Fieldbus System (128 Points/64 Points)

EX500 Series

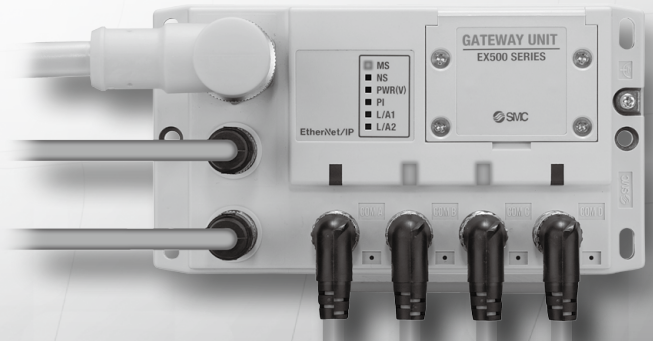## Decentralized valve installation

⌄

Valves can be installed
near the actuators!

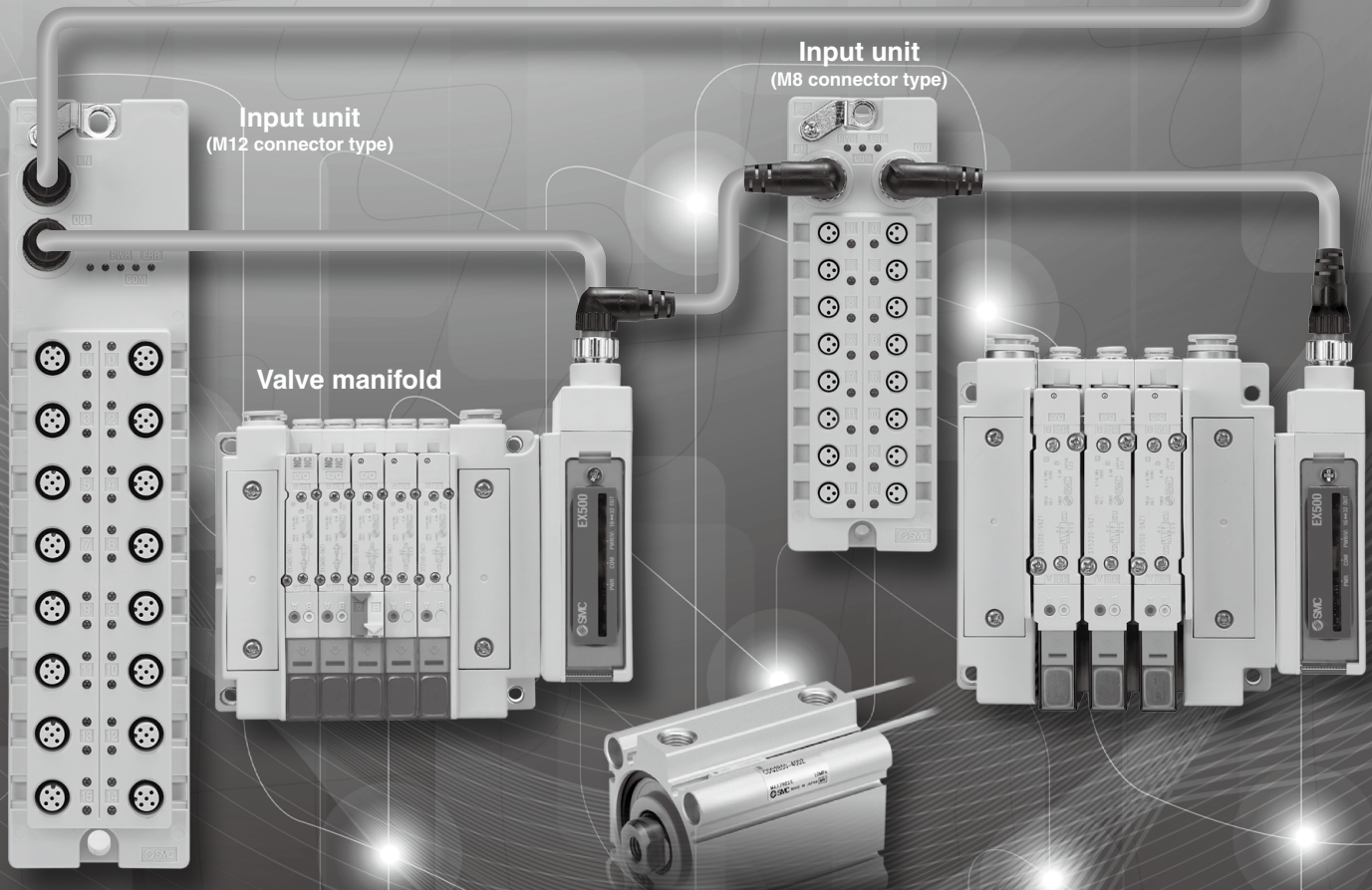| Reduced piping space and piping materials | Reduced wiring space | No need to set the address for the valve manifolds and input units |

C E | c**UL**us | RoHS

∗ Only the SY and SV valves are UL-compliant.

GW unit (Gateway unit)

Description	Compatible protocol	Number of inputs/outputs	Number of valve manifold and input unit connections	Branch cable length	New function
Gateway Decentralized System 2 Page 61	*PROFINET* Ether Net/IP	**128 inputs/ 128 outputs**	**Max. 16 units**	**Max. 20 m**	**Web server function** • Valve operation test • Connection diagnostic • Short-circuit diagnostic Page 56
Gateway Decentralized System Page 75	DeviceNet *PROFIBUS*	**64 inputs/ 64 outputs**	**Max. 8 units**	**Max. 10 m**	—

Input unit (M8 connector type)

Input unit (M12 connector type)

Valve manifold

EX500

EX500

SMC

EX260
EX123/124/126
Type 1

EX500
Type 2

EX600
EX245
EX250
Type 3

EX120/121/122
EX140
Type 1
EX180
EX510
Type 2
M8/M12
ATEX

EX500 *Series* Fieldbus System

Gateway Decentralized System 2 (128 Points)

