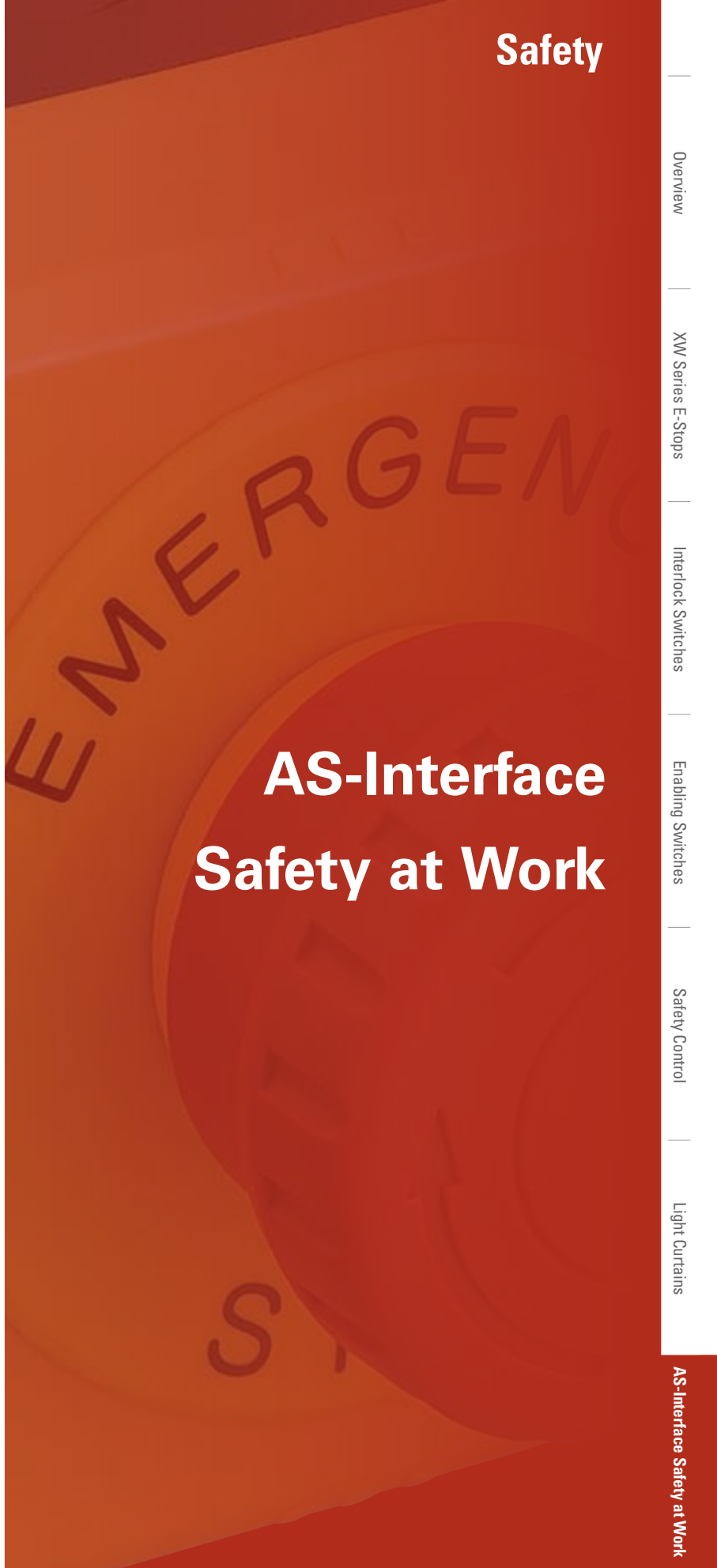


Emergency Stop Switches 444
 Operating Instructions..... 448



AS-Interface Safety at Work



www.IDEC.com/safety

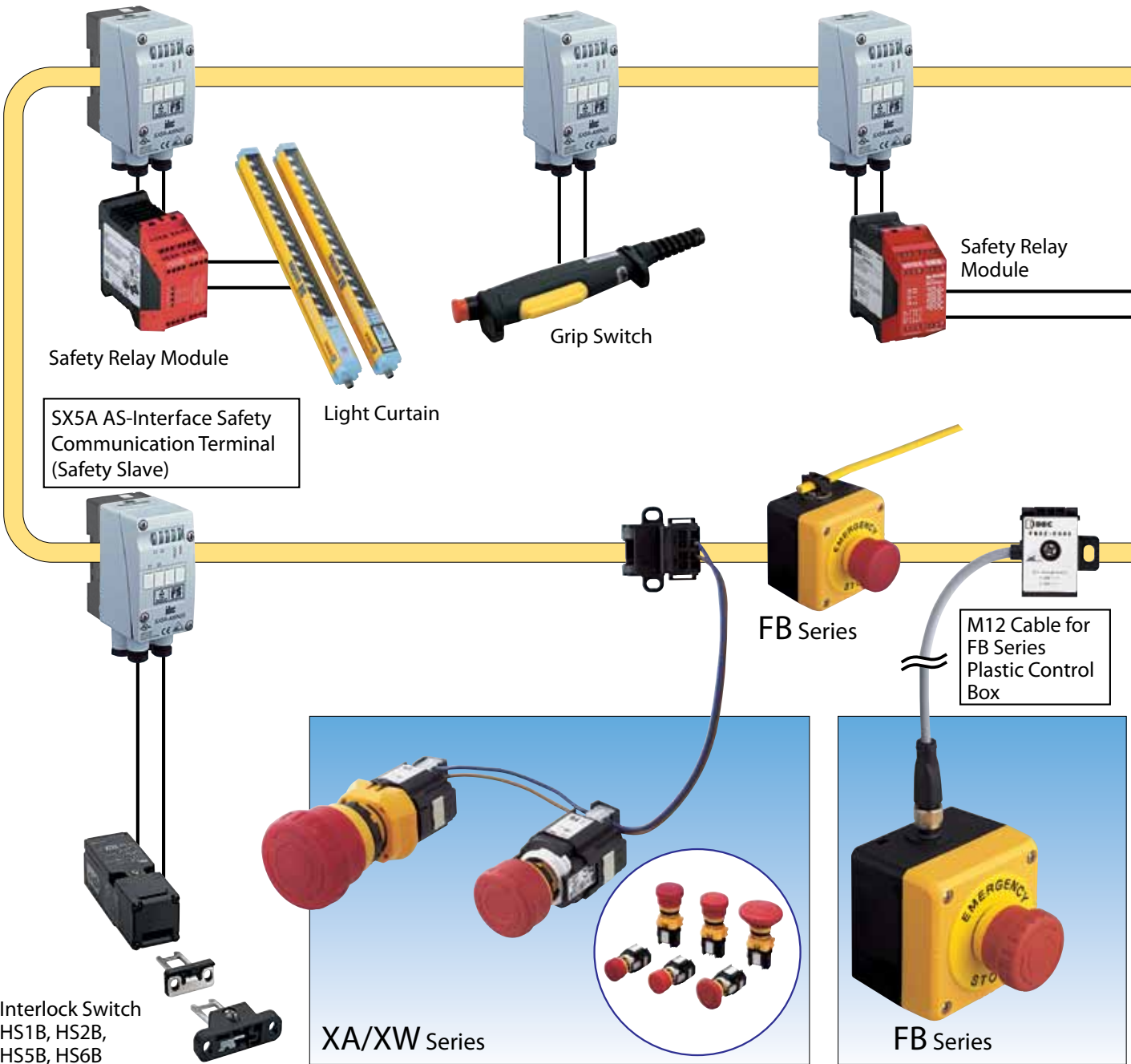


AS-Interface Safety at Work

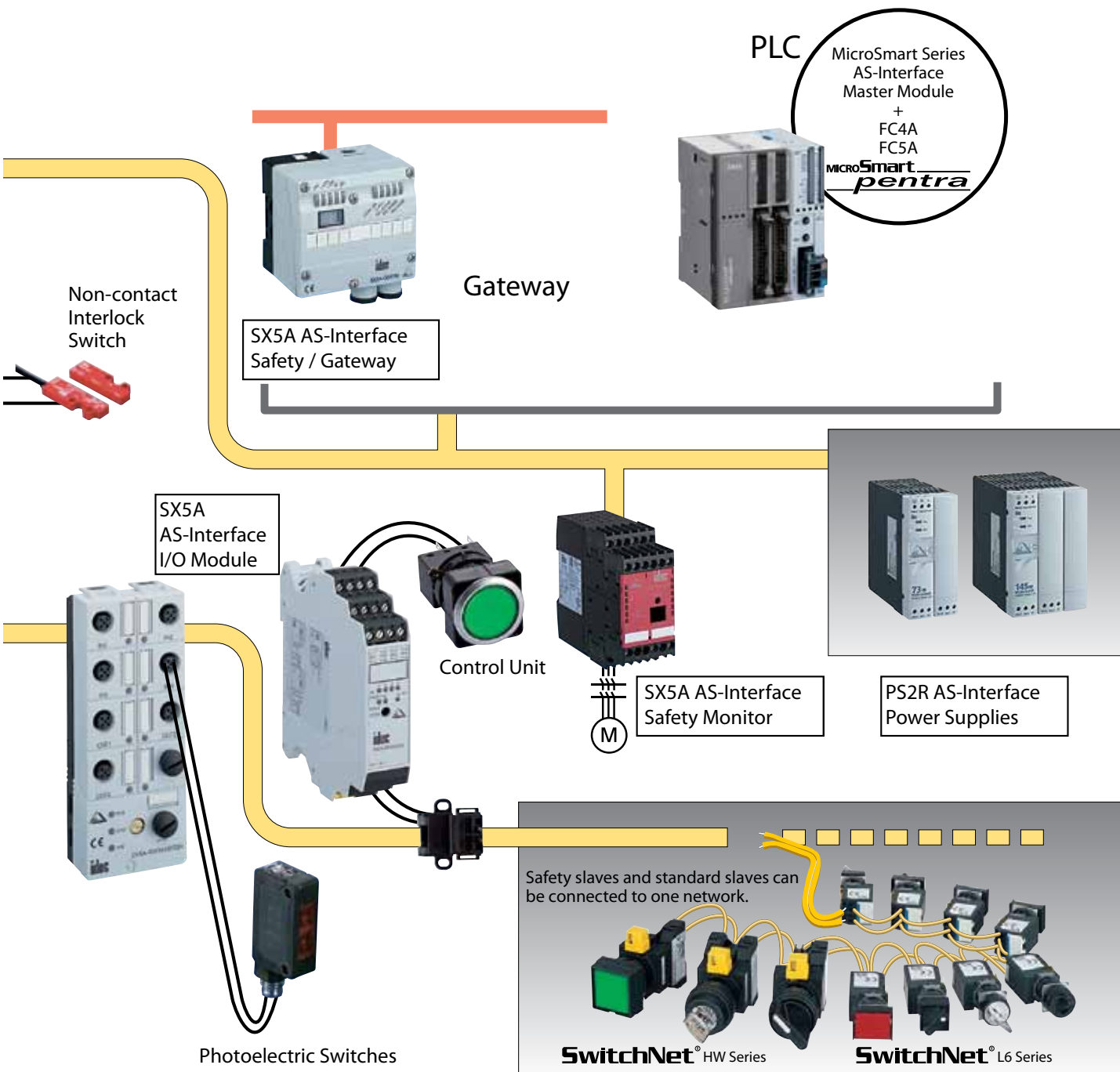
AS-Interface safety at work integrates a safety network into one wire-saving system.

- Safety slaves and safety monitors can be simply connected to the existing AS-Interface network to establish the AS-Interface Safety at Work.
- Emergency stop switches can be connected directly to AS-Interface Safety at Work, further reducing wiring.
- Interlock switches, safety relay modules and other safety components can be connected to the safety network via safety slaves.
- Safety components can be connected to other networks through gateways.

