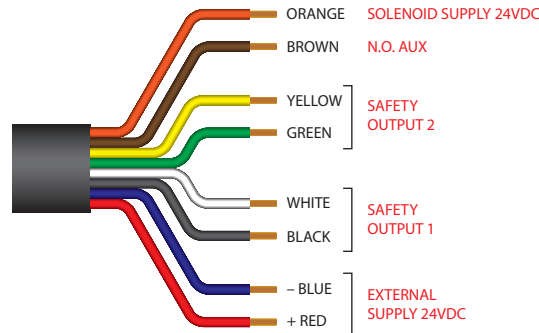
IDEM Non-Contact RFID Locking Switches LED Operation and Switch Status Indication			
Switch Status	Guard	Green LED	Yellow LED
<b>Locked</b>	Closed	Steady	Off
<b>Solenoid Power OFF (Unlocked)</b>	Closed	Flashing	Off
<b>Guard Open</b>	Open	Off	Steady
<b>Door Forced Open</b>	Open	Off	Flashing
<b>Wrong Actuator Code</b>	Closed	Flashing	Flashing



### Connection Colors



Pin View from Switch



IDEM Non-Contact RFID Locking Switches Wiring Diagram			
Quick Connect (QC) M12 8-way male plug	Conductor Colors	Function	Power Rating
8	Orange	Lock Applied (24VDC ± 10%)	500mA Max.
5	Brown	Auxiliary Signal	+24VDC
4	Yellow	Safety Output 2	200mA Max.
6	Green	Safety Output 2	
1	White	Safety Output 1	200mA Max.
7	Black	Safety Output 1	
3	Blue	0VDC	50mA Max.
2	Red	+ 24VDC ± 10%	

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# IDEM Solenoid Interlock Safety Switch Selection Guide

**KLP-201002**



**KLM-202002**



**KL3-SS-205002**



**KL1-P-221302**



Series	KLP	KLM	KL3-SS	KL1-P
<b>Prices start at</b>	\$168.00	\$182.00	\$335.00	\$162.00
<b>Description</b>	Solenoid locking, tongue (key) interlock operated, 1800N holding force, power to unlock, 90° adjustable head	Solenoid locking, tongue (key) interlock operated, 2000N holding force, power to unlock, 90° adjustable head	Solenoid locking, tongue (key) interlock operated, 2000N holding force, power to unlock, 90° adjustable head	Solenoid locking, tongue (key) interlock operated, 1400N holding force, power to unlock, 180° adjustable head
<b>Construction Material</b>	46mm wide polyester plastic body, 40mm wide 316 stainless steel head	46mm wide die-cast aluminum body, 40mm wide die-cast aluminum head	48mm wide 316 stainless steel body, 40mm wide 316 stainless steel head	63mm wide polyester plastic body, 52mm wide 316 stainless steel head
<b>Degree of Protection (IEC529)</b>	IEC IP67		IEC IP67, IEC IP69K	IEC IP67
<b>Mechanical Service Life</b>	2.5M operations at 100mA load			
<b>Conduit Opening</b>	1 conduit opening, 1/2 in female NPT	3 conduit openings, 1/2 in female NPT		1 conduit opening, 1/2 in female NPT
<b>Agency Approvals</b>	cULus E258676, CE			

**KL1-SS-220002**



**KLTM-450002**



**KLT-SS-451002**



Series	KL1-SS	KLTM	KLT-SS
<b>Prices start at</b>	\$304.00	\$182.00	\$321.00
<b>Description</b>	Solenoid locking, tongue (key) interlock operated, 1600N holding force, power to unlock, 180° adjustable head	Solenoid locking, tongue (key) interlock operated, 2000N holding force, power to unlock, 180° adjustable head	Solenoid locking, tongue (key) interlock operated, 2000N holding force, power to unlock, 180° adjustable head
<b>Construction Material</b>	63mm wide 316 stainless steel body, 52mm wide 316 stainless steel head	105mm wide die-cast aluminum body, 95mm wide 316 stainless steel head	105mm wide 316 stainless steel body, 95mm wide 316 stainless steel head
<b>Degree of Protection (IEC529)</b>	IEC IP67, IEC IP69K	IEC IP67	IEC IP69K
<b>Mechanical Service Life</b>	2.5M operations at 100mA load		
<b>Conduit Opening</b>	1 conduit opening, 1/2 in female NPT	3 conduit openings, 1/2 in female NPT	
<b>Agency Approvals</b>	cULus E258676, CE		



# IDEM Solenoid Interlock Safety Switches

## KLP/KLM/KL3-SS Series Housing

- Solenoid locking, tongue (key) interlock operated
- Power to unlock
- 90 degree adjustable head
- One (KLP) or three (KLM, KL3-SS) 1/2 in. female NPT conduit opening
- 30mm mounting profile

- Slotted manual release on lid and side (KLP/KLM) or anti-tamper keyed manual release on lid and side (KL3-SS)
- Includes one tamper-proof T20 Torx bit
- Purchase actuating key and anti-tamper manual release key separately (See Accessories)

See electrical specifications later in this section.

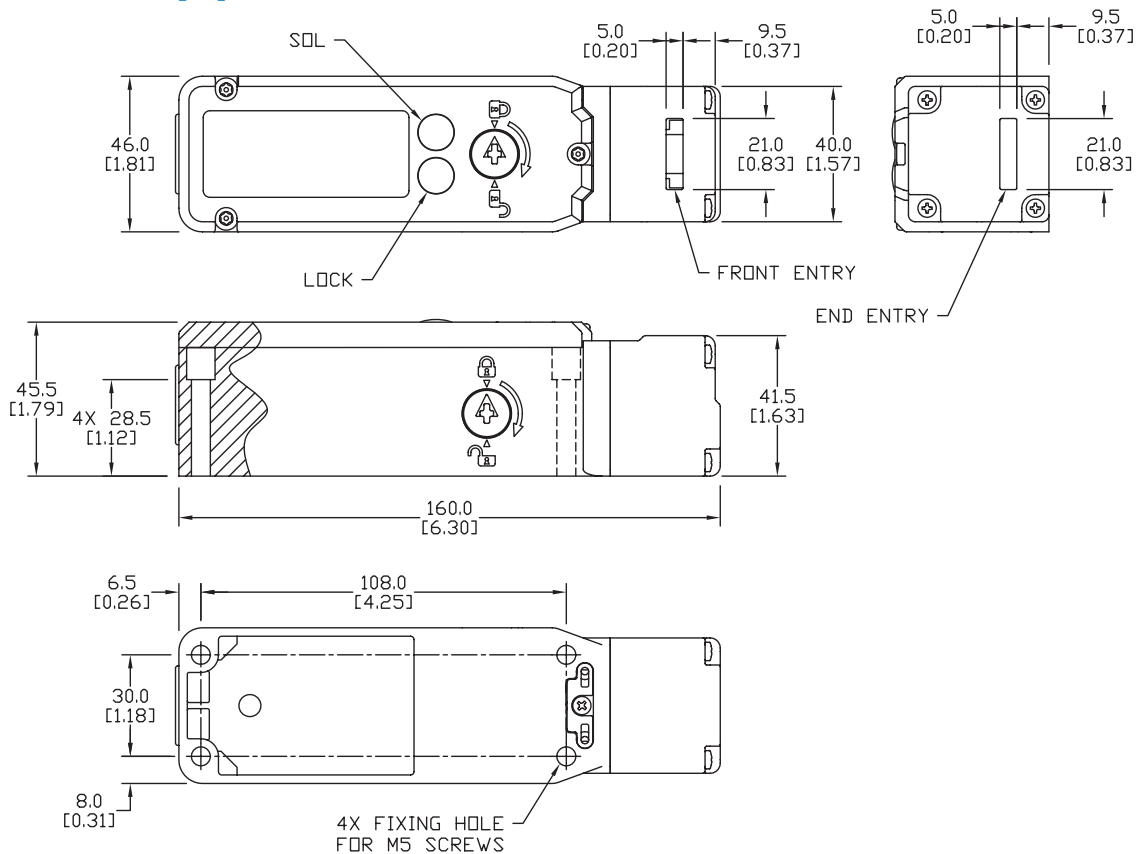
**KLP-201002**  
**KLM-202002**  
**KL3-SS-205002**



IDEM KLP/KLM/KL3-SS Series Solenoid Interlock Safety Switches														
Part Number	Price	Body Material	Head Material	Weight (lbs)	Actuator Travel / Force for Positive Opening	Holding Force	Solenoid Voltage	LED	Contact Configuration	Dimensions				
<b>KLP-201002</b>	\$168.00	Polyester plastic	316 stainless steel	1.4	10mm	1800N	24 VAC/DC	1 Solenoid Status 1 Optional Lock Status	2 NC safety contacts (1 selectable output (1 NO auxiliary contact or LED for lock status) 1 NO auxiliary contact for actuator tongue (key) status)	Figure 1				
<b>KLP-201005</b>	\$173.00						110VAC							
<b>KLP-201008</b>	\$173.00						230VAC							
<b>KLM-202002</b>	\$182.00	Die-cast aluminum	Die-cast aluminum	1.9			24 VAC/DC		2000N	24 VAC/DC	4 NC safety contacts (1 selectable output (1 NO auxiliary contact or LED for lock status) 1 NO auxiliary contact for actuator tongue (key) status)	Figure 2		
<b>KLM-202005</b>	\$188.00						110VAC							
<b>KLM-202008</b>	\$188.00						230VAC							
<b>KL3-SS-205002</b>	\$335.00	316 stainless steel	316 stainless steel	2.9			24 VAC/DC			24 VAC/DC		230VAC	1 NO auxiliary contact for actuator tongue (key) status	Figure 3
<b>KL3-SS-205005</b>	\$341.00						110VAC							
<b>KL3-SS-205008</b>	\$341.00						230VAC							

## Dimensions mm[in]

Figure 1



# IDEM Solenoid Interlock Safety Switches

Dimensions mm[in]

Figure 2

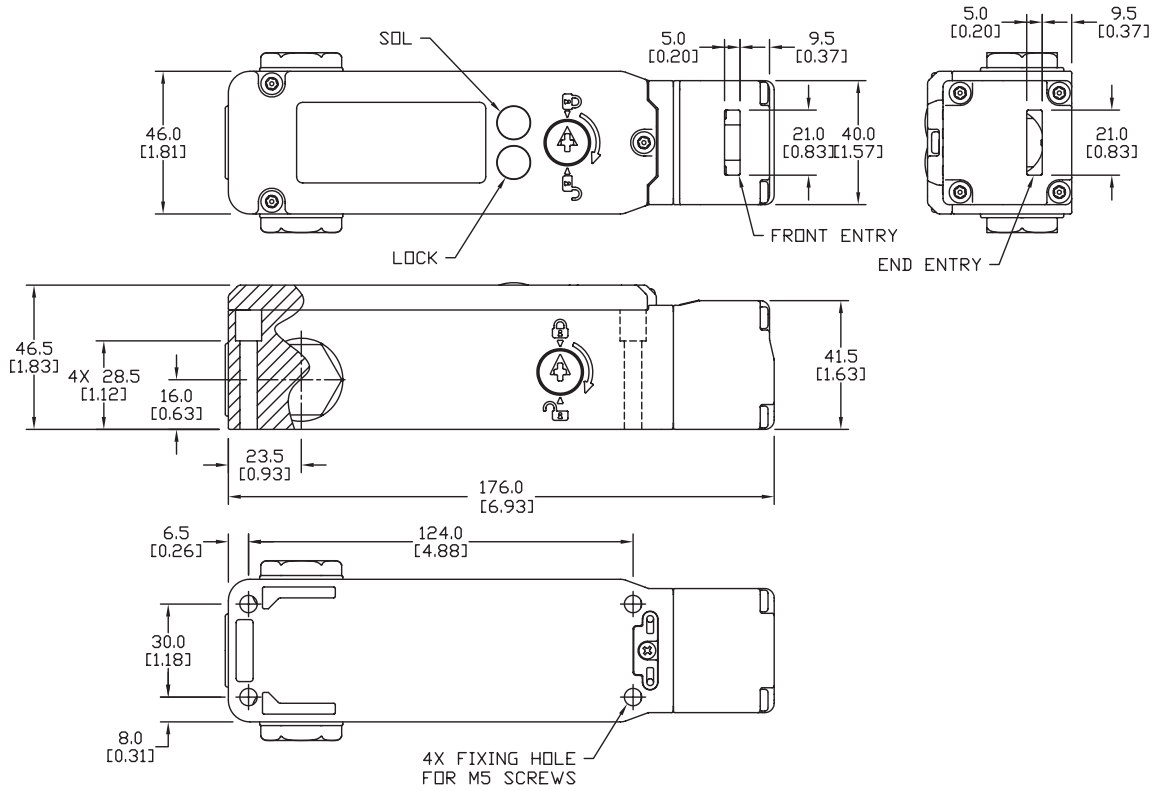
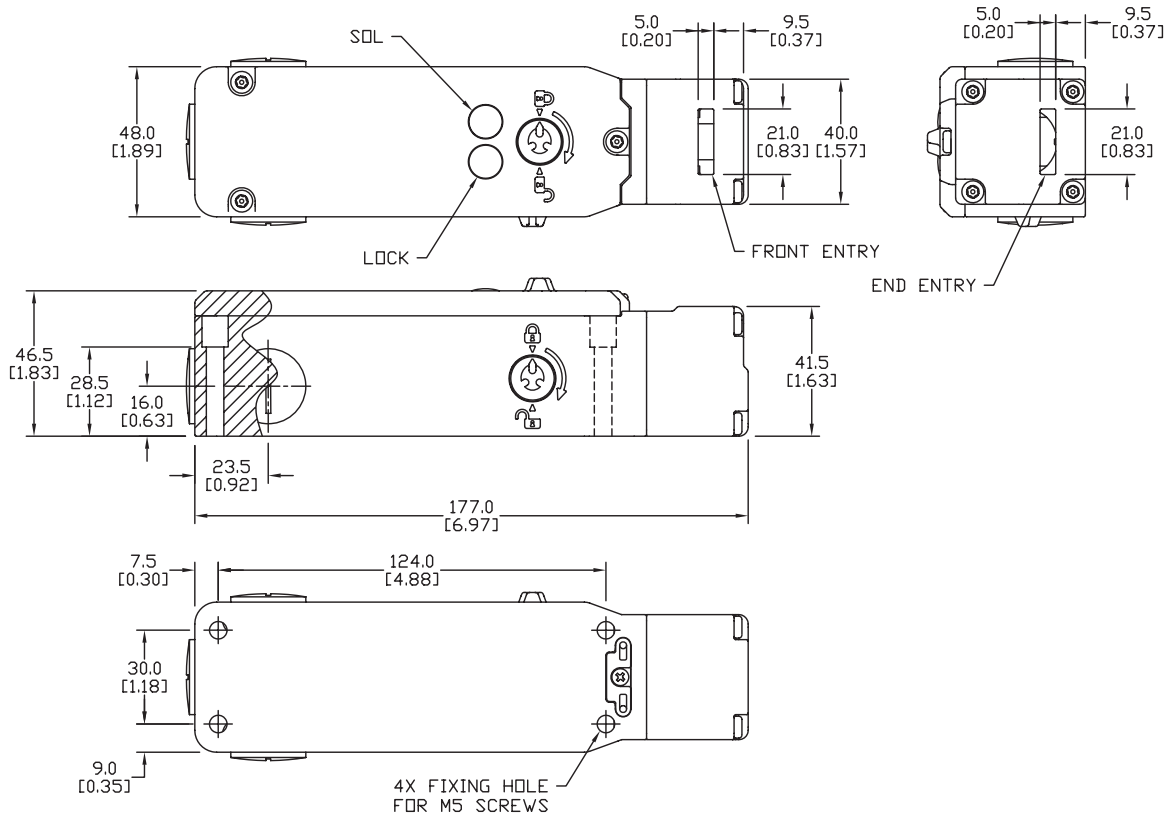


Figure 3



# IDEM Solenoid Interlock Safety Switches

## KL1-P/KL1-SS Series Housing

- Solenoid locking, tongue (key) interlock operated
- Power to unlock
- 180 degree adjustable head
- One 1/2 in. NPT female conduit opening

- Slotted manual release on lid and side
- 40mm mounting profile
- Purchase actuating key separately (See Accessories)

**See electrical specifications later in this section.**

**KL1-P-221302**  
**KL1-SS-220002**



IDEM KL1-P/KL1-SS Series Solenoid Interlock Safety Switches										
Part Number	Price	Body Material	Head Material	Weight (lbs)	Actuator Travel / Force for Positive Opening	Holding Force	Solenoid Voltage	LED	Contact Configuration	Dimensions
<b>KL1-P-221002</b>	\$162.00	Polyester plastic	316 stainless steel	1.4	10mm	1400N	24 VAC/DC	1 solenoid status	2 NC safety contacts 2 NO auxiliary contacts	Figure 1
<b>KL1-P-221005</b>	\$168.00			1.3			110VAC			
<b>KL1-P-221008</b>	\$168.00			1.4			230VAC			
<b>KL1-P-221302</b>	\$162.00			1.3			24 VAC/DC	1 solenoid status 1 optional lock status	2 NC safety contacts 1 NO auxiliary contact for actuator tongue (key) status	
<b>KL1-P-221305</b>	\$168.00			1.3			110VAC			
<b>KL1-P-221308</b>	\$168.00			2.5			230VAC			
<b>KL1-SS-220002</b>	\$304.00	316 stainless steel	316 stainless steel	2.5	1600N	24 VAC/DC	1 solenoid status	2 NC safety contacts 2 NO auxiliary contacts	Figure 2	
<b>KL1-SS-220005</b>	\$315.00					110VAC				
<b>KL1-SS-220008</b>	\$315.00					230VAC				
<b>KL1-SS-220302</b>	\$304.00					24 VAC/DC	1 solenoid status 1 optional lock status	2 NC safety contacts 1 NO auxiliary contact for actuator tongue (key) status		
<b>KL1-SS-220305</b>	\$315.00					110VAC				
<b>KL1-SS-220308</b>	\$315.00					230VAC				

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# IDEM Solenoid Interlock Safety Switches

## Dimensions mm[in]

Figure 1

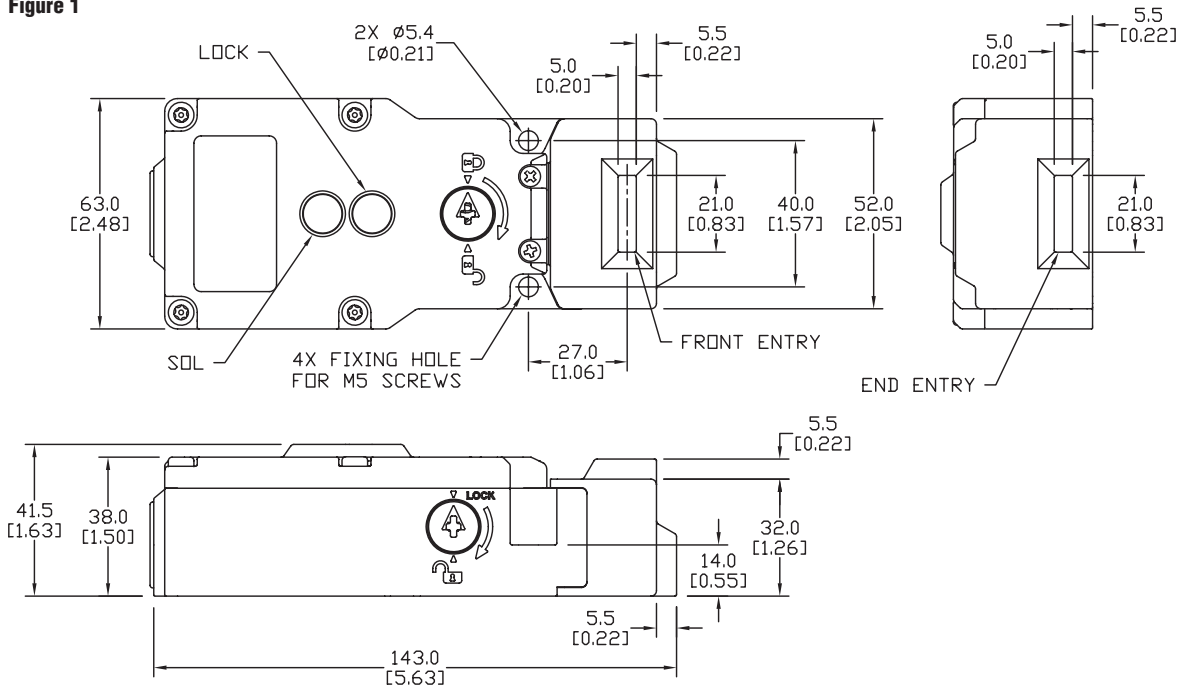
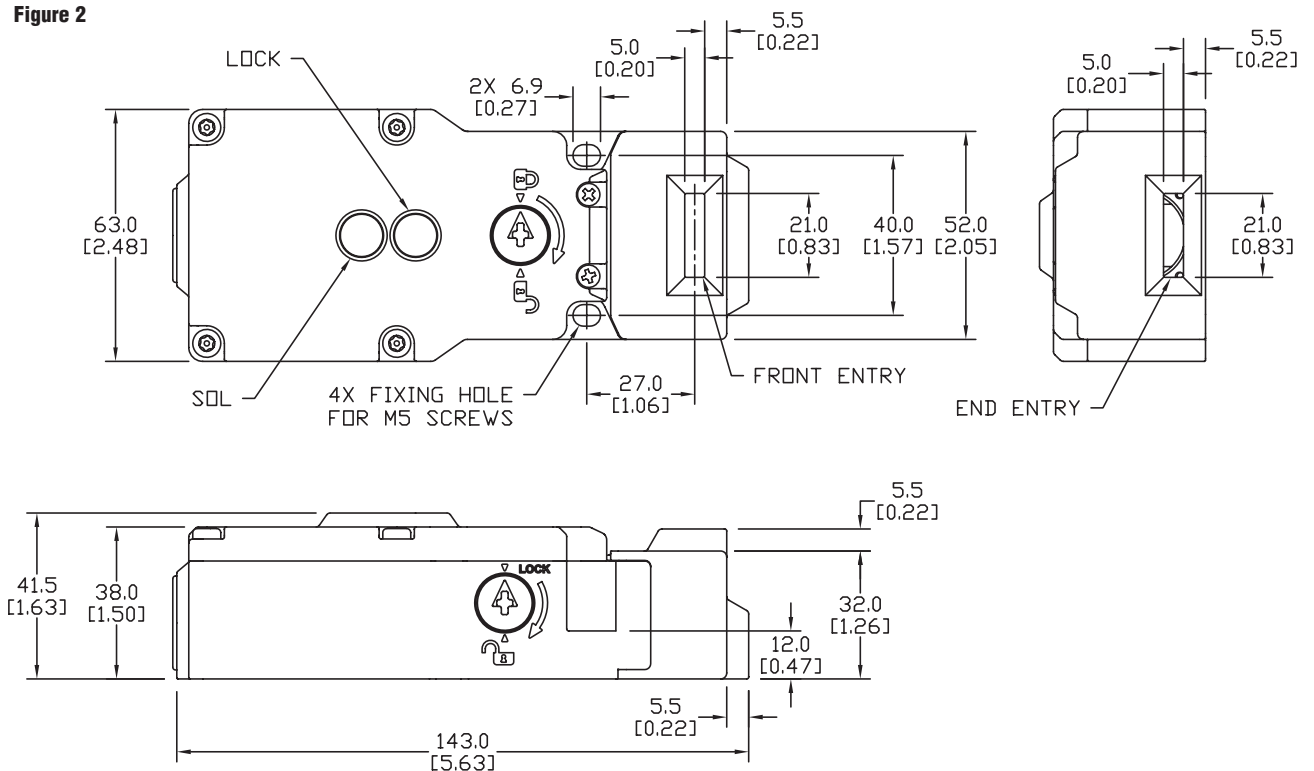


Figure 2



# IDEM Solenoid Interlock Safety Switches

## KLTM/KLT-SS Series Housing

- Solenoid locking, tongue (key) interlock operated
- Power to unlock
- 180 degree adjustable head
- One (KLTM) or three (KLT-SS) 1/2 in. NPT female conduit opening
- 73mm mounting profile

- Slotted manual release on lid and side (KLTM) or anti-tamper keyed manual release on lid and side (KLT-SS)
- Includes one tamper-proof T20 Torx bit
- Purchase actuating key and anti-tamper manual release key separately (See accessories)

**See electrical specifications later in this section.**

**KLTM-450002**  
**KLT-SS-451002**



IDEM KLTM/KLT-SS Series Solenoid Interlock Safety Switches										
Part Number	Price	Body Material	Head Material	Weight (lbs)	Actuator Travel for Positive Opening	Holding Force	Solenoid Voltage	LED	Contact Configuration	Dimensions
<b>KLTM-450002</b>	\$182.00	Die-cast aluminum	316 stainless steel	2.7	10mm	2000N	24 VAC/DC	1 solenoid status 1 optional lock status	4 NC safety contacts 1 NO auxiliary contact for actuator tongue (key) status	Figure 1
<b>KLTM-450005</b>	\$188.00			2.6			110VAC			
<b>KLTM-450008</b>	\$188.00			2.6			230VAC			
<b>KLT-SS-451002</b>	\$321.00	316 stainless steel	316 stainless steel	4.7			24 VAC/DC			
<b>KLT-SS-451005</b>	\$335.00						110VAC			
<b>KLT-SS-451008</b>	\$335.00						230VAC			
					230VAC					

- Company Information
- Terminal Blocks
- Power Distribution Blocks
- Wiring Accessories
- ZIPLink Connection System
- Multi-wire Connectors
- Sensor Cables and Connectors
- M12 Junction Blocks
- Panel Interface Connectors
- Wiring Duct
- Cable Ties
- Wire
- Bulk Multi-conductor Cables
- Wire Management Products
- Power Supplies
- DC Converters
- Transformers and Filters
- Circuit Protection
- Tools
- Test Equipment
- Enclosures
- Enclosure Climate Control
- Safety: Electrical Components
- Safety: Protective Wear
- Terms and Conditions

# IDEM Solenoid Interlock Safety Switches

## Dimensions mm[in]

Figure 1

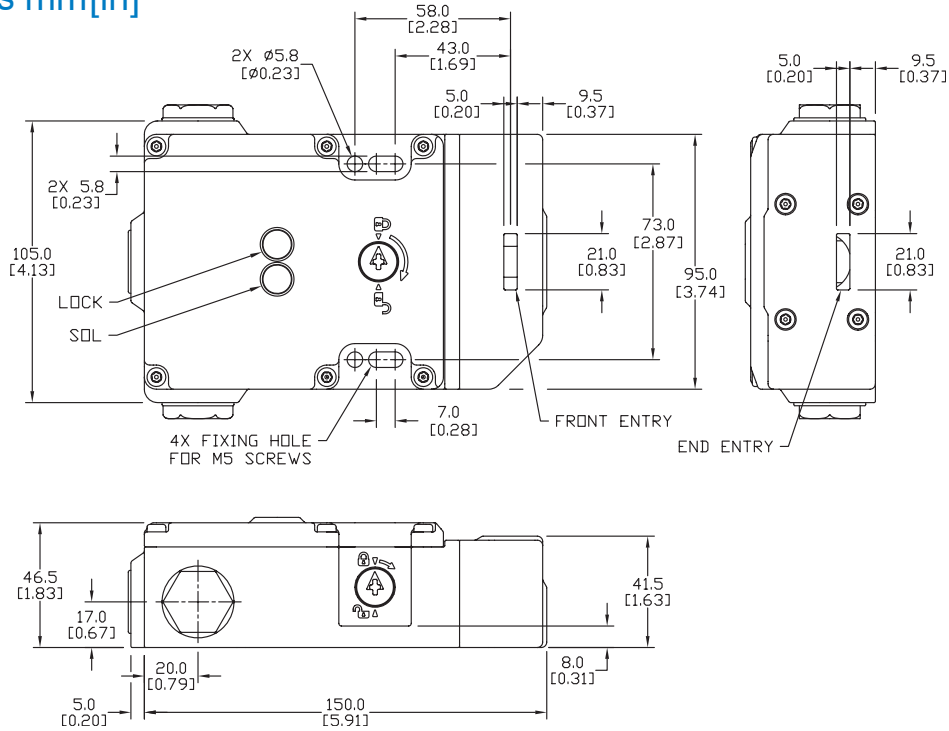
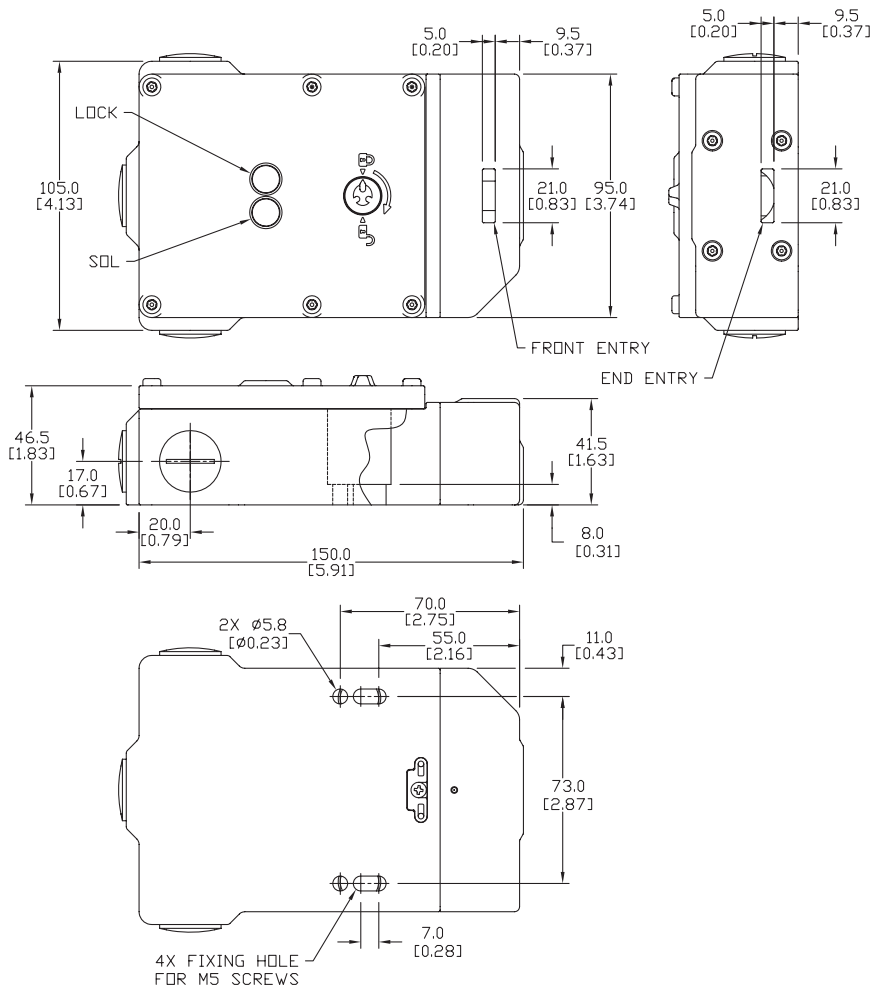


Figure 2



# IDEM Solenoid Interlock Safety Switches Specifications

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

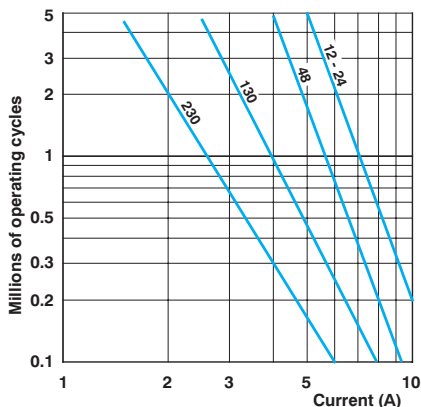
Safety: Protective Wear

Terms and Conditions

Solenoid Interlock Safety Switches Specifications			
	KL3/KLM/KL3-SS	KL1-P/KL1-SS	KLTM/KLT-SS
<b>Safety Classification and Reliability Data</b>			
<b>Switching Reliability (B10d)</b>	2.5M operations at 100mA load		
<b>EN 954-1</b>	Up to Category 4 with Safety Relay		
<b>ISO 13849-1</b>	Up to PLe depending upon system architecture		
<b>EN 62061</b>	Up to SIL3 depending upon system architecture		
<b>Safety Data - Annual Usage</b>	8 cycles per hour / 24 hours per day / 365 days		
<b>MTTF<sub>d</sub></b>	356 years		
<b>Agency Approvals</b>	cULus E258676, CE		
<b>Electrical and General Specifications</b>			
<b>Utilization Category</b>	AC15, A300,3A max		
<b>Thermal Current</b>	5A		3A
<b>Short Circuit Overload Protection</b>	External 10A Fast Acting recommended		
<b>Rated Insulation Voltage</b>	500VAC		
<b>Contact Terminals</b>	Plated Brass, Max conductor 1mm <sup>2</sup> , 16AWG; 0.7 Nm torque		
<b>LED2 Voltage</b>	24VDC		
<b>Solenoid Wattage</b>	12W		
<b>Solenoid Voltage</b>	24 VAC/VDC or 110VAC or 230VAC		
<b>Max. Switching Current</b>	Safety contacts 2.5A @24VDC, 6A @ 120VAC, 3A @ 240VDC (720VA Break); Auxiliary contacts max 230V@0.5A		
<b>Maximum Approach/Withdrawal Speed</b>	1000 mm/s		600 mm/s
<b>Enclosure Protection</b>	IP67 (IP69K on all models with both stainless steel head and body)		
<b>Operating Temperature</b>	-25°C – 55°C [-13°F – 131°F]		-25°C to 40°C [-13°F to 104°F]
<b>Vibration</b>	IEC 68-2-6, 10–55 Hz + 1Hz		
<b>Lid Screws/Torque</b>	Stainless Steel; T20 Torx; 1.5 Nm (1.11 lb-ft)	Stainless Steel; T20 Torx; 1Nm (0.74 lb-ft)	Stainless Steel; T20 Torx; 1.5 Nm (1.11 lb-ft)
<b>Recommended Mounting Screws/Torque</b>	M5; 4Nm (2.95 lb-ft)		
<b>Head Screws/Torque</b>	Stainless Steel; T20 Torx (KL3-SS only); 1.5 Nm (1.11 lb-ft)	Stainless Steel; T20 Torx; 1.5 Nm (1.11 lb-ft)	Stainless Steel; T20 Torx; 1Nm (0.74 lb-ft)

## Electrical Durability (according to IEC 947-5-1)

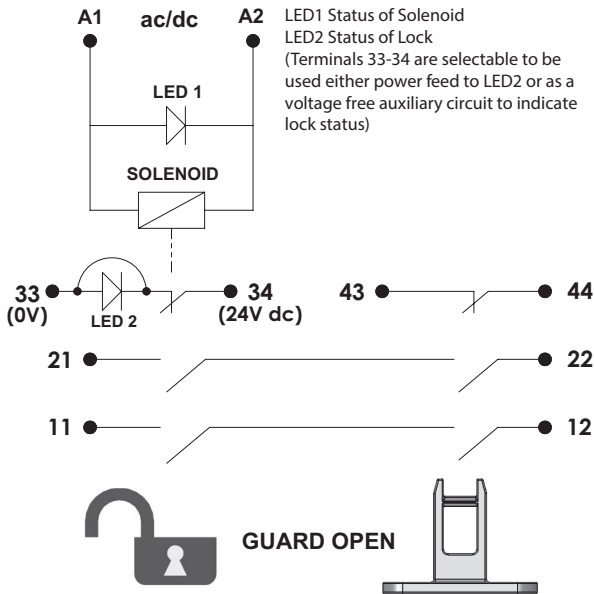
AC-15 Slow Action



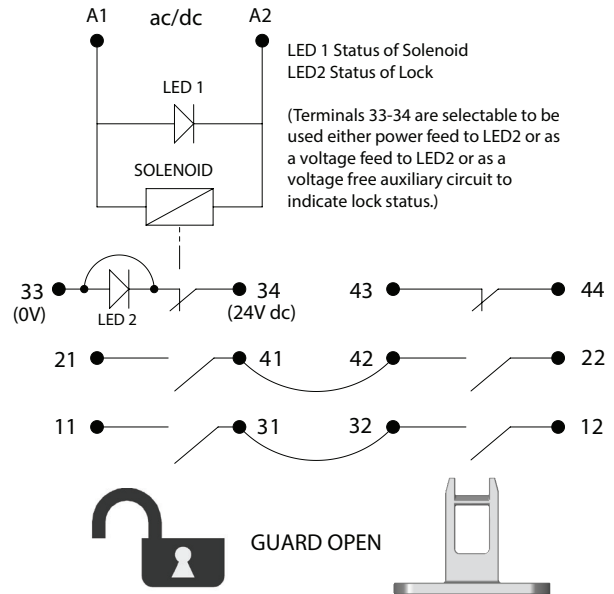
# IDEM Solenoid Interlock Travel Charts

## Contacts Configuration

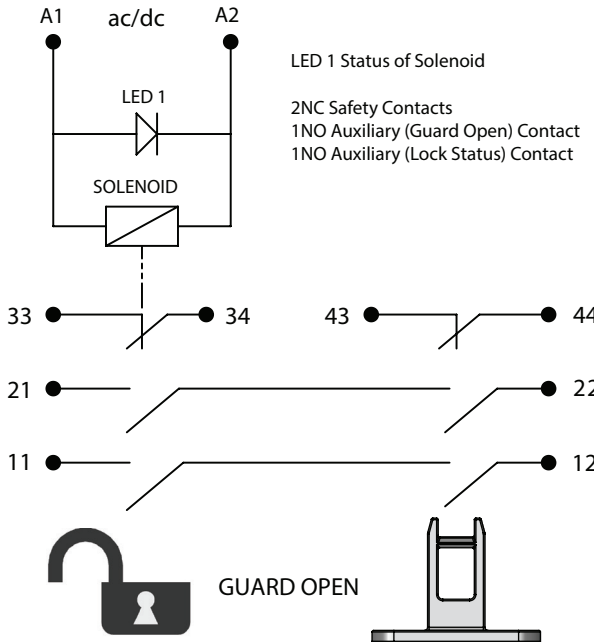
### KLP



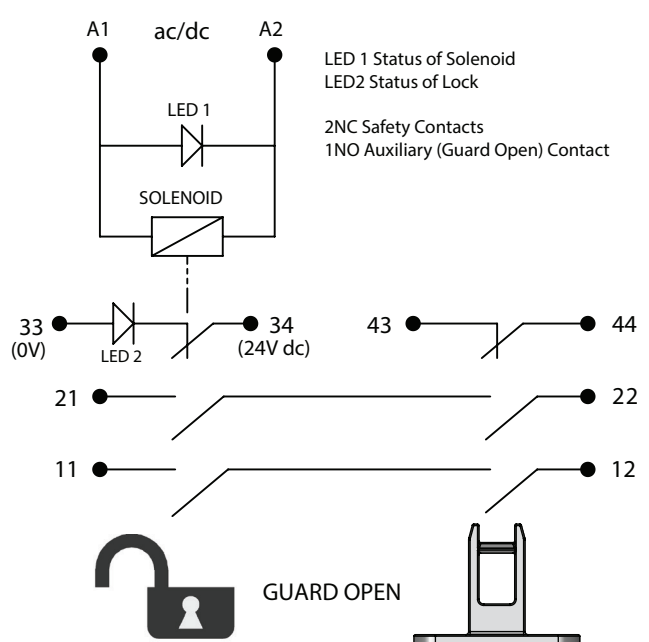
### KLM/KL3-SS/KLTM/KLT-SS



### KL1-P/KL1-SS (Standard)



### KL1-P/KL1-SS (Extra LED2)



## Travel Charts

Actuator Insertion

6.0 5.0 0 mm

11/12	Open		
21/22	Open		
33/34		Open	Contact Open
43/44		Open	Contact Closed

For all IDEM switches, the normally closed (NC) circuits are closed when the guard is closed with actuator inserted.



# IDEM Solenoid Interlock Accessories

## Actuators

- 4 available keys
- All keys are 316 stainless steel
- Flexible key options available
- Lockout actuator available

140107



140108



140110



140111



140130



140123



IDEM Interlock Safety Switch Actuator Tongue (Keys)							
Part Number	Price	Description	Use with:		Weight (lbs)	Minimum Entry Radius	Dimensions
			KLP/KLM/KL1/KLTM	KL3-SS/KLT-SS			
140107	\$6.50	40mm mounting hole spacing, 90 degree stainless steel key/mounting tab	✓	✓	0.07	175mm	Figure 1
140108	\$6.50	20mm mounting hole spacing, straight stainless steel key with plastic stop	✓	✓	0.07	175mm	Figure 2
140110	\$24.00	40mm mounting hole spacing, stainless steel key with black-painted aluminum flexible mounting tab	✓	✓	0.16	100mm	Figure 3
140111	\$47.00	40mm mounting hole spacing, stainless steel key with mirror polished stainless steel flexible mounting tab	✓	✓	0.22	100mm	Figure 3
140130	\$25.50	IDEM lockout actuator, stainless steel, for use with all IDEM tongue (key) switches	✓	✓	0.10	NA	Figure 4
140123	\$9.25	IDEM anti-tamper manual release key, for use with KL3 and KLT series safety switches		✓	0.05	NA	Figure 5

## Accessories

- Gate bolt kits provide a sliding latch and lockout for swinging or sliding doors
- Comes with handle and flat actuator
- Sliding action prevents accidental closure
- Requires four M5 x 35mm mounting screws (not included)
- Gate bolt kit materials: ABS plastic handle; mild steel yellow plate; aluminum black base; mild steel plated bar (inserts into guide); stainless steel guide and key

GBL-1-210001



GBL-1-210002



GB - 210005



GB - 210006



IDEM Interlock Safety Switch Accessories						
Part Number	Price	Description	Use with:		Weight (lbs)	Dimensions
			KLP/KLM	GBL-1		
GBL-1-210001	\$92.00	IDEM gate bolt, left hand version, for use with KLP and KLM series safety switches. Includes actuating tongue (key).	✓		4.12	Figure 6
GBL-1-210002	\$92.00	IDEM gate bolt, right hand version, for use with KLP and KLM series safety switches. Includes actuating tongue (key).	✓		4.12	Figure 7
GB-210005	\$12.00	IDEM rear escape handle, for use with GBA-1 and GBL-1 series gate bolts		✓	0.1	Figure 8
GB-210006	\$12.00	IDEM spring loaded catch, for use with GBA-1 and GBL-1 series gate bolts		✓	0.08	Figure 9

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

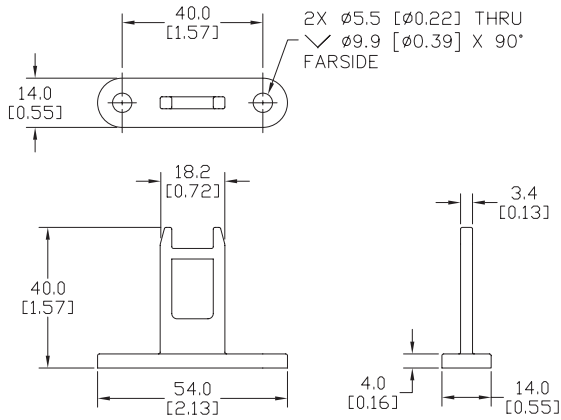
Safety: Protective Wear

Terms and Conditions

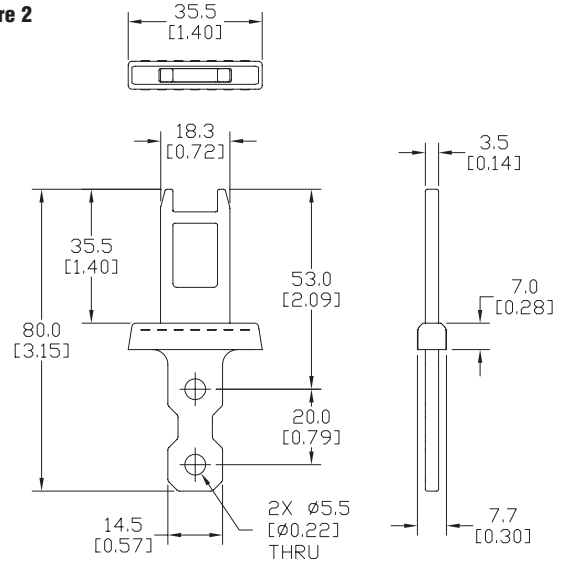
# IDEM Solenoid Interlock Safety Accessories

## Dimensions mm[in]

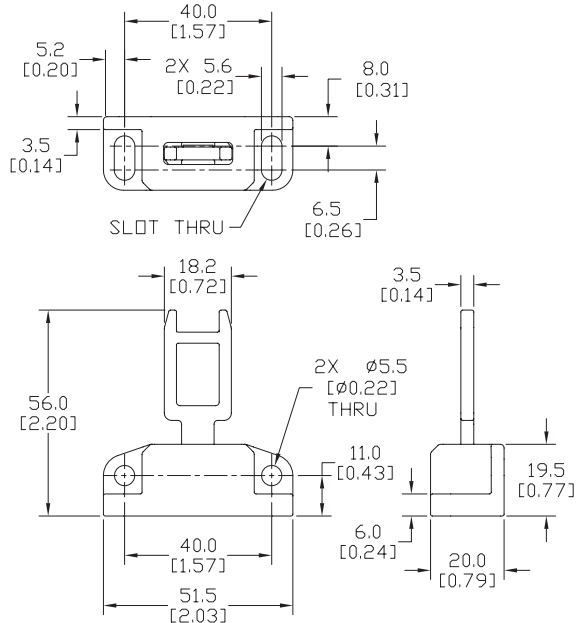
**Figure 1**



**Figure 2**



**Figure 3**



# IDEM Solenoid Interlock Safety Accessories

## Dimensions mm[in]

Figure 4

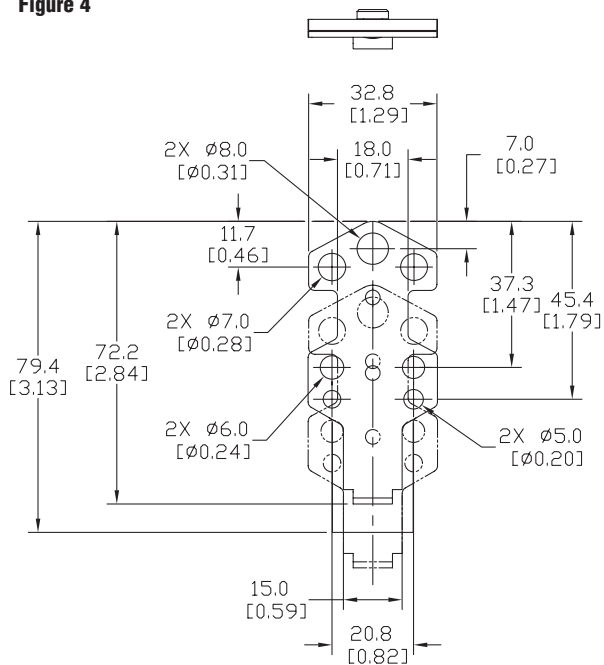


Figure 5

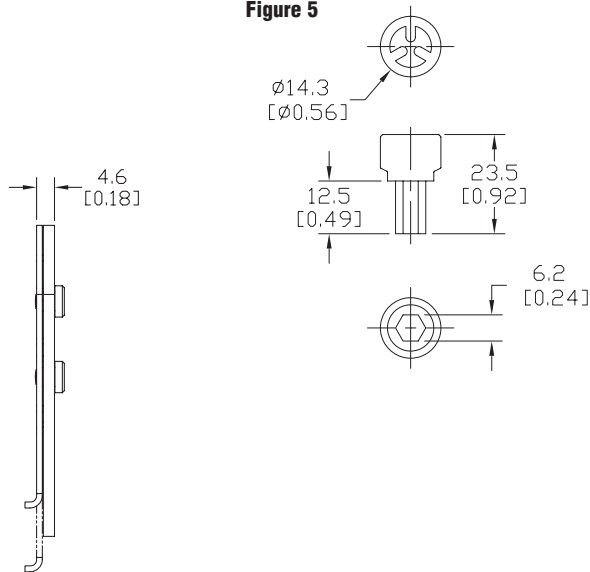
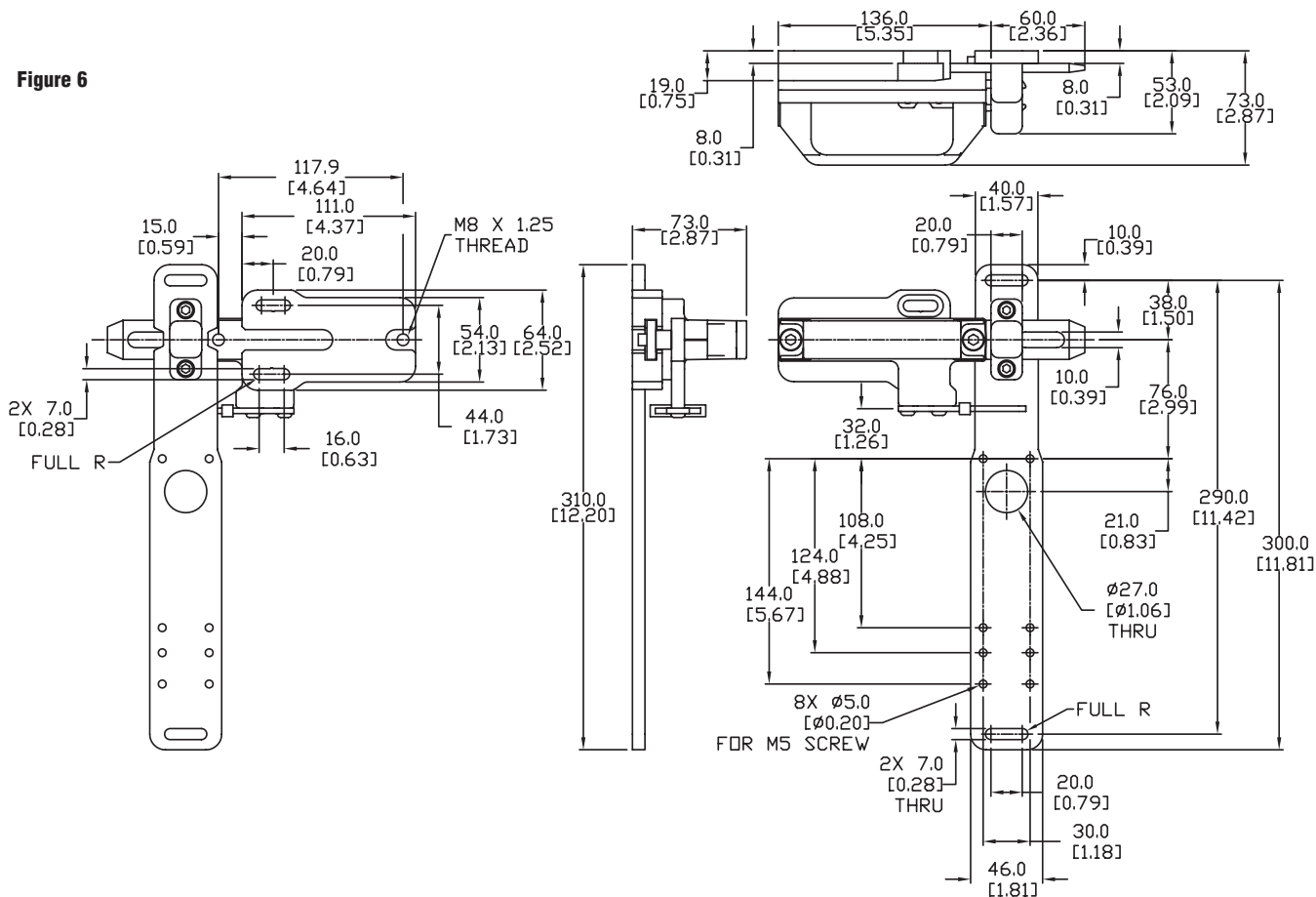


Figure 6



Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# IDEM Solenoid Interlock Safety Accessories

## Dimensions mm[in]

Figure 7

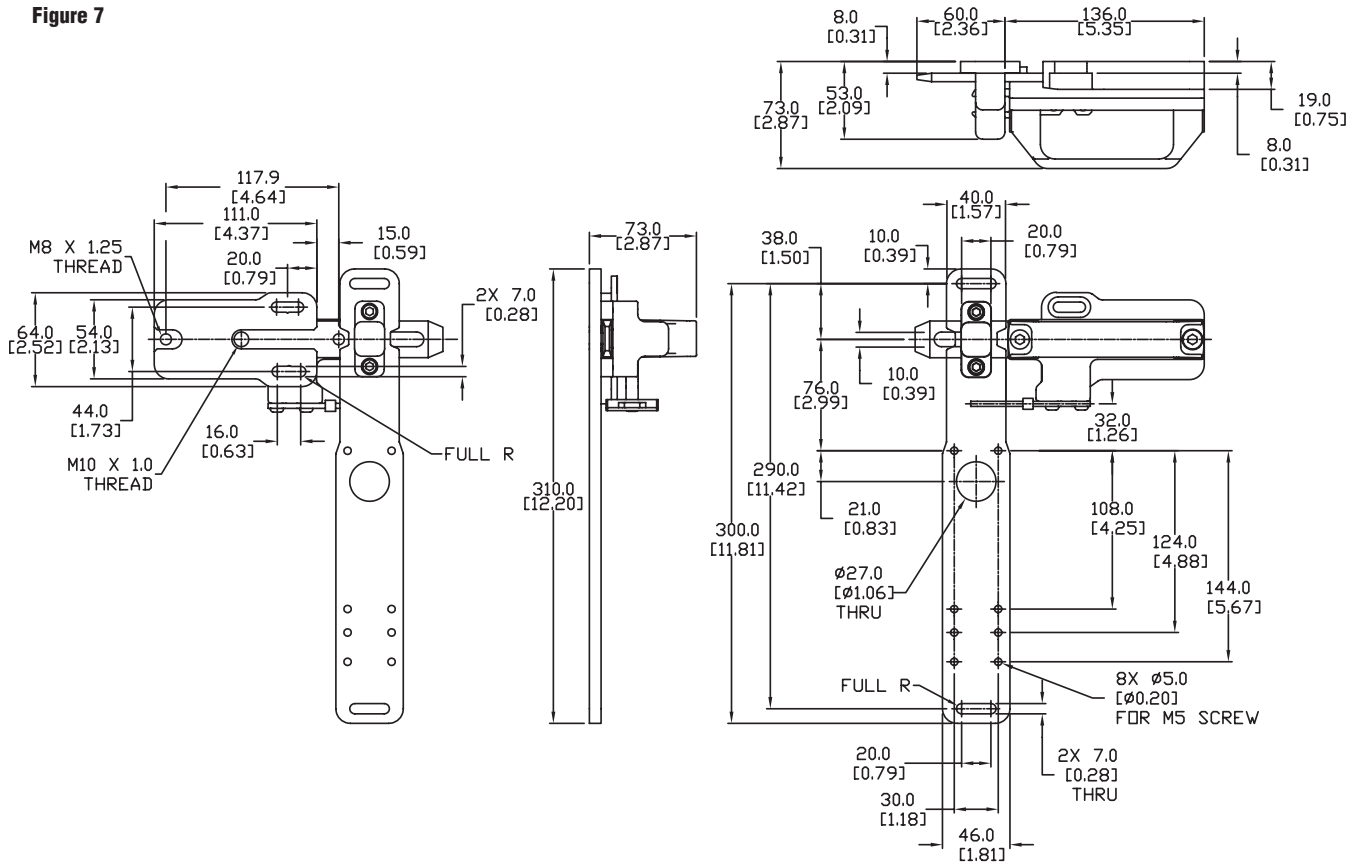


Figure 8

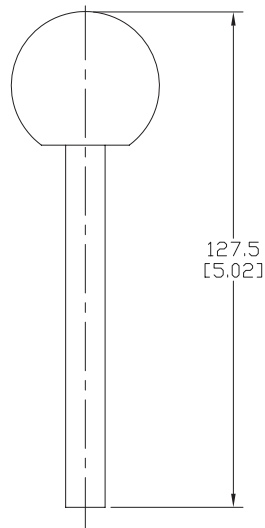
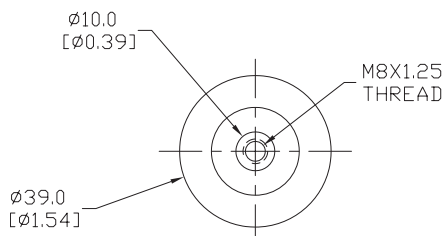
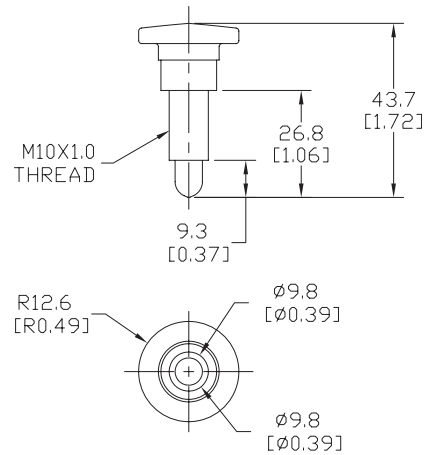


Figure 9



# IDEM Interlock Safety Switch Selection Guide

**Inch-1/Inch-3 Series**



**MK1-SS Series**



**HC-1/HC-3 Series**



**HC-SS Series**



Series	Inch-1 Inch-3	MK1-SS	HC-1 HC-3	HC-SS
<b>Prices start at</b>	\$29.50	\$89.50	\$31.50	\$90.00
<b>Description</b>	Safety switch, tongue (Key) Interlock operated, 90 degree adjustable Head		Safety switch, Compact Hinge Interlock	
<b>Construction Material</b>	25mm wide plastic body with metal head	30mm wide stainless steel 316	25mm wide plastic body with 316 stainless steel head	30mm wide stainless steel 316
<b>Degree of Protection (IEC529)</b>	IP67	IP69K	IP67	IP69K
<b>Mechanical Service Life</b>	2.5 x 10 <sup>6</sup> operations at 100mA load			
<b>Conduit Opening</b>	M16 & M12 QD	1/2 in NPT M20 & M12 QD	M16 & M12 QD	1/2 in NPT M20 & M12 QD
<b>Agency Approvals</b>	cULus E258676, CE			

**IDIS-190051**



**IDIS-192002**



**KM-203002  
KM-203002-SS**



**KM-SS-204002**



Series	IDIS-1	IDIS-2	KM	KM-SS
<b>Prices start at</b>	\$26.00	\$25.00	\$61.00	\$119.00
<b>Description</b>	Safety switch, tongue (key) interlock operated, 90 degree adjustable head	Safety switch, lever hinge interlock operated, 90 degree adjustable head	Safety switch, tongue (key) interlock operated, 90 degree adjustable head	
<b>Construction Material</b>	31.5 mm wide, plastic body and head		40 mm wide, die-cast aluminum body and head or die-cast aluminum body and 316 stainless steel head	41.6 mm wide, 316 stainless body and head
<b>Degree of Protection (IEC529)</b>	IEC IP67			IEC IP67, IEC IP69K
<b>Mechanical Service Life</b>	2.5 x 10 <sup>6</sup> operations at 100 mA load			
<b>Conduit Opening</b>	One conduit opening, 1/2 in. female NPT			
<b>Agency Approvals</b>	cULus E258676, CE			

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# IDEM Interlock Safety Switch Selection Guide

**KP-200002**  
**KP-200002-SS**



**K-SS-208002**



**K-15-207002**



**K-15-207002-SS**



Series	KP	K-SS	K-15	K-15-SS
<b>Prices start at</b>	\$39.00	\$114.00	\$39.00	\$60.00
<b>Description</b>	Safety switch, tongue (key) interlock operated, 180 degree adjustable head		Safety switch, tongue (key) interlock operated, 180 degree adjustable head	
<b>Construction Material</b>	58 mm wide, plastic body and head or plastic body and 316 stainless head	58 mm wide, 316 stainless body and head	54 mm wide, plastic body and head	54 mm wide, plastic body and 316 stainless head
<b>Degree of Protection (IEC529)</b>	IEC IP67	IEC IP67, IEC IP69K	IEC IP67	
<b>Mechanical Service Life</b>	2.5 x 10 <sup>6</sup> operations at 100 mA load			
<b>Conduit Opening</b>	Three conduit openings, 1/2 in. female NPT			
<b>Agency Approvals</b>	cULus E258676, CE			

**GLM-143067-AS**



**GLS-142053**



**GLS-SS-144020-AS**



Series	GLM	GLS	GLS-SS
<b>Prices start at</b>	\$113.00	\$123.00	\$258.00
<b>Description</b>	Safety switch, cable-pull interlock operated, with reset. Protection up to 50 meters (164 ft)	Safety switch, cable-pull interlock operated, with reset. Protection up to 80 meters (262 ft)	Safety switch, cable-pull interlock operated, with reset. Protection up to 100 meters (328 ft)
<b>Construction Material</b>	57 mm wide, die-cast aluminum body	63 mm wide, die-cast aluminum body	65 mm wide, 316 stainless steel body
<b>Degree of Protection (IEC529)</b>	IEC IP67		IEC IP67, IP69K
<b>Mechanical Service Life</b>	1.5 x 10 <sup>6</sup> operations at 100 mA load		
<b>Conduit Opening</b>	Three conduit openings, 1/2 in. female NPT		
<b>Agency Approvals</b>	cULus E258676, CE		

# IDEM Inch Safety Switches

## Inch Series Housing

- Tongue interlocking switch
- Designed to fit leading edge, hinged or lift off machine guards
- 16.5 mm- 18mm mounting profile (Inch-X); 16.5 mm- 22mm mounting profile (MK-1)
- M16, 1/2" NPT threaded opening or M12 quick disconnect connection
- 90 degree adjustable head

- Standard and compact housings
- Force guided NC contacts
- Rotating heads with dual actuator entry
- Purchase actuating key separately (See accessories)

**See electrical specifications later in this section.**

### IDEM Inch Series



IDEM Inch Safety Switches								
Part Number	Price	Body Material	Head Material	Weight (lbs)	Actuator Travel / Force for Positive Opening	Contact Configuration	Connection	Dimensions
<b>INCH-1 Miniature Tongue Interlock Safety Switch</b>								
<b>INCH-1-222001</b>	\$29.50	Plastic	316 stainless steel	0.29	6mm/12N	2 N.C. Slow action	1 x M16	Figure 1
<b>INCH-1-222002</b>	\$63.00			0.32			M12 Quick disconnect	
<b>INCH-1-222003</b>	\$29.50			0.29		1 N.O., 1 N.C. Slow action, break before make	1 x M16	
<b>INCH-1-222004</b>	\$63.00			0.32		M12 Quick disconnect		
<b>INCH-3 Miniature Tongue Interlock Safety Switch</b>								
<b>INCH-3-223001</b>	\$32.50	Plastic	316 stainless steel	0.29	6mm/12N	1 N.O., 2 N.C. Slow action, break before make	3 x M16	Figure 2
<b>INCH-3-223002</b>	\$66.00			0.32			M12 Quick disconnect	
<b>MK1-SS Miniature Tongue Interlock Safety Switch</b>								
<b>MK1-SS-224001</b>	\$89.50	316 stainless steel		0.70	6mm/12N	1 N.O., 2 N.C. Slow action, break before make	1 x M20	Figure 3
<b>MK1-SS-224002</b>	\$89.50			0.70			1 x 1/2" NPT	
<b>MK1-SS-224003</b>	\$123.00			0.75			M12 Quick disconnect	

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZiPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

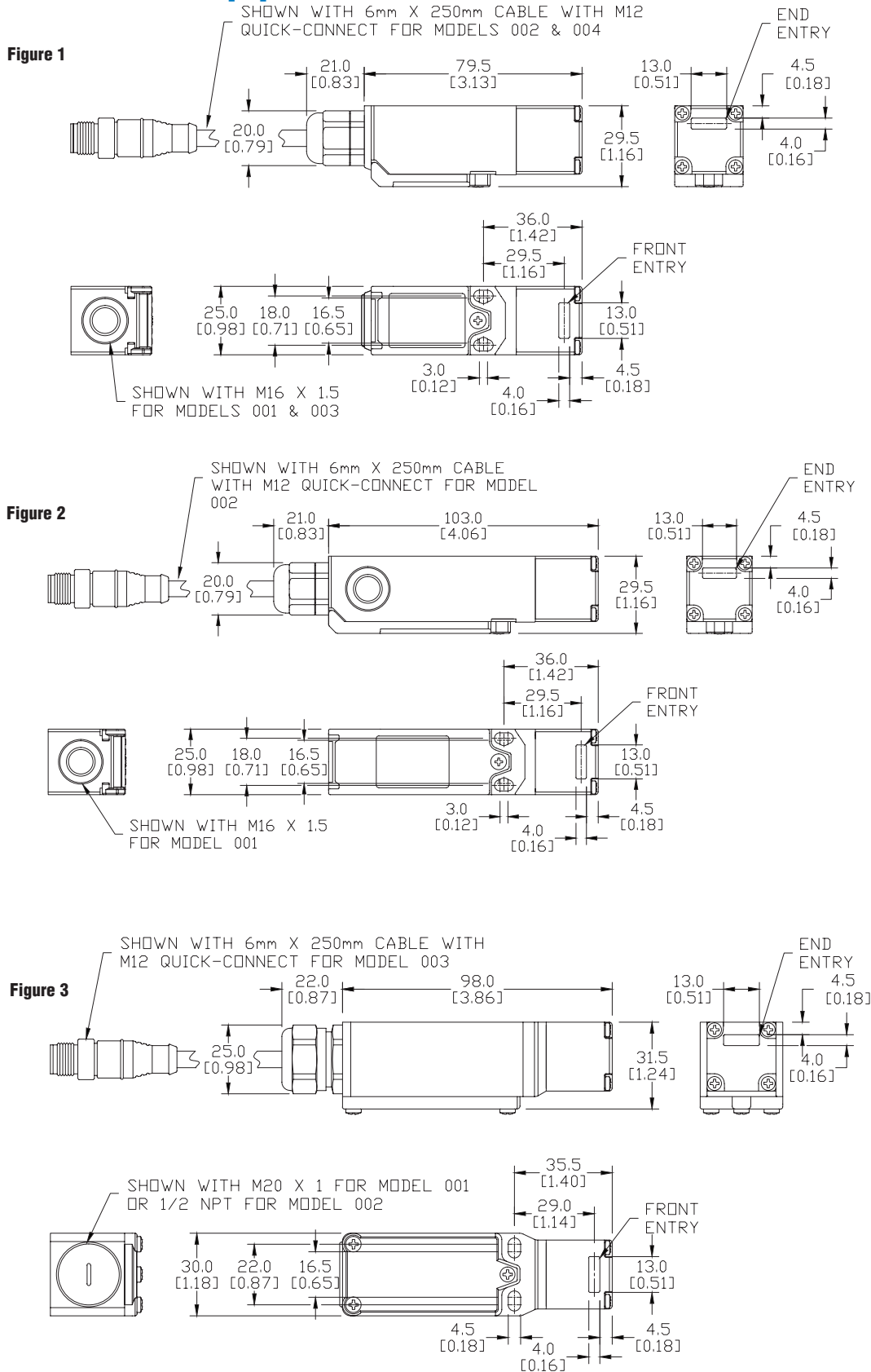
Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# IDEM Inch Safety Switches

## Dimensions mm[in]



See our website, [www.AutomationDirect.com](http://www.AutomationDirect.com), for complete Engineering drawings.