● **Number of branch ports: 4**

Number of inputs/outputs ▶ **128** inputs/ **128** outputs
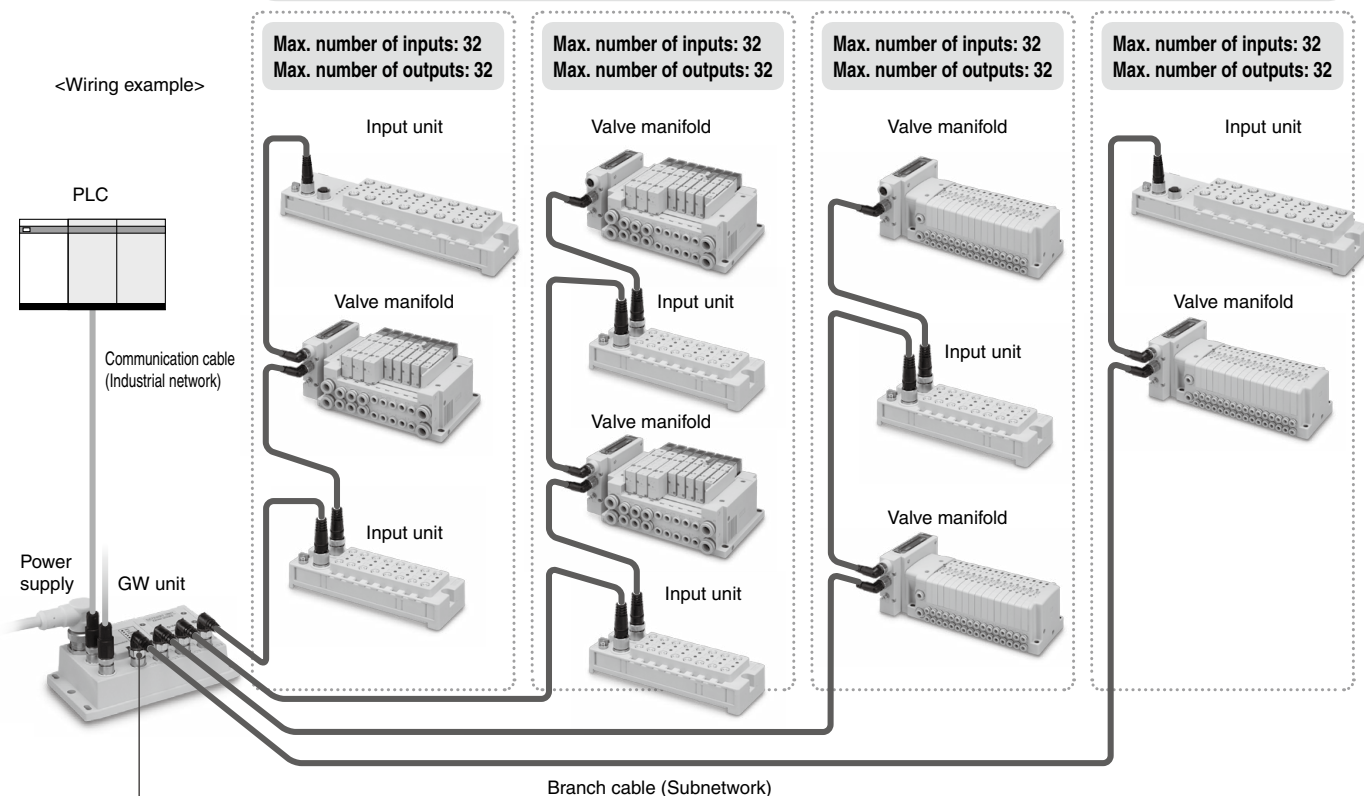
● Number of inputs/outputs per branch: Max. **32** inputs/**32** outputs

Number of valve manifold connections ▶ Max. **8** units[*1] **Number of input unit connections** ▶ Max. **8** units

● Number of valve manifold connections per branch: Max. **2** units[*1] ● Number of input unit connections per branch: Max. **2** units

Total cable length per branch ▶ Max. **20** m

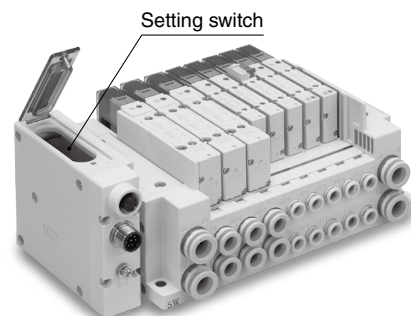*1 When the number of outputs is set to "16 outputs" using the built-in setting switch of the SI unit

Maximum number of inputs: 128 points **Maximum number of outputs: 128** points

| Max. number of inputs: 32 Max. number of outputs: 32 | Max. number of inputs: 32 Max. number of outputs: 32 | Max. number of inputs: 32 Max. number of outputs: 32 | Max. number of inputs: 32 Max. number of outputs: 32 |

<Wiring example>

PLC

Communication cable (Industrial network)

Power supply   GW unit

Branch port

Input unit

Valve manifold

Input unit

Valve manifold

Input unit

Valve manifold

Input unit

Valve manifold

Valve manifold

Input unit

Valve manifold

Input unit

Valve manifold

Branch cable (Subnetwork)

Setting switch

Two valve manifolds can be connected to one branch port.

The SI unit has a built-in setting switch which switches the number of outputs (32 points/16 points) of the valve manifold connected to the SI unit. By setting the number of outputs to 16 points, two valve manifolds can be installed to one branch port.
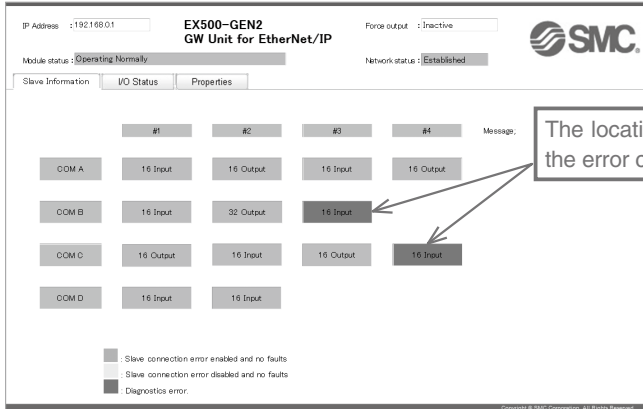
SI unit

