

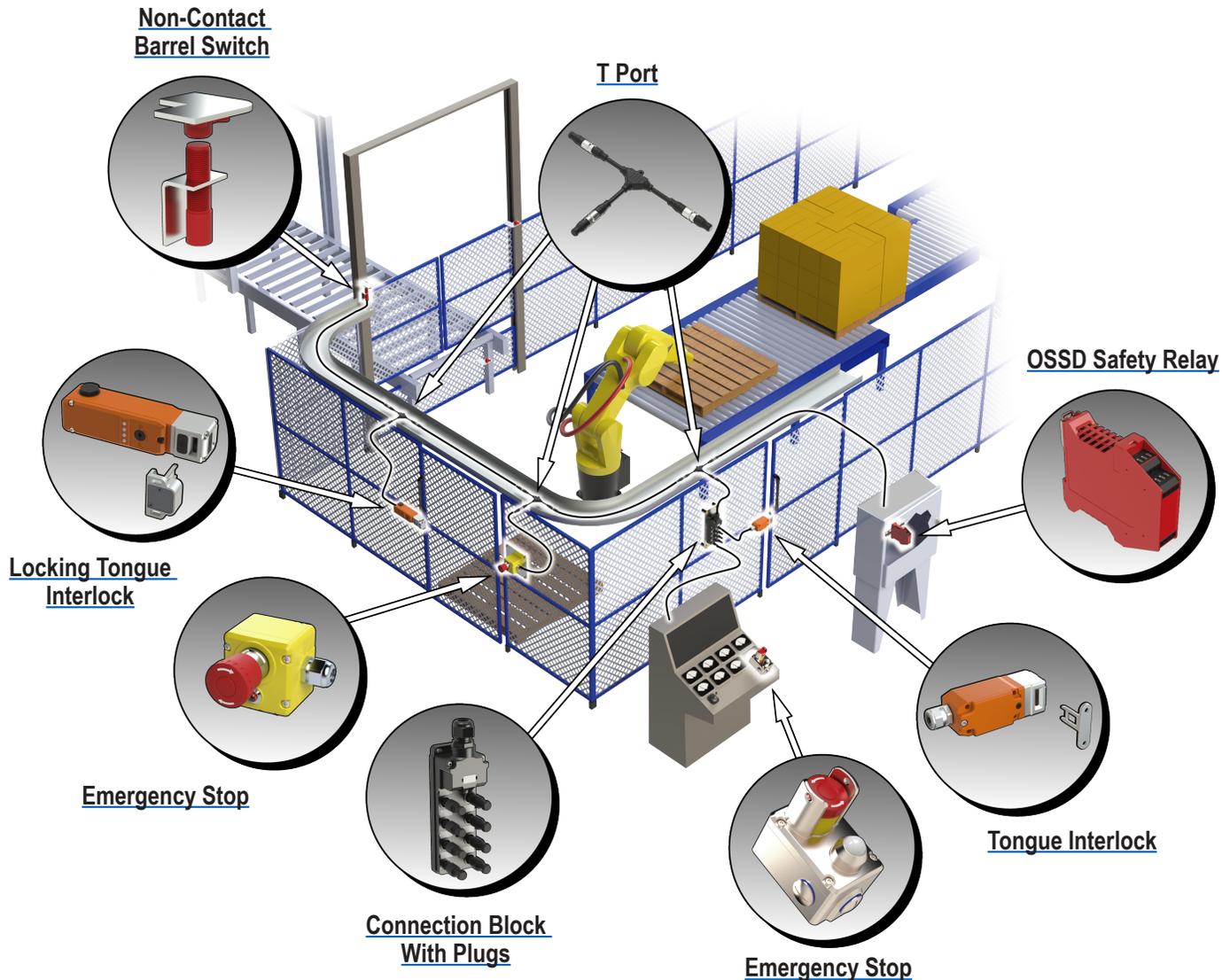


IDEM Z-Range Safety Switches

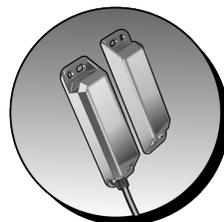
IDEM's Z-Range of products have one set of dual OSSD outputs and one set of dual OSSD inputs. This enables the devices to be wired in series, reducing cost and time associated with wiring back to the panel. Up to 30 Z-Range devices can be connected to one safety relay. These safety switches feature self 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 KLP-Z/KLM-Z/KL3-Z Tongue Interlock Safety Switches with Guard Locking and RFID Coding

Description

IDEM's KLP/KLM/KL3 Series of RFID Coded Safety Switches has been designed to fit into the leading edge of machine guard doors to provide robust guard locking while also providing a double tamper resistant interlock mechanism.