SX5A AS-Interface Safety Communication Terminal (Safety Slave)



Overview
XW Series E-Stops
Interlock Switches
Enabling Switches
Safety Control
Light Curtains
AS-Interface Safety at Work



Emergency Stop Switches

XA Series/XW Series/FB Series (Plastic Enclosures) with Safety Slave Functions for Direct Connection to the AS-Interface Safety at Work

- Emergency stop switches with safety slave functions can be connected to the AS-Interface Safety at Work network.
- Complies with IEC 61508 SIL3 (Functional safety of electrical/electronic/programmable electronic safety-related systems) and EN954-1 safety category 4 (Safety of machinery-Safety related parts of control systems).
- Space, wire, and labor-saving solutions for safety equipment
- Equipped with AS-Interface standard slave functions. Monitored with AS-Interface master devices.
- A wide variety of safety components:
 - 1) 1-IN (non-illuminated) and 1-IN/1-OUT (illuminated) available.
 - 2) FB series plastic control stations with ø16mm XA series and ø22mm XW series emergency stop switches available.
 - 3) XA series available with ø29mm and ø40mm mushroom buttons and XW series available with ø40mm and ø60mm jumbo mushroom buttons.
 - 4) Terminal connectors are available in insulation displacement, crimping, and M12 connectors which enable effective connection of multiple switches.



Part Numbers

ø16mm XA Series

| Button Size | Connector Terminal | I/O Points | Illumination | Part Number | Button/Lens Color |
|-------------|--------------------|-------------|-----------------|-----------------|-------------------|
| ø29 | IDC | 1-IN | Non-illuminated | XA1E-BV3Z10C1R | Red |
| | | | | XA1E-BV3Z10C1N | Gray |
| 1-IN 1-OUT | | Illuminated | XA1E-LV3Z114C1R | Red | |
| ø40 | | 1-IN | Non-illuminated | | XA1E-BV4Z10C1R |
| | 1-IN 1-OUT | | Illuminated | XA1E-LV4Z114C1R | |

ø22mm XW Series

| Button Size | Connector Terminal | I/O Points | Illumination | Part Number | Button/Lens Color |
|-------------|--------------------|---------------|-----------------|-----------------|-------------------|
| ø40 | IDC | 1-IN | Non-illuminated | XW1E-BV4Z10C1R | Red |
| | Crimping | | | XW1E-BV4Z10C2R | |
| | IDC | 1-IN 1-OUT | Illuminated | XW1E-LV4Z114C1R | |
| | Crimping | | | XW1E-LV4Z114C2R | |
| ø60 | IDC | 1-IN | Non-illuminated | XW1E-BV5Z10C1R | |
| | Crimping | | | XW1E-BV5Z10C2R | |

E-Stop Enclosure

| Button Size | Connector Terminal | I/O Points | Illumination | Nameplate | Part Number | Button/Lens Color |
|-------------|------------------------|---------------|-----------------|-----------|---------------------------|-------------------|
| ø40 | M12 | 1-IN | Non-illuminated | Without | FB1W-XW1E-BV4Z10C2R-Y0-1 | Red |
| | | | | With | FB1W-XW1E-BV4Z10C2R-Y1-1 | |
| | | 1-IN 1-OUT | Illuminated | Without | FB1W-XW1E-LV4Z114C2R-Y0-1 | |
| | | | | With | FB1W-XW1E-LV4Z114C2R-Y1-1 | |
| ø60 | | 1-IN | Non-illuminated | Without | FB1W-XW1E-BV5Z10C2R-Y0-1 | |
| | | | | With | FB1W-XW1E-BV4Z10C2R-Y0-2 | |
| ø40 | AS- Interface Piercing | 1-IN | Non-illuminated | Without | FB1W-XW1E-BV4Z10C2R-Y0-2 | |
| | | | | With | FB1W-XW1E-BV4Z10C2R-Y1-2 | |
| | | 1-IN 1-OUT | Illuminated | Without | FB1W-XW1E-LV4Z114C2R-Y0-2 | |
| | | | | With | FB1W-XW1E-LV4Z114C2R-Y1-2 | |
| ø60 | | 1-IN | Non-illuminated | Without | FB1W-XW1E-BV5Z10C2R-Y0-2 | |

1. Units have been evaluated as emergency stop devices by TÜV.
 2. Units with nameplates are engraved "Emergency Stop".

Overview

XW Series E-Stops

Interlock Switches

Enabling Switches

Safety Control

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AS-Interface Safety at Work

Accessories

| Name | Specification | Part Number |
|--|-----------------------------------|-------------|
| XA/XW Series IDC Connector Kit ¹ | End connector (with cover) | XW9Z-C100-1 |
| | Through connector (with cover) | XW9Z-C100-2 |
| IDC Connector Termination Tool | Manufactured by ITW Pancon | MMIT-156F |
| Crimping Type Connector Cable | Length 500 mm, with one connector | XW9Z-C205 |
| | Length 1m, with one connector | XW9Z-C210 |
| FB Series Control Station M12 Connector Cable | Length 300 mm, straight | FB9Z-CS03 |
| | Length 1m, straight | FB9Z-CS10 |
| | Length 2m, straight | FB9Z-CS20 |
| | Length 1m, right-angle | FB9Z-CL10 |
| | Length 2m, right-angle | FB9Z-CL20 |
| Hand-held Programming Device ² | | SX9Z-ADR1N |