55

SMC

EX260

EX123/124/126 | Type 1

EX500 | Type 2

EX600

EX245 | Type 3

EX250

EX120/121/122

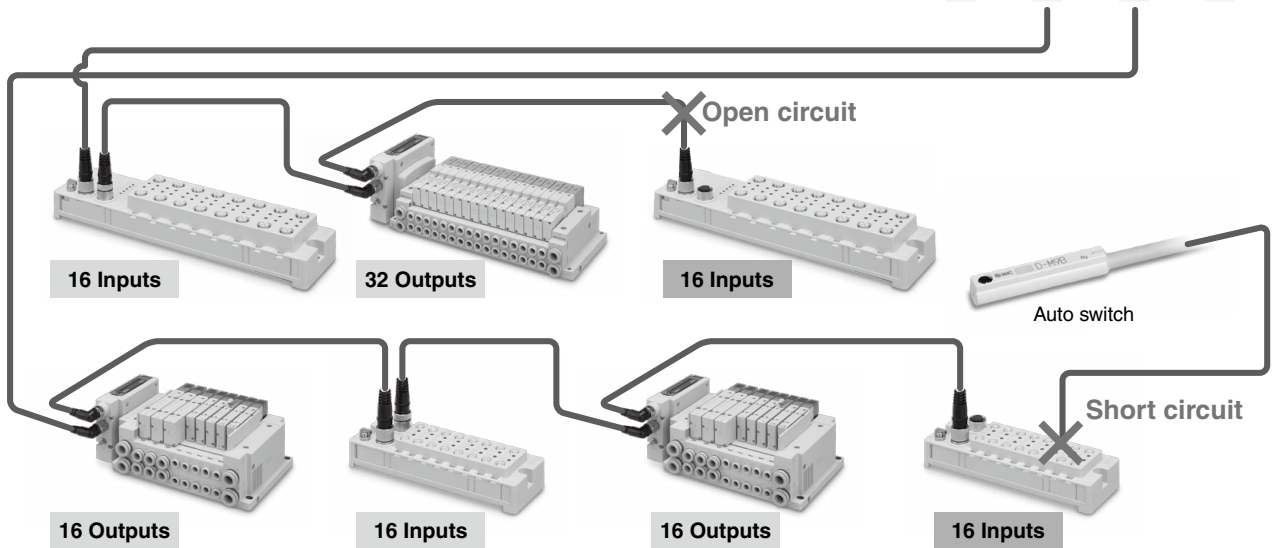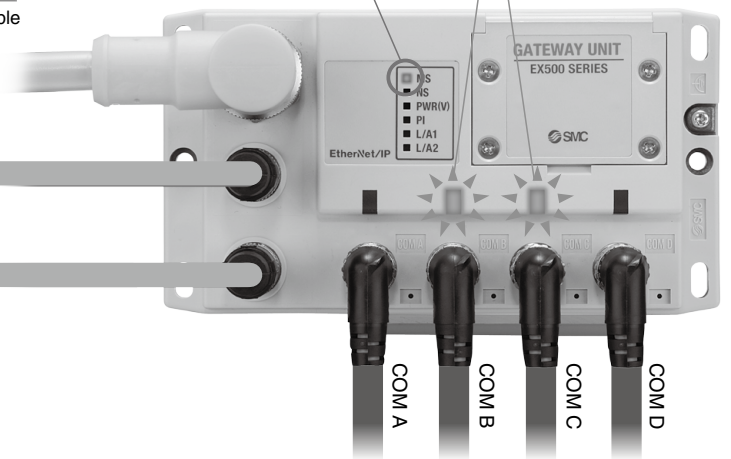EX140 | Type 1

EX180

EX510 | Type 2

M8/M12

ATEX

Web server function

A valve operation test (ON/OFF), a connection diagnostic between the valve manifolds and the input units, and a short-circuit diagnostic of input devices can be performed on a web browser.

A password can be used for the valve operation test (ON/OFF) for security.

IP Address : 192.168.0.1 | **EX500-GEN2** **GW Unit for EtherNet/IP** | Force output : Inactive | **SMC.**

Module status : Operating Normally | Network status : Established

Slave Information | I/O Status | Properties

	#1	#2	#3	#4	Message:
COM A	16 Input	16 Output	16 Input	16 Output	
COM B	16 Input	32 Output	16 Input		
COM C	16 Output	16 Input	16 Output	16 Input	
COM D	16 Input	16 Input			

The location of the error can be identified. Details of the error can be identified on a web browser.

- Slave connection error enabled and no faults
- Slave connection error disabled and no faults
- Diagnostics error.

Copyright © SMC Corporation. All Rights Reserved.

∗ Web display example

PC

RJ-45 connector

Red LED ON

Green LED flashing
These ports are in error.

GATEWAY UNIT EX500 SERIES

MS
NS
PWR(V)
PI
L/A1
L/A2

EtherNet/IP

SMC

COM A | COM B | COM C | COM D

Open circuit

16 Inputs | **32 Outputs** | **16 Inputs**

Auto switch

Short circuit

16 Outputs | **16 Inputs** | **16 Outputs** | **16 Inputs**

No need to set the address

I/O mapping for the SI unit and input unit is set by the gateway unit automatically.

The unit installation order is not specified.

(The upper limit of the inputs/outputs is 32 points for one branch port.)

Gateway Decentralized System 2 (128 Points)

Reduced wiring

The amount of communication and power supply wiring for the I/O device can be reduced.

Reduction in number of communication nodes

By reducing the number of communication nodes, the load on the network is reduced.

Accessories can be ordered together.

Page **67**   Page **84**

Accessories including cables and connectors can be ordered together from SMC. Parts selection and ordering times as well as delivery management can be reduced.

Flexibly copes with changes in the protocol

Previously, it was necessary to change the part number of the slave unit, return the slave unit, and make arrangements once again to obtain a new unit (additional quotation, delivery management).

Now, only the GW unit needs to be changed.

Applicable to output devices other than valve manifolds

Page **71**

By using an output block, lights and buzzers can be operated.

Output block

Output device

Solenoid valve

Others
Indicator light, Relay, Buzzer
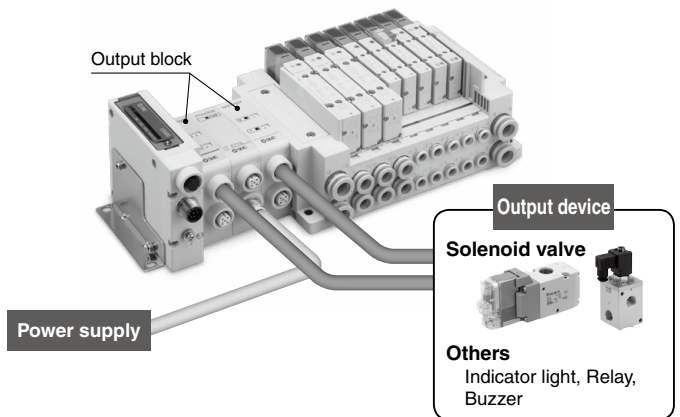
Power supply

Specified valve manifolds can be controlled by supplying power from a different system.

Page **69**

By using a Y branch connector, power from a different system can be supplied to the SI unit (valve manifold).
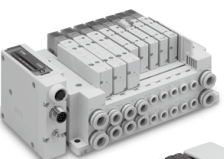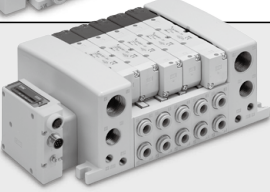
<Example of use>

Workpieces machined by robots

Power supply A

Valve manifold for holding a workpiece when robots are operating

Valve manifold for holding a workpiece when supplying parts

Workpieces placed by an operator. (Parts supply)

Rotational workbench

Power is off when parts are being positioned.

