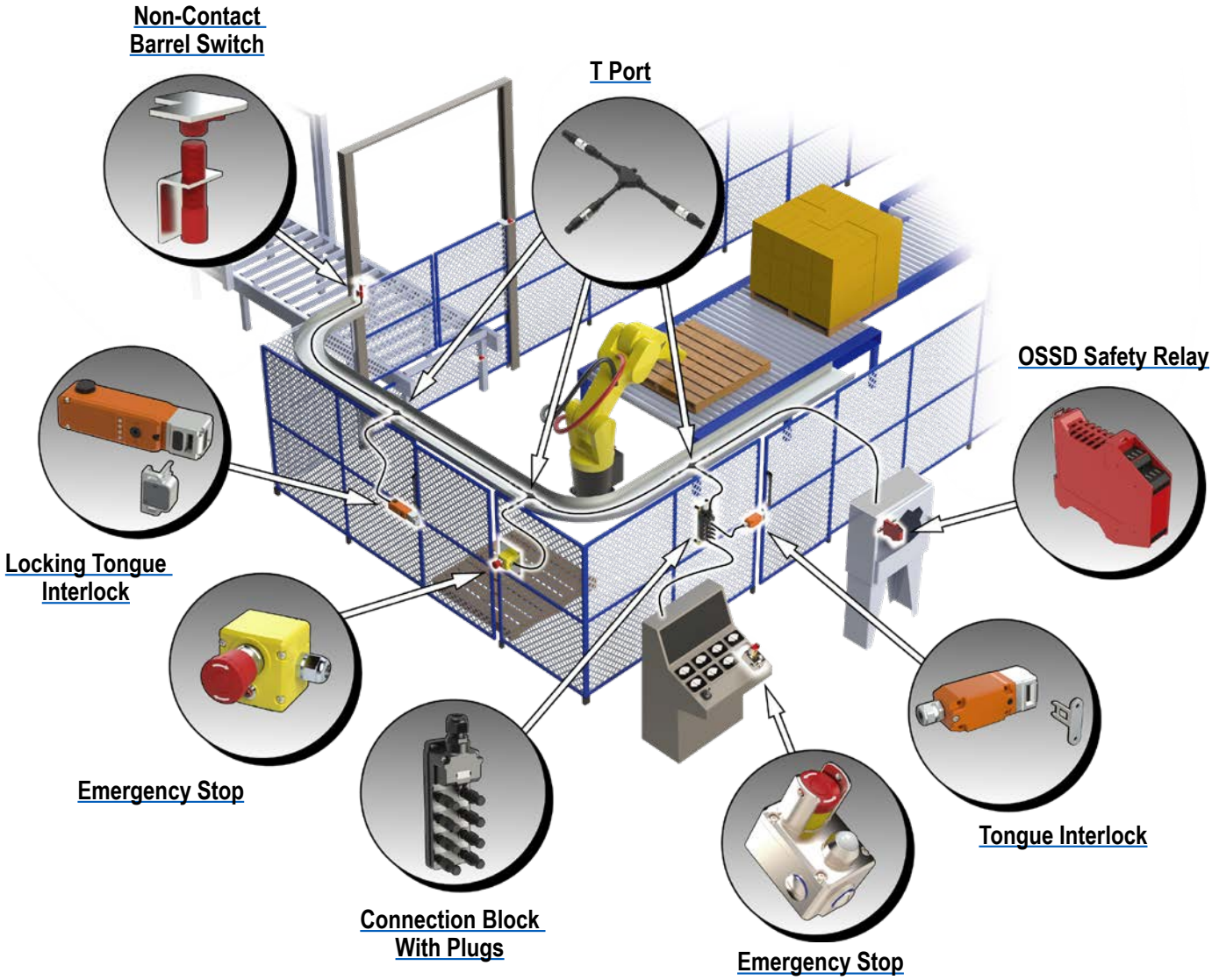
IDEM Z-Range Safety Switches

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



Set-ups similar to the one illustrated here may also include these other Z-Range safety components:

Non-Contact Rectangular Switch

Hinge Switch

Cable Pull

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

HS-SS-Z-RH-352003
(Right Hand)

