

## Supports safety communication (PROFIsafe)



PROFIsafe is established as an international standard (IEC 61784-3-3). It is a communication protocol that transmits safety-related data by PROFINET communication and can be used up until safety standards ISO 13849-1 PL e and IEC 61508/IEC 62061 SIL 3.



PROFINET/PROFIsafe compatible PLC



PROFINET/PROFIsafe

PROFIsafe



EX260-FPS1  
(PROFIsafe compatible SI unit)

PROFINET



EX260-SPN□  
(PROFINET compatible SI unit)

A PROFIsafe compatible PLC allows for the use of a PROFINET compatible SI unit and a PROFIsafe compatible SI unit to be used on one communication line at the same time.

## Compliant with safety standards

This product (EX260-FPS1) is intended to facilitate safe machine and system designing (ISO/IEC standard compliance) and has been certified by a third party (TÜV Rheinland) for use up until the standards listed below.



IEC 61508/IEC 62061 SIL 3  
ISO 13849 PL e/Cat. 3

### · SIL (Safety Integrity Level)

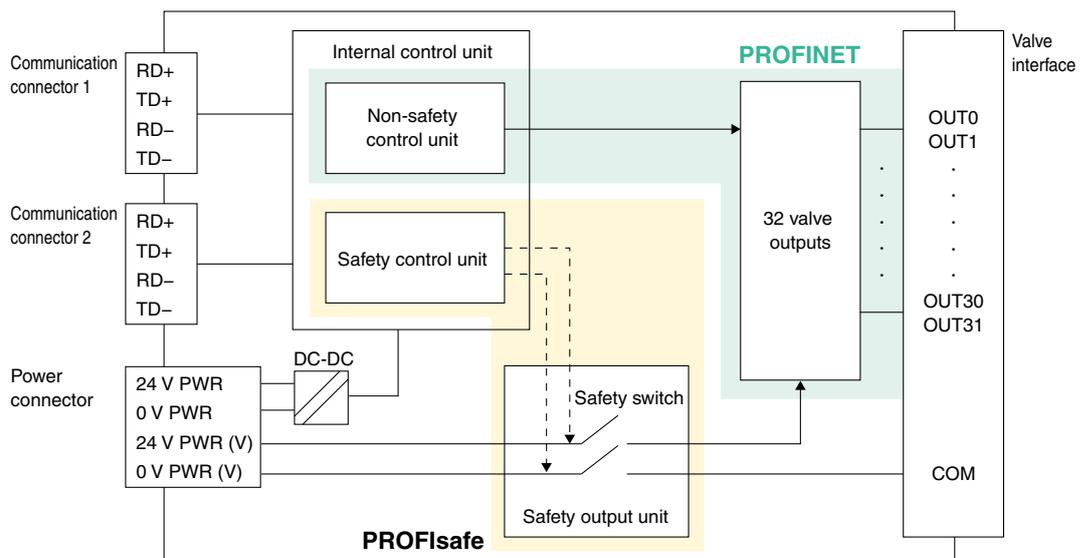
A safety integrity level as defined by international standard IEC 61508/62061  
There are 4 levels of safety, with the lowest being SIL 1 and the highest being SIL 4.

### · PL (Performance Level)

A scale used to define the capability of safety-related parts to perform a safety function as defined by international standard ISO 13849  
There are 5 levels of safety function, with the lowest being PL a and the highest being PL e.

## Safety Output

This product (EX260-FPS1) has a safety switch inside the product. It shuts off the voltage supplied to the valve by turning OFF the safety switch via directive from the PLC to enter safe state. The safety switch of this product (EX260-FPS1) has two redundancies, one on the 24 V side and the other on the 0 V side. It continuously runs diagnostics. The safety switch is turned OFF in the event of an error detection.