Y branch connector

Power supply B

SMC
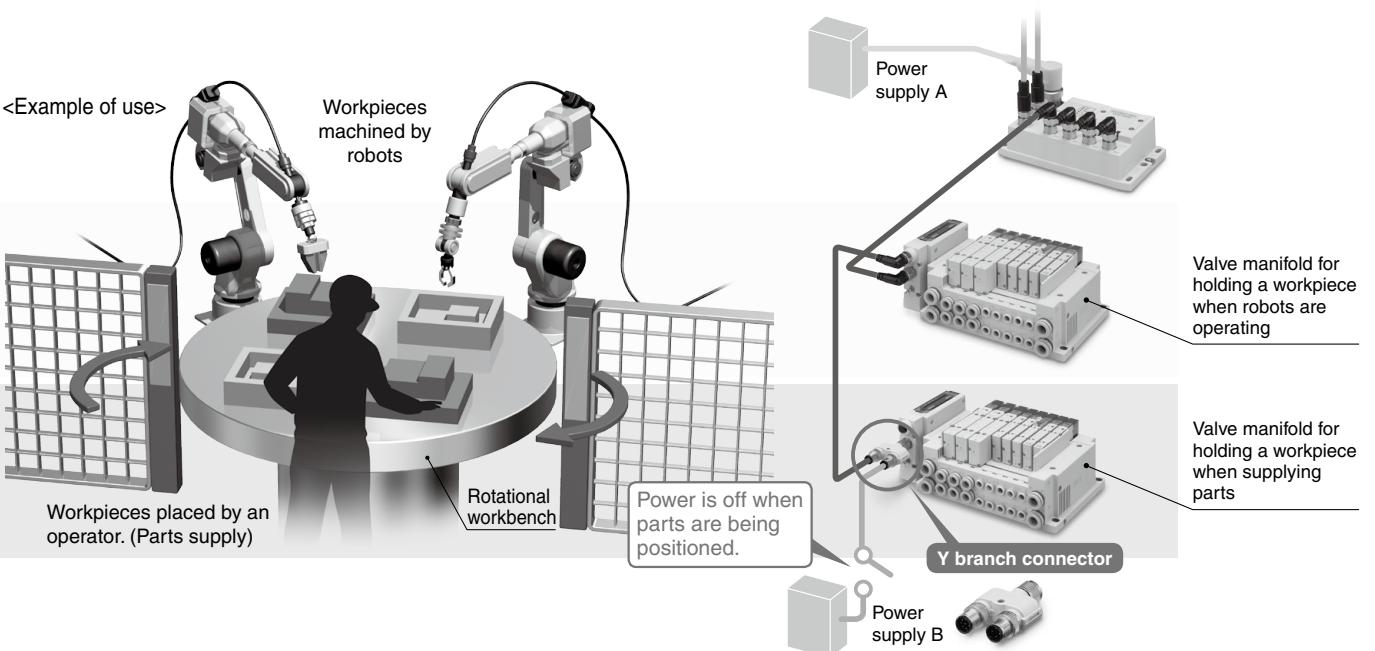
System Comparison Table

	Gateway Decentralized System 2	Gateway Decentralized System (Current model)
Protocol	PROFINET® EtherNet/IP™	DeviceNet™ PROFIBUS®
Number of inputs/outputs (Number of inputs/outputs per branch)	**128 inputs/128 outputs** **(32 inputs/32 outputs)**	64 inputs/64 outputs (16 inputs/16 outputs)
Number of valve manifold connections (Number of connections per branch)	**Max. 8 units**[*1] **(Max. 2 units)**	Max. 4 units (1 unit)
Number of input unit connections (Number of connections per branch)	**Max. 8 units** **(Max. 2 units)**	Max. 4 units (1 unit)
Branch cable length	**Max. 20 m**	Max. 10 m
Enclosure	GW unit: IP65 SI unit: IP67 Input unit: IP67	GW unit: IP65 SI unit: IP67 Input unit: IP65
Function	Web server function (Valve operation test, Connection diagnostic, Short-circuit diagnostic)	—
Page	61	75

[*1] When the number of outputs is set to "16 outputs" using the built-in setting switch of the SI unit
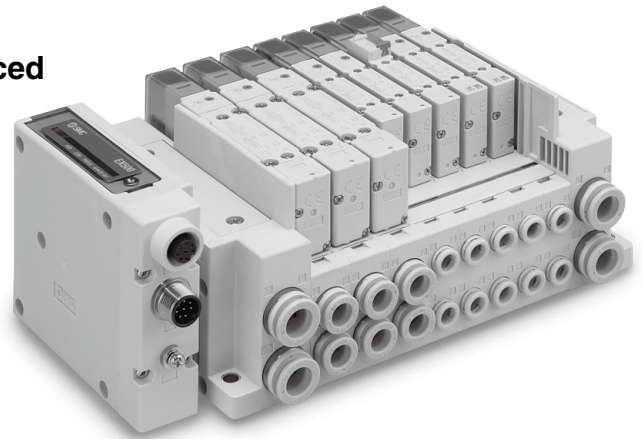
Applicable Valve Series

Series		Flow rate characteristics (4/2→5/3)		Maximum number of solenoids	Power consumption [W]	Enclosure	Standards	Page
		C [dm³/(s·bar)]	b					
	SY3000	1.6	0.19	32	0.35 (Standard) 0.1 (With power-saving circuit) [Inrush 0.4, Holding 0.1]	IP67	CE	Best Pneumatics No. 1-1
	SY5000	3.6	0.17					
	SY7000	5.9	0.20					
	VQC1000	1.0[*1]	0.30[*1]	24	0.4 (Standard)	IP67	CE	Best Pneumatics No. 1-2
	VQC2000	3.2[*1]	0.30[*1]					
	VQC4000	7.3[*1]	0.38[*1]		0.95 (Standard) 0.4 (Low-wattage type)			
	VQC5000	17.0[*1]	0.31[*1]					
	S0700	0.37	0.39	32	0.35	IP40	CE	Best Pneumatics No. 1-1
	SV1000	1.1	0.35	32	0.6	IP67	CE cULus	Best Pneumatics No. 1-2
	SV2000	2.4	0.18					
	SV3000	4.3	0.21					

[*1] Values for 2-position single, rubber seal type

Type 1 EX260
EX123/124/126
Type 2 EX500
EX600
Type 3 EX245
EX250
EX120/121/122
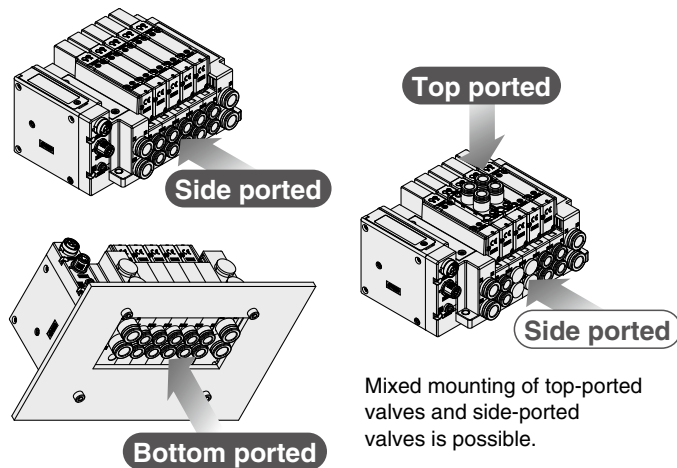Type 1 EX140
EX180
Type 2 EX510
M8/M12
ATEX

SY3000/5000/7000 Series

Piping on the top or the bottom allows for a reduced footprint and increased space saving.