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-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	316 stainless steel	Right hand	Pigtail	5m [16.4 ft]	2 OSSD and 1 Status	PDF
HS-SS-Z-RH-352002	$314.00			Pigtail	10m [32.8 ft]		PDF
HS-SS-Z-RH-352003	$330.00			8-pin M12 quick-disconnect	250mm [9.8 in]		PDF
HS-SS-Z-LH-352004	$307.00		Left hand	Pigtail	5m [16.4 ft]		PDF
HS-SS-Z-LH-352005	$314.00			Pigtail	10m [32.8 ft]		PDF
HS-SS-Z-LH-352006	$330.00			8-pin M12 quick-disconnect	250mm [9.8 in]		PDF
HSM-Z-RH-353001	$239.00	Die-cast aluminum alloy	Right hand	Pigtail	5m [16.4 ft]		PDF
HSM-Z-RH-353002	$246.00			Pigtail	10m [32.8 ft]		PDF
HSM-Z-RH-353003	$262.00			8-pin M12 quick-disconnect	250mm [9.8 in]		PDF
HSM-Z-LH-353004	$239.00		Left hand	Pigtail	5m [16.4 ft]		PDF
HSM-Z-LH-353005	$246.00			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
HS-SS-Z-350020	$136.00	316 stainless steel	None	PDF
HSM-Z-351020	$69.00	Die-cast aluminum alloy		PDF

HS-SS-Z-350020
Works with either right- or left-handed doors

Mounting Plate

IDEM Z-Range (HS-SS/HSM Series) Mounting Plate Selection Guide

Part Number	Price	Description	Handing	Drawing
HSM-Z-350025	$31.50	Door hinge switches ounting bracket	None	PDF

HSM-Z-350025

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]

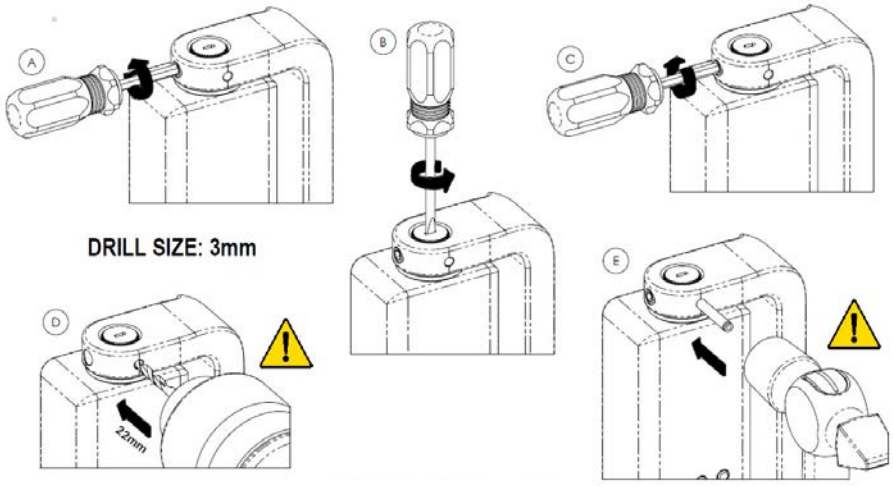
LED Operation

Guard	
Guard Closed	Green
Guard Open	Red

Input	
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

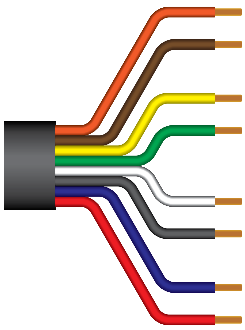


Installer MUST drill and pin switch in final switching position. Installer must not rely only on adjustment grub screw for safety. See operating instructions for additional information on switching angle window adjustment.

IDEM Z-Range Safety Switches Electrical Connections

Wiring

IDEM Quick Disconnect Leads Color Coding



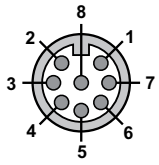
Orange – Guard open signal out
Brown – Not used