## ⚠ Safety Definition

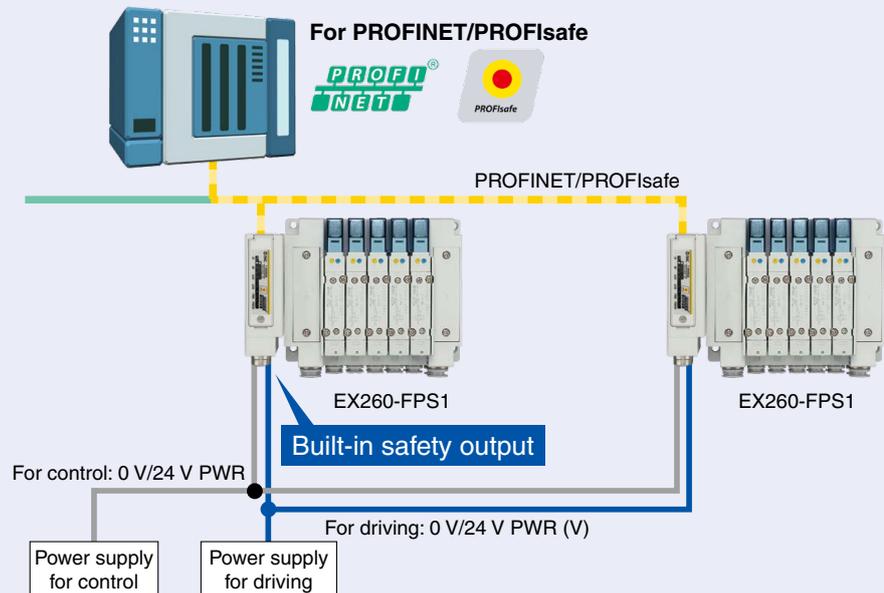
The safe state of this product (EX260-FPS1) is a condition in which the safety output described above is turned OFF to shut off the supply of power to the valve manifold.

This product does not cover valve manifolds that are being used in connection with this product or the safety function and safe state of electric/air equipment that includes a peripheral circuit.

## Reduced wiring, Space saving

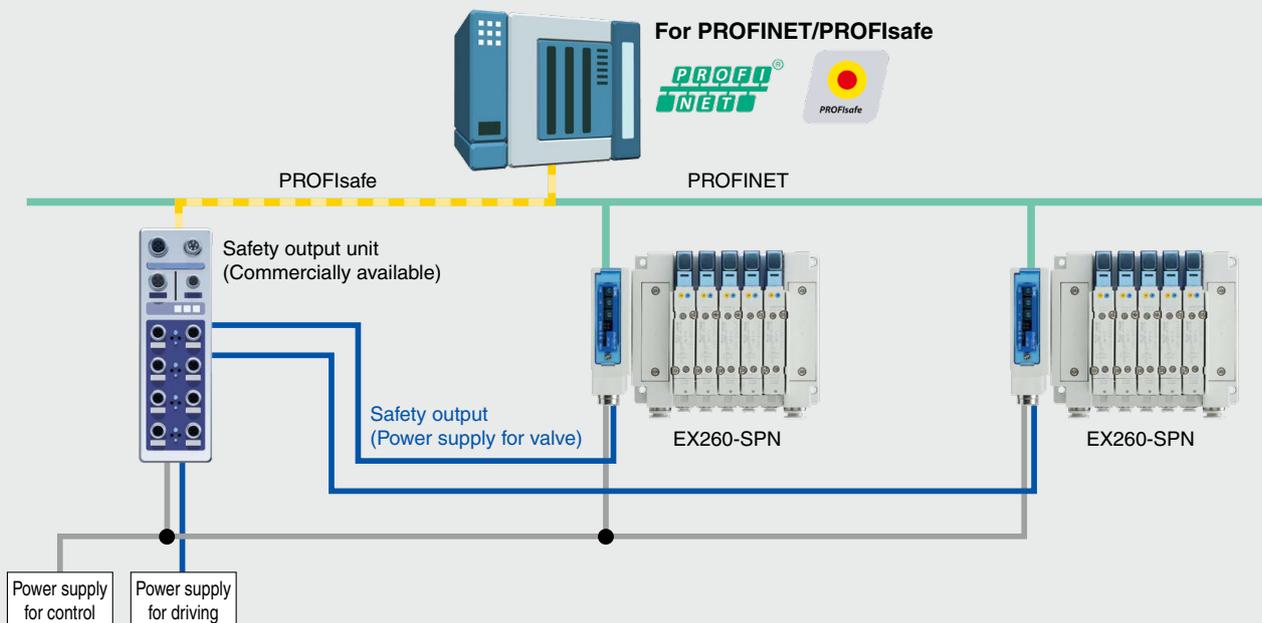
### For built-in safety output (EX260-FPS1)

- A separate safety output unit is not required. (Space saving)
- There is no need for wiring between the safety output unit and the EX260-FPS1. (Reduced wiring)



