# **IDEM Z-Range Safety Switches**

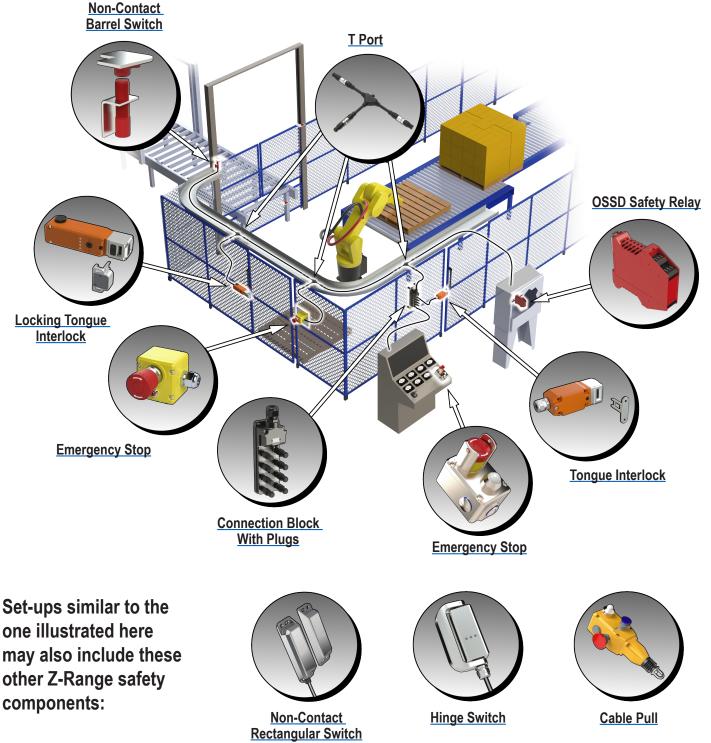


IDEM's Z-Range of products have one set of dual OSSD outputs and one set of dual OSSD inputs. This enables the devices to be wired in series, reducing cost and time associated with wiring back to the panel. Up to 30 Z-Range devices can be connected to one safety relay.

These safety switches feature self monitoring OSSD outputs to achieve CAT 4 PLe, according to ISO 13849-1, and SIL3, according to IEC 62061, even when connected in a series.

Components in the Z-Range consists of non contact switches, hinge switches, emergency stop control stations, solenoid locking RFID tongue interlocks, and non-locking tongue interlocks, along with t-port cables, connection blocks and accessories.

### Z-Range Safety Switch Installation Example



www.automationdirect.com

Safety Electrical Components tesc-226

### 1-800-633-0405

## IDEM Z-Range (HS-SS/HSM) Hinge Safety Switches



HS-SS-Z-LH-352006 (Left Hand)

### Description

HS-SS-Z and HSM-Z hinge switches are designed to be fitted to the hinged axis of machine guard doors and provide a robust hinge function in addition to interlock position sensing. Enclosures are protected to IP67/ IP69K with a low profile, hygienic design for washdown.

When used in combination with an OSSD safety relay or control device, the hinge safety switches can be used to provide protection up to Category 4 and PLe to ISO13849-1, and they can maintain Ple level protection with other IDEM Z-Range switches connected in series due to internal test functions of the switches.

In addition, each switch provides input, output and guard state LEDs. It is recommended to limit the number of switches connected in series to a maximum of 30.



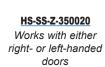
#### **Features**

- Designed to provide a safety interlock on a hinge door
- Suitable for use in extreme temperature or moisture environments
- Adjustable guard open detection of 0 to 10 degrees
- Provides a high level of anti-tamper protection
- Suitable for use in high-hygiene requirement areas (e.g. food industry hosedown) IP67 / IP69K
- Long mechanical life (no moving or touching parts)
- Designed to conform to EN60947-5-3
- For use as directed by ISO14119 and EN ISO12100