- Minimum order is 5 pieces. IDC connector termination tool MMIT-156F (ITW Pancon) may be required to connect the cable to the connector.
- *Hand-held programming device accessories:
 - Programming device cable (SX9Z-CN1)
 - Programming device AC adapter (SX9Z-ADPT)
 - SwitchNet addressing port adapter (LA9Z-SNADP)

Specifications

| | | Specification | |
|---------------|--|--|---|
| General | Operating Voltage | 26.5 to 31.6V DC (supplied from AS-Interface) | |
| | Rated Input Current | Illuminated type: 35 mA (XA series), 40 mA (XW, FB series) Non-illuminated type: 25 mA | |
| | Dielectric Strength | 500V AC, 1 minute | |
| | Insulation Resistance | 100 MΩ (500V DC megger) | |
| | Operating Temperature | XA, XW series: -25 to +55°C (no freezing) FB series: Illuminated type -25 to +50°C (no freezing) Non-illuminated type -25 to +55°C (no freezing) | |
| | Storage Temperature | -40 to +70°C (no freezing) | |
| | Operating Humidity | 45 to 85% RH (no condensation) | |
| | Pollution Degree (IEC60664) | XA, XW series - Operator unit: 3, Communication unit: 2, FB series: 3 (2 - per UL) | |
| | Degree of Protection | Operator unit: IP65 | |
| | IEC60529 | Terminal unit: IP20 (FB series: IP65) | |
| | Corrosion Immunity | Free from corrosive gases | |
| | Vibration Resistance | Damage limits/Operating extremes: 10 to 500 Hz, amplitude 0.35 mm, acceleration 50 m/s ² | |
| | Shock Resistance | Damage limits: 150 m/s ² , Operating extremes: 1000 m/s ² | |
| | Weight (approx.) | XA series ø29: 35g, ø40: 40g XW series ø40: 60g, ø60: 70g FB series M12 connector: 195g (ø40), 205g (ø60) Piercing: 235g (ø40), 245g (ø60) | |
| Communication | Communication | AS-Interface Ver. 3.0 | |
| | Slave Type | Safety slave | |
| | Maximum Network Length | 100m total | |
| | Maximum No. of Slaves | 31 (when only safety slaves are connected) | |
| | Profile (I/O, ID, ID2) | S-7, B, E (illuminated type) S-0, B, E (non-illuminated type) | |
| | Data Bit | Input | Emergency stop switch DIO D11 D12 D13 When pressed 0 0 0 0 |
| | | Output | Emergency stop switch DIO D11 D12 D13 When not pressed X X X X <small>x0.1 (unspecified)</small> |
| Parameter Bit | D00 = 1 Pilot light: on D01 to 3: not used D00 = 0 Pilot light: off | | |
| Parameter Bit | Not used | | |

Overview

XW Series E-Stops

Interlock Switches

Enabling Switches

Safety Control

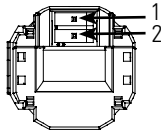
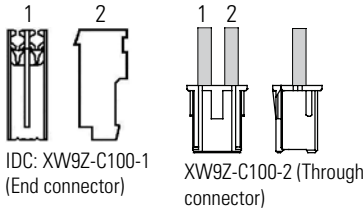
Light Curtains