# IDEM Inch Hinge Safety Switches

## Inch Hinge Series Housing

### IDEM Inch Hinge Series



- Shaft hinge (Idem Inch Hinge) interlock operated
- M16, M20, 1/2" NPT threaded opening or M12 connection
- 16.5 mm- 18mm mounting profile (Inch-X); 16.5 mm- 22mm mounting profile (MK-1)
- 25mm plastic, 30mm stainless steel housings

- Compact body
- Plastic and stainless steel housings
- 90 degree adjustable head
- Force guided NC contacts

**See electrical specifications later in this section.**

IDEM Inch Hinge Safety Switches									
Part Number	Price	Body Material	Head Material	Weight (lbs)	Actuator Travel / Force for Positive Opening	Contact Configuration	Shaft Size	Connection	Dimensions
<b>HC-1 Hinge Interlock Safety Switch</b>									
<b>HC-1-193001</b>	\$31.50	Plastic	316 Stainless steel	0.29	7 degrees/0.5N	2 N.C. Slow action	Solid diameter 10mm x 80mm	1 x M16	Figure 1
<b>HC-1-193002</b>	\$62.50			0.32				M12 Quick disconnect	
<b>HC-1-193003</b>	\$30.00			0.29			1 x M16		
<b>HC-1-193004</b>	\$59.00			0.32				M12 Quick disconnect	
<b>HC-1-193005</b>	\$30.00			0.29			1 x M16		
<b>HC-1-193006</b>	\$59.00			0.32				M12 Quick disconnect	
<b>HC-1-193007</b>	\$33.00			0.29			1 x M16		
<b>HC-1-193008</b>	\$65.50			0.32				M12 Quick disconnect	
<b>HC-1-193009</b>	\$31.50			0.29		1 x M16			
<b>HC-1-193010</b>	\$62.50			0.32			M12 Quick disconnect		
<b>HC-1-193011</b>	\$30.00			0.29		1 x M16			
<b>HC-1-193012</b>	\$59.00			0.32			M12 Quick disconnect		
<b>HC-1-193013</b>	\$30.00			0.29		1 x M16			
<b>HC-1-193014</b>	\$59.00			0.32			M12 Quick disconnect		
<b>HC-1-193015</b>	\$33.00			0.29		1 x M16			
<b>HC-1-193016</b>	\$65.50			0.32			M12 Quick disconnect		

- Company Information
- Terminal Blocks
- Power Distribution Blocks
- Wiring Accessories
- ZIPLink Connection System
- Multi-wire Connectors
- Sensor Cables and Connectors
- M12 Junction Blocks
- Panel Interface Connectors
- Wiring Duct
- Cable Ties
- Wire
- Bulk Multi-conductor Cables
- Wire Management Products
- Power Supplies
- DC Converters
- Transformers and Filters
- Circuit Protection
- Tools
- Test Equipment
- Enclosures
- Enclosure Climate Control
- Safety: Electrical Components
- Safety: Protective Wear
- Terms and Conditions

# IDEM Inch Hinge Safety Switches

## Inch Hinge Series Housing

IDEM Inch Hinge Safety Switches									
Part Number	Price	Body Material	Head Material	Weight (lbs)	Actuator Travel / Force for Positive Opening	Contact Configuration	Shaft Size	Connection	Dimensions
<b>HC-3 Hinge Interlock Safety Switch</b>									
<b>HC-3-194001</b>	\$34.00	Plastic	316 Stainless steel	0.29	7 degrees/0.5N	1 N.O., 2 N.C. Slow action, break before make	Solid diameter 10mm x 80mm	3 x M16	Figure 2
<b>HC-3-194002</b>	\$65.00			0.32				M12 Quick disconnect	
<b>HC-3-194003</b>	\$32.50			0.29			3 x M16		
<b>HC-3-194004</b>	\$62.00			0.32			M12 Quick disconnect		
<b>HC-3-194005</b>	\$32.50			0.29			3 x M16		
<b>HC-3-194006</b>	\$62.00			0.32			M12 Quick disconnect		
<b>HC-3-194007</b>	\$35.50			0.29			3 x M16		
<b>HC-3-194008</b>	\$68.00			0.32			M12 Quick disconnect		

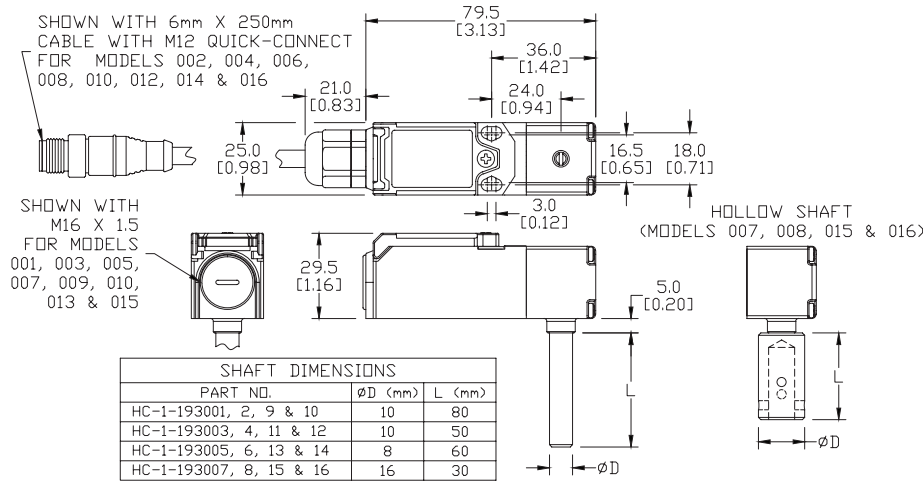
IDEM Inch Hinge Safety Switches									
Part Number	Price	Body Material	Head Material	Weight (lbs)	Actuator Travel / Force for Positive Opening	Contact Configuration	Shaft Size	Connection	Dimensions
<b>HC-SS Hinge Interlock Safety Switch</b>									
<b>HC-SS-195001</b>	\$91.00	316 Stainless steel		0.70	7 degrees/0.5N	1 N.O., 2 N.C. Slow action, break before make	Solid diameter 10mm x 80mm	3 x M20	Figure 3
<b>HC-SS-195002</b>	\$91.50			0.70				3 x 1/2" NPT	
<b>HC-SS-195003</b>	\$122.00			0.75				M12 Quick disconnect	
<b>HC-SS-195004</b>	\$90.00			0.70			3 x M20		
<b>HC-SS-195005</b>	\$90.00			0.70			3 x 1/2" NPT		
<b>HC-SS-195006</b>	\$119.00			0.75			M12 Quick disconnect		
<b>HC-SS-195007</b>	\$90.00			0.70			3 x M20		
<b>HC-SS-195008</b>	\$90.00			0.70			3 x 1/2" NPT		
<b>HC-SS-195009</b>	\$119.00			0.75			M12 Quick disconnect		
<b>HC-SS-195010</b>	\$93.00			0.70			3 x M20		
<b>HC-SS-195011</b>	\$93.00			0.70			3 x 1/2" NPT		
<b>HC-SS-195012</b>	\$125.00			0.75			M12 Quick disconnect		

# IDEM Inch Hinge Safety Switches

## Dimensions mm[in]

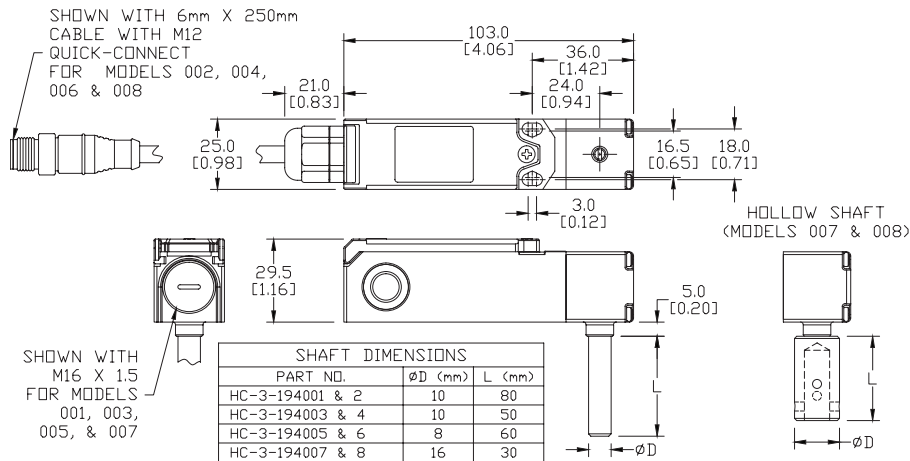
**Figure 1**

**HC-1**



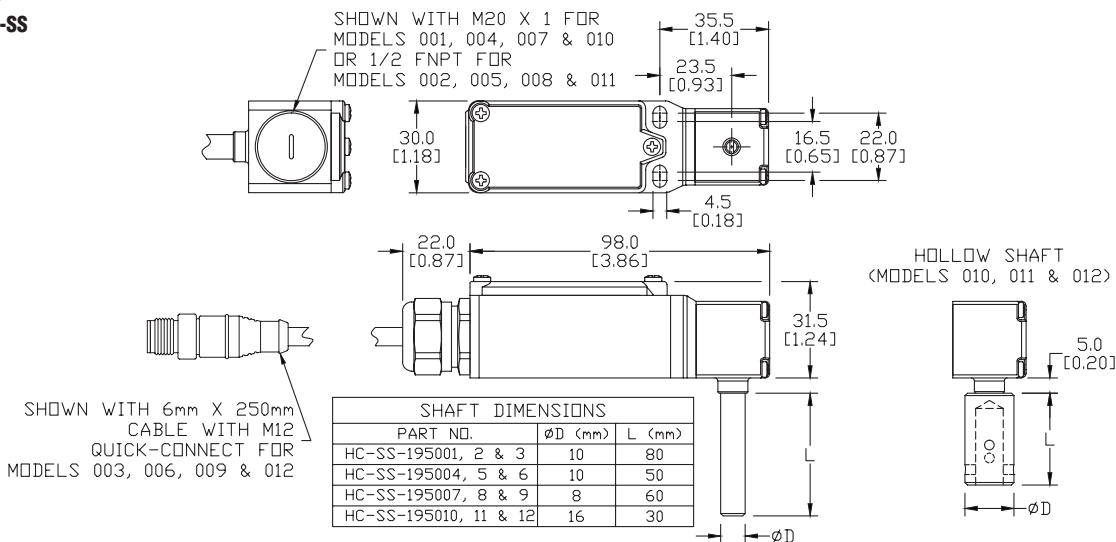
**Figure 2**

**HC-3**



**Figure 3**


**HC-SS**



See our website, [www.AutomationDirect.com](http://www.AutomationDirect.com), for complete Engineering drawings.

# IDEM IDIS Interlock Safety Switches

## IDIS Series Housing

- Tongue (key) (IDIS-1) or lever hinge (IDIS-2) interlock operated
  - 90 degree adjustable head
  - One 1/2 in. NPT female conduit opening
  - 22 mm mounting profile
  - Standard and compact housings
  - Force guided NC contacts 
  - Purchase actuating key separately (See accessories)
- See electrical specifications later in this section.**

IDEM IDIS-1 Tongue (Key) Interlock Safety Switches							
Part Number	Price	Body Material	Head Material	Weight (lbs)	Actuator Travel / Force for Positive Opening	Contact Configuration	Dimensions
IDIS-190051	\$26.00	Plastic	Plastic	0.35	6mm/12N	1 N.O., 2 N.C. Slow action	Figure 1
IDIS-190055	\$26.00					3 N.C. Slow action	Figure 1
IDIS-190059	\$26.00					1 N.O., 1 N.C. Snap action	Figure 1

IDIS-190051



IDEM IDIS-2 Hinge Interlock Safety Switches							
Part Number	Price	Body Material	Head Material	Weight (lbs)	Actuator Rotation / Force for Positive Opening	Contact Configuration	Dimensions
IDIS-192002	\$25.00	Plastic	Plastic	0.35	7 degrees / 0.5N	1 N.O., 2 N.C. Slow action	Figure 2
IDIS-192005	\$25.00					3 N.C. Slow action	Figure 2
IDIS-192008	\$25.00					1 N.O., 1 N.C. Snap action	Figure 2

IDIS-192002



## Dimensions mm[in]

Figure 1

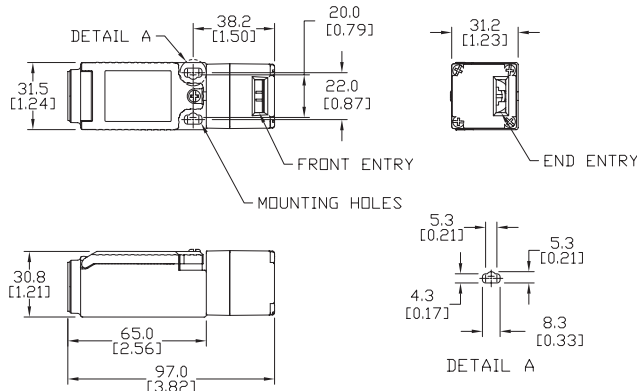
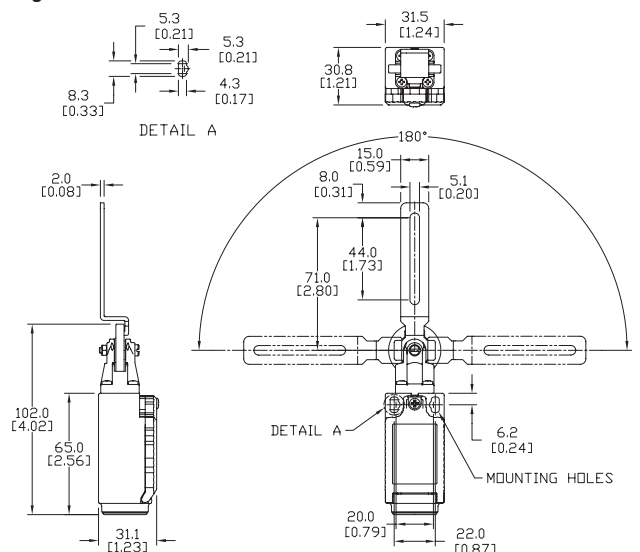


Figure 2



# IDEM KM/KM-SS Interlock Safety Switches

## KM/KM-SS Series Housing

- Tongue (key) interlock operated
- 90 degree adjustable head
- 8 actuator entry positions
- One 1/2 in. NPT female conduit opening
- Force guided NC contacts
- 30 mm mounting profile
- Aluminum and 316 stainless steel options available
- Includes one tamper-proof T20 Torx bit
- Purchase actuating key separately. (See accessories)

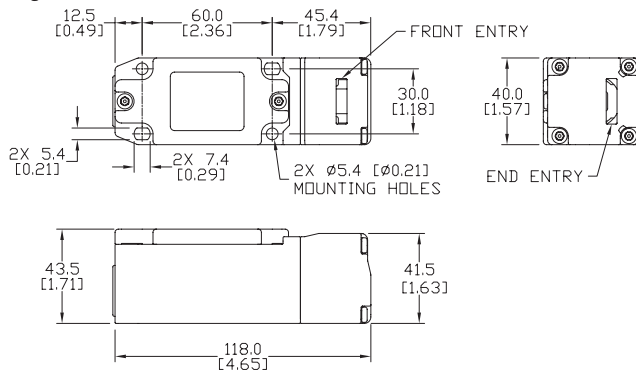
**See electrical specifications later in this section.**



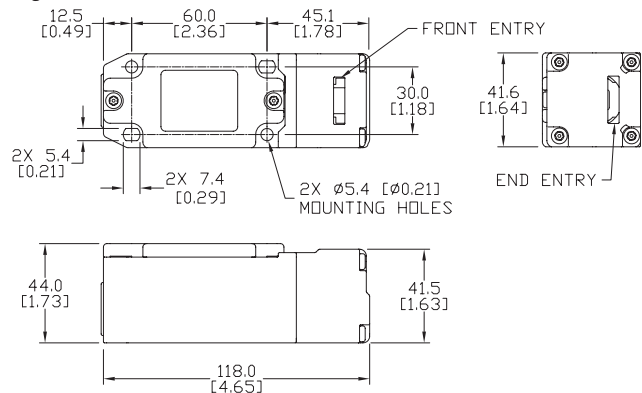
IDEM KM /KM-SS Interlock Safety Switches									
Part Number	Price	Body Material	Head Material	Weight (lbs)	Actuator Travel / Force for Positive Opening	Contact Configuration	Dimensions		
<b>KM-203002</b>	\$61.00	Die-cast aluminum	Die-cast aluminum	0.92	6mm/12N	1 N.O., 2 N.C. Slow action	Figure 1		
<b>KM-203008</b>	\$71.00					1 N.O., 3 N.C. Slow action	Figure 1		
<b>KM-203011</b>	\$71.00					2 N.O., 2 N.C. Slow action	Figure 1		
<b>KM-203002-SS</b>	\$81.00					316 stainless steel	1.1	1 N.O., 2 N.C. Slow action	Figure 2
<b>KM-203008-SS</b>	\$91.00							1 N.O., 3 N.C. Slow action	Figure 2
<b>KM-203011-SS</b>	\$93.00							2 N.O., 2 N.C. Slow action	Figure 2
<b>KM-SS-204002</b>	\$119.00	316 stainless steel	1.4	6mm/12N	1 N.O., 2 N.C. Slow action	Figure 2			
<b>KM-SS-204008</b>	\$128.00				1 N.O., 3 N.C. Slow action	Figure 2			
<b>KM-SS-204011</b>	\$128.00				2 N.O., 2 N.C. Slow action	Figure 2			

## Dimensions mm[in]

**Figure 1**




**Figure 2**



# IDEM KP/K-SS and K-15 Interlock Safety Switches

## KP/K-SS and K-15 Series Housing

- Tongue (key) interlock operated
  - 180 degree adjustable head
  - 4 actuator entry positions
  - Three 1/2 in. NPT female conduit openings
  - Force guided NC contacts 
  - 40 mm mounting profile
  - Purchase actuating key separately. (See accessories.)
- See electrical specifications later in this section.**

**KP-200002**



**KP-200002-SS**



**K-SS-208002**



IDEM KP/K-SS Interlock Safety Switches							
Part Number	Price	Body Material	Head Material	Weight (lbs)	Actuator Travel/Force for Positive Opening	Contact Configuration	Dimensions
<b>KP-200002</b>	\$39.00	Plastic	Plastic	0.7	6mm/12N	1 N.O., 2 N.C. Slow action	Figure 1
<b>KP-200008</b>	\$50.00					1 N.O., 3 N.C. Slow action	Figure 1
<b>KP-200011</b>	\$50.00					2 N.O., 2 N.C. Slow action	Figure 1
<b>KP-200002-SS</b>	\$60.00		316 stainless steel	0.85		1 N.O., 2 N.C. Slow action	Figure 2
<b>KP-200008-SS</b>	\$68.00					1 N.O., 3 N.C. Slow action	Figure 2
<b>KP-200011-SS</b>	\$68.00					2 N.O., 2 N.C. Slow action	Figure 2
<b>K-SS-208002</b>	\$114.00	316 stainless steel		1.63	1 N.O., 2 N.C. Slow action	Figure 3	
<b>K-SS-208008</b>	\$123.00				1 N.O., 3 N.C. Slow action	Figure 3	
<b>K-SS-208011</b>	\$123.00				2 N.O., 2 N.C. Slow action	Figure 3	

**K-15-207002**



**K-15-207002-SS**

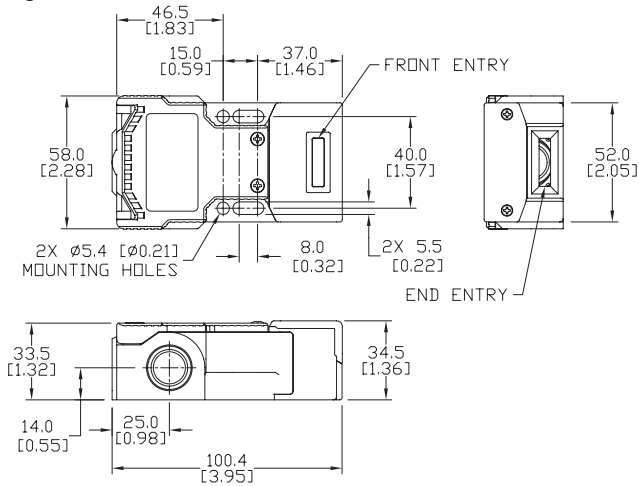


IDEM K-15 Interlock Safety Switches							
Part Number	Price	Body Material	Head Material	Weight (lbs)	Actuator Travel / Force for Positive Opening	Contact Configuration	Dimensions
<b>K-15-207002</b>	\$39.00	Plastic	Plastic	0.66	6mm/12N	1 N.O., 2 N.C. Slow action	Figure 4
<b>K-15-207005</b>	\$39.00					3 N.C. Slow action	Figure 4
<b>K-15-207002-SS</b>	\$57.00		316 Stainless Steel	0.8		1 N.O., 2 N.C. Slow action	Figure 5
<b>K-15-207005-SS</b>	\$57.00					3 N.C. Slow action	Figure 5

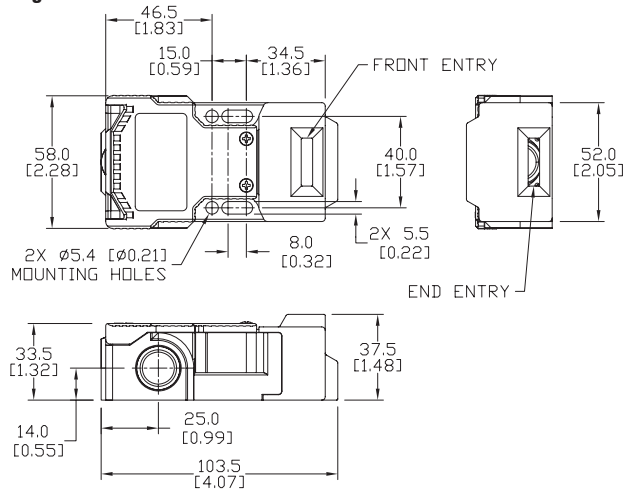
# IDEM KP/K-SS and K-15 Interlock Safety Switches

## Dimensions mm[in]

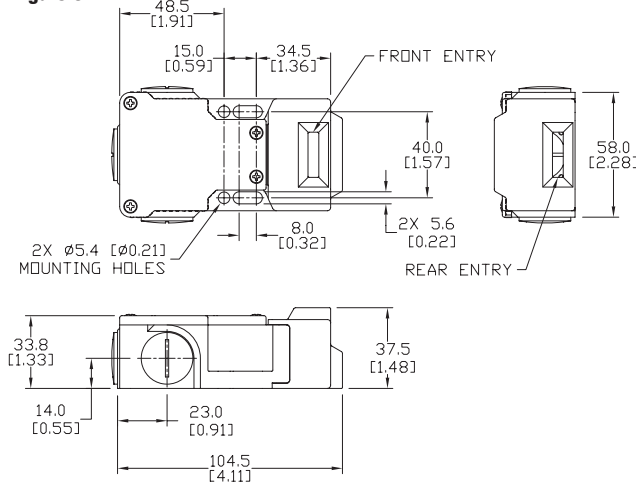
**Figure 1**



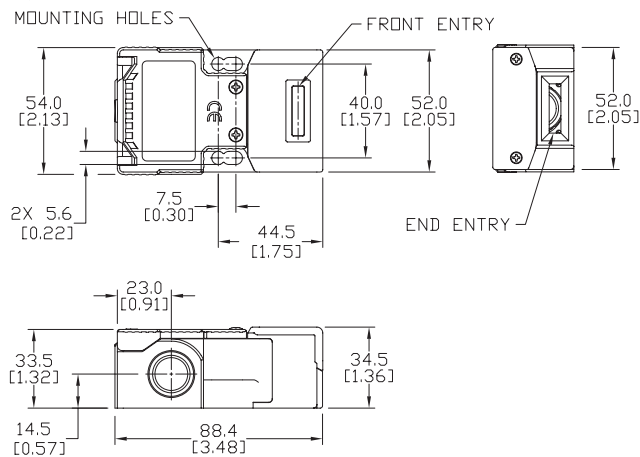
**Figure 2**



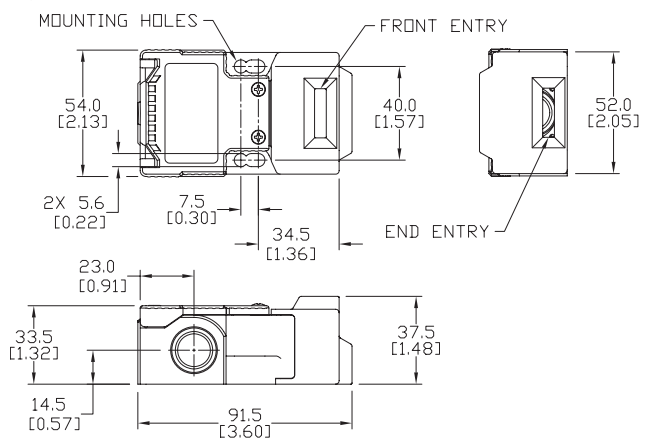
**Figure 3**



**Figure 4**



**Figure 5**



Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# IDEM Interlock Safety Accessories

## Actuator Keys

- 14 available keys
- All keys are 316 stainless steel
- Flexible key options available



IDEM Interlock Safety Switch Actuator Tongue (Keys)										
Part Number	Price	Description	Use with:					Weight (lbs)	Minimum Entry Radius	Dimensions
			IDIS-1	KP/K15	K-SS/KM/KM-SS	INCH	MK1			
140103	\$6.50	14.4 mm mounting hole spacing, 90° bent stainless steel key/mounting tab	✓					0.03	175mm	Figure 1
140104	\$6.50	14.4 mm mounting hole spacing, straight stainless steel key/mounting tab	✓					0.03	175mm	Figure 2
140105	\$11.50	40mm mounting hole spacing, stainless steel key with polyester flexible mounting tab	✓					0.06	100mm	Figure 3
140106	\$6.50	40mm mounting hole spacing, 90° stainless steel key/mounting tab		✓**				0.07	175mm	Figure 4
140107	\$6.50	40mm mounting hole spacing, 90° stainless steel key/mounting tab		✓*	✓			0.07	175mm	Figure 5
140108	\$6.50	20mm mounting hole spacing, straight stainless steel key with plastic stop		✓	✓			0.07	175mm	Figure 6
140109	\$11.50	40mm mounting hole spacing, stainless steel key with polyester flexible mounting tab		✓	✓			0.10	100mm	Figure 7
140110	\$24.00	40mm mounting hole spacing, stainless steel key with black-painted aluminum flexible mounting tab		✓	✓			0.16	100mm	Figure 8
140111	\$47.00	40mm mounting hole spacing, stainless steel key with mirror polished stainless steel flexible mounting tab		✓	✓			0.22	100mm	Figure 9
140130	\$25.50	IDEM lockout actuator, stainless steel, for use with IDEM tongue (key) switches		✓	✓					Figure 10
140179	\$14.00	IDEM key guide, 316 stainless steel. Mounting hardware included. For use with IDEM INCH series safety switches				✓			NA	Figure 15
140179-SS	\$14.00	IDEM key guide, 316 stainless steel. For use with IDEM MK1 series safety switches					✓			
140180	\$7.00	IDEM actuator tongue (key), 8mm mounting hole spacing, 316 stainless steel, 90 degree mounting tab. For use with IDEM MK1 and INCH series safety switches				✓	✓	0.10	150mm	Figure 16
140181	\$7.00	IDEM actuator tongue (key), 15mm mounting hole spacing, 316 stainless steel, straight mounting tab, shock absorbing. For use with IDEM MK1 and INCH series safety switches				✓	✓			Figure 17
140182	\$12.00	IDEM actuator tongue (key), 40mm mounting hole spacing, 316 stainless steel, flexible mounting tab. For use with IDEM MK1 and INCH series safety switches				✓	✓		100mm	Figure 18

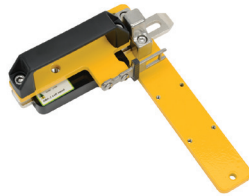


# IDEM Interlock Safety Accessories

## Accessories

- Gate bolt kits provide a sliding latch and lockout for swinging or sliding doors
- Comes with handle and flat actuator
- Sliding action prevents accidental closure
- Requires four M5 x 45mm mounting hardware (not included)
- Gate bolt kit materials: ABS plastic handle; mild steel yellow plate; aluminum black base; mild steel plated bar (inserts into guide); stainless steel guide and key

**GBA-1-210003**



**GBA-1-210004**



**GB - 210005**



**GB - 210006**



IDEM Interlock Safety Switch Accessories						
Part Number	Price	Description	Use with:		Weight (lbs)	Dimensions
			KM	GBA-1		
<b>GBA-1-210003</b>	\$90.00	IDEM gate bolt, left hand version, for use with KM series safety switches. Includes actuating tongue (key).	✓		3.7	Figure 11
<b>GBA-1-210004</b>	\$90.00	IDEM gate bolt, right hand version, for use with KM series safety switches. Includes actuating tongue (key).	✓		3.7	Figure 12
<b>GB-210005</b>	\$12.00	IDEM rear escape handle, for use with GBA-1 and GBL-1 series gate bolts		✓	0.1	Figure 13
<b>GB-210006</b>	\$12.00	IDEM spring loaded catch, for use with GBA-1 and GBL-1 series gate bolts		✓	0.08	Figure 14

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

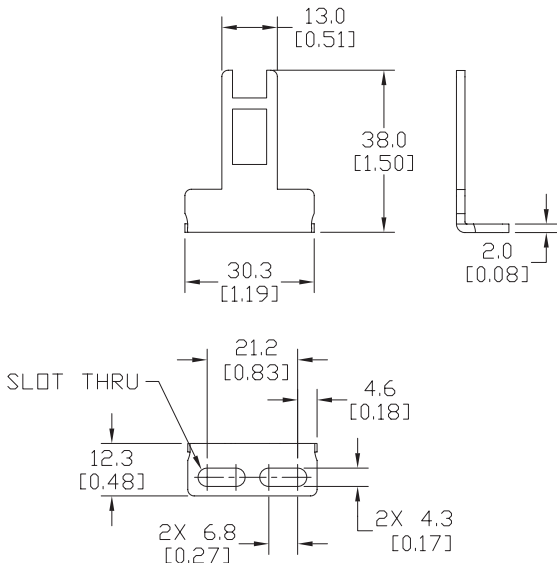
Safety: Protective Wear

Terms and Conditions

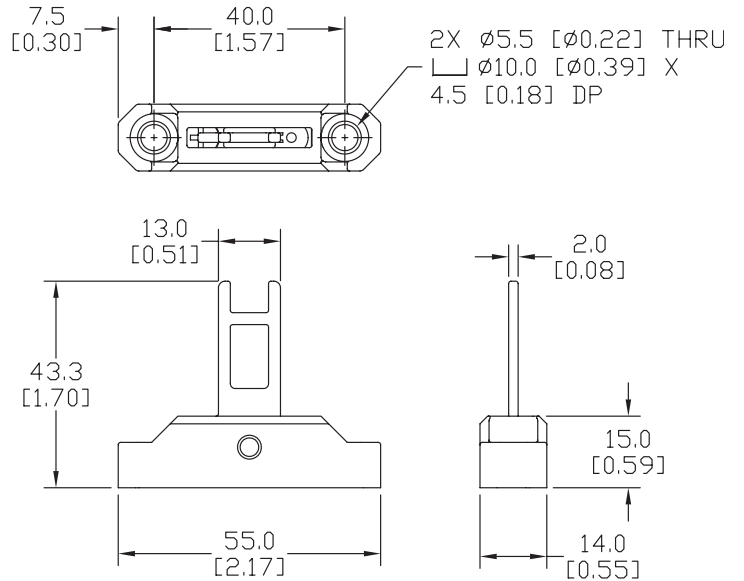
# IDEM Interlock Safety Accessories

## Dimensions mm[in]

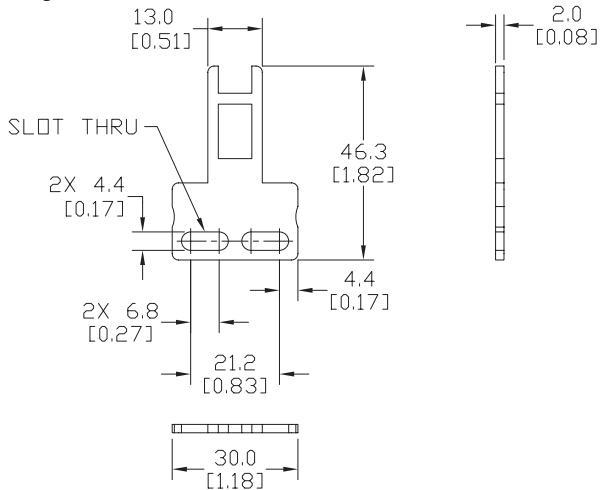
**Figure 1**



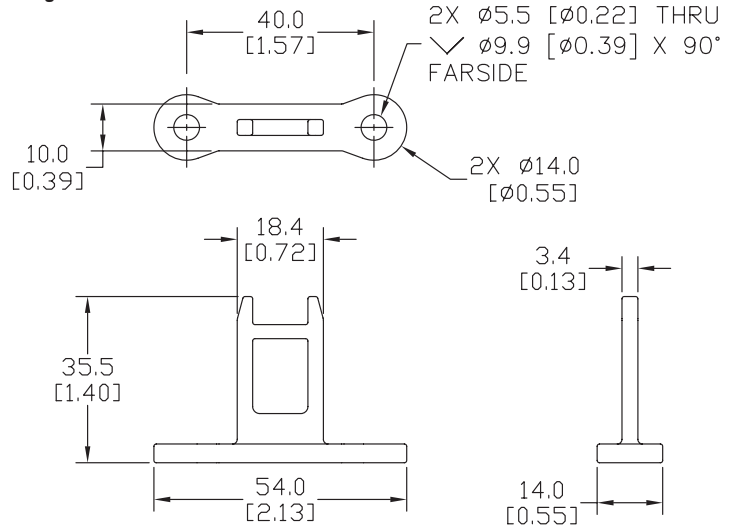
**Figure 3**



**Figure 2**



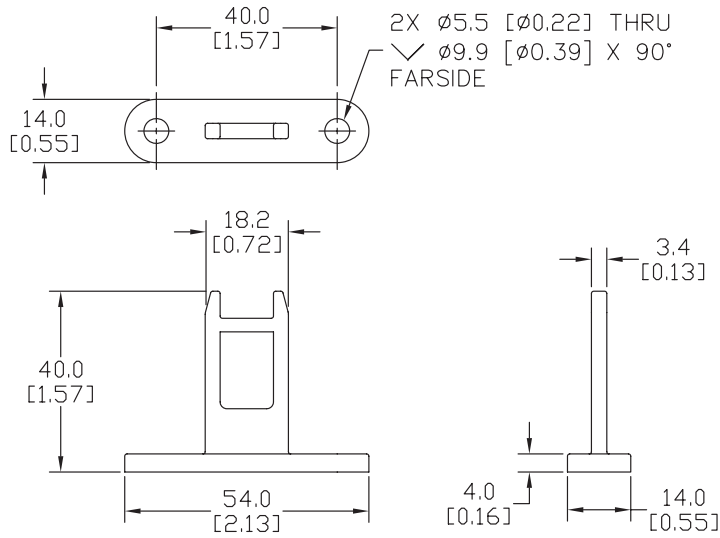
**Figure 4**



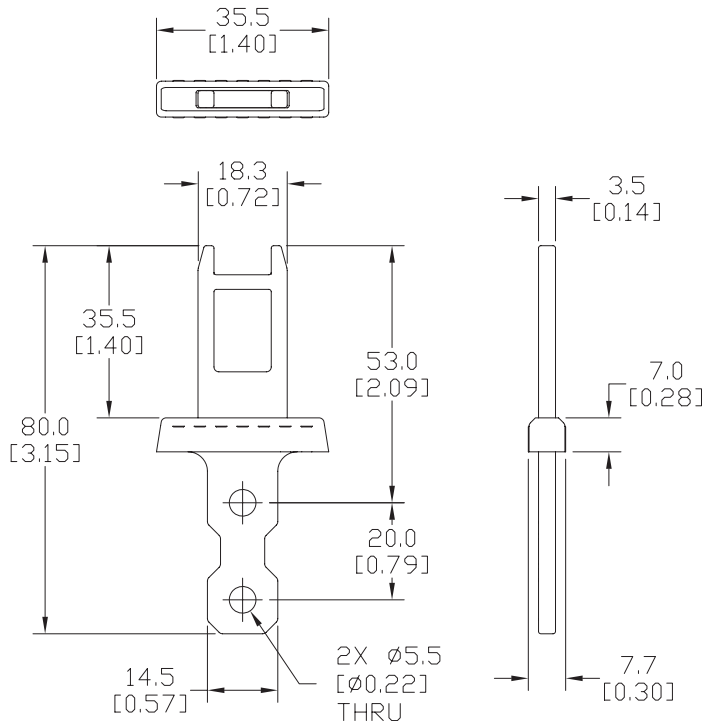
# IDEM Interlock Safety Accessories

## Dimensions mm[in]

**Figure 5**



**Figure 6**



Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# IDEM Interlock Safety Accessories

## Dimensions mm[in]

Figure 7

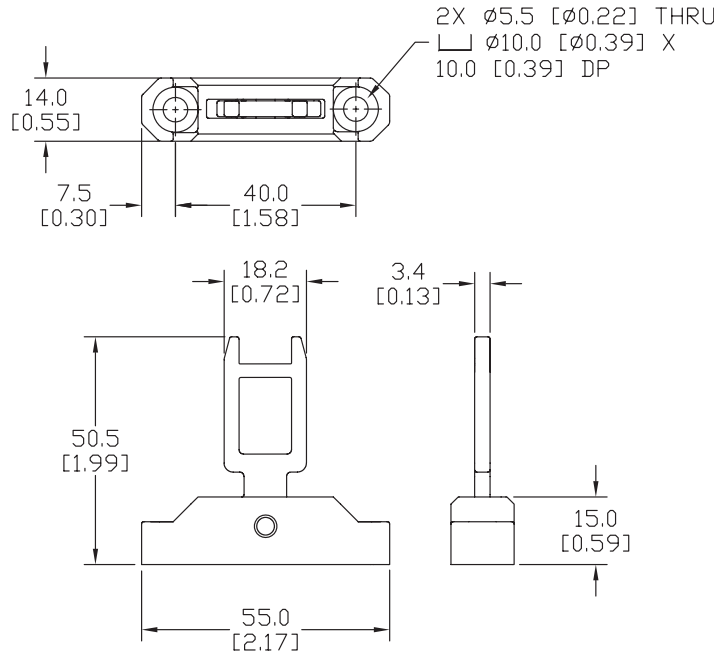
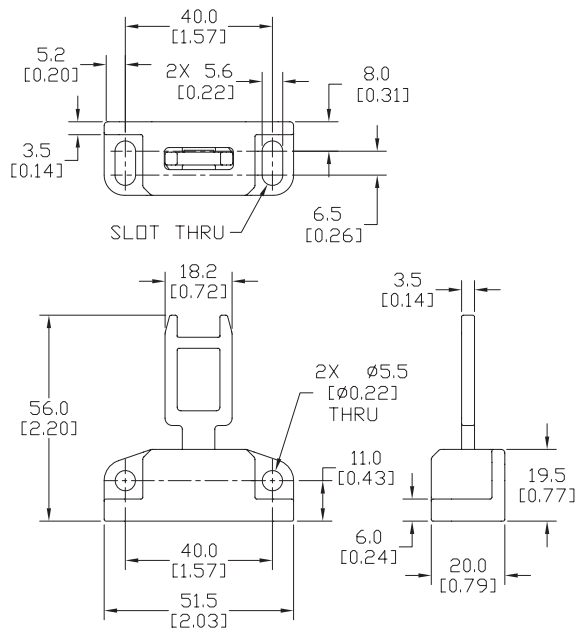


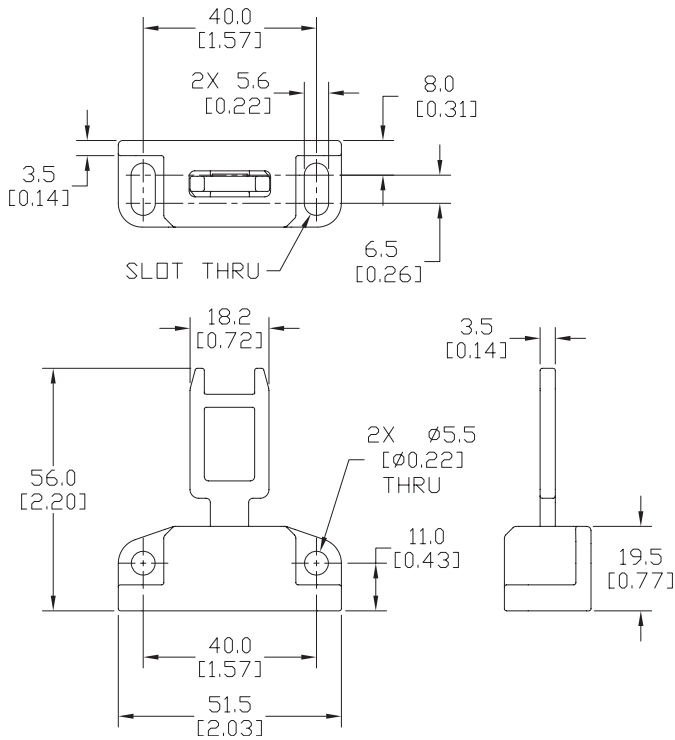
Figure 8



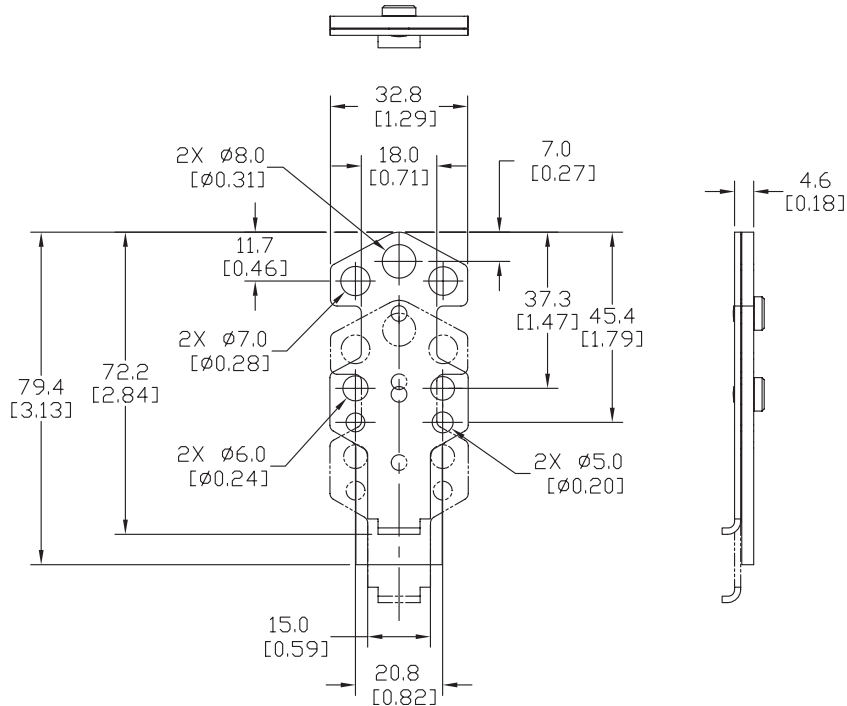
# IDEM Interlock Safety Accessories

## Dimensions mm[in]

**Figure 9**



**Figure 10**



Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# IDEM Interlock Safety Accessories

## Dimensions mm[in]

Figure 11

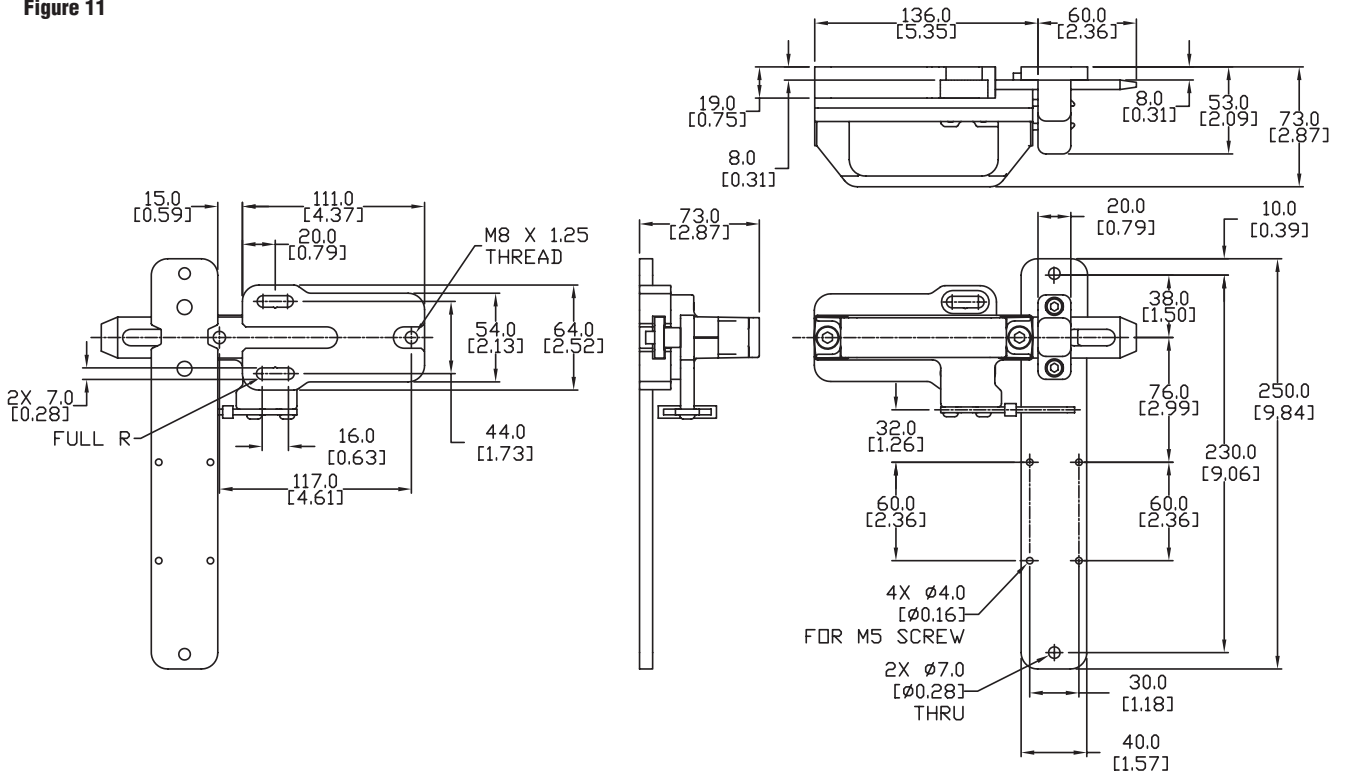
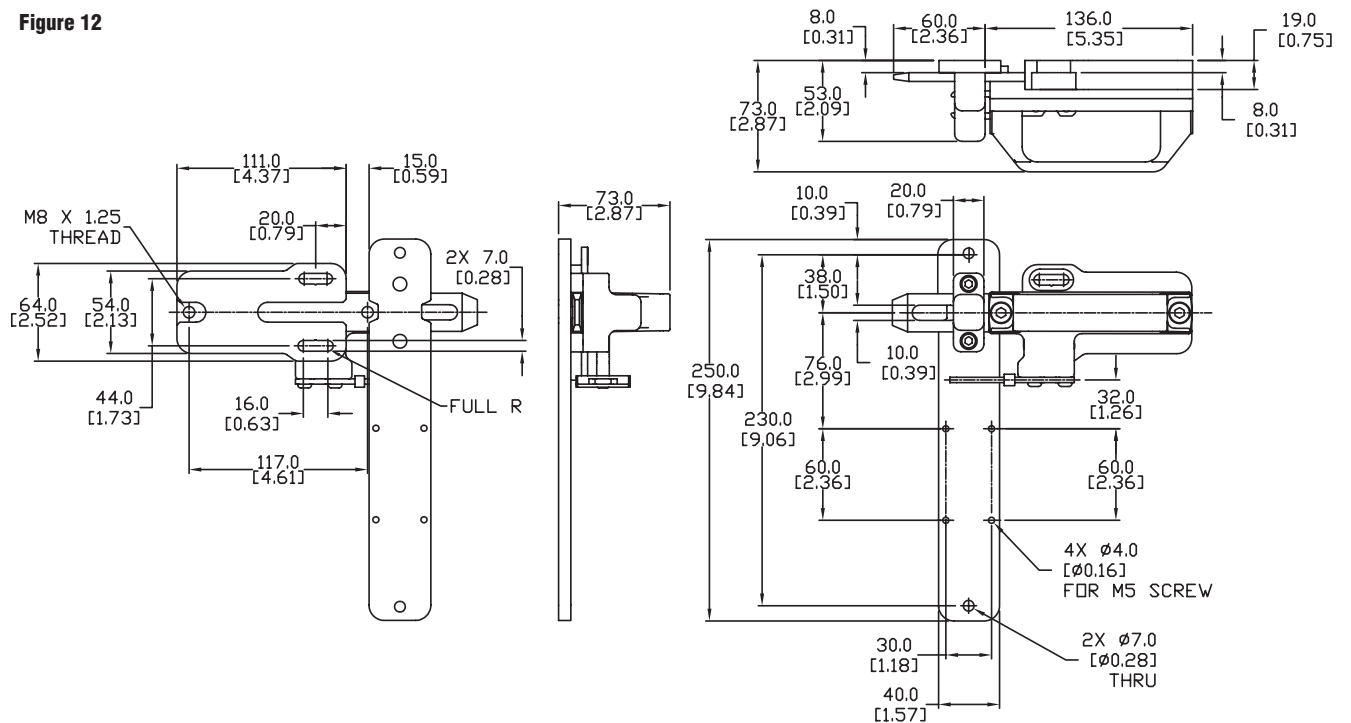


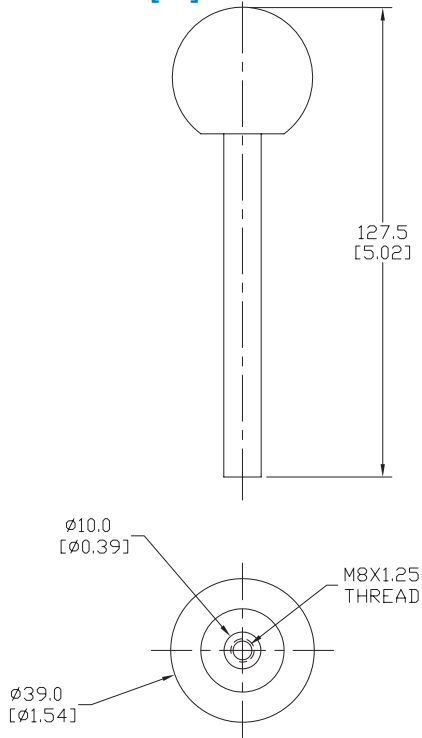
Figure 12



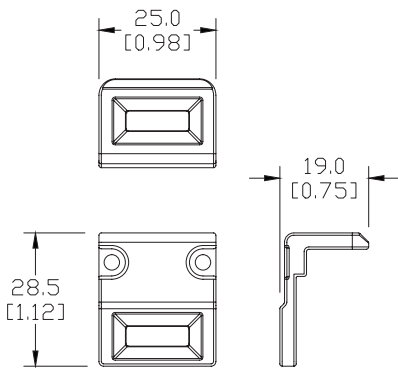
# IDEM Interlock Safety Accessories

## Dimensions mm[in]

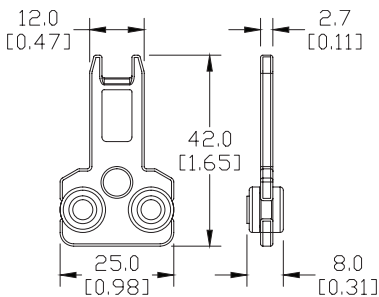
**Figure 13**



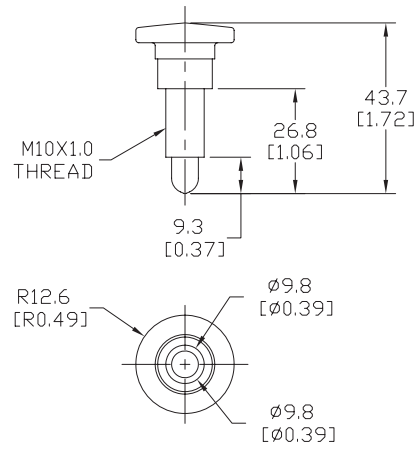
**Figure 15**



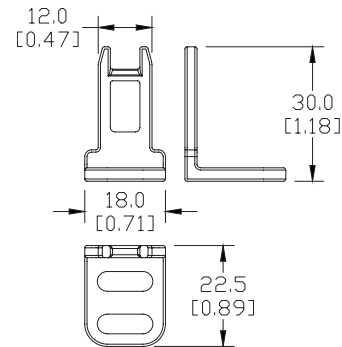
**Figure 17**



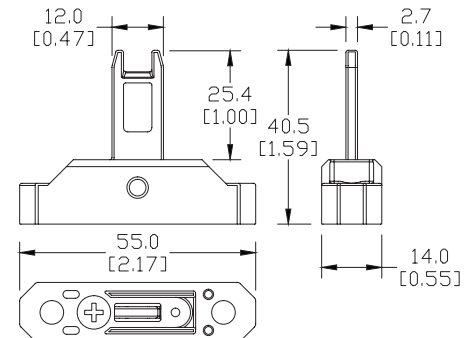
**Figure 14**



**Figure 16**



**Figure 18**



See our website, [www.AutomationDirect.com](http://www.AutomationDirect.com), for complete Engineering drawings.

# IDEM GM and GLS Safety Rope Switches

## GLM and GLS Series Pull Cord Housings

- Three 1/2 in. NPT female fittings
  - Includes one tamper-proof T20 Torx bit
  - 57 mm, 63 mm, and 65 mm mounting profiles
  - Rope Pull kits sold separately and recommended for increased reliability
  - 50m, 80m, and 100m length systems
- See electrical specifications later in this section.**

IDEM GLM/GLS Interlock Safety Switches								
Part Number	Price	Construction Material	Weight (lbs)	E-Stop	LED	Maximum Rope Length	Contact Configuration	Dimensions
GLM-143002	\$113.00	57 mm Die-cast Aluminum	1.5	No	No	50m/164 ft.*	1 N.O., 2 N.C. Slow	Figure 1
GLM-143051	\$123.00		1.5	No	No		1 N.O., 3 N.C.	Figure 1
GLM-143053	\$123.00		1.5	No	No		2 N.O., 2 N.C.	Figure 1
GLM-143057	\$145.00		1.6	Yes	No		1 N.O., 3 N.C.	Figure 1
GLM-143067-AS	\$161.00		1.7	Yes	24VDC		1 N.O., 3 N.C.	Figure 2
GLM-143067-BS	\$165.00		1.7	Yes	110VAC		1 N.O., 3 N.C.	Figure 2
GLS-142002	\$123.00	63 mm Die-cast Aluminum	1.75	No	No	80m/262 ft.*	1 N.O., 2 N.C.	Figure 3
GLS-142051	\$137.00		1.75	No	No		1 N.O., 3 N.C.	Figure 3
GLS-142053	\$137.00		1.75	No	No		2 N.O., 2 N.C.	Figure 3
GLS-142063	\$155.00		1.85	Yes	No		1 N.O., 3 N.C.	Figure 3
GLS-142075-AS	\$174.00		1.9	Yes	24VDC		1 N.O., 3 N.C.	Figure 4
GLS-142075-BS	\$181.00		1.9	Yes	110VAC		1 N.O., 3 N.C.	Figure 4
GLS-SS-144002	\$258.00	65 mm Stainless Steel	4.2	No	No	100m/328 ft.*	1 N.O., 3 N.C.	Figure 5
GLS-SS-144004	\$258.00		4.2	No	No		2 N.C., 2 N.O.	Figure 5
GLS-SS-144014	\$299.00		4.3	Yes	No		1 N.O., 3 N.C.	Figure 5
GLS-SS-144020-AS	\$332.00		4.4	Yes	24VDC		1 N.O., 3 N.C.	Figure 6
GLS-SS-144020-BS	\$337.00		4.4	Yes	110VAC		1 N.O., 3 N.C.	Figure 6

GLM-143067-AS



GLS-142053



GLS-SS-144020-AS



\*See Recommended Rope Span Options and Fittings for number of switches recommended with specific maximum rope lengths.

## Cable Kits for IDEM Cable-Pull Safety Switches

- One end of cables terminated with a thimble, permanent clamp, and a threaded quick link
- Kit includes everything needed for installation
- 4 mm diameter cable with red plastic coating
- 4 mm Allen key

Cable Kits for IDEM Cable-Pull Safety Switches					
Part Number	Price	Description	Cable Length	Construction Material	Weight (lbs)
140002	\$60.00	Includes (1) cable, (5) eyebolts, (1) tensioner / gripper and (1) allen key.	10m/32 ft.	galvanized steel	0.8
140011	\$81.00			stainless steel	1.3
140004	\$81.00	Includes (1) cable, (9) eyebolts, (1) tensioner / gripper and (1) allen key.	20m/65 ft.	galvanized steel	2.2
140013	\$99.00			stainless steel	2.9
140005	\$93.00	Includes (1) cable, (12) eyebolts, (1) tensioner / gripper and (1) allen key.	30m/98 ft.	galvanized steel	2.8
140014	\$114.00			stainless steel	3.9
140006	\$112.00	Includes (1) cable, (20) eyebolts, (1) tensioner / gripper and (1) allen key.	50m/164 ft.	galvanized steel	4.5
140015	\$129.00			stainless steel	6.0
140007	\$123.00	Includes (1) cable, (30) eyebolts, (2) tensioner / grippers and (1) allen key.	80m/262 ft.	galvanized steel	7.0
140016	\$164.00			stainless steel	9.5

140002





# IDEM GLM and GLS Safety Rope Switches

## Dimensions mm[in]

Figure 1

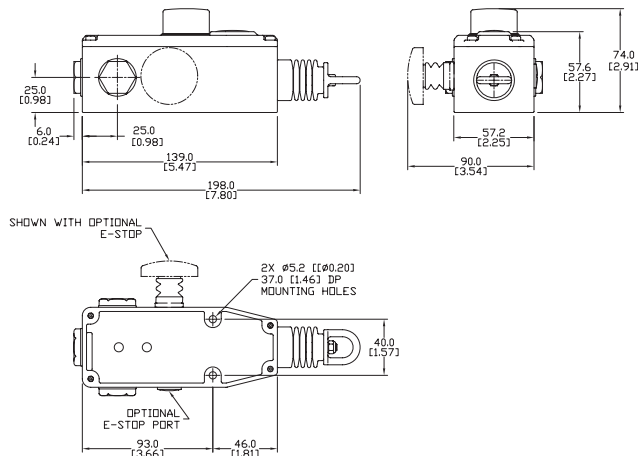


Figure 2

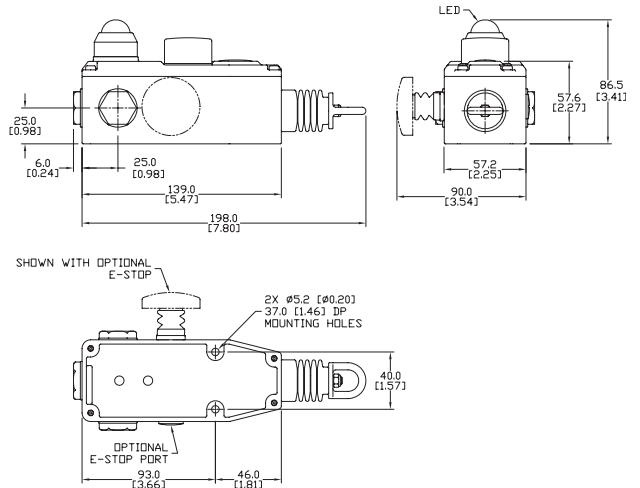


Figure 3

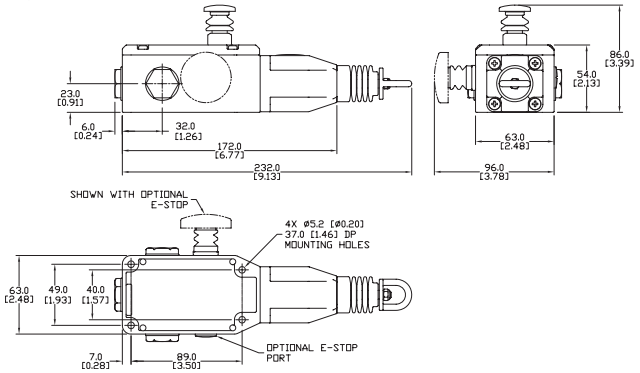


Figure 4

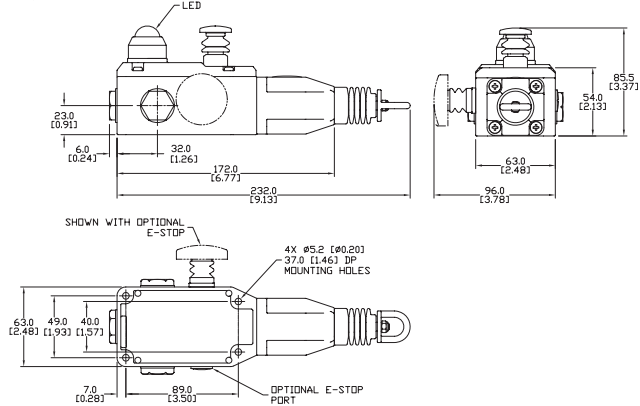


Figure 5

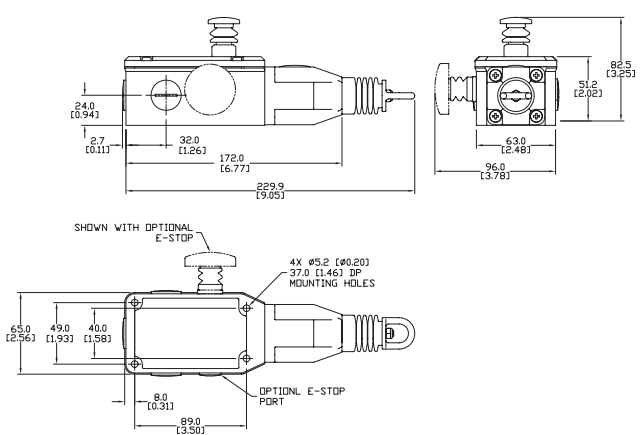
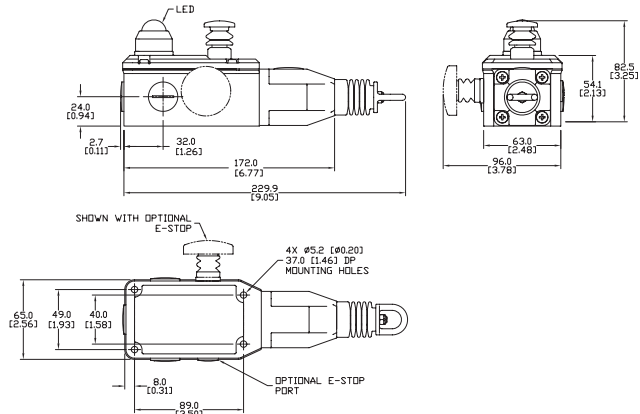


Figure 6



Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# IDEM Interlock Safety Rope Switch Accessories

Steel Cable for IDEM Cable-Pull Safety Switches				
Part Number	Price	Description	Cable Length	Weight (lbs)
140033	\$11.50	5 meter length steel cable, 4mm diameter, red	5m/16 ft.	0.35
140034	\$19.00	10 meter length steel cable, 4mm diameter, red	10m/32 ft.	0.7
140036	\$29.00	20 meter length steel cable, 4mm diameter, red	20m/65 ft.	1.4
140037	\$36.00	30 meter length steel cable, 4mm diameter, red	30m/98 ft.	2.1
140038	\$50.00	50 meter length steel cable, 4mm diameter, red	50m/164 ft.	3.5
140039	\$76.00	80 meter length steel cable, 4mm diameter, red	80m/262 ft.	5.4
140040	\$86.00	100 meter length steel cable, 4mm diameter, red	100m/328 ft.	6.6
140041	\$99.00	126 meter length steel cable, 4mm diameter, red	126m/413 ft.	8.42



IDEM Interlock Safety Switch Accessories					
Part Number	Price	Description	Construction Material	Weight (lbs)	Dimensions
140019	\$47.00	Cable Tensioner / Gripper. Includes 4mm allen wrench	Stainless Steel	0.5	Figure 1
140020	\$30.00		Galvanized Steel	0.3	Figure 1
140021	\$24.00	Pulley assembly	Stainless Steel	0.3	Figure 2
140064	\$18.00		Galvanized Steel	0.2	Figure 2
140045	\$25.00	Eye bolt 84mm long, M8 x 1.25 threads. Includes (2) flat washers and (2) nuts per eye bolt. Package of 8.	Stainless Steel	0.8	Figure 3
140046	\$12.50		Galvanized Steel	0.5	Figure 3
140043	\$16.50	Spring, 220mm long	Stainless Steel	0.4	Figure 4
140132-AS	\$26.00	Replacement LED assembly, 24VDC, bi-color steady green and red. Use with GLM, GLS or GLS-SS series cable pull switches.	NA	0.08	NA
140132-BS	\$31.00	Replacement LED assembly, 110VAC, bi-color steady green and red. Use with GLM, GLS or GLS-SS series cable pull switches.	NA	0.08	NA



## Dimensions mm[in]

Figure 1

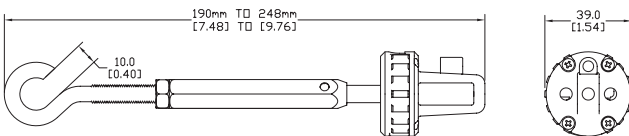


Figure 2

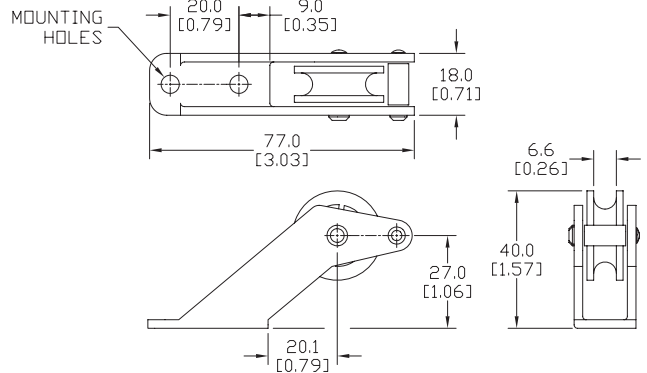


Figure 3

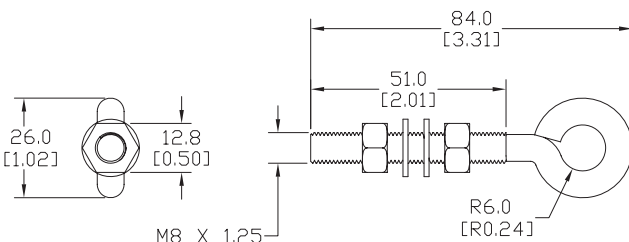
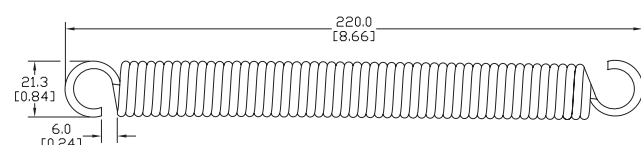


Figure 4



# IDEM Interlock Rope Span Options

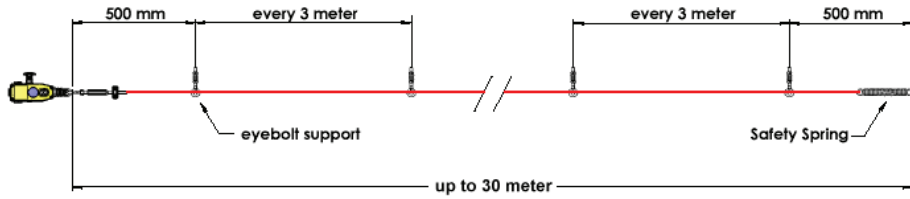
## Recommended Options and Fittings

Recommended options and fittings:

- Use two switches when using two pulleys
- When using a safety spring, use a maximum of one corner pulley

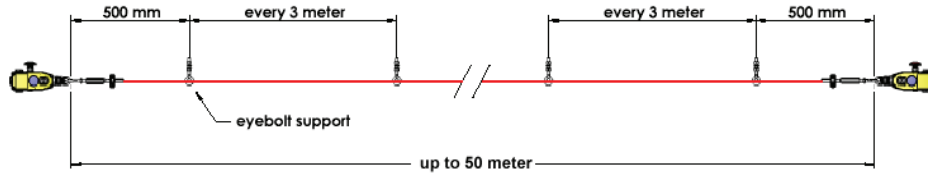
### GLM 30m

Up to 30m  
1 switch/1 spring



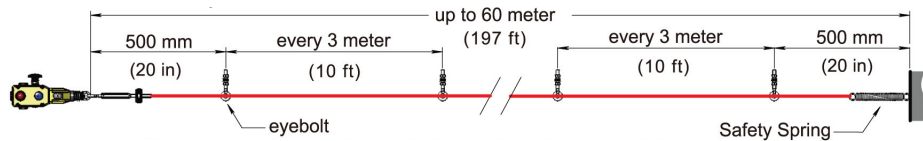
### GLM 50m

30 to 60m  
2 switches



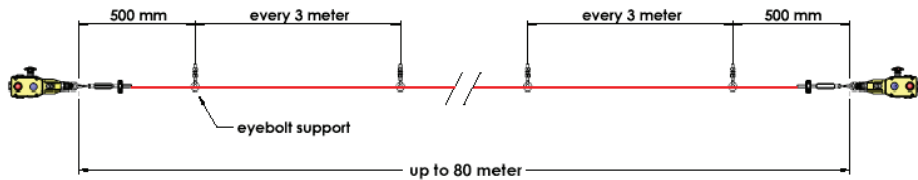
### GLS 60m

Up to 60m  
1 switch/1 spring



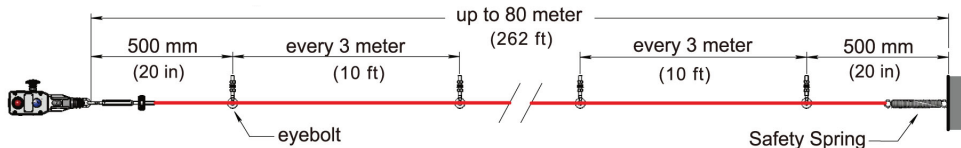
### GLS 80m

60 to 80m  
2 switches



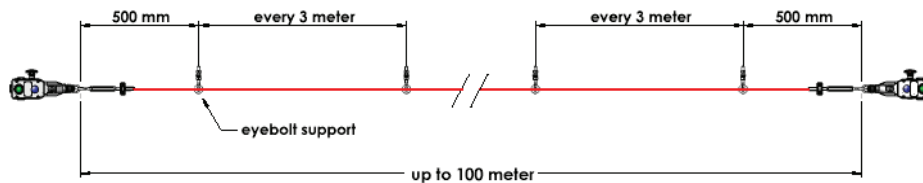
### GLS-SS 80m

Up to 80m  
1 switch/1 spring

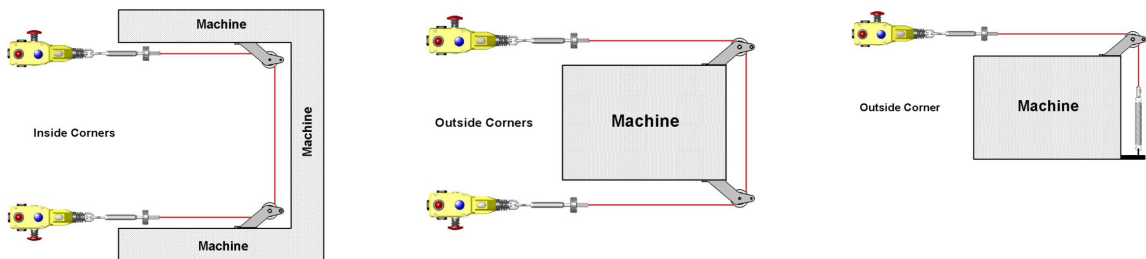


### GLS-SS 100m

80 to 100m  
2 switches



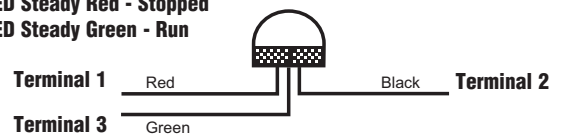
## Universal Pulley Examples



## LED

When power is applied to the Red wire (terminal 1), the lamp will illuminate Red. When power is applied to the Green Wire (terminal 3), the Lamp will illuminate Green. Black is 0 VDC or Neutral for 110 VAC and 230 VAC versions.

### LED Steady Red - Stopped LED Steady Green - Run

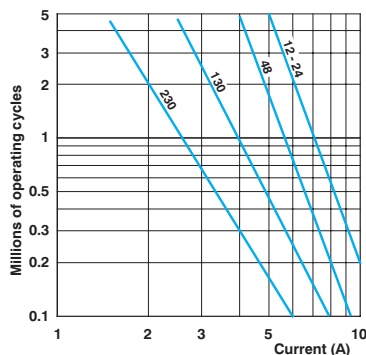


# IDEM Interlock Safety Switches Specifications

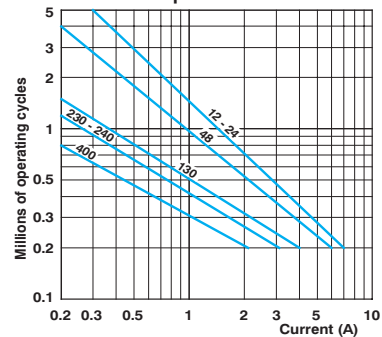
Specifications							
	IDIS	KM	KP/K-SS	K-15	GLM/GLS	INCH/MK1	HC
<b>Safety Classification and Reliability Data</b>							
Switching Reliability (B10d)	2.5 x 10 <sup>6</sup> operations at 100mA load						
ISO 13849-1	Up to PL <sub>e</sub> depending upon system architecture						
EN 62061	Up to SIL3 depending upon system architecture						
Safety Data - Annual Usage	8 cycles per hour / 24 hours per day / 365 days						
Agency Approvals	cULus (E258676), CE, TUV (rope pull switches)						
<b>Electrical and General Specifications</b>							
Conductor Sizes	16-12 AWG (1.5 to 2.5 mm <sup>2</sup> )						
Utilization Category	AC15, A300, 3A						
Thermal Current	10A						
Short Circuit Overload Protection	External 10A Fast Acting recommended						
Rated Insulation Voltage	500 VAC					600 VAC	
Contact Terminals	Stainless steel (Snap action Plated Brass); Max conductor 1.5 m <sup>2</sup> (IDIS), 2.5 m <sup>2</sup> (KM, K/K-15); 1 Nm torque						
Max. Switching Current	2.5A @24 VDC 6A @ 120VAC, 3A @ 240VDC (720VA Break)						
Maximum Approach/Withdrawal Speed	600mm/s						
Enclosure Protection	IP67 (IP69K on all models with both stainless steel head and body)					IP67 Plastic or IP69K Stainless Steel 316	
Operating Temperature	-25C to 80C / -13F to 176F						
Vibration	IEC 68-2-6, 10-55Hz+1Hz						
Lid Screws/Torque	Plated Brass; 1Nm (.74 lb-ft)	Stainless Steel; T20 Torx; 1Nm (.74 lb-ft)	Stainless Steel; 1Nm (.74 lb-ft)		Stainless Steel; T20 Torx; 1Nm (.74 lb-ft)	Stainless Steel; 1Nm (.74 lb-ft)	
Recommended Mounting Screws/Torque	M4; 1.5 Nm (1.11 lb-ft)	M5; 4Nm (2.95 lb-ft)			M4; 1.5 Nm (1.11 lb-ft)		
Head Screws/Torque	Stainless Steel, except snap (Plated Brass); 1Nm (.74 lb-ft)	Stainless Steel; T20 Torx; 1Nm (.74 lb-ft)	Stainless Steel; 1Nm (.74 lb-ft)				

## Electrical Durability (according to IEC 947-5-1)

AC-15 Slow Action



AC-15 Snap Action



# IDEM Interlock/Hinge Safety Travel Charts

## Interlock Safety Switch Types

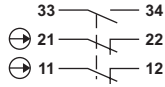
**Slow-make/slow-break contacts:** A contact element in which the contact motion is dependent on the actuator speed.

**Snap-action contact:** A contact element in which the contact motion is independent of the speed of the actuator. This feature ensures reliable electrical performance even in applications involving very slow moving actuators.

## Contacts Configuration

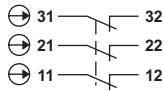
### 1 N.O. and 2 N.C.

Slow-make/ slow-break contacts



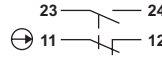
### 3 N.C.

Slow-make/ slow-break contacts



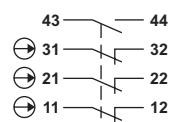
### 1 N.O. and 1 N.C.

Snap action contacts



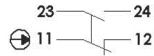
### 1 N.O. and 3 N.C.