They are designed to provide robust position interlock detection for moving guards and will remain locked until the solenoid voltage is applied to the switch.

These switches can be used in conjunction with delay timers to provide the solenoid energize signal only after a pre-determined amount of time has passed.

When used in combination with a dual channel safety relay or control device, Non-Contact Safety Switches can be used to provide protection up to Category 4 and PLe to ISO13849-1.

Features

- Highly effective anti-tamper RFID coding.
- Holding force of 3000N to keep guard doors closed until hazards have been removed.
- Unique rotating head offers both front and end actuation.
- Diecast housing fitting with a robust 316 stainless steel head.
- Choice of standard or flexible actuators.
- For use as directed by ISO14119 and EN ISO12100



KLP/KLM/KL3 Tongue Interlock Safety Switches with Guard Locking and RFID Coding Selection Guide

| Part Number | Price | Body Material | Actuator Type* | Connection | Circuits | Head | Holding Force | To Unlock |
|------------------------------------|----------|---------------------|-------------------|--|----------------|----------------|---------------|-----------|
| KLP-Z-455002AZ | \$358.00 | Polyester | Standard actuator | Two 0.5 in [12.7 mm] NPT cable entries | 2 OSSD outputs | 90° adjustable | 2000N | 24VDC |
| KLP-Z-455002HFZ | \$397.00 | Polyester | Flexible actuator | Two 0.5 in [12.7 mm] NPT cable entries | 2 OSSD outputs | 90° adjustable | 2000N | 24VDC |
| KLP-Z-455003AZ | \$434.00 | Polyester | Standard actuator | 8-pin M12 quick-disconnect | 2 OSSD outputs | 90° adjustable | 2000N | 24VDC |
| KLP-Z-455003HFZ | \$473.00 | Polyester | Flexible actuator | 8-pin M12 quick-disconnect | 2 OSSD outputs | 90° adjustable | 2000N | 24VDC |
| KLM-Z-454002AZ | \$425.00 | Die-cast aluminum | Standard actuator | Two 0.5 in [12.7 mm] NPT cable entries | 2 OSSD outputs | 90° adjustable | 3000N | 24VDC |
| KLM-Z-454002HFZ | \$464.00 | Die-cast aluminum | Flexible actuator | Two 0.5 in [12.7 mm] NPT cable entries | 2 OSSD outputs | 90° adjustable | 3000N | 24VDC |
| KLM-Z-454003AZ | \$501.00 | Die-cast aluminum | Standard actuator | 8-pin M12 quick-disconnect | 2 OSSD outputs | 90° adjustable | 3000N | 24VDC |
| KLM-Z-454003HFZ | \$540.00 | Die-cast aluminum | Flexible actuator | 8-pin M12 quick-disconnect | 2 OSSD outputs | 90° adjustable | 3000N | 24VDC |
| KL3-SS-Z-456002AZ | \$597.00 | 316 stainless steel | Standard actuator | Two 0.5 in [12.7 mm] NPT cable entries | 2 OSSD outputs | 90° adjustable | 3000N | 24VDC |
| KL3-SS-Z-456002HFZ | \$639.00 | 316 stainless steel | Flexible actuator | Two 0.5 in [12.7 mm] NPT cable entries | 2 OSSD outputs | 90° adjustable | 3000N | 24VDC |
| KL3-SS-Z-456003AZ | \$679.00 | 316 stainless steel | Standard actuator | 8-pin M12 quick-disconnect | 2 OSSD outputs | 90° adjustable | 3000N | 24VDC |
| KL3-SS-Z-456003HFZ | \$720.00 | 316 stainless steel | Flexible actuator | 8-pin M12 quick-disconnect | 2 OSSD outputs | 90° adjustable | 3000N | 24VDC |