Valve piping direction variations

■ Piping is possible from 3 directions.

Side ported

Top ported

Side ported

Bottom ported

Mixed mounting of top-ported valves and side-ported valves is possible.

Max. 24 stations are connectable.

■ It is possible to connect only the number of valves required, from 1 to 24 stations, to suit the application. (Maximum number of solenoids: 32)
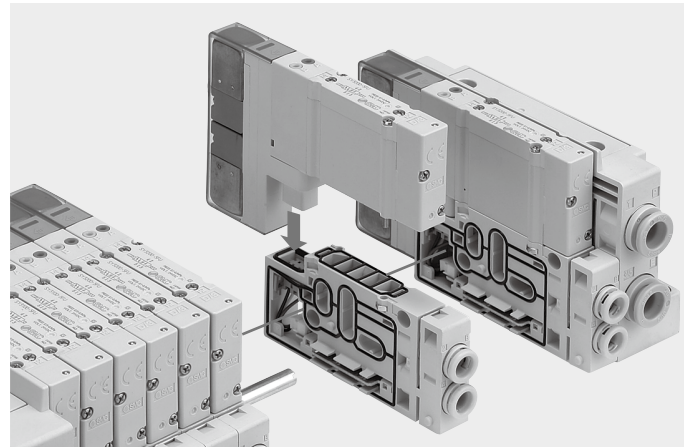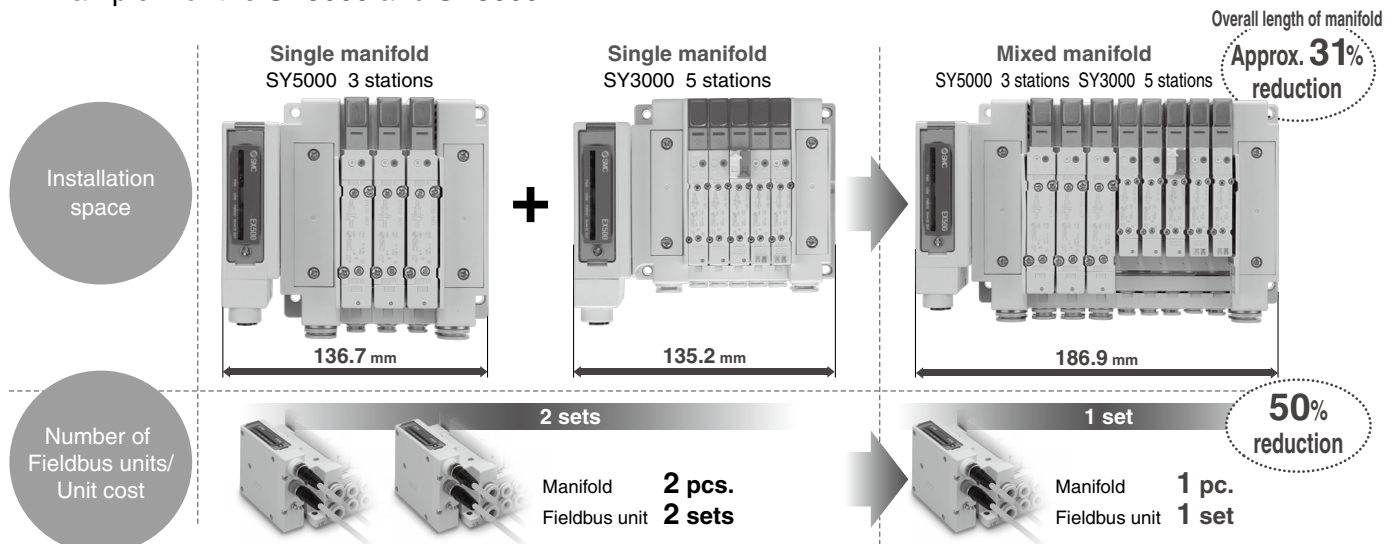
Mixed valve sizes manifold

It is also possible to install a combination of different-sized valves on the same manifold. (SY3000 and SY5000, or SY5000 and SY7000)
This facilitates a reduction in the installation space and number of units/cables.
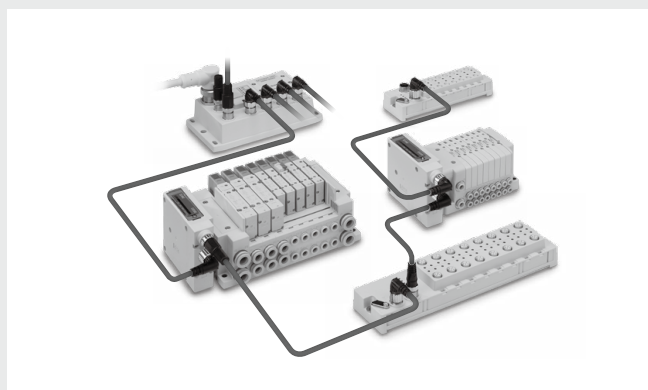
■ Example: For the SY5000 and SY3000

Overall length of manifold
Approx. 31% reduction

Single manifold SY5000 3 stations	**Single manifold** SY3000 5 stations	**Mixed manifold** SY5000 3 stations SY3000 5 stations	

Installation space

136.7 mm + **135.2** mm → **186.9** mm

Number of Fieldbus units/ Unit cost

2 sets

Manifold **2 pcs.**
Fieldbus unit **2 sets**

1 set

Manifold **1 pc.**
Fieldbus unit **1 set**

50% reduction

SMC

CONTENTS

Type 1 EX260
EX123/124/126
Type 2 EX500
EX600
Type 3 EX245
EX250
EX120/121/122
Type 1 EX140
EX180
Type 2 EX510
M8/M12
ATEX

Type 2 **Gateway type**

Fieldbus System (128 Points/64 Points)
EX500 Series

Fieldbus System
Gateway Decentralized System 2 (128 Points)
EX500 Series $C \in$ $_C \mathbf{\Omega}_{US}$

∗ Only the SY and SV valves
  are UL-compliant.

(RoHS)

★ **Valve manifolds and input units can be connected around the GW (Gateway) unit.**

★ **Compatible with other protocols by replacing the GW unit**

★ **Number of inputs/outputs = 128 points/128 points**
   The number of outputs (solenoids) per branch is 32 points.