Slow-make/ slow-break contacts



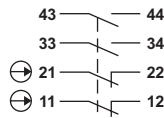
### 1 N.O. and 1 N.C.

Slow-make/ slow-break contacts



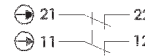
### 2 N.O. and 2 N.C.

Slow-make/ slow-break contacts



### 2 N.C.

Slow-make/ slow-break contacts



## Travel Charts



### Interlock Switches

2NC 1NO 6.8 6.0 0 mm

11/12	Open	
21/22	Open	
33/34		Open

3NC 6.0 0 mm

11/12	Open	
21/22	Open	
31/32	Open	

3NC 1NO 6.8 6.0 0 mm

11/12	Open	
21/22	Open	
31/32	Open	
43/44		Open

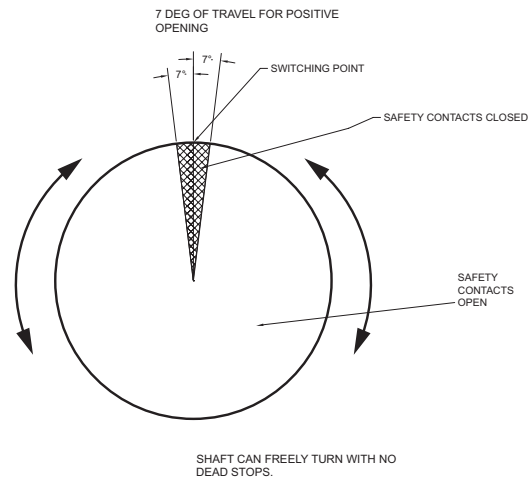
2NC 2NO 6.8 6.0 0 mm

11/12	Open	
21/22	Open	
33/34		Open
43/44		Open

1NC 1NO (SNAP) 6.5 0 mm

11/12	Open	
23/24		Open

### Hinge Switch



User to ensure that by correct positioning of the shaft at installation causes the safety contacts to open such that no hazard exists to the operator when the door is opened a few degrees.

### Safety Rope Switches

EX	1 N.O./2 N.C.	1 N.O./3 N.C.	2 N.O./2 N.C.	Latched off - Rope Slack	Tension Range (Switch Reset)	Rope Pulled
NC	11/12	11/12	11/12	Open		Open
	21/22	21/22	21/22	Open		Open
		31/32		Open		Open
NO	33/34	43/44	33/44		Open	
			43/44		Open	

130N Force

# Comepi Safety Limit Switches Selection Guide



Series	SP2 Series	SDM Series	SBM Series
<b>Prices start at</b>	\$15.00	\$19.00	\$25.50
<b>Description</b>	30 mm safety limit switch with keys or shaft lever	50 mm safety limit switch with keys, shaft lever or pull wire	40 mm safety limit switch with keys or pull wire
<b>Material of Construction</b>	Plastic casing, double insulated <input type="checkbox"/>	ZAMAK (zinc alloy) casing	Aluminum casing
<b>Degree of Protection (IEC529)</b>	IEC IP65	IEC IP66	IEC IP66
<b>Maximum Switching Frequency</b>	Contact blocks: 1 cycle per second (all)	Contact blocks: 1 cycle per second (all)	Contact blocks: 1 cycle per second (all)
<b>Mechanical Service Life</b>	1,000,000 operations interlock and limit switches	1,000,000 operations. interlock and limit switches 25,000 operations for pull wire	1,000,000 operations. interlock and limit switches 25,000 operations for pull wire
<b>Contact Configuration</b>	X11 - Slow action break before make, positive opening, 1 N.O. + 1 N.C. W02 - Simultaneous, slow action, positive opening, 2 N.C.	X11 - Slow action break before make, positive opening, 1 N.O. + 1 N.C. W02 - Simultaneous, slow action, positive opening, 2 N.C.	X11 - Slow action break before make, positive opening, 1 N.O. + 1 N.C. W02 - Simultaneous, slow action, positive opening, 2 N.C. X12 - Slow action break before make, positive opening, 1 N.O. + 2 N.C. W03 - Simultaneous, slow action, positive opening 3 N.C.
<b>Conduit Opening</b>	One cable hole, 1/2" NPT adapter	Three cable holes, 1/2" NPT	One cable hole, 1/2" NPT
<b>Connection</b>	2x2.5mm <sup>2</sup> (AWG14) to 2x0.5mm <sup>2</sup> (AWG 18)	2x2.5mm <sup>2</sup> (AWG14) to 2x0.5mm <sup>2</sup> (AWG 18)	2x2.5mm <sup>2</sup> (AWG14) to 2x0.5mm <sup>2</sup> (AWG 18)
<b>Agency Approvals</b>	CE, UL file E189258, CSA 176294, RoHS	CE, UL file E189258, CSA 176294, RoHS	CE, UL file E189258, CSA 176294, RoHS



Series	SCM Series	AP2 Series
<b>Prices start at</b>	\$26.00	\$13.00
<b>Description</b>	60 mm safety limit switches with keys or pull wire	30 mm limit switches with pull button reset
<b>Material of Construction</b>	Aluminum casing	Plastic casing, double insulated <input type="checkbox"/>
<b>Degree of Protection (IEC529)</b>	IEC IP66	IEC IP65
<b>Maximum Switching Frequency</b>	Contact blocks: 1 cycle per second (all)	Contact blocks: 1 cycle per second (all)
<b>Mechanical Service Life</b>	1,000,000 operations interlock and limit switches 25,000 operations for pull wire	1,000,000 operations interlock and limit switches
<b>Contact Configuration</b>	X11 - Slow action break before make, positive opening, 1 N.O. + 1 N.C. W02 - Simultaneous, slow action, positive opening, 2 N.C. X12 - Slow action break before make, positive opening, 1 N.O. + 2 N.C. W03 - Simultaneous, slow action, positive opening 3 N.C.	X11 - Slow action break before make, positive opening, 1 N.O. + 1 N.C. W02 - Simultaneous, slow action, positive opening, 2 N.C.
<b>Conduit Opening</b>	Three cable holes, 1/2" NPT	One cable hole, 1/2" NPT adapter
<b>Connection</b>	2x2.5mm <sup>2</sup> (AWG14) to 2x0.5mm <sup>2</sup> (AWG 18)	2x2.5mm <sup>2</sup> (AWG14) to 2x0.5mm <sup>2</sup> (AWG 18)
<b>Agency Approvals</b>	CE, UL file E189258, CSA 176294, RoHS	CE, UL file E189258, CSA 176294, RoHS

# Comepi Safety Limit Switches

These limit switches are developed and manufactured according to IEC and EN European standards.

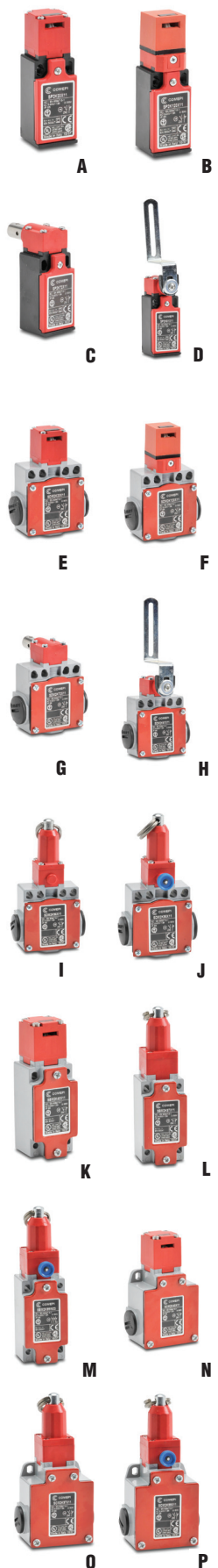
Easy to use, electromechanical limit switches provide:

- Visible operation
- Ability to switch large currents (10 A conventional thermal current)
- Precise operating points (consistency)

- Immunity to electromagnetic disturbances
- Electrically separated contacts (Zb)
- N.C. contacts with positive opening operation
- Actuation Speed: Max. - 0.5 m/s; Min. - 0.01 m/s
- Conduit opening - 1/2" NPT threaded or adapter

*Note: Purchase actuating tongue (key) separately.*

Safety Limit Switches														
Part Number	Price	Actuator Type	No. of Conduit Holes	Min Force for Key Actuation	Min Torque	Positive Opening Force	B10 <sub>d</sub>	Dimensions Body / Head	Contact Config. Diagram	Weight (lbs.)	Photo			
SP2K20X11	\$15.00	90° adjustable head, tongue (key) interlock	One	15N		30N		Figures 1, 5	1	0.2	A			
SP2K20W02	\$15.00		One								Figures 1, 5	2	0.2	A
SP2K120X11	\$18.50	360° adjustable head, tongue (key) interlock	One								Figures 1, 6	1	0.2	B
SP2K120W02	\$18.50		One								Figures 1, 6	2	0.2	B
SP2K72X11	\$21.50	90° adjustable head, shaft hinge interlock	One	0.12 Nm		0.60 Nm		Figures 1, 7	1	0.2	C			
SP2K72W02	\$21.50		One								Figures 1, 7	2	0.2	C
SP2K61X11	\$14.50	90° adjustable head, lever hinge interlock	One								Figures 1, 8	1	0.2	D
SP2K61W02	\$14.50		One								Figures 1, 8	2	0.2	D
SDM2K20X11	\$19.00	90° adjustable head, tongue (key) interlock	Three	15N		30N	2,000,000 operations	Figures 2, 5	1	0.6	E			
SDM2K20W02	\$19.00		Three								Figures 2, 5	2	0.6	E
SDM2K120X11	\$22.00	360° adjustable head, tongue (key) interlock	Three								Figures 2, 6	1	0.6	F
SDM2K120W02	\$22.00		Three								Figures 2, 6	2	0.6	F
SDM2K72X11	\$25.00	90° adjustable head, shaft hinge interlock	Three	0.12 Nm		0.60 Nm		Figures 2, 7	1	0.6	G			
SDM2K72W02	\$25.00		Three								Figures 2, 7	2	0.6	G
SDM2K61X11	\$18.00	90° adjustable head, lever hinge interlock	Three								Figures 2, 8	1	0.6	H
SDM2K61W02	\$18.00		Three								Figures 2, 8	2	0.6	H
SDM2K96X11	\$22.00	Cable-pull interlock, no reset	Three				25,000 operations	Figures 2, 9	1	0.6	I			
SDM2K96W02	\$22.00		Three								Figures 2, 9	2	0.6	I
SDM2K98X11	\$24.00	Cable-pull interlock with reset	Three								Figures 2, 10	1	0.6	J
SDM2K98W02	\$24.00		Three								Figures 2, 10	2	0.6	J
SBM2K40X11	\$25.50	90° adjustable head, tongue (key) interlock	One	30N		45N	2,000,000 operations	Figures 3, 11	1	0.4	K			
SBM2K40W02	\$25.50		One								Figures 3, 11	2	0.4	K
SBM2K40X12	\$27.50		One								Figures 3, 11	3	0.4	K
SBM2K40W03	\$28.00		One								Figures 3, 11	4	0.4	K
SBM2K97X11	\$20.50	Cable-pull interlock, no reset	One				25,000 operations	Figures 3, 12	1	0.6	L			
SBM2K97W02	\$20.50		One								Figures 3, 12	2	0.6	L
SBM2K97X12	\$22.50		One								Figures 3, 12	3	0.6	L
SBM2K97W03	\$23.00		One								Figures 3, 12	4	0.6	L
SBM2K99X11	\$22.50	Cable-pull interlock with reset	One					Figures 3, 13	1	0.6	M			
SBM2K99W02	\$22.50		One								Figures 3, 13	2	0.6	M
SBM2K99X12	\$24.50		One								Figures 3, 13	3	0.6	M
SBM2K99W03	\$25.00		One								Figures 3, 13	4	0.6	M
SCM2K40X11	\$26.00	90° adjustable head, tongue (key) interlock	Three	30N		45N	2,000,000 operations	Figures 4, 11	1	0.5	N			
SCM2K40W02	\$26.00		Three								Figures 4, 11	2	0.5	N
SCM2K40X12	\$29.00		Three								Figures 4, 11	3	0.5	N
SCM2K40W03	\$29.00		Three								Figures 4, 11	4	0.5	N
SCM2K97X11	\$22.00	Cable-pull interlock, no reset	Three				25,000 operations	Figures 4, 12	1	0.7	O			
SCM2K97W02	\$22.00		Three								Figures 4, 12	2	0.7	O
SCM2K97X12	\$24.00		Three								Figures 4, 12	3	0.7	O
SCM2K97W03	\$24.00		Three								Figures 4, 12	4	0.7	O
SCM2K99X11	\$23.50	Cable-pull interlock with reset	Three					Figures 4, 13	1	0.7	P			
SCM2K99W02	\$23.50		Three								Figures 4, 13	2	0.7	P
SCM2K99X12	\$25.50		Three								Figures 4, 13	3	0.7	P
SCM2K99W03	\$25.50		Three								Figures 4, 13	4	0.7	P



Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

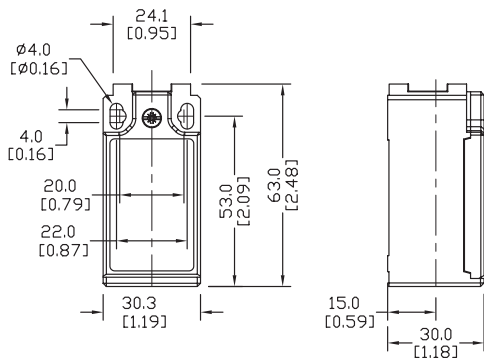
Safety: Protective Wear

Terms and Conditions

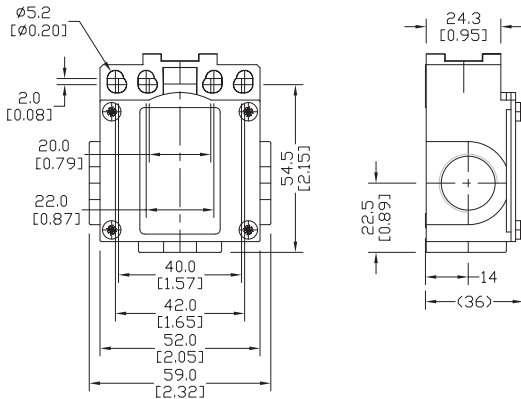
# Comepi Safety Limit Switches

## Switch Body Dimensions mm [in]

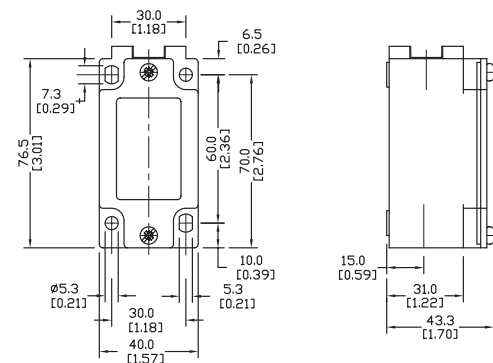
**Figure 1: SP2K body**



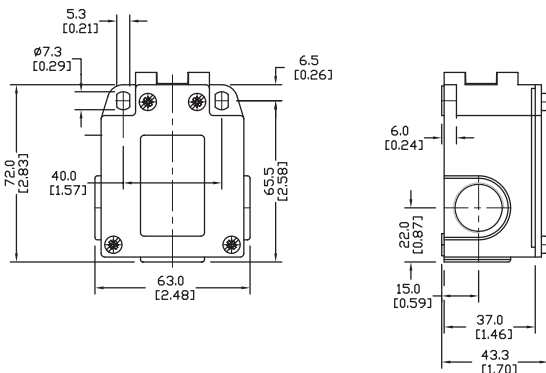
**Figure 2: SDM2K body**



**Figure 3: SBM2K body**

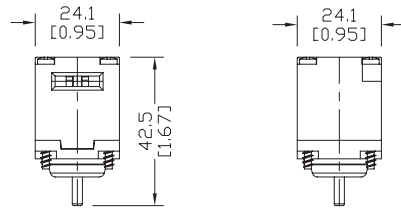


**Figure 4: SCM2K body**

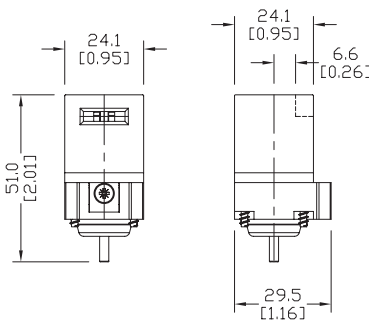


## Actuator Dimensions mm [in]

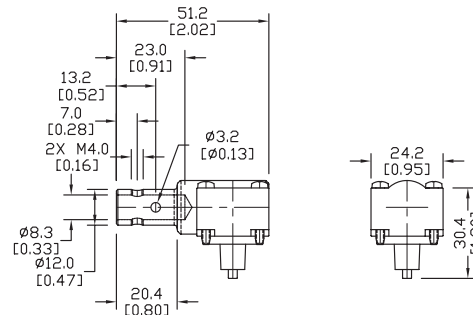
**Figure 5: 90° adjustable head - SP2K20, SDM2K20 models**



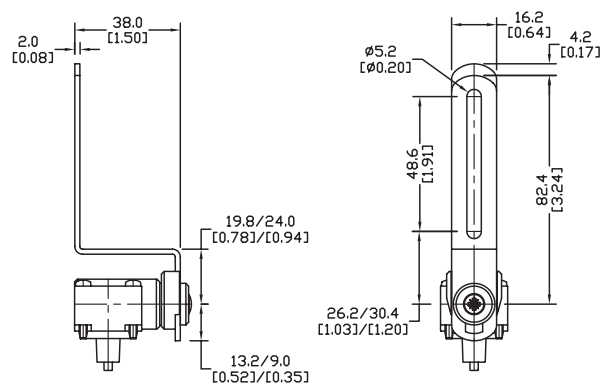
**Figure 6: Fully turnable 360° head - SP2K120, SDM2K120 models**



**Figure 7: 90° adjustable head with shaft hinge interlock - SP2K72, SDM2K72 models**



**Figure 8: 90° adjustable head with lever hinge interlock - SP2K61, SDM2K61 models**

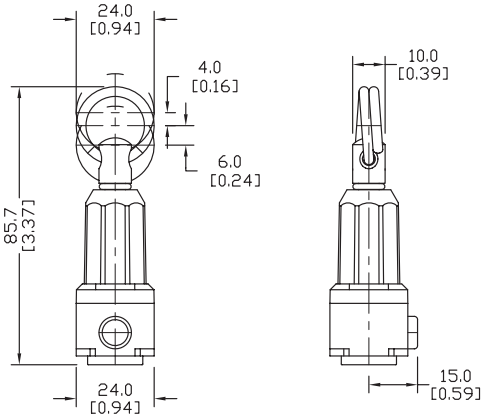




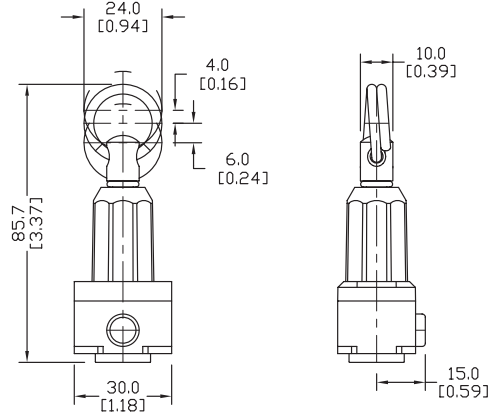
# Comepi Safety Limit Switches

## Actuators Dimensions mm [in]

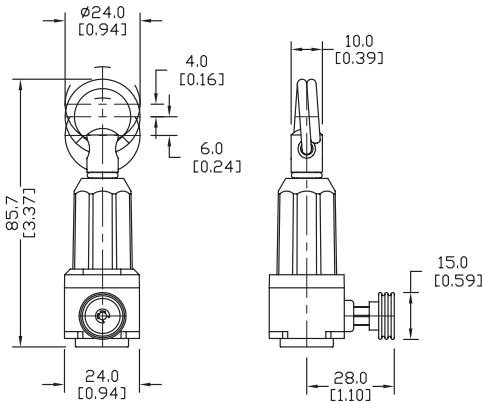
**Figure 9: Pull wire without reset for simple stop - SDM2K96 models**



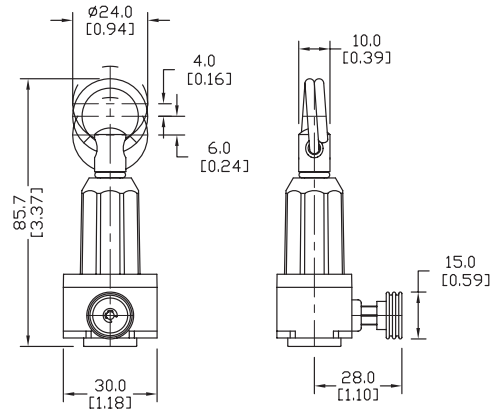
**Figure 12: Pull wire without reset for simple stop - SBM2K97 and SCM2K97 models**



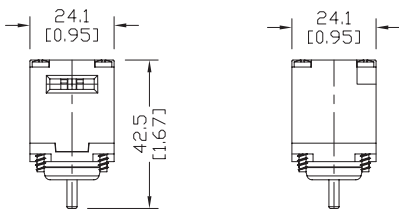
**Figure 10: Pull wire with reset for emergency stop - SDM2K98 models**



**Figure 13: Pull wire with reset for emergency stop - SBM2K99 and SCM2K99 models**



**Figure 11: 90° adjustable head - SBM2K40, SCM2K40 models**



Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Comepi Safety Limit Switches

These limit switches are developed and manufactured according to IEC and EN European standards. Easy to use, electromechanical limit switches provide:

- Visible operation
- Ability to switch large currents (10 A conventional thermal current)

- Precise operating points (consistency)
- Immunity to electromagnetic disturbances
- Electrically separated contacts (Zb)
- N.C. contacts with positive opening operation  $\ominus$
- Conduit threads - 1/2" NPT adapter



AP2R Series Safety Limit Switches Selection Chart											
Part Number	Price	Actuator Type	No. of Conduit Holes	Max. Actuation Speed (m/s)	Min. Actuation Force (N) / Torque (Nm)	Min. Positive Opening Force (N) / Torque (Nm)	B10 <sub>d</sub>	Head Dimensions	Contact Config. Diagram	Weight (lbs.)	Photo
AP2R11X11	\$13.00	Steel plunger with reset	One	0.5	9N	44N	2,000,000 operations	Figure 1	1	0.2	A
AP2R11W02	\$13.00		One					Figure 1	2	0.2	
AP2R13X11	\$14.00	Steel plunger with nylon roller with reset	One	0.3	12N	44N		Figure 2	1	0.2	B
AP2R13W02	\$14.00		One					Figure 2	2	0.2	
AP2R31X11	\$14.50	Steel plunger with one-way horizontal actuated nylon roller with reset	One	1.0	7N	24N		Figure 3	1	0.2	C
AP2R31W02	\$14.50		One					Figure 3	2	0.2	
AP2R32X11	\$15.00	Steel plunger with one-way vertical actuated nylon roller with reset	One	1.0	7N	24N		Figure 4	1	0.2	D
AP2R32W02	\$15.00		One					Figure 4	2	0.2	
AP2R41X11	\$16.50	Lever with nylon roller with reset	One	1.5	0.10Nm	0.32Nm		Figure 5	1	0.2	E
AP2R41W02	\$16.50		One					Figure 5	2	0.2	
AP2R51X11	\$17.00	Adjustable lever with nylon roller with reset	One	1.5	0.10Nm	0.32Nm		Figure 6	1	0.2	F
AP2R51W02	\$17.00		One					Figure 6	2	0.2	

## Dimensions mm [in]

### AP2R Series Body

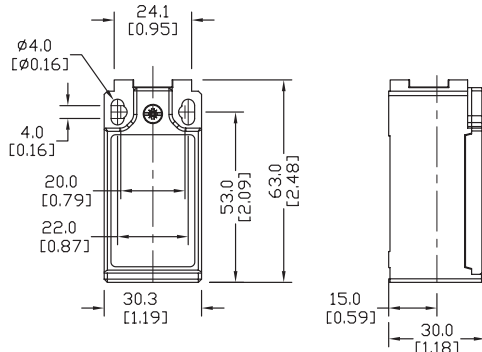
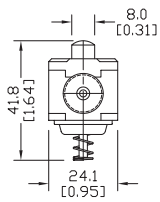
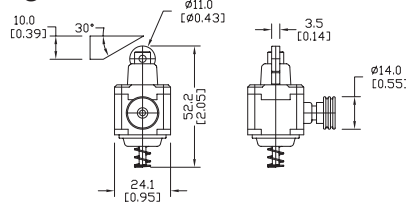


Figure 1



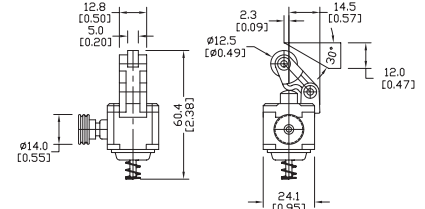
AP2R11

Figure 2



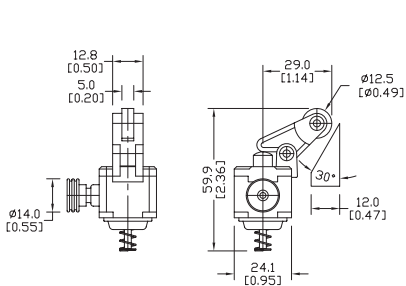
AP2R13

Figure 3



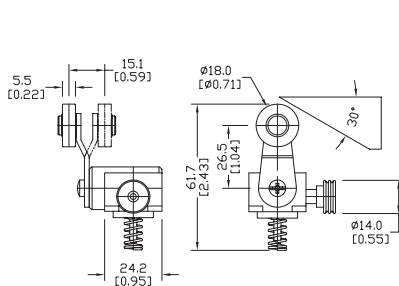
AP2R31

Figure 4



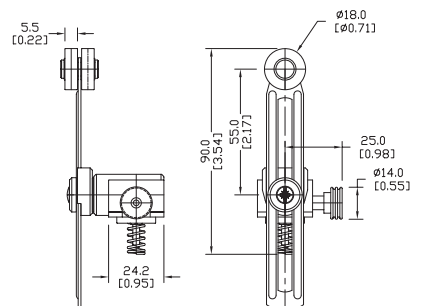
AP2R32

Figure 5



AP2R41

Figure 6



AP2R51

# Comepi Safety Limit Switches

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

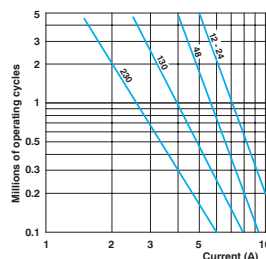
Safety: Protective Wear

Terms and Conditions

Approvals	
All: IEC 947-5-1, EN 60947-5-1, UL 508, CSA C22.2 No 14, RoHS	
Environmental	
<b>Degree of Protection</b>	Plastic models: IP65 according to IEC 529 Aluminum and ZAMAK (zinc alloy) models: IP66 according to IEC 529
<b>Temperature Range</b>	Plastic models: storage: -30° to 80°C (-22° to 176°F) operating: -25° to 70°C (-13° to 158°F) Aluminum and ZAMAK (zinc alloy) models: storage: -30° to 80°C (-22° to 176°F) operating: -25° to 70°C (-13° to 158°F); minimum temperatures assume that the atmosphere is free of moisture, which could cause moving parts to freeze up.
<b>Rated Insulation Voltage</b>	SDM:400V, All others 500V; (degree of pollution - 3)
Mechanical Ratings	
<b>Mechanical Life</b>	1 million operations. Pull wire models - 25,000 operations
<b>Enclosure Material</b>	Plastic models: fiberglass-reinforced plastic-V0 class (UL94); aluminum models: die-cast aluminum; ZAMAK models: zinc alloy
Contact Blocks Rating	
<b>Positive Opening</b>	Yes, all models
<b>Electrical Ratings</b>	<b>AC15</b> Make: 60A@120VAC; 30A @ 240VAC; 18A @ 400VAC Break: 10A @ 24VAC; 6.5A @130VAC; 3.1A @ 230VAC; 1.8A @ 400VAC
	<b>DC13</b> 2.8A @ 24VDC; 0.5A @ 110VDC
<b>Maximum Switching Frequency</b>	Contact blocks: all one cycle per second
<b>Repeat Accuracy</b>	0.01mm on the operating points at 1 million operations
<b>Short-Circuit Protection</b>	Cartridge fuses, general purpose, gl 10A-500V 10.3x38 1 100KA
<b>Contact Resistance</b>	25 milli Ω
<b>Recommended Minimum Operating Speed</b>	With slow-action contacts: 500 mm per minute*
<b>Rated Insulation Voltage</b>	660V
<b>Terminals Marking</b>	According to CENELEC EN 50013
<b>Wiring Connections</b>	2 x 2.5mm <sup>2</sup> (AWG14) to 2 x 0.5mm <sup>2</sup> (AWG18)
<b>Wiring Terminal Type</b>	Captive screw with self-lifting pressure plate
<b>Wiring Terminal Markings</b>	According to CENELEC EN50013
<b>User Protection</b>	Double insulation (plastic models only)
Contact Blocks Performance	
<b>Operation Frequency</b>	3600 ops/h
<b>Electrical Durability (according to IEC 947-5-1)</b>	Utilization categories AC-15 and DC-13; load factor of 0.5. See table and curves below.
Tools Needed	
Phillips screwdriver, #1 #2 / Hex wrench, 10mm	
<b>*Note: Slow-action contacts must not be operated at very low speeds because of the tendency to maintain the arc if contacts are not rapidly separated.</b>	

## Electrical Durability (according to IEC 947-5-1)

AC-15 Slow Action



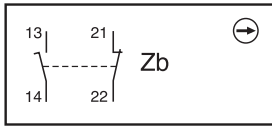
DC-13	Slow Action
	Power breaking for a durability of 5 million cycles
<b>24 Volts</b>	12W
<b>48 Volts</b>	9W
<b>110 Volts</b>	6W

# Comepi Safety Limit Switches

## Contacts Configuration Charts

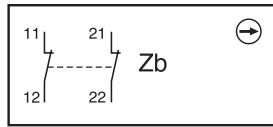
**Chart 1**

X11 Slow action break before make 1NO+1NC



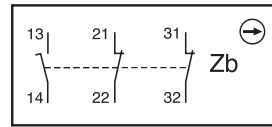
**Chart 2**

W02 Simultaneous slow action 2NC



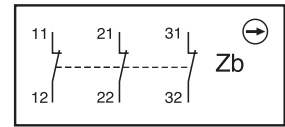
**Chart 3**

X12 Slow action break before make 1NO+2NC



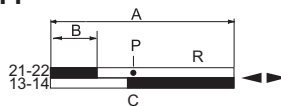
**Chart 4**

W03 Simultaneous slow action 3NC

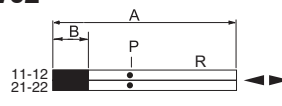


## Bar charts for keys, shaft lever or limit switches

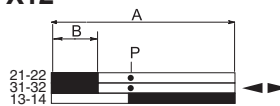
**X11**



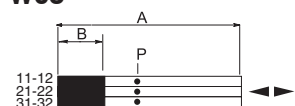
**W02**



**X12**



**W03**



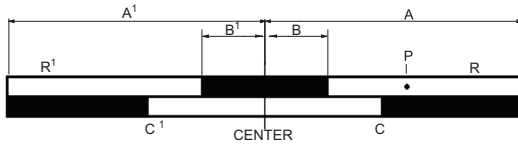
- A = Max. travel of the operator in mm or degrees
  - B = Tripping travel of the N.C. contact
  - C = Tripping travel of the N.O. contact
  - P = Point from which positive opening is assured
  - R = Reset latch activates
- = Contact open  
 = Contact closed

Part Series	Contact Configuration	Displacement Values mm(in) or degrees				
		A	B	C	P	R
<b>SP2K20, SP2K120, SDM2K20, SDM2K120</b> Top Key Extraction	X11	21.5 (0.85)	2.0 (0.08)	3.0 (0.12)	3.5 (0.14)	–
	W02	21.5 (0.85)	1.8 (0.07)	–	3.3 (0.13)	–
<b>SP2K20, SP2K120, SDM2K20, SDM2K120</b> Front Key Extraction	X11	21.5 (0.85)	3.8 (0.15)	4.8 (0.19)	5.3 (0.21)	–
	W02	21.5 (0.85)	3.5 (0.14)	–	5.0 (0.20)	–
<b>SP2K72, SP2K61, SDM2K72, SDM2K61</b>	X11	±90°	±6°	±15°	±31°	–
	W02	±90°	±5°	–	±30°	–
<b>SBM2K40, SCM2K40</b> Top Key Extraction	X11	26.6 (1.05)	4.6 (0.18)	6.1 (0.24)	5.8 (0.23)	–
	W02	26.6 (1.05)	4.1 (0.16)	–	5.6 (0.22)	–
	X12	26.6 (1.05)	4.3 (0.17)	5.8 (0.23)	5.5 (0.21)	–
	W03	26.6 (1.05)	4.1 (0.16)	–	5.6 (0.22)	–
<b>SBM2K40, SCM2K40</b> Front Key Extraction	X11	26.6 (1.05)	5.8 (0.23)	7.3 (0.29)	7.0 (0.28)	–
	W02	26.6 (1.05)	5.3 (0.21)	–	6.8 (0.27)	–
	X12	26.6 (1.05)	5.5 (0.21)	7.0 (0.28)	6.7 (0.26)	–
	W03	26.6 (1.05)	5.3 (0.21)	–	6.8 (0.27)	–
<b>AP2R11</b>	X11	5.6 (0.22)	1.6 (0.06)	2.5 (0.10)	3.2 (0.13)	4.4 (0.17)
	W02	5.6 (0.22)	1.5 (0.06)	–	3.1 (0.12)	4.4 (0.17)
<b>AP2R13</b>	X11	9.6 (0.38)	3.2 (0.13)	4.6 (0.18)	6.0 (0.23)	7.5 (0.30)
	W02	9.6 (0.38)	3.0 (0.12)	–	5.9 (0.23)	7.5 (0.30)
<b>AP2R31, AP2R32</b>	X11	21.0 (0.83)	6.0 (0.24)	8.6 (0.34)	10.5 (0.41)	15.6 (0.61)
	W02	21.0 (0.83)	5.7 (0.22)	–	10.2 (0.40)	15.6 (0.61)
<b>AP2R41, AP2R51</b>	X11	±74°	±21°	±30°	±37°	±60°
	W02	±74°	±19°	–	±37°	±60°

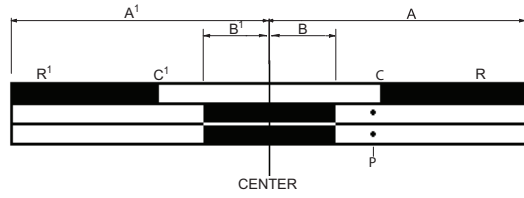
# Comepi Safety Limit Switches

## Bar charts for cable pulls

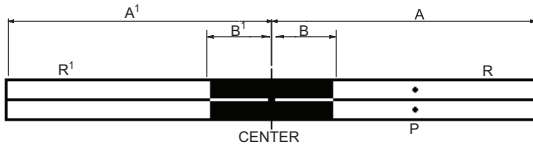
**X11**



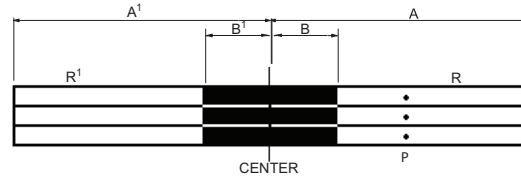
**X12**



**W02**



**W03**



### Pull Tension from Center

- A = Max. travel of the operator in mm
- B = Tripping travel of the N.C. contact
- C = Tripping travel of the N.O. contact
- P = Point from which positive opening is assured
- R = Reset latch activates

### Lax Tension from Center

- A<sup>1</sup> = Max. travel of the operator in mm
- B<sup>1</sup> = Tripping travel of the N.C. contact
- C<sup>1</sup> = Tripping travel of the N.O. contact
- R<sup>1</sup> = Reset latch activates



Part Series	Contact Configuration	Displacement Values mm(in)									
		A	B	C	P	R	Center**	A <sup>1</sup>	B <sup>1</sup>	C <sup>1</sup>	R <sup>1</sup>
SBM2K97* SBM2K99 SCM2K97* SCM2K99	X11	4 (0.16)	1.4(0.06)	2.3 (0.09)	2.6 (0.10)	3.7 (0.15)	0	6 (0.24)	1.4 (0.06)	2.4 (0.09)	4.7 (0.19)
	W02	4 (0.16)	1.2 (0.05)	–	2.4 (0.09)	3.7 (0.15)	0	6 (0.24)	1.2 (0.05)	–	4.7 (0.19)
	X12	4 (0.16)	1.5 (0.06)	3.0(0.12)	2.7 (0.11)	3.7 (0.15)	0	6 (0.24)	1.5 (0.06)	3.0 (0.12)	4.7 (0.19)
	W03	4 (0.16)	1.4 (0.06)	–	2.6 (0.10)	3.7 (0.15)	0	6 (0.24)	1.4 (0.06)	–	4.7 (0.19)
SDM2K96 SDM2K98	X11	4 (0.16)	1.4 (0.06)	2.3 (0.09)	2.6 (0.10)	3.7 (0.15)	0	6 (0.24)	1.4 (0.06)	2.4 (0.09)	4.7 (0.19)
	W02	4 (0.16)	1.2 (0.05)	–	2.4 (0.09)	3.7 (0.15)	0	6 (0.24)	1.2 (0.05)	–	4.7 (0.19)

Part Series	Contact Configuration	Force Values N									
		A	B	C	P	R	Center**	A <sup>1</sup>	B <sup>1</sup>	C <sup>1</sup>	R <sup>1</sup>
SBM2K97* SBM2K99 SCM2K97* SCM2K99	X11	300	170	190	240	260	100	0	70	55	40
	W02	300	170	–	240	260	100	0	70	–	40
	X12	300	170	190	240	260	100	0	70	55	40
	W03	300	170	–	240	260	100	0	70	–	40
SDM2K96 SDM2K98	X11	140	95	100	115	120	70	0	50	40	30
	W02	140	95	–	115	120	70	0	50	–	30

**Notes:**

- \* K97 models do not support Rest Latch (R).
- \*\*At center line, green ring on switch will be visible.

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Comepi Safety Limit Switches



**KEY13**



**KEY14**



**KEY15**



**KEY16**



**KEY17**



**KEY18**



**KEY19**

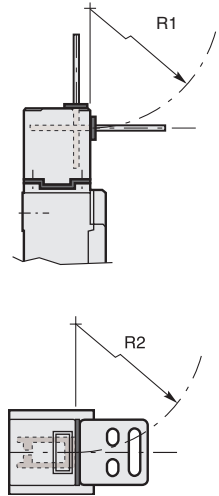
**KEY35**

**KEY36**

**KEY39**

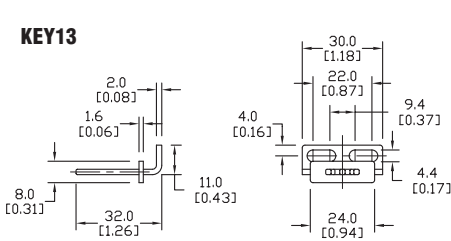
## Safety Limit Switches Operating Keys

Part Number	Price	Description	Weight (lbs.)	Mounting Holes Spacing mm [in]	Use With	Minimum Values mm [in]	
						R1	R2
KEY13	\$1.25	Actuator tongue. Key with 90-degree bent mounting tab.	0.1	22 [0.87]	SP2K and SDM2K series safety switches	400 [15.75]	400 [15.75]
KEY14	\$1.25	Actuator tongue. Key with straight mounting tab.	0.1	22 [0.87]		400 [15.75]	400 [15.75]
KEY15	\$1.25	Actuator tongue. Key with 90-degree bent mounting tab.	0.1	13 [0.51]		400 [15.75]	400 [15.75]
KEY16	\$1.00	Actuator tongue. Key with straight mounting tab.	0.1	13 [0.51]		400 [15.75]	400 [15.75]
KEY17	\$2.50	Shock-absorbing actuator tongue. Key with 90-degree bent mounting tab.	0.1	15 [0.59]		250 [9.84]	350 [13.78]
KEY18	\$2.50	Shock-absorbing actuator tongue. Key with straight mounting tab.	0.1	15 [0.59]		350 [13.78]	350 [13.78]
KEY19	\$3.25	Actuator tongue. Key with adjustable mounting tab.	0.1	40 [1.57]	SBM2K and SCM2K series safety switches	180 [7.09]	200 [7.87]
KEY35	\$1.75	Actuator tongue. Key with 90-degree bent mounting tab.	0.1	13 [0.51]		400 [15.75]	400 [15.75]
KEY36	\$1.50	Actuator tongue. Key with straight mounting tab.	0.1	13 [0.51]		400 [15.75]	400 [15.75]
KEY39	\$3.75	Actuator tongue. Key with adjustable mounting tab.	0.1	40 [1.57]		180 [7.09]	200 [7.87]

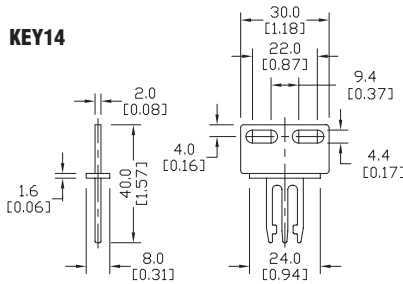


## Dimensions mm[in]

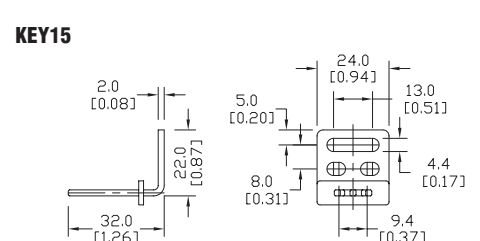
**KEY13**



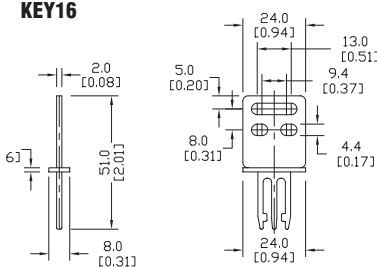
**KEY14**



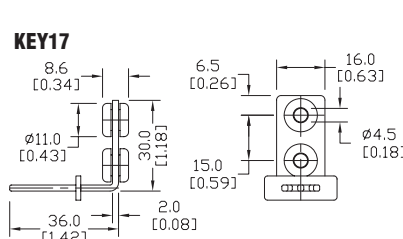
**KEY15**



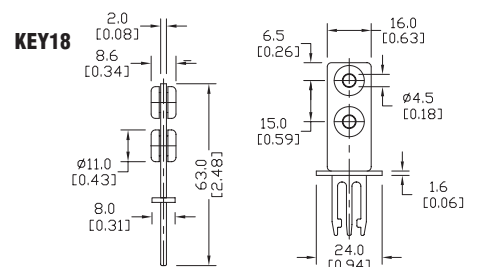
**KEY16**



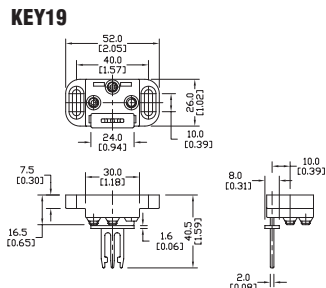
**KEY17**



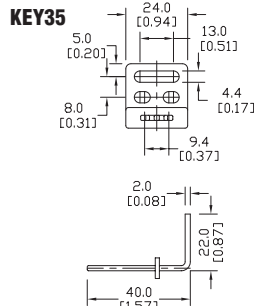
**KEY18**



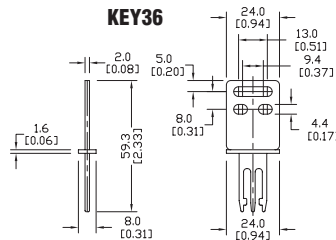
**KEY19**



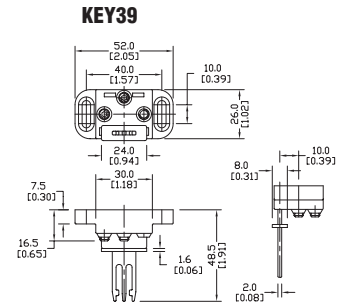
**KEY35**



**KEY36**



**KEY39**



# Comepi Safety Limit Switches Accessories

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

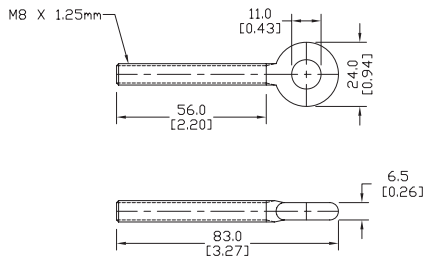
Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions



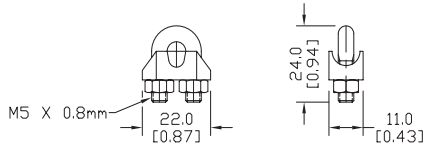
OCC08



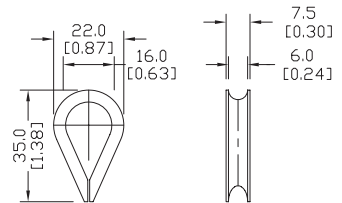
Safety Limit Switches Cable Pull Accessories			
Part Number	Price	Description	Weight (lbs.)
OCC08	\$1.00	Eye bolt	0.2
MOR05	\$1.00	Cable Clamp	0.1
RED05	\$1.00	Eye thimble	0.0
FUN05M015	\$13.00	15 meter length steel cable 5 mm diameter, Red	2.0
FUN05M025	\$20.00	25 meter length steel cable, 5 mm diameter, Red	3.3



MOR05



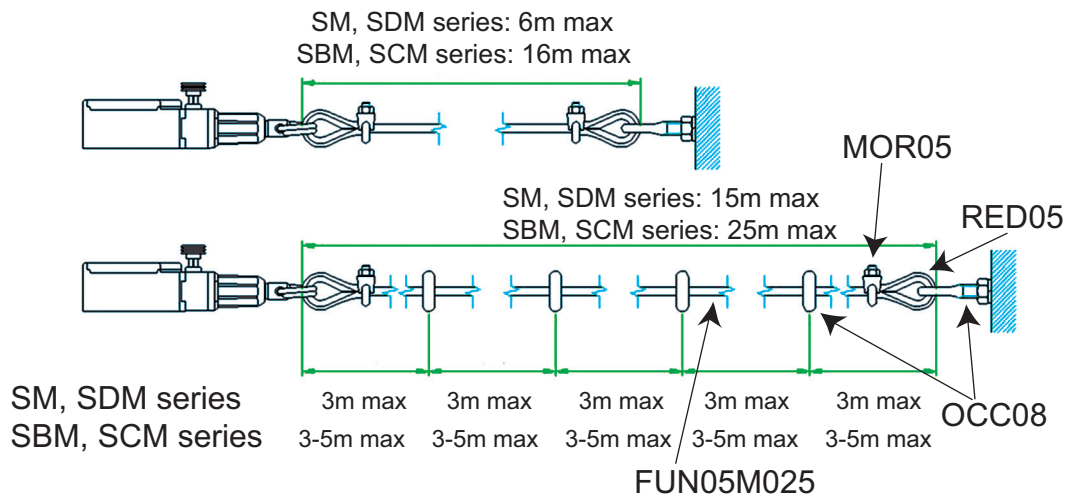
RED05



FUN05M025

All dimensions are in mm [in].

## Installation example



# Safety Products



***Warning: Safety products sold by AutomationDirect are Safety components only. The purchaser/installer is solely responsible for the application of these components and ensuring all necessary steps have been taken to assure each application and use meets all performance and applicable safety requirements and/or local, national and/or international safety codes as required by the application. AutomationDirect cannot certify that our products, used solely or in conjunction with other AutomationDirect or other vendors' products, will assure safety for any application. Any person using or applying any products sold by AutomationDirect is responsible for learning the safety requirements for their individual application and applying them, and therefore assumes all risks, and accepts full and complete responsibility, for the selection and suitability of the product for their respective application. AutomationDirect does not provide design or consulting services, and cannot advise whether any specific application or use of our products would ensure compliance with the safety requirements for any application.***



# IDEM Non-Contact Safety Switches Overview



Plastic Housing



Stainless Steel Housing

## Non-Contact Safety Switches

Non-contact safety switches are interlocking devices that are designed to protect both people and machines. They are preferred in certain applications where no physical contact (under normal conditions) takes place between the switch and actuator, such as:

- Where a high level of protection from tampering is required.
- Where reduced wear from frequent mechanical contact is desired.

- Where poor guard alignment exists. Their operating principle enables greater tolerances, making them ideal for applications where precise guidance of guards is difficult.
- Where there is exposure to contamination or where there are strict hygiene standards (for example, in the food industry). The devices are easy to clean, making them ideal for these environments.
- Where a long service life is required. The switches are mechanically non-wearing, insensitive to shock and vibration, and resistant to moisture and extreme temperatures.

## Non-Contact Magnetic and Non-Contact Coded Magnetic Styles

Both style switches provide a wide (>10mm) sensing distance and a high tolerance to misalignment after sensing. Both styles are available with plastic and stainless steel housings.

Up to ten magnetic or four coded switches can be connected in series to one of our Dold safety relays.

### Non-Contact Magnetic Safety Switches

These are simple magnetic reed switches and are designed to conform to IEC 60947-5-3 and be used as directed by EN1088, EN ISO12100 and EN 60204-1.



### Non-Contact Coded Magnetic Safety Switches

Coded non-contact safety switches use coded magnets to close the circuits, thereby offering even more protection. The safety switch and actuator work together in such a way that the enable condition from the safety device is only triggered if the actuating element is within the switch's response range and the code on the actuator matches that of the switch. Codes are not unique and can be used with other models of the same series.

All coded non-contact safety switches are designed to conform to IEC 60947-5-3 and be used as directed by EN1088, EN ISO12100 and EN 60204-1.

When used in combination with a dual channel safety relay, non-contact coded switches can be used to provide protection up to Category 4 and Plc to ISO13849-1.

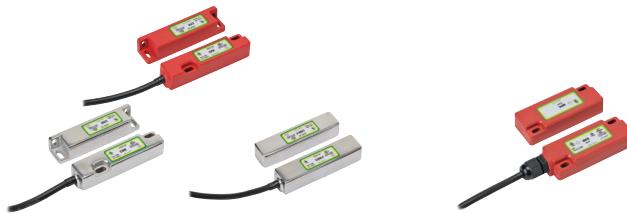


# IDEM Non-Contact Safety Switches Selection Guide

## Magnetic Safety Switches



Specification	MPR Series Light Duty	LPR and LMR Series Medium Duty	SPR, SMR, and SMR-F Series Medium Duty
<b>Body Material</b>	Plastic	Plastic, Stainless steel	Plastic, Stainless steel
<b>Contact Configuration &amp; Rating</b>	2 N.C. and 1 N.O. contacts; 0.5A	2 N.C. and 1 N.O. contacts; 1A	2 N.C. and 1 N.O. contacts; 1A



Specification	CPR, CMR, and CMR-F Series Heavy Duty	WPR Series Heavy Duty
<b>Body Material</b>	Plastic, Stainless steel	Plastic
<b>Contact Configuration &amp; Rating</b>	1 N.C. and 1 N.O. contacts; 2A	2 N.C. and 1 N.O. contacts; 2A

## Coded Magnetic Safety Switches



Specification	MPC Series	LPC and LMC Series	SPC, SMC, and SMC-F Series
<b>Body Material</b>	Plastic	Plastic, Stainless steel	Plastic, Stainless steel
<b>Contact Configuration &amp; Rating</b>	2 N.C. and 1 N.O. contacts; 0.2A	2 N.C. and 1 N.O. contacts; 0.2A	2 N.C. and 1 N.O. contacts; 0.2A



Specification	CPC, CMC, and CMC-F Series	WPC Series
<b>Body Material</b>	Plastic, Stainless steel	Plastic
<b>Contact Configuration &amp; Rating</b>	2 N.C. and 1 N.O. contacts; 0.2A	2 N.C. and 1 N.O. contacts; 0.2A

# IDEM Non-Contact Safety Switches Specifications

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

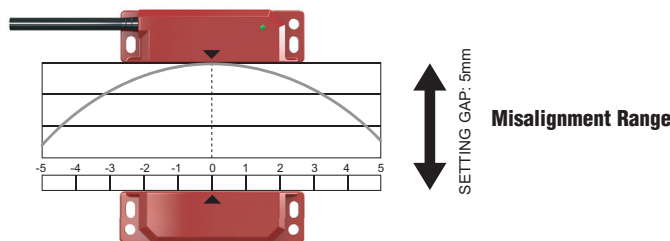
Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

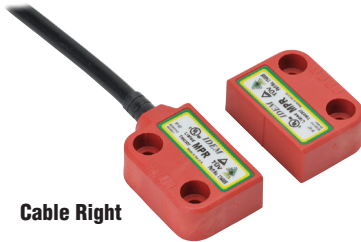
Terms and Conditions

Non-contact Safety Switches Specifications		
	Non-Contact Magnetic Switches	Non-Contact Coded Magnetic Switches
<b>Safety Classification and Reliability Data</b>		
<b>Switching Reliability (B10d)</b>	3.3 x 10 <sup>6</sup> operations at 100 mA load	
<b>EN 954-1</b>	Up to category 4 with safety relay	
<b>ISO 13849-1</b>	Up to PL <sub>e</sub> depending upon system architecture	
<b>EN 62061</b>	Up to SIL3 depending upon system architecture	
<b>Safety Data - Annual Usage</b>	8 cycles per hour / 24 hours per day / 365 days	
<b>PFHd</b>	2.52 x 10 <sup>-8</sup>	
<b>Proof Test Interval (Life)</b>	47 Years	
<b>MTTFd</b>	470 Years	
<b>Agency Approvals</b>	CE, cULus, RoHS	
<b>Electrical and General Specifications</b>		
<b>Contact Ratings:</b>	MPR: Voltage free: 250 VAC, 0.5 A Max.	
<b>Safety Contact NC</b>	LPR, LMR, SPR, SMR, SMR-F: Voltage free: 250 VAC, 1.0A Max.	24 VDC, 0.2A Max. (Optocoupler)
	CPR, CMR, CMR-F, WPR: Voltage free: 250 VAC, 2.0A Max.	
<b>Monitoring (Auxiliary) Contact NO</b>	Voltage free: 24 VDC, 0.2A Max.	24 VDC, 0.2A Max.
<b>Fuses (NC Circuits)</b>	MPR: Fuse externally 0.4A (F) LPR, LMR, SPR, SMR, SMR-F, CMR, CMR-F: Fuse externally 0.8A (F) CPR, WPR: Fuse externally 1.6A (F)	NA
<b>Contact Release Time</b>	<2ms	NA
<b>Initial Contact Resistance</b>	<500 milliohm	NA
<b>Minimum Switched Current</b>	10 VDC, 1mA	
<b>Dielectric Withstand</b>	250 VAC	
<b>Insulation Resistance</b>	100 Megohms	
<b>Recommended Setting Gap</b>	5mm	
<b>NC Switching Distance</b>	Sao (assured ON) 10 mm close; Sar (assured OFF) 20 mm open	
<b>N.O. Switching Operation</b>	Opens before NC circuits close	
<b>Tolerance to Misalignment</b>	5mm in any direction from 5mm setting gap (See Misalignment Range drawing on this page)	
<b>Switching Frequency</b>	1.0 Hz Max.	
<b>Approach Speed</b>	200 mm per minute to 1000 mm per second	
<b>Body Material - Polyester</b>	CPR, LPR, MPR, SPR, WPR	CPC, LPC, MPC, SPC, WPC
<b>Body Material - 316 Stainless Steel</b>	CMR, CMR-F, LMR, SMR, SMR-F	CMC, CMC-F, LMC, SMC, SMC-F
<b>Temperature Range</b>	Polyester: -25° to +80°C (-13° to +176° F)	
	316 Stainless Steel: -25° to +105° C (-13° to +221° F)	
<b>Enclosure Protection</b>	IP67, IP69K	
<b>Shock Resistance</b>	IEC 68-2-27 11 ms 30g	
<b>Vibration Resistance</b>	IEC 68-2-6 10-55 Hz 1mm	
<b>Cable Type</b>	PVC, 6.5 mm outside diameter max.	
<b>Mounting Bolts (recommended)</b>	2 x M4; Tightening torque: 1.0 Nm	



# IDEM MPR Light Duty Non-Contact Magnetic Safety Switches

## MPR Series Plastic Housing

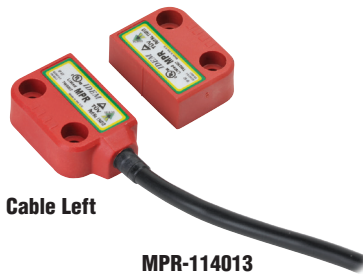


Cable Right

MPR-114005

- Compact yet robust fitting suitable for all small guard applications
- Can be mounted unobtrusively in channels or behind doors - left or right cable exit
- Hygienic screw cap covers ensure suitability for food processing washdown
- Can be high-pressure hosed at high temperature - IP69K rated
- Wide 12 mm sensing, high tolerance to misalignment
- High switching capability - up to 0.5A
- Will operate with most safety relays
- Available with 2m, 5m, or 10m cable
- Codes are not unique and can be used with other models of the same series

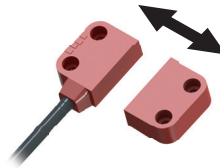
See Dimensions later in this section.



Cable Left

MPR-114013

## Actuator Operating Direction



MPR

MPR Non-Contact Magnetic Safety Switches					
Part Number	Price	Body Material	Cable Length / Exit Type	Circuits	Contact Type / Rating
MPR-114005	\$71.00	Plastic	2m / Right	2 N.C., 1 N.O.	Light duty / 0.5A
MPR-114006	\$77.00		5m / Right		
MPR-114007	\$89.00		10m / Right		
MPR-114013	\$71.00		2m / Left		
MPR-114014	\$77.00		5m / Left		
MPR-114015	\$89.00		10m / Left		

# IDEM LPR and LMR Medium Duty Non-Contact Magnetic Safety Switches

## LPR Series Plastic Housing



LPR-110013

## LMR Series Stainless Steel Housing



LMR-133013

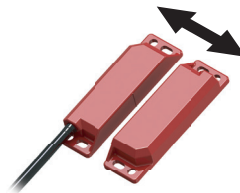
- Popular housing suitable for all industry applications
- Narrow style for flush mounting
- Can be high-pressure hosed at high temperature - IP69K rated
- Medium duty 1A
- Wide 12 mm sensing, high tolerance to misalignment
- Will operate with most safety relays
- Available with 2m, 5m, or 10m cable

### LMR Series Only

- Specifically designed for food processing applications
- Suitable for CIP SIP cleaning - food splash zones per EHEDG guidelines
- 316 Stainless steel mirror polished finish
- Codes are not unique and can be used with other models of the same series

See Dimensions later in this section.

### Actuator Operating Direction



LPR, LMR

LPR and LMR Non-Contact Magnetic Safety Switches					
Part Number	Price	Body Material	Cable Length	Circuits	Contact Type / Rating
LPR-110013	\$89.00	Plastic	2m	2 N.C., 1 N.O.	Medium duty / 1A
LPR-110014	\$99.00		5m		
LPR-110015	\$109.00		10m		
LMR-133013	\$151.00	Stainless steel	2m		
LMR-133014	\$155.00		5m		
LMR-133015	\$171.00		10m		

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# IDEM SPR, SMR, and SMR-F Medium Duty Non-Contact Magnetic Safety Switches

## SPR Series Plastic Housing

## SMR Series Stainless Steel Housing

## SMR-F Series Stainless Steel Housing Rear Mount



**SPR-111013**



**SMR-139013**



**SMR-F-137014**

- Universal housing - 22mm fixing footprint suitable for most general applications; 50 mm wide body
- Withstands environments where high humidity or hose down is required.
- Wide 12 mm sensing, high tolerance to misalignment
- Long life switching capability - up to 1A
- Will operate with most safety relays
- SPR and SMR series available with 2m, 5m, or 10m cable
- Codes are not unique and can be used with other models of the same series

### SMR Series, SMR-F Only

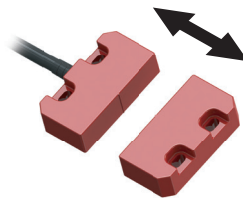
- Specifically designed for food processing applications
- Suitable for CIP SIP cleaning - Food Splash Zones per EHEDG guidelines
- 316 Stainless steel mirror polished finish
- Can be high-pressure hosed at high temperature - IP69K rated

### SMR-F Only

- Same as SMR series, but with no-food-trap housing - rear mounting holes
- 5m cable only

**See Dimensions later in this section.**

### Actuator Operating Direction



**SPR, SMR  
SMR-F**

SPR, SMR, and SMR-F Non-Contact Magnetic Safety Switches					
Part Number	Price	Body Material	Cable Length	Circuits	Contact Type / Rating
SPR-111013	\$93.00	Plastic	2m	2 N.C., 1 N.O.	Medium duty / 1A
SPR-111014	\$99.00		5m		
SPR-111015	\$113.00		10m		
SMR-139013	\$119.00	Stainless steel	2m		
SMR-139014	\$123.00		5m		
SMR-139015	\$139.00		10m		
SMR-F-137014	\$123.00		5m		

# IDEM CPR, CMR, and CMR-F Heavy Duty Non-Contact Magnetic Safety Switches

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions



**CPR-113013**

## CPR Series Plastic Housing



**CMR-138030**

## CMR Series Stainless Steel Housing

## CMR-F Series Stainless Steel Housing Rear Mount

- Slim 20mm wide housing can be fitted into narrow channels
- Can be high-pressure hosed at high temperature - IP69K rated
- Wide 12 mm sensing, high tolerance to misalignment
- High switching capability - up to 2A
- Will operate with most safety relays
- CPR and CMR series available with 2m, 5m, or 10m cable
- Codes are not unique and can be used with other models of the same series

### CMR Series, CMR-F Only

- Specifically designed for food processing applications
- Suitable for CIP/SIP cleaning - Food Splash Zones per EHEDG guidelines
- 316 Stainless steel mirror polished finish

### CMR-F Only

- Same as CMR series, but with no-food-trap housing - rear mounting holes
- 5m cable only

### Actuator Operating Direction

See Dimensions later in this section.



**CMR-F-135030**



**CPR, CMR  
CMR-F**

CPR, CMR, and CMR-F Non-Contact Magnetic Safety Switches					
Part Number	Price	Body Material	Cable Length	Circuits	Contact Type / Rating
<b>CPR-113013</b>	\$93.00	Plastic	2m	1 N.C., 1 N.O.	Heavy duty / 2A
<b>CPR-113014</b>	\$103.00		5m		
<b>CPR-113015</b>	\$113.00		10m		
<b>CMR-138030</b>	\$123.00	Stainless steel	5m		
<b>CMR-138031</b>	\$133.00		10m		
<b>CMR-F-135030</b>	\$123.00		5m		

# IDEM WPR Heavy Duty Non-Contact Magnetic Safety Switches

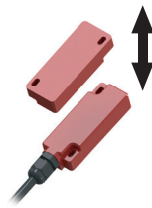


## WPR Series Plastic Housing

- Robust wide housing suitable for all industry applications
- Can be high-pressure hosed at high temperature - IP69K rated
- Wide 12 mm sensing, high tolerance to misalignment
- High switching capability - up to 2A
- Will operate with most safety relays
- Available with 2m or 5m cable
- Codes are not unique and can be used with other models of the same series

## Actuator Operating Direction

See Dimensions later in this section.