* All actuators feature uniquely coded RFID

Female Quick Disconnect Lead

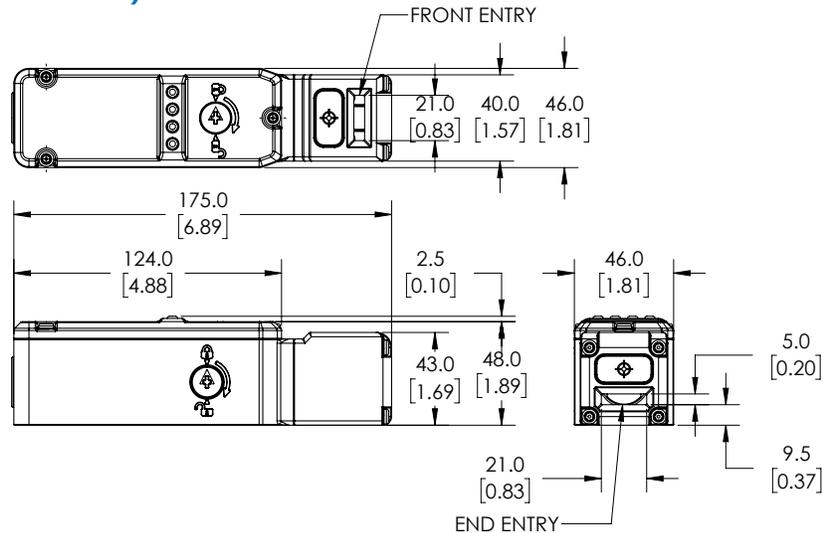
| Part Number | Price | Description | Exit Type/Cable Length |
|------------------------|---------|----------------|---------------------------------|
| 140101 | \$60.00 | Female QD Lead | M12 Female 5m [16.4 ft], 8-pin |
| 140102 | \$91.00 | Female QD Lead | M12 Female 10m [32.8 ft], 8-pin |



IDEM KLP-Z/KLM-Z/KL3-Z Tongue Interlock Safety Switches with Guard Locking and RFID Coding

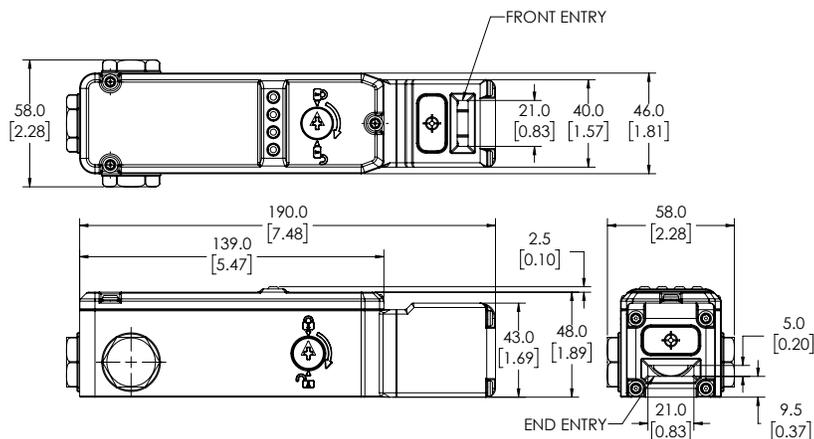
Dimensions (KLP Series)

mm [in]



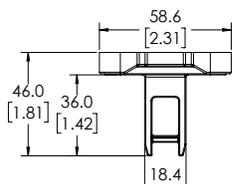
Dimensions (KLM Series and KL3 Series)

mm [in]



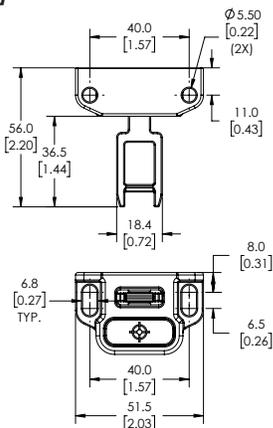
Key (AZ Standard Actuator)

mm [inch]



Key (HFZ Flexible Actuator)

mm [inch]



See our website www.AutomationDirect.com for complete engineering drawings.

IDEM KLP-Z/KLM-Z/KL3-Z Tongue Interlock Safety Switches with Guard Locking and RFID Coding

LED Operation

| GUARD | | INPUT | |
|---------------------------|----------------|----------------------|----------------|
| Guard Closed and Locked | Green (Steady) | Safety Inputs On | Green (Steady) |
| Guard Closed and Unlocked | Green (Flash) | Safety Input Missing | Green (Flash) |
| Code Incorrect | Red (Flash) | Safety Inputs Off | Off |
| Guard Open | Red | Internal fault | Red (Steady) |

| OUTPUT | |
|--------------------|----------------|
| Safety Outputs On | Green (Steady) |
| Safety Outputs Off | Off |
| External fault | Red (Flashing) |

| SOLENOID | |
|-----------------------|-----|
| Solenoid Energised | Red |
| Solenoid De-energised | Off |