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



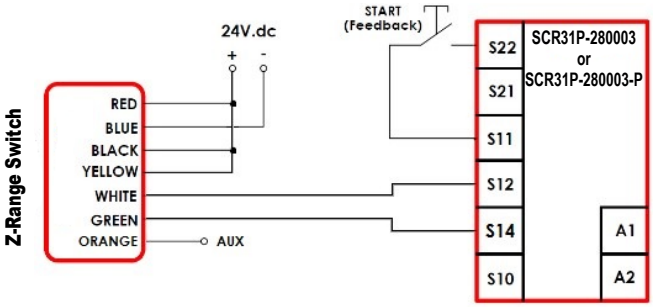
Pin View from Switch
M12 Male

Coded Magnetic Switches Electrical Connections

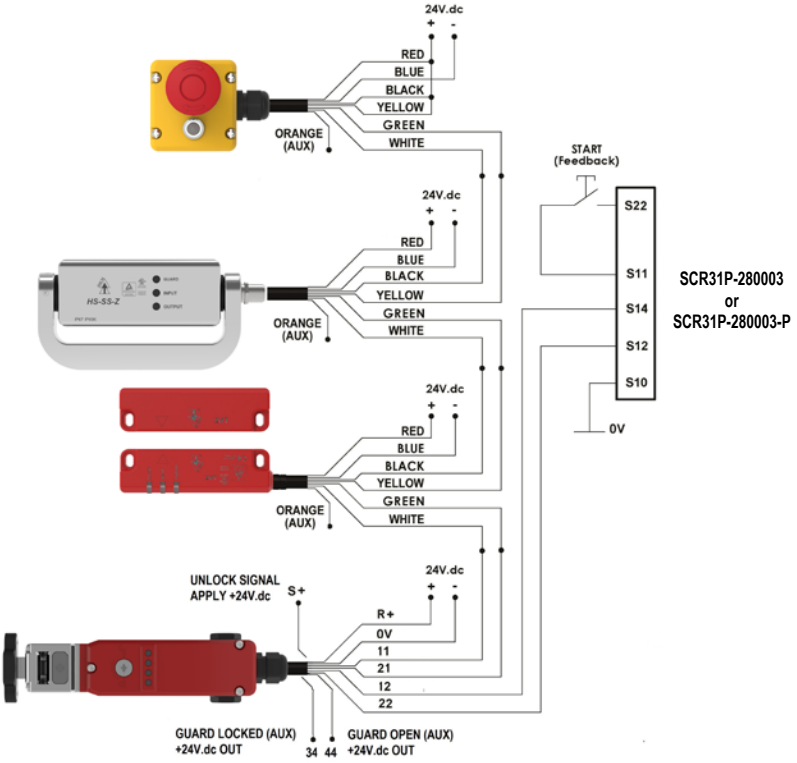
Quick Disconnect Connector Pin Out	*IDEM Quick Disconnect Leads Color Coding*	*Terminal*	*Switch Circuit*
2	Red	R+	Supply +24 VDC
3	Blue	0V	Supply 0VDC
7	Black	11	Safety Input 1
1	White	12	Safety Output 1
4	Yellow	21	Safety Input 2
6	Green	22	Safety Output 2
8	Orange	44	Guard open signal +24VDC out
N/A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

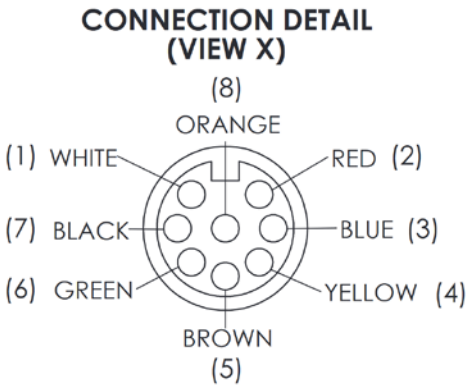
Only the pigtail cables have fixed wire colors.

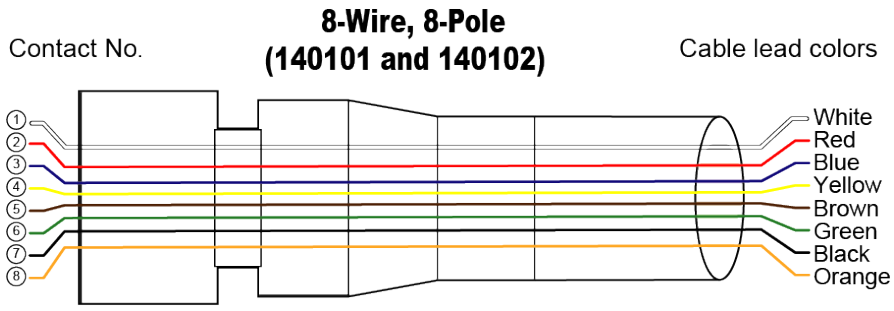
140201

IDEM Connection Cables Selection Chart					
Part Number	***Price***	***Description***	***Connection***	***Length***	***Cable Jacket***
140201	$41.00	Connection cable	8-pin M12 axial female to 8-pin M12 axial male	2m [6.56 ft]	Black PVC
140202	$51.00	Connection cable	8-pin M12 axial female to 8-pin M12 axial male	5m [16.40 ft]	Black PVC
140203	$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***
140101	$59.00	8-pin M12 female quick disconnect	Pigtail, 5m [16.4 ft]
140102	$88.00		Pigtail, 10m [32.8 ft]