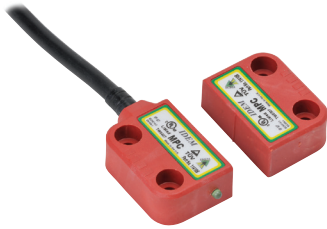
WPR

WPR Non-Contact Magnetic Safety Switches					
Part Number	Price	Body Material	Cable Length	Circuits	Contact Type / Rating
WPR-112005	\$103.00	Plastic	2m	2 N.C., 1 N.O.	Heavy duty / 2A
WPR-112006	\$113.00		5m		



# IDEM MPC Non-Contact Coded Magnetic Safety Switches

## MPC Series Plastic Housing



**MPC-114105**

- Coded magnetic actuation
- Compact yet robust fitting suitable for all small guard applications
- Hygienic screw cap covers ensure suitability for food processing washdown
- Cost effective interlock solution
- Can be mounted unobtrusively in channels or behind doors - left or right cable exit
- High specification polyester housing with backplate

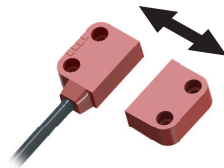
- LED indication
- Can be high-pressure hosed at high temperature - IP69K rated
- Sensing distance up to 10 mm
- Switching capability up to 0.2A
- Will operate with most safety relays
- Available with 2m, 5m, or 10m cable

**See Dimensions later in this section.**



**MPC-114113**

### Actuator Operating Direction



**MPC**

MPC Non-Contact Coded Magnetic Safety Switches					
Part Number	Price	Body Material	Cable Length / Exit Type	Circuits	Contact Rating
<b>MPC-114105</b>	\$71.00	Plastic	2m / Right	2 N.C., 1 N.O.	0.2A
<b>MPC-114106</b>	\$81.00		5m / Right		
<b>MPC-114107</b>	\$93.00		10m / Right		
<b>MPC-114113</b>	\$71.00		2m / Left		
<b>MPC-114114</b>	\$81.00		5m / Left		
<b>MPC-114115</b>	\$93.00		10m / Left		

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# IDEM LPC and LMC Duty Non-Contact Coded Magnetic Safety Switches



**LPC-110005**

## LPC Series Plastic Housing



**LMC-133005**

## LMC Series Stainless Steel Housing

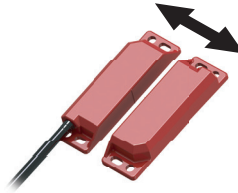
- Coded magnetic actuation
- Narrow housing can be fitted into narrow channels
- Can be high-pressure hosed at high temperature - IP69K rated
- LED indication
- Wide 14 mm sensing distance, high tolerance to misalignment
- Long life switching capability - up to 0.2A
- Will operate with most safety relays
- Available with 2m, 5m, or 10m cable

### LMC Only

- Specifically designed for food processing applications
- Suitable for CIP SIP cleaning - Food Splash Zones per EHEDG guidelines
- 316 Stainless steel mirror polished finish

**See Dimensions later in this section.**

### Actuator Operating Direction



**LPC, LMC**

LPC and LMC Non-Contact Coded Magnetic Safety Switches					
Part Number	Price	Body Material	Cable Length	Circuits	Contact Rating
LPC-110005	\$77.00	Plastic	2m	2 N.C., 1 N.O.	0.2A
LPC-110006	\$81.00		5m		
LPC-110007	\$93.00		10m		
LMC-133005	\$123.00	Stainless steel	2m		
LMC-133006	\$133.00		5m		
LMC-133007	\$145.00		10m		

# IDEM SPC, SMC, and SMC-F Non-Contact Coded Magnetic Safety Switches

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

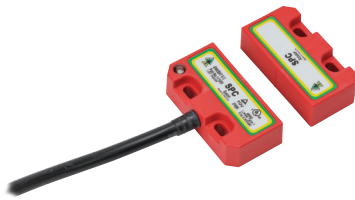
Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions



**SPC-111005**

## SPC Series Plastic Housing

## SMC Series Stainless Steel Housing

## SMC-F Series Stainless Steel Housing Rear Mount



**SMC-139005**

- Coded magnetic actuation
- Universal housing suitable for most general applications
- Can be high-pressure hosed at high temperature - IP69K rated
- LED indication
- Wide 14 mm sensing distance, high tolerance to misalignment
- Long life switching capability - up to 0.2A
- Will operate with most safety relays
- SPC and SMC series available with 2m, 5m, or 10m cable

### SMC Series Only

- Specifically designed for food processing applications
- Suitable for CIP SIP cleaning - Food Splash Zones per EHEDG guidelines
- 316 Stainless steel mirror polished finish

### SMC-F Only

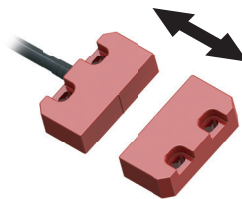
- Same as SMC series, but with no-food-trap housing - rear mounting holes
- 5m cable only

**See Dimensions later in this section.**



**SMC-F-137006**

## Actuator Operating Direction



**SPC, SMC  
SMC-F**

SPC, SMC, and SMC-F Non-Contact Coded Magnetic Safety Switches					
Part Number	Price	Body Material	Cable Length	Circuits	Contact Rating
<b>SPC-111005</b>	\$71.00	Plastic	2m	2 N.C., 1 N.O.	0.2A
<b>SPC-111006</b>	\$81.00		5m		
<b>SPC-111007</b>	\$93.00		10m		
<b>SMC-139005</b>	\$123.00	Stainless steel	2m		
<b>SMC-139006</b>	\$133.00		5m		
<b>SMC-139007</b>	\$145.00		10m		
<b>SMC-F-137006</b>	\$133.00		5m		

# IDEM CPC, CMC, and CMC-F Non-Contact Coded Magnetic Safety Switches



**CPC-115005**

## CPC Series Plastic Housing

## CMC Series Stainless Steel Housing

## CMC-F Series Stainless Steel Housing Rear Mount



**CMC-138005**

- Coded magnetic actuation
- Universal housing suitable for most general applications
- Can be high-pressure hosed at high temperature - IP69K rated
- LED indication
- Wide 14 mm sensing distance, high tolerance to misalignment
- Long life switching capability - up to 0.2A
- Will operate with most safety relays
- CPC and CMC series available with 2m, 5m, or 10m cable

### CMC Series Only

- Specifically designed for food processing applications
- Suitable for CIP/SIP cleaning - Food Splash Zones per EHEDG guidelines
- 316 Stainless steel mirror polished finish

### CMC-F Only

- Same as CMC series, but with no-food-trap housing - rear mounting holes
- 5m cable only

**See Dimensions later in this section.**



**CMC-F-135006**

### Actuator Operating Direction



**CPC, CMC  
CMC-F**

CPC, CMC, and CMC-F Non-Contact Coded Magnetic Safety Switches					
Part Number	Price	Body Material	Cable Length	Circuits	Contact Rating
<b>CPC-115005</b>	\$81.00	Plastic	2m	2 N.C., 1 N.O.	0.2A
<b>CPC-115006</b>	\$89.00		5m		
<b>CPC-115007</b>	\$103.00		10m		
<b>CMC-138005</b>	\$123.00	Stainless steel	2m		
<b>CMC-138006</b>	\$133.00		5m		
<b>CMC-F-135006</b>	\$133.00		5m		

# IDEM WPC Non-Contact Coded Magnetic Safety Switches

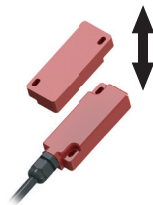
## WPC Series Plastic Housing



- Coded magnetic actuation
- Slim fitting suitable for all industry applications
- LED indication
- Can be high-pressure hosed at high temperature - IP69K rated
- Wide 14 mm sensing, high tolerance to misalignment
- Switching capability up to 0.2A
- Will operate with most safety relays
- Available with 2m or 5m cable

**See Dimensions later in this section.**

### Actuator Operating Direction



WPC

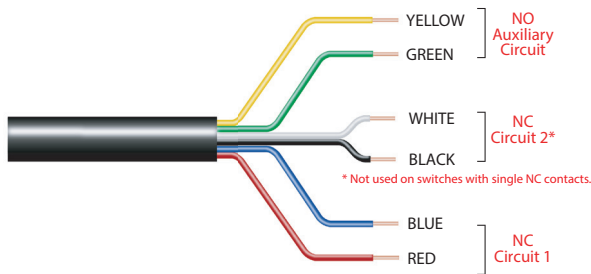
WPC Non-Contact Coded Magnetic Safety Switches					
Part Number	Price	Body Material	Cable Length	Circuits	Contact Rating
WPC-112017	\$81.00	Plastic	2m	2 N.C., 1 N.O.	0.2A
WPC-112018	\$89.00		5m		

- Company Information
- Terminal Blocks
- Power Distribution Blocks
- Wiring Accessories
- ZIPLink Connection System
- Multi-wire Connectors
- Sensor Cables and Connectors
- M12 Junction Blocks
- Panel Interface Connectors
- Wiring Duct
- Cable Ties
- Wire
- Bulk Multi-conductor Cables
- Wire Management Products
- Power Supplies
- DC Converters
- Transformers and Filters
- Circuit Protection
- Tools
- Test Equipment
- Enclosures
- Enclosure Climate Control
- Safety: Electrical Components
- Safety: Protective Wear
- Terms and Conditions

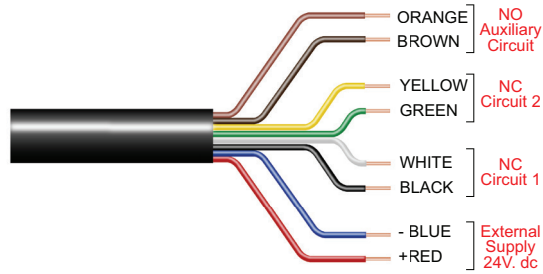
# IDEM Non-Contact Safety Switches Electrical Connections and Dimensions

## Electrical Connections

### Magnetic Switches



### Coded Switches



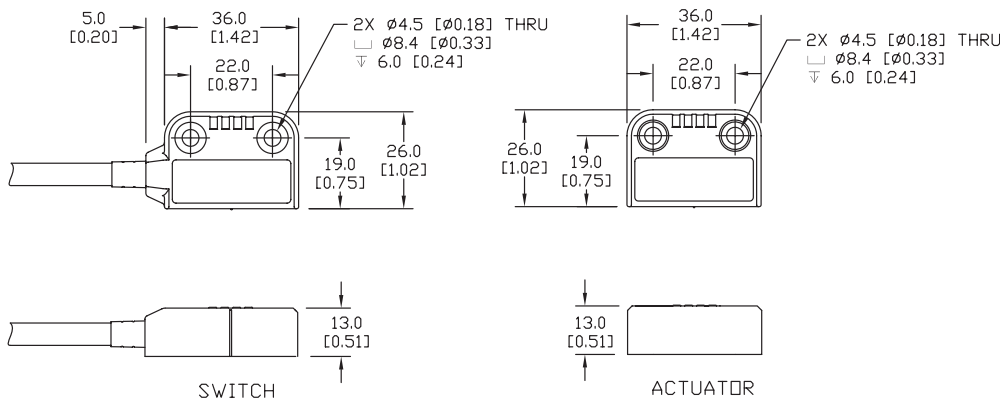
Magnetic Switches - Electrical Connections	
Lead Color	Type of Circuit (Actuator Present)
Yellow	NO
Green	NO
Black	NC2
White	NC2
Red	NC1
Blue	NC1

Coded Magnetic Switches - Electrical Connections		
Lead Color	Type of Circuit (Actuator Present)	Output Types (Solid State)
Orange	Auxiliary (NO)	200 mA max. 24 VDC
Brown	Auxiliary (NO)	
Yellow	NC2 +	200 mA max. 24 VDC (Optocoupler)
Green	NC2 -	
Black	NC1 +	200 mA max. 24 VDC (Optocoupler)
White	NC1 -	
Red	Supply +24 VDC	Supply 24 VDC +10% / -15%
Blue	Supply 0VDC	

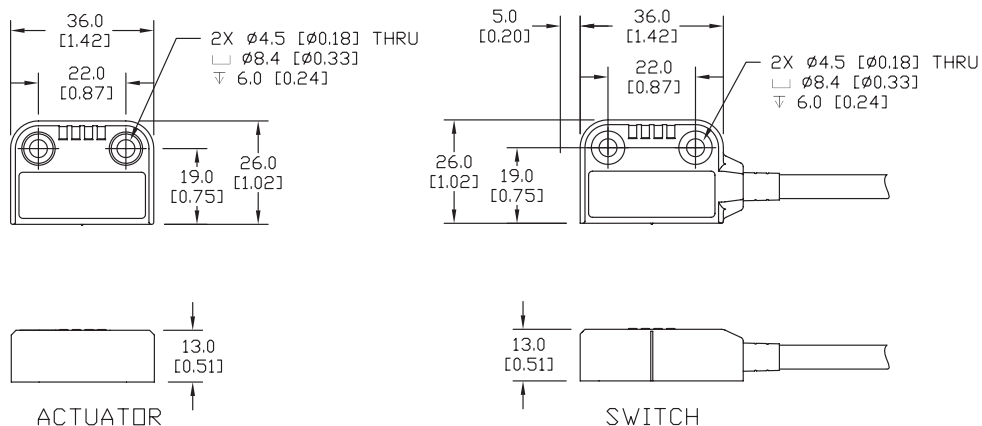
## Dimensions

### MPR Series

#### Left Cable Exit

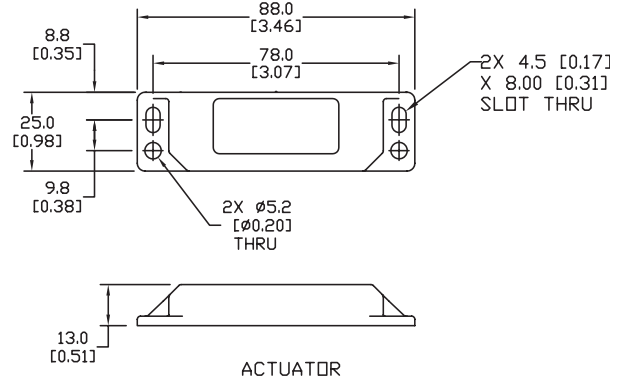
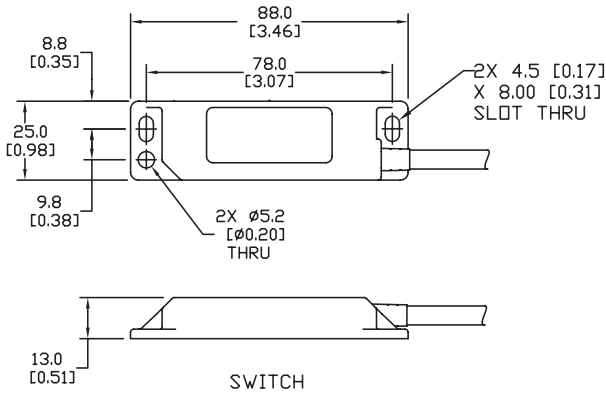


#### Right Cable Exit

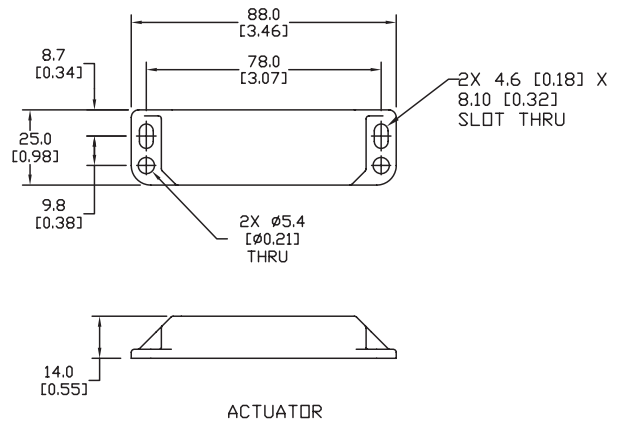
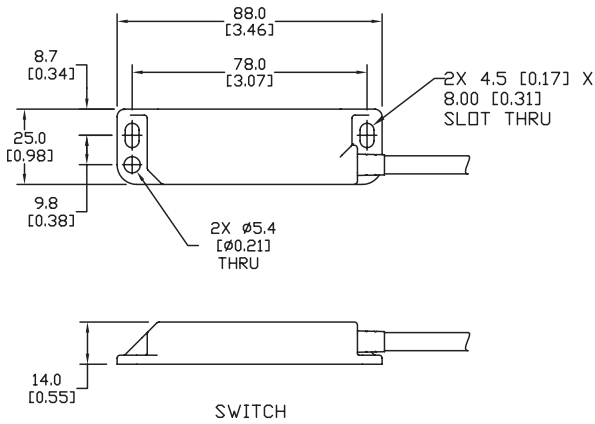


# IDEM Non-Contact Safety Switches Dimensions

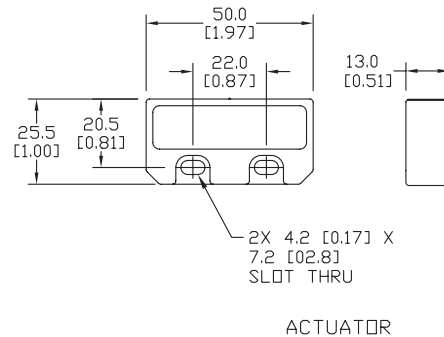
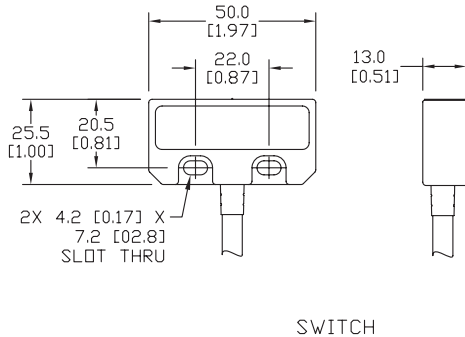
## LPR Series



## LMR Series



## SPR Series



Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

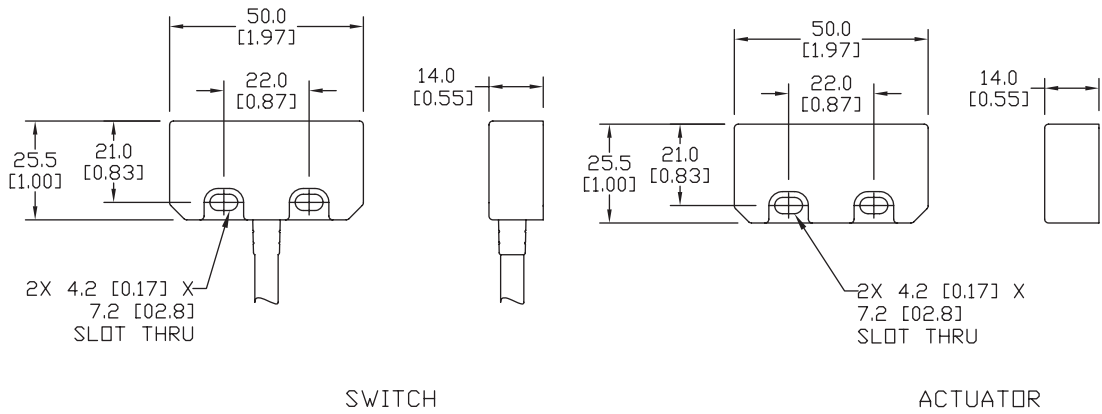
Safety: Electrical Components

Safety: Protective Wear

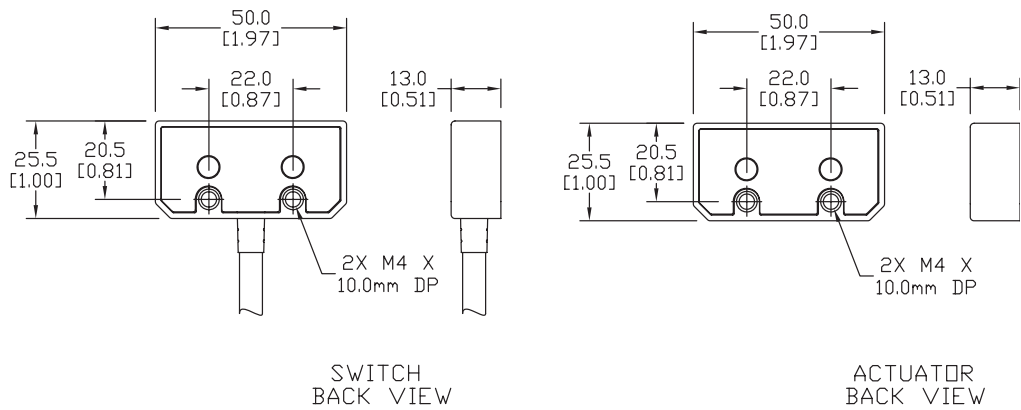
Terms and Conditions

# IDEM Non-Contact Safety Switches Dimensions

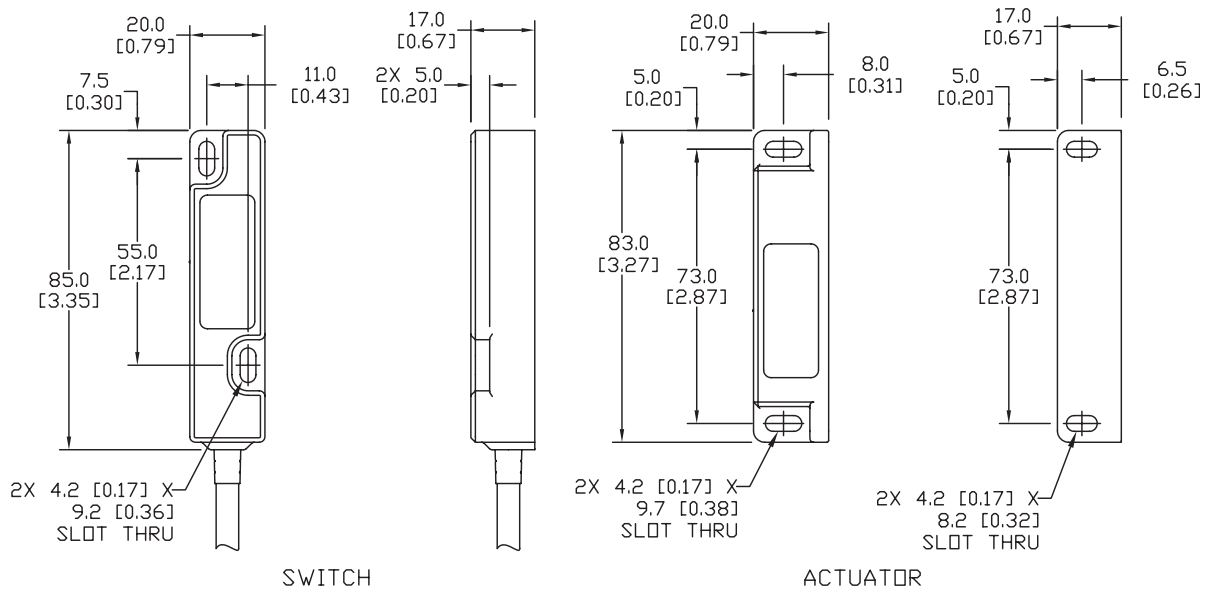
## SMR Series



## SMR-F Series



## CPR Series





# IDEM Non-Contact Safety Switches Dimensions

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

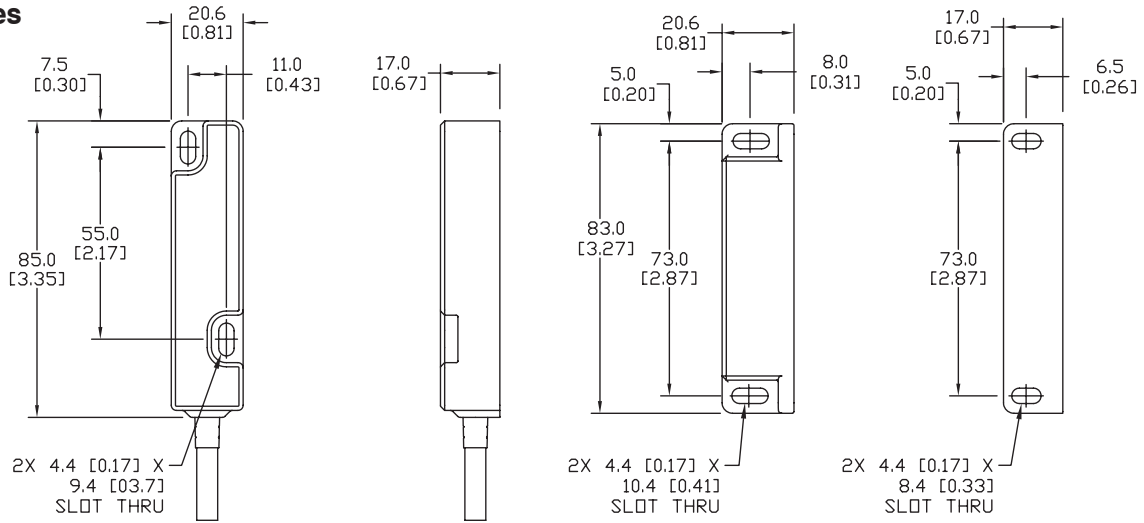
Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

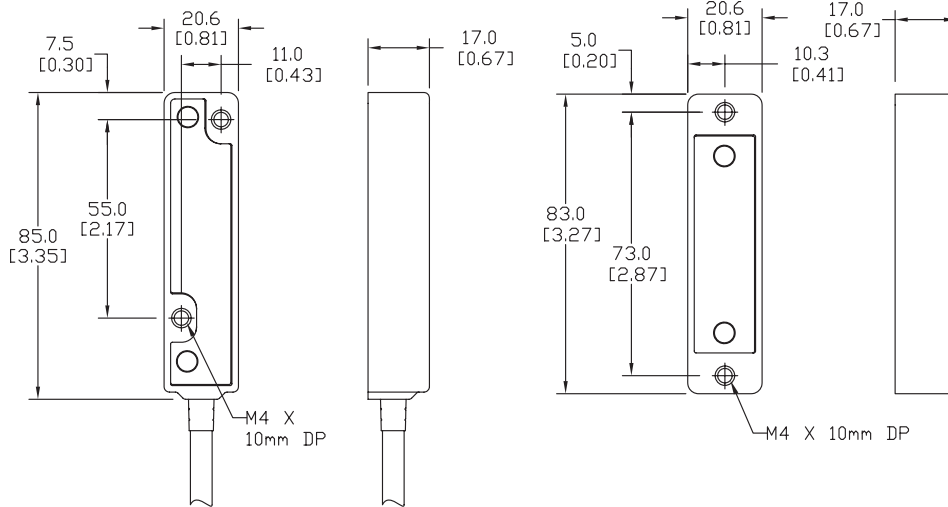
## CMR Series



SWITCH

ACTUATOR

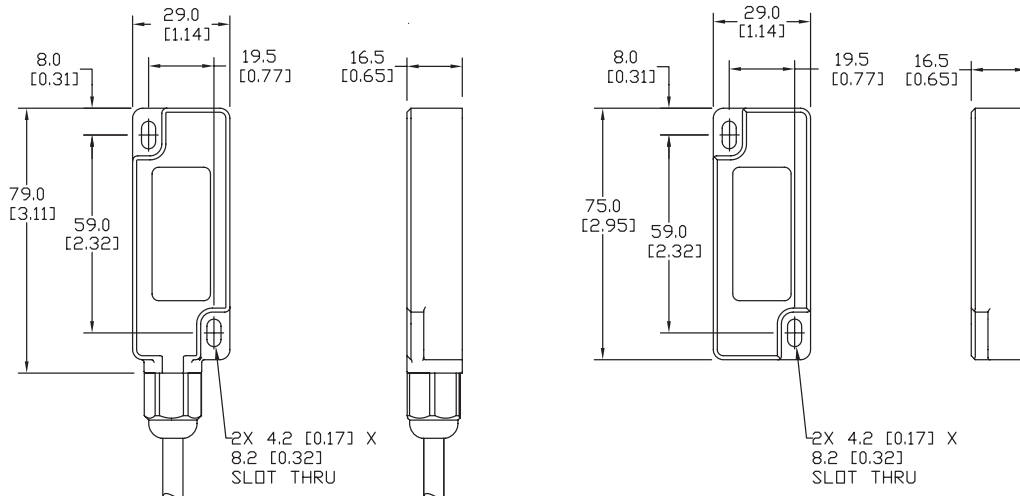
## CMR-F Series



SWITCH

ACTUATOR

## WPR Series



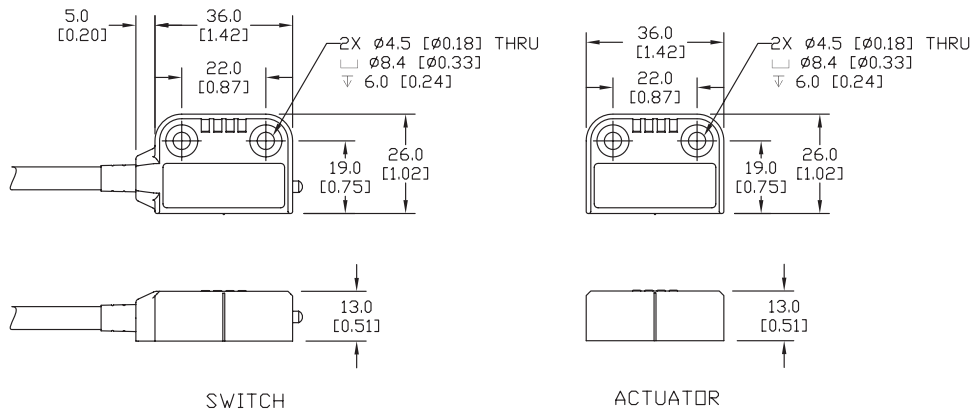
SWITCH

ACTUATOR

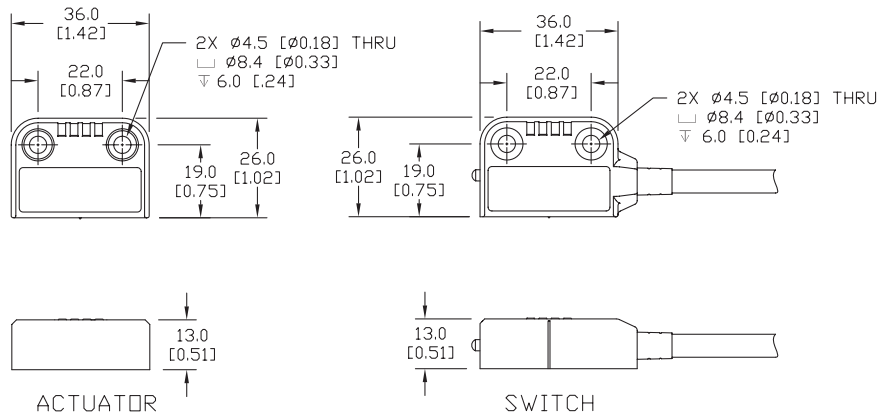
# IDEM Non-Contact Safety Switches Dimensions

## MPC Series

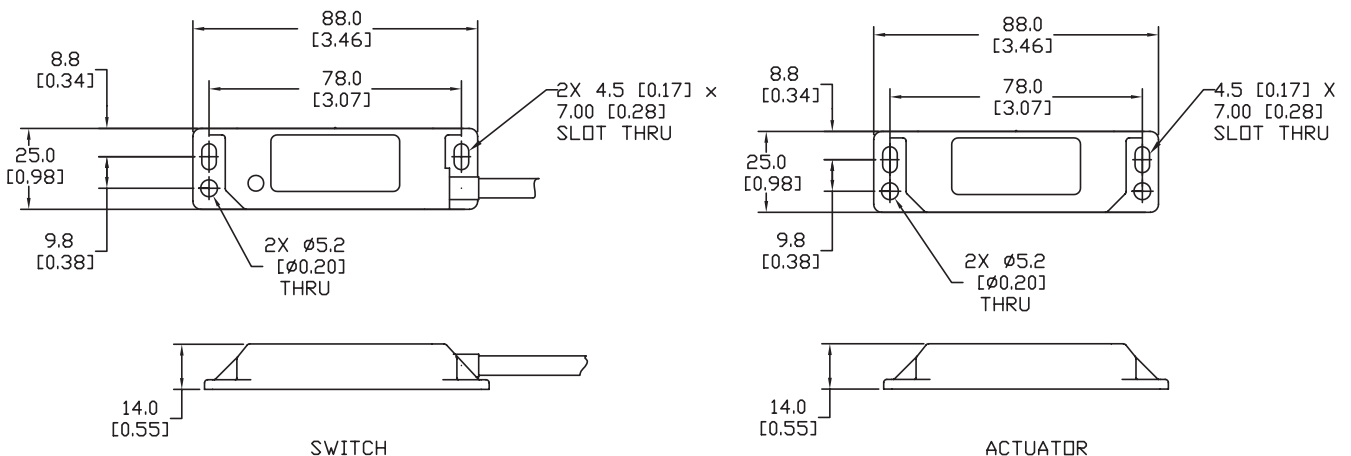
### Left Cable Exit



### Right Cable Exit

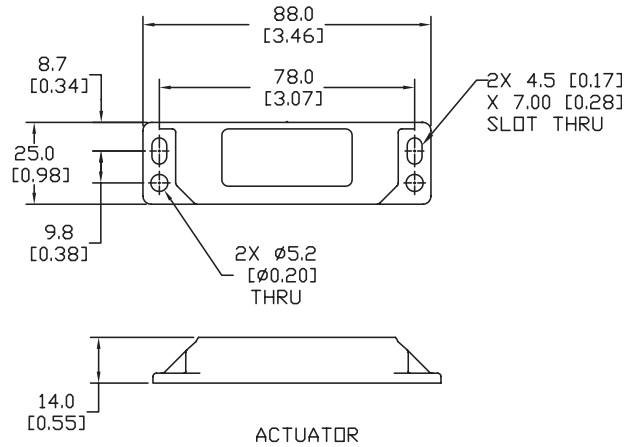
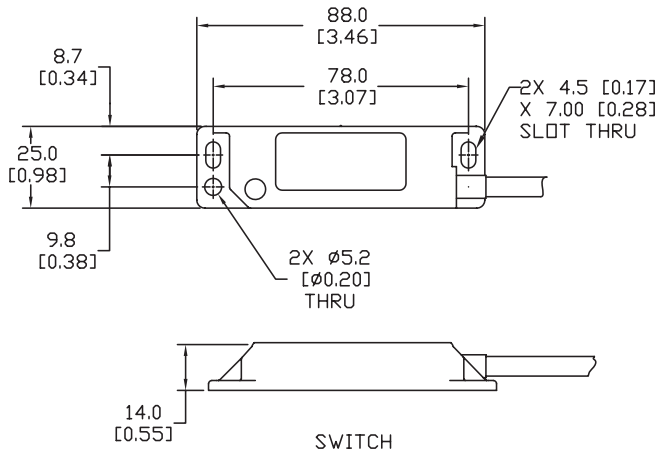


## LPC Series

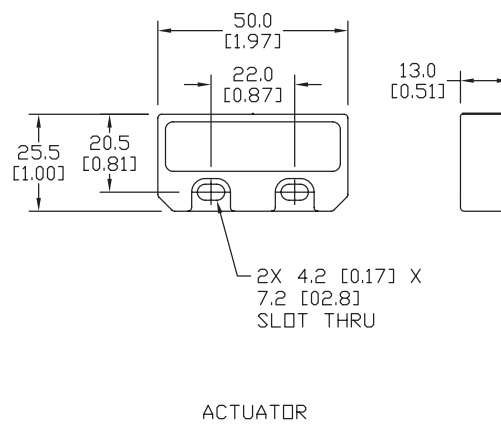
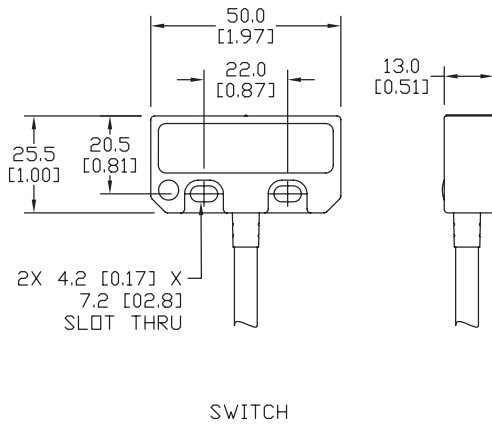


# IDEM Non-Contact Safety Switches Dimensions

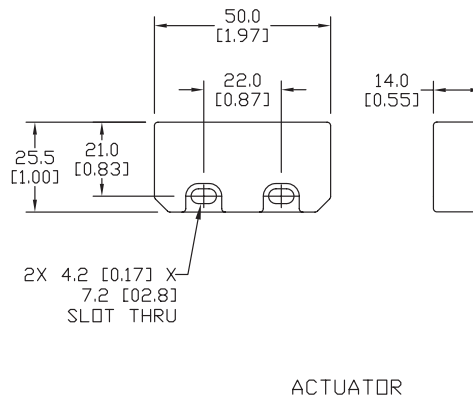
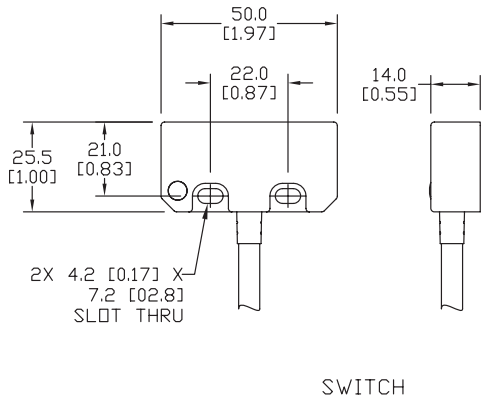
## LMC Series



## SPC Series



## SMC Series



Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

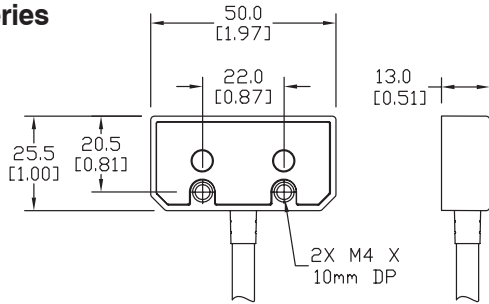
Safety: Electrical Components

Safety: Protective Wear

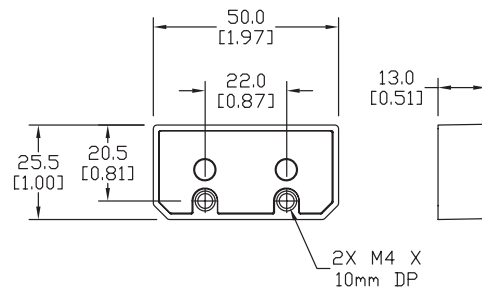
Terms and Conditions

# IDEM Non-Contact Safety Switches Dimensions

## SMC-F Series

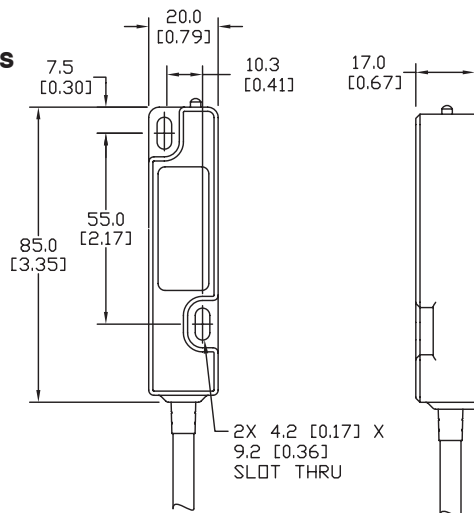


SWITCH  
BACK VIEW

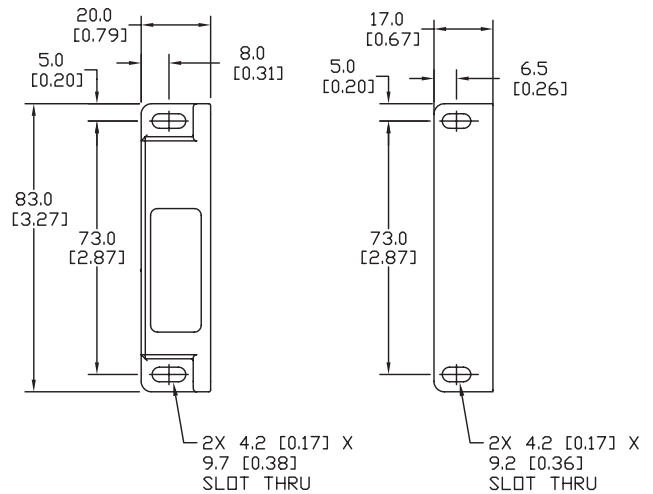


ACTUATOR  
BACK VIEW

## CPC Series

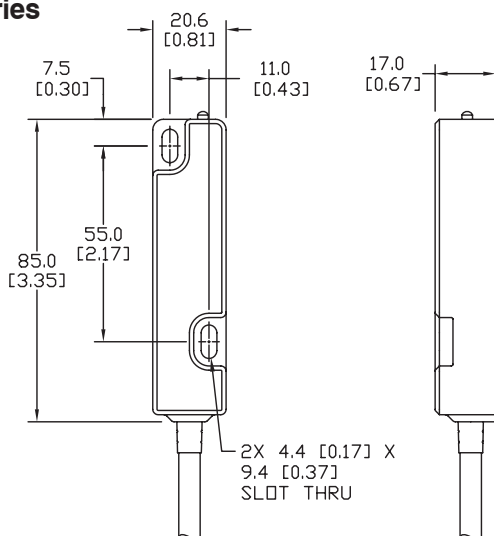


SWITCH

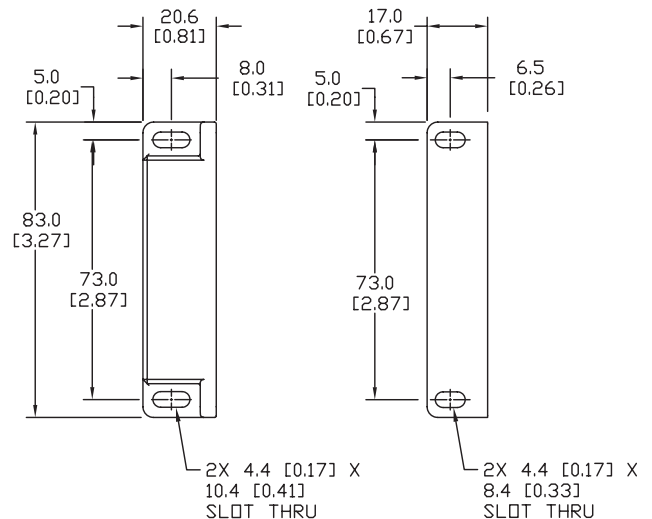


ACTUATOR

## CMC Series



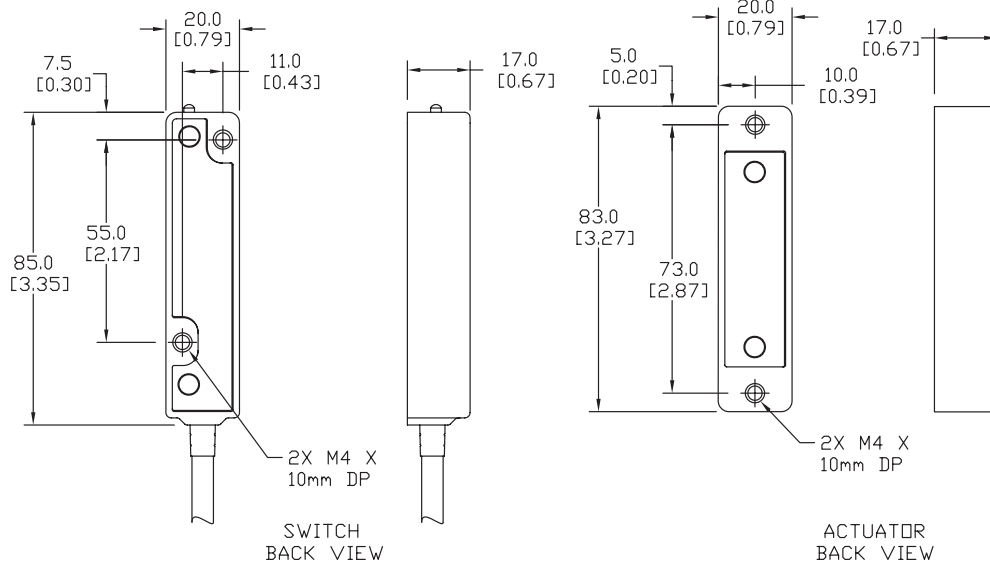
SWITCH



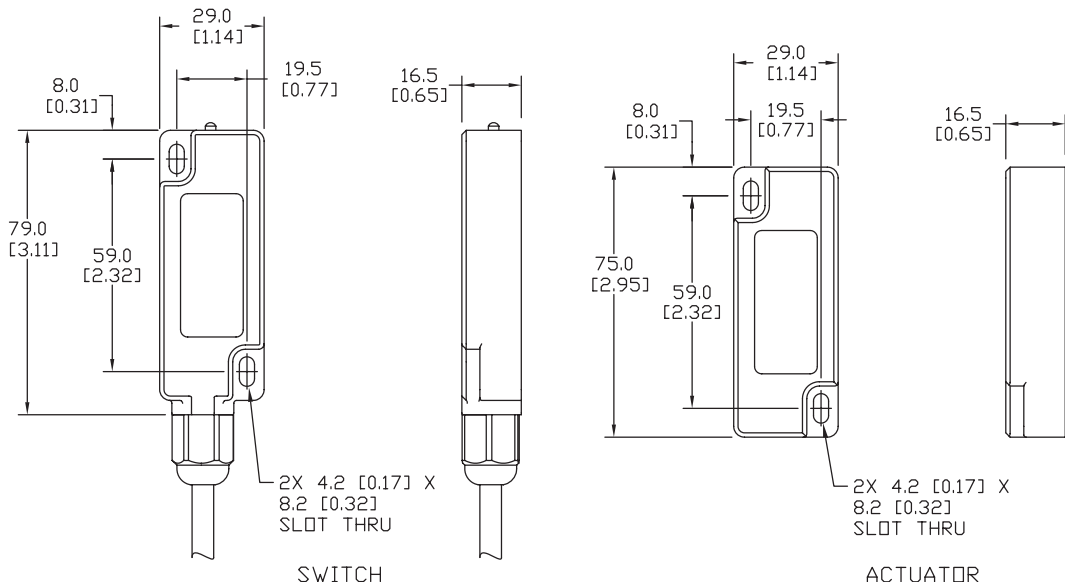
ACTUATOR

# IDEM Non-Contact Safety Switches Dimensions

## CMC-F Series



## WPC Series



Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Dold Trapped Key System Overview

## Trapped Key System

A trapped key system uses a series of mechanical locks and keys to control the access of gates or doors to running equipment or machines, ensuring safe access to those machines. Systems are set up in a predefined sequence, preventing accidental access to running equipment.

An operator must shut down machinery and lock it down, then remove the key and use the same key to unlock the door or doors that access the machinery. Keys are trapped and released in a sequential order.

- Main station has a switch module and optional solenoid actuator; Door stations have mechanical, rather than electrical, systems to provide safety for one or a series of gates.
- Allows control of a series of lock points
- Human operation of locking/unlocking provides peace of mind of firsthand, observable safety
- Cost-effective for multiple locks over a large area; eliminates cost of running electrical wiring over long distances

Note: Ordering a larger gate set than needed for the number of gates in a system compromises the safety integrity of that system. Spare keys are not available.

## Dold Standard and Solenoid Trapped Key Gate Sets

Dold Trapped Key System Gate Sets provide you with a full trapped key safety system, in one- to five-gate sets. They are available in either standard (SX) or solenoid-locking (ZRH) versions. All keys and their corresponding 01 and 10 modules are unique within a set. We also offer tongue key actuators (purchased separately from the gate sets), and optional items such as door actuators, captive safety key sets, key modules for key exchange box setup, and mounting plates.

See the following section, "Selecting a Dold Trapped Key Gate Set," for more information.

## Tongue Key Actuators

Our gate sets require one or more tongue key actuators:

- Standard right angle actuator (part no. ST2310-S-ACTUATOR)
- 4-spring actuator (part no. ST2311-C-ACTUATOR)
- Sliding actuator with spring (part no. ST2312-CS-ACTUATOR)

## Accessories

The following optional actuator key sets can be used with any of our trapped key gate sets:

- Safety key (part no. 01-SAFETY-KEY-SET) or padlock captive door actuator key (part no. PADLOCKMODULE-SET)
- Door actuator set (part no. ACTUATOR-SET-B) for use in "door at main" situation
- Key module set for implementing a key exchange box (part no. 1001-KEYMODULE-SET)



**ZRH-3GATE-SET**

## Mounting Plates

- Steel plates sized to easily mount various configured trapped key stations
- 8 pre-fabricated sizes
- Mounting plate size depends on size and number of modules in your application
- See Mounting Plates section for options


SEE OUR WEBSITE: [WWW.AUTOMATIONDIRECT.COM](http://WWW.AUTOMATIONDIRECT.COM) FOR ONLINE TRAINING VIDEOS.

# Selecting a Dold Trapped Key Gate Set

## ▶ STEP 1


Select the required gate set type for your application: Standard or solenoid locking.

**Standard Gate Sets (SX Series)**



SX-1GATE-SET
SX-3GATE-SET
SX-5GATE-SET

**Solenoid Gate Sets (ZRH Series)**



ZRH-1GATE-SET
ZRH-3GATE-SET
ZRH-5GATE-SET

## ▶ STEP 2

Select the required number of gates for your set (1-5). Note: Selecting a larger set than needed can compromise the safety integrity of the system. (See Dold Trapped Key Interlock Gate Sets.)

**SX Series**

SX-1GATE-SET  
SX-2GATE-SET  
SX-3GATE-SET  
SX-4GATE-SET  
SX-5GATE-SET


**ZRH Series**

ZRH-1GATE-SET  
ZRH-2GATE-SET  
ZRH-3GATE-SET  
ZRH-4GATE-SET  
ZRH-5GATE-SET

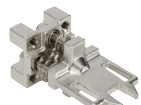
## ▶ STEP 3

Select the required number of tongue key actuators to match the number of gates in your application. Select one tongue key actuator per gate. (See Tongue Key Lock Actuators.)


**Tongue Key Actuators**



Actuator tongue, 90° mounting tab  
Order no.  
**ST2310-S-ACTUATOR**



Actuator tongue, 90° flexible mounting tab  
Order no.  
**ST2311-C-ACTUATOR**




Actuator tongue, 90° flexible handle  
Order no.  
**ST2312-CS-ACTUATOR**


## ▶ STEP 4

Select the optional accessories for your application. (See Dold Trapped Key Accessories.)


**Accessories**




Key module kit  
Order no.  
**01-SAFETY-KEY-SET**



Padlock module  
Order no.  
**PADLOCKMODULE-SET**



Gate actuator module  
Order no.  
**ACTUATOR-SET-B**




Safety key set  
Order no.  
**1001-KEYMODULE-SET**

## ▶ STEP 5

Select a mounting plate for your application. (See Dold Trapped Key Mounting Plates.)

**Mounting Plates**



Order no.

**ST2361100-PLATE-2**

**ST2362100-PLATE-3**

**ST2363100-PLATE-4**

**ST2364100-PLATE-5**

**ST2365100-PLATE-6**

**ST2366100-PLATE-7**

**ST2367100-PLATE-8**

**ST2368100-PLATE-9**

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Dold Trapped Key Interlock Gate Sets

## SX and ZRH Series

- Dold Safemaster trapped key modular and expandable interlock gate sets
- Easy installation through comprehensive accessories
- Wireless mechanical safeguarding
- One- to five-gate sets available
- Solenoid and standard versions available
- One conduit opening that accepts M20 x 1.5 fittings
- 316L stainless steel interlock safety switch body, coded trap key modules, coded keys, and tongue (key) gate actuator modules
- For safety applications up to PLe/Category 4 according to EN/ISO 13849-1
- Order actuating tongue (key) separately
- (2) m4x50 T20 tamper proof screws provided for the main station installation and each additional door installation

### Solenoid Gate Sets (ZRH)

- Interlocking safety switch with solenoid (24 VAC/DC), power to unlock
- (1) NC and (2) forced opening NO and NC changeover contacts for actuator tongue (key) status, (2) NC and (1) forced opening NO and NC changeover contacts for solenoid status

### Standard Gate Sets (SX)

- 316L stainless steel body interlock safety switches
- (1) NC and (2) forced opening NO / NC changeover contacts

### ZRH-1GATE-SET



Dold Trapped Key Interlock Gate Sets*			
Part Number	Price	Description	Weight (lbs)
ZRH-1GATE-SET	\$1,239.00	Solenoid trapped key interlock system, one gate set. Includes (1) interlocking safety switch with solenoid, (2) coded trap key modules and (1) coded key, (1) tongue (key) gate actuator module	7.6
ZRH-2GATE-SET	\$2,015.00	Solenoid trapped key interlock system, two gate set. Includes (1) interlocking safety switch with solenoid, (4) coded trap key modules and (2) coded keys, (2) tongue (key) gate actuator modules	11.7
ZRH-3GATE-SET	\$2,789.00	Solenoid trapped key interlock system, three gate set. Includes (1) interlocking safety switch with solenoid, (6) coded trap key modules and (3) coded keys, (3) tongue (key) gate actuator modules	15.9
ZRH-4GATE-SET	\$3,565.00	Solenoid trapped key interlock system, four gate set. Includes (1) interlocking safety switch with solenoid, (8) coded trap key modules and (4) coded keys, (4) tongue (key) gate actuator modules	20.0
ZRH-5GATE-SET	\$4,339.00	Solenoid trapped key interlock system, five gate set. Includes (1) interlocking safety switch with solenoid, (10) coded trap key modules and (5) coded keys, (5) tongue (key) gate actuator modules	24.2
SX-1GATE-SET	\$1,019.00	Trapped key interlock system, one gate set. Includes (1) interlock safety switch, (2) coded trap key modules and (1) coded key, (1) tongue (key) gate actuator module	5.8
SX-2GATE-SET	\$1,790.00	Trapped key interlock system, two gate set. Includes (1) interlock safety switch, (4) coded trap key modules and (2) coded keys, (2) tongue (key) gate actuator modules	10.0
SX-3GATE-SET	\$2,565.00	Trapped key interlock system, three gate set. Includes (1) interlock safety switch, (6) coded trap key modules and (3) coded keys, (3) tongue (key) gate actuator modules	14.1
SX-4GATE-SET	\$3,345.00	Trapped key interlock system, four gate set. Includes (1) interlock safety switch, (8) coded trap key modules and (4) coded keys, (4) tongue (key) gate actuator modules	18.3
SX-5GATE-SET	\$4,115.00	Trapped key interlock system, five gate set. Includes (1) interlock safety switch, (10) coded trap key modules and (5) coded keys, (5) tongue (key) gate actuator modules	22.4

\* See corresponding key transfer plans for each gate set.

## Tongue Key Lock Actuators

- Tongue key lock actuators for use with Dold Trapped Key System gate sets
- Standard right angle, 4-spring, and sliding with spring actuators available
- (1) T20 tamper proof screw included

### ST2310-S-ACTUATOR



### ST2311-C-ACTUATOR



### ST2312-CS-ACTUATOR



Dold Trapped Key Interlock Actuator Tongue (Keys)				
Part Number	Price	Description	Weight (lbs)	Minimum Entry Radius
ST2310-S-ACTUATOR	\$12.00	Dold Safemaster actuator tongue (key), for trapped key interlock systems, 316L stainless steel, 90° mounting tab	0.1	NA
ST2311-C-ACTUATOR	\$55.00	Dold Safemaster actuator tongue (key), for trapped key interlock systems, 316L stainless steel, 90° flexible mounting tab	0.2	200mm
ST2312-CS-ACTUATOR	\$115.00	Dold Safemaster actuator tongue (key), for trapped key interlock systems, 316L stainless steel, flexible handle	0.9	NA

Note: Spare keys compromise the safety of the system and are not available.



# Dold Trapped Key Accessories

## Accessory Sets

- Protection from being locked into machine
- TÜV certificate according to the legal and standard requirements
- For safety applications up to PLe/Category 4 according to EN/ISO 13849-1
- 316L stainless steel

### 1001-KEYMODULE-SET



1001-KEYMODULE-SET modifies an SX-GATE-SET or a ZRH-GATE-SET to implement a key exchange box. Uniquely keyed within itself, the 1001-KEYMODULE-SET allows for expansion of a key exchange plan.

### ACTUATOR-SET-B



ACTUATOR-SET-B is a gate actuator. It can be added anywhere a gate function is required, so that the SX or ZRH module can be used to protect or to lock a gate (mounting it directly on the gate).

Example: Add to an SX or ZRH unit to add a gate lock at the main key station.  
(Purchase tongue key separately.)

### PADLOCKMODULE-SET



PADLOCKMODULE-SET adds a personal safety feature for protection against being locked into a gate. One or more personal padlocks can be applied to the module. While a padlock is fixed to the module, the system cannot be restarted. The module can be inserted in an SX or ZRH module or for individual protection on the actual gate modules.

### 01-SAFETY-KEY-SET



01-SAFETY-KEY-SET adds a personal safety key as protection against being locked into any module of an SX or ZRH gate set.

This key is normally trapped; when released the operator can take it while in the machine.

Dold Trapped Key Interlock Accessory Sets			
Part Number	Price	Description	Weight (lbs)
<b>1001-KEYMODULE-SET</b>	\$615.00	Dold Safemaster key module set, for trapped key interlock systems, includes (2) 316L stainless steel coded trap key modules, (1) coded key, (1) bayonet mounting ring and (2) end modules	3.1
<b>PADLOCKMODULE-SET</b>	\$215.00	Dold Safemaster padlock module, for trapped key interlock systems, 316L stainless steel. Includes bayonet mounting ring.	1.4
<b>ACTUATOR-SET-B</b>	\$159.00	Dold Safemaster gate actuator module, for trapped key interlock systems, 316L stainless steel. Includes bayonet mounting ring. Order actuating tongue (key) separately.	1.1
<b>01-SAFETY-KEY-SET</b>	\$335.00	Dold Safemaster safety key set, for trapped key interlock systems. Includes (1) 316L stainless steel coded trap key module and (1) coded key	1.3

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Dold Trapped Key Mounting Plates

## Mounting Plates

- For mounting trapped key interlock systems to gates or doors
- Choose a mounting plate based on the number of modules/gates in your application.
- 316 stainless steel
- T20 M4 x 40 mounting screws (2 tamper proof) included



**ST2361100-PLATE-2**  
**ST2362100-PLATE-3**  
**ST2363100-PLATE-4**  
**ST2364100-PLATE-5**

**ST2365100-PLATE-6**  
**ST2366100-PLATE-7**  
**ST2367100-PLATE-8**  
**ST2368100-PLATE-9**

<b>Dold Trapped Key Interlock Mounting Plates</b>			
<b>Part Number</b>	<b>Price</b>	<b>Description</b>	<b>Weight (lbs)</b>
<b>ST2361100-PLATE-2</b>	\$45.00	Dold Safemaster mounting plate, for trapped key interlock systems, 316L stainless steel, 40mm wide by 291mm long	0.8
<b>ST2362100-PLATE-3</b>	\$49.00	Dold Safemaster mounting plate, for trapped key interlock systems, 316L stainless steel, 40mm wide by 351mm long	1.0
<b>ST2363100-PLATE-4</b>	\$55.00	Dold Safemaster mounting plate, for trapped key interlock systems, 316L stainless steel, 40mm wide by 411mm long	1.2
<b>ST2364100-PLATE-5</b>	\$59.00	Dold Safemaster mounting plate, for trapped key interlock systems, 316L stainless steel, 40mm wide by 471mm long	1.4
<b>ST2365100-PLATE-6</b>	\$85.00	Dold Safemaster mounting plate, for trapped key interlock systems, 316L stainless steel, 40mm wide by 531mm long	1.6
<b>ST2366100-PLATE-7</b>	\$105.00	Dold Safemaster mounting plate, for trapped key interlock systems, 316L stainless steel, 40mm wide by 591mm long	1.8
<b>ST2367100-PLATE-8</b>	\$120.00	Dold Safemaster mounting plate, for trapped key interlock systems, 316L stainless steel, 40mm wide by 651mm long	2.0
<b>ST2368100-PLATE-9</b>	\$128.00	Dold Safemaster mounting plate, for trapped key interlock systems, 316L stainless steel, 40mm wide by 711mm long	2.2

## Choosing a Mounting Plate

Choose a mounting plate based on the number of modules/gates in your application:

- ZRH counts as three.
- SX counts as one.
- Each actuator counts as one.

**Example: A ZRH-4-GATE-SET requires four ST2361100-PLATE-2 and one ST2366100-PLATE-7.**

# Dold Trapped Key Safety and Electrical Specifications

Specifications		
	Standard (SX)	Solenoid (ZRH)
<b>Safety Classification and Reliability Data</b>		
<b>Switching Reliability (B10d)</b>	2 x 10 <sup>6</sup> switching cycles	
<b>EN 954-1</b>	Up to Category 4	
<b>ISO 13849-1</b>	Up to PL <sub>e</sub>	
<b>Electrical and General Specifications</b>		
<b>Short Circuit Strength</b>	4A max fusing	
<b>Rated Insulation Voltage</b>	<60 V	
<b>Contact Terminals</b>	Cage tension plugs Min. 0.25 mm <sup>2</sup> ; max 1.5 mm <sup>2</sup> (16 to 22 AWG)	
<b>Current Consumption</b>	0.3W	6W
<b>Solenoid Voltage</b>	NA	24 VAC/VDC
<b>Max. Switching Current</b>	2A @ 24 VAC/VDC	
<b>Enclosure Protection</b>	IP 65 (electrical components only)	
<b>Operating Temperature (Electrical Components)</b>	-25 °C to +65 °C [-13°F – 149°F]	-25 °C to +60 °C [-13°F – 140°F]
<b>Storage Temperature (Electrical Components)</b>	Storage temperature: -40 °C to +80 °C	
<b>Operating/Storage Temperature (Mechanical Components)</b>	-75 °C to 140 °C	
<b>Recommended Mounting Screws/Torque</b>	M4; 2Nm	
<b>Cable Entry</b>	M20 x 1.5	
<b>Solenoid Holding Force</b>	>1000N	
<b>Operating Speed (Key/Tongue)</b>	Max 500 mm/s; Min 100 mm/s	
<b>Switching Frequency (Contacts)</b>	Max 360/h	
<b>Agency Approvals</b>	CE, TUV	

Note: To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

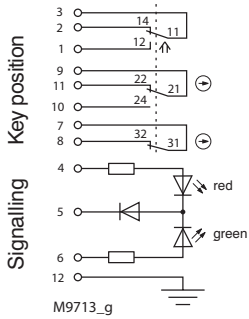
Safety: Protective Wear

Terms and Conditions

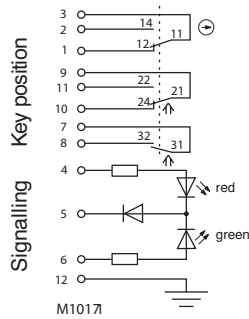
# Dold Trapped Key Safety and Electrical Specifications

## Electrical Drawings and Travel Charts

### SX Series



**Fig. 1:**  
Locked while activated:  
Key inserted



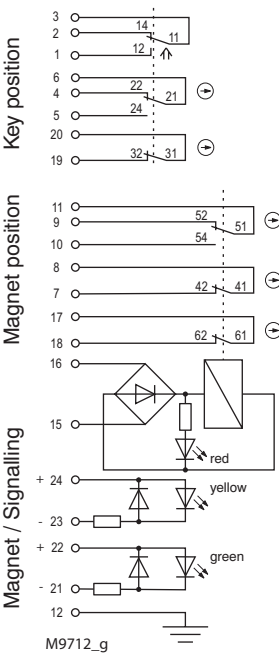
**Fig. 2:**  
Lock deactivated:  
Key removed

Switching logic

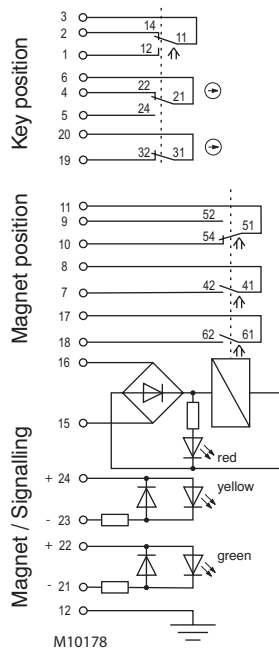
			Fig. 1	Fig. 2
Door contacts	3	2	■	□
	3	1	□	■
	9	11	■	■
	9	10	■	■
	7	8	■	■

■ closed  
□ open

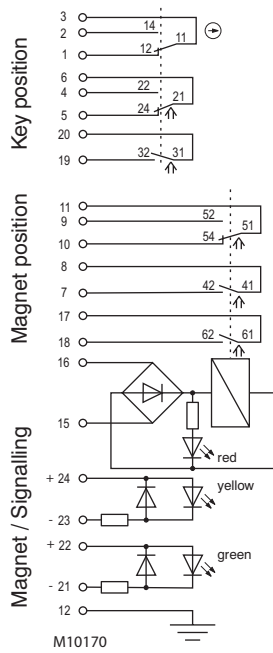
### ZRH Series



**Fig. 1:**  
Solenoid locking activated:  
Magnet locked,  
Key inserted



**Fig. 2:**  
Solenoid locking deactivated:  
Magnet released,  
Key inserted



**Fig. 3:**  
Solenoid locking deactivated:  
Magnet released,  
Key removed

Switching logic

			Fig. 1	Fig. 2	Fig. 3
Key Position Door contacts	3	2	■	□	□
	3	1	□	■	■
	6	4	■	■	■
	6	5	■	■	■
Magnet Position Magnet contact	11	9	■	□	□
	11	10	■	■	■
	7	8	■	□	□
	17	18	■	□	□
Magnet/ Signalling Control signal Magnet	15	16	□	■	□
			U <sub>N</sub>		

■ closed  
□ open

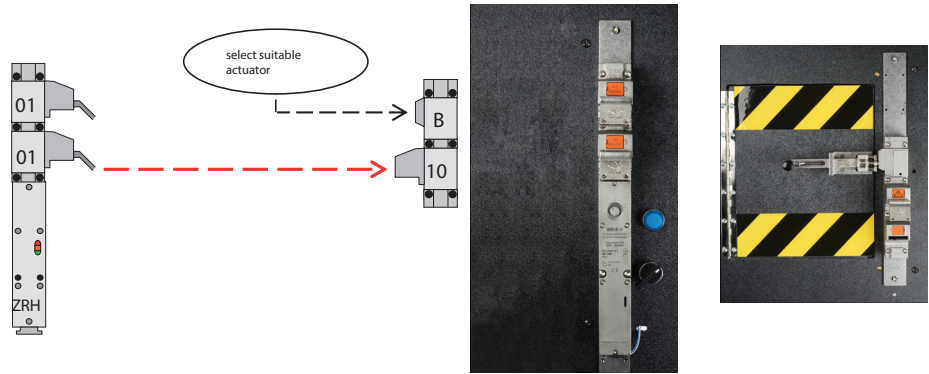
The state shown in **Figure 3** does not depend on the control signal of the magnet.

If the control signal is applied and the key inserted the solenoid locking changes to the state of **Figure 2**.

If no signal is applied and the key inserted the solenoid locking changes to the state of **Figure 1**

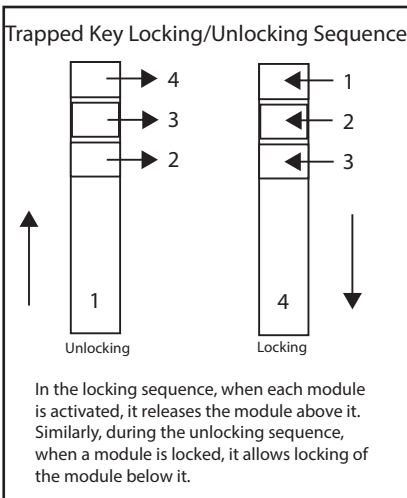
# Dold Trapped Key Transfer Plans

## Example: 2-gate set Mechanical Trapped Key Path

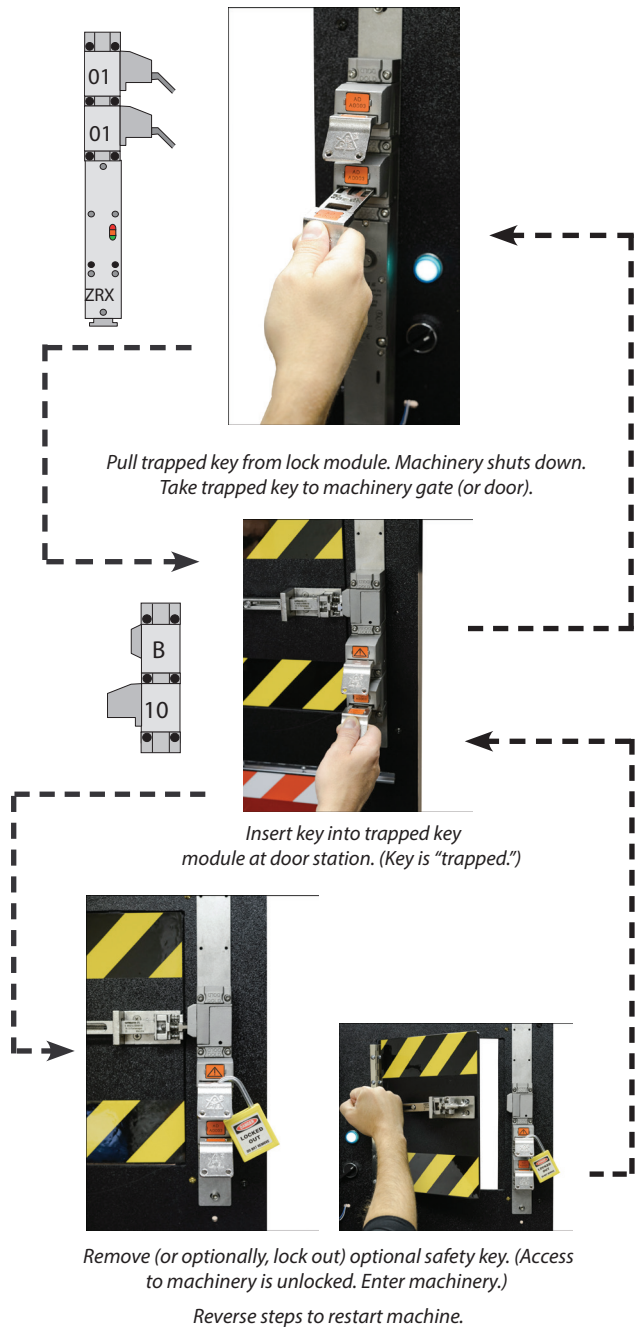


Keys trapped at main station (left).  
Door station with optional padlock module (right).

The following example shows the path of the mechanical key opening and closing one gate in a 2-gate set trapped key system.



Transfer Plan Legend		
Gate Sets		
<b>SX</b>	Standard key set base (main station)	A-labeled keys
<b>ZRH</b>	Solenoid locking key set base (main station)	
<b>01</b>	Trapped key removal module (main station)	
<b>B</b>	Door actuator (door station)	
<b>10</b>	Trapped key Insertion module (door station)	
Accessories		
<b>10/01</b>	Key exchange box (main station)	B-labeled keys
<b>V</b>	Padlock Module (main station)	—
<b>B</b>	Door actuator (main station)	—
<b>01</b>	Safety key (door station)	C-labeled keys



Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

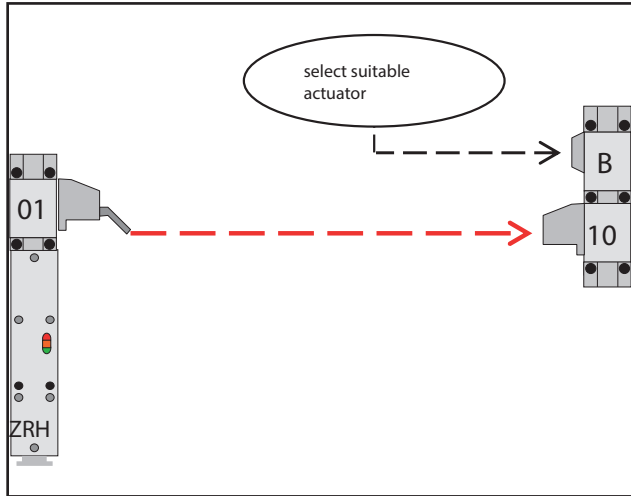
Terms and Conditions

# Dold Trapped Key Transfer Plans

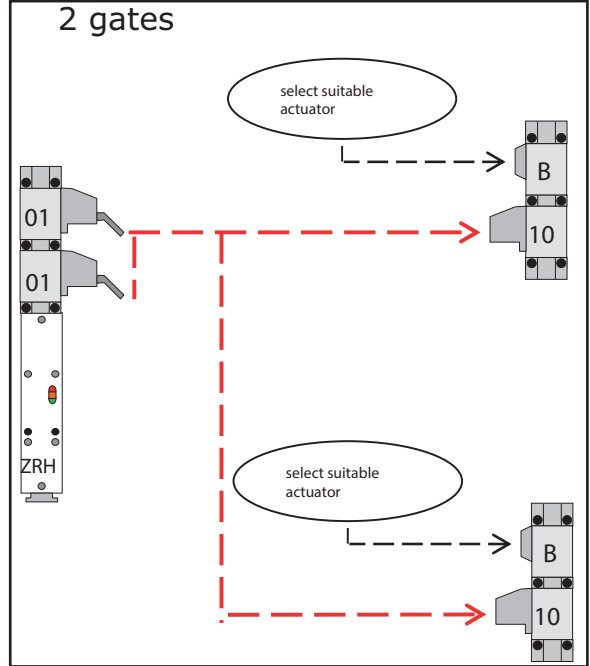
## SX and ZRH Series

\*ZRH Series gate sets shown. (SX series 01 modules have smaller footprint.)

