IDEM Z-Range Safety Switches

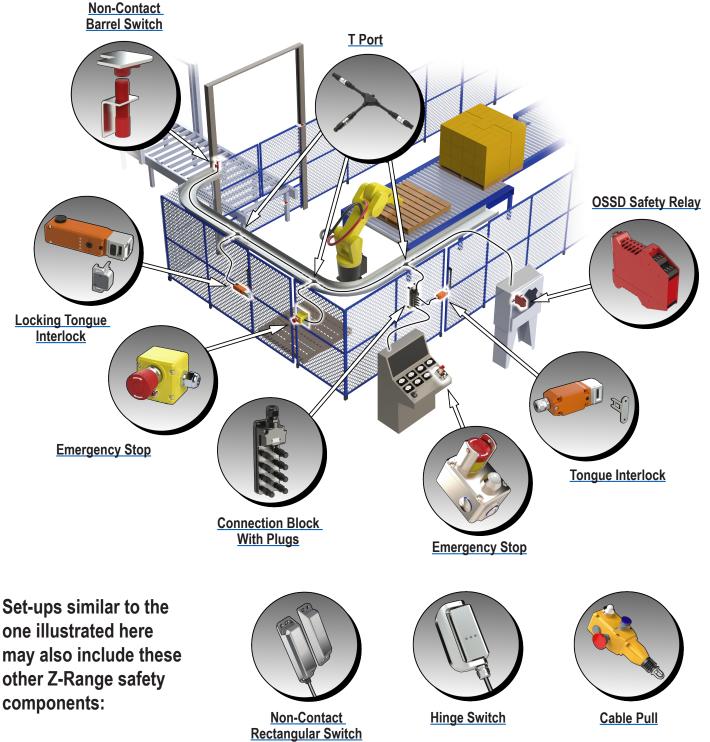


IDEM's Z-Range of products have one set of dual OSSD outputs and one set of dual OSSD inputs. This enables the devices to be wired in series, reducing cost and time associated with wiring back to the panel. Up to 30 Z-Range devices can be connected to one safety relay.

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



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Safety Electrical Components tESC-218

IDEM Z-Range (KM-Z / KM-SS-Z) Interlock Safety Switches



KM-203300-Z



KM-SS-204300-Z

Description

KM-Z and KM-SS-Z tongue interlock switches are designed to fit to the leading edge of sliding, hinged or lift-off machine guards to provide positively operated switching circuits and a tamper-resistant actuator mechanism. They provide robust position interlock detection for moving guards.

When used in combination with an OSSD safety relay or control device, the tongue interlock safety switches can provide protection up to Category 4 and PLe to ISO13849-1, and they can maintain PLe level performance 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.

Application

The switch is rigidly mounted to the frame of the guard or machine. The actuator (sold separately) is fitted to the moving part (frame) of the guard and is aligned to the switch entry aperture. The actuator profile is designed to match a cam mechanism within the switch head and provides a positively operated and not easily defeatable interlock switch. When the actuator is inserted into the switch, the safety circuits close and allow the machine start circuit to be enabled. When the actuator is withdrawn, the safety circuits are positively opened and the machine circuit is broken.



Features

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

IDEM Z-Range (KM-Z /KM-SS-Z) Interlock Safety Switches Selection Guide								
Part Number Price Body Material Head Material Actuator Travel/Force for Positive Opening Circuit Configuration Drawing								
<u>KM-203300-Z</u>	\$234.00	Die-cast aluminum	Die-cast aluminum	6mm/12N	2 OCCD and 1 Status	<u>PDF</u>		
<u>KM-SS-204300-Z</u>	\$311.00	316 stainless steel	316 stainless steel	011111/1210	6mm/12N 2 OSSD and 1 Status			

Safety Classification and Reliability Data					
Mechanical Reliability B10d 1.5 x 106 operations at 100mA load					
ISO 13849-1	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 day					
PFHd	8.8x10 ⁻⁵				
Proof Test Interval (Life)	20 years				
MTTFd	771 years				

IDEM Z-Range Safety Switches



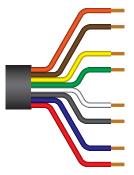
IDEM Z-Range General Specifications						
	GLx-Z (Cable Pull) KM-Z / KM-SS-Z (Interlock Switch) ES-P-Z/ESL-SS-Z (E-Stop Statio					
Enclosure / Cover	Polyester or stainless steel 316					
IP Rating / NEMA		IP67 plastic / IP69K stainless steel / NEMA 6				
Mounting		4 x M4				
Torque Settings		Mounting: M4 4.0 N·m Lid: T20 Torx M4 1.5 N·m				
Ambient Temperature	-25 to 50°C [-13 to 122°F]					
Weight	Plastic: 250g [0.55 lb] Stainless steel: 1000g [2.20 lb]					
Rated Operating Voltage	20.4 VDC to 26.4 VDC					
Withstand Voltage (U _{imp})		250V				
Power Consumption		0.7 W				
Output Voltage / Min and Max Current	24VDC /1mA to 0.2 A					
Input Voltage / Current	24VDC / 2mA					
Response Time (Device Activated)	60ms max					
Response Time (Inputs Off)		20ms max				

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**



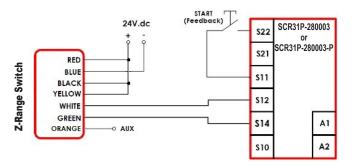
Pin View from Switch M12 Male

Coded Magnetic Switches Electrical Connections

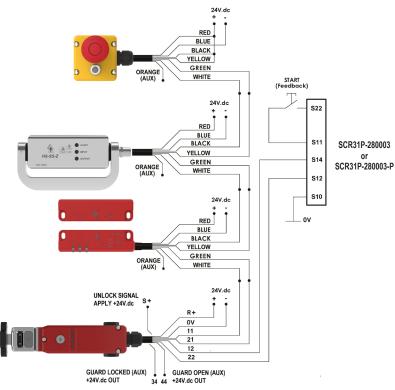
Quick Disconnect Connector Pin Out	IDEM Quick Disconnect Leads Color Coding	Terminal	Switch Circuit
2	Red	R+	Supply +24 VDC
3	Blue	0V	Supply 0VDC
7	Black	11	Safety Input 1
1	White	12	Safety Output 1
4	Yellow	21	Safety Input 2
6	Green	22	Safety Output 2
8	Orange	44	Guard open signal +24VDC out
N/A	_	34	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.

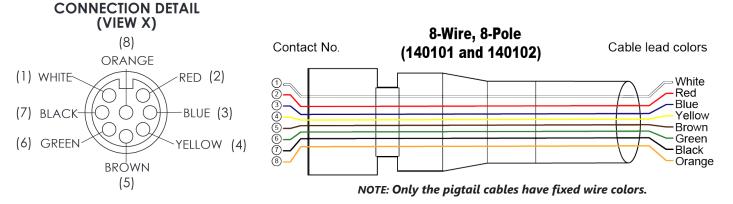


140201

IDEM Connection Cables Selection Chart							
Part Number	Price	Description	Connection	Length	Cable Jacket		
<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.



140204



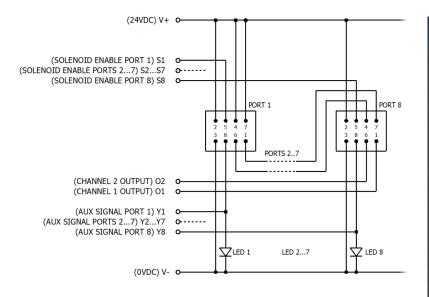
140205

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)				
Operating Temperature	-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					
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	Saf	ety 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.