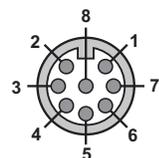


Wiring

IDEM Quick Disconnect Leads Color Coding



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 | S+ | Unlock signal Apply +24VDC |

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

Travel Charts

| Actuator Insertion | 15.0 mm | 5.0 mm | 0mm |
|--------------------|--|--------|-----------------------|
| 11/12 | Open | | Closed |
| 21/22 | Open | | Closed |
| 44 | Guard open signal ON | | Guard open signal OFF |
| 34 | Guard unlocked signal (ON when solenoid energized) | | |

IDEM KLP-Z/KLM-Z/KL3-Z Tongue Interlock Safety Switches with Guard Locking and RFID

| Solenoid Interlock Safety Switches Specifications | | | |
|---|--|--|---|
| | KLP-Z | KLM-Z | KL3-Z |
| Safety Classification and Reliability Data | | | |
| Switching Reliability (B10d) | 2.5M operations at 100mA load | | |
| EN 954-1 | Up to Category 4 with Safety Relay | | |
| 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 days | | |
| MTTFd | 771 years | | |
| Agency Approvals | cULus E258676, CE | | |
| Electrical and General Specifications | | | |
| Rated Insulation Voltage | 500VAC | | |
| Contact Terminals | Plated Brass, Max conductor 1mm ² , 16AWG; 0.7 N•m [0.52 lb•ft] torque | | |
| Solenoid Wattage | 12W | | |
| Solenoid Voltage | 24VDC | | |
| Max. Switching Current | Safety contacts 2.5A @24VDC, 6A @ 120VAC, 3A @ 240VDC (720VA Break); Auxiliary contacts max 230V@0.5A | | |
| Maximum Approach/Withdrawal Speed | 1000 mm/s [39.37 in/s] | 600 mm/s [23.62 in/sec] | 600 mm/s [23.62 in/sec] |
| Enclosure Protection | IP67 (IP69K on all KL3-Z models) | | |
| Operating Temperature | -25°C to +55°C [-13°F to +131°F] | -25°C to +55°C [-13°F to +131°F] | -25°C to +40°C [-13°F to +104°F] |
| Vibration | IEC 68-2-6, 10-55 Hz + 1Hz | | |
| Lid Screws/Torque | Stainless steel; T20 Torx; 1.5 N•m [1.11 lb•ft] | Stainless steel; T20 Torx; 1N•m [0.74 lb•ft] | Stainless steel; T20 Torx; 1.5 Nm [1.11 lb•ft] |
| Recommended Mounting Screws/Torque | M5; 4N•m [2.95 lb•ft] | | |
| Head Screws/Torque | Stainless steel, T20 Torx 1.5 N•m [1.11 lb•ft] | Stainless steel; T20 Torx; 1.5 N•m [1.11 lb•ft] | Stainless steel; T20 Torx; 1N•m [0.74 lb•ft] |

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

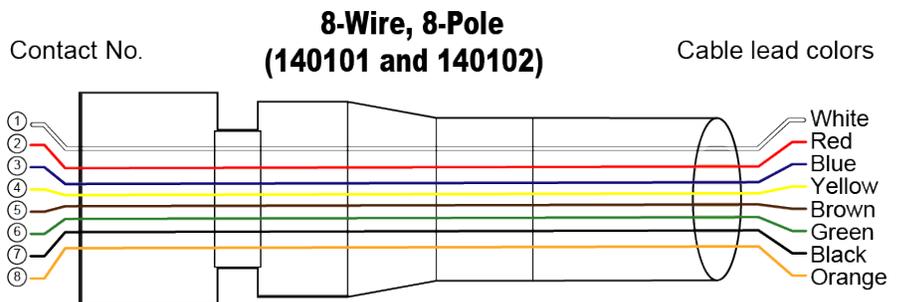
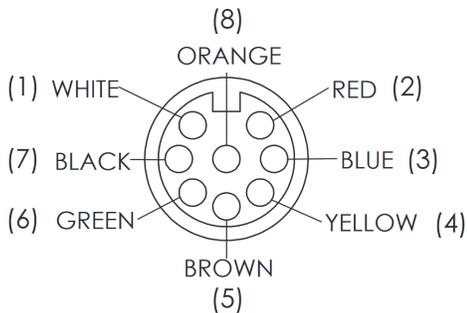
| IDEM Connection Cables Selection Chart | | | | | |
|--|---------|------------------|--|----------------|--------------|
| Part Number | Price | Description | Connection | Length | Cable Jacket |
| 140201 | \$42.50 | Connection cable | 8-pin M12 axial female to 8-pin M12 axial male | 2m [6.56 ft] | Black PVC |
| 140202 | \$53.00 | Connection cable | 8-pin M12 axial female to 8-pin M12 axial male | 5m [16.40 ft] | Black PVC |
| 140203 | \$63.00 | 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 | \$60.00 | 8-pin M12 female quick disconnect | Pigtail, 5m [16.4 ft] |
| 140102 | \$91.00 | | Pigtail, 10m [32.8 ft] |