### 1-Gate Set

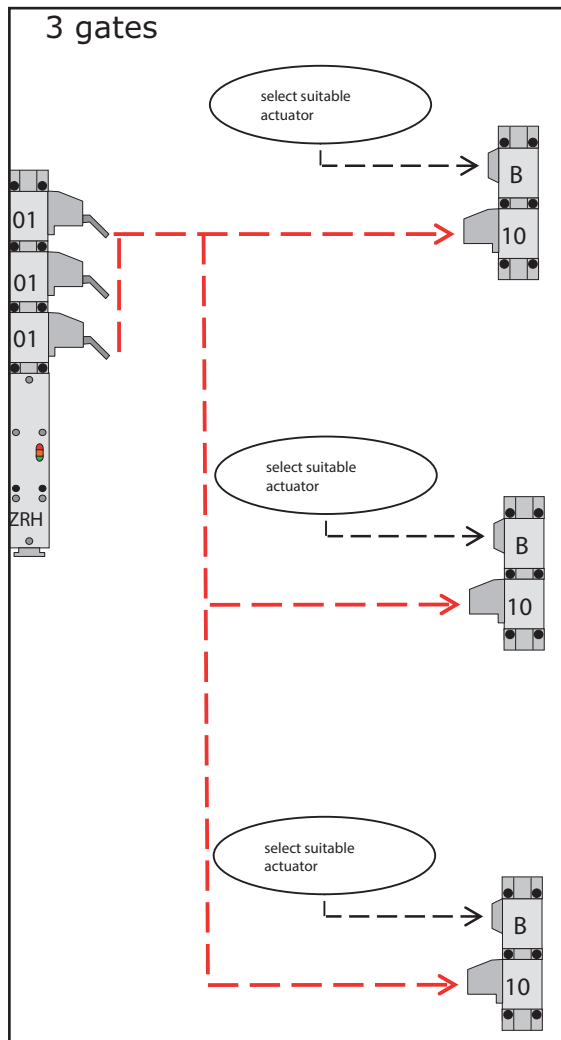


### 2-Gate Set



- \*Suitable actuators:
- ST2310-S-ACTUATOR
  - ST2311-C-ACTUATOR
  - ST2312-CS-ACTUATOR

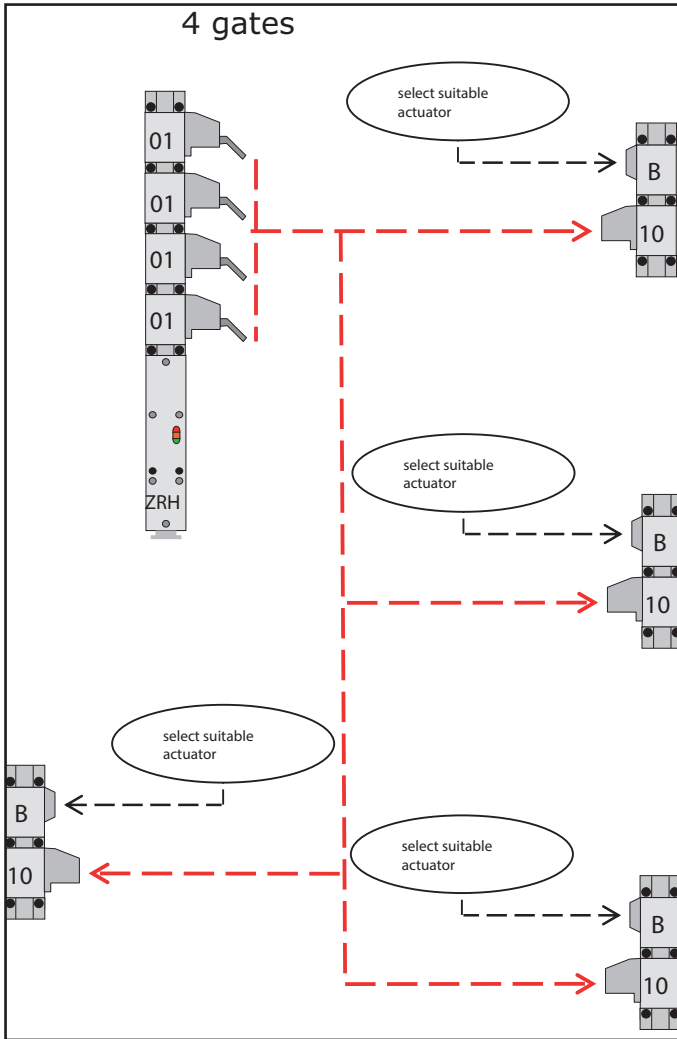
### 3-Gate Set



Transfer Plan Legend		
Gate Sets		
<b>SX</b>	Standard key set base (main station)	
<b>ZRH</b>	Solenoid locking key set base (main station)	
<b>01</b>	Trapped key removal module (main station)	A-labeled keys
<b>B</b>	Door actuator (door station)	
<b>10</b>	Trapped key Insertion module (door station)	
Accessories		
<b>10/01</b>	Key exchange box (main station)	B-labeled keys
<b>V</b>	Padlock Module (main station)	—
<b>B</b>	Door actuator (main station)	—
<b>01</b>	Safety key (door station)	C-labeled keys

# Dold Trapped Key Transfer Plans

## 4-Gate Set



- \*Suitable actuators:
- ST2310-S-ACTUATOR
  - ST2311-C-ACTUATOR
  - ST2312-CS-ACTUATOR

Transfer Plan Legend		
Gate Sets		
<b>SX</b>	Standard key set base (main station)	A-labeled keys
<b>ZRH</b>	Solenoid locking key set base (main station)	
<b>01</b>	Trapped key removal module (main station)	
<b>B</b>	Door actuator (door station)	
<b>10</b>	Trapped key Insertion module (door station)	
Accessories		
<b>10/01</b>	Key exchange box (main station)	B-labeled keys
<b>V</b>	Padlock Module (main station)	—
<b>B</b>	Door actuator (main station)	—
<b>01</b>	Safety key (door station)	C-labeled keys

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

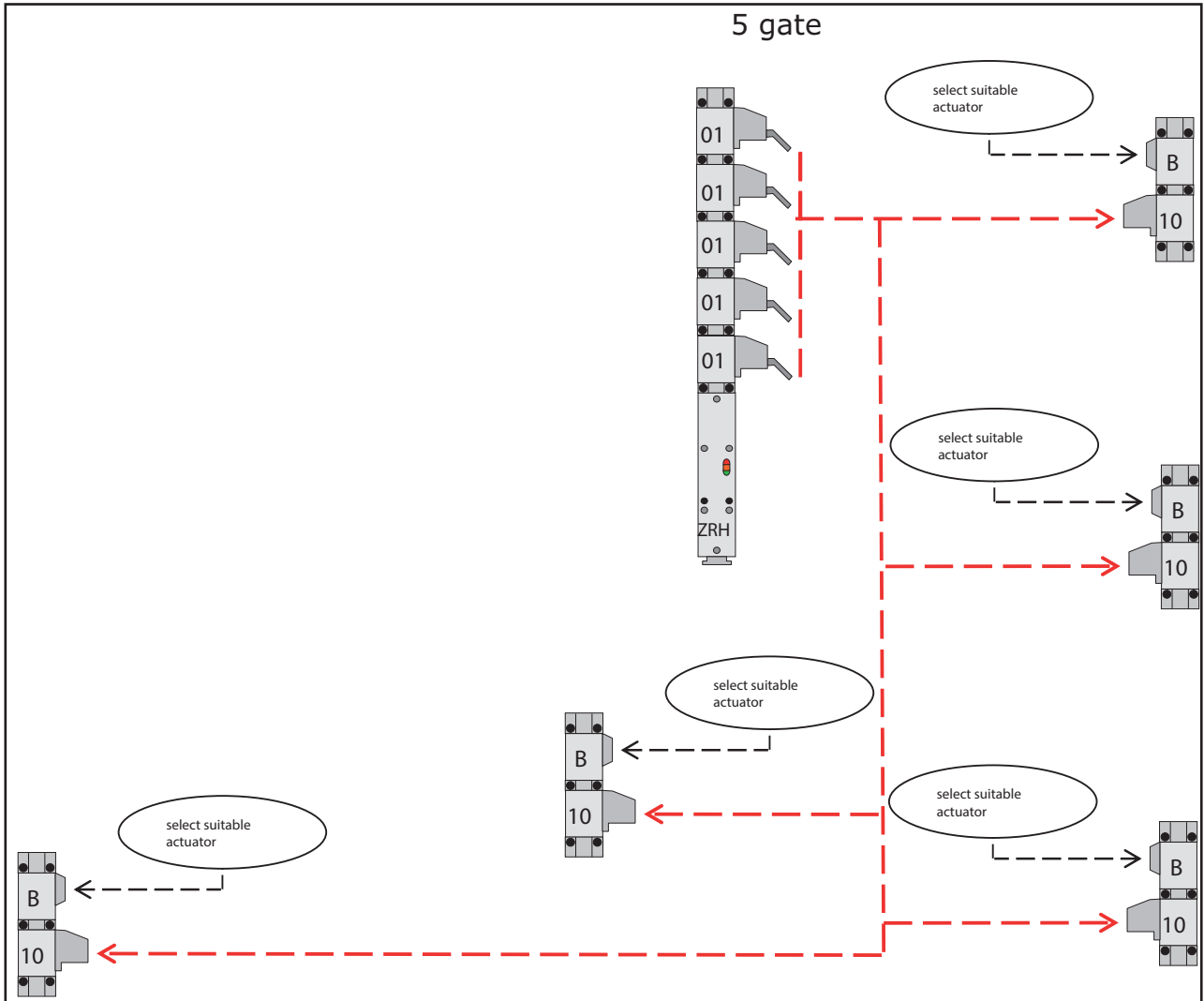
Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Dold Trapped Key Transfer Plans

## 5-Gate Set



- \*Suitable actuators:
- ST2310-S-ACTUATOR
  - ST2311-C-ACTUATOR
  - ST2312-CS-ACTUATOR

Transfer Plan Legend		
Gate Sets		
<b>SX</b>	Standard key set base (main station)	A-labeled keys
<b>ZRH</b>	Solenoid locking key set base (main station)	
<b>01</b>	Trapped key removal module (main station)	
<b>B</b>	Door actuator (door station)	
<b>10</b>	Trapped key Insertion module (door station)	
Accessories		
<b>10/01</b>	Key exchange box (main station)	B-labeled keys
<b>V</b>	Padlock Module (main station)	—
<b>B</b>	Door actuator (main station)	—
<b>01</b>	Safety key (door station)	C-labeled keys



# Dold Trapped Key Accessories

## Accessories

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

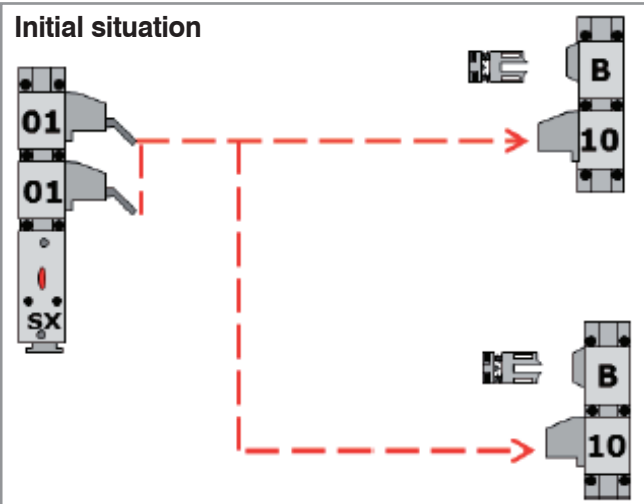
Safety: Electrical Components

Safety: Protective Wear

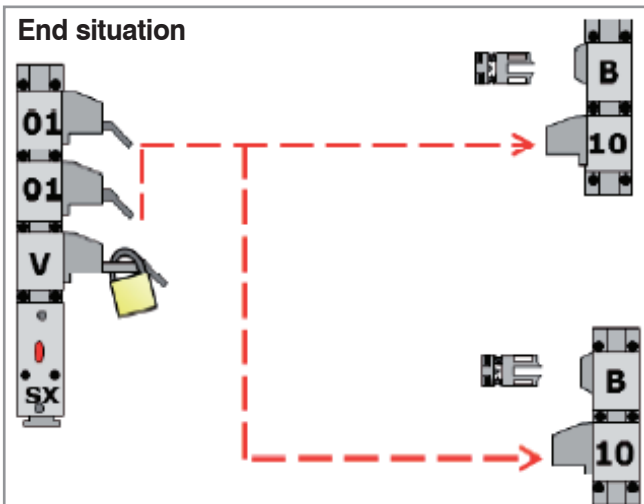
Terms and Conditions

### PADLOCKMODULE-SET

Example: SX-2GATE-SET:

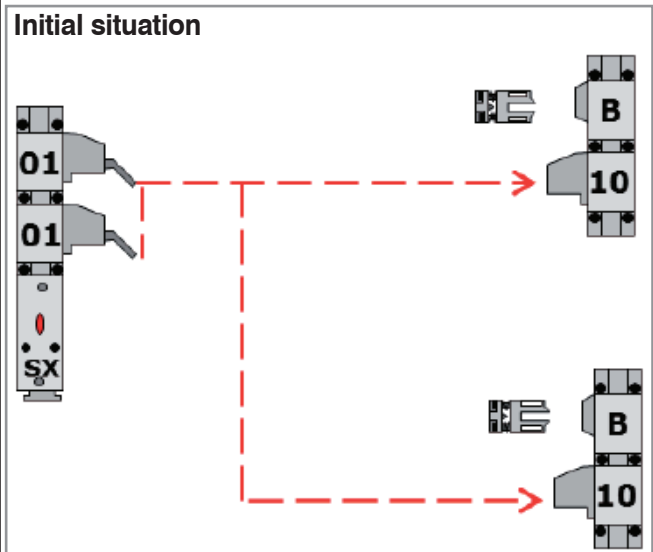


Example: SX-2GATE-SET with additional PADLOCKMODULE-SET:

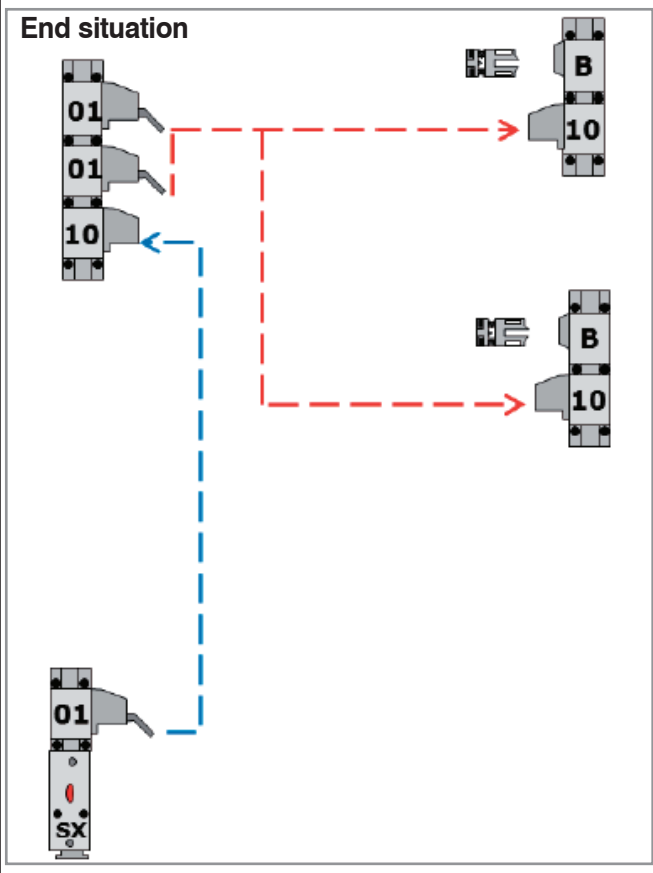


### 1001-KEYMODULE-SET

Example: SX-2GATE-SET:



Example: SX-2GATE-SET with key exchange box:



### Transfer Plan Legend

#### Gate Sets

<b>SX</b>	Standard key set base (main station)	A-labeled keys
<b>ZRH</b>	Solenoid locking key set base (main station)	
<b>01</b>	Trapped key removal module (main station)	
<b>B</b>	Door actuator (door station)	
<b>10</b>	Trapped key Insertion module (door station)	

#### Accessories

<b>10/01</b>	Key exchange box (main station)	B-labeled keys
<b>V</b>	Padlock Module (main station)	—
<b>B</b>	Door actuator (main station)	—
<b>01</b>	Safety key (door station)	C-labeled keys

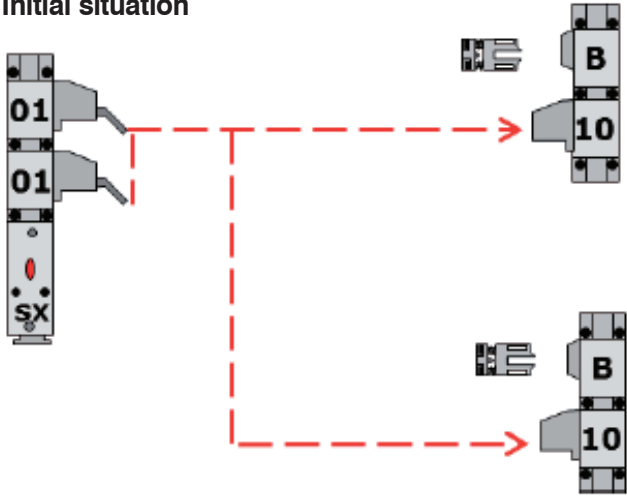
# Dold Trapped Key Accessories

## Accessories

### 01-SAFETY-KEY-SET

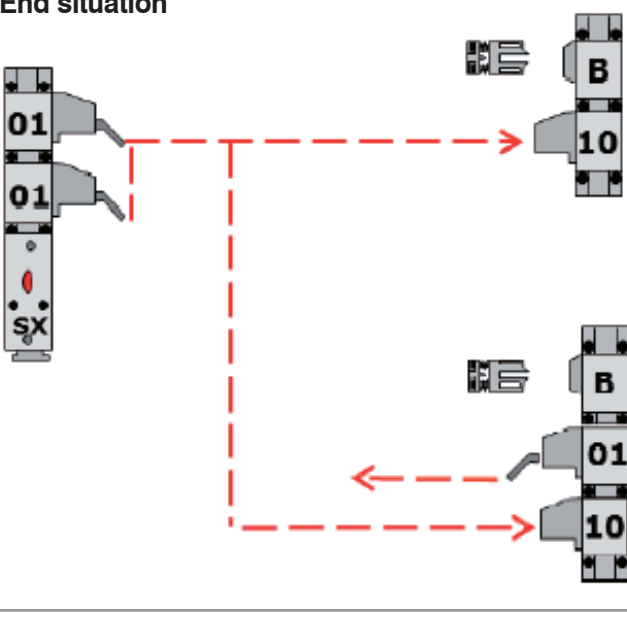
Example: SX-2GATE-SET:

#### Initial situation



Example: SX-2GATE-SET with safety key:

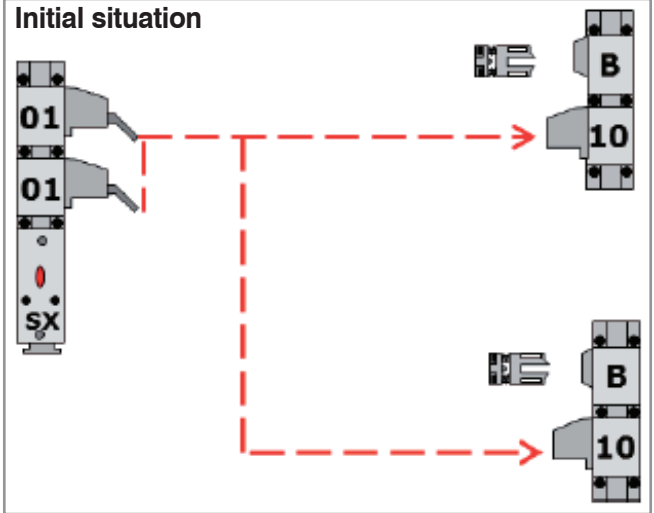
#### End situation



### ACTUATOR-SET-B

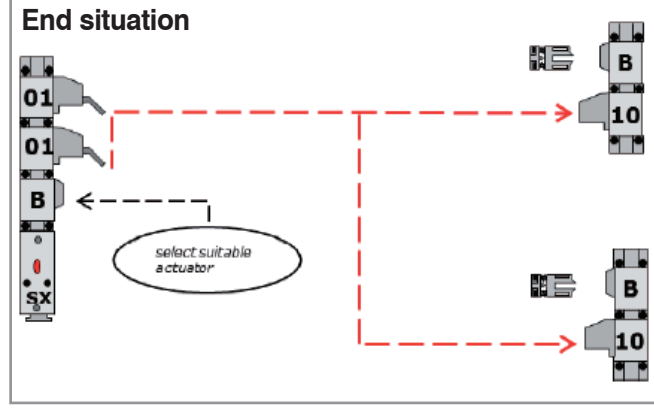
Example: SX-2GATE-SET:

#### Initial situation



Example: SX-2GATE-SET with additional B-ACTUATOR-SET:

#### End situation



### Transfer Plan Legend

#### Gate Sets

<b>SX</b>	Standard key set base (main station)	A-labeled keys
<b>ZRH</b>	Solenoid locking key set base (main station)	
<b>01</b>	Trapped key removal module (main station)	
<b>B</b>	Door actuator (door station)	
<b>10</b>	Trapped key Insertion module (door station)	

#### Accessories

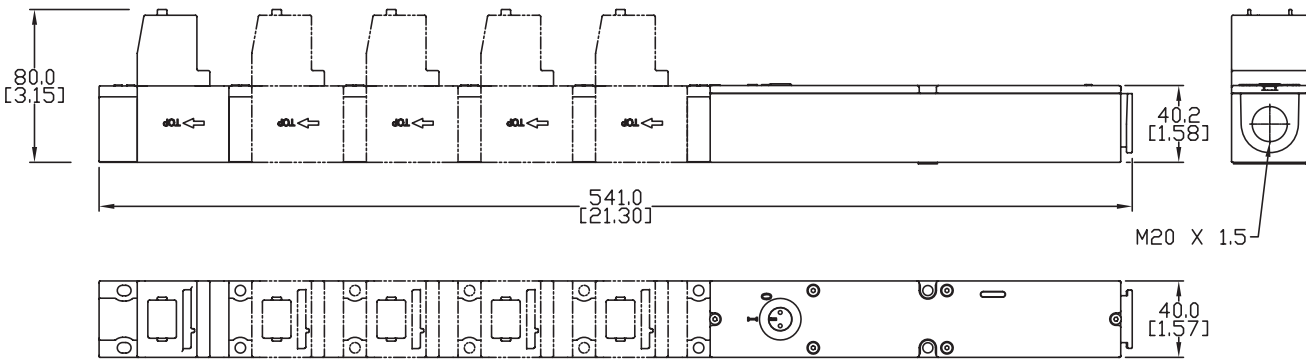
<b>10/01</b>	Key exchange box (main station)	B-labeled keys
<b>V</b>	Padlock Module (main station)	—
<b>B</b>	Door actuator (main station)	—
<b>01</b>	Safety key (door station)	C-labeled keys

# Dold Trapped Key System Dimensions

Dimensions mm[in]

## ZRH-XGATE-SET

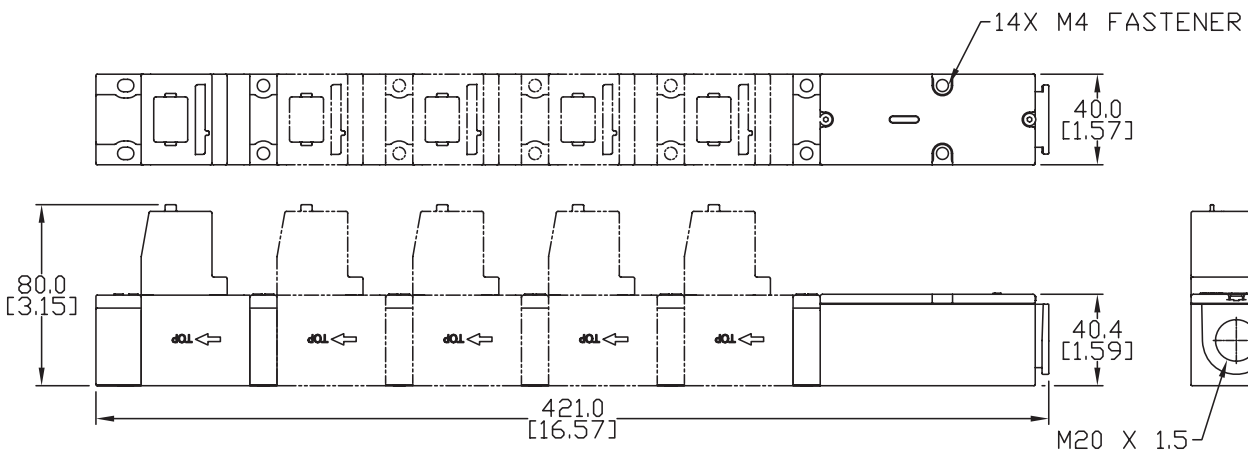
UP TO 5X GATE MODULE



**Note:** ZRH-XGATE-SET also includes 1-5 GATE ACTUATOR MODULES, depending on the gate set kit number (1-5).

## SX-XGATE-SET

UP TO 5X GATE MODULE



**Note:** SX-XGATE-SET also includes 1-5 GATE ACTUATOR MODULES, depending on the gate set kit number (1-5).

SEE OUR WEBSITE: [WWW.AUTOMATIONDIRECT.COM](http://WWW.AUTOMATIONDIRECT.COM) FOR COMPLETE ENGINEERING DRAWINGS.

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

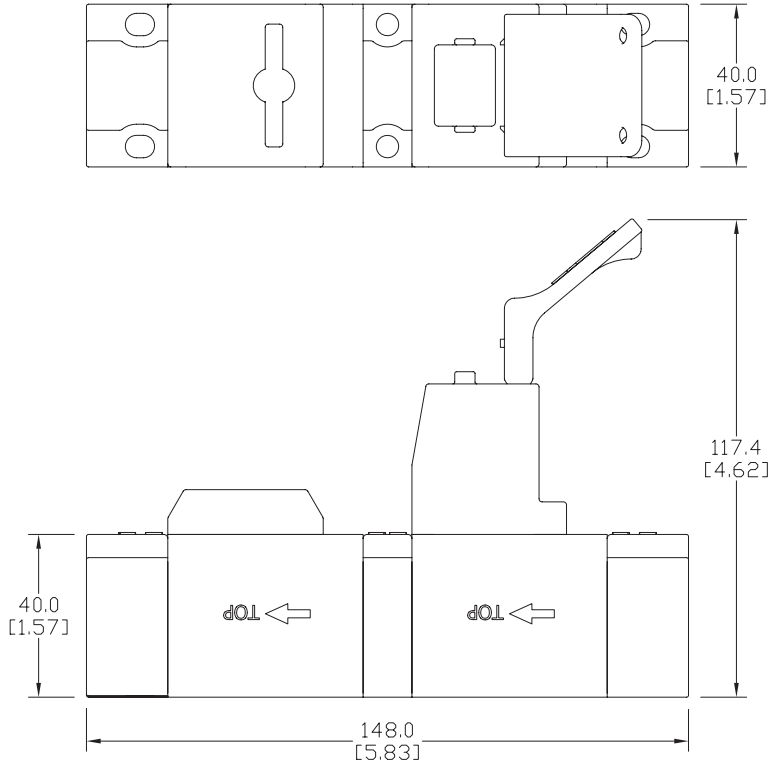
Terms and Conditions

# Dold Trapped Key System Dimensions

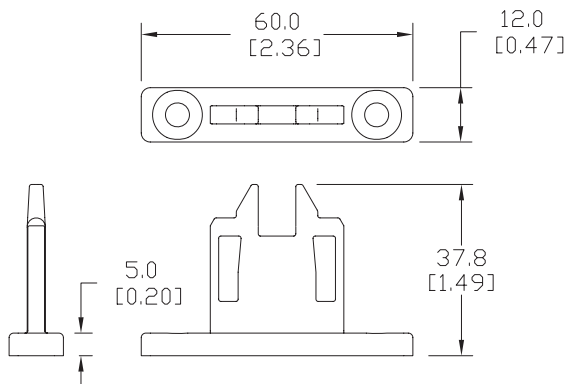
## Dimensions mm[in]

### Gate Actuator Module

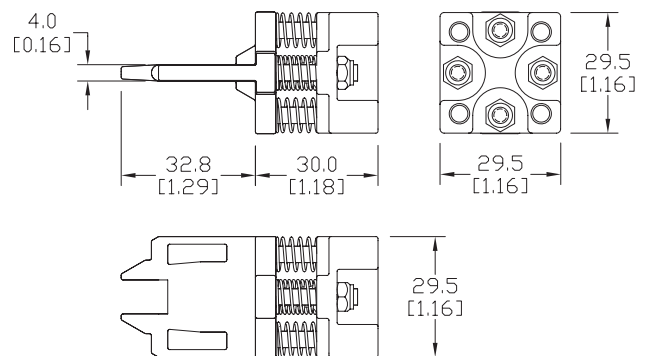
Gate actuator modules are included with both ZRH-XGATE-SET and SX-XGATE-SET. The number of gate actuator modules included in a gate set corresponds to the gate set number (1-5). Example: ZRH-3GATE-SET kit includes three gate actuator modules.



### ST2310-S-ACTUATOR



### ST2311-C-ACTUATOR

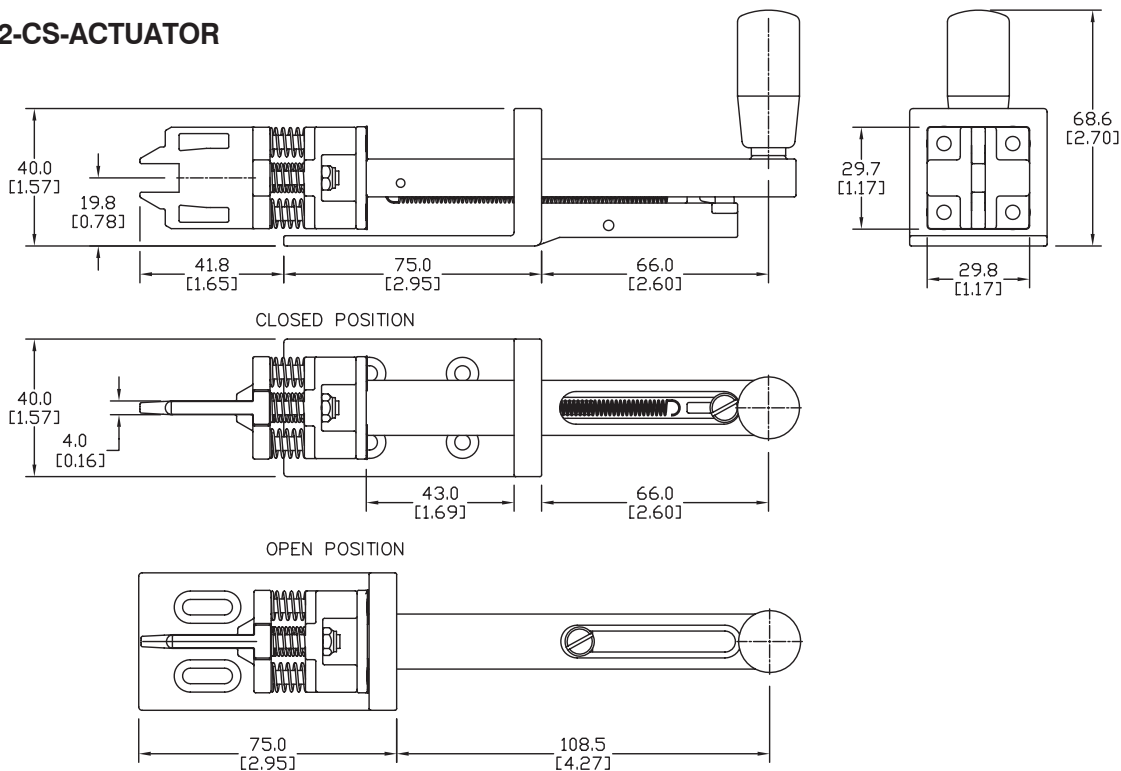


SEE OUR WEBSITE: [WWW.AUTOMATIONDIRECT.COM](http://WWW.AUTOMATIONDIRECT.COM) FOR COMPLETE ENGINEERING DRAWINGS.

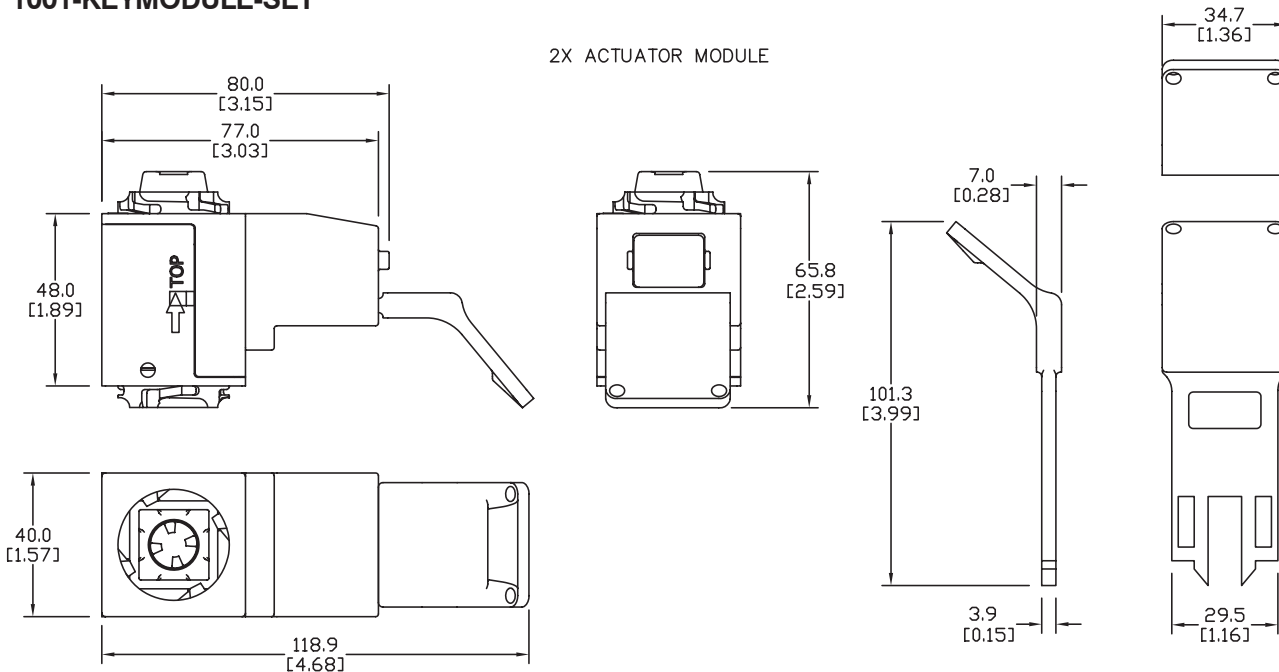
# Dold Trapped Key System Dimensions

## Dimensions mm[in]

### ST2312-CS-ACTUATOR



### 1001-KEYMODULE-SET



SEE OUR WEBSITE: [WWW.AUTOMATIONDIRECT.COM](http://WWW.AUTOMATIONDIRECT.COM) FOR COMPLETE ENGINEERING DRAWINGS.

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

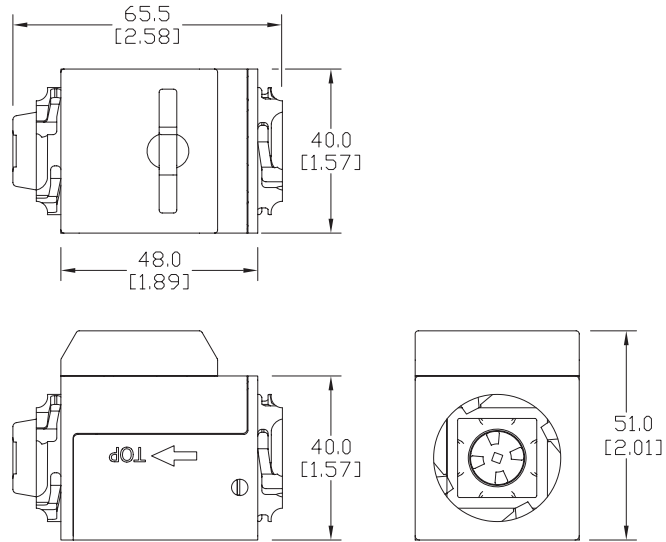
Safety: Protective Wear

Terms and Conditions

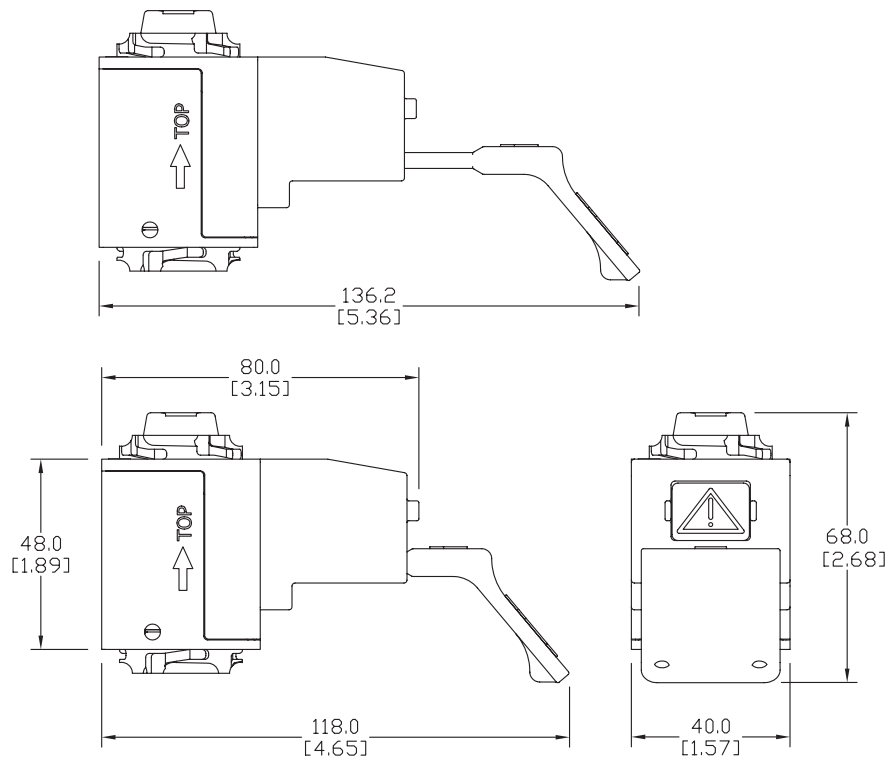
# Dold Trapped Key System Dimensions

Dimensions mm[in]

## ACTUATOR-SET-B



## PADLOCKMODULE-SET



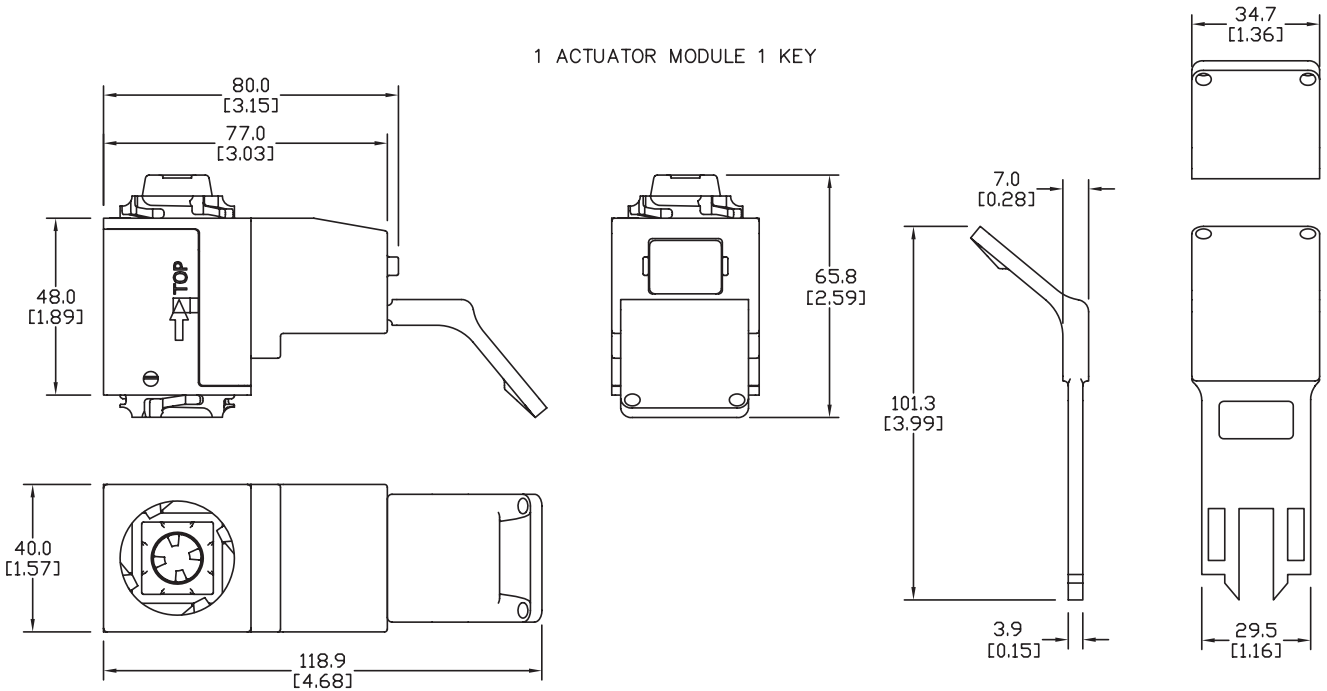
SEE OUR WEBSITE: [WWW.AUTOMATIONDIRECT.COM](http://WWW.AUTOMATIONDIRECT.COM) FOR COMPLETE ENGINEERING DRAWINGS.

# Dold Trapped Key System Dimensions

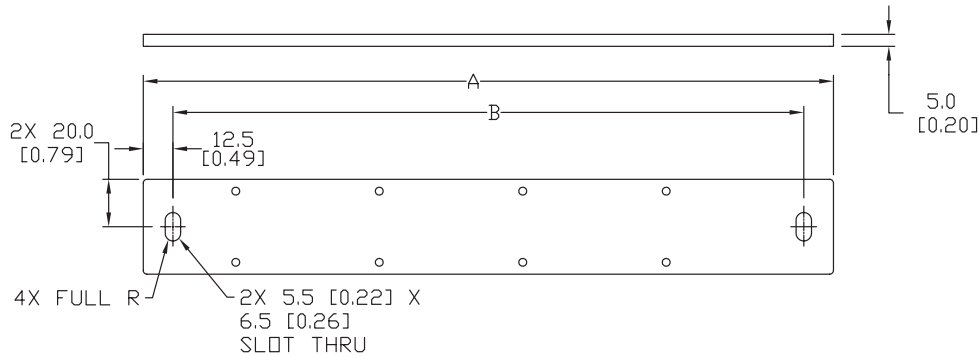
Dimensions mm[in]

## 01-SAFETY-KEY-SET

1 ACTUATOR MODULE 1 KEY



## STX36XXXX-PLATE-X



DIMENSION TABLE			
PART NO.	A	B	# OF MODULE MNTG HOLES
STE361100-PLATE-2	291.0 [11.46]	266.0 [10.47]	8
STE362100-PLATE-3	351.0 [13.82]	326.0 [12.83]	10
STE363100-PLATE-4	411.0 [16.18]	386.0 [15.20]	12
STE364100-PLATE-5	471.0 [18.54]	446.0 [17.56]	14
STE365100-PLATE-6	531.0 [20.91]	506.0 [19.92]	16
STE366100-PLATE-7	591.0 [23.27]	566.0 [22.28]	18
STE367100-PLATE-8	651.0 [25.63]	626.0 [24.65]	20
STE368100-PLATE-9	711.0 [27.99]	686.0 [27.01]	22

SEE OUR WEBSITE: [WWW.AUTOMATIONDIRECT.COM](http://WWW.AUTOMATIONDIRECT.COM) FOR COMPLETE ENGINEERING DRAWINGS.

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZiLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Shop online at [www.AutomationDirect.com](http://www.AutomationDirect.com)

Direct Sales in US and Canada | 1-800-633-0405

Search from over 13,000 products

FREE 2-Day Shipping  
On orders \$49 and over - See Details

0 Items - \$0.00

Home | Tech Support | Downloads | Manuals/Docs | Product Info | About Us

**Shopping Categories**

- Cables
- Circuit Protection / Fuses / Disconnects
- Communications
- Drives
- Enclosures
- Field I/O
- Industrial Monitors
- Manuals
- Motion Control
- Motor Controls
- Motors
- Operator Interfaces
- PC-based Control
- Pneumatic Components
- Power Products (Electrical)
- Power Transmission (Mechanical)
- Process Control & Measurement
- Programmable Controllers
- Pushbuttons / Switches / Indicators
- Relays / Timers
- Safety
- Sensors / Encoders
- Software Products
- Stacklights
- Terminal Blocks
- Tools & Test Equipment
- Wiring Solutions
- Inventory Reduction
- Retired Products
- Re-Manufactured Products

**New Products**

- PN Series low-cost IP69K Proximity Sensors
- More Pneumatics: Hoses and Fittings just added
- More KOYO Rectangular Proximity Sensors
- Over 200 Enclosure Subpanels Just Added
- DirectSOFT Version 6

**Get the News** Sign up to receive e-newsletters:

**Fast Help**  
Voted top in service 14 years straight

- Free phone/email Tech Support
- Library.AutomationDirect.com
- Free video tutorials
- Customer Forum
- PLC Training

**Popular Links**

- Track Your Order
- Pay Open Invoices
- What's New
- Download Price List
- Online catalog
- Free software downloads

**Company Reviews**  
Overall Score - 4.7 out of 5  
(324 reviews / 267 comments)  
Read what customers are saying

**Top Product Categories**

**Affordable industrial controllers from the #1 value in automation**

- CLICK**  
• Easy for new user  
• Basic machine control  
• Lowest cost
- Do-more**  
• Cost effective hardware  
• All documentation on board  
• Built-in communications
- Direct Koyo**  
• Advanced discrete  
• Basic process control  
• Expandability  
• Ethernet
- Productivity**  
• Advanced discrete and process  
• Extensive communications  
• Distributed I/O  
• Data collection

USE links on this green bar for account and purchase related tasks

[Login/Register](#) [Check Account](#) [Ordering Help](#) [Chat](#) ... plus more

USE this blue bar for dropdown menus that link to our online resources

- | Technical Support  | Downloads  | Manuals/Docs   | Product Info   |
|--|--|--|--|
| <ul style="list-style-type: none"><li>• Online Tech Forum</li><li>• Product FAQs</li><li>• Example Programs</li><li>• Software/Firmware Downloads</li><li>• CAD Drawings</li><li>• ... plus more</li></ul> | <ul style="list-style-type: none"><li>• Firmware</li><li>• Software</li><li>• Upgrades</li><li>• Tools and Utilities</li><li>• ... plus more</li></ul> | <ul style="list-style-type: none"><li>• Product Manuals</li><li>• CAD Drawings</li><li>• Compliance Docs</li><li>• Automation Terms</li><li>• Country of Origin Docs</li><li>• ... plus more</li></ul> | <ul style="list-style-type: none"><li>• News and Features</li><li>• Online Catalog</li><li>• Request Printed Catalog</li><li>• Download Pricelist</li><li>• Product Application Stories</li><li>• Sign up for our e-news</li><li>• ... plus more</li></ul> |

Our online store is the best way to buy industrial controls.

All the information you need is there to help you make your purchases easily, quickly, and efficiently.

## It's easy to find what you need

When you're ready to browse or choose parts in the store, use one of five different ways to shop based on your needs.

- Quick Form - fastest if you already have a list of parts, key in part numbers and quantities
- Category drill down - choose parts from product categories on left side of any site screen
- Search - use the Search box to find parts or information you need; use List or Picture organization. Parametric search results can help you find product by specifications required.
- Bill of Materials (create, save, retrieve) - for frequent similar purchases
- Favorites List - save part numbers in list to reorder

## Get a quote in seconds

Just log in, add parts to your shopping cart, choose "Get a Quote" from the cart screen, and a printable quote is generated. We maintain your quotes for you. Prices are guaranteed for 30 days. You can easily re-quote when they expire.

## Getting the right stuff

For each product you take to the checkout, we list "Recommended" items that are normally necessary to properly operate your selected product. This helps you order all the parts you need the first time.

## Secure server

We use the latest encryption technology to ensure that your order will be secure, whether it's by P.O. or credit card.

**AUTOMATIONDIRECT**.com

## Order using your form of payment

We accept approved purchase orders, major credit cards (MasterCard, Amex, Discover, VISA), and just recently added, PayPal. To establish a credit account with AutomationDirect, you can print our credit application from the Web site and fax it back to us to get the process started. We also offer payment by I-checks. See Terms and Conditions section for complete details:

<http://www.automationdirect.com/static/specs/adpolicy.pdf>

## Automatic e-mail confirmation

If you order online, you will receive e-mails confirming acceptance and shipment of your order (including tracking number). Please make sure we have your current e-mail address by logging in and selecting "Registration."

## Order tracking

Using the Processed Orders and Tracking report in your personal home page, you can track your order. (Order tracking is available the evening after your order is processed.)

## Need Web site help?

Unlike some other e-commerce companies, be assured that you can contact us if you need help using our Web site. Call 1-800-633-0405, or email us at [store@automationdirect.com](mailto:store@automationdirect.com) with questions. Also, a library of "Help videos" and helpful links are under the "Site Help" tab of our site.

## Take the entire catalog with you

Our entire set of printed catalogs are also online in searchable PDF format and you can download it to view it anywhere you want.

[www.AutomationDirect.com/PDFcatalog](http://www.AutomationDirect.com/PDFcatalog)



# Dold Safety Relays Selection Guide



Specification	E-Stop and Gate Safety Relay		Time Delay Safety Relay
<b>Coil Voltages</b>	24VDC, 110VAC, 230VAC		24VAC/DC
<b>Contact Configuration</b>	2 N.O. positive guided safety contacts or 3 N.O. positive guided safety contacts and 1 N.C. monitoring contact		3 N.O. time delay positive guided safety contacts, 2 N.O. instantaneous positive guided safety contacts and 1 N.C. instantaneous monitoring contact
<b>Safety Data</b>	Category 2 according to 13849-1 PL <sub>d</sub> according to EN 13849-1 SIL 2 according to IEC/EN 61508		Category 4 according to 13849-1 PL <sub>d</sub> according to EN 13849-1 SIL 3 according to IEC/EN 61508
<b>Agency Approvals</b>	cULus, RoHS, CE, TUV		cULus, RoHS, CE, TUV



Specification	Two-hand Controllers	Light Curtain and Safety Mat Controllers
<b>Coil Voltages</b>	24VDC, 110VAC, 230VAC	24VDC
<b>Contact Configuration</b>	2 N.O. positive guided safety contacts and 1 N.C. monitoring contact or 3 N.O. positive guided safety contacts and 1 N.C. monitoring contact	2 N.O. positive guided safety contacts and 1 N.C. monitoring contact or 3 N.O. positive guided safety contacts and 1 N.C. monitoring contact
<b>Safety Data</b>	Category 4 according to EN 13849-1 PL <sub>d</sub> according to EN 13849-1 SIL 3 according to IEC/EN 61508	Category 4 according to 13849-1 PL <sub>d</sub> according to EN 13849-1 SIL 3 according to IEC/EN 61508
<b>Agency Approvals</b>	cULus, RoHS, CE, TUV	cULus, RoHS, CE, TUV



Specification	Speed Safety Relay (Speed Monitoring and Motor Standstill)	Extension Relays	Multifunction Safety Relay
<b>Coil Voltages</b>	24VAC/VDC	24VAC/VDC	24VDC
<b>Safety Data</b>	Category 4 according to 13849-1 PL <sub>d</sub> according to EN 13849-1 SIL 3 according to IEC/EN 61508	Category 4 according to 13849-1 PL <sub>d</sub> according to EN 13849-1 SIL 3 according to IEC/EN 61508	Category 4 according to 13849-1 PL <sub>d</sub> according to EN 13849-1 SIL 3 according to IEC/EN 61508
<b>Agency Approvals</b>	cULus, RoHS, CE, TUV	cULus, RoHS, CE, TUV	cULus, RoHS, CE, TUV

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Dold LG5924 Series 1-Channel Emergency Stop



LG5924-48-61-24

Designed to protect people and machines in applications with E-stop buttons.

- Single channel operation
- Output options: 2 N.O. contacts, or 3 N.O. contacts and 1 N. C. contact
- LED indicators for power and state of operation
- Short circuit detection between terminal Y1 and common

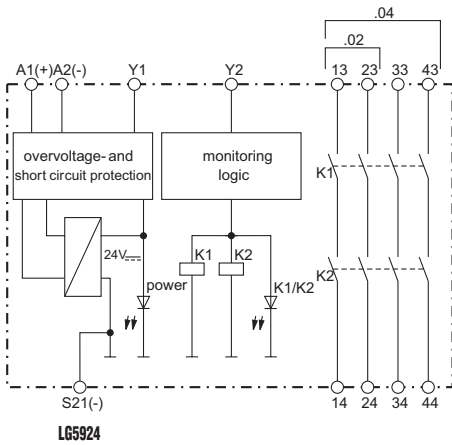
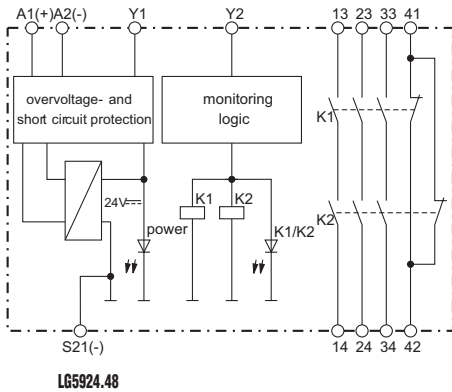
LG5924 Series Single Channel Safety Relays Selection Chart				
Part Number	Price	Marking Type	Voltage	Outputs
LG5924-02-61-24	\$88.00	1-channel E-STOP	24 VDC	2 N.O.
LG5924-48-61-24	\$99.00	1-channel E-STOP	24 VDC	3 N.O. and 1 N.C.
LG5924-48-61-110	\$112.00	1-channel E-STOP	110 VAC	3 N.O. and 1 N.C.
LG5924-48-61-230	\$112.00	1-channel E-STOP	230 VAC	3 N.O. and 1 N.C.

Safety Data – Values per EN ISO 13849-1	
Category	2 according to EN 954-1
Performance level	PLd according to EN 13849-1
MTTF <sub>d</sub>	180.3 years
DC <sub>avg</sub>	99%
Safety Data – Values per IEC/EN 62061 /IEC/EN 61508	
SIL CL	2 per IEC/EN 62061
SIL	2 per IEC/EN 61508
HFT (Hardware Failure Tolerance)	1
DC <sub>avg</sub>	99%
SFF	99.7%
PFHD	2.60E-10 h <sup>4</sup>

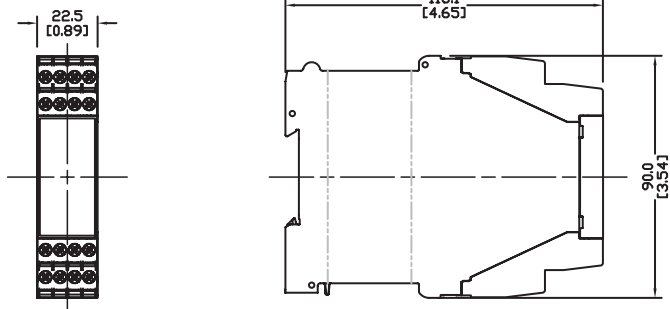
LG5924 Controllers Safety Relay Specification Table	
<b>General Specifications</b>	
Temperature	Storage: -25°C to 85°C (-13°F to 185°F) Operating: -15°C to 55°C (5°F to 131°F)
Altitude	< 2,000 meters
Vibration Resistance	Amplitude: 0.35mm, Frequency: 10 to 55 Hz (IEC/EN 60-068-2-6)
Degree of Protection	Per IEC/EN 60 529. Housing: IP40; Terminals IP20
Housing	UL 94V-0 Thermoplastic; DIN mount, 35 mm x 7.5 mm
Weight	LG5924 24VDC 200 g (7.05 oz.) LG5924 110, 230VAC 270 g (9.52 oz.)
Agency Approvals and Standards	cULus file E107778, CE, RoHS, TUV
Terminal Designation per EN 50 005 Wire Connections	1x4 mm <sup>2</sup> solid or 1 x 2.5 mm <sup>2</sup> stranded ferruled (isolated) or 2 x 1.5 mm <sup>2</sup> stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm <sup>2</sup> solid DIN 46 228-1/-2/-3
Wire Fixing	Plus-minus terminal screws M3.5 box terminals with self-lifting wire protection or cage clamp terminals.
<b>Input Specifications</b>	
Nominal Voltage	110, 230VAC, 24VDC
Voltage Range	AC: 0.85 to 1.1 U <sub>N</sub> . At 10% residual ripple: DC: 0.9 to 1.1 U <sub>N</sub> . At 48% residual ripple: DC: 0.85 to 1.1 U <sub>N</sub>
Maximum Consumption	230VAC approx. 3.5 A; 24V DC approx. 1.5W
Nominal Frequency	50 to 60 Hz
Control Voltage on Y1	24V DC: typ. 22V DC. 110V, 230V AC: typ. 45V DC
Control Current	24VDC: typ. DC 65 mA. 110V, 230V AC: typ. AC 16 mA
Short Circuit Protection	Internal with PTC (Positive Temperature Coefficient resistor)
Overvoltage Protection	Internal VDR (Voltage Dependent Resistor)
<b>Output Specifications</b>	
Electrical Contact Life	According to DC15: at 5A, 230V AC: >1.5x150,000 switching cycles. According to DC13: N.O. contacts, 2 contacts in series: 8A/24V >25x25,000 ON: 0.4s, OFF: 9.6 s
Mechanical Life	>10x10 <sup>6</sup> switching cycles
Contact Type	LG5924.02: 2 N.O. relay contacts, positively driven. LG5924.48: 3 N.O. positively driven and 1 N.C. relay contacts. (N.O. contacts are safety contacts.)
Operate Delay	Operate delay: 24VDC: typ. 40 ms; 110VAC, 230VAC typ. 200 ms
Release Delay	Release delay: 24VAC/DC typ. 70 ms; 230VAC typ. 35 ms.
Nominal Output Voltage	250VAC
Thermal Current (I <sub>th</sub> )	Max. 5A. See continuous current limit curve in installation manual.
Short Circuit Strength	Max. fuse rating: 10A gL (IEC/EN 60 947-5-1); Line circuit breaker: B 6A
Switching Capacity (IEC/EN 60947-5-1)	To AC 15: N.O. contacts: 3A/230VAC; N.C. contacts: 2A/230VAC To DC 13: N.C. contacts: 4A/24VDC; N.O. contacts: 4A/24VDC; 0.5A/110V
Switching Frequency	Max. 600 switching cycles/hr

# Dold LG5924 Series 1-Channel Emergency Stop

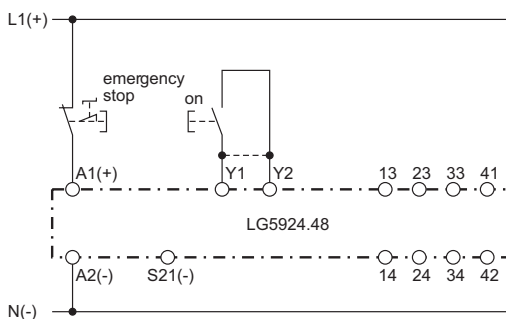
## LG5924 Block Diagrams



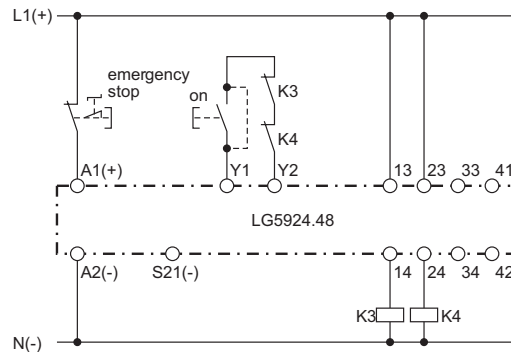
## Dimensions mm(in)



## Applications



Single-channel, emergency-stop circuit without feedback loop, with or without automatic restart. For automatic restart, terminals Y1 - Y2 must be jumpered. No ON pushbutton necessary.



Contact reinforcement by external contactors, 2-channel controlled. For currents >5A, the output contacts can be reinforced by external contactors. Functioning of the external contactors is monitored by looping the N.C. contacts into the start circuit (Y1 - Y2).

**\*Note: When switching inductive loads, surge suppressors are recommended.**

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Dold LG5925 Series 2-Channel Emergency Stop and Safety Gates



LG5925-48-61-24

Designed to protect people and machines in applications with E-stop buttons and safety gates.

- Outputs: 3 N.O. contacts and 1 N.C. contact
- Feedback circuit to monitor external contactors used for reinforcement of contacts
- Overvoltage and short-circuit protection
- Monitored manual restart
- Single and 2-channel operation
- LED indicators for power and state of operation

Safety Data – Values per EN ISO 13849-1	
Category	4 according to EN 954-1
Performance level	PLe according to EN 13849-1
MTTF <sub>d</sub>	>100 years
DC <sub>avg</sub>	99%
Safety Data – Values per IEC/EN 62061 / IEC/EN 61508	
SIL CL	3 per IEC/EN 62061
SIL	3 per IEC/EN 61508
HFT (Hardware Failure Tolerance)	1
DC <sub>avg</sub>	99%
SFF	99.7%
PFH <sub>D</sub>	2.66E-10 h <sup>-1</sup>

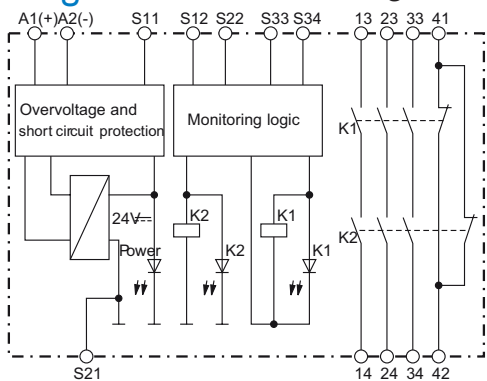
Safety Relays Selection Chart				
Part Number	Price	Marking Type	Voltage	Outputs
LG5925-48-61-24	\$115.00	2-channel E-STOP / GATE	24 VAC/DC	3 N.O. and 1 N.C.
LG5925-48-61-110	\$125.00	2-channel E-STOP / GATE	110 VAC	3 N.O. and 1 N.C.
LG5925-48-61-230	\$125.00	2-channel E-STOP / GATE	230 VAC	3 N.O. and 1 N.C.

LG5925 Controllers Safety Relay Specification Table	
General Specifications	
Temperature	Storage: -25°C to 85°C (-13°F to 185°F) Operating: -15°C to 55°C (5°F to 131°F)
Altitude	<2,000 meters
Vibration Resistance	Amplitude: 0.35mm, Frequency: 10 to 55 Hz (IEC/EN 60-068-2-6)
Degree of Protection	Per IEC/EN 60 529. Housing: IP40; Terminals IP20
Housing	UL 94V-0 Thermoplastic; Din mount 35 mm x 7.5 mm
Weight	LG5925 24V AC/DC: 210 g (7.40 oz.); LG5925 110V, 230V AC: 275 g (9.70 oz.)
Agency Approvals and Standards	CSA, cULus file E107778, CE, RoHS, TUV
Terminal Designation per EN 50 005	1x4 mm <sup>2</sup> solid or 1 x 2.5 mm <sup>2</sup> stranded ferruled (isolated) or 2 x 1.5 mm <sup>2</sup> stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4
Wire Connections	or 2 x 2.5 mm <sup>2</sup> solid DIN 46 228-1/-2/-3/-4
Wire Fixing	Terminal screws M3.5 box terminals with wire protection or cage clamp terminals.
Input Specifications	
Nominal Voltage	110VAC, 230VAC, 24VAC/DC
Voltage Range	At 10% residual ripple: AC/DC: 0.9 to 1.1 U <sub>N</sub> ; AC: 0.85 to 1.1 U <sub>N</sub>
Maximum Consumption	DC approx. 1.5W; AC approx. 3.7 VA
Nominal Frequency	50 to 60 Hz
Minimum Off-time	250 ms
Control Voltage on S11 At U <sub>N</sub>	AC/DC units: 22VDC; AC units: 24VDC
Control Current Typ. Over S12, S22	30 mA at U <sub>N</sub>
Min. Voltage on S12, S22 (relay activated)	AC/DC units: 20VDC; AC units: 19VDC
Short Circuit Protection	Internal with PTC (Positive Temperature Coefficient resistor)
Overvoltage Protection	Internal VDR (Voltage Dependent Resistor)
Output Specifications	
Electrical Contact Life	AC 15 at 5A, 230VAC: > 2.2x10 <sup>6</sup> switching cycles
Mechanical Life	> 20x10 <sup>6</sup> switching cycles
Contact Type	3 positively driven N.O. and 1 N.C. relay contacts (N.O. contacts are safety contacts)
Operate Delay	Manual start: 30 ms; automatic start: 350 ms.
Release Delay	Disconnecting the supply: AC units:150 ms; DC units: 50 ms Disconnecting S12, S22: AC units: 130 ms. DC units: 50 ms
Nominal Output Voltage	AC: 250V; DC: See continuous current limit curve in installation manual.
Thermal Current (I <sub>th</sub> )	Max. 8A. See continuous current limit curve in installation manual.
Short Circuit Strength	Max. fuse rating: 10A gL (IEC/EN 60 947-5-1); Line circuit breaker: B 6A
Switching Capacity (IEC/EN 60 947-5-1)	AC 15: N.O. contacts: 3A/230V; N.C. contacts: 2A/230V DC 13: N.O. contacts: 4A/DC24V. 0.5A/110V; N.C. contacts: 4A/24V; DC 13: N.O. contacts: 8A/24V >25x10 <sup>3</sup> . ON: 0.4s, OFF: 9.6 s
Switching Frequency	Max. 1200 switching cycles/hr

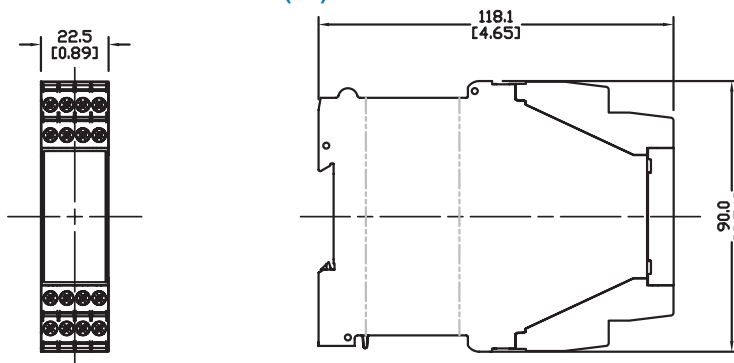
# Dold LG5925 Series 2-Channel Emergency Stop and Safety Gates

## Wiring

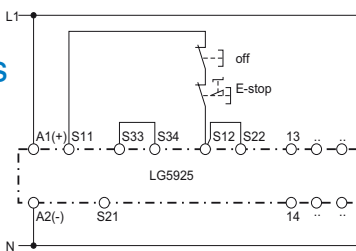
### LG5925 Block Diagram



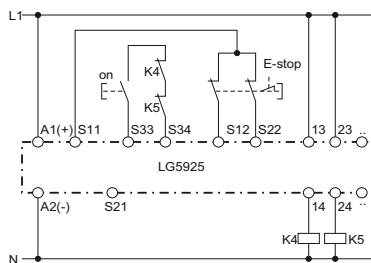
## Dimensions mm(in)



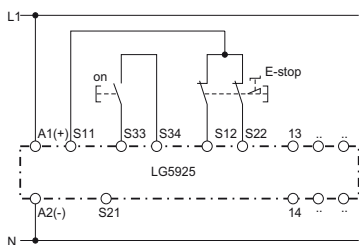
## Applications



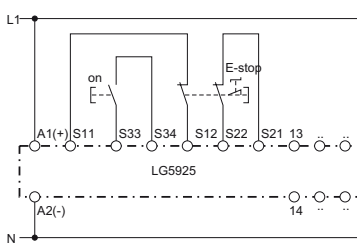
Single channel emergency stop circuit. This circuit does not have any redundancy in the emergency-stop control circuit.  
 Note: Refer to "Unit programming"  
 Set switch or dip switch in pos.: S1 no cross fault detection  
 S2 automatic start



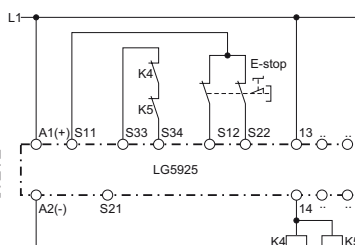
Contact reinforcement by external contactors, 2-channel controlled.  
 The output contacts can be reinforced by external contactors with positive guided contacts for switching currents > 8 A.  
 Functioning of the external contactors is monitored by looping the N.C. contacts into the closing circuit (terminals S33-S34).  
 Note: Refer to "Unit programming"  
 Set switch or dip switch in pos.: S1 no cross fault detection  
 S2 manual start



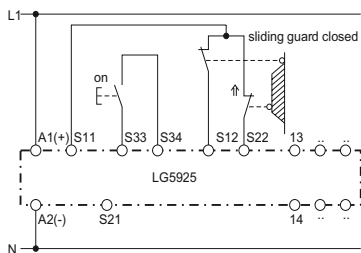
2-channel emergency stop circuit without cross fault monitoring.  
 Note: Refer to "Unit programming"  
 Set switch or dip switch in pos.: S1 no cross fault detection  
 S2 manual start



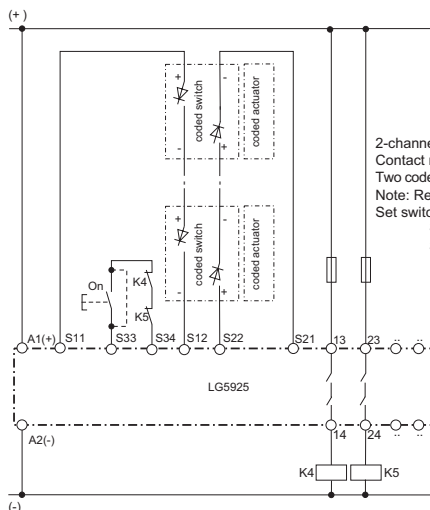
2-channel emergency stop circuit with cross fault detection.  
 Note: Refer to "Unit programming"  
 Set switch or dip switch in pos.: S1 cross fault detection  
 S2 manual start



Contact reinforcement by external contactors controlled by one contact path.  
 Note: Refer to "Unit programming"  
 Set switch or dip switch in pos.: S1 no cross fault detection  
 S2 automatic start



2-channel safety gate monitoring.  
 Note: Refer to "Unit programming"  
 Set switch or dip switch in pos.: S1 no cross fault detection  
 S2 manual start



2-channel emergency stop circuit with cross fault.  
 Contact reinforcement by external contactors.  
 Two coded non-contact sensors in series.  
 Note: Refer to "Unit programming"  
 Set switch or dip switch in pos.: S1 cross fault detection  
 S2 Manual or Automatic (dotted jumper)

**Note: When switching inductive loads, surge suppressors are recommended.**

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

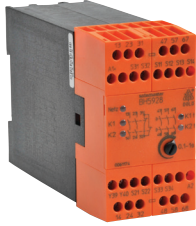
Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Dold BH5928 Series – 2-Channel Emergency Stop and Safety Gates with Delay



**BH5928-92-61-24-1**

Designed to protect people and machines in applications with E-stop buttons and safety gates. One or two channels can be monitored with time-delay function.

- Three time-delay options with potentiometer adjustment
- Single and 2-channel operation
- Output: 3 N.O. contacts with delay, 2 N.O. instantaneous contacts, 1 N.C. instantaneous contact
- Line fault detection for **ON** button, when connected to S33-S34
- Manual restart with button on S33-S34 or automatic restart with jumper between S13-S14
- Can be wired with or without cross-fault monitoring in the E-stop loop
- LED indicators for power and state of operation

Safety Relays					
Part Number	Price	Marking Type	Voltage	Outputs	Time Delay
BH5928-92-61-24-1	\$198.00	2-channel E-STOP / GATE	24 VDC	3 N.O. time delay positive guided safety contacts,	0.1 to 1 second
BH5928-92-61-24-5	\$198.00	2-channel E-STOP / GATE	24 VDC	2 N.O. instantaneous positive guided safety contacts and	0.5 to 5 seconds
BH5928-92-61-24-30	\$198.00	2-channel E-STOP / GATE	24 VDC	1 N.C. instantaneous monitoring contact	3 to 30 seconds

Safety Data – Values per EN ISO 13849-1	
Category	4 according to EN 954-1
Performance level	PLe according to EN 13849-1
MTTF <sub>d</sub>	>240.5 years
DC <sub>avg</sub>	99%
Safety Data – Values per IEC/EN 62061 /IEC/EN 61508	
SIL CL	3 per IEC/EN 62061
SIL	3 per IEC/EN 61508
HFT (Hardware Failure Tolerance)	1
DC <sub>avg</sub>	99%
SFF	99.9%
PFH <sub>D</sub>	1.94E-10 h <sup>-1</sup>

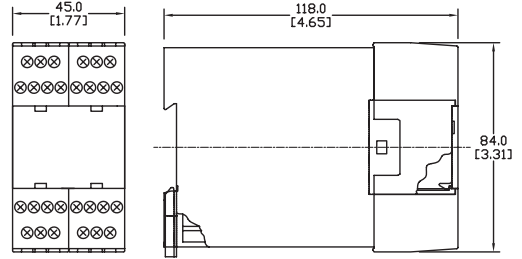
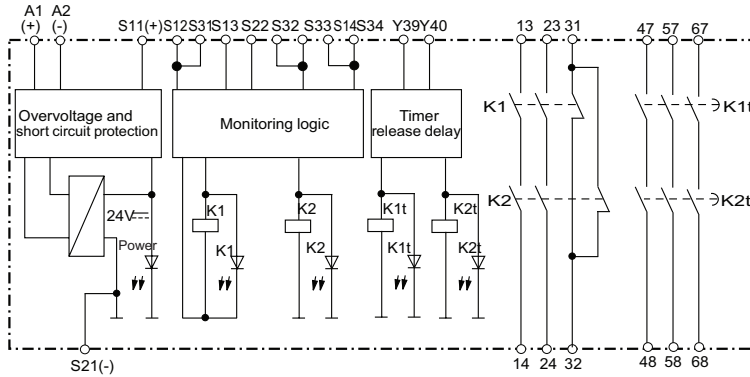
Two-Hand Controllers Safety Relay Specification Table	
General Specifications	
Temperature	Storage: -25°C to 85°C (-13°F to 185°F) Operating: -15°C to 55°C (5°F to 131°F)
Altitude	< 2,000 meters
Vibration Resistance	Amplitude: 0.35mm, Frequency: 10 to 55 Hz (IEC/EN 60-068-2-6)
Degree of Protection	Per IEC/EN 60 529. Housing: IP40; Terminals IP20
Housing	UL 94V-0 Thermoplastic; Din mount 35 mm x 7.5 mm
Weight	400 g (14.11 oz.)
Agency Approvals and Standards	cULus file E107778, CE, RoHS
Terminal Designation per EN 50 005	1x4 mm <sup>2</sup> solid or 1 x 2.5 mm <sup>2</sup> stranded ferruled (isolated) or 2 x 1.5 mm <sup>2</sup> stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm <sup>2</sup> stranded ferruled DIN 46 228-1/-2/-3
Wire Connections	
Wire Fixing	Box terminal with wire protection
Input Specifications	
Nominal Voltage	24VDC
Voltage Range	At 10% residual ripple: DC: 0.9 to 1.1 U <sub>N</sub> At 48% residual ripple: DC: 0.8 to 1.1 U <sub>N</sub>
Maximum Consumption	DC approx. 3.5W
Minimum Off-time	1.0 second
Short Circuit Protection	Internal with PTC (Positive Temperature Coefficient resistor)
Overvoltage Protection	Internal VDR (Voltage Dependent Resistor)
Output Specifications	
Electrical Contact Life	To DC 13 at 2A, DC 24V: >1.5 x 10 <sup>5</sup> switching cycles To AC 15 at 2A, 230VAC: 10 <sup>5</sup> switching cycles IEC/EN 60 947-5-1
Mechanical Life	10 x 10 <sup>6</sup> switching cycles
Contact Type	2 N.O. positively driven and 1 N.C. relay contacts, and 3 N.O. positively driven relay contacts with delay. (N.O. contacts are safety contacts)
Operate Delay	Operate delay typ at U <sub>N</sub> : manual start: 40 ms; automatic start: 500 ms;
Release Delay	Release delay typ at U <sub>N</sub> : Disconnecting supply: 40 ms; Disconnecting S12, S22, S31 and S32: 15ms
Repeat Accuracy	±1% of setting value
Nominal Output Voltage	AC: 250V; DC: See continuous current limit curve in manual.
Thermal Current (I <sub>th</sub> )	Max. 5A. See continuous current limit curve in manual.
Switching of Low Loads	≥ 100 mV; (contacts with 5μ Au) ≥ 1 mA
Short Circuit Strength	Max. fuse rating: 6 A gL (IEC/EN 60 947-5-1); Line circuit breaker C 8 A
Switching Capacity	AC 15: N.O. contacts: 3A/230V; N.C. contacts: 2A/230VAC; DC 13: N.O. contacts: 5A/24VDC; ON: 0.4s, OFF: 9.6 s
Switching Frequency	Max. 1200 switching cycles/hr, with manual restart and short release delay time
Indicator Contact	DC 13: N.C. contact: 2A/24VDC

# Dold BH5928 Series – 2-Channel Emergency Stop and Safety Gates with Delay

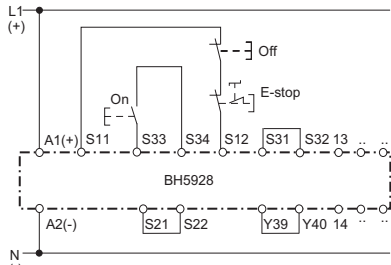
## Wiring

### BH5928 Block Diagram

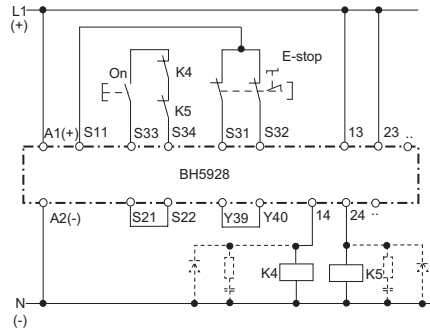
### Dimensions mm(in)



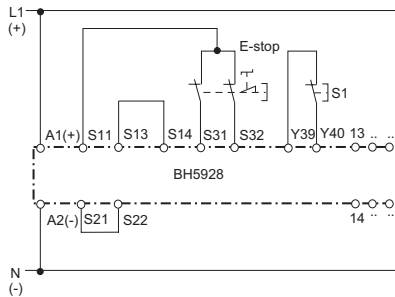
## Applications



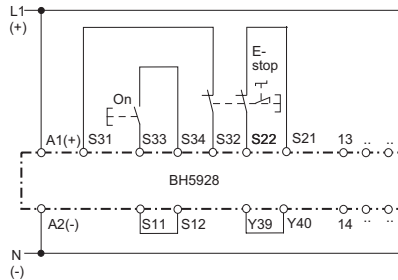
Single channel emergency stop circuit. This circuit does not have any redundancy in the emergency-stop control circuit.