### When a separate safety output unit is installed (Conventional connection example)

- A separate safety output unit is required. (Increased installation space)
- Increased wiring is required for connection with another unit. (Increased wiring)



### Safety of the machine or system

The manufacturer of the machine/system and its user are responsible for the safety of the machine/system. Use of this product (EX260-FPS1) requires machine/system safety concepts which are in accordance with the corresponding directives and standards, safety function validation, and hazard and risk analysis. Target SILs (IEC 61508/62061 compliance) and performance levels/categories (ISO 13849 compliance) are determined based on the risk analysis. For more information, refer to the "Safety of the machine or system" section in the operation manual of the EX260-FPS1.

For Output

# EX260 Series



\* Only the SY and SV valves are UL-compliant.



## Specifications

### All SI Units Common Specifications

Power supply for control	Power supply voltage	20.4 to 28.8 VDC
	Internal current consumption	200 mA or less
Power supply for output	Power supply voltage	20.4 to 28.8 VDC
Environmental resistance	Enclosure	IP67
	Operating temperature range	-10 to +50°C
	Operating humidity range	35 to 85% RH (No condensation)
	Withstand voltage	500 VAC for 1 minute between terminals and housing
	Insulation resistance	10 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing
Legislation/Standards		CE (EMC/RoHS/Machinery Directives), UKCA (EMC/RoHS/Machinery Regulations), UL (CSA) compliant
Weight		200 g
Accessories	Mounting screw	2 pcs.
	Seal cap (for M12 connector socket)	EX9-AWTS (1 pc.)

Model		EX260-FPS1
Applicable system	Protocol	PROFINET/PROFIsafe*2
	Version*1	PROFINET Specification Version 2.3 PROFIsafe Specification Version 2.4
	Configuration file*3	GSD file
I/O occupation area (Inputs/Outputs)		0/32*4
Applicable function		FSU, Shared Device, MRP
Communication speed		100 Mbps*2
Communication connector specification		M12
Output	Output type	Source/PNP (Negative common)
	Number of outputs	32
	Load	Solenoid valve with surge voltage suppressor 24 VDC, 0.95 W or less (SMC)
	Voltage drop to valve supply	Max. 1.2 VDC at 24 VDC
	Supplied current	Max. 1.3 A

\*1 Please note that the version is subject to change.

\*2 Use a CAT5 or higher communication cable.

\*3 The configuration file can be downloaded from the SMC website: <https://www.smcworld.com>

\*4 In addition, it occupies input 4 byte/output 5 byte for safety.

# EX260 Series

## How to Order

Safety communication compliant SI unit

### EX260 - F PS1

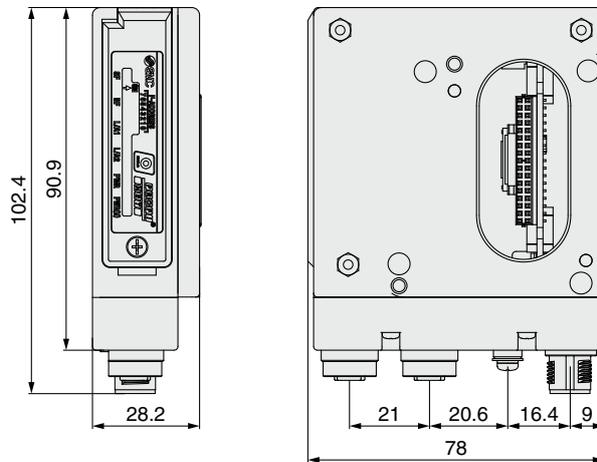
Communication protocol ●

Symbol	Protocol	Number of outputs	Output polarity	Communication connector	Manifold symbol	Applicable manifold
PS1	PROFIsafe	32	Source/PNP (Negative common)	M12	FPN	SY3000/5000/7000 JSY1000/3000/5000