IDEM Z-F	IDEM Z-Range (HS-SS/HSM Series) Hinge Safety Switches Selection Guide						
Part Number	Price	Body Material	Coding	Connection	Cable Length (Dim A)	Outputs	Drawing
HS-SS-Z-RH-352001	\$307.00			Pigtail	5m [16.4 ft]		PDF
HS-SS-Z-RH-352002	\$314.00		Right hand	Pigtail	10m [32.8 ft]		PDF
HS-SS-Z-RH-352003	\$330.00	316		8-pin M12 quick-disconnect	250mm [9.8 in]		PDF
HS-SS-Z-LH-352004	\$307.00	stainless steel		Pigtail	5m [16.4 ft]		PDF
<u>HS-SS-Z-LH-352005</u>	\$314.00		Left hand	Left hand Pigtail	10m [32.8 ft]	2 OSSD	PDF
HS-SS-Z-LH-352006	\$330.00			8-pin M12 quick-disconnect	250mm [9.8 in]		PDF
<u>HSM-Z-RH-353001</u>	\$239.00			Pigtail	5m [16.4 ft]	and 1 Status	PDF
HSM-Z-RH-353002	\$246.00	F	Right hand	Pigtail	10m [32.8 ft]		PDF
HSM-Z-RH-353003	\$262.00	Die-cast		8-pin M12 quick-disconnect	250mm [9.8 in]		PDF
HSM-Z-LH-353004	\$239.00	aluminum alloy		Pigtail	5m [16.4 ft]		PDF
<u>HSM-Z-LH-353005</u>	\$246.00		Left hand	Pigtail	10m [32.8 ft]		PDF
HSM-Z-LH-353006	\$262.00			8-pin M12 quick-disconnect	250mm [9.8 in]		PDF

#### **Blank Hinge**

IDEM Z-Range (HS-SS/HSM Series) Blank Hinge Selection Guide						
Part Number	Price Body Material Handing Drawing					
<u>HS-SS-Z-350020</u>	\$136.00	316 stainless steel	None	PDF		
<u>HSM-Z-351020</u>	\$69.00	Die-cast aluminum alloy	None	PDF		



HSM-Z-350025

### **Mounting Plate**

IDEM Z-Range (HS-SS/HSM Series) Mounting Plate Selection Guide					
Part Number	Price	Description	Handing	Drawing	
<u>HSM-Z-350025</u>	\$31.50	Door hinge switches ounting bracket	None	PDF	

#### 1-800-633-0405

For the latest prices, please check AutomationDirect.com.

## IDEM Z-Range Hinge Safety Switches



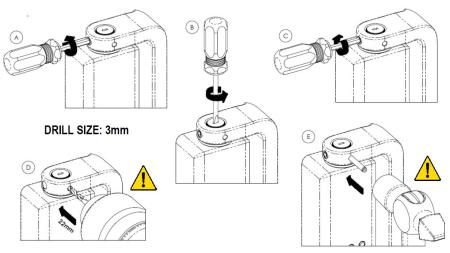
IDEM Z-Range Hinge Safety Switches General Specifications					
	HSM-Z / HS-SS-Z				
Safety Classification and Reliability Data					
Switching Reliability (B10d)	N/A - no mechanical parts are implemented				
ISO 13849-1	Up to Category 4 with Safety Relay Up to PLe depending upon system architecture				
EN 62061	Up to SIL3 depending upon system architecture				
Safety Data - Annual Usage	8 cycles per hour / 24 hours per day / 365 days				
MTTFd	771 years				
Max Response Time (Actuator Removed) 60ms					
Max Response Time (Input Off)	20ms				
Agency Approvals	cULus E258676, CE				
	Electrical and General Specifications				
Rated Operating Voltage	20.4 VDC to 26.4 VDC				
Power Consumption	0.7 W				
Output Current	Max = 0.2 A Min = 1mA				
Switching Angle Window	Fixed at 10 degrees				
Fixed Switching Angle	Typical is 0 to 10 degrees. Alternate installations could be (for example) 90 to 100 degrees, or 355 to 5 degrees, or any other 10-degree range. See illustration below and refer to operating instructions for additional information.				
Enclosure Protection	IP67				
Operating Temperature	-25°C to +80°C [-13°F to +176°F] For UL applications: -25 to 45°C [-13 to 113°F]				
Recommended Mounting Screws/Torque	7 x M5 screws; 1N•m [0.74 lb•ft]				

#### **LED Operation**

Guard				
Guard Closed	Green			
Guard Open	Red			
Inj	out			
Safety Inputs On	Green (steady)			
Safety Input Missing	Green (flashing)			
Safety Inputs Off Off				
Internal Fault Red (steady)				

Output					
Safety Outputs On	Green (steady)				
Safety Outputs Off	Off				
External Fault	Red (flashing)				

### **Final Setting After Installation**



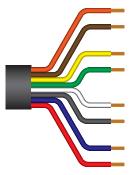
Installer MUST drill and pin switch in final switching position. Installer must not rely only on adjustment grub screw for safety. See operating instructions for additional information on switching angle window adjustment.