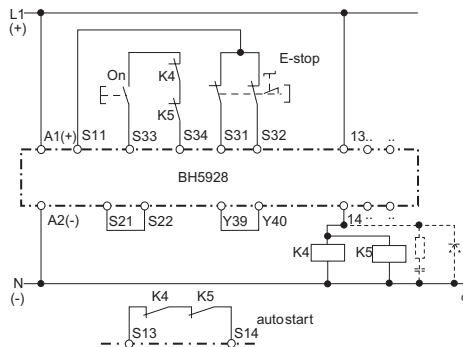
Contact reinforcement by external contactors, 2-channel controlled. The output contacts can be reinforced by external contactors with positive guided contacts for switching currents > 5 A. Functioning of the external contactors is monitored by looping the N.C. contacts into the closing circuit (terminals S13-S14 or S33-S34)



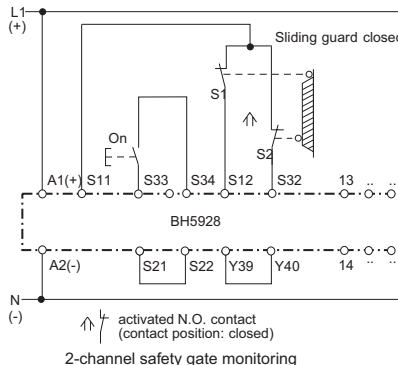
2-channel emergency stop circuit without cross fault monitoring autostart and interruption of time by S1



2-channel emergency stop circuit with cross fault detection



Contact reinforcement by external contactors controlled by one contact path. S33 - S34 must be opened.



activated N.O. contact (contact position: closed)

2-channel safety gate monitoring

**\*Note: When switching inductive loads, surge suppressors are recommended.**

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Dold UG6960 Series Dual Channel Emergency Stop with Adjustable Delay



Designed to protect people and machines in applications with E-stop buttons and safety gates.

- Various delay functions adjustable at device (power off before selecting the desired function):
  - Release delay
  - Release delay retriggerable
  - On delay
  - Fleeting on make / break
  - Delay function settable via potentiometer

**Note:** See Delay Functions for more information.

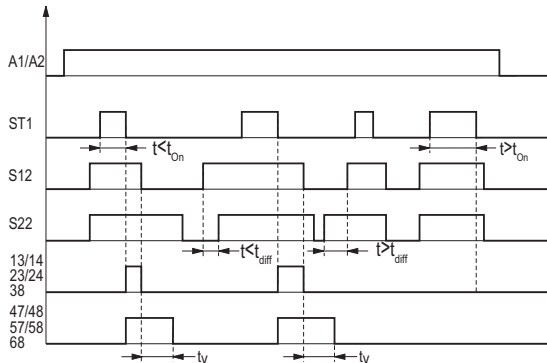
- According to:
  - Performance Level (PL) e and category 4 to EN ISO 13849-1: 2008
  - SIL Claimed Level (SIL CL) 3 to IEC/EN 62061
  - Safety Integrity Level (SIL) 3 to IEC/EN 61508 and IEC/EN 61511
  - Acc. to EN 50156-1 for furnaces
- Line fault detection at the ON pushbutton:
- Manual restart or automatic restart
- With cross fault monitoring
- 2-channel
- Forcibly guided output contacts
- Output: 2 N.O. instantaneous contact and 2 N.O. delayed contacts
- 1 semiconductor monitoring output for instantaneous contacts, 1 semiconductor monitoring output for delayed contacts
- LED indicator for operation, safety function, time delay and failure
- Width: 22.5 mm



Safety Data – Values per EN ISO 13849-1	
Category	4
Performance level	PLe
MTTF <sub>d</sub>	>100 years
DC <sub>avg</sub>	99%
Safety Data – Values per IEC/EN 62061 / IEC/EN 61508	
SIL CL	3
SIL	3
HFT (Hardware Failure Tolerance)	1
DC <sub>avg</sub>	99%
SFF	99.7%
PFH <sub>D</sub>	3.59E-10 h <sup>-1</sup>

Safety Relays Selection Chart				
Part Number	Price	Marking Type	Voltage	Outputs
<b>UG6960-04PS100-300</b>	\$235.00	Safety relay module	24VDC	2 N.O. instantaneous positive guided safety contact(s), 2 N.O. time delay (selectable) positive guided safety contact(s), 1 N.O. instantaneous monitoring contact, 1 N.O. time delay monitoring contact

## Function Diagram

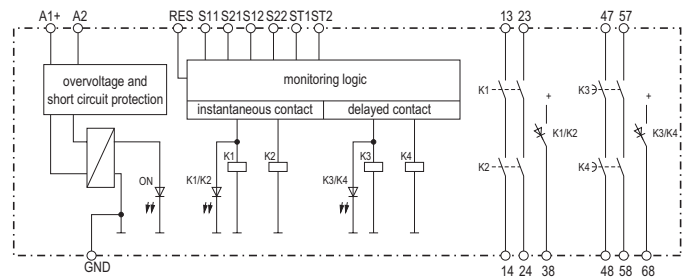


$t_{diff}$ : max. time delay for simultaneity demand dependent on selected safety function  
 E-Stop, safety gate, safety mat  $t_{diff}$ : max. 3s  
 Light curtains  $t_{diff}$ : max. 1s  
 Two-hand control  $t_{diff}$ : max. 0,5s  
 other times on request

$t_{On}$ : max. actuation time of start button  
 Standard  $t_{On}$ : max. 3s  
 other times on request

$t_v$ : Time delay  
 Example: release delay

## Block Diagram





# Dold UG6960 Series Dual Channel Emergency Stop with Adjustable Delay

## Dold UG6960 Series Dual Channel Emergency Stop with Adjustable Delay Specification Table

General Specifications	
<b>Temperature</b>	Storage: -25°C to 85°C (-13°F to 185°F) Operating: -15°C to 55°C (5°F to 131°F)
<b>Altitude</b>	<2.000 meters
<b>Vibration Resistance</b>	Amplitude: 0.35mm, Frequency: 10 to 55 Hz (IEC/EN 60-068-2-6)
<b>Degree of Protection</b>	Per IEC/EN 60 529. Housing: IP40; Terminals IP20
<b>Housing</b>	UL 94V-0 Thermoplastic
<b>Weight</b>	250g (8.82 oz.)
<b>Terminal Designation per EN 50 005</b>	1x4 mm <sup>2</sup> solid or 1 x 2.5 mm <sup>2</sup> stranded ferruled (isolated) or 2 x 1.5 mm <sup>2</sup> stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm <sup>2</sup> solid DIN 46 228-1/-2/-3/-4
<b>Wire Connections</b>	
<b>Wire Fixing</b>	Terminal screws M3.5 box terminals with wire protection.
<b>Wire Connection</b>	60degC/75degC Copper conductors only; AWG20-12 Sol/Str Torque 0.5NM
Input Specifications	
<b>Nominal Voltage</b>	24VDC
<b>Voltage Range</b>	At 10% residual ripple: AC/DC: 0.9 to 1.1 U <sub>N</sub> ; AC: 0.85 to 1.1 U <sub>N</sub>
<b>Maximum Consumption</b>	DC approx. 3.2 W
<b>Nominal Frequency</b>	Not applicable
<b>Minimum Off-time</b>	250 ms
<b>Control Voltage on S11 At U<sub>N</sub></b>	22VDC
<b>Control Current Typ. Over S12, S22</b>	8mA at U <sub>N</sub>
<b>Min. Voltage on S12, S22 (relay activated)</b>	20VDC
<b>Short Circuit Protection</b>	Internal with PTC (Positive Temperature Coefficient resistor)
<b>Overvoltage Protection</b>	Internal VDR (Voltage Dependent Resistor)
Output Specifications	
<b>Electrical Contact Life</b>	AC 15 at 5A, 230VAC: > 1.5x10 <sup>5</sup> switching cycles
<b>Mechanical Life</b>	> 10x10 <sup>6</sup> switching cycles
<b>Contact Type</b>	2 N.O. instantaneous contacts 2 N.O. delayed contacts(N.O. contacts are safety contacts)
<b>Operate Delay</b>	Manual start: 30 ms; automatic start: 350 ms.
<b>Release Delay</b>	E-Stop (1) (6), Safety gate (2) (7), Exclusive or contacts (5): Start up at U : < 65 ms Release delay at U and disconnecting the supply: < 40 ms Release delay at U and disconnecting S12,S22: < 60 ms
<b>Nominal Output Voltage</b>	24VDC: See continuous current limit curve in installation manual.
<b>Thermal Current (I<sub>th</sub>)</b>	Max. 8A. See continuous current limit curve in installation manual.
<b>Short Circuit Strength</b>	Max. fuse rating: 6A gL (IEC/EN 60 947-5-1); Line circuit breaker: B 6A
<b>Switching Capacity (IEC/EN 60 947-5-1)</b>	AC 15: N.O. contacts: 3A/230V DC 13: N.O. contacts: 2A/DC24V.
<b>Switching Frequency</b>	instantaneous: Max. 1800 switching cycles/hr delayed: Max. 360 switching cycles/hr
<b>Agency Approvals and Standards</b>	CSA, cULus file E107778, CE, RoHS, TUV

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page at [www.automationdirect.com](http://www.automationdirect.com)

**Release Delay:** When disconnecting the signal the contacts remain closed and only open after the time is finished. Restarting the unit during time delay has no influence. The time has to run down fully before you can restart the unit.

**Release Delay Retriggerable:** Same as above, but you can restart the unit while the time is running and before the contacts open.

**On Delay:** The output contacts are energized after the adjusted time after restarting the unit.

**Fleeting on Make:** The output contacts are energized after restarting the unit for the adjusted time, and then go off again.

**Fleeting on Break:** The output contacts are energized for the adjusted time after disconnecting the signal, and then go off again.

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZiPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

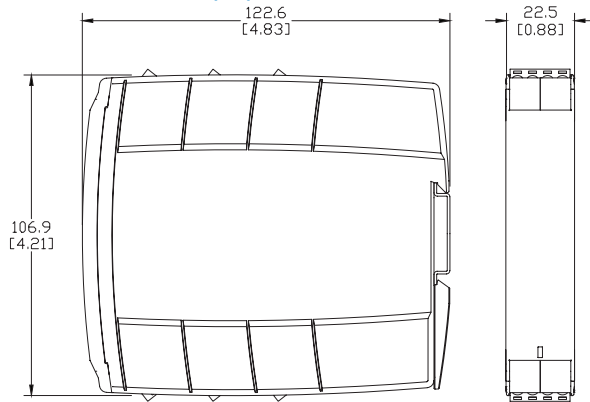
Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Dold UG6960 Series Dual Channel Emergency Stop with Adjustable Delay

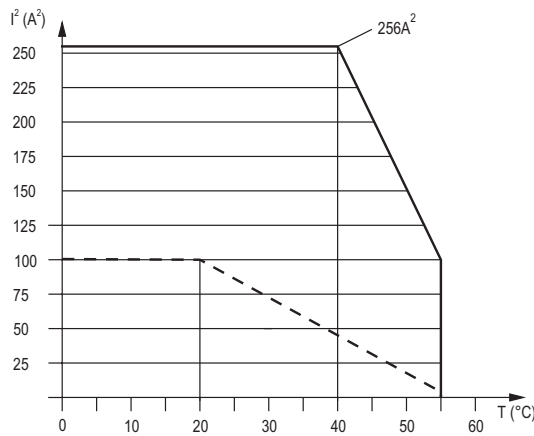
## Dimensions mm(in)



## Connection Terminals

Terminal designation	Signal designation
A1 +	DC 24 V
A2	0 V
13, 14, 23, 24	Forcibly guided NO contacts for release circuit
47, 48, 57, 58	Forcibly guided NO contacts for delayed contacts
38, 68	Semiconductor monitoring output
GND	Reference potential for Semiconductor monitoring output
S11, S21	Control output
S12, S22, ST1, ST2, RES	Control input

## Characteristic Curves



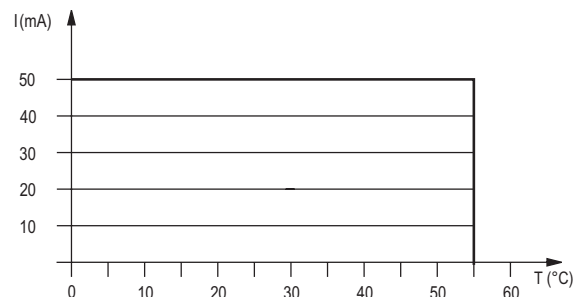
— device free-standing  
max. current at 55°C over  
4 contact path = 5A  $\hat{=}$  4x5<sup>2</sup>A<sup>2</sup> = 100A<sup>2</sup>

- - - device mounted without distance heated by  
devices with same load,  
max. current at 55°C over  
4 contact path = 1A  $\hat{=}$  4x1<sup>2</sup>A<sup>2</sup> = 4A<sup>2</sup>

$$\sum I^2 = I_1^2 + I_2^2 + I_3^2 + I_4^2$$

$I_1, I_2, I_3$  - current in contact paths

Quadratic total current limit curve output contacts

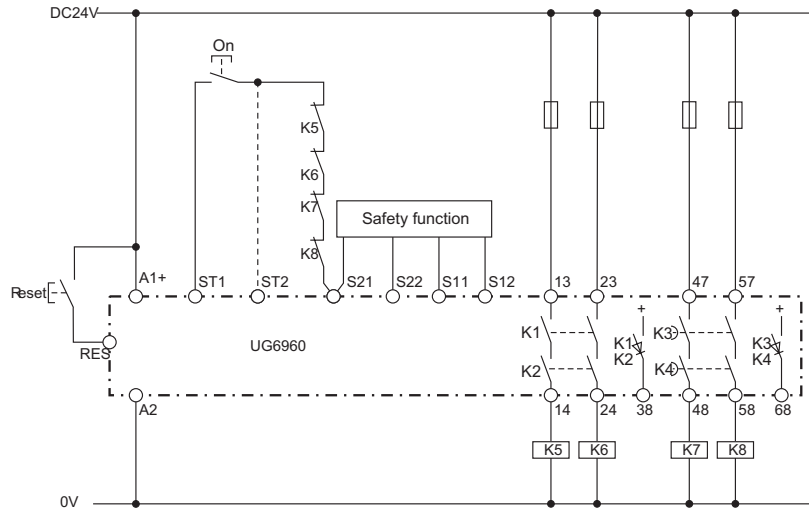


$\sum I = I_{38} + I_{68}$   
z.B. :  $\sum I = 35\text{mA} + 15\text{mA} = 50\text{mA}$   
 $I_{38}$  - current semiconductor output 38  
 $I_{68}$  - current semiconductor output 68

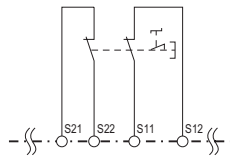
Quadratic total current limit curve semiconductor monitoring outputs

# Dold UG6960 Series Dual Channel Emergency Stop with Adjustable Delay

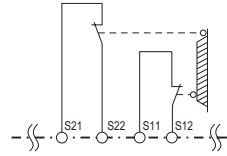
## Application Examples



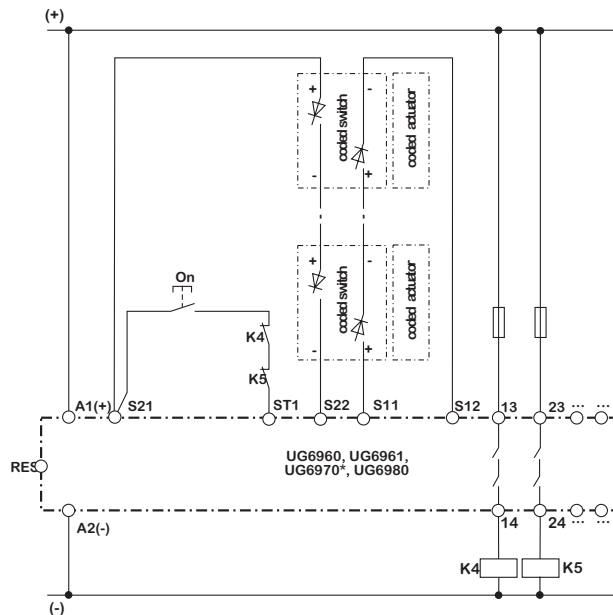
Safety function: see below, Manual-Start (for automatic start make a bridge to ST2 instead of ON button).  
 Delay function: release delay (1)  
 K1/K2 instantaneous contact, K3/K4 delayed contact



Fct.: E-stop (1),  
 with cross fault detection  
 3, PL e, Cat. 4



Fct.: Safety gate (2),  
 with cross fault detection  
 SIL 3, PL e, Cat. 4



\*UG6970: The safety function 2 is connected as well as safety function 1, but  
 S11' = S31, S12' = S32, S21 = S41, S22 = S42 and ST1 = ST2

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Dold UG6961 Series Dual Channel Emergency Stop with Adjustable Delay



Designed to protect people and machines in applications with E-stop buttons and safety gates.

- Various delay functions adjustable at device (power off before selecting the desired function):
  - Release delay
  - Release delay retriggerable
  - On delay
  - Fleeting on make / break
  - Delay function settable via potentiometer

*Note: See Delay Functions for more information.*

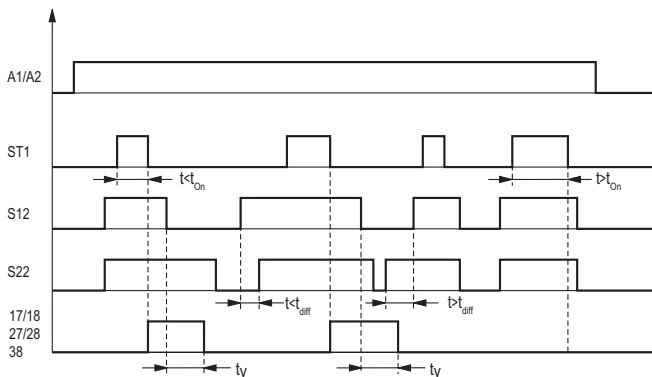


- According to:
  - Performance Level (PL) e and category 4 to EN ISO 13849-1: 2008
  - SIL Claimed Level (SIL CL) 3 to IEC/EN 62061
  - Safety Integrity Level (SIL) 3 to IEC/EN 61508 and IEC/EN 61511
  - Acc. to EN 50156-1 for furnaces
- Line fault detection on Push-button:
- Manual restart or automatic restart
- With cross fault monitoring
- 2-channel
- 2 N.O. time delay (selectable) positive guided safety contact(s), 1 N.O. time delay monitoring contact
- LED indicator for operation, delay contacts and failure
- Pluggable terminal blocks for easy exchange of devices

Safety Relays Selection Chart				
Part Number	Price	Marking Type	Voltage	Outputs
UG6961-02PS100-300	\$167.00	Safety relay module	24VDC	2 N.O. time delay (selectable) positive guided safety contact(s), 1 N.O. time delay monitoring contact

Safety Data – Values per EN ISO 13849-1	
Category	4
Performance level	PLe
MTTF <sub>d</sub>	215.7 years
DC <sub>avg</sub>	99%
Safety Data – Values per IEC/EN 62061 / IEC/EN 61508	
SIL CL	3
SIL	3
HFT (Hardware Failure Tolerance)	1
DC <sub>avg</sub>	99%
SFF	99.6%
PFH <sub>D</sub>	2.33E-10 h <sup>-1</sup>

## Function Diagram

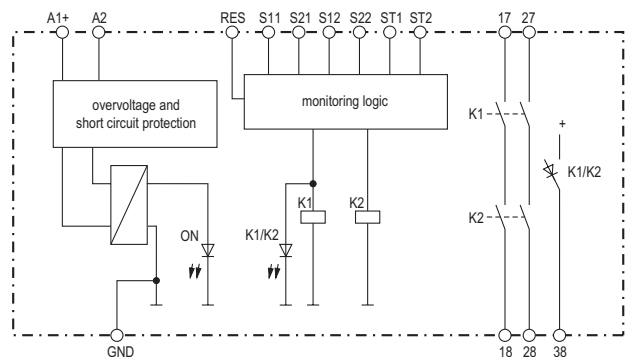


$t_{diff}$ : max. time delay for simultaneity demand dependent on selected safety function  
 E-Stop, safety gate, safety mat  $t_{diff}$ : max. 3s  
 Light curtains  $t_{diff}$ : max. 1s  
 Two-hand control  $t_{diff}$ : max. 0,5s  
 other times on request

$t_{on}$ : max. actuation time of start button  
 Standard  $t_{on}$ : max. 3s  
 other times on request

$t_v$ : Time delay  
 Example: release delay

## Block Diagram



# Dold UG6961 Series Dual Channel Emergency Stop with Adjustable Delay

## Dold UG6961 Series Dual Channel Emergency Stop with Adjustable Delay Specification Table

General Specifications	
<b>Temperature</b>	Storage: -25°C to 85°C (-13°F to 185°F) Operating: -15°C to 55°C (5°F to 131°F)
<b>Altitude</b>	<2,000 meters
<b>Vibration Resistance</b>	Amplitude: 0.35mm, Frequency: 10 to 55 Hz (IEC/EN 60-068-2-6)
<b>Degree of Protection</b>	Per IEC/EN 60 529. Housing: IP40; Terminals IP20
<b>Housing</b>	UL 94V-0 Thermoplastic; DIN mount 35 mm x 7.5 mm
<b>Weight</b>	210g (210 oz.)
<b>Agency Approvals and Standards</b>	CSA, cULus file E107778, CE, RoHS, TUV
<b>Terminal Designation per EN 50 005 Wire Connections</b>	1x4 mm <sup>2</sup> solid or 1 x 2.5 mm <sup>2</sup> stranded ferruled (isolated) or 2 x 1.5 mm <sup>2</sup> stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm <sup>2</sup> solid DIN 46 228-1/-2/-3/-4
<b>Wire Fixing</b>	Terminal screws M3.5 box terminals with wire protection.
<b>Wire Connection</b>	60degC/75degC Copper conductors only; AWG20-12 Sol/Str Torque 0.5NM
Input Specifications	
<b>Nominal Voltage</b>	24VDC
<b>Voltage Range</b>	At 10% residual ripple: DC: 0.8 to 1.1 U <sub>N</sub> ;
<b>Maximum Consumption</b>	DC approx. 1.9W
<b>Nominal Frequency</b>	Not applicable
<b>Minimum Off-time</b>	250 ms
<b>Control Voltage on S11 At U<sub>N</sub></b>	22VDC
<b>Control Current Typ. Over S12, S22</b>	8mA at U <sub>N</sub>
<b>Min. Voltage on S12, S22 (relay activated)</b>	10VDC
<b>Short Circuit Protection</b>	Internal with PTC (Positive Temperature Coefficient resistor)
<b>Oversvoltage Protection</b>	Internal VDR (Voltage Dependent Resistor)
Output Specifications	
<b>Electrical Contact Life</b>	AC 15 at 5A, 230VAC: > 2.2x10 <sup>5</sup> switching cycles
<b>Mechanical Life</b>	> 10x10 <sup>6</sup> switching cycles
<b>Contact Type</b>	2 N.O. time delay (selectable) positive guided safety contact(s), 1 N.O. time delay contact
<b>Operate Delay</b>	Manual start: 30 ms; automatic start: 350 ms.
<b>Release Delay</b>	E-Stop (1) (6), Safety gate (2) (7), Exclusive or contacts (5): Start up at U: < 65 ms Release delay at U and disconnecting the supply: < 40 ms Release delay at U and disconnecting S12,S22: < 60 ms
<b>Nominal Output Voltage</b>	24VDC: See continuous current limit curve in installation manual.
<b>Thermal Current (I<sub>th</sub>)</b>	Max. 8A. See continuous current limit curve in installation manual.
<b>Short Circuit Strength</b>	Max. fuse rating: 6A gL (IEC/EN 60 947-5-1)
<b>Switching Capacity (IEC/EN 60 947-5-1)</b>	AC 15: N.O. contacts: 3A/230V DC 13: N.O. contacts: 2A/DC24V
<b>Switching Frequency</b>	Max. 1800 switching cycles/hr
<b>Agency Approvals and Standards</b>	CSA, cULus file E107778, CE, RoHS, TUV

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page at [www.automationdirect.com](http://www.automationdirect.com)

**Release Delay:** When disconnecting the signal the contacts remain closed and only open after the time is finished. Restarting the unit during time delay has no influence. The time has to run down fully before you can restart the unit.

**Release Delay Retriggerable:** Same as above, but you can restart the unit while the time is running and before the contacts open.

**On Delay:** The output contacts are energized after the adjusted time after restarting the unit.

**Fleeting on Make:** The output contacts are energized after restarting the unit for the adjusted time, and then go off again.

**Fleeting on Break:** The output contacts are energized for the adjusted time after disconnecting the signal, and then go off again.

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZiPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

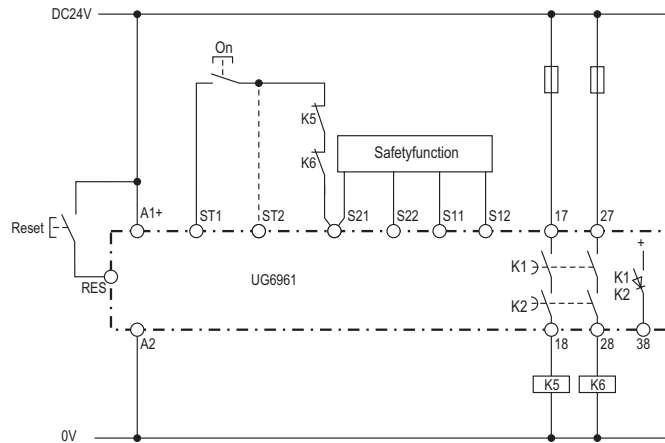
Safety: Electrical Components

Safety: Protective Wear

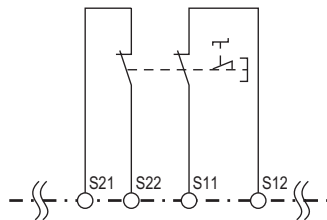
Terms and Conditions

# Dold UG6961 Series Dual Channel Emergency Stop with Adjustable Delay

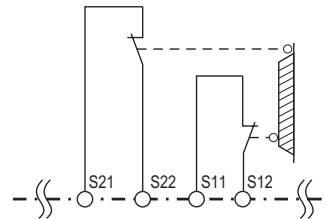
## Application Examples



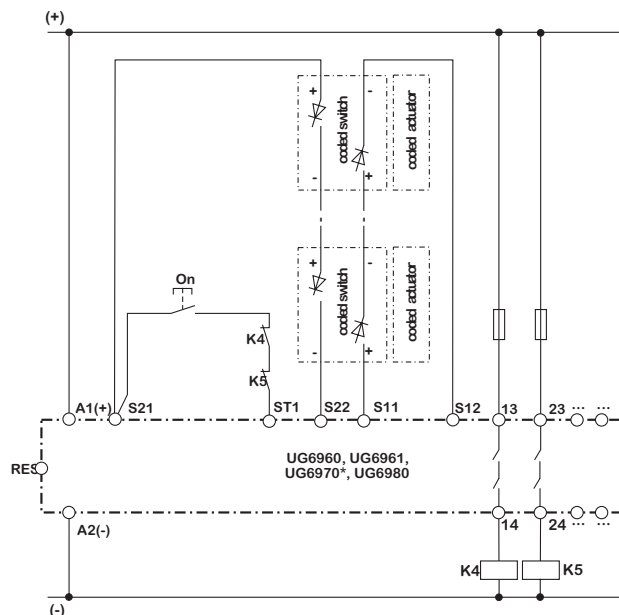
Safety function: see below, Manual-Start (for automatic start make a bridge to ST2 instead of ON button).  
 Delay function: release delay (1)



Fct.: E-stop (1),  
 with cross fault detection  
 3, PL e, Cat. 4



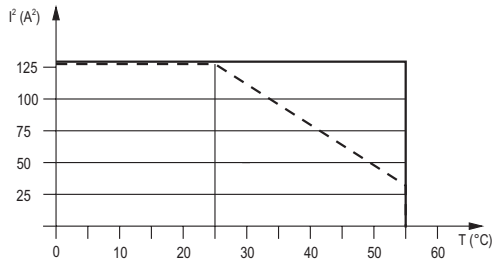
Fct.: Safety gate (2),  
 with cross fault detection  
 SIL 3, PL e, Cat. 4



\*UG6970: The safety function 2 is connected as well as safety function 1, but  
 S11 = S31, S12 = S32, S21 = S41, S22 = S42 and ST1 = ST2

# Dold UG6961 Series Dual Channel Emergency Stop with Adjustable Delay

## Characteristic Curves



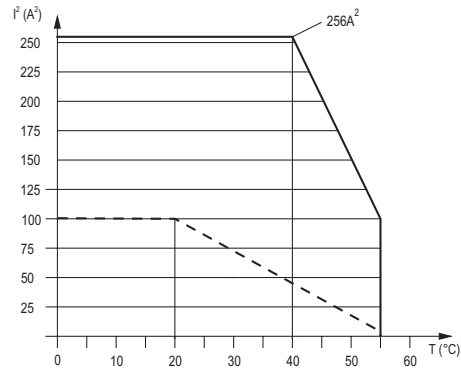
— device free-standing  
max. current at 55°C over  
2 contact path =  $8A \triangleq 2 \times 8^2 A^2 = 128A^2$

- - - device mounted without distance heated by  
devices with same load,  
max. current at 55°C over  
2 contact path =  $4A \triangleq 2 \times 4^2 A^2 = 32A^2$

$$\sum I^2 = I_1^2 + I_2^2$$

$I_1, I_2$  - current in contact paths

Quadratic total current limit curve



— device free-standing  
max. current at 55°C over  
4 contact path =  $5A \triangleq 4 \times 5^2 A^2 = 100A^2$

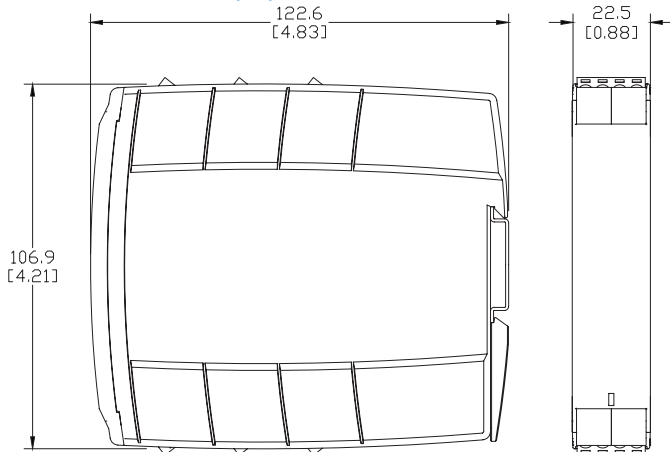
- - - device mounted without distance heated by  
devices with same load,  
max. current at 55°C over  
4 contact path =  $1A \triangleq 4 \times 1^2 A^2 = 4A^2$

$$\sum I^2 = I_1^2 + I_2^2 + I_3^2 + I_4^2$$

$I_1, I_2, I_3, I_4$  - current in contact paths

Quadratic total current limit curve

## Dimensions mm(in)



## Setting Delay Mode

On the variant /\_0\_ the delay mode can be set via rotary switch  $t_{Fkt}$ .  
Possible functions:

$t_{Fkt}$	Function
1	Release delay
2	Release delay retriggerable
3	On delay
4	Fleeting on make
5	Fleeting on break

SEE OUR WEBSITE: [WWW.AUTOMATIONDIRECT.COM](http://WWW.AUTOMATIONDIRECT.COM) FOR COMPLETE ENGINEERING DRAWINGS.

# Dold LG5928 Series – Dual Channel Safety Relay with Delay



Designed to protect people and machines in applications with E-stop buttons and safety gates. One or two channels can be monitored with time-delay function.

- Compact, flexible and safe
- Short response time
- LED indicators for power and state of operation
- Performance Level (PL) e and category 4 to EN ISO 13849-1: 2008
- SIL Claimed Level (SIL CL) 3 to IEC/EN 62061
- Safety Integrity Level (SIL) 3 to IEC/EN 61508 and IEC/EN 61511
- Output: 2 N.O. instantaneous contacts and 1 N.O. Release-Delayed contact
- 1- or 2-channel connection
- Line fault detection at the ON pushbuttons at connection on terminals S33-S34

- Manual restart with button on S33-S34 or automatic restart with bridge between S13-S34
- With or without cross fault monitoring in the E-stop loop
- Indication for released time circuit
- LED indication for supply, channel 1/2 and Release-Delayed contacts



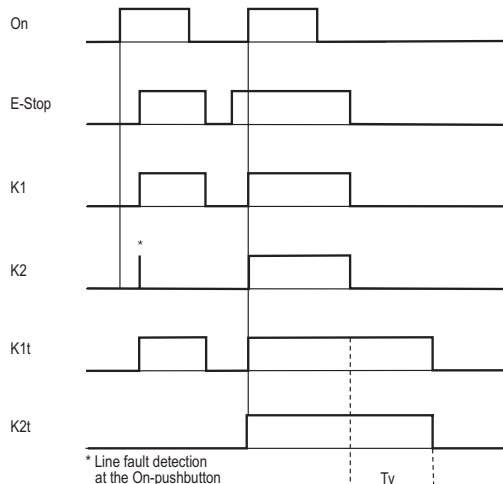
Safety Relays					
Part Number	Price	Marking Type	Voltage	Outputs	Time Delay
LG5928-41-61-3	\$185.00	Dual safety relay module	24VDC	2 N.O. instantaneous positive guided safety contact(s), 1 N.O. time delay positive guided safety contact(s)	0.3 to 3 second
LG5928-41-61-10	\$185.00		24VDC	2 N.O. instantaneous positive guided safety contact(s), 1 N.O. time delay positive guided safety contact(s)	1 to 10 second
LG5928-41-61-60	\$185.00		24VDC	2 N.O. instantaneous positive guided safety contact(s), 1 N.O. time delay positive guided safety contact(s)	6 to 60 second

Safety Data – Values per EN ISO 13849-1		
	Non-Delayed Contacts	Delayed Contacts
Category	4	3
Performance level	PLe	PLd
MTTF <sub>d</sub>	351.8 years	495.4 years
DC <sub>avg</sub>	99%	97.3%

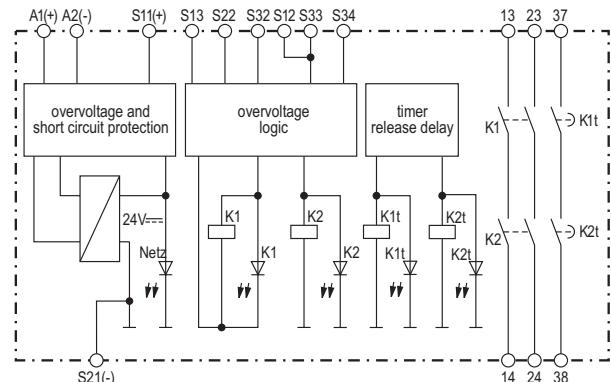
  

Safety Data – Values per IEC/EN 62061 / IEC/EN 61508		
SIL CL	3	2
SIL	3	2
HFT (Hardware Failure Tolerance)	1	1
DC <sub>avg</sub>	99%	97.3%
SFF	99.9%	99.1%
PFH <sub>D</sub>	1.37E-10 h <sup>-1</sup>	2.76E-10 h <sup>-1</sup>

## Function Diagram



## Block Diagram





# Dold LG5928 Series – Dual Channel Safety Relay with Delay

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

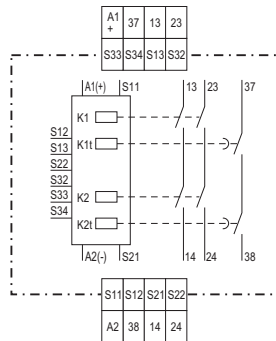
Safety: Protective Wear

Terms and Conditions

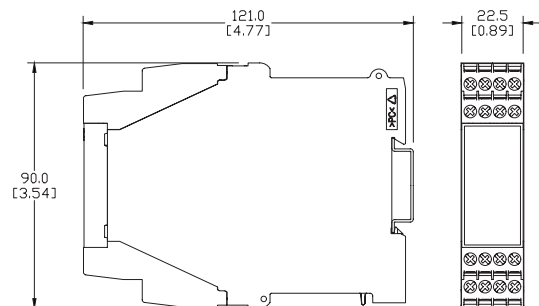
Dual Channel Safety Relay with Delay Specification Table	
<b>General Specifications</b>	
Temperature	Storage: -25°C to 85°C (-13°F to 185°F) Operating: -15°C to 55°C (5°F to 131°F)
Altitude	< 2,000 meters
Vibration Resistance	Amplitude: 0.35mm, Frequency: 10 to 55 Hz (IEC/EN 60-068-2-6)
Degree of Protection	Per IEC/EN 60 529. Housing: IP40; Terminals IP20
Housing	UL 94V-0 Thermoplastic; Din mount 35 mm x 7.5 mm
Weight	210 g (7.41 oz.)
Agency Approvals and Standards	cULus file E107778, CE, RoHS
Terminal Designation per EN 50 005	1x4 mm <sup>2</sup> solid or 2 x 2.5 mm <sup>2</sup> stranded ferruled (isolated) or 2 x 1.5 mm <sup>2</sup> stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm <sup>2</sup> stranded ferruled DIN 46 228-1/-2/-3
Wire Connections	Box terminal with wire protection
Wire Fixing	60degC/75degC Copper conductors only; AWG20-12 Sol/Str Torque 0.8NM
Wire Connection	
<b>Input Specifications</b>	
Nominal Voltage	24VDC
Voltage Range	At 10% residual ripple: DC: 0.9 to 1.1 U <sub>N</sub> At 48% residual ripple: DC: 0.8 to 1.1 U <sub>N</sub>
Maximum Consumption	DC approx. 3.5W
Minimum Off-time	1.0 second
Short Circuit Protection	Internal with PTC (Positive Temperature Coefficient resistor)
Overvoltage Protection	Internal VDR (Voltage Dependent Resistor)
<b>Output Specifications</b>	
Electrical Contact Life	To DC 13 at 2A, DC 24V: >1.5 x 10 <sup>6</sup> switching cycles To AC 15 at 2A, 230VAC: 10 <sup>6</sup> switching cycles IEC/EN 60 947-5-1
Mechanical Life	10 x 10 <sup>6</sup> switching cycles
Contact Type	2 N.O. contacts instantaneous and 1 contact release delay
Operate Delay	Operate delay typ at U <sub>N</sub> : manual start: 25 ms; automatic start: 100 ms;
Release Delay	Release delay typ at U <sub>N</sub> : Disconnecting supply: 20 ms; Disconnecting S12, S22, S31 and S32: 10ms
Repeat Accuracy	±1% of setting value
Nominal Output Voltage	AC: 250V; DC: See continuous current limit curve in manual.
Thermal Current (I <sub>th</sub> )	Max. 8A/6A, See quadratic total current curve in manual.
Switching of Low Loads	≥100 mV; (contacts with 5μ Au) ≥ 1 mA
Short Circuit Strength	Max. fuse rating: 10 A gL (IEC/EN 60 947-5-1); Line circuit breaker B 6 A
Switching Capacity	AC 15: N.O. contacts: 3A/230V; DC 13: N.O. contacts: 2A/24VDC
Switching Frequency	Max. 360 switching cycles/hr, with short release delay time
Indicator Contact	DC 13: N.C. contact: 2A/24VDC
Agency Approvals and Standards	cULus file E107778, CE, RoHS

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page at [www.automationdirect.com](http://www.automationdirect.com)

## Connection Terminals



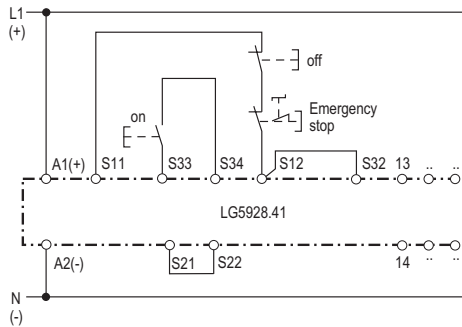
## Dimensions mm(in)



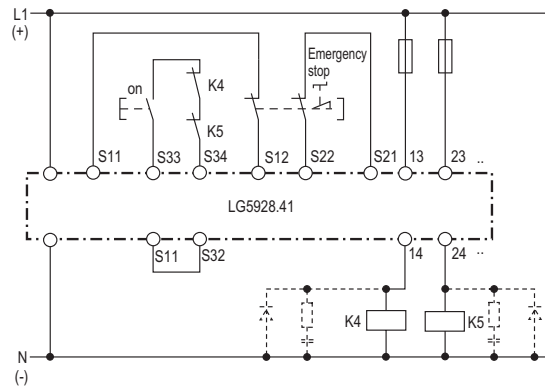
SEE OUR WEBSITE: [WWW.AUTOMATIONDIRECT.COM](http://WWW.AUTOMATIONDIRECT.COM) FOR COMPLETE ENGINEERING DRAWINGS.

# Dold LG5928 Series – Dual Channel Safety Relay with Delay

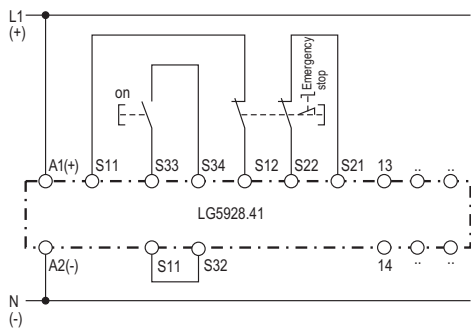
## Application Examples



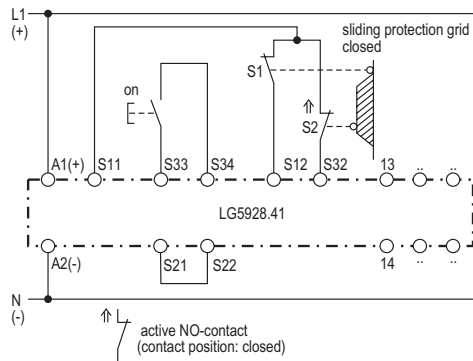
Single channel emergency stop circuit. This circuit does not have any redundancy in the emergency-stop control circuit. Suited up to SIL2, Performance Level d, Cat. 3



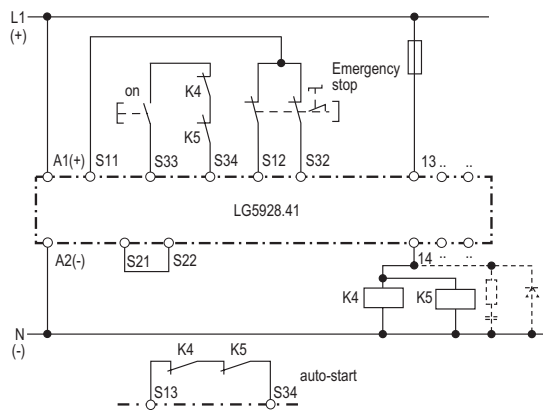
Contact reinforcement by external contactors, 2-channel controlled. The output contacts can be reinforced by external contactors with forcibly guided contacts for switching currents > 8 A e.g. 6 A. Functioning of the external contactors is monitored by looping the NC contacts into the closing circuit (terminals S13-S34 or S33-S34). Suited up to SIL3, Performance Level e, Cat. 4



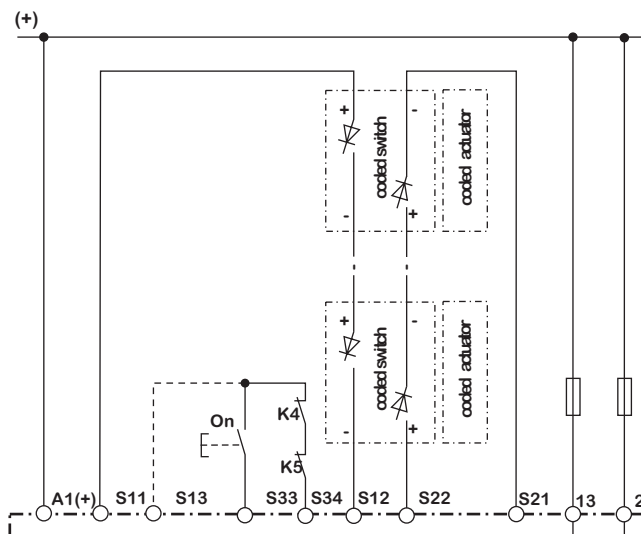
2-channel emergency stop circuit with cross fault monitoring. Suited up to SIL3, Performance Level e, Cat. 4



2-channel safety gate monitoring. Suited up to SIL3, Performance Level e, Cat. 4

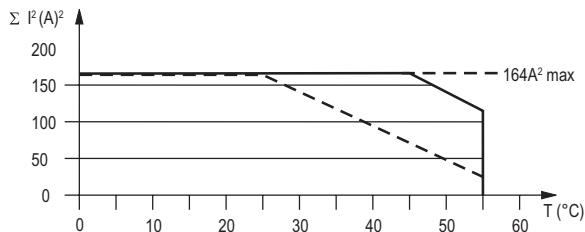
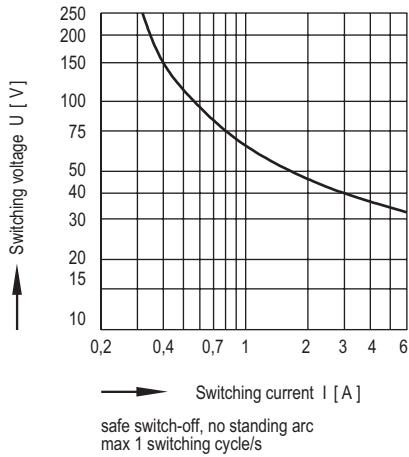


Contact reinforcement by external contactors controlled by one contact path. S33 - S34 must stay open on auto start. Suited up to SIL3, Performance Level e, Cat 4, if the external contactors are in the same cabinet and the wiring is short circuit and crossfault prove.



# Dold LG5928 Series – Dual Channel Safety Relay with Delay

## Curves



— device mounted on distance with air circulation.  
max. current at 55°C over  
3 contact rows =  $2 \times (7A)^2 + (5A)^2 = 123A^2$

- - - device mounted without distance heated by  
devices with same load,  
max. current at 55°C over  
3 contact rows =  $3 \times (3A)^2 = 27A^2$

$$\Sigma I^2 = I_1^2 + I_2^2 + I_3^2$$

$I_1, I_2, I_3$  - current in contact rows

Quadratic total current limit curve

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

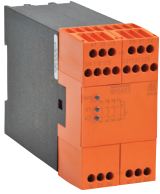
Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Dold BG5933 and BH5933 Series – Two-Hand Controllers



**BH5933-48-61-230**

Designed to protect people and machines in applications with two-hand buttons or production machinery with dangerous closing movements.

- Inputs for 2 pushbuttons, each with 1 N.C. and 1 N.O. contact.
- Output options: 2 N.O. contacts and 1 N.C. contact, or 3 N.O. contacts and 1 N.C. contact
- Feedback circuit Y1 - Y2 to monitor external contactors used for reinforcement of contacts
- Overvoltage and short-circuit protection
- LED indicators for power and state of operation

## Two-Hand Controllers Selection Chart

Part Number	Price	Marking Type	Voltage	Outputs
BG5933-22-61-24	\$139.00	Two-hand controller	24 VDC	2 N.O. and 1 N.C.
BH5933-48-61-110	\$189.00	Two-hand controller	110 VAC	3 N.O. and 1 N.C.
BH5933-48-61-230	\$189.00	Two-hand controller	230 VAC	3 N.O. and 1 N.C.

Note: Output contacts will be switched if both pushbuttons are operated within  $\leq 0.5s$ . If both buttons are pressed while switching on the operating voltage (e.g. after voltage functions), the output contacts do not energize.

### Safety Data – Values per EN ISO 13849-1

Category	4 according to EN 954-1
Performance level	PLe according to EN 13849-1
MTTF <sub>d</sub>	30.7 years
DC <sub>avg</sub>	99%

### Safety Data – Values per IEC/EN 62061 /IEC/EN 61508

SIL CL	3 per IEC/EN 62061
SIL	3 per IEC/EN 61508
HFT (Hardware Failure Tolerance)	1
DC <sub>avg</sub>	99%
SFF	99.7%
PFH <sub>D</sub>	$7.51E-9 h^{-1}$

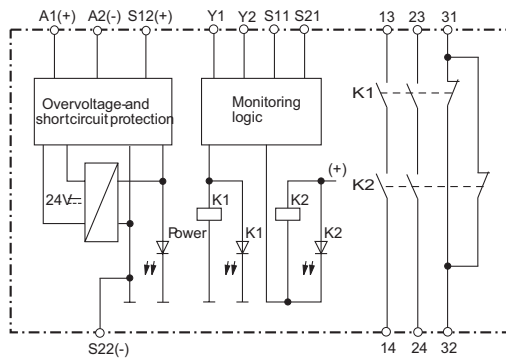
## Two-Hand Controllers Safety Relay Specification Table

Part Numbers	BG5933-22-61-24	BH5933-48-61-110	BH5933-48-61-230
<b>General Specifications</b>			
Temperature	Storage: -25°C to 85°C (-13°F to 185°F) Operating: -15°C to 55°C (5°F to 131°F)		
Altitude	< 2,000 meters		
Vibration Resistance	Amplitude: 0.35mm, Frequency: 10 to 55 Hz (IEC/EN 60-068-2-6)		
Degree of Protection	Per IEC/EN 60 529. Housing: IP40; Terminals IP20		
Housing	UL 94V-0 Thermoplastic; Din mount 35 mm x 7.5 mm		
Weight	200 g (7.05 oz.)	400 g (14.11 oz.)	400 g (14.11 oz.)
Agency Approvals and Standards	cULus file E107778, CE, RoHS, TUV		
Terminal Designation per EN 50 005	1x4 mm <sup>2</sup> solid or 1 x 2.5 mm <sup>2</sup> stranded ferruled (isolated) or 2 x 1.5 mm <sup>2</sup> stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm <sup>2</sup> stranded ferruled DIN 46 228-1/-2/-3		
Wire Fixing	Terminal screws M3.5. Box terminals with self-lifting wire protection		
<b>Input Specifications</b>			
Nominal Voltage	24V DC	110V AC, 230V AC	
Voltage Range	At 10% residual ripple: DC: 0.9 to 1.1 U <sub>N</sub>	At 10% residual ripple: AC: 0.85 to 1.1 U <sub>N</sub>	
Maximum Consumption	DC approx. 2.3W	AC approx. 4 VA	
Nominal Frequency		50 to 60 Hz	
Time Delay for Simultaneous Demand	0.5 sec max		
Recovery time	1 second		
Control Contacts	2 x (1 N.O. and 1 N.C. contacts)		
Current via Control Contacts with 24VDC	N.O. contact: typ. 50 mA; N.C. contact: typ. 20 mA		
Short Circuit Protection	Internal with PTC (Positive Temperature Coefficient resistor)		
Overvoltage Protection	Internal VDR (Voltage Dependent Resistor)		
<b>Output Specifications</b>			
Electrical Contact Life	To DC 13 at 2A, DC 24V: >1.5 x 10 <sup>6</sup> switching cycles To AC 15 at 2A, 230 VAC : 10 <sup>5</sup> switching cycles IEC/EN 60 947-5-1		
Mechanical Life	10 x 10 <sup>6</sup> switching cycles		
Contact Type (N.O. are safety contacts)	2 N.O. positively driven and 1 N.C. relay contacts	3 positively driven N.O. and 1 N.C. relay contacts	
Operate Time	Operate time: typ. 40 ms		
Release Time	Release time: typ. 15 ms		
Nominal Output Voltage	AC: 250V; DC: See continuous current limit curve in manual.		
Thermal Current (I <sub>th</sub> )	Max. 5A See continuous current limit curve in manual.		
Switching of Low Loads	≥100 mV; (contacts with 5μ Au) ≥ 1 mA		
Short Circuit Strength	Max. fuse rating: 6 A gl (IEC/EN 60 947-5-1); line circuit breaker C 6 K		
Switching Capacity	AC 15: N.O. contacts: 3A/230V; N.C. contacts: 2A/230VAC DC 13: N.C. contacts: 2A/24VDC 2 N.O. contacts in series; 8 A/24V >10 <sup>5</sup> . ON: 0.4s, OFF: 9.6 s		
Switching Frequency	Max. 1800 switching cycles/hr		

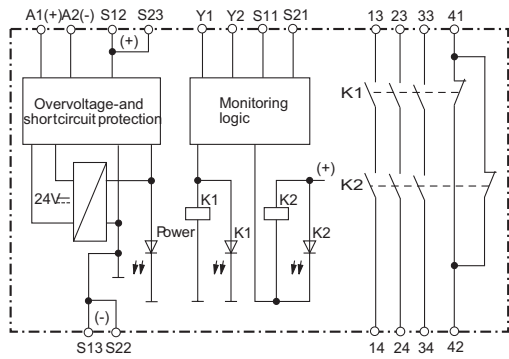
# Dold BG5933 and BH5933 Series – Two-Hand Controllers

## Wiring

**BG5933 Block Diagram**

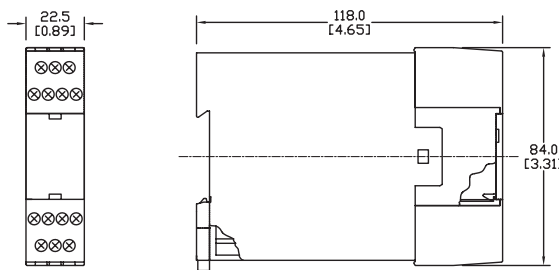


**BH5933 Block Diagram**

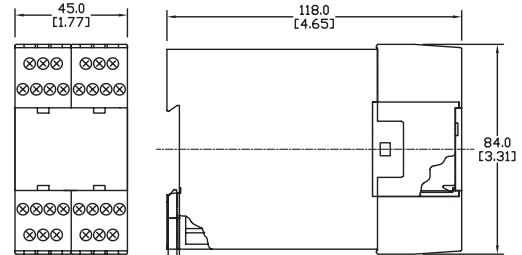


## Dimensions mm(in)

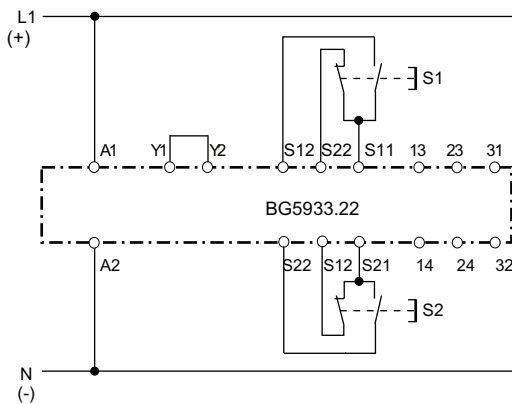
**BG5933**



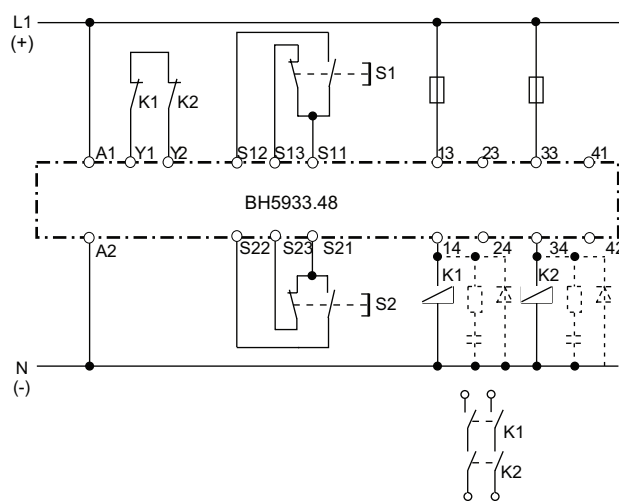
**BH5933**



## Applications



Two-hand control



Two-hand control with contact reinforcement via external positively-driven contactors

*\*Note: When switching inductive loads, surge suppressors are recommended.*

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Dold UG6960 Series Safety Relay Light Curtain with Adjustable Delay



Designed to protect people and machines in applications with light curtains.

- Various delay functions adjustable at device (power off before selecting the desired function):
  - Release delay
  - Release delay retriggerable
  - On delay
  - Fleeting on make / break
  - Delay function settable via potentiometer

**Note: See Delay Functions for more information.**

- According to:
  - Performance Level (PL) e and category 4 to EN ISO 13849-1: 2008
  - SIL Claimed Level (SIL CL) 3 to IEC/EN 62061
  - Safety Integrity Level (SIL) 3 to IEC/EN 61508 and IEC/EN 61511
  - Acc. to EN 50156-1 for furnaces
- Line fault detection ON pushbutton
- Manual restart or automatic restart
- Without cross fault monitoring

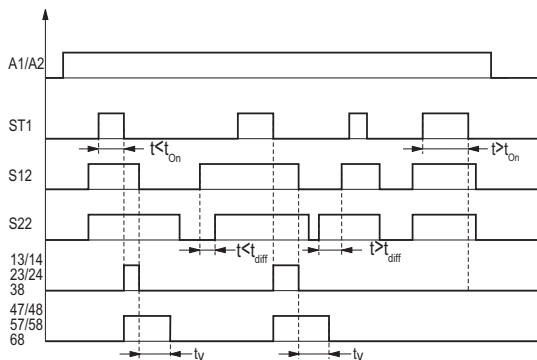
- 2-channel
- Forcibly guided output contacts
- Output: max. 2 N.O. instantaneous semiconductor monitoring outputs, 2 N.O. time-delay guided contacts, 1 instant monitoring contact, and 1 time-delayed monitoring contact
- LED indicator for operation, delay contacts and failure
- Pluggable terminal blocks for easy exchange of devices



Safety Relays Selection Chart				
Part Number	Price	Marking Type	Voltage	Outputs
UG6960-04PS800-300	\$235.00	Safety Relay Light Curtain	24 VDC	2 N.O. instantaneous positive guided safety contact(s), 2 N.O. time delay (selectable) positive guided safety contact(s), 1 N.O. instantaneous monitoring contact, 1 N.O. time delay monitoring contact

Safety Data – Values per EN ISO 13849-1	
Category	4
Performance level	PLe
MTTF <sub>d</sub>	584.5 years
DC <sub>avg</sub>	99%
Safety Data – Values per IEC/EN 62061 / IEC/EN 61508	
SIL CL	3
SIL	3
HFT (Hardware Failure Tolerance)	1
DC <sub>avg</sub>	99%
SFF	99.7%
PFHD	3.59E-10 h <sup>-1</sup>

## Function Diagram

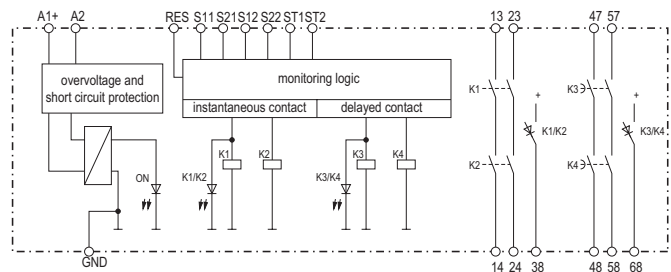


$t_{off}$ : max. time delay for simultaneity demand dependent on selected safety function  
 E-Stop, safety gate, safety mat  $t_{off}$ : max. 3s  
 Light curtains  $t_{off}$ : max. 1s  
 Two-hand control  $t_{off}$ : max. 0,5s  
 other times on request

$t_{on}$ : max. actuation time of start button  
 Standard  $t_{on}$ : max. 3s  
 other times on request

$t_v$ : Time delay  
 Example: release delay

## Block Diagram



# Dold UG6960 Series Safety Relay Light Curtain with Adjustable Delay

## Dold UG6960 Series Safety Relay Light Curtain with Adjustable Delay Specification Table

General Specifications	
<b>Temperature</b>	Storage: -25°C to 85°C (-13°F to 185°F) Operating: -15°C to 55°C (5°F to 131°F)
<b>Altitude</b>	<2,000 meters
<b>Vibration Resistance</b>	Amplitude: 0.35mm, Frequency: 10 to 55 Hz (IEC/EN 60-068-2-6)
<b>Degree of Protection</b>	Per IEC/EN 60 529. Housing: IP40; Terminals IP20
<b>Housing</b>	UL 94V-0 Thermoplastic
<b>Weight</b>	250g (8.82 oz.)
<b>Terminal Designation per EN 50 005</b>	1x4 mm <sup>2</sup> solid or 1 x 2.5 mm <sup>2</sup> stranded ferruled (isolated) or 2 x 1.5 mm <sup>2</sup> stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm <sup>2</sup> solid DIN 46 228-1/-2/-3/-4
<b>Wire Connections</b>	
<b>Wire Fixing</b>	Terminal screws M3.5 box terminals with wire protection.
<b>Wire Connection</b>	60degC/75degC Copper conductors only; AWG20-12 Sol/Str Torque 0.5NM
Input Specifications	
<b>Nominal Voltage</b>	24VDC
<b>Voltage Range</b>	At 10% residual ripple: AC/DC: 0.9 to 1.1 U <sub>N</sub> ; AC: 0.85 to 1.1 U <sub>N</sub>
<b>Maximum Consumption</b>	DC approx. 3.2 W
<b>Nominal Frequency</b>	Not applicable
<b>Minimum Off-time</b>	250 ms
<b>Control Voltage on S11 At U<sub>N</sub></b>	22VDC
<b>Control Current Typ. Over S12, S22</b>	8mA at U <sub>N</sub>
<b>Min. Voltage on S12, S22 (relay activated)</b>	20VDC
<b>Short Circuit Protection</b>	Internal with PTC (Positive Temperature Coefficient resistor)
<b>Overvoltage Protection</b>	Internal VDR (Voltage Dependent Resistor)
Output Specifications	
<b>Electrical Contact Life</b>	AC 15 at 5A, 230VAC: > 1.5x10 <sup>6</sup> switching cycles
<b>Mechanical Life</b>	> 10x10 <sup>6</sup> switching cycles
<b>Contact Type</b>	2 N.O. instantaneous contacts 2 N.O. delayed contacts (N.O. contacts are safety contacts)
<b>Operate Delay</b>	Manual start: 30 ms; automatic start: 350 ms. E-Stop (1) (6), Safety gate (2) (7), Exclusive or contacts (5): Start up at U : < 65 ms
<b>Release Delay</b>	Light curtains (8) Start up at U : < 35 ms Release delay at U and disconnecting the supply: < 40 ms Release delay at U and disconnecting S12,S22: < 25 ms
<b>Nominal Output Voltage</b>	24VDC: See continuous current limit curve in installation manual.
<b>Thermal Current (I<sub>th</sub>)</b>	Max. 8A. See continuous current limit curve in installation manual.
<b>Short Circuit Strength</b>	Max. fuse rating: 6A gL (IEC/EN 60 947-5-1); Line circuit breaker: B 6A
<b>Switching Capacity (IEC/EN 60 947-5-1)</b>	AC 15: N.O. contacts: 3A/230V DC 13: N.O. contacts: 2A/DC24V.
<b>Switching Frequency</b>	instantaneous: Max. 1800 switching cycles/hr delayed: Max. 360 switching cycles/hr
<b>Agency Approvals and Standards</b>	CSA, cULus file E107778, CE, RoHS, TÜV

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page at [www.automationdirect.com](http://www.automationdirect.com)

**Release Delay:** When disconnecting the signal the contacts remain closed and only open after the time is finished. Restarting the unit during time delay has no influence. The time has to run down fully before you can restart the unit.

**Release Delay Retriggerable:** Same as above, but you can restart the unit while the time is running and before the contacts open.

**On Delay:** The output contacts are energized after the adjusted time after restarting the unit.

**Fleeting on Make:** The output contacts are energized after restarting the unit for the adjusted time, and then go off again.

**Fleeting on Break:** The output contacts are energized for the adjusted time after disconnecting the signal, and then go off again.

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZiPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

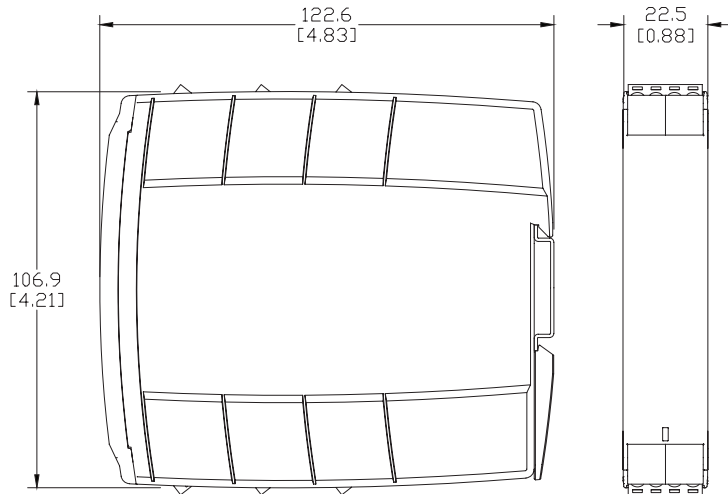
Safety: Electrical Components

Safety: Protective Wear

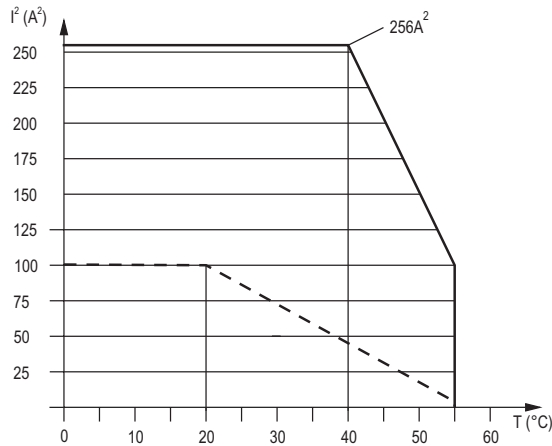
Terms and Conditions

# Dold UG6960 Series Safety Relay Light Curtain with Adjustable Delay

## Dimensions mm [in]



## Characteristic Curves



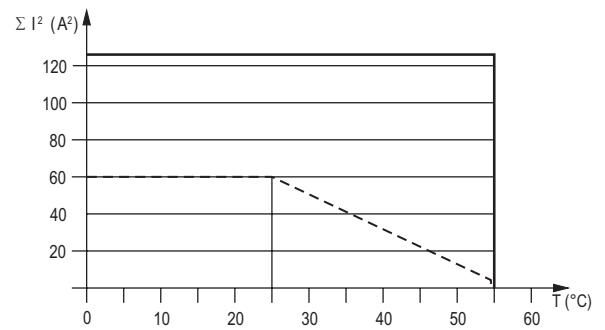
— device free-standing  
max. current at 55°C over  
4 contact path =  $5A \triangleq 4 \times 5^2 A^2 = 100A^2$

- - - device mounted without distance heated by  
devices with same load,  
max. current at 55°C over  
4 contact path =  $1A \triangleq 4 \times 1^2 A^2 = 4A^2$

$$\Sigma I^2 = I_1^2 + I_2^2 + I_3^2 + I_4^2$$

$I_1, I_2, I_3$  - current in contact paths

Quadratic total current limit curve output contacts



— AC 230V device mounted on distance with air circulation.  
max. current at 55°C over  
5 contact path =  $5A \triangleq 5 \times 5^2 A^2 = 125A^2$

- - - AC 230V device mounted without distance heated by  
devices with same load,  
max. current at 55°C over  
5 contact path =  $1A \triangleq 5 \times 1^2 A^2 = 5A^2$

Quadratic total current

$$\Sigma I_{th}^2 = I_{th1}^2 + I_{th2}^2 + I_{th3}^2 + I_{th4}^2 + I_{th5}^2$$

$I_{th1}, I_{th2}, I_{th3}, I_{th4}, I_{th5}$  : current in contact paths

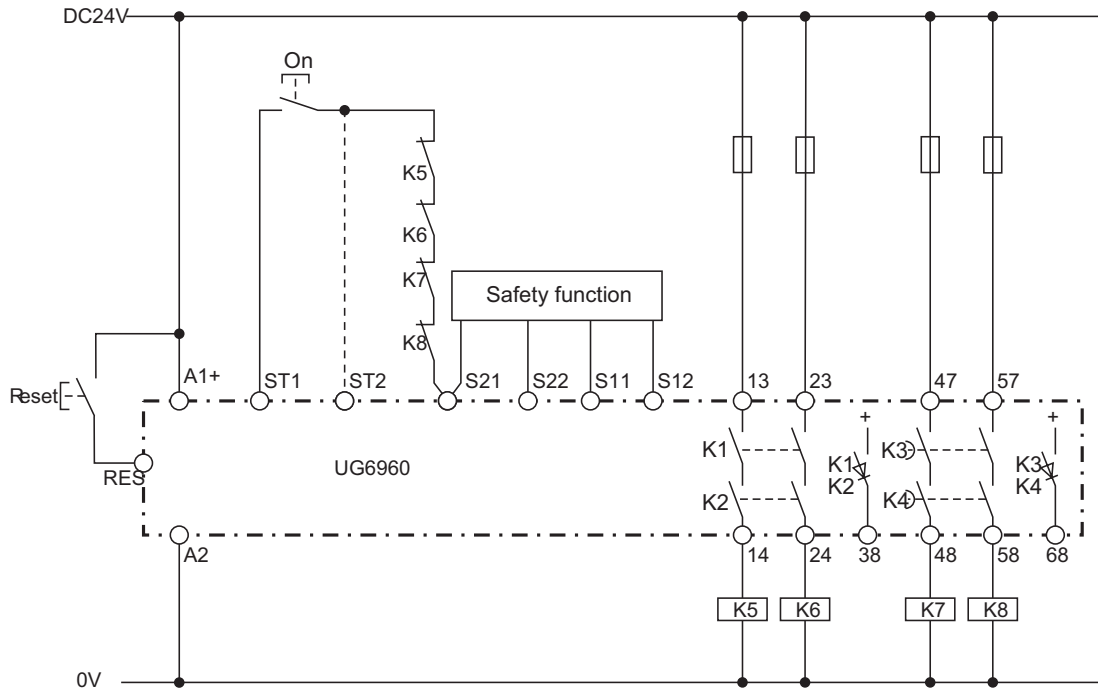
Quadratic total current limit curve AC 230 V

SEE OUR WEBSITE: [WWW.AUTOMATIONDIRECT.COM](http://WWW.AUTOMATIONDIRECT.COM) FOR COMPLETE ENGINEERING DRAWINGS.



# Dold UG6960 Series Safety Relay Light Curtain with Adjustable Delay

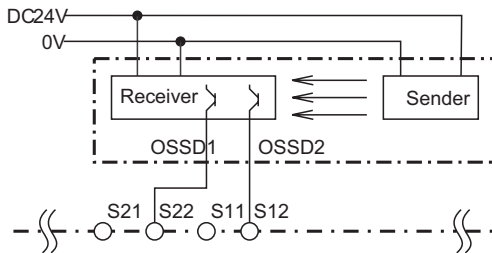
## Application Examples



Safety function: see below, Manual-Start (for automatic start make a bridge to ST2 instead of ON button).

Delay function: release delay (1)

K1/K2 instantaneous contact, K3/K4 delayed contact



Fct.: Light curtain (8),  
without cross fault detection  
SIL 3, PL e, Cat. 4<sup>2)</sup>

2) To achieve the stated safety classification light curtains with selftest (type 4) according to IEC/EN 61496-1 have to be used.

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

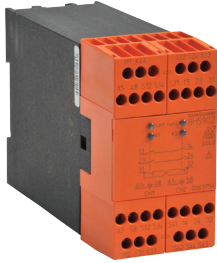
Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Dold Safety Relays – Multi-Function Light Curtain Controller



Designed to protect people and machinery in applications with light curtains; can be operated in protection, muting and stepping modes.