140101

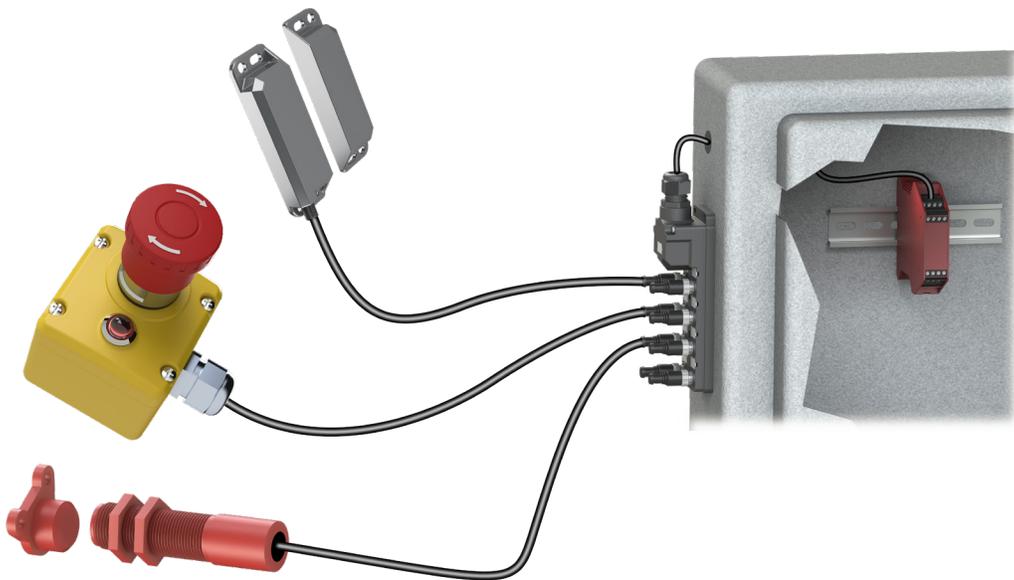
CONNECTION DETAIL (VIEW X)



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 |
| <u>140210-Z</u> | \$297.00 | 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> | \$31.50 | Shorting plug, 8 pole, for use with IDEM Z-Range connection blocks | - | - | - | - | <u>PDF</u> |
| <u>140204</u> | \$46.50 | 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.



[140210-Z](#)



[140204](#)



[140205](#)

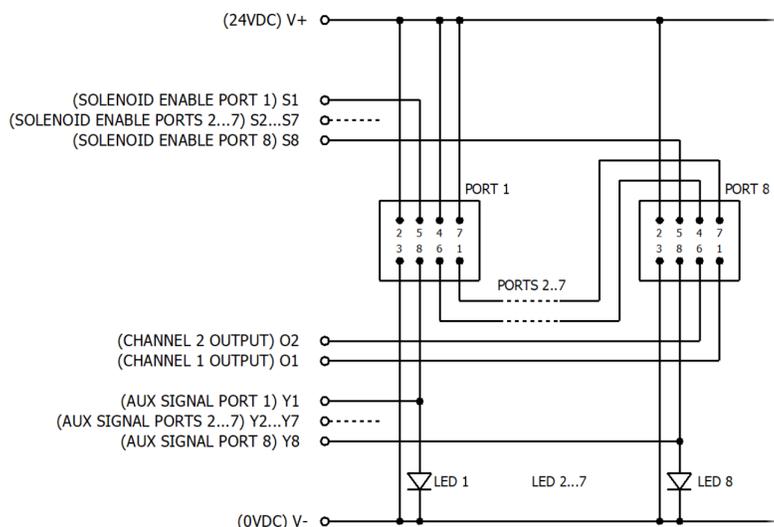
IDEM Connection Box For Use With Z-Range Switches



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 bolts, 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.