## IDEM Z-Range Safety Switches Electrical Connections



#### Wiring

#### IDEM Quick Disconnect Leads Color Coding



Orange – Guard open signal out Brown – Not used

Yellow – Safety input 2 (see note) Green – Safety output 2 (OSSD)

White – Safety output 1 (OSSD) Black – Safety input 1 (see note)

Blue – 0VDC Red – +24VDC **Connection Colors** 



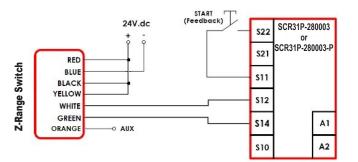
Pin View from Switch M12 Male

#### Coded Magnetic Switches Electrical Connections

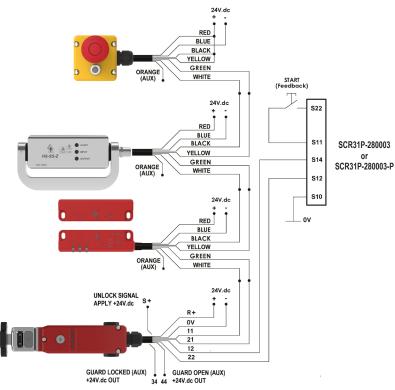
Quick Disconnect Connector Pin Out	IDEM Quick Disconnect Leads Color Coding	Terminal	Switch Circuit
2	Red	R+	Supply +24 VDC
3	3 Blue		Supply 0VDC
7	7 Black		Safety Input 1
1	White	12	Safety Output 1
4	Yellow	21	Safety Input 2
6	Green	22	Safety Output 2
8	Orange	44	Guard open signal +24VDC out
N/A	_	34	Guard unlocked signal +24VDC out
5	Brown	Not used	Not used

NOTE: Safety outputs 1 and 2 are OSSD signals Safety inputs 1 and 2 are 24VDC if not in series or OSSD inputs if in series

#### Single Switch to SCR31P-280003 or SCR31P-280003-P



#### Mulitple Switches to SCR31P-280003 or SCR31P-280003-P



## **IDEM Cables**

### **Connection Cables**

IDEM connection cables are sold as a complete cable that is not meant to be cut into, so the manufacturer doesn't guarantee the internal wire colors will always be the same. It will always be pin 1 to pin 1, pin 2 to pin 2, etc., but the internal colors might change.

Only the pigtail cables have fixed wire colors.

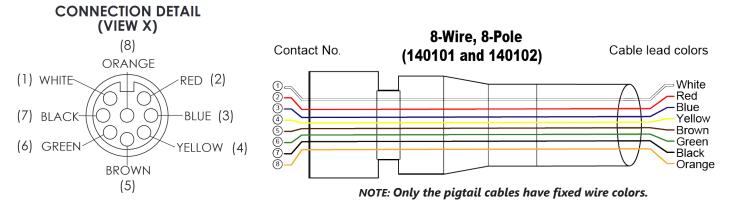


140201

IDEM Connection Cables Selection Chart						
Part Number Price Description Connection Length Cab						
<u>140201</u>	\$41.00	Connection cable	8-pin M12 axial female to 8-pin M12 axial male	2m [6.56 ft]	Black PVC	
<u>140202</u>	\$51.00	Connection cable	8-pin M12 axial female to 8-pin M12 axial male	5m [16.40 ft]	Black PVC	
<u>140203</u>	\$62.00	Connection cable	8-pin M12 axial female to 8-pin M12 axial male	10m [32.81 ft]	Black PVC	

Female Quick Disconnect Lead				
Part Number	Price	Description	Exit Type/Cable Length	
<u>140101</u>	\$59.00	8-pin M12 female	Pigtail, 5m [16.4 ft]	
<u>140102</u>	\$88.00	quick disconnect	Pigtail, 10m [32.8 ft]	