★ **Number of valve manifold connections = Max. 8 units, Number of input unit connections = Max. 8 units, Branch cable length = Max. 20 m**

★ **Web server function (Valve operation test, Connection diagnostic of units, Short-circuit diagnostic of input devices)**

★ **No need to set the address for the valve manifolds or input units**
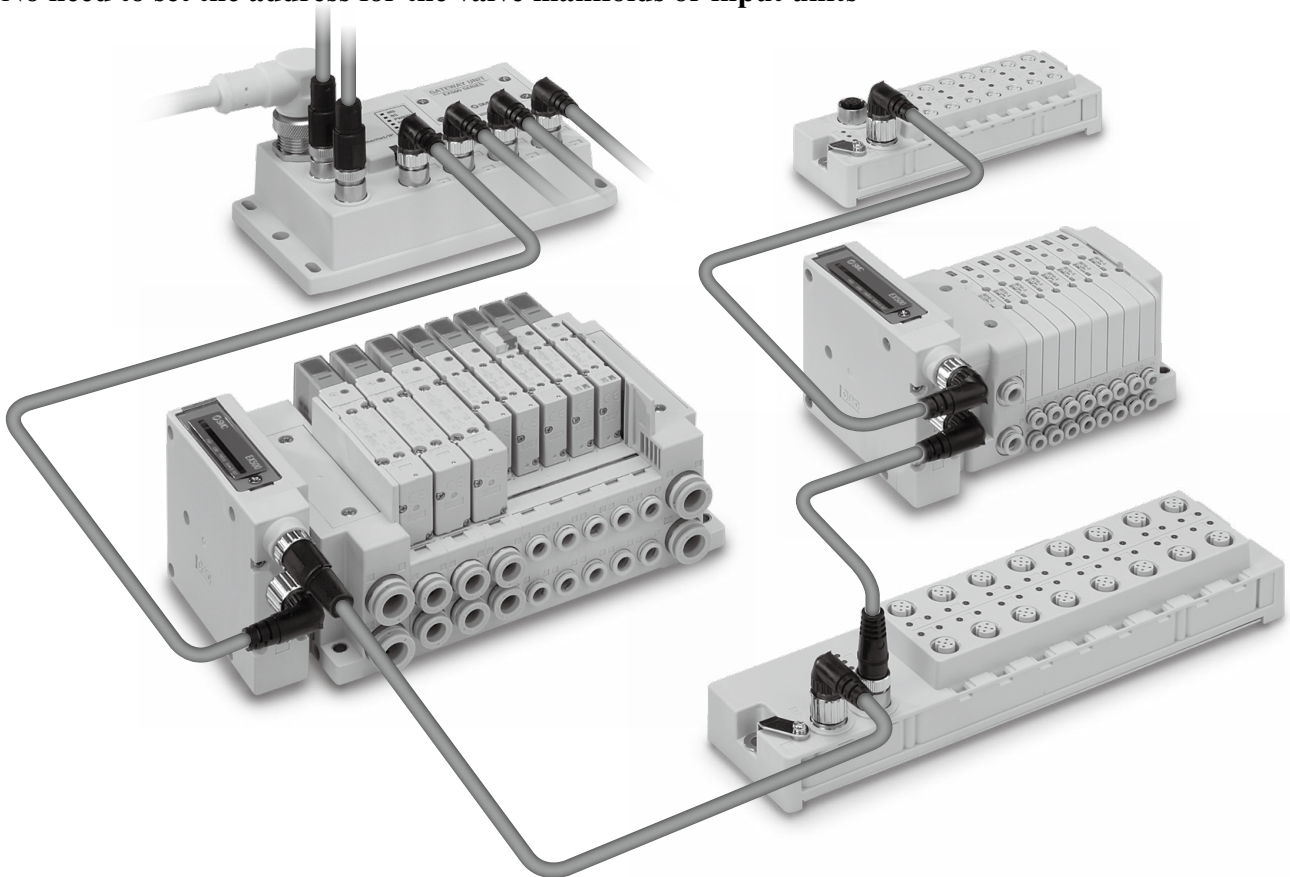
Manifold Solenoid Valves

SY3000/5000/7000	VQC1000/2000/4000/5000	S0700	SV1000/2000/3000

⊿SMC

EX500 *Series*
Gateway Decentralized System 2 (128 Points)
GW Unit

RoHS

How to Order

$$EX500-G\boxed{EN2}$$

Protocol

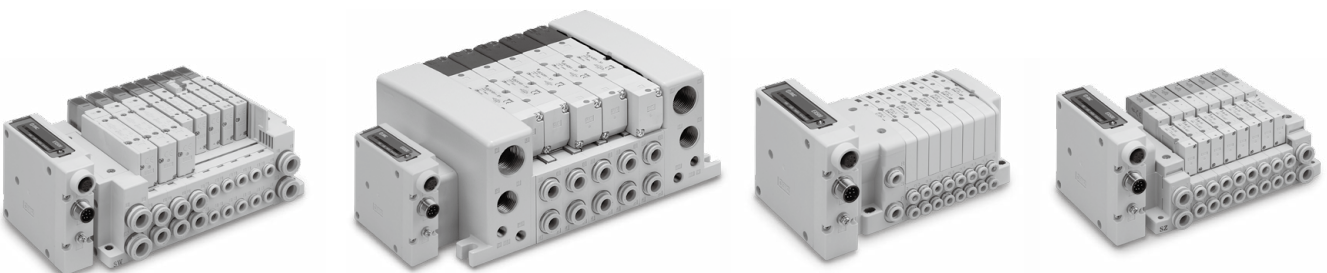| EN2	EtherNet/IP™ (Input/Output = 128 points/128 points)
PN2	PROFINET (Input/Output = 128 points/128 points)

Specifications

	Model	EX500-GEN2	EX500-GPN2
Communication	Protocol	EtherNet/IP™∗1	PROFINET IO
	Version∗2	Volume 1 (Edition 3.14) Volume 2 (Edition 1.15)	PROFINET Specification Version 2.2
	Media	100BASE-TX	100BASE-TX
	Communication speed	10/100 Mbps (Automatic)	100 Mbps
	Communication method	Full duplex/Half duplex (Automatic)	Full duplex
	Number of inputs/ outputs (I/O occupation area)	128 inputs/128 outputs (20 bytes/20 bytes)	128 inputs/128 outputs (18 bytes/16 bytes)
	Configuration file∗3	EDS file	GSDML
	IP address setting range	Switch settings: 192.168.0.1 to 254 or 192.168.1.1 to 254, Through DHCP server: Optional address	Optional address
	Device information	Vendor ID: 7 (SMC Corporation) Product type: 12 (Communication Adapter), Product code: 198	—
	Applicable function	DLR QuickConnect™ Web server	MRP Fast Start Up Web server
Power supply voltage	For input and control	24 VDC ±10%	
	For valve	24 VDC +10%, −5%	
Current consumption	For input and control	6.2 A or less (Max. 1.5 A per branch x 4 branches + GW unit internal current consumption: 0.2 A or less)	
	For output (valve)	4 A or less (Max. 1 A per branch x 4 branches)	
Branch port	Number of branch ports	4 ports	
	Number of inputs and outputs	32 inputs/32 outputs per branch	
	Branch cable length	20 m or less per branch	
Environmental resistance	Enclosure	IP65	
	Operating temperature range	Operating: −10 to +50°C, Stored: −20 to +60°C (No condensation)	
	Operating humidity range	Operating, Stored: 35 to 85%RH (No condensation)	
Standards		CE marking (EMC directive/ RoHS directive), UL (CSA)	
Weight		550 g	
Enclosed parts		Seal cap (for M12 connector socket) 5 pcs.	