## Dimensions

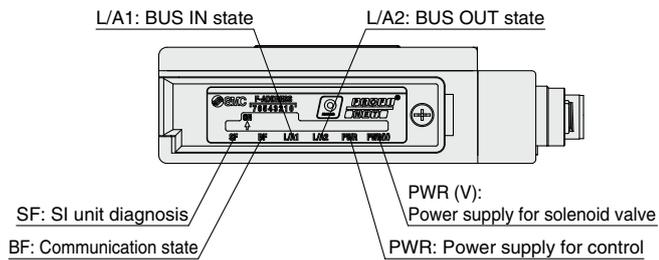
M12 communication connector type

For PROFIsafe

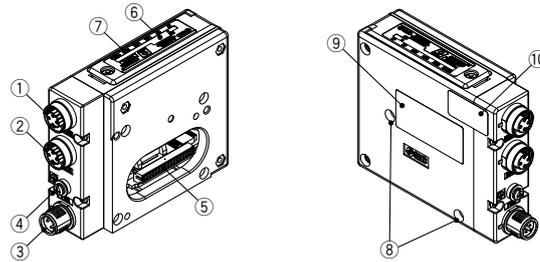


## LED Indicator

For PROFIsafe EX260-FPS1



## Parts description



No.	Components	Function
1	PROFINET connection (BUS OUT)	PROFINET connection for Port 2 M12 4-pin socket, D-coded
2	PROFINET connection (BUS IN)	PROFINET connection for Port 1 M12 4-pin socket, D-coded
3	Power supply connection	Power supply for valves and power supply for logic of the SI unit M12 4-pin plug, A-coded
4	FE terminal	Functional earth terminal M3 screw
5	Output connector	Output connection for valve manifold
6	F-Address switch under the switch cover	An eight-bit DIP-Switch is provided for the safety address setting
7	LED indicators	LED display to indicate the status of SI Unit
8	Mounting hole	Mounting hole for connection to the valve manifold
9	Production label	Production label indicates the SI Unit information, MAC address and so on
10	Security label	To prevent hardware modification

## Accessories

Components	Function
Hexagon socket head cap screw	2pcs. M3 x 30 screw for connection to the valve manifold
Seal cap	1pc. seal cap for unused fieldbus interface connector

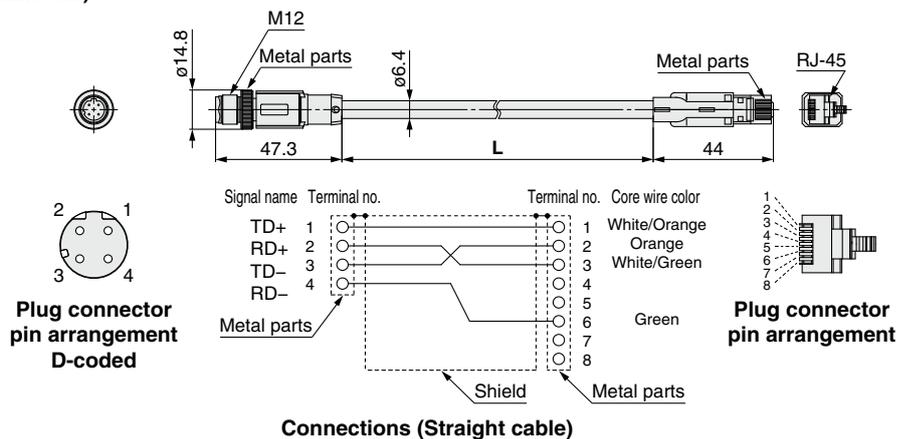
## ① Communication Cable

### EX9-AC 020 EN-PSRJ (Plug/RJ-45 connector)

#### ● Cable length (L)

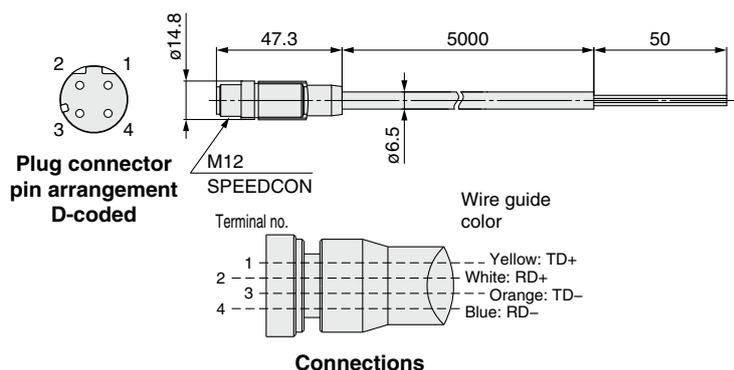
010	1000 mm
020	2000 mm
030	3000 mm
050	5000 mm
100	10000 mm