AS-Interface Safety at Work

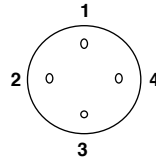
| | | |
|--|--|---|
| Mechanical/Electrical | Operating Force | Pushlock: 10.5N (XA series), 32N (XW, FB series) Pull reset: 10N (XA series), 21N (XW, FB series) Turn reset: 0.16N-m (XA series), 0.27 N-m (XW, FB series) |
| | Minimum Force Required for Direct Opening Action | 60N (XA series), 80N (XW, FB series) |
| | Minimum Operator Stroke Required for Direct Opening Action | 4.0 mm |
| | Maximum Operating Stroke | 4.5 mm |
| | Operating Frequency | 900 operations/hour |
| | Mechanical Life | 250,000 operations minimum |
| | Electrical Life | 250,000 operations minimum |
| | Connectors | IDC connector (XA series) IDC connector, crimping connector (XW series) M12 connector/AS-Interface piercing connector (FB series) |
| Recommended Tightening Torque for Locking Ring | 0.88 N-m (XA series), 2.0 N-m (XW series) | |

Pin Assignment

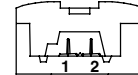
XA/XW Series



FB Series (M12 Connector)



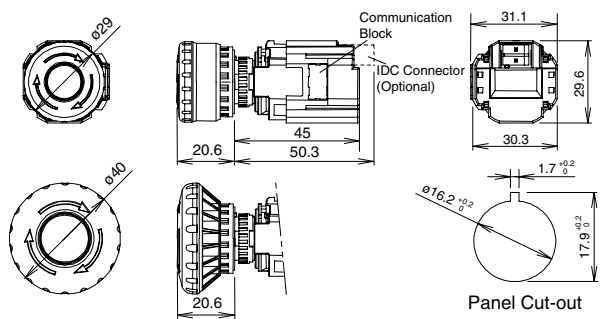
(AS-Interface Piercing Connector)



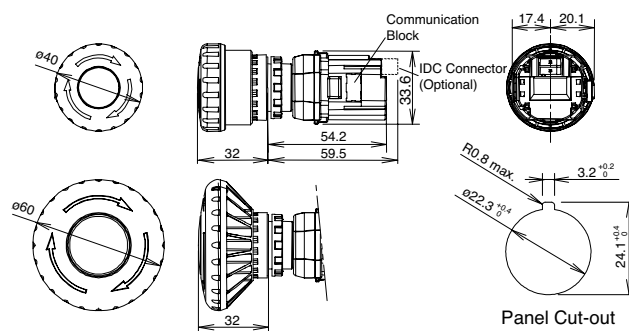
1: AS-i+
2: AS-i-

Dimensions

XA Series

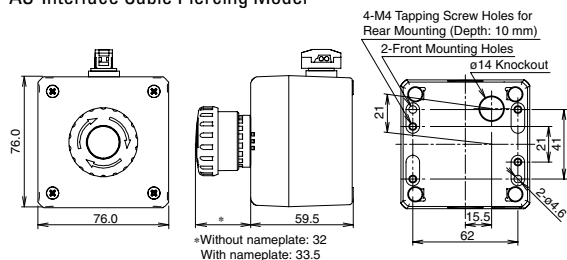


XW Series

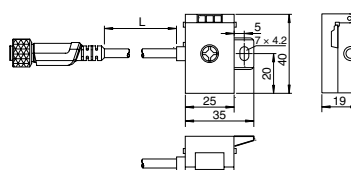


FB Series

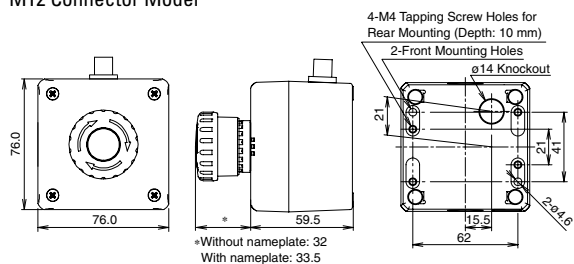
AS-Interface Cable Piercing Model



M12 Connector Cable for FB Series



M12 Connector Model

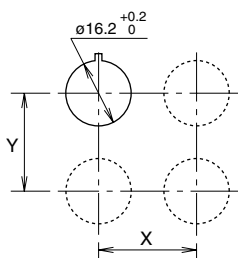


Mounting Centers

XA Series

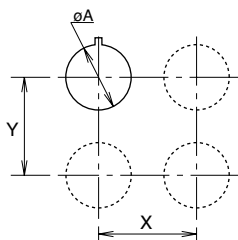
| XA Size | X & Y |
|---------|--------------|
| ø29 | 40mm minimum |
| ø40 | 50mm minimum |
| ø60 | 70mm minimum |

The above values are for installing with ø16mm pushbutton switches. For using with control units of other size and operator shape, determine the mounting centers in consideration of easy operation and wiring.