∗1 Use a CAT5 or higher communication cable.
∗2 Please note that the version is subject to change.
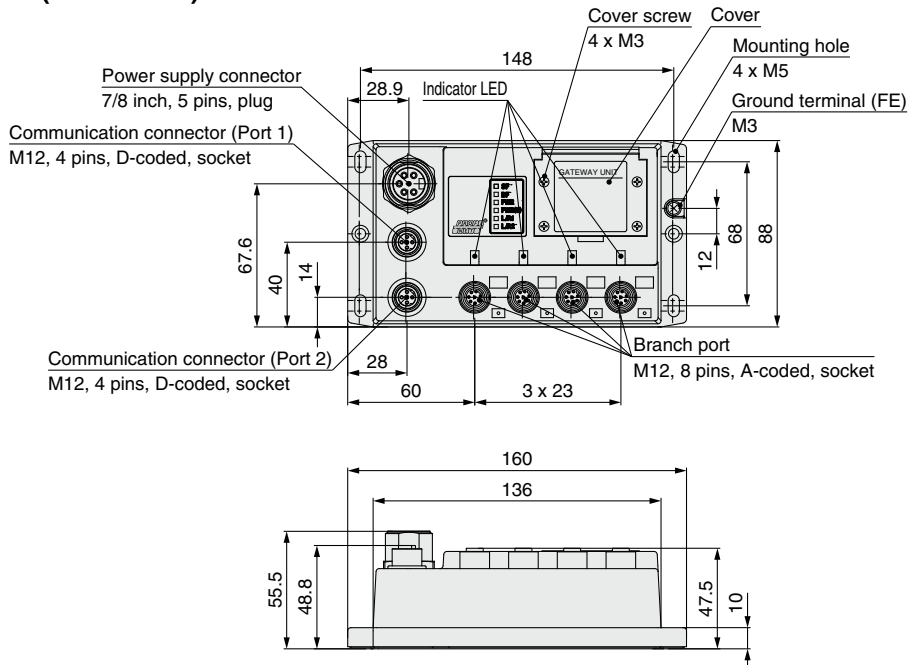∗3 The setting file can be downloaded from SMC website, http://www.smcworld.com

SMC

EX500 *Series*

Dimensions/Parts Description

EX500-GEN2 (EtherNet/IP™)

Cover screw
4 x M3

Cover (Setting switch)

Mounting hole
4 x M5

Ground terminal (FE)
M3

Power supply connector
7/8 inch, 4 pins, plug

Indicator LED

Communication connector (Port 1)
M12, 4 pins, D-coded, socket

148

28.9

67.6

40

14

68

88

12

Communication connector (Port 2)
M12, 4 pins, D-coded, socket

28

60

3 x 23

Branch port
M12, 8 pins, A-coded, socket

160

136

55.5

48.8

47.5

10

EX500-GPN2 (PROFINET)

Cover screw
4 x M3

Cover

Mounting hole
4 x M5

Ground terminal (FE)
M3

Power supply connector
7/8 inch, 5 pins, plug

Indicator LED

Communication connector (Port 1)
M12, 4 pins, D-coded, socket

GATEWAY UNIT

148

28.9

67.6

40

14

68

88

12

Communication connector (Port 2)
M12, 4 pins, D-coded, socket

28

60

3 x 23

Branch port
M12, 8 pins, A-coded, socket

160

136

55.5

48.8

47.5

10

SMC

Gateway Decentralized System 2 (128 Points)
SI Unit

Output unit for valve manifold connection

How to Order

EX500－S103

Specifications

Model	EX500-S103		
Applicable valve	SY, VQC, S0700, SV		
Output	Number of outputs	16/32 outputs (Switched by built-in setting switch)	
	Output type	Source/PNP (Negative common)	
	Rated voltage	24 VDC	
	Supply current	With power supplied to GW unit: Max. 1.0 A With external power∗1 supplied: Max. 1.5 A	
Internal current consumption	50 mA or less		
Environmental resistance	Enclosure	IP67	
	Operating temperature range	Operating: −10 to +50°C, Stored: −20 to +60°C (No condensation)	
	Operating humidity range	Operating, Stored: 35 to 85%RH (No condensation)	
Standards	CE marking, UL (CSA), RoHS compliant		
Weight	200 g		
Enclosed parts	Seal cap (for M12 connector socket) 1 pc.		
	Valve manifold mounting screw (M3 x 30) 2 pcs.		

∗1 When an accessory, Y branch connector, is used.

Dimensions/Parts Description
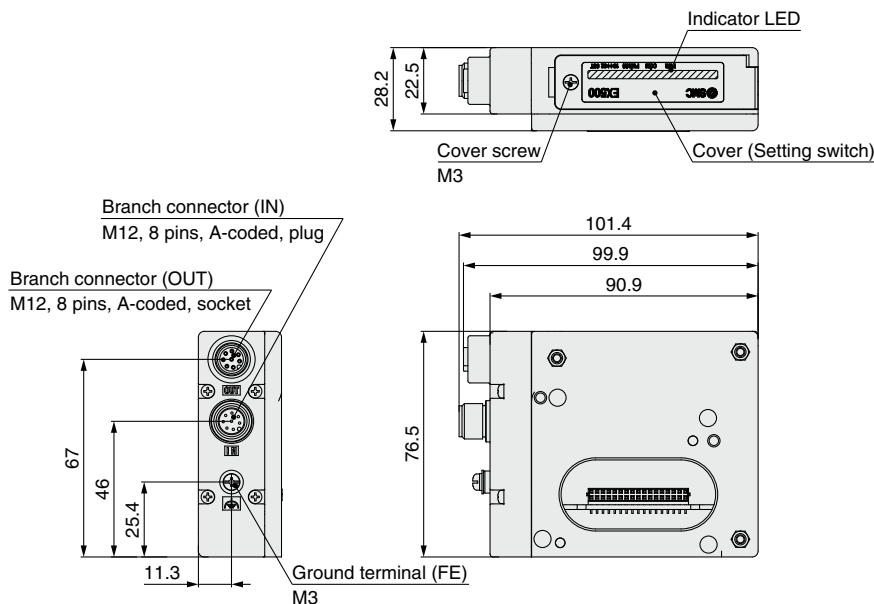
Indicator LED