Item	Specifications
Cable O.D.	ø6.4 mm
Conductor nominal cross section	0.14 mm <sup>2</sup> /AWG26
Wire O.D. (Including insulator)	0.98 mm
Min. bending radius (Fixed)	26 mm



### PCA-1446566 (Plug)

Item	Specifications
Cable O.D.	ø6.5 mm
Conductor nominal cross section	0.34 mm <sup>2</sup> /AWG22
Wire O.D. (Including insulator)	1.55 mm
Min. bending radius (Fixed)	19.5 mm



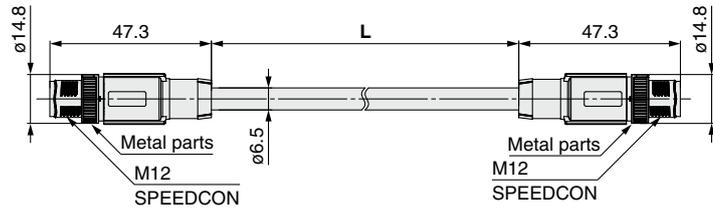
# EX260 Series

## ① Communication Cable

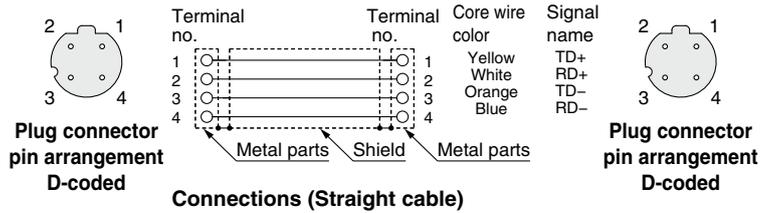
### EX9-AC 005 EN-PSPS (With connector on both sides (Plug/Plug))

● Cable length (L)

005	500 mm
010	1000 mm
020	2000 mm
030	3000 mm
050	5000 mm
100	10000 mm



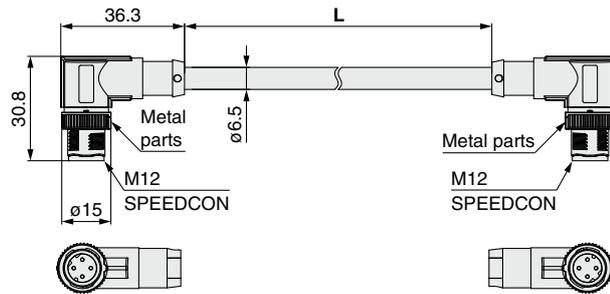
Item	Specifications
Cable O.D.	φ6.5 mm
Conductor nominal cross section	0.34 mm <sup>2</sup> /AWG22
Wire O.D. (Including insulator)	1.55 mm
Min. bending radius (Fixed)	19.5 mm



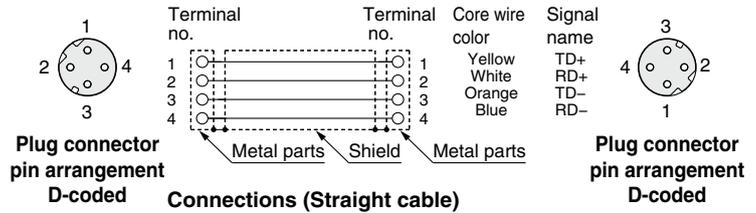
### EX9-AC 005 EN-PAPA (With angled connector on both sides (Plug/Plug))

● Cable length (L)

005	500 mm
010	1000 mm
020	2000 mm
030	3000 mm
050	5000 mm
100	10000 mm

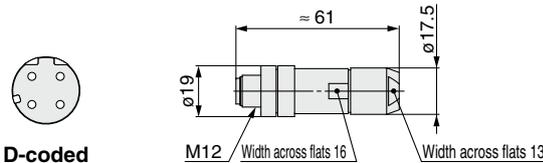


Item	Specifications
Cable O.D.	φ6.5 mm
Conductor nominal cross section	0.34 mm <sup>2</sup> /AWG22
Wire O.D. (Including insulator)	1.55 mm
Min. bending radius (Fixed)	19.5 mm



## ② Field-wireable Communication Connector

### PCA-1446553



#### Applicable Cable

Item	Specifications
Cable O.D.	4.0 to 8.0 mm
Wire gauge (Stranded wire cross section)	0.14 to 0.34 mm <sup>2</sup> /AWG26 to 22

\* The table above shows the specifications for the applicable cable. Adaptation for the connector may vary on account of the conductor construction of the electric wire.