- Connect up to 3 light curtains
- Broken wire detection on light curtain input
- Multifunction device - different functions selectable by rotational switches: protective, muting, stepping
- Suitable to connect light curtains of type 4 or self-testing light curtains type 2 according to IEC/EN 61 496-1, cross-fault monitoring in the light curtain
- Undervoltage and overvoltage detection and indication
- LED indicators for RUN and Status Outputs 1 and 2

Safety Data – Values per EN ISO 13849-1	
Category	4 according to EN 954-1
Performance level	PLe according to EN 13849-1
MTTF <sub>d</sub>	31.5 years
DC <sub>avg</sub>	98.9%
Safety Data – Values per IEC/EN 62061 / IEC/EN 61508	
SIL CL	3 per IEC/EN 62061
SIL	3 per IEC/EN 61508
HFT (Hardware Failure Tolerance)	1
DC <sub>avg</sub>	98.9%
SFF	99.6%
PFD <sub>D</sub>	7.80E-9 h <sup>-1</sup>

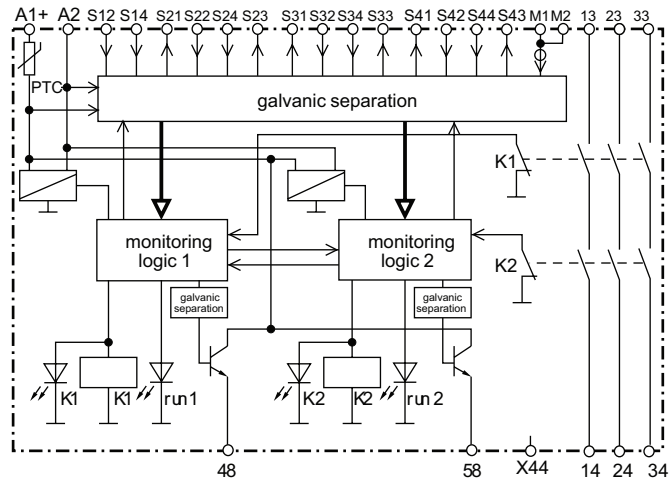
Selection Chart				
Part Number	Price	Marking Type	Voltage	Outputs
BH5902-22-01MF2-61	\$339.00	Light curtain controller, with 2-channel operation and selectable standard, with protective, muting or stepping modes	24 VDC	2 N.O. and 1 N.C.

2-Channel Light Curtain Controller Specification Table	
<b>General Specifications</b>	
<b>Temperature</b>	Storage: -25°C to 85°C (-13°F to 185°F) Operating: 0°C to 50°C (32°F to 122°F)
<b>Altitude</b>	< 2,000 meters
<b>Vibration Resistance</b>	Amplitude: 0.35mm, Frequency: 10 to 55 Hz (IEC/EN 60-068-2-6)
<b>Degree of Protection</b>	Per IEC/EN 60 529. Housing: IP40; Terminals IP20
<b>Housing</b>	UL 94V-0 Thermoplastic; Din mount 35 mm x 7.5 mm
<b>Weight</b>	320 g (11.29 oz.)
<b>Agency Approvals and Standards</b>	cULus file E107778, CE, RoHS, TUV
<b>Terminal Designation per EN 50 005 Wire Connections</b>	1x4 mm <sup>2</sup> solid or 1 x 2.5 mm <sup>2</sup> stranded ferruled (isolated) or 2 x 1.5 mm <sup>2</sup> stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm <sup>2</sup> stranded ferruled DIN 46 228-1/-2/-3
<b>Wire Fixing</b>	Terminal screws M3.5 box terminals with wire protection or cage clamp terminals.
<b>Input Specifications</b>	
<b>Nominal Voltage</b>	24V DC
<b>Voltage Range</b>	At 5% residual ripple: 0.85 to 1.15 U <sub>N</sub>
<b>Maximum Consumption</b>	170 mA (no load on semiconductor outputs)
<b>Control Voltage - S21, S23, S31, S33, S41, S43, S48, S58</b>	23V DC at U <sub>N</sub>
<b>Control Current on S12, S14, S22, S24, S32, S34, S42, S44</b>	each 4.5 mA at U <sub>N</sub>
<b>Minimum Voltage on Terminals S12, S14, S22, S24, S32, S34, S42, S44</b>	16V DC
<b>Minimum Current on M1, M2</b>	25 mA with active lamp
<b>Short Circuit Protection</b>	Internal with PTC (Positive Temperature Coefficient resistor)
<b>Overvoltage Protection</b>	Internal VDR (Voltage Dependent Resistor)
<b>Output Specifications</b>	
<b>Electrical Contact Life</b>	To AC 15 at 2A, AC 230V: 10 <sup>6</sup> switching cycles IEC/EN 60 947-5-1
<b>Mechanical Life</b>	10 x 10 <sup>6</sup> switching cycles
<b>Contact Type</b>	2 N.O., positively driven and 1 N.C relay contacts; (N.O. contacts are safety contacts)
<b>Operate Delay</b>	Operate delay typ. at U <sub>N</sub> : manual start 50 ms; automatic start: 1.5 s.; automatic restart: max. 55 ms.;
<b>Release Delay</b>	Release delay typ. at U <sub>N</sub> : Max: 30 ms (max 50 ms when failure on LC and only one input channel de-energizes)
<b>Nominal Output Voltage</b>	AC: 250V; DC: See continuous current limit curve in manual.
<b>Thermal Current (I<sub>th</sub>)</b>	Max. 5A. See continuous current limit curve in manual.
<b>Switching of Low Loads</b>	≥ 100 mV; (contacts with 5μ Au) ≥ 1 mA
<b>Short Circuit Strength</b>	Max fuse rating: 6A gl (IEC/EN 60 9470-5-1); Line circuit breaker: C 8 A
<b>Switching Capacity</b>	AC 15: N.O. contacts: 3A/230V; N.C. contacts: 2A/230V AC DC 13 at 0.1 Hz: N.C. contacts: 8A/24V DC
<b>Switching Frequency</b>	Max. 1,200 switching cycles/hr
<b>Semi-conductor Output Type (over-temperature and overload protected)</b>	Transistor plus switching, max 100 mA continuous; 400mA for 0.5 sec.

# Dold Safety Relays – Multi-Function Light Curtain Controller

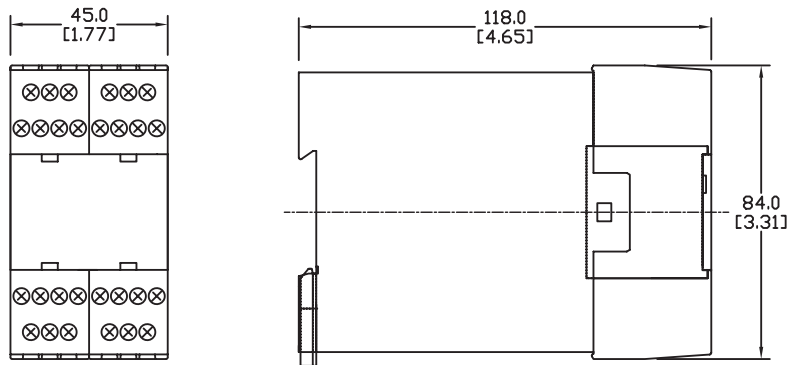
## Wiring

**BH5902-22-01MF2-61 Block Diagram**

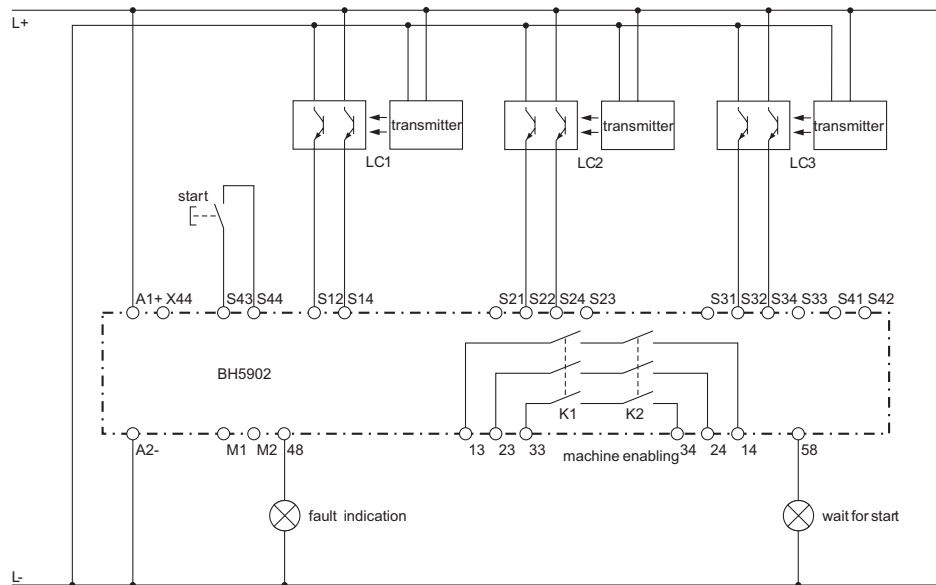


*Note: All drawings are for a 3 N.O. configuration. The units will actually have a 2 N.O. and 1 N.C. configuration.*

## Dimensions mm [in]



## Applications

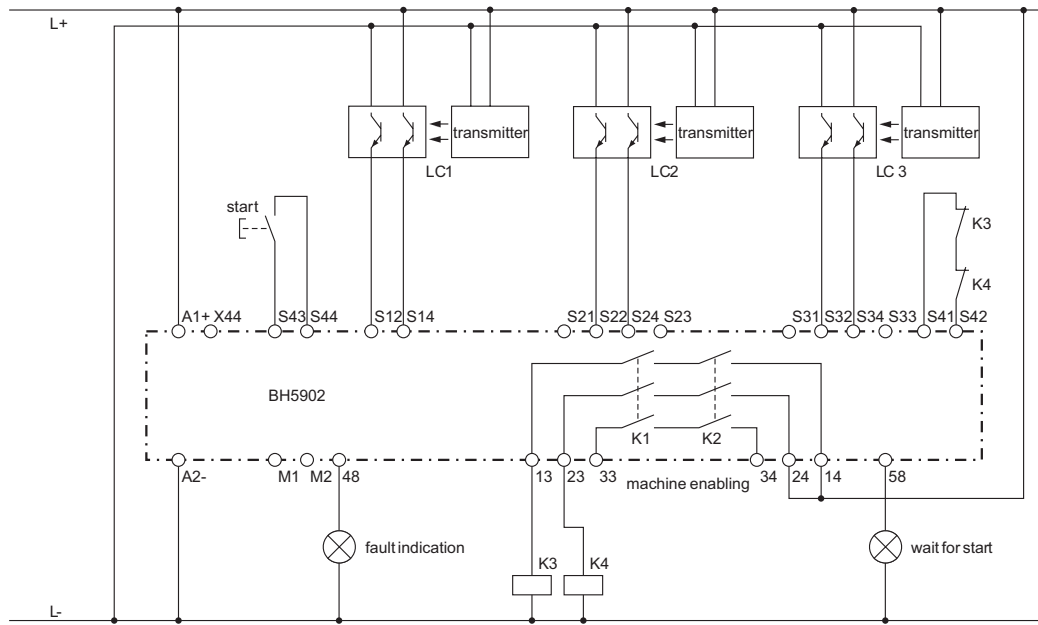


Protective operation with 3 Light Curtains, manual or auto start, setting without feedback input

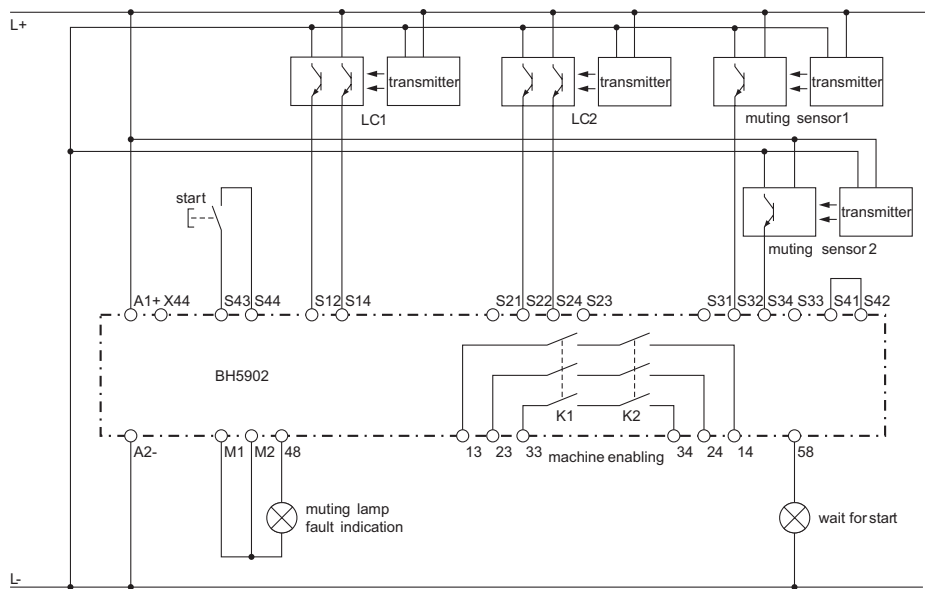
*\*Note: When switching inductive loads, surge suppressors are recommended.*

# Dold Safety Relays – Multi-Function Light Curtain Controller

## Applications



Protective operation with 3 Light Curtains, manual or autostart, setting with contact reinforcement and feedback input

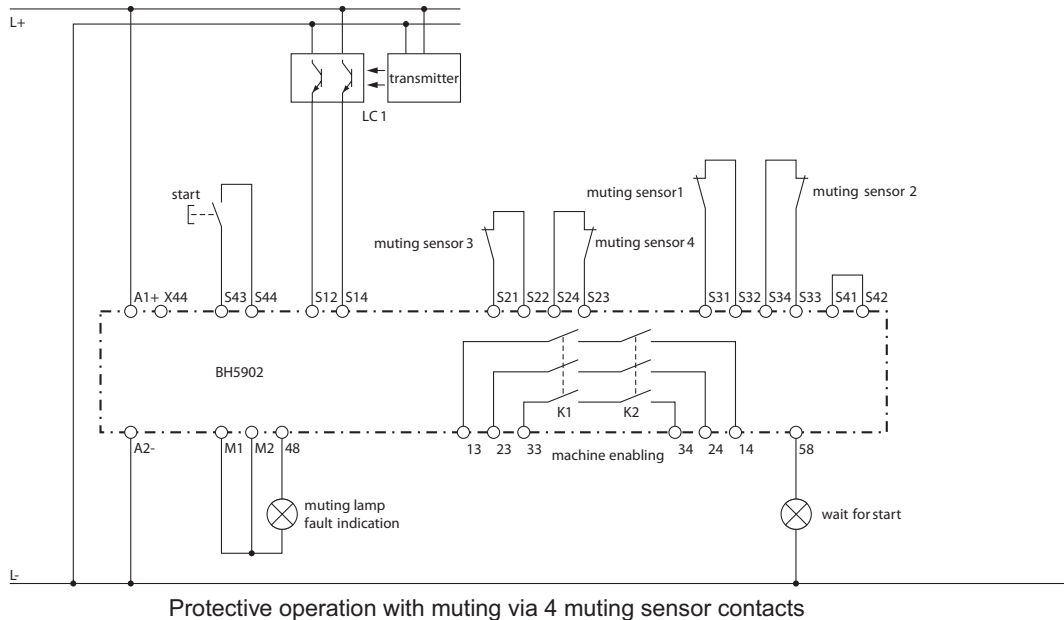
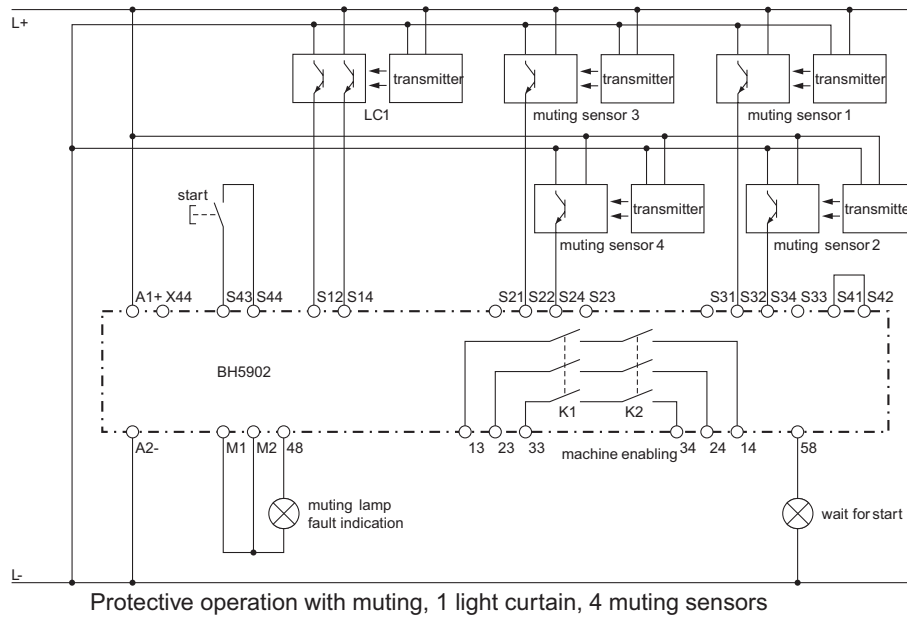


Protective operation with muting a light curtain via 2 muting sensors, 2 light curtains

*\*Note: When switching inductive loads, surge suppressors are recommended.*

# Dold Safety Relays – Multi-Function Light Curtain Controller

## Applications



### Contact reinforcement

If external relays or contactors are used to reinforce or multiply the contacts of the safety relays, these must be monitored by feeding back one N.C. contact from each relay/contactors into the feedback inputs.

*\*Note: When switching inductive loads, surge suppressors are recommended.*

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

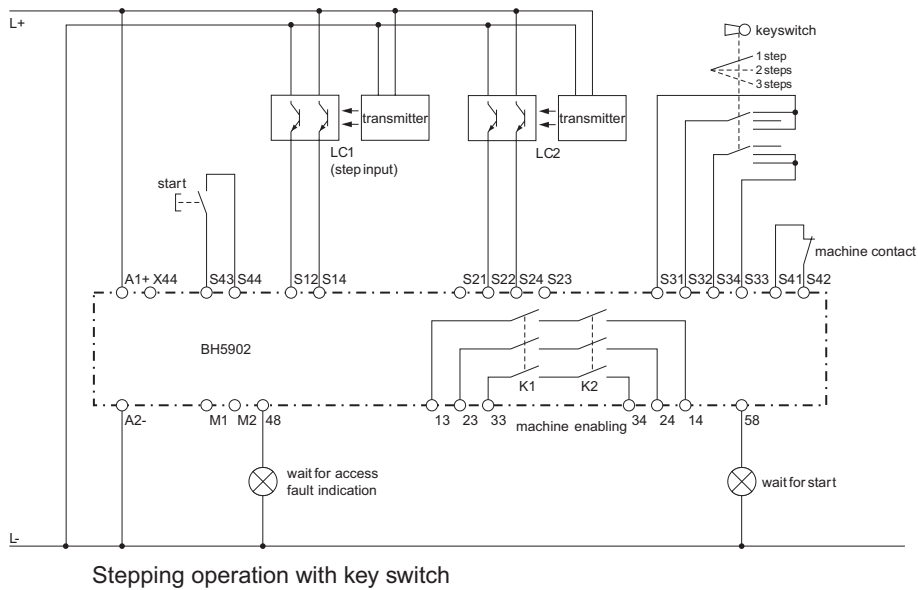
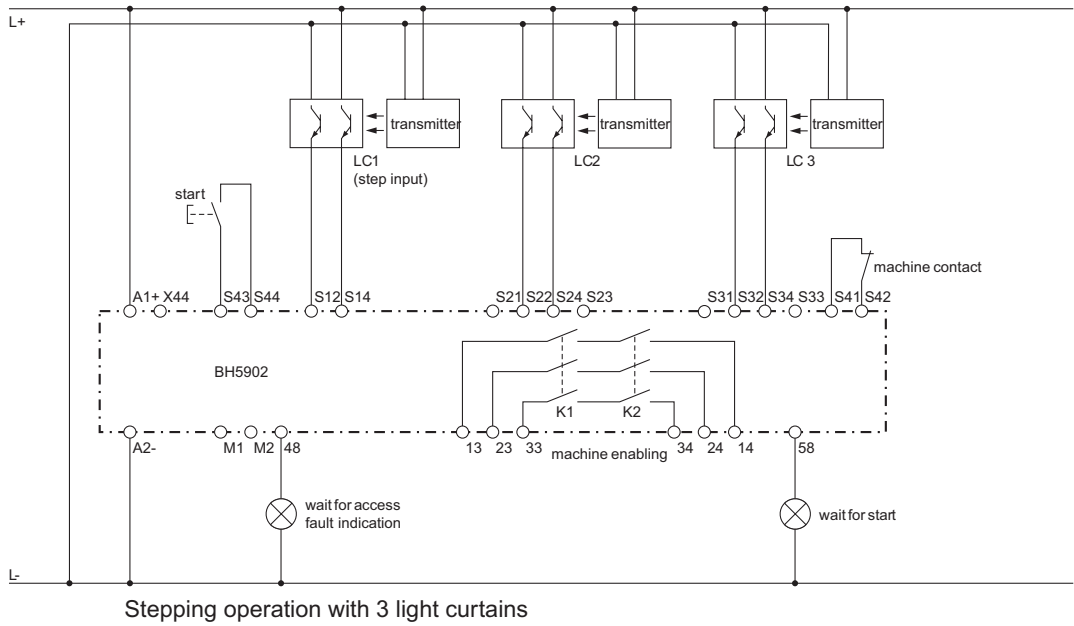
Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Dold Safety Relays – Multi-Function Light Curtain Controller

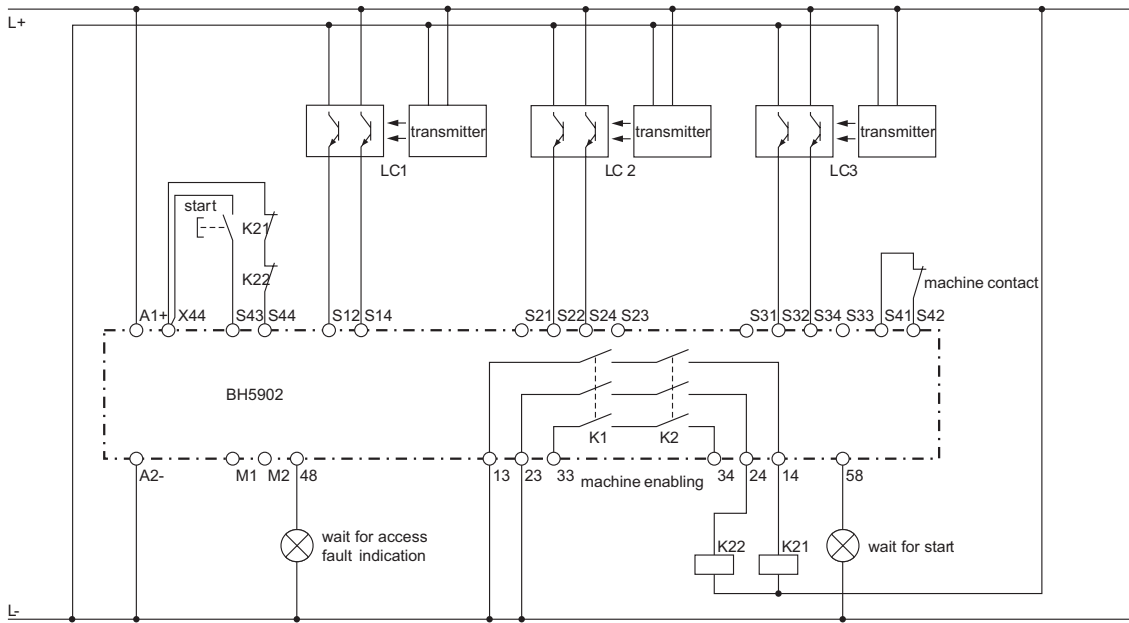
## Applications



*\*Note: When switching inductive loads, surge suppressors are recommended.*

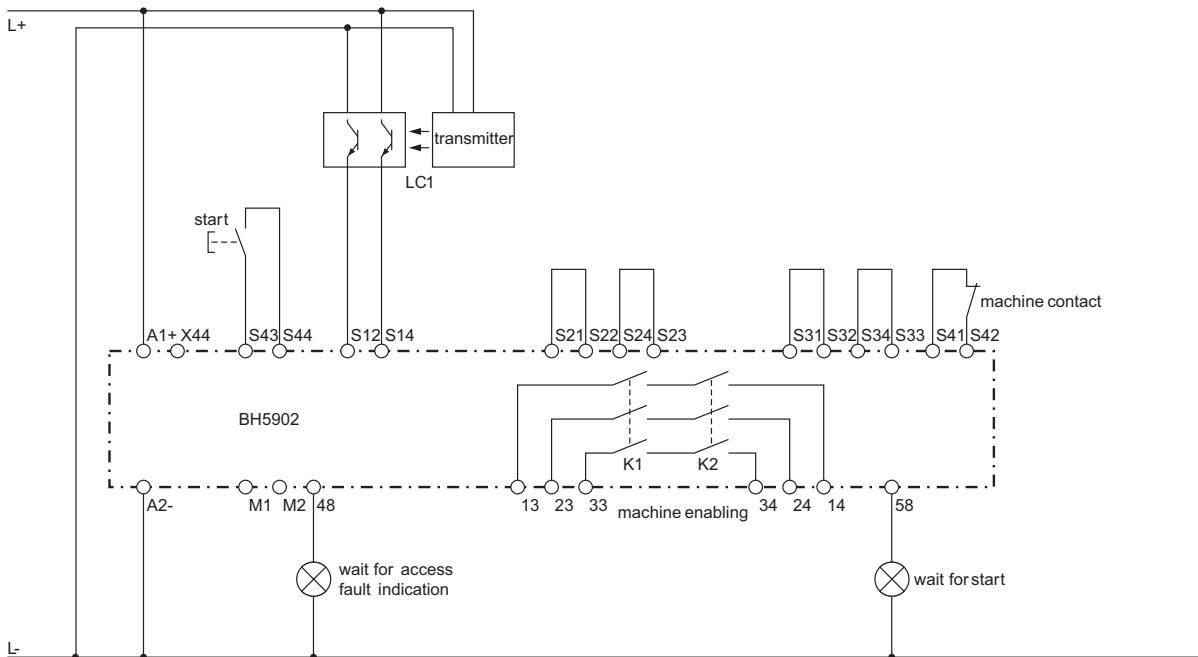
# Dold Safety Relays – Multi-Function Light Curtain Controller

## Applications



Stepping operation with 3 light curtains and contact reinforcement by external contactors, 2-channel operation (switching of feedback input can also be used at protective operation with muting)

The feedback circuit of the external relays is only tested when the module is started by pressing the pushbutton. When using this circuit, the safe function has to be tested at regular intervals. This can be done by interrupting a light curtain so that a reset requires activation of the START button. Activating the module is only possible when all external relays are de-energized.



Stepping operation with one light curtain (with all operating modes, unused inputs must be jumpered).

*\*Note: When switching inductive loads, surge suppressors are recommended.*

# Dold Safety Relays – Light Curtain Controller



Designed to protect people and machinery in applications with light curtains.

- For light curtains with symmetric or asymmetric outputs, adjustment with switch S1
- Output: 3 N.O. and 1 N.C. contacts
- Line fault detection for **ON**-button
- LED indicators for power and state of operation
- Single and 2-channel operation

Safety Data – Values per EN ISO 13849-1	
Category	4 according to EN 954-1
Performance level	PLe according to EN 13849-1
MTTF <sub>d</sub>	584.5 years
DC <sub>avg</sub>	99%
Safety Data – Values per IEC/EN 62061 /IEC/EN 61508	
SIL CL	3 per IEC/EN 62061
SIL	3 per IEC/EN 61508
HFT (Hardware Failure Tolerance)	1
DC <sub>avg</sub>	99%
SFF	99.7%
PFHD	2.66E-10 h <sup>-1</sup>

Safety Relays Selection Chart				
Part Number	Price	Marking Type	Voltage	Outputs
LG5925-48-900-61	\$115.00	Light curtain controller, 2-channel	24 VDC	3 N.O. and 1 N.C.

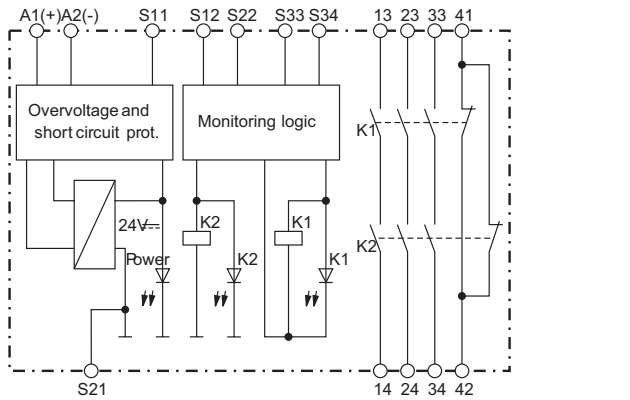
2-Channel Light Curtain Controller Specification Table	
<b>General Specifications</b>	
Temperature	Storage: -25°C to 85°C (-13°F to 185°F) Operating: -15°C to 55°C (5°F to 131°F)
Altitude	< 2,000 meters
Vibration Resistance	Amplitude: 0.35mm, Frequency: 10 to 55 Hz (IEC/EN 60-068-2-6)
Degree of Protection	Per IEC/EN 60 529. Housing: IP40; Terminals IP20
Housing	UL 94V-0 Thermoplastic; Din mount 35 mm x 7.5 mm
Weight	220 g (7.76 oz.)
Agency Approvals and Standards	cULus file E107778, CE, RoHS, TUV
Terminal Designation per EN 50 005 Wire Connections	1x4 mm <sup>2</sup> solid or 1 x 2.5 mm <sup>2</sup> stranded ferruled (isolated) or 2 x 1.5 mm <sup>2</sup> stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm <sup>2</sup> stranded ferruled DIN 46 228-1/-2/-3
Wire Fixing	Terminal screws M3.5 box terminals with wire protection or cage clamp terminals.
<b>Input Specifications</b>	
Nominal Voltage	24V DC
Voltage Range	At 5% residual ripple: 0.9 to 1.1 U <sub>N</sub>
Maximum Consumption	DC approx. 1.7 W
Control Voltage - S11	U <sub>N</sub> : 22.5V DC
Control Current on S12, S22	35 mA at U <sub>N</sub>
Minimum Voltage on Terminals S12, S22(when relay activated)	21V DC
Short Circuit Protection	Internal with PTC (Positive Temperature Coefficient resistor)
Overvoltage Protection	Internal VDR (Voltage Dependent Resistor)
<b>Output Specifications</b>	
Electrical Contact Life	To 5 A, AC 230V: >.5 x 10 <sup>5</sup> switching cycles IEC/EN 60 947-5-1
Mechanical Life	20 x 10 <sup>6</sup> switching cycles
Contact Type	3 N.O. positively driven and 1 N.C. relay contacts, (N.O. contacts are safety contacts)
Operate Delay	Operate delay typ at U <sub>N</sub> : manual start 20 ms; automatic start: 350 ms.
Release Delay	Release delay typ. at U <sub>N</sub> : Disconnecting the supply: 20 ms.; Disconnecting S12, S22: 15 ms.
Nominal Output Voltage	AC: 250V; DC: See continuous current limit curve in installation manual.
Thermal Current (I <sub>th</sub> )	Max. 8A per contact. See continuous current limit curve in installation manual.
Switching of Low Loads	≥100 mV; (contacts with 5μ Au) ≥ 1 mA
Short Circuit Strength	Max fuse rating:10A gl (IEC/EN 60 9470-5-1); Line circuit breaker: B 6 A
Switching Capacity	AC 15: N.O. contacts: 3A/230V; N.C. contacts: 2A/230V AC DC 13: N.O. contacts: 4A/24V AC, 0.5A/110V AC; N.C. contacts: 4A/24V DC
Switching Frequency	Max. 1,200 switching cycles/hr



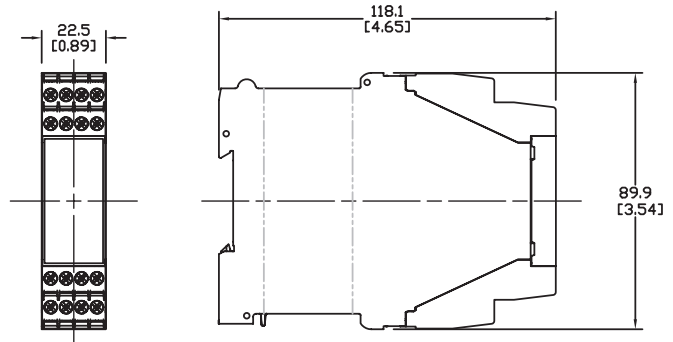
# Dold Safety Relays – Light Curtain Controller

## Wiring

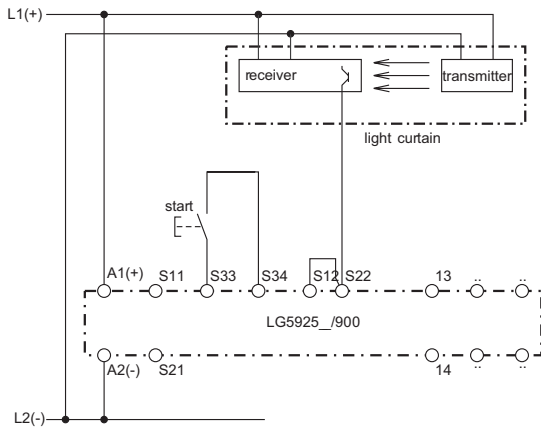
### LG5925-48-900-61 Block Diagram



### Dimensions mm [in]

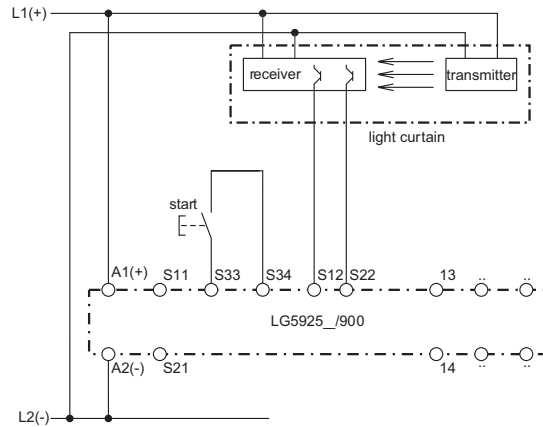


## Applications



Single channel connection of light curtains with self-test according to EN 61 496-1.

Note: Refer to "Unit programming"  
Set switch or dip switches in position:  
S1 "without"  
S2 "manual"  
With autostart link S33 - S34 set to "automatic."

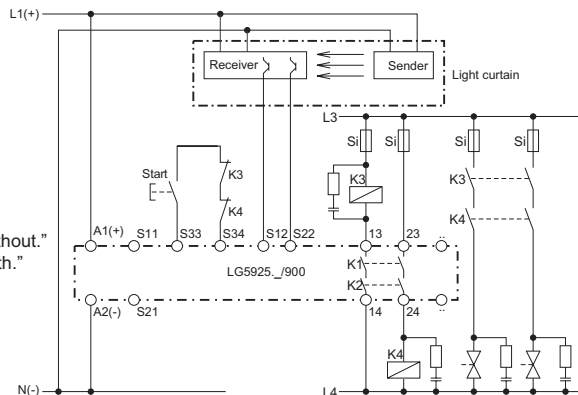


2 channel connection of light curtains with self-test according to EN 61 496-1.

Cross fault detection in the light curtain.  
Note: Refer to "Unit programming"  
Set switch or dip switches in position:  
S1: With symmetric outputs on light curtain, switch S1 in position "without."  
With asymmetric outputs on light curtains, switch S1 in position "with."  
S2: "manual"

Contact reinforcement and contact extension by external contactors

Note: Refer to "Unit programming"  
Set switches or dip switches in position:  
S1: With symmetric outputs on light curtain, switch S1 in position "without."  
With asymmetric outputs on light curtains, switch S1 in position "with."  
S2: "manual"



**\*Note: When switching inductive loads, surge suppressors are recommended.**

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

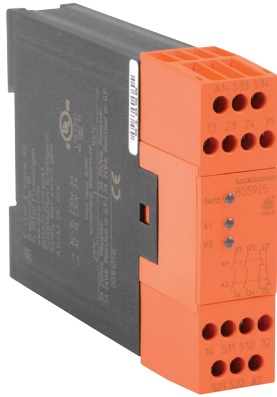
Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Dold Safety Relay Mat and Edge



- Safety-mat switch gear with manual or automatic restart
- Can also be used for safety edges
- Output: 2 N.O. contacts
- Line fault detection at the ON pushbutton
- LED indicator for state of operation
- LED indicator for channel 1 and 2
- Wire connection: also 2 x 1.5 mm<sup>2</sup> stranded ferruled (isolated), DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm<sup>2</sup> stranded



Safety Data – Values per EN ISO 13849-1	
Category	4
Performance level	PLe
MTTF <sub>d</sub>	236.3 years
DC <sub>avg</sub>	99%
Safety Data – Values per IEC/EN 62061 /IEC/EN 61508	
SIL CL	3
SIL	3
HFT (Hardware Failure Tolerance)	1
DC <sub>avg</sub>	99%
SFF	99.7%
PFH <sub>D</sub>	2.09E-10 h <sup>-1</sup>

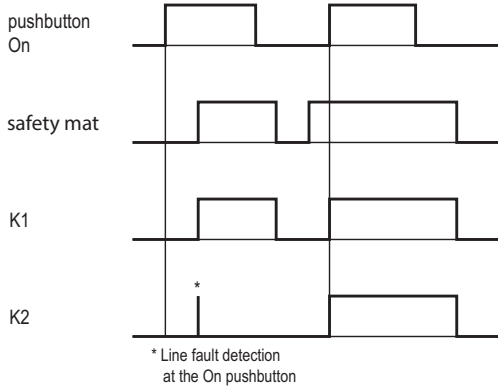
Safety Relays Selection Chart				
Part Number	Price	Marking Type	Voltage	Outputs
<b>BG5925-22-910-24</b>	\$125.00	Dold safety relay module, safety mat/edges, dual channel, manual or automatic restart	24VDC coil voltage	2 N.O. positive guided safety contact(s), 1 N.C. monitoring contact(s)

Relay Mat and Edge Specification Table	
General Specifications	
<b>Temperature</b>	Storage: -25°C to 85°C (-13°F to 185°F) Operating: -15°C to 55°C (5°F to 131°F)
<b>Altitude</b>	< 2,000 meters
<b>Vibration Resistance</b>	Amplitude: 0.35mm, Frequency: 10 to 55 Hz (IEC/EN 60-068-2-6)
<b>Degree of Protection</b>	Per IEC/EN 60 529. Housing: IP40; Terminals IP20
<b>Housing</b>	UL 94V-0 Thermoplastic; DIN mount 35 mm x 7.5 mm
<b>Weight</b>	220 g (7.76 oz.)
<b>Terminal Designation per EN 50 005 Wire Connections</b>	1x4 mm <sup>2</sup> solid or 1 x 2.5 mm <sup>2</sup> stranded ferruled (isolated) or 2 x 1.5 mm <sup>2</sup> stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm <sup>2</sup> stranded ferruled DIN 46 228-1/-2/-3
<b>Wire Fixing</b>	Box terminal with wire protection, removable terminal strips
<b>Wire Connection</b>	60degC/75degC Copper conductors only AWG20-12 Sol Torque 0.8NM AWG 20 - 14 STR Torque 0.8 NM
Input Specifications	
<b>Nominal Voltage</b>	24VDC
<b>Voltage Range</b>	At 10% residual ripple: 0.9 to 1.1 U <sub>N</sub>
<b>Maximum Consumption</b>	DC approx. 2 W
<b>Control Voltage - S11</b>	U <sub>N</sub> : 23V DC
<b>Control Current on S12, S22</b>	40 mA at U <sub>N</sub>
<b>Minimum Voltage on Terminals S12, S22(when relay activated)</b>	21VDC
<b>Short Circuit Protection</b>	Internal fuse rating
<b>Overvoltage Protection</b>	Internal VDR (Voltage Dependent Resistor)
Output Specifications	
<b>Electrical Contact Life</b>	To 2A, AC 230V: > 10 <sup>5</sup> switching cycles IEC/EN 60 947-5-1
<b>Mechanical Life</b>	10 x 10 <sup>6</sup> switching cycles
<b>Contact Type</b>	forcibly guided
<b>Operate Delay</b>	Operate delay typ at U <sub>N</sub> : manual start 40 ms; automatic start: 200 ms.
<b>Release Delay</b>	Release delay typ. at U <sub>N</sub> : Disconnecting the supply: 50 ms.; Disconnecting S12, S22: 15 ms.
<b>Nominal Output Voltage</b>	AC: 250V; DC: See continuous current limit curve in installation manual.
<b>Thermal Current (I<sub>th</sub>)</b>	Max. 5A per contact. See continuous current limit curve in installation manual.
<b>Switching of Low Loads</b>	≥100 mV; (contacts with 5μ Au) ≥ 1 mA
<b>Short Circuit Strength</b>	Max fuse rating: 6A gl (IEC/EN 60 947-5-1); Line circuit breaker: C 8A
<b>Switching Capacity</b>	AC 15: N.O. contacts: 3A/230V; N.C. contacts: 2A/230V AC DC 13: N.O. contacts: 1A/24V DC, 0.5A/110V AC; N.O. contacts: 1A/24V DC
<b>Switching Frequency</b>	Max. 1,200 switching cycles/hr
<b>Agency Approvals</b>	cULus file E107778, CE, RoHS, TUV

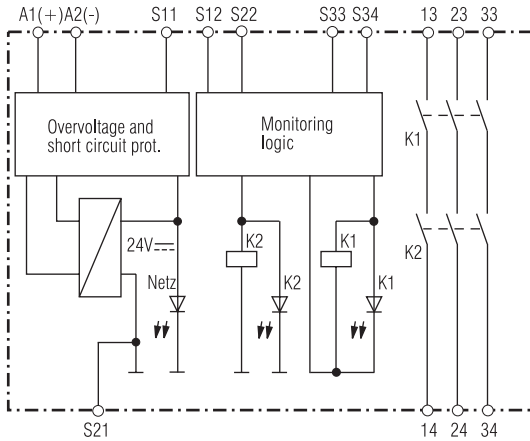
To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page at [www.automationdirect.com](http://www.automationdirect.com)

# Dold Safety Relay Mat and Edge

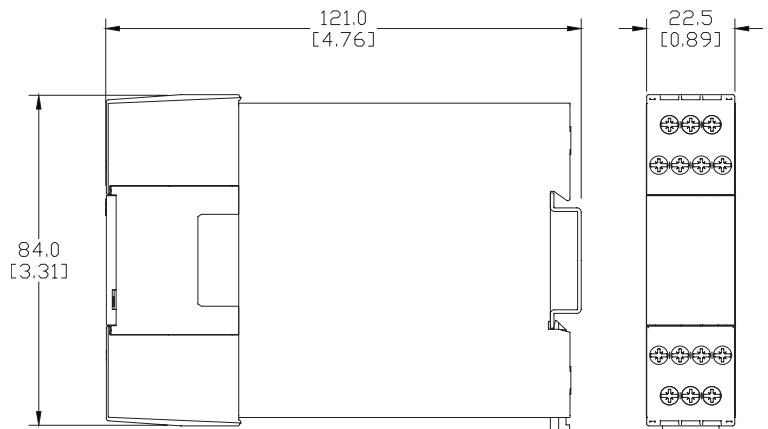
## Function Diagram



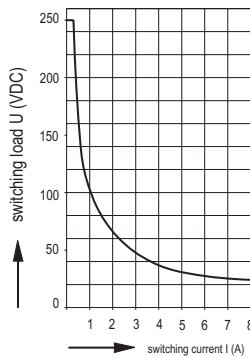
## Block Diagram



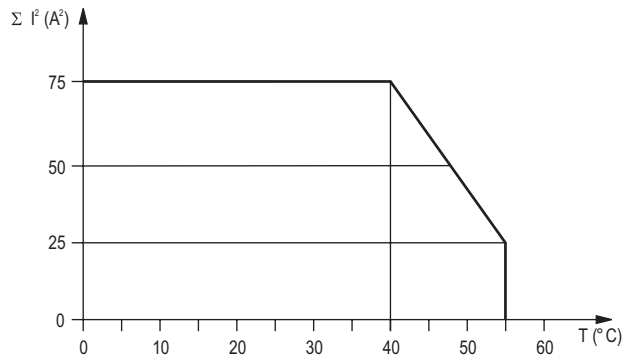
## Dimensions mm [in]



## Characteristic Curves



Safe breaking, no continuous arcing,  
max. 1 switching cycle/s  
Arc limit curve under resistive load



Quadratic total current

$$\Sigma I^2 = I_1^2 + I_2^2 + I_3^2$$

$I_1, I_2, I_3$  - current in contact paths

Quadratic total current limit curve

SEE OUR WEBSITE: [WWW.AUTOMATIONDIRECT.COM](http://WWW.AUTOMATIONDIRECT.COM) FOR COMPLETE ENGINEERING DRAWINGS.

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

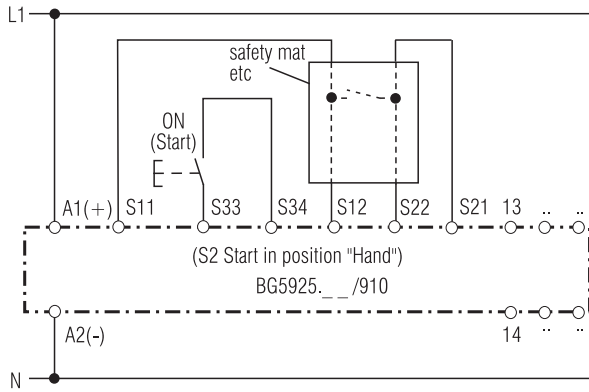
Safety: Electrical Components

Safety: Protective Wear

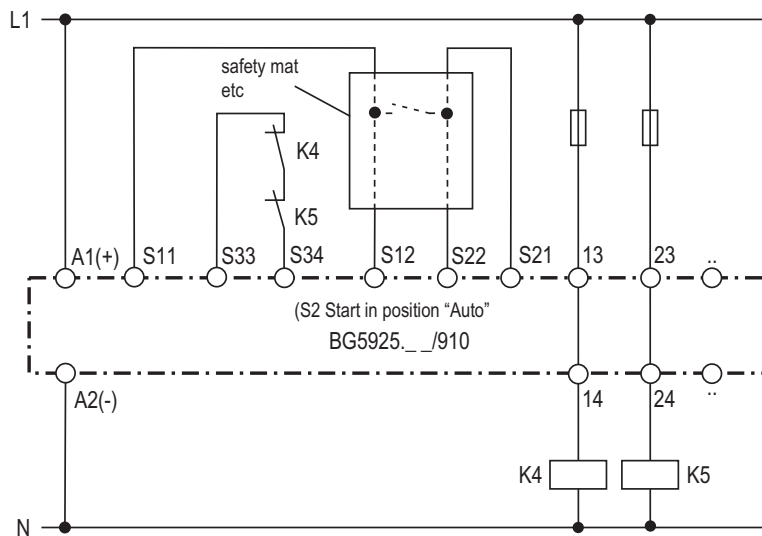
Terms and Conditions

# Dold Safety Relay Mat and Edge

## Application Examples

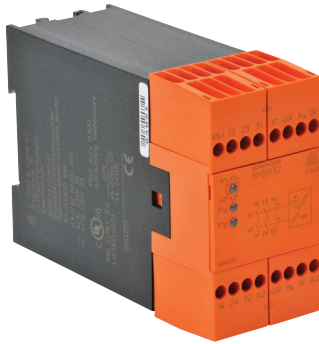


Switch gear for safety mats and edges  
 switch S2 position: Manual start  
 (For automatic restart S2 in position Autostart and link on S33-S34)  
 Suited up to SIL3, Performance Level e, Cat. 4



Switch gear for safety mats and edges  
 Contact reinforcement by external contactors, 2-channel.  
 switch S2 position: Auto start  
 Suited up to SIL3, Performance Level e, Cat. 4

# Dold BH5932 Speed Monitor Relays



BH5932 speed monitoring safety relay modules use inputs from proximity sensors that are detecting rotating targets on the motor that needs monitoring.

- Energized when speed is under setting value
- Two PNP sensor inputs
- 10 to 20,000 IPM (impulses per minute) adjustable range
- Monitors rotation and linear movement
- 2-channel operation for standstill and over-speed monitoring
- 2 N.O. and 1 N.C. positive-guided contacts
- LED status indicators

Safety Data – Values per EN ISO 13849-1	
Category	3 according to EN 954-1
Performance level	PL according to EN 13849-1
MTTF <sub>d</sub>	>273 years
DC <sub>avg</sub>	99%

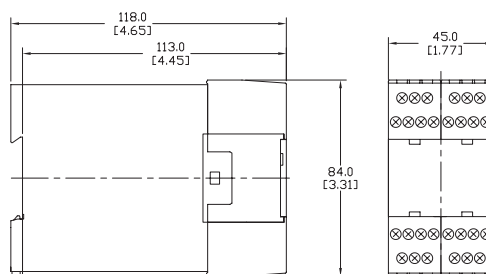
  

Safety Data – Values per IEC/EN 62061 / IEC/EN 61508	
SIL CL	3 per IEC/EN 62061
SIL	3 per IEC/EN 61508
HFT (Hardware Failure Tolerance)	1
DC <sub>avg</sub>	99%
SFF	99.7%
PFH <sub>D</sub>	1.69E-10 h <sup>-1</sup>

Safety Speed Monitor Relays Selection Chart				
Part Number	Price	Marking Type	Voltage	Outputs
BH5932-22-113-24	\$279.00	Speed-monitoring safety relay module	24 VAC/VDC	2 N.O. and 1 N.C.
BH5932-22-113-120	\$279.00		120 VAC	
BH5932-22-113-230	\$279.00		230 VAC	

Safety Speed Monitor Relay Module Specification Table	
General Specifications	
Temperature	Storage: -25°C to 85°C (-13°F to 185°F) Operating: -25°C to 60°C (-13°F to 140°F)
Altitude	< 2,000 meters
Vibration Resistance	Amplitude: 0.35mm, Frequency: 10 to 55 Hz (IEC/EN 60-068-2-6)
Degree of Protection	Per IEC/EN 60 529. Housing: IP40; Terminals IP20
Housing	UL 94V-0 Thermoplastic; Din mount 35 mm x 7.5 mm
Weight	410g (14.46 oz.)
Agency Approvals and Standards	cULus file E107778, CE, RoHS
Terminal Designation per EN 50 005 Wire Connections	1x4 mm <sup>2</sup> solid or 1 x 2.5 mm <sup>2</sup> stranded ferruled (isolated) or 2 x 1.5 mm <sup>2</sup> stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm <sup>2</sup> solid per DIN 46 228-1/-2/-3 /-4
Wire Fixing	Plus-minus terminal screws M3.5 box terminals with wire protection. Torque 0.8 Nm (7 lb-in)
Input Specifications	
Nominal Voltage	24V AC/DC, 110 VAC, 239VAC
Voltage Range	AC: 0.85 to 1.1 U <sub>N</sub> . At 10% residual ripple: 0.9 to 1.1 U <sub>N</sub> . At 48% residual ripple: 0.85 to 1.1 U <sub>N</sub> DC: 0.9 to 1.1 U <sub>N</sub> . At 10% residual ripple: 0.9 to 1.1 U <sub>N</sub> . At 48% residual ripple: 0.85 to 1.1 U <sub>N</sub>
Nominal Consumption	ca. 4 VA, 2.5W
Nominal Frequency	50 to 60 Hz. Frequency range: 45 to 65 Hz
Control Current	Control current typ. at 24V over 2 relays: 75 mA
Overvoltage Protection	Internal VDR (Voltage Dependent Resistor)
Sensor Inputs	24 VDC; 25 mA max./3 mA min. per channel.; 1 ms On/1ms Off min. pulse time; 30,000 lpm max. at inputs I <sub>NA</sub> and I <sub>NB</sub>
Output Specifications	
Electrical Contact Life	To AC15 at 2 A, 230V: 3x10 <sup>6</sup> switching cycles IEC/EN 60 947-5-1
Mechanical Life	≥50 x 10 <sup>6</sup> switching cycles
Contact Type	2 N.O. positively driven and 1 N.C. relay contacts (N.O. contacts are safety contacts)
Operate Delay on Standstill	Depends on setting; see manual and supplement
Release Delay on Overspeed	t <sub>off</sub> = typ. 350 ms
Nominal Output Voltage	250VAC
Thermal Current (I <sub>th</sub> )	Max. 4A per contact. See continuous current limit curve in installation manual.
Short Circuit Strength	Max fuse rating: 4A gl (IEC/EN 60 9470-5-1)
Switching Capacity IEC/EN 60 947-5-1	AC 15: N.O. contacts: 3A/230V; N.C. contacts: 2A/230VAC
Switching Frequency	Max. 1,200 switching cycles/hr

## Dimensions mm [in]



Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

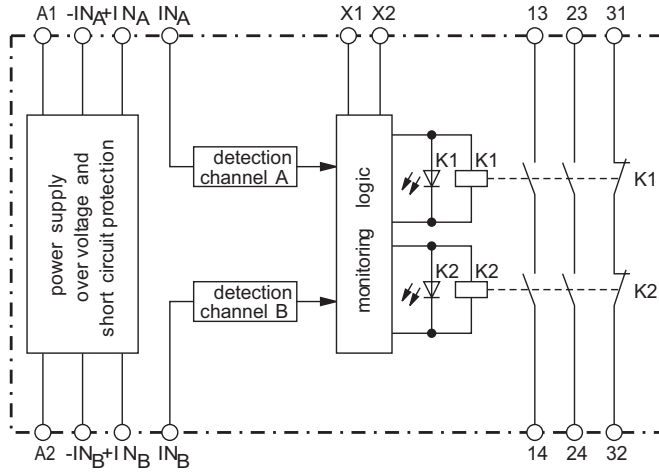
Safety: Protective Wear

Terms and Conditions

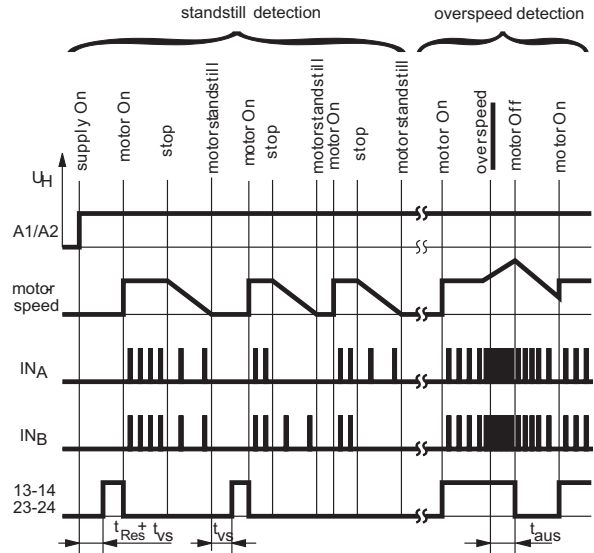
# Dold BH5932 Speed Monitor Relays

## Wiring

### BH5932 Block Diagram



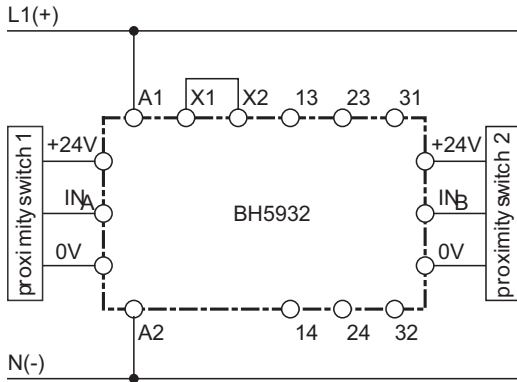
## Function diagram



IN<sub>A</sub> : proximity switch A  
 IN<sub>B</sub> : proximity switch B  
 $t_{Res}^+$  : reset time after connection of supply voltage  
 $t_{vs}$  : operate delay after detection of standstill/underspeed  
 $t_{aus}$  : release delay after detection of overspeed

## Application

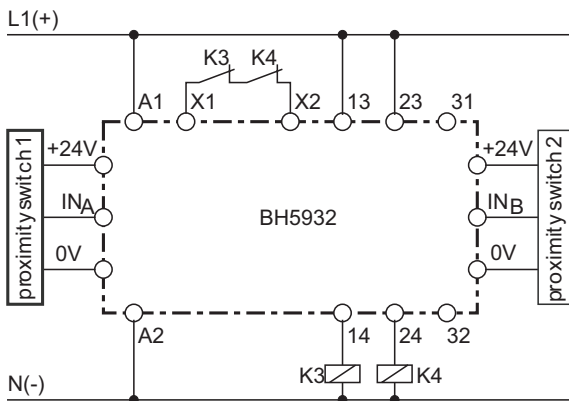
### Two PNP Proximity Sensors Monitoring a 3-Phase Motor



Standard connection

### Connection Terminals

Terminal designation	Signal designation
A1 (+)	+ / L
A2	- / N
X1, X2	Feedback circuit
+24V	+ supply for proximity sensors 1 e. g. 2
0V	- supply for proximity sensors 1 e. g. 2
INA, INB	measuring output of proximity sensors 1 e. g. 2
13, 14, 23, 24	Positive driven NO contacts for release circuit
31, 32	Positive driven NC contacts for release circuit



Connection with external contactors

# Dold LH5946 Standstill Monitor Relays



LH5946 speed monitoring safety relay modules provide safe standstill detection on 3-phase and single-phase motors by monitoring remanence voltage.

- Can monitor motor voltages up to 690 VAC or VDC
- No external sensors necessary
- Independent of direction
- Broken wire detection
- Monitors rotation and linear movement

- 2-channel operation for standstill and over-speed monitoring
- 3 N.O. and 1 N.C. positive-guided safety contacts
- LED status indicator
- Adjustable voltage setting
- Adjustable standstill time delay
- Semiconductor outputs for monitoring

## Safety Standstill Monitor Relays Selection Chart

Part Number	Price	Marking Type	Voltage Monitor Range	Voltage	Outputs
LH5946-48-24-04	\$349.00	Standstill-monitoring safety relay module	20mV to 400mV	24 VDC	3 N.O./1 N.C.
LH5946-48-115-04	\$349.00			115 VAC	
LH5946-48-230-04	\$349.00			230 VAC	
LH5946-48-24-40	\$349.00		200mV to 4V	24 VDC	
LH5946-48-115-40	\$349.00			115 VAC	
LH5946-48-230-40	\$349.00			230 VAC	

**Note: The -04 models are recommended for applications where motors are controlled directly from contactors. The -40 models are recommended for applications involving VFDs or soft starters where OFF-state leakage is present and higher voltage settings are required.**

## Safety Standstill Monitor Relays Specification Table

General Specifications																			
<b>Temperature</b>	Storage: -40°C to 75°C (-40°F to 167°F) Operating: -25°C to 60°C (-13°F to 140°F)																		
<b>Altitude</b>	< 2,000 meters																		
<b>Vibration Resistance</b>	Amplitude: 0.35mm, Frequency: 10 to 55 Hz (IEC/EN 60-068-2-6)																		
<b>Degree of Protection</b>	Per IEC/EN 60 529. Housing: IP40; Terminals IP20																		
<b>Housing</b>	UL 94V-0 Thermoplastic; Din mount 35 mm x 7.5 mm																		
<b>Weight</b>	400g (14.11 oz.)																		
<b>Agency Approvals and Standards</b>	cULus file E107778, CE, RoHS, TUV																		
<b>Terminal Designation per EN 50 005 Wire Connections</b>	1x4 mm <sup>2</sup> solid or 1 x 2.5 mm <sup>2</sup> stranded ferruled (isolated) or 2 x 1.5 mm <sup>2</sup> stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm <sup>2</sup> solid per DIN 46 228-1/-2/-3 /-4																		
<b>Wire Fixing</b>	Plus-minus terminal screws M3.5 box terminals with wire protection. Torque 0.8 Nm (7 lb-in)																		
Input Specifications																			
<b>Nominal Voltage</b>	24V DC, 115 V AC, 230V AC																		
<b>Measuring/Motor Voltage</b>	690 V																		
<b>Input Resistance</b>	500 k ohms																		
<b>Response Value U<sub>an</sub></b>	20 mV to 400 mV, adjustable or 0.2 to 4V adjustable																		
<b>Response Value Dependent on Frequency</b>	<table border="1"> <thead> <tr> <th>Input Frequency (Hz)</th> <th>50</th> <th>100</th> <th>200</th> <th>400</th> <th>600</th> <th>1k</th> <th>1.5k</th> <th>2k</th> </tr> </thead> <tbody> <tr> <td>Response Value U<sub>an</sub></td> <td>1.0</td> <td>1.1</td> <td>1.2</td> <td>1.5</td> <td>2.0</td> <td>2.8</td> <td>5</td> <td>8</td> </tr> </tbody> </table>	Input Frequency (Hz)	50	100	200	400	600	1k	1.5k	2k	Response Value U <sub>an</sub>	1.0	1.1	1.2	1.5	2.0	2.8	5	8
Input Frequency (Hz)	50	100	200	400	600	1k	1.5k	2k											
Response Value U <sub>an</sub>	1.0	1.1	1.2	1.5	2.0	2.8	5	8											
<b>Voltage Range</b>	AC: 0.8 to 1.1 U <sub>N</sub> . At 10% residual ripple: 0.9 to 1.1 U <sub>N</sub> ; At 48% residual ripple: 0.85 to 1.1 U <sub>N</sub> DC: 0.9 to 1.2 U <sub>N</sub> . At 10% residual ripple: 0.9 to 1.1 U <sub>N</sub> ; At 48% residual ripple: 0.85 to 1.1 U <sub>N</sub>																		
<b>Nominal Consumption</b>	ca. 5 VA, 3W																		
<b>Nominal Frequency</b>	50 to 60 Hz. Frequency range: 45 to 65 Hz																		
<b>Control Current</b>	Control current typ. at 24V over 2 relays: 75 mA																		
<b>Overvoltage Protection</b>	Internal VDR (Voltage Dependent Resistor)																		
Output Specifications																			
<b>Electrical Contact Life</b>	To AC15 at 2 A, 230V: 2x10 <sup>5</sup> switching cycles IEC/EN 60 947-5-1																		
<b>Mechanical Life</b>	≥50 x 10 <sup>6</sup> switching cycles																		
<b>Contact Type</b>	3 N.O. positively driven and 1 N.C. relay contacts (N.O. contacts are safety contacts)																		
<b>Operate Delay on Standstill</b>	Depends on setting; adjust by potentiometer																		
<b>Release Delay on Overspeed</b>	t <sub>off</sub> = typ. 700 ms																		
<b>Nominal Output Voltage</b>	250VAC																		
<b>Thermal Current (I<sub>th</sub>)</b>	Max. 5A per contact. See continuous current limit curve in installation manual.																		
<b>Short Circuit Strength</b>	Max fuse rating: 4A gl (IEC/EN 60 9470-5-1), line circuit breaker C6A																		
<b>Switching Capacity IEC/EN 60 947-5-1</b>	AC 15: N.O. contacts: 3A/230V; N.C. contacts: 2A/230VAC. DC13: 2A/24V																		
<b>Switching Frequency</b>	Max. 1,200 switching cycles/hr																		
<b>Semi-conductor Monitoring</b>	100 mA DC 24V; supply via A3+/A4																		

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

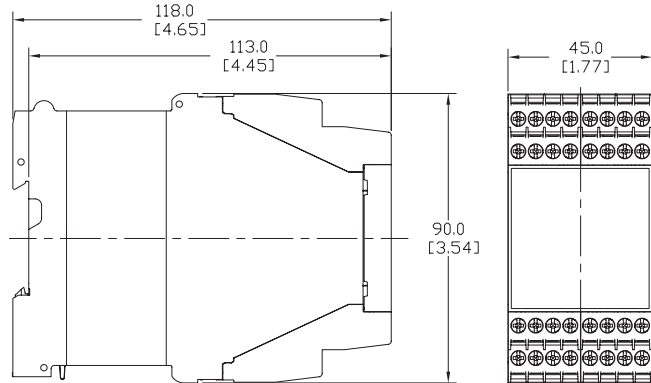
Safety: Protective Wear

Terms and Conditions

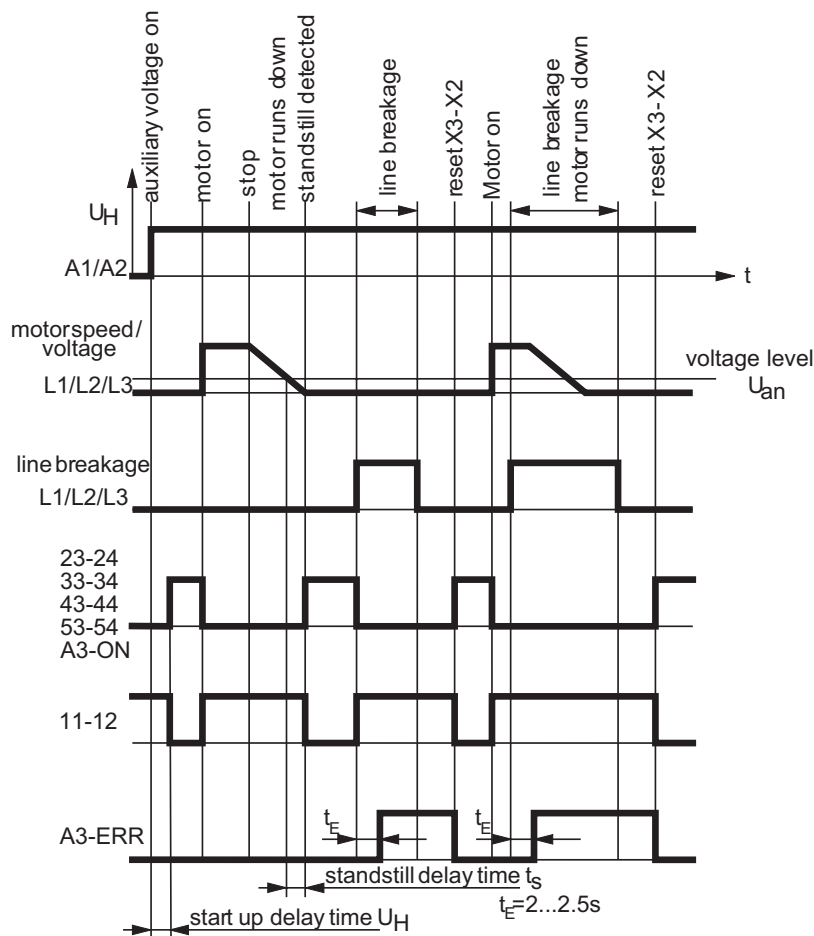
# Dold LH5946 Standstill Monitor Relays

## Dimensions mm [in]

Safety Data – Values per EN ISO 13849-1	
Category	4 according to EN 954-1
Performance level	PLe according to EN 13849-1
MTTF <sub>d</sub>	>93 years
DC <sub>avg</sub>	99%
Safety Data – Values per IEC/EN 62061 /IEC/EN 61508	
SIL CL	3 per IEC/EN 62061
SIL	3 per IEC/EN 61508
HFT (Hardware Failure Tolerance)	1
DC <sub>avg</sub>	99%
SFF	99.7%
PFH <sub>D</sub>	4.10E-10 h <sup>-1</sup>



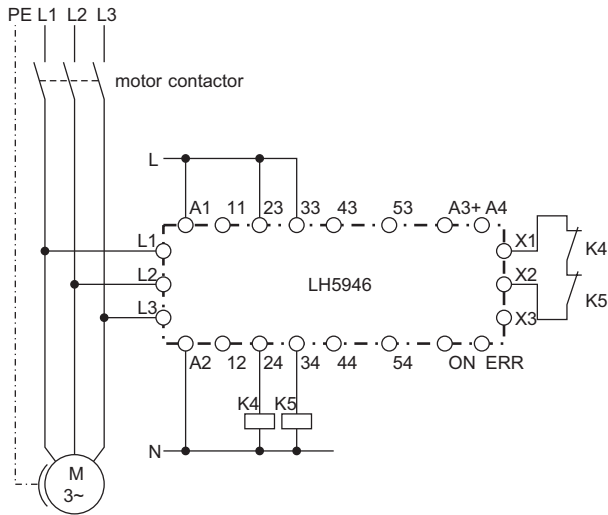
## Function diagram



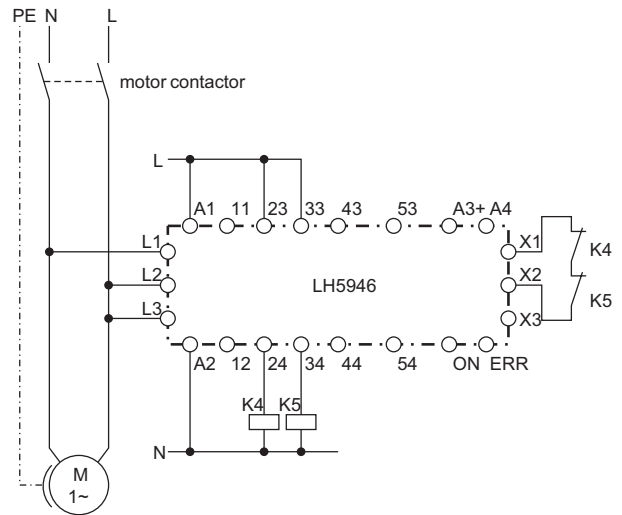


# Dold LH5946 Standstill Monitor Relays

## Applications



With 3-phase motor



With single-phase motor

### Connection terminals

Terminal designation	Signal designation
L1 - L2 - L3	Connection to monitored motor
11 - 12	Safety contacts (NC)
23 - 24, 33 - 34, 43 - 44	Safety contacts (NO)
53 - 54	Monitoring contact (NO)
X1 - X2	Connection of feedback circuit (for external contactors)
X2 - X3	Manual reset for external faults
A1 - A2	Auxiliary supply (U) <sub>H</sub>
A3(+) - A4	Supply for semiconductor outputs
ON:	Semiconductor output indicates state of safety contacts
ERR:	Semiconductor output indicates failures
Attention: The outputs 53-54, ON and ERR are only monitoring outputs and must not be used in safety circuits	

### Setting

Poti „U <sub>an</sub> “:	Adjustment of voltage level for standstill detection
Poti „t <sub>s</sub> “:	Adjustment of time delay before activation of safety contacts

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Dold UG6929 Series Safety Relay Extension Module



Additional contacts for emergency-stop modules and safety gate monitors.

- Safety contact multiplication
- According to
  - Performance Level (PL) e and category 4 to EN ISO 13849-1: 2008
  - SIL Claimed Level (SIL CL) 3 to IEC/EN 62061
  - Safety Integrity Level (SIL) 3 to IEC/EN 61508 and IEC/EN 61511 when connected to a suitable safety module
  - EN 50156-1 for furnaces
- Control with safety semiconductor outputs (light curtain, e-stop) possible
- Redundant and forcibly guided contacts

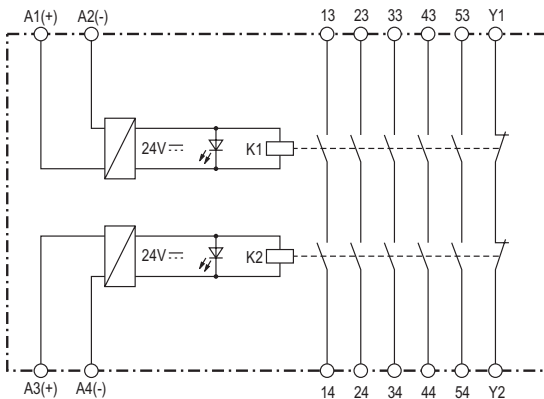
- Output: max. 5 N.O. contacts, 1 N.C. contact for feedback circuit
- 2-channel
- LED Indicator
- Pluggable terminal blocks for easy exchange of devices



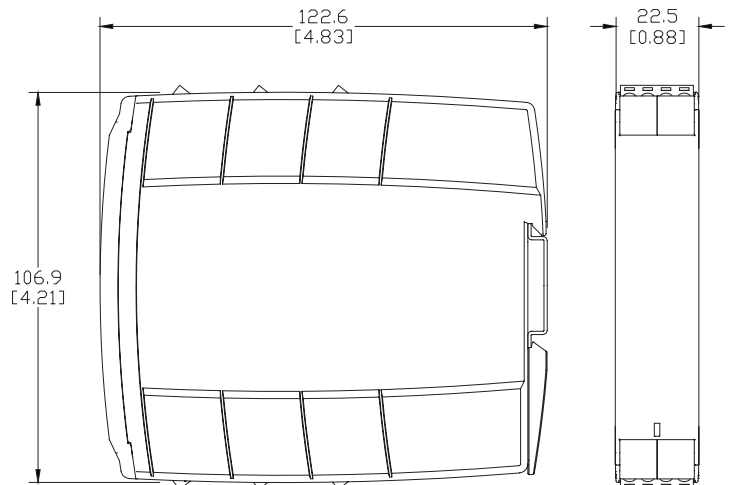
Safety Relays Selection Chart				
Part Number	Price	Marking Type	Voltage	Outputs
UG6929-60PS-100-24	\$105.00	Safety relay extension module	24 VAC/DC	5 N.O. positive guided safety contact(s), 1 N.C. monitoring contact(s)

Safety Data – Values per EN ISO 13849-1	
Category	4
Performance level	PLe
MTTF <sub>d</sub>	144.3 years
DC <sub>avg</sub>	99%
Safety Data – Values per IEC/EN 62061 / IEC/EN 61508	
SIL CL	3
SIL	3
HFT (Hardware Failure Tolerance)	1
DC <sub>avg</sub>	99%
SFF	99.7%
PFH <sub>D</sub>	3.59E-10 h <sup>-1</sup>

## Block Diagram



## Dimensions mm [in]



SEE OUR WEBSITE: [WWW.AUTOMATIONDIRECT.COM](http://WWW.AUTOMATIONDIRECT.COM) FOR COMPLETE ENGINEERING DRAWINGS.