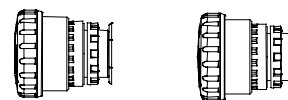
XW Series

| XW Size | øA | X & Y |
|---------|----------------------|----------|
| 40mm | 22.3 ^{+0.4} | 70mm min |



Resetting

These emergency stop switches are push-lock, pull/turn reset types. When pressed, the operator is latched, and reset by pulling or turning.



Overview

XW Series E-Stops

Interlock Switches

Enabling Switches

Safety Control

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AS-Interface Safety at Work

Operating Instructions

AS-Interface Safety Monitor

Wiring and Installation

Before wiring the interface cable, discharge static electricity. Tighten the screws to a torque of 0.8 to 1.2 N·m.

The AS-Interface power supply unit must separate the main power (input) and output safely according to IEC 60742. It must also maintain a stable supply in the event of instantaneous power failure.

Replacing the Safety Slave

Press "Service" button before and after replacing the safety slave. Resetting of safety monitor using the PC is not necessary. After replacement, check whether the new safety slave performs correctly.

Replacing the Safety Monitor

The settings of the safety monitor can be transferred to the new safety monitor using the download cable sold separately, and the new safety monitor does not require resetting using software. After replacement, check whether the new safety monitor performs correctly.

AS-Interface Safety Communication Terminal & Base Module

Wiring

The AS-Interface safety communication terminal will be connected to the AS-Interface network via the base module. When only one AS-i flat cable is used, plug the unused grooves using the gaskets supplied with the base module. Tighten the screws to a torque of 0.7 N·m maximum.

Before wiring, disconnect the safety communication terminal and discharge static electricity with an adequate method. Connect the emergency stop switches and interlock switches in normally-closed status.

The slave has two independent inputs for connecting the products to comply with the required safety category. When complying with safety category 4, limit the cable length between the module and the input device to not longer than 30m. For leading in the cables, use the upper part (1 and 2), and tighten the cable gland to a torque of 0.5 to 0.7 N·m.

Emergency Stop Switches

Panel Mounting

The panel thickness should be within the range from 0.8 to 6.0 mm. Remove the locking ring from the operator and check that the rubber gasket is in place. Insert the operator from panel front into the panel hole. Face the side without thread on the operator with TOP marking upward, and tighten the locking ring using ring wrench MW9Z-T1 to a torque of 2.0 N·m maximum. Do not use pliers. Do not tighten with excessive force, otherwise the locking ring will be damaged.

To prevent the XW emergency stop switches from rotating when resetting from the latched position, use of an anti-rotation ring (HW9Z-RL) or a nameplate is recommended.

Address Setting

The lid of the address setting device on the side of the unit can be removed by prying it out. Take care not to lose the lid, which comes off completely. By removing the lid of the address setting section, you can see the terminals for connecting a programming cable. Connect the programming cable to the terminals.

To set an address while mounting this product on the panel, more than 60mm space is necessary on the left side in terms of the AS-Interface communication unit. Note that adequate space cannot be allocated by the distance specified with minimum mounting centers. If adequate space cannot be allocated, set the address before installing the product on the panel or set the address after removing the AS-Interface communication unit from the operation section.

Wiring

A maximum of 31 units can be connected to a network. Addresses must be assigned to avoid overlaps.

This product allows connecting safety slaves with safety equipment, and normal slaves without safety equipment at the same time. Do not connect safety related signals to a normal slave.

The AS-Interface slaves are divided into two types: A/B slaves with expanded addresses and standard slaves without expanded addresses. If A/B slaves and standard slaves are connected simultaneously, the maximum number of slaves connectable to a network may exceed 31.

The network length is a maximum of 100 meters, including all wires. However, the maximum possible length of the wires may actually be shorter than 100 meters depending on the type of master and composition of slaves. Consider the lengths of cables and wiring topology so that voltage drops in transmission lines are no higher than 3V.

Use applicable two-wire flat cables for wiring.

Do not operate the switch using solid object such as metal or with excessive force, otherwise the switch may be deformed or damaged, causing malfunction or operation failure.