## ③ Power Supply Cable (For SI unit)

EX500-AP **050** - **S**

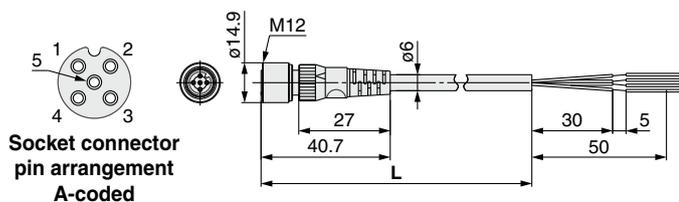
Cable length (L)

<b>010</b>	1000 mm
<b>050</b>	5000 mm

Connector specification

<b>S</b>	Straight
<b>A</b>	Angled

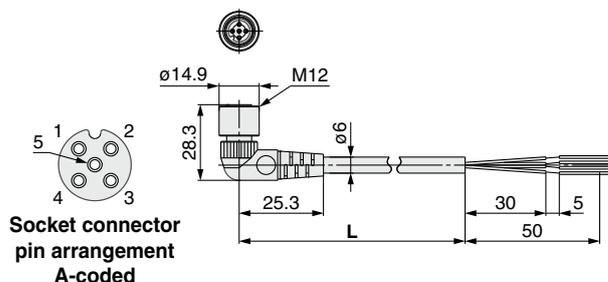
### Straight connector type



Socket connector pin arrangement A-coded

Item	Specifications
Cable O.D.	ø6 mm
Conductor nominal cross section	0.3 mm <sup>2</sup> /AWG22
Wire O.D. (Including insulator)	1.5 mm
Min. bending radius (Fixed)	40 mm

### Angled connector type



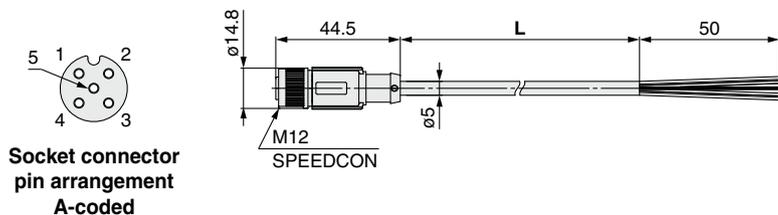
Socket connector pin arrangement A-coded

Item	Specifications
Cable O.D.	ø6 mm
Conductor nominal cross section	0.3 mm <sup>2</sup> /AWG22
Wire O.D. (Including insulator)	1.5 mm
Min. bending radius (Fixed)	40 mm

PCA- **1401804**

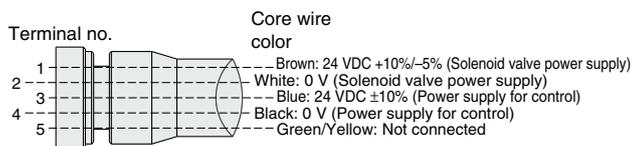
Cable length (L)

<b>1401804</b>	1500 mm
<b>1401805</b>	3000 mm
<b>1401806</b>	5000 mm



Socket connector pin arrangement A-coded

Item	Specifications
Cable O.D.	ø5 mm
Conductor nominal cross section	0.34 mm <sup>2</sup> /AWG22
Wire O.D. (Including insulator)	1.27 mm
Min. bending radius (Fixed)	21.7 mm



## ⑤ Seal Cap (10 pcs.)

Use this on ports that are not being used for communication connector (M12 connector socket).

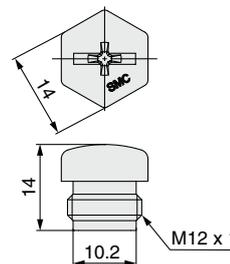
Use of this seal cap maintains the integrity of the IP67 enclosure.

\* Tighten the seal cap with the prescribed tightening torque. (For M12: 0.1 N·m)

EX9-AW **TS**

Connector specification

<b>TS</b>	For M12 connector socket (10 pcs.)
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For M12 connector socket

# EX260 Series Made to Order

Please contact SMC for detailed specifications and lead times.