# Dold UG6929 Series Safety Relay Extension Module

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZiPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

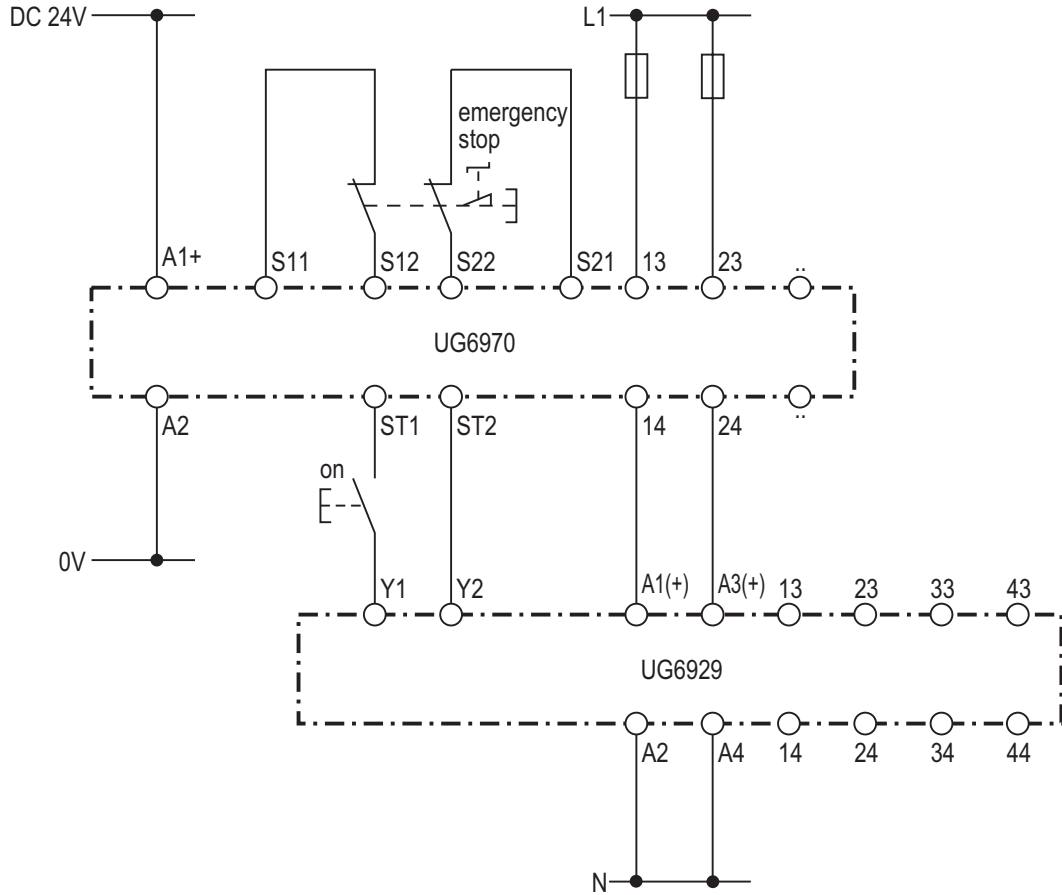
**Dold UG6929 Series Safety Relay Extension Module Specification Table**

<b>General Specifications</b>	
<b>Temperature</b>	Storage: -25°C to 85°C (-13°F to 185°F) Operating: -15°C to 55°C (5°F to 131°F)
<b>Altitude</b>	< 2,000 meters
<b>Vibration Resistance</b>	Amplitude: 0.35mm, Frequency: 10 to 55 Hz (IEC/EN 60-068-2-6)
<b>Degree of Protection</b>	Per IEC/EN 60 529. Housing: IP40; Terminals IP20
<b>Housing</b>	UL 94V-0 Thermoplastic; Din mount 35 mm x 7.5 mm
<b>Weight</b>	210g (7.41 oz.)
<b>Terminal Designation per EN 50 005 Wire Connections</b>	1x4 mm <sup>2</sup> solid or 1 x 2.5 mm <sup>2</sup> stranded ferruled (isolated) or 2 x 1.5 mm <sup>2</sup> stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm <sup>2</sup> solid per DIN 46 228-1/-2/-3/-4
<b>Wire Fixing</b>	Plus-minus terminal screws M3.5 box terminals with wire protection.
<b>Wire Connection</b>	60degC/75degC Copper conductors only; AWG20-12 Sol/Str Torque 0.5NM
<b>Input Specifications</b>	
<b>Nominal Voltage</b>	24VAC/DC
<b>Voltage Range</b>	AC: 0.85 to 1.1 U <sub>N</sub> At 10% residual ripple: 0.9 to 1.1 U <sub>N</sub> ; At 48% residual ripple: 0.85 to 1.1 U <sub>N</sub>
<b>Maximum Consumption</b>	24VAC/DC: 1.8VA
<b>Nominal Frequency</b>	50 to 60 Hz
<b>Control Current</b>	Control current typ. at 24V over 2 relays: 75 mA
<b>Overvoltage Protection</b>	Internal VDR (Voltage Dependent Resistor)
<b>Output Specifications</b>	
<b>Electrical Contact Life</b>	To AC15 at 2A, 230V: 10 <sup>5</sup> switching cycles IEC/EN 60 947-5-1
<b>Mechanical Life</b>	20 x 10 <sup>6</sup> switching cycles
<b>Contact Type</b>	5 N.O. positive guided and 1 N.C. monitoring contacts
<b>Operate/Release Time</b>	Operate typ at U <sub>N</sub> : 20 ms.; Release typ at U <sub>N</sub> : 35 ms.
<b>Nominal Output Voltage</b>	250VAC
<b>Thermal Current (I<sub>th</sub>)</b>	Max. 5A per contact. See quadratic total current limit curve in installation manual.
<b>Short Circuit Strength</b>	Max fuse rating: 6A gl (IEC/EN 60 9470-5-1); Line circuit breaker: B6A
<b>Switching Capacity IEC/EN 60 947-5-1</b>	AC 15: N.O. contacts: 3A/230V; N.C. contacts: 2A/230VAC DC 13: N.O. contacts: 4A/24V; N.C. contacts: 4A/24VDC; N.O. contact: 8A/24V >25x10 <sup>3</sup> ON: 0.4s, OFF: 9.6s
<b>Switching Frequency</b>	Max. 1,200 switching cycles/hr
<b>Agency Approvals and Standards</b>	CSA, cULus file E107778, CE, RoHS, TUV

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page at [www.automationdirect.com](http://www.automationdirect.com)

# Dold UG6929 Series Safety Relay Extension Module

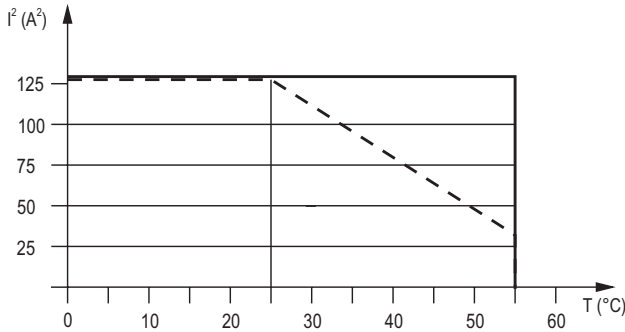
## Application Example



Contact extensions with UG6929/100; suited up to SIL3, Performance Level e, Cat. 4

# Dold UG6929 Series Safety Relay Extension Module

## Characteristic Curves



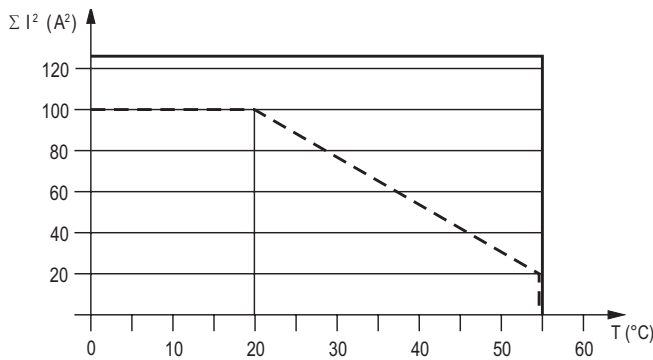
— device free-standing  
max. current at 55°C over  
2 contact path =  $8A \hat{=} 2 \times 8^2 A^2 = 128A^2$

- - - device mounted without distance heated by  
devices with same load,  
max. current at 55°C over  
2 contact path =  $4A \hat{=} 2 \times 4^2 A^2 = 32A^2$

$$\sum I^2 = I_1^2 + I_2^2$$

$I_1, I_2$  - current in contact paths

Quadratic total current limit curve



— AC / DC 24V device mounted on distance with air circulation.  
max. current at 55°C over  
5 contact path =  $5A \hat{=} 5 \times 5^2 A^2 = 125A^2$

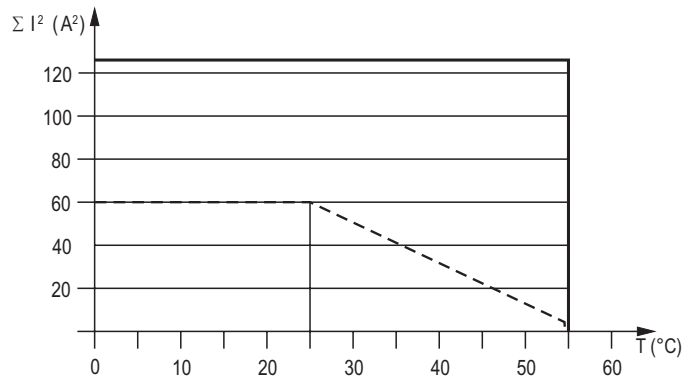
- - - AC / DC 24V device mounted without distance heated by  
devices with same load,  
max. current at 55°C over  
5 contact path =  $2A \hat{=} 5 \times 2^2 A^2 = 20A^2$

Quadratic total current

$$\sum I_{th}^2 = I_{th1}^2 + I_{th2}^2 + I_{th3}^2 + I_{th4}^2 + I_{th5}^2$$

$I_{th1}, I_{th2}, I_{th3}, I_{th4}, I_{th5}$  : current in contact paths

Quadratic total current limit curve AC/DC 24 V



— AC 230V device mounted on distance with air circulation.  
max. current at 55°C over  
5 contact path =  $5A \hat{=} 5 \times 5^2 A^2 = 125A^2$

- - - AC 230V device mounted without distance heated by  
devices with same load,  
max. current at 55°C over  
5 contact path =  $1A \hat{=} 5 \times 1^2 A^2 = 5A^2$

Quadratic total current

$$\sum I_{th}^2 = I_{th1}^2 + I_{th2}^2 + I_{th3}^2 + I_{th4}^2 + I_{th5}^2$$

$I_{th1}, I_{th2}, I_{th3}, I_{th4}, I_{th5}$  : current in contact paths

Quadratic total current limit curve AC 230 V

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Dold LG7927/ LG7928 Extension Module



Additional contacts for emergency-stop modules and safety gate monitors.

- Safe timing circuits
- 4 forcibly guided output contacts at only 22.5 mm width

According to:

- Performance Level (PL) d and category 3 to EN ISO 13849-1: 2008
- SIL Claimed Level (SIL CL) 2 to IEC/EN 62061
- Safety Integrity Level (SIL) 2 to IEC/EN 61508 and IEC/EN 61511 when connected to a suitable safety module
- Adjustable time delay
- On - Delayed / Released Delayed
- Long life stability due to digital time base

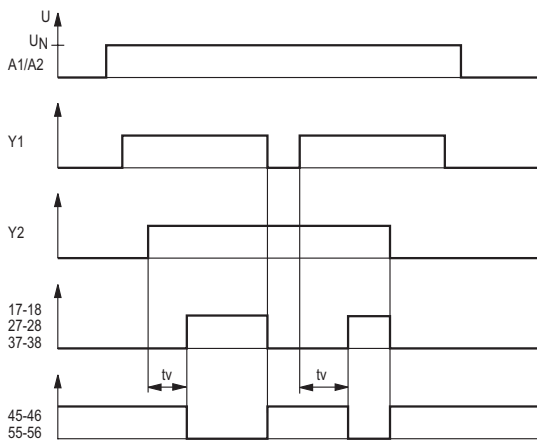
- Adjustable with or without cross fault detection
- Output: 3 N.O. contacts + 1 N.C. contact, 1 positive guided feedback contact
- LED indicator for channel 1, 2 and operation voltage



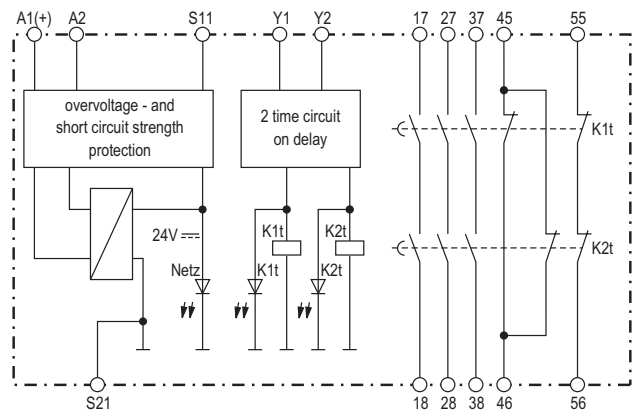
Safety Relays Selection Chart				
Part Number	Price	Marking Type	Voltage	Outputs
LG7927-97-61-10	\$122.00	On-Delayed Safety Relay Extension Model	24VAC/VDC	3 N.O. time delay (1 to 10 second) positive guided safety contact(s), 1 N.C. time delay (1 to 10 second) positive guided safety contact(s), 1 N.C. time delay monitoring contact
LG7927-97-61-60	\$122.00			3 N.O. time delay (6 to 60 second) positive guided safety contact(s), 1 N.C. time delay (6 to 60 second) positive guided safety contact(s), 1 N.C. time delay monitoring contact
LG7928-97-61-10	\$122.00	Release-Delayed Safety Relay Extension Model		3 N.O. time delay (1 to 10 second) positive guided safety contact(s), 1 N.C. time delay (1 to 10 second) positive guided safety contact(s), 1 N.C. time delay monitoring contact
LG7928-97-61-60	\$122.00			3 N.O. time delay (6 to 60 second) positive guided safety contact(s), 1 N.C. time delay (6 to 60 second) positive guided safety contact(s), 1 N.C. time delay monitoring contact

Safety Data – Values per EN ISO 13849-1	
Category	3
Performance level	PLd
MTTF <sub>d</sub>	172.3 years
DC <sub>avg</sub>	99%
Safety Data – Values per IEC/EN 62061 /IEC/EN 61508	
SIL CL	2
SIL	2
HFT (Hardware Failure Tolerance)	1
DC <sub>avg</sub>	99%
SFF	99.7%
PFD <sub>D</sub>	2.95E-10 h <sup>-1</sup>

## Function Diagram



## Block Diagram

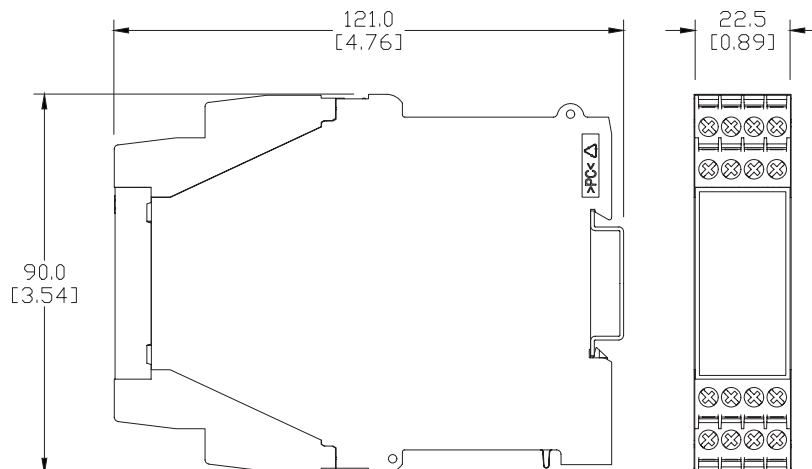


# Dold LG7927/LG7928 Extension Module

Safety Relay Extension Module Specification Table	
General Specifications	
Temperature	Storage: -25°C to 85°C (-13°F to 185°F) Operating: -15°C to 55°C (5°F to 131°F)
Altitude	< 2,000 meters
Vibration Resistance	Amplitude: 0.35mm, Frequency: 10 to 55 Hz (IEC/EN 60-068-2-6)
Degree of Protection	Per IEC/EN 60 529. Housing: IP40; Terminals IP20
Housing	UL 94V-0 Thermoplastic; DIN mount 35 mm x 7.5 mm
Weight	approximately 190g (6.70 oz.)
Agency Approvals and Standards	CSA, cULus file E107778, CE, RoHS, TUV
Terminal Designation per EN 50 005 Wire Connections	2 x 2.5 mm <sup>2</sup> stranded ferruled (isolated) or 2 x 1.5 mm <sup>2</sup> stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm <sup>2</sup> solid per DIN 46 228-1/-2/-3 /-4
Wire Fixing	Plus-minus terminal screws M3.5 box terminals with wire protection.
Wire Connection	60degC/75degC Copper conductors only; AWG20-12 Sol/Str Torque 0.8NM
Input Specifications	
Nominal Voltage	24VAC/DC
Voltage Range	AC: 0.9 to 1.1 U <sub>N</sub> At 10% residual ripple: 0.9 to 1.1 U <sub>N</sub> ; At 48% residual ripple: 0.85 to 1.1 U <sub>N</sub>
Maximum Consumption	24VAC/DC: 3.5 VA/2.0 W
Nominal Frequency	50 to 60 Hz
Control Current	Control current typ. at 24V over 2 relays: 75 mA
Overvoltage Protection	Internal VDR (Voltage Dependent Resistor)
Output Specifications	
Electrical Contact Life	To AC15 at 5A, 230V: 2.2 x 10 <sup>5</sup> switching cycles IEC/EN 60 947-5-1
Mechanical Life	20 x 10 <sup>6</sup> switching cycles
Contact Type	3 N.O. contacts + 1 N.C. contact + 1 forcibly guided feedback contact
Operate/Release Time	Operate typ at U <sub>N</sub> : DC - 2.2 mA.; AC - 3.1mA. Release typ at U <sub>N</sub> : 35 ms.
Nominal Output Voltage	24VDC/24VAC
Thermal Current (I <sub>th</sub> )	Max. 5A per contact. See quadratic total current limit curve in installation manual.
Short Circuit Strength	Max fuse rating: 6A gl (IEC/EN 60 9470-5-1); Line circuit breaker: B6A
Switching Capacity IEC/EN 60 947-5-1	AC 15: N.O. contacts: 3A/230V; N.C. contacts: 2A/230VAC DC 13: N.O. contacts: 2A/24V; N.C. contacts: 2A/24VDC; N.O. contact: 4A/24V at 0.1Hz
Switching Frequency	Max. 1,200 switching cycles/hr
Agency Approvals and Standards	cULus file E107778, CE, RoHS

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page at [www.automationdirect.com](http://www.automationdirect.com)

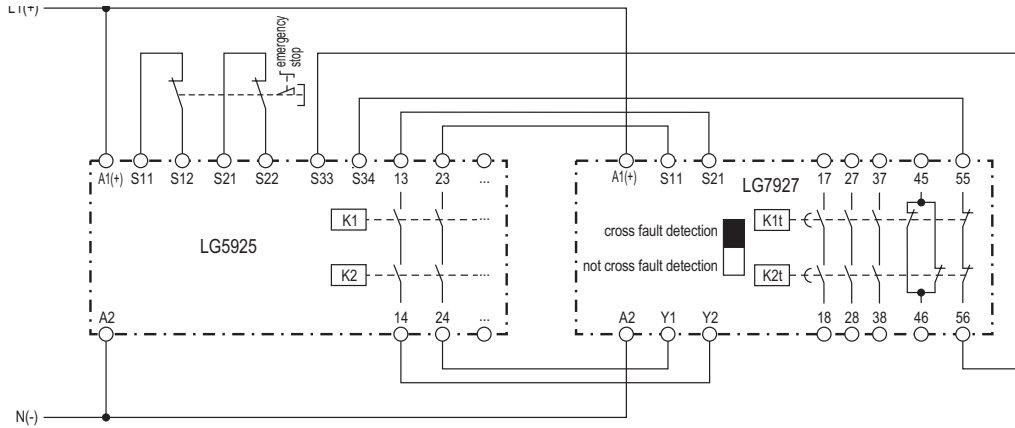
## Dimensions mm [in]



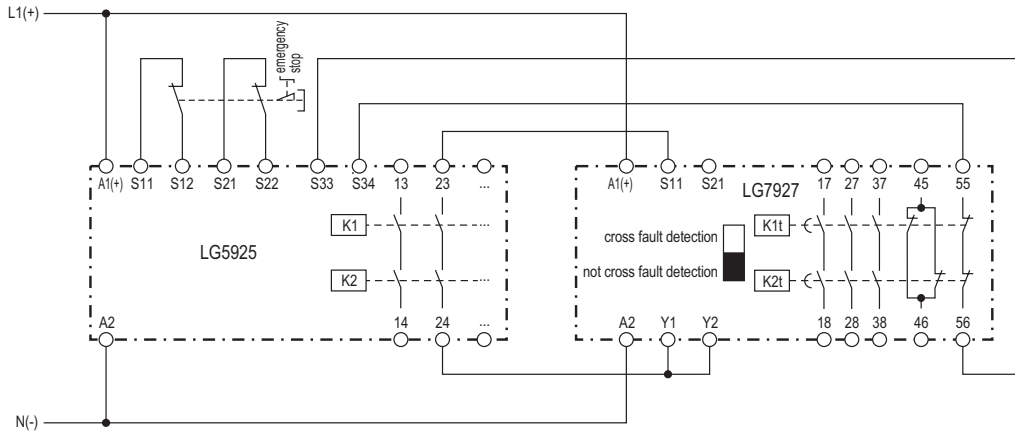
SEE OUR WEBSITE: [WWW.AUTOMATIONDIRECT.COM](http://WWW.AUTOMATIONDIRECT.COM) FOR COMPLETE ENGINEERING DRAWINGS.

# Dold LG7927/LG7928 Extension Module

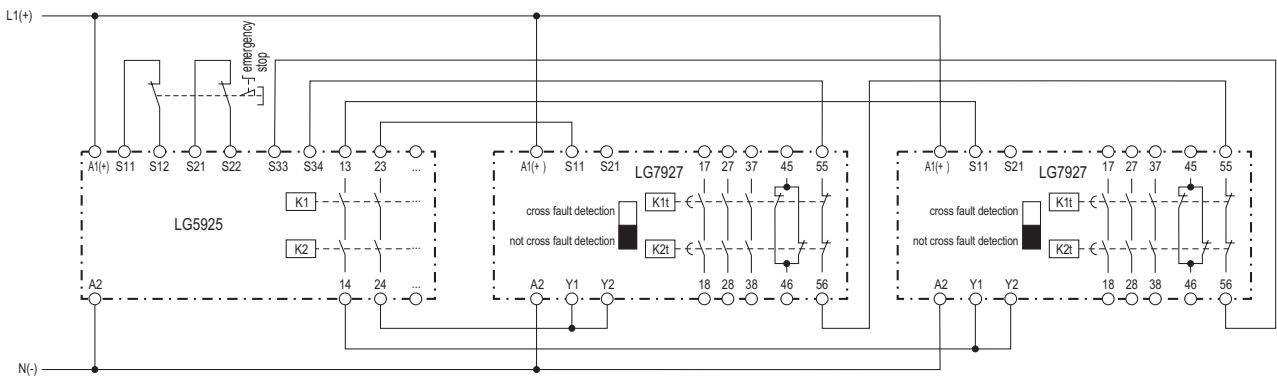
## LG7927 Application Examples



LG 5925 with LG 7927, cross fault detection, suitable up to SIL2, Performance Level d, Cat. 3



LG 5925 with LG 7927, non cross fault detection, suitable up to SIL2, Performance Level d, Cat. 3

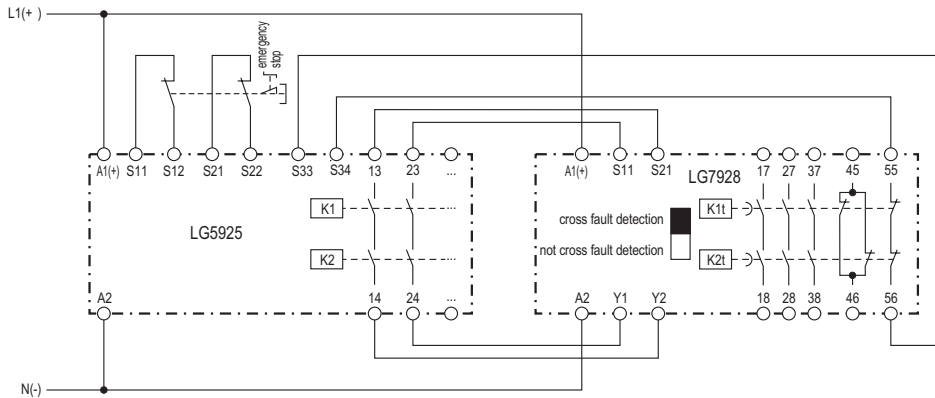


LG 5925 with two LG 7927, non cross fault detection, suitable up to SIL2, Performance Level d, Cat. 3

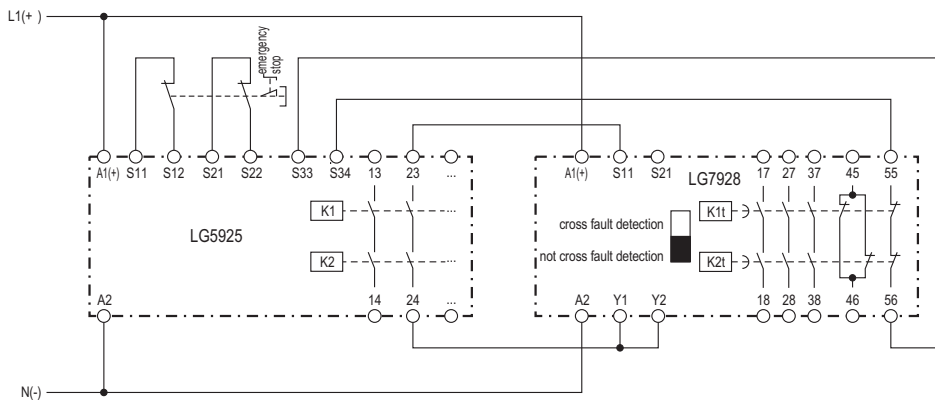


# Dold LG7927/LG7928 Extension Module

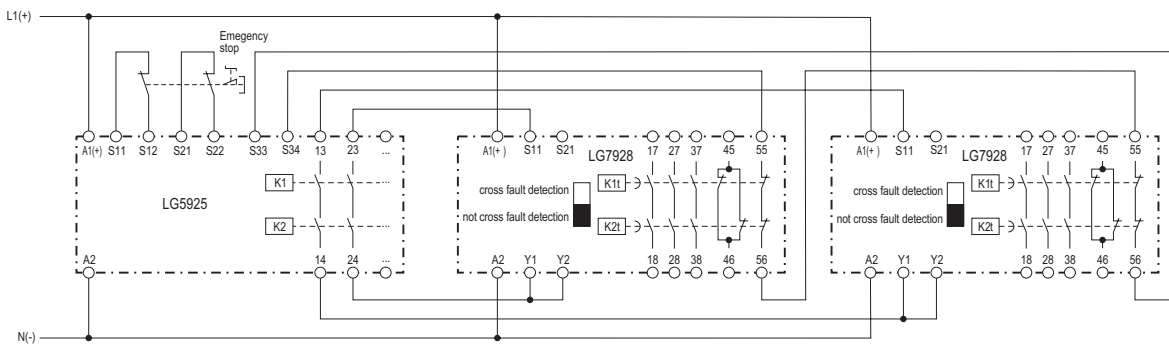
## LG7928 Application Examples



LG 5925 with LG 7928, cross fault detection, suitable up to SIL2, Performance Level d, Cat. 3



LG 5925 with LG 7928, non cross fault detection, suitable up to SIL2, Performance Level d, Cat. 3



LG 5925 with 2 LG 7928, non cross fault detection, suitable up to SIL2, Performance Level d, Cat. 3

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Dold LG5929 Extension Module



Additional contacts for emergency-stop modules and safety gate monitors.

- 1-channel or 2-channel connection
- LED indication for operation
- Output: 5 N.O. and 1 N.C. contacts

Safety Data – Values per EN ISO 13849-1	
Category	4 according to EN 954-1
Performance level	PLe according to EN 13849-1
MTTF <sub>d</sub>	>100 years
DC <sub>avg</sub>	99%
Safety Data – Values per IEC/EN 62061 /IEC/EN 61508	
SIL CL	3 per IEC/EN 62061
SIL	3 per IEC/EN 61508
HFT (Hardware Failure Tolerance)	1
DC <sub>avg</sub>	99%
SFF	99.7%
PFH <sub>d</sub>	4.68E-10 h <sup>-1</sup>

## Safety Relays Selection Chart

Part Number	Price	Marking Type	Voltage	Outputs
LG5929-60-100-61	\$95.00	Safety relay extension module	24 VAC/VDC	5 N.O./1 N.C.

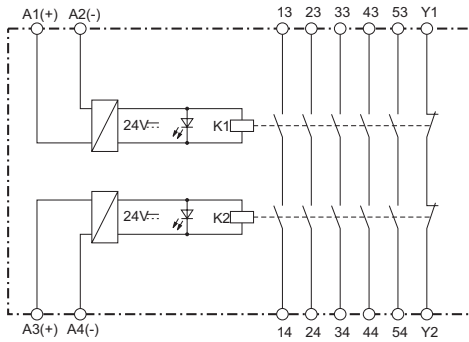
## Safety Relay Extension Module Specification Table

General Specifications	
Temperature	Storage: -25°C to 85°C (-13°F to 185°F) Operating: -15°C to 55°C (5°F to 131°F)
Altitude	< 2,000 meters
Vibration Resistance	Amplitude: 0.35mm, Frequency: 10 to 55 Hz (IEC/EN 60-068-2-6)
Degree of Protection	Per IEC/EN 60 529. Housing: IP40; Terminals IP20
Housing	UL 94V-0 Thermoplastic; Din mount 35 mm x 7.5 mm
Weight	205g (7.23 oz.)
Agency Approvals and Standards	CSA, cULus file E107778, CE, RoHS, TUV
Terminal Designation per EN 50 005 Wire Connections	1x4 mm <sup>2</sup> solid or 1 x 2.5 mm <sup>2</sup> stranded ferruled (isolated) or 2 x 1.5 mm <sup>2</sup> stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm <sup>2</sup> solid per DIN 46 228-1/-2/-3 /-4
Wire Fixing	Plus-minus terminal screws M3.5 box terminals with wire protection or cage clamp terminals.
Input Specifications	
Nominal Voltage	24V AC/DC
Voltage Range	AC: 0.85 to 1.1 U <sub>N</sub> At 10% residual ripple: 0.9 to 1.1 U <sub>N</sub> ; At 48% residual ripple: 0.85 to 1.1 U <sub>N</sub>
Maximum Consumption	24VAC/DC: 1.8VA
Nominal Frequency	50 to 60 Hz
Control Current	Control current typ. at 24V over 2 relays: 75 mA
Overvoltage Protection	Internal VDR (Voltage Dependent Resistor)
Output Specifications	
Electrical Contact Life	To AC15 at 2 A,230V: 10 <sup>5</sup> switching cycles IEC/EN 60 947-5-1
Mechanical Life	20 x 10 <sup>6</sup> switching cycles
Contact Type	5 N.O. positively driven and 1 N.C. relay contacts (N.O. contacts are safety contacts)
Operate/Release Time	Operate typ at U <sub>N</sub> : 20 ms.; Release typ at U <sub>N</sub> : 35 ms.
Nominal Output Voltage	250VAC
Thermal Current (I <sub>th</sub> )	Max. 5A per contact. See continuous current limit curve in installation manual.
Short Circuit Strength	Max fuse rating:10A gl (IEC/EN 60 9470-5-1); Line circuit breaker: B6A
Switching Capacity IEC/EN 60 947-5-1	AC 15: N.O. contacts: 3A/230V; N.C. contacts: 2A/230VAC DC 13: N.O. contacts: 4A/24V; N.C. contacts: 4A/24VDC; N.O. contact: 8A/24V >25x10 <sup>3</sup> ON: 0.4s, OFF: 9.6s
Switching Frequency	Max. 1,200 switching cycles/hr

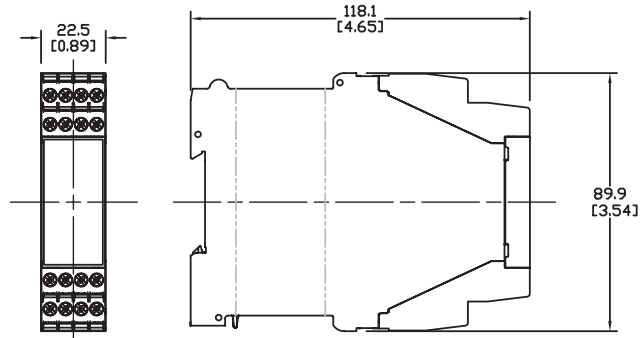
# Dold LG5929 Extension Module

## Wiring

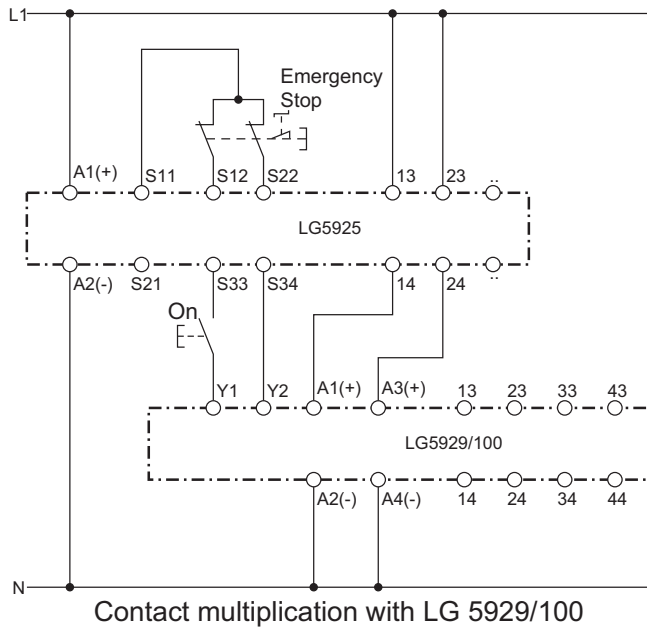
LG5929 Block Diagram



## Dimensions mm [in]



## Applications



*\*Note: When switching inductive loads, surge suppressors are recommended.*

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Dold UG6970 Series Safety Relay 2 with Independent Selectable Function



Designed to protect people and machines in applications with various safety devices.

- 2 independent, separately adjustable safety functions: (power off before selecting the desired function):
  - E-Stop
  - Safety gate
  - Two-hand control
  - Safety mat / Safety edge
  - Exclusive XOR contacts
  - Light curtain
- Only one device, two safety functions at the same time

- Acc. to EN 50156-1 for furnaces
- Line fault detection on Pushbutton:
- Manual restart or automatic restart
- With or without cross fault monitoring
- 2-channel
- Forcibly guided output contacts
- Output: 2 N.O. contacts per safety function
- 1 semiconductor output per safety function
- LED indicator for operation, safety function 1, 2 and failure
- Pluggable terminal blocks for easy exchange of devices
- Width: 22.5 mm

### Safety Data – Values per EN ISO 13849-1

Category	4
Performance level	PLe
MTTF <sub>d</sub>	134.5 years
DC <sub>avg</sub>	99%

### Safety Data – Values per IEC/EN 62061 / IEC/EN 61508

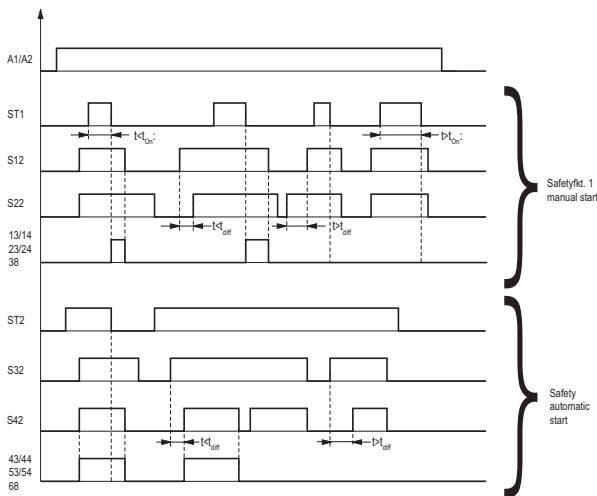
SIL CL	3
SIL	3
HFT (Hardware Failure Tolerance)	1
DC <sub>avg</sub>	99%
SFF	99.6%
PFHD	3.89E-10 h <sup>-1</sup>

According to:

- Performance Level (PL) e and category 4 to EN ISO 13849-1: 2008
- SIL Claimed Level (SIL CL) 3 to IEC/EN 62061
- Safety Integrity Level (SIL) 3 to IEC/EN 61508 and IEC/EN 61511

Safety Relays Selection Chart				
Part Number	Price	Marking Type	Voltage	Outputs
UG6970-04PS-61-24	\$240.00	Safety relay module	24VDC	4 N.O. positive guided safety contact(s); 2 N.O. monitoring contact(s)

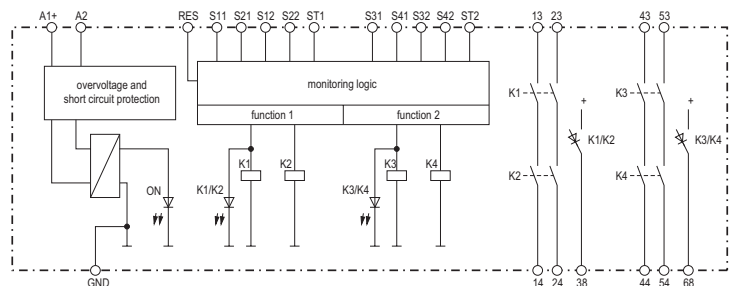
## Function Diagram



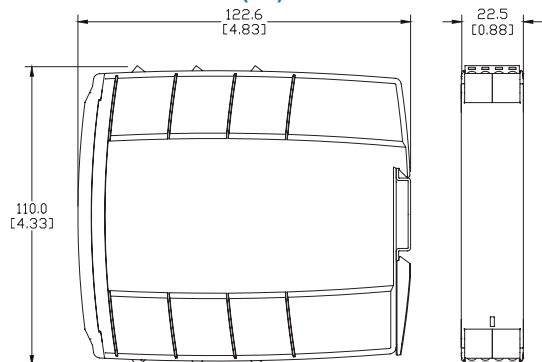
$t_{diff}$ : max. time delay for simultaneity demand dependent on selected safety function  
 E-Stop, safety gate, safety mat  $t_{diff}$ : max. 3s  
 Light curtains  $t_{diff}$ : max. 1s  
 Two-hand control  $t_{diff}$ : max. 0,5s  
 other times on request

$t_{on}$ : max. actuation time of start button  
 Standard  $t_{on}$ : max. 3s  
 other times on request

## Block Diagram



## Dimensions mm(in)



SEE OUR WEBSITE: [WWW.AUTOMATIONDIRECT.COM](http://WWW.AUTOMATIONDIRECT.COM) FOR COMPLETE ENGINEERING DRAWINGS.

# Dold UG6970 Series Safety Relay 2 with Independent Selectable Function

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZiPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

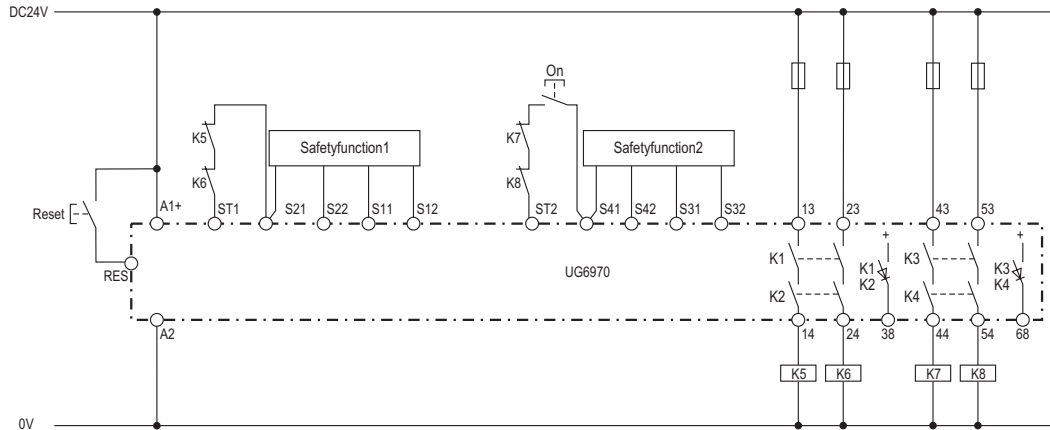
**Dold UG6970 Series Safety Relay 2 with Independent Selectable Function Specification Table**

<b>General Specifications</b>	
<b>Temperature</b>	Storage: -25°C to 85°C (-13°F to 185°F) Operating: -15°C to 55°C (5°F to 131°F)
<b>Altitude</b>	<2,000 meters
<b>Vibration Resistance</b>	Amplitude: 0.35mm, Frequency: 10 to 55 Hz (IEC/EN 60-068-2-6)
<b>Degree of Protection</b>	Per IEC/EN 60 529. Housing: IP40; Terminals IP20
<b>Housing</b>	UL 94V-0 Thermoplastic; DIN mount 35 mm x 7.5 mm
<b>Weight</b>	275g (9.7 oz.)
<b>Terminal Designation per EN 60 000 Wire Connections</b>	1x4 mm <sup>2</sup> solid or 1 x 2.5 mm <sup>2</sup> stranded ferruled (isolated) or 2 x 1.5 mm <sup>2</sup> stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm <sup>2</sup> solid DIN 46 228-1/-2/-3/-4
<b>Wire Fixing</b>	Terminal screws M3.5 box terminals with wire protection.
<b>Wire Connection</b>	60degC/75degC Copper conductors only; AWG20-12 Sol/Str Torque 0.5NM
<b>Input Specifications</b>	
<b>Nominal Voltage</b>	24VDC
<b>Voltage Range</b>	At 10% residual ripple: DC: 0.8 to 1.1 U <sub>N</sub>
<b>Maximum Consumption</b>	DC approx. 3.2W
<b>Nominal Frequency</b>	Not applicable
<b>Minimum Off-time</b>	250 ms
<b>Control Voltage on S11 At U<sub>N</sub></b>	20VDC
<b>Control Current Typ. Over S12, S22</b>	8 mA at U <sub>N</sub>
<b>Min. Voltage on S12, S22 (relay activated)</b>	10VDC
<b>Short Circuit Protection</b>	Internal with PTC (Positive Temperature Coefficient resistor)
<b>Overvoltage Protection</b>	Internal VDR (Voltage Dependent Resistor)
<b>Output Specifications</b>	
<b>Electrical Contact Life</b>	AC 15 at 5A, 230VAC: > 1.5x10 <sup>6</sup> switching cycles
<b>Mechanical Life</b>	> 10x10 <sup>6</sup> switching cycles
<b>Contact Type</b>	Independent N.O. positive-guided safety contacts (2 per safety function)
<b>Operate Delay</b>	Manual start: 30 ms; automatic start: 350 ms.
<b>Release Delay</b>	E-Stop (1) (6), Safety gate (2) (7), Exclusive or contacts (5): Start up at U : < 65 ms Release delay at U and disconnecting the supply: < 40 ms Release delay at U and disconnecting S12,S22: < 60 ms
	Two-hand control (3) Start up at U : < 110 ms Release delay at U and disconnecting the supply: < 40 ms Release delay at U and disconnecting S12,S22: < 60 ms simultaneity demand: max. 0,5 s
	Safety mat (4) Start up at U : < 85 ms Release delay at U and disconnecting the supply: < 40 ms Release delay at U and disconnecting S12,S22: < 60 ms
	Light curtains (8) Start up at U : < 35 ms Release delay at U and disconnecting the supply: < 40 ms Release delay at U and disconnecting S12,S22: < 25 ms
<b>Nominal Output Voltage</b>	AC: 24VDC. See continuous current limit curve in installation manual.
<b>Thermal Current (I<sub>th</sub>)</b>	Max. 8A. See quadratic total current limit curve in installation manual.
<b>Short Circuit Strength</b>	Max. fuse rating: 6A gL (IEC/EN 60 947-5-1); Line circuit breaker: B 6A
<b>Switching Capacity (IEC/EN 60 947-5-1)</b>	AC 15: N.O. contacts: 3A/230V DC 13: N.O. contacts: 2A/DC24V
<b>Switching Frequency</b>	Safety function 1: Max. 1800 switching cycles/hr Safety function 1: Max. 360 switching cycles/hr
<b>Agency Approvals and Standards</b>	CSA, cULus file E107778, CE, RoHS, TUV

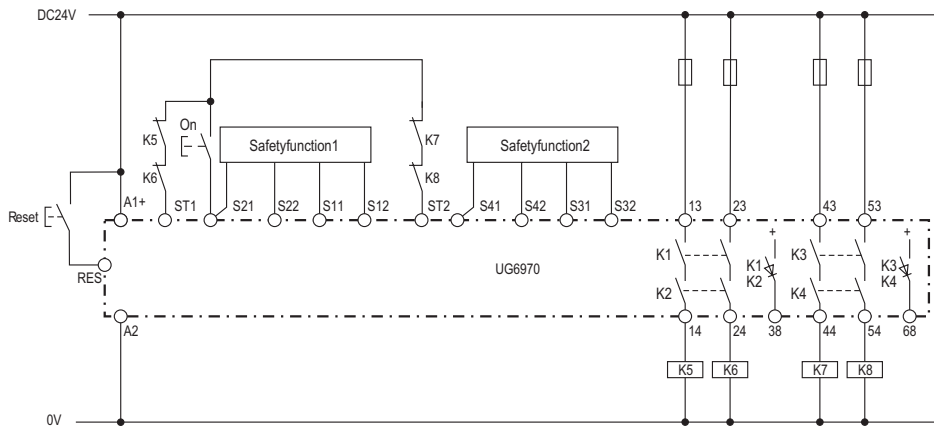
To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page at [www.automationdirect.com](http://www.automationdirect.com)

# Dold UG6970 Series Safety Relay 2 with Independent Selectable Function

## Application Examples



Operating mode: 3 Fkt1=AUTO ; Fkt2=MANUAL

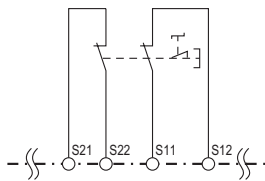


Operating mode: 5 (MANUAL with common button)

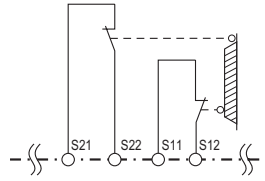
**Note:** See page SA-191 for Safety Function example drawings.

# Dold UG6970 Series Safety Relay 2 with Independent Selectable Function

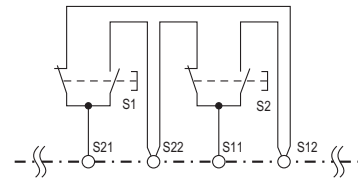
## Safety Functions



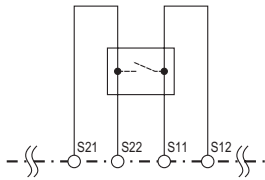
Fct.: E-stop (1),  
with cross fault detection  
SIL 3, PL e, Cat. 4



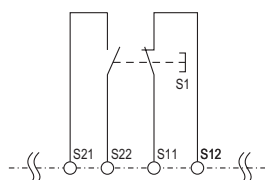
Fct.: Safety gate (2),  
with cross fault detection  
SIL 3, PL e, Cat. 4



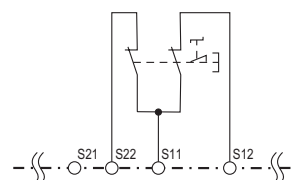
Fct.: Two-hand control (3),  
with cross fault detection  
SIL 3, PL e, Cat. 4  
Type III C to EN 574



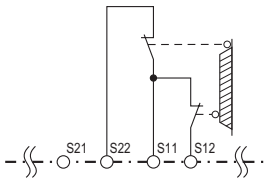
Fct.: Safety mat / Safety edge (4),  
with cross fault detection  
SIL 3, PL e, Cat. 4



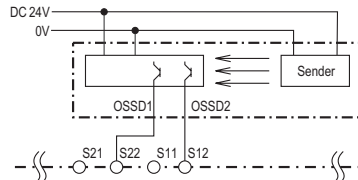
Fct.: Exclusive XOR contacts (5),  
with cross fault detection  
SIL 3, PL e, Cat. 4



Fct.: E-Stop (6),  
without cross fault detection  
SIL 3, PL e, Cat. 4<sup>1)</sup>

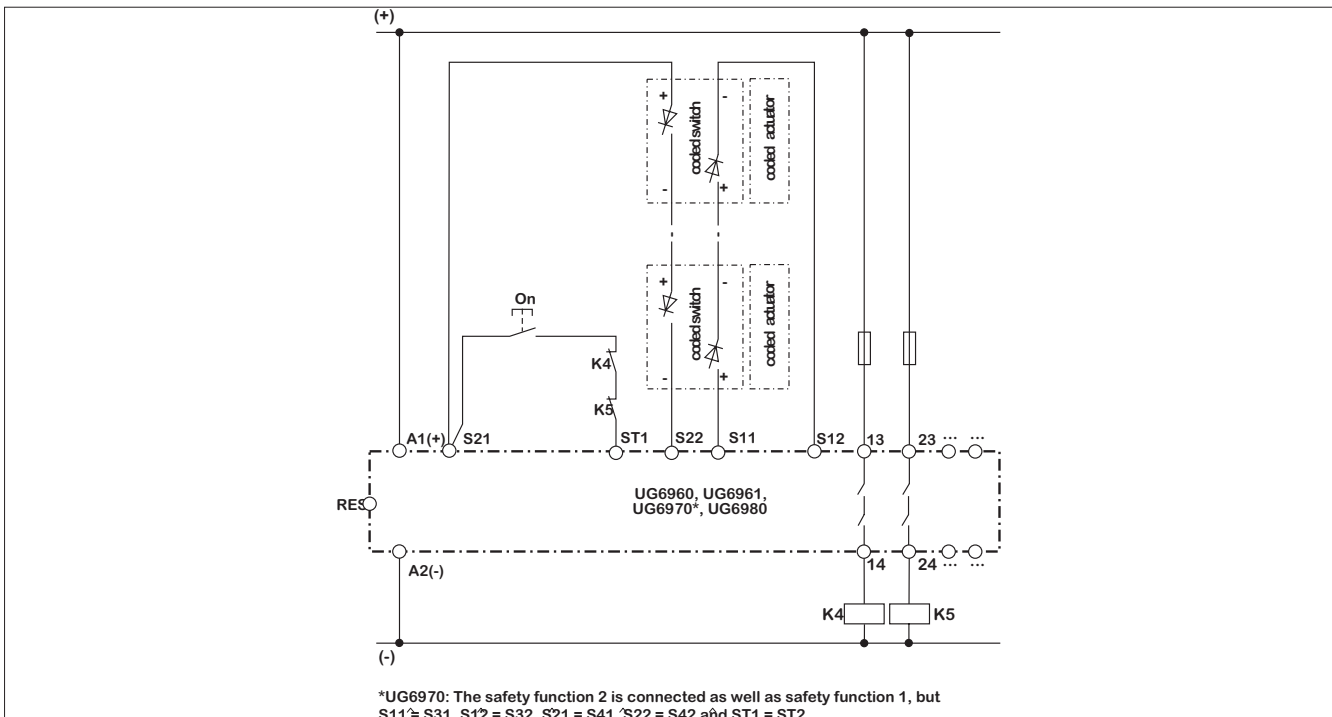


Fct.: Safety gate (7),  
without cross fault detection  
SIL 3, PL e, Cat. 4<sup>1)</sup>



Fct.: Light curtain (8),  
without cross fault detection  
SIL 3, PL e, Cat. 4<sup>2)</sup>

<sup>1)</sup>To achieve the stated safety classification the wiring has to be done with crossfault monitoring.  
<sup>2)</sup>To achieve the stated safety classification light curtains with selftest (type 4) according to IEC/EN 61496-1 have to be used.



\*UG6970: The safety function 2 is connected as well as safety function 1, but  
S11' = S31, S12' = S32, S21 = S41, S22 = S42 and ST1 = ST2

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

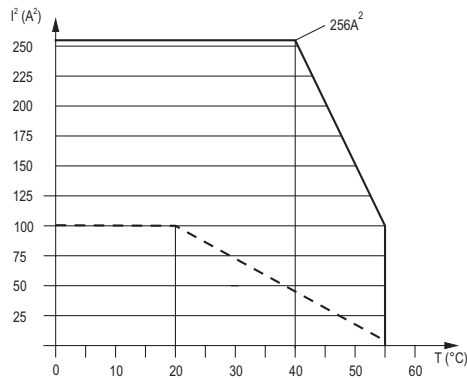
Terms and Conditions

# Dold UG6970 Series Safety Relay 2 with Independent Selectable Function

## Connection Terminals

Terminal designation	Signal designation
A1 +	DC 24 V
A2	0 V
13, 14, 23, 24, 43, 44, 53, 54	Forcibly guided NO contacts for release circuit
38, 68	Semiconductor monitoring output
GND	Reference potential for Semiconductor monitoring output
S11, S21, S31, S41	control output
S12, S22, S32, S42, ST1, ST2, RES	control input

## Characteristic Curves



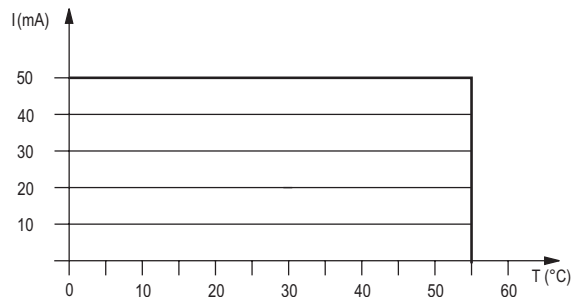
— device free-standing  
max. current at 55°C over  
4 contact path =  $5A \hat{=} 4 \times 5^2 A^2 = 100A^2$

- - - device mounted without distance heated by  
devices with same load,  
max. current at 55°C over  
4 contact path =  $1A \hat{=} 4 \times 1^2 A^2 = 4A^2$

$$\Sigma I^2 = I_1^2 + I_2^2 + I_3^2 + I_4^2$$

$I_1, I_2, I_3$  - current in contact paths

Quadratic total current limit curve output contacts



$$\Sigma I = I_{38} + I_{68}$$

z.B. :  $\Sigma I = 35mA + 15mA = 50mA$

$I_{38}$  - current semiconductor output 38

$I_{68}$  - current semiconductor output 68

Quadratic total current limit curve semiconductor monitoring outputs

## Function Setting

Fkt. 1/Fkt. 2	Safety Function	
1	E-Stop	cross fault detection
2	Safety Gate	
3	Two-hand Control	
4	Safety mat / safety edge	
5	Exclusive XOR contacts	
6	E-stop	without cross fault deflection
7	Safety gate	
8	Light curtain	



# Dold UG6980 Series Safety Relay with Selectable Function



Designed to protect people and machines in applications with various safety devices.

- Adjustable safety functions (power off before selecting the desired function):
  - E-Stop
  - Safety gate
  - Two-hand control
  - Safety mat / Safety edge
  - Exclusive XOR contacts
  - Light curtain

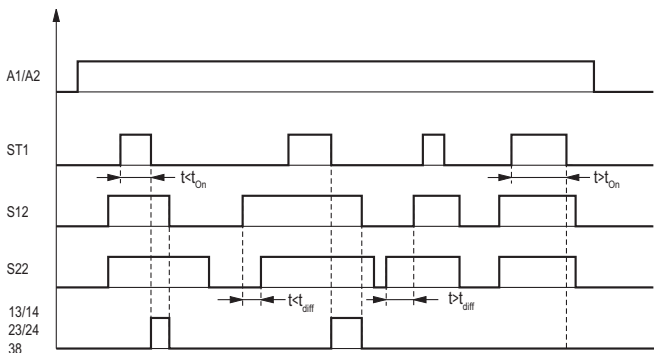
• According to:

- Performance Level (PL) e and category 4 to EN ISO 13849-1: 2008
- SIL Claimed Level (SIL CL) 3 to IEC/EN 62061
- Safety Integrity Level (SIL) 3 to IEC/EN 61508 and IEC/EN 61511
- Acc. to EN 50156-1 for furnaces
- Line fault detection on pushbutton:
- Manual restart or automatic restart
- With or without cross fault monitoring
- 2-channel
- Forcibly guided output contacts
- Output: 2 N.O. contacts per safety function
- 1 semiconductor output per safety function
- LED indicator for operation, safety function 1, 2 and failure
- Pluggable terminal blocks for easy exchange of devices

Safety Data – Values per EN ISO 13849-1	
Category	4
Performance level	PLe
MTTF <sub>d</sub>	>100 years
DC <sub>avg</sub>	99%
Safety Data – Values per IEC/EN 62061 / IEC/EN 61508	
SIL CL	3
SIL	3
HFT (Hardware Failure Tolerance)	1
DC <sub>avg</sub>	99%
SFF	99.7%
PFFH <sub>D</sub>	1.88E-10 h <sup>-1</sup>

Safety Relays Selection Chart				
Part Number	Price	Marking Type	Voltage	Outputs
UG6980-02PS-61-24	\$155.00	Safety relay module	24 VDC	2 N.O. positive guided safety contact(s), 1 N.O. monitoring contact(s)

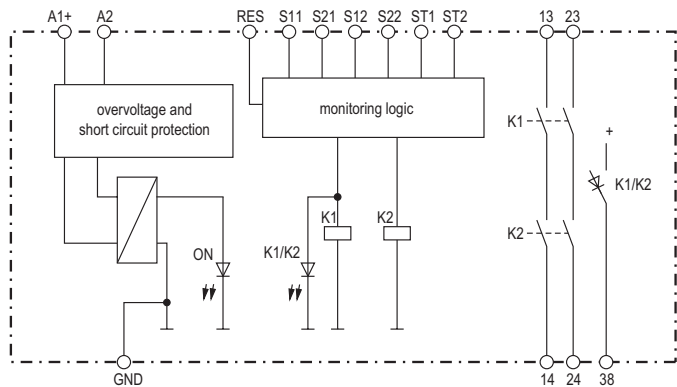
## Function Diagram



$t_{diff}$ : max. time delay for simultaneity demand dependent on selected safety function  
 E-Stop, safety gate, safety mat  $t_{diff}$ : max. 3s  
 Light curtains  $t_{diff}$ : max. 1s  
 Two-hand control  $t_{diff}$ : max. 0.5s  
 other times on request

$t_{on}$ : max. actuation time of start button  
 Standard  $t_{on}$ : max. 3s  
 other times on request

## Block Diagram



Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Dold UG6980 Series Safety Relay with Selectable Function

**Dold UG6980 Series Safety Relay with Selectable Function Specification Table**

General Specifications	
Temperature	Storage: -25°C to 85°C (-13°F to 185°F) Operating: -15°C to 55°C (5°F to 131°F)
Altitude	<2,000 meters
Vibration Resistance	Amplitude: 0.35mm, Frequency: 10 to 55 Hz (IEC/EN 60-068-2-6)
Degree of Protection	Per IEC/EN 60 529. Housing: IP40; Terminals IP20
Housing	UL 94V-0 Thermoplastic; DIN mount 35 mm x 7.5 mm
Weight	210 g (7.40 oz.)
Terminal Designation per EN 50 005	1x4 mm <sup>2</sup> solid or 1 x 2.5 mm <sup>2</sup> stranded ferruled (isolated) or 2 x 1.5 mm <sup>2</sup> stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4
Wire Connections	or 2 x 2.5 mm <sup>2</sup> solid DIN 46 228-1/-2/-3/-4
Wire Fixing	Terminal screws M3.5 box terminals with wire protection.
Wire Connection	60degC/75degC Copper conductors only; AWG20-12 Sol/Str Torque 0.5NM
Input Specifications	
Nominal Voltage	24VDC
Voltage Range	At 10% residual ripple: 0.8 to 1.1 U <sub>N</sub>
Maximum Consumption	DC approx. 1.9W
Nominal Frequency	Not applicable
Minimum Off-time	250 ms
Control Voltage on S11, S21, S31, S41 At U <sub>N</sub>	20VDC pulsed, 10 ms ON, 10 ms OFF
Control Current Over S12, S22, S32, S42	Typ. 8 mA at U <sub>N</sub> ; Safety mats: Typ. 15 mA at U <sub>N</sub>
Min. Voltage on S12, S22, S32, S42 (relay activated)	10VDC
Short Circuit Protection	Internal with PTC (Positive Temperature Coefficient resistor)
Overvoltage Protection	Internal VDR (Voltage Dependent Resistor)
Output Specifications	
Electrical Contact Life	AC 15 at 5A, 230VAC: > 2.2x10 <sup>6</sup> switching cycles
Mechanical Life	> 20x10 <sup>6</sup> switching cycles
Contact Type	2 positive guided N.O. safety contacts
Operate Delay	Manual start: 30 ms; automatic start: 350 ms.
Release Delay	Disconnecting the supply: AC units:150 ms; DC units: 50 ms Disconnecting S12, S22: AC units: 130 ms. DC units: 50 ms
Nominal Output Voltage	AC: 250V; DC: See continuous current limit curve in installation manual.
Thermal Current (I <sub>th</sub> )	Max. 8A. See quadratic total current limit curve in installation manual.
Short Circuit Strength	Max. fuse rating: 6A gL (IEC/EN 60 947-5-1); Line circuit breaker: B 6A
Switching Capacity (IEC/EN 60 947-5-1)	AC 15: N.O. contacts: 3A/230V; N.C. contacts: 2A/230V DC 13: N.O. contacts: 4A/DC24V. 0.5A/110V; N.C. contacts: 4A/24V; DC 13: N.O. contacts: 8A/24V >25x10 <sup>3</sup> . ON: 0.4 s, OFF: 9.6 s
Switching Frequency	Max. 1200 switching cycles/hr
Agency Approvals and Standards	CSA, cULus file E107778, CE, RoHS, TUV

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page at [www.automationdirect.com](http://www.automationdirect.com)

## Settings

### Setting

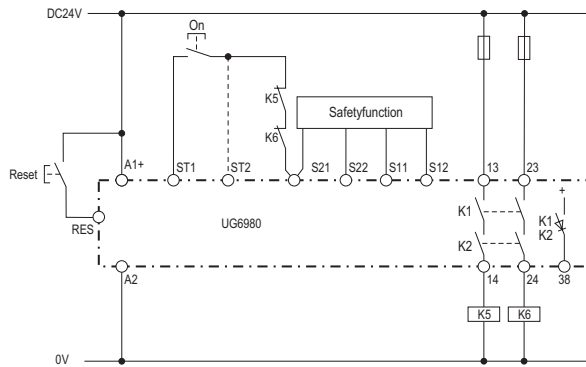
On the variant /0\_ \_ the safety function can be set via rotary switch.

Possible functions:

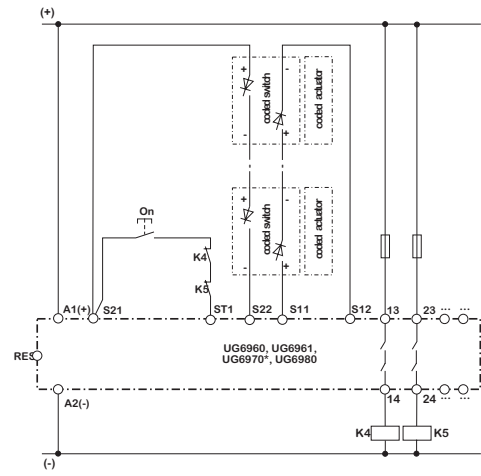
Fct.	Safety function	
1	E-Stop	cross fault detection
2	Safety gate	
3	Two-hand control	
4	Safety mat / Safety edge	
5	Exclusive or contacts	without cross fault detection
6	E-Stop	
7	Safety gate	
8	Light curtain	

# Dold UG6980 Series Safety Relay with Selectable Function

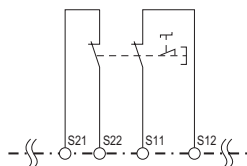
## Applications



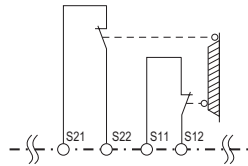
Safety function: see below, Manual-Start (for automatic start make a bridge to ST2 instead of ON button).



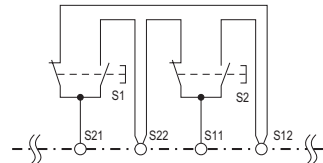
\*UG6970: The safety function 2 is connected as well as safety function 1, but S11 = S31, S12 = S32, S21 = S41, S22 = S42 and ST1 = ST2



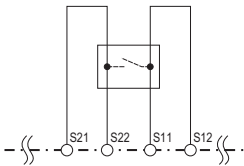
Fct.: E-stop (1), with cross fault detection SIL 3, PL e, Cat. 4



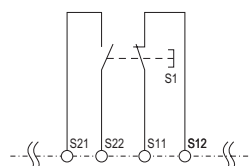
Fct.: Safety gate (2), with cross fault detection SIL 3, PL e, Cat. 4



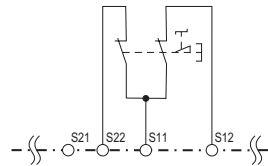
Fct.: Two-hand control (3), with cross fault detection SIL 3, PL e, Cat. 4 Type III C to EN 574



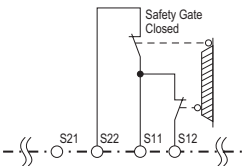
Fct.: Safety mat / Safety edge (4), with cross fault detection SIL 3, PL e, Cat. 4



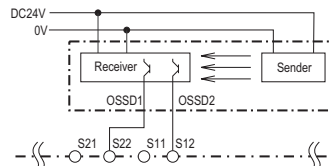
Fct.: Exclusive XOR contacts (5), with cross fault detection SIL 3, PL e, Cat. 4



Fct.: E-Stop (6), without cross fault detection SIL 3, PL e, Cat. 4<sup>1)</sup>



Fct.: Safety gate (7), without cross fault detection SIL 3, PL e, Cat. 4<sup>1)</sup>



Fct.: Light curtain (8), without cross fault detection SIL 3, PL e, Cat. 4<sup>2)</sup>

<sup>1)</sup> To achieve the stated safety classification the wiring has to be done with crossfault monitoring.  
<sup>2)</sup> To achieve the stated safety classification light curtains with selftest (type 4) according to IEC/EN 61496-1 have to be used.

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

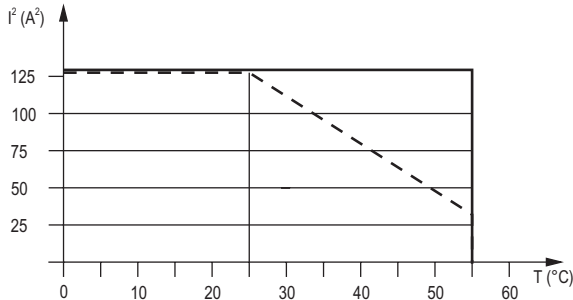
Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

# Dold UG6980 Series Safety Relay with Selectable Function

## Characteristic Curves



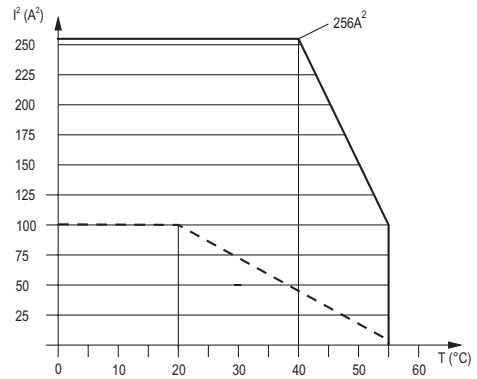
— device free-standing  
max. current at 55°C over  
2 contact path =  $8A \triangleq 2 \times 8^2 A^2 = 128A^2$

- - - device mounted without distance heated by  
devices with same load,  
max. current at 55°C over  
2 contact path =  $4A \triangleq 2 \times 4^2 A^2 = 32A^2$

$$\sum I^2 = I_1^2 + I_2^2$$

$I_1, I_2$  - current in contact paths

UG 6980.02  
Quadratic total current limit curve



— device free-standing  
max. current at 55°C over  
4 contact path =  $5A \triangleq 4 \times 5^2 A^2 = 100A^2$

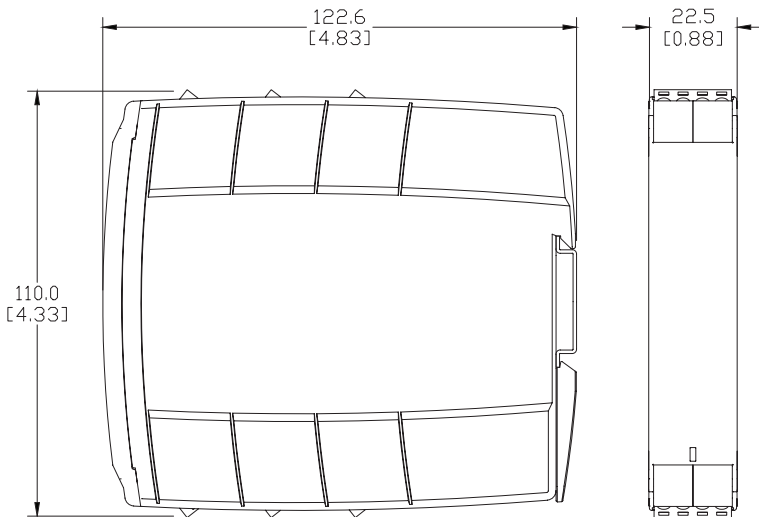
- - - device mounted without distance heated by  
devices with same load,  
max. current at 55°C over  
4 contact path =  $1A \triangleq 4 \times 1^2 A^2 = 4A^2$

$$\sum I^2 = I_1^2 + I_2^2 + I_3^2 + I_4^2$$

$I_1, I_2, I_3, I_4$  - current in contact paths

Quadratic total current limit curve output contacts

## Dimensions mm(in)



## Connection Terminals

Terminal designation	Signal designation
A1 +	DC 24 V
A2	0 V
13, 14, 23, 24, 43, 44, 53, 54	Forcibly guided NO contacts for release circuit
38	Semiconductor monitoring output
GND	Reference potential for Semiconductor monitoring output
S11, S21	control output
S12, S22, ST1, ST2, RES	control input

SEE OUR WEBSITE: [WWW.AUTOMATIONDIRECT.COM](http://WWW.AUTOMATIONDIRECT.COM) FOR COMPLETE ENGINEERING DRAWINGS.