140101

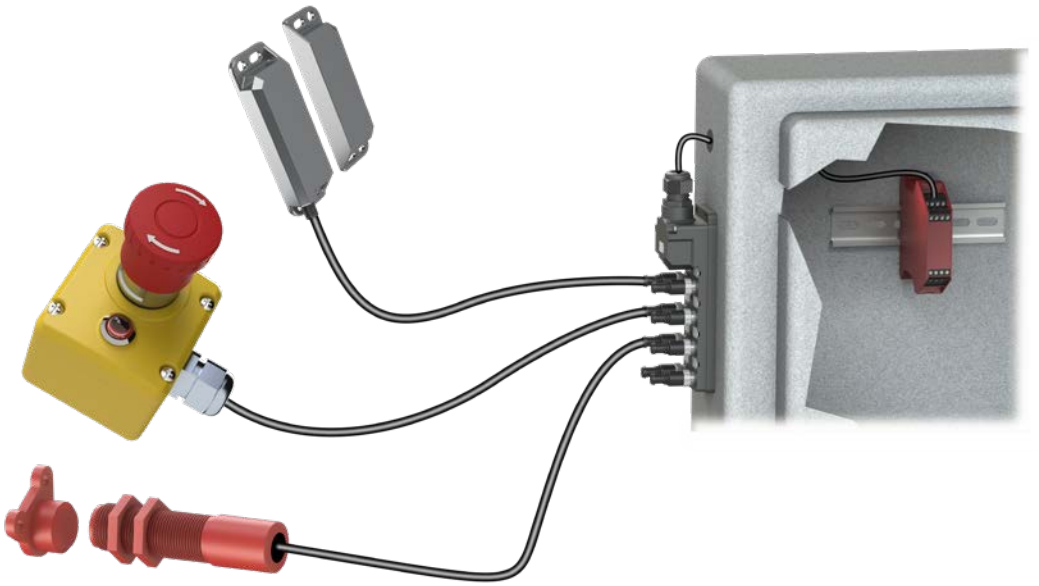




NOTE: Only the pigtail cables have fixed wire colors.

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



Features

- 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
140210-Z	$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	PDF
140205	$22.00	Shorting plug, 8 pole, for use with IDEM Z-Range connection blocks	–	–	–	–	PDF
140204	$41.00	T-port for use with Z-Range safety switches	–	2 8-pole M12 axial male	1 8-pole M12 axial female	–	PDF

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

140210-Z

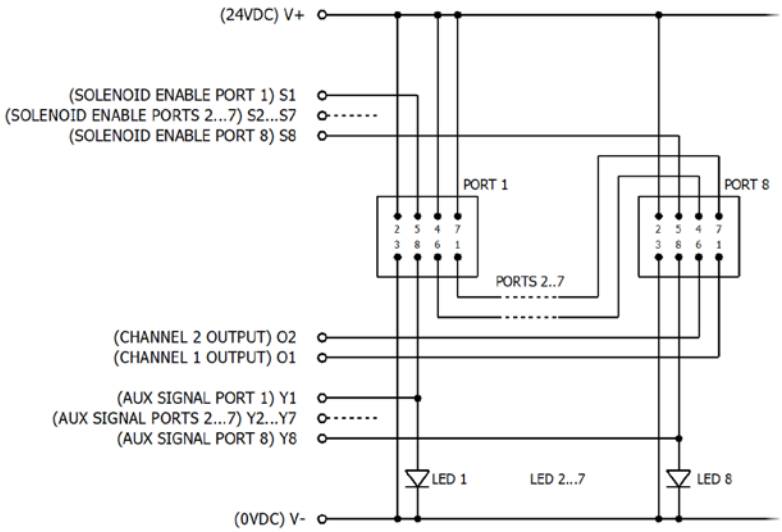
140204

140205

IDEM Connection Box For Use With Z-Range Switches

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
O1	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.