## Power Supply Cable

With connector on one side (Socket)

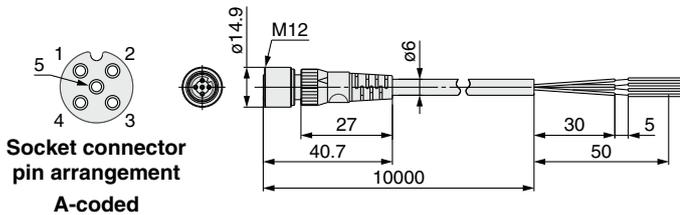
Cable length: 10000 mm

EX500-AP100-**S**-X1

• Connector specification

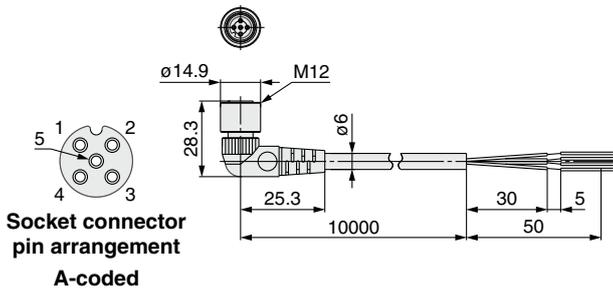
<b>S</b>	Straight
<b>A</b>	Angled

### Straight connector type

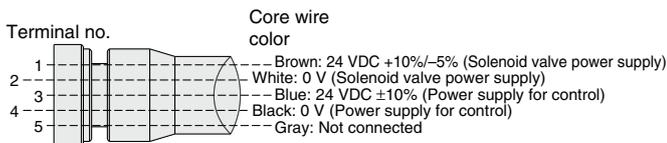


Item	Specifications
Cable O.D.	ø6 mm
Conductor nominal cross section	0.3 mm <sup>2</sup> /AWG22
Wire O.D. (Including insulator)	1.5 mm
Min. bending radius (Fixed)	40 mm

### Angled connector type



Item	Specifications
Cable O.D.	ø6 mm
Conductor nominal cross section	0.3 mm <sup>2</sup> /AWG22
Wire O.D. (Including insulator)	1.5 mm
Min. bending radius (Fixed)	40 mm





# EX260-FPS1

## Specific Product Precautions

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For fieldbus system precautions, refer to the “Handling Precautions for SMC Products” and the “Operation Manual” on the SMC website: <https://www.smcworld.com>

### Wiring

#### Caution

1. **Select connectors that are  $\phi 16$  or less if mounting valve manifolds directly using field-wireable connectors for SI unit power supply wiring.**

Using large diameter connectors causes interference with the mounting surface.

The following cables with connectors are recommended.

<Cable with connector>

- EX500-AP□□□□-□
- PCA-1401804/-1401805/-1401806

### Operating Environment

#### Caution

1. **Select the proper type of enclosure according to the operating environment.**

IP67 is achieved when the following conditions are met.

- 1) Provide appropriate wiring between all units using electrical wiring cables, communication connectors and cables with M12 connectors.
- 2) Appropriately mount each unit and valve manifold.
- 3) Be sure to mount a seal cap on any unused connectors.

If using in an environment that is exposed to water splashes, please take measures such as using a cover.

When the enclosure is IP40, do not use in an operating environment or atmosphere where it may come in contact with corrosive gas, chemical agents, seawater, water, or water vapor.

### Adjustment / Operation

#### Caution

1. **For details on programming and address setting, refer to the manual from the PLC manufacturer.**

The programming content related to the protocol is designed by the manufacturer of the PLC used.

## Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)\*1), and other safety regulations.

 **Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

 **Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

 **Danger:** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

\*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.  
ISO 4413: Hydraulic fluid power – General rules relating to systems.  
IEC 60204-1: Safety of machinery – Electrical equipment of machines.  
(Part 1: General requirements)  
ISO 10218-1: Manipulating industrial robots – Safety.  
etc.

### Warning

#### 1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

#### 2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

#### 3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

#### 4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

### Caution

#### 1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.  
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.  
If anything is unclear, contact your nearest sales branch.

### Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

#### Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.\*2)  
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.  
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

##### \*2) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.  
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

#### Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

### Caution

#### SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

## Safety Instructions

Be sure to read the “Handling Precautions for SMC Products” (M-E03-3) and “Operation Manual” before use.