IDEM Connection Cables General Specifications					
Temperature Rating	105°C [221°F]				
Core	22 strands of 0.12 mm bare copper				
Inner insulation (Core) Diameter 1.35 (±0.1) mm					
Outer Sheath (Jacket) Color Black (printed)					
Outer Insulation	PVC				
Inner Insulation	PVC				
Number of cores	8 cores (24AWG) UL style 2517				
Rated Voltage/Current	250V / 3A				

## IDEM M12 Connection Box For Use With Z-Range Switches





- When combined with the T-port, allows you to connect up to 30 Z-Range devices in series to a single safety controller
- Configured for dual channel to a safety controller
- Shorting plugs must be inserted into all unused ports
- M20 conduit exit; M20 cable gland accepts cable OD 6.5-12.0 mm [0.26-0.47 in]

	IDEM M12 Connection Box For Use With Z-Range Switches Selection Chart							
Part Number	Price	Description	Ports	Input Connections	Output Connection	Indicators	Drawing	
<u>140210-Z</u>	\$262.00	IDEM junction block for use with IDEM Z-Range switches only	8	8-pin M12 sockets	Cable clamp for field-wired connection	24VDC LED	<u>PDF</u>	
<u>140205</u>	\$22.00	Shorting plug, 8 pole, for use with IDEM Z-Range connection blocks	-	_	-	-	<u>PDF</u>	
<u>140204</u>	\$41.00	T-port for use with Z-Range safety switches	-	2 8-pole M12 axial male	1 8-pole M12 axial female	-	<u>PDF</u>	

NOTE: The appropriate shorting plug must be inserted into all unused ports.



<u>140210-Z</u>



140204



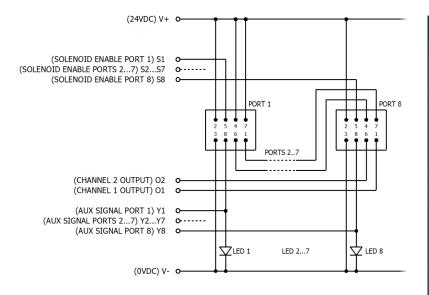
<u>140205</u>

## IDEM Connection Box For Use With Z-Range Switches



IDE	IDEM M12 Connection Box For Use With Z-Range Switches Specifications					
Port Connection Type	8-pin M12 female sockets (qty 8)					
<b>Operating Temperature</b>	-20 to +40°C [-4 to +104°F]					
Supply Voltage	24VDC ±10%					
Maximum Current	500mA (each port) if solenoid feed is used					
Body Material	Polyester					
Internal Terminals	Spring-type clamp for 22-30 AWG conductors					
Cable Exit	M20 x 1.5 mm cable gland (M20 cable gland accepts cable OD 6.5 mm to 12.0 mm [0.26 in to 0.47 in]					
Mounting	2xM4 bolds, 4.6 mm [0.18 in] diameter clearance holes					
Accessory	Shorting plug for unused ports					
LEDs (1-8)	Red, auxiliary indication of switch open					

### Connections (140210-Z) for Z-Range Switches Only



Output Terminal Connections			
Terminal	Output	Indication	LED Status
Y1	Auxiliary out +24VDC	Switch 1 open	LED 1 on
Y2	Auxiliary out +24VDC	Switch 2 open	LED 2 on
Y3	Auxiliary out +24VDC	Switch 3 open	LED 3 on
Y4	Auxiliary out +24VDC	Switch 4 open	LED 4 on
Y5	Auxiliary out +24VDC	Switch 5 open	LED 5 on
Y6	Auxiliary out +24VDC	Switch 6 open	LED 6 on
Y7	Auxiliary out +24VDC	Switch 7 open	LED 7 on
Y8	Auxiliary out +24VDC	Switch 8 open	LED 8 on
V+	Supply +24VDC		
V-	Supply 0VDC		
S1	Solenoid energize (apply +24VDC (if used)		Port 1
S2	Solenoid energize (apply +24VDC (if used)		Port 2
S3	Solenoid energize (apply +24VDC (if used)		Port 3
S4	Solenoid energize (apply +24VDC (if used) Port 4		Port 4
S5	Solenoid energize (apply +24VDC (if used) Port 5		
S6	Solenoid energize (apply +24VDC (if used) Port 6		
S7	Solenoid energize (apply +24VDC (if used) Port 7		
S8	Solenoid energize (apply +24VDC (if used) Port 8		
01	Safety output channel 1		
O2	Safety output channel 2		

### **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.