28.2
22.5

Cover screw
M3

Cover (Setting switch)

Branch connector (IN)
M12, 8 pins, A-coded, plug

Branch connector (OUT)
M12, 8 pins, A-coded, socket

101.4
99.9
90.9

76.5

67
46
25.4

11.3

Ground terminal (FE)
M3

Type 1   EX260
EX123/124/126
Type 2   EX500
EX600
Type 3   EX245
EX250
EX120/121/122
Type 1   EX140
EX180
Type 2   EX510
M8/M12
ATEX

EX500 Series
Gateway Decentralized System 2 (128 Points)
Input Unit

CE c UL US

RoHS
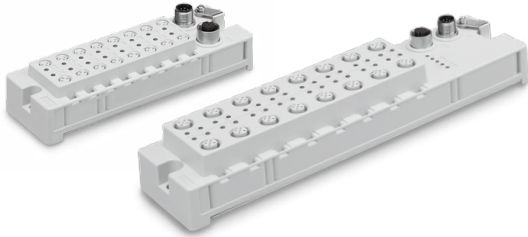
How to Order

EX500－DX P A

Input unit ● ● **Connector type**

A	M8 connector type
B	M12 connector type

Specifications

Model		EX500-DXPA	EX500-DXPB
Connector type		M8 connector	M12 connector
Input	**Number of inputs**	16 inputs	
	Input type	PNP sensor input	
	Rated voltage	24 VDC	
	Supply current	Max. 1.3 A/Unit [Total of 8 connectors of even number must be Max. 0.65 A, 8 connectors of odd number must be Max. 0.65 A]	
	Input ON voltage/Input ON current	11 V or more/Typ. 7 mA (at 24 VDC)	
	Input OFF voltage/Input OFF current	5 V or less/1.5 mA or less	
Internal current consumption		200 mA or less (when the input signal is ON)	
Environmental resistance	**Enclosure**	IP67	
	Operating temperature range	Operating: −10 to +50°C, Stored: −20 to +60°C (No condensation)	
	Operating humidity range	Operating, Stored: 35 to 85%RH (No condensation)	
Standards		CE marking, UL (CSA), RoHS compliant	
Weight		250 g	450 g
Enclosed parts		Seal cap (for M8 connector socket) 16 pcs.	Seal cap (for M12 connector) 17 pcs.
		Seal cap (for M12 connector socket) 1 pc.	

Dimensions/Parts Description

EX500-DXPA

Ground terminal (FE)

Branch connector (IN)
M12, 8 pins,
A-coded, plug

Indicator LED

Branch connector (OUT)
M12, 8 pins,
A-coded, socket

Connector
M8, 3 pins,
socket

Indicator LED

2 x M4

49
37
24.5
12
149
138
7 x 12
121.7
24.5
35.2
34.3
12
(7.5)
(16)

EX500-DXPB

Ground terminal (FE)

Branch connector (IN)
M12, 8 pins,
A-coded, plug

Branch connector (OUT)
M12, 8 pins,
A-coded, socket

Indicator LED

Connector
M12, 5 pins,
socket

12.9
251
222.65
201.65
7 x 20
237.5
25.05
6.75
15
30
45
60
41.3
40.3
13.2

LED Indicator

EX500-GEN2

MS: Operation state
NS: Communication state of EtherNet/IP™
PWR(V): Valve power supply
PI: Forced output
GATEWAY UNIT
L/A1
Port 1
Communication state
L/A2
Port 2
Communication state
COM A to D: Connection state

EX500-GPN2

SF: Diagnostic error/
Configuration defect
BF: PROFINET communication state
PWR: Power supply for input and control
PWR(V):
Valve power supply
GATEWAY UNIT
L/A1
Port 1
Communication state
L/A2
Port 2
Communication state
COM A to D: Connection state

EX500-S103

PWR: Power supply for input and control
SMC   EX500
COM: Communication state
PWR(V): Valve power supply

EX500-DXPA

PWR: Power supply for
input and control
COM: Communication state
ERR: Error
0 to 15:
Sensor signal state

EX500-DXPB

PWR: Power supply for
input and control
COM: Communication state
ERR: Error
0 to 15:
Sensor signal state

EX260
EX123/124/126
Type 1
EX500
Type 2
EX600
EX245
Type 3
EX250
EX120/121/122
EX140
Type 1
EX180
EX510
Type 2
M8/M12
ATEX

SMC

66

Gateway Decentralized System 2 (128 Points)
Accessories

❶ Power Supply Cable

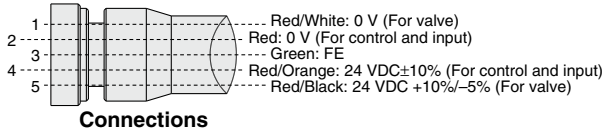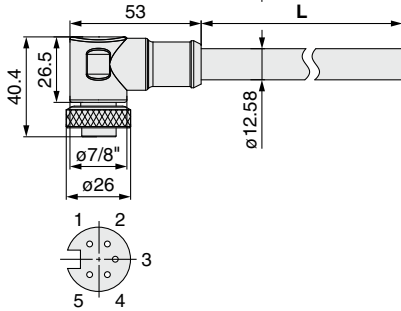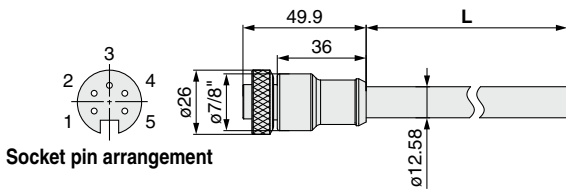Supplies power to the GW unit.

For PROFINET

PCA- 1558810

● **Connector specification, Cable length (L)**

1558810	Straight 2 m
1558823	Straight 6 m
1558836	Angle 2 m
1558849	Angle 6 m

Socket pin arrangement

Socket pin arrangement

Connections

1 ---- Red/White: 0 V (For valve)
2 ---- Red: 0 V (For control and input)
3 ---- Green: FE
4 ---- Red/Orange: 24 VDC±10% (For control and input)
5 ---- Red/Black: 24 VDC +10%/–5% (For valve)

Item	Specifications
Cable O.D.	ø12.58 mm
Conductor nominal cross section	1.5 mm²/AWG16
Wire O.D. (Including insulator)	2.35 mm
Min. bending radius (Fixed)	110 mm

For EtherNet/IP™

PCA- 1416000

● **Connector specification, Cable length (L)**

1415999	Straight 2 m
1415996	Straight 6 m
1416000	Angle 2 m
1415997	Angle 6 m

Socket pin arrangement

Socket pin arrangement

Connections

1 ---- Red: 24 VDC +10%/–5% (For valve)
2 ---- Green: 24 VDC±10% (For control and input)
3 ---- White: 0 V (For control and input)
4 ---- Black: 0 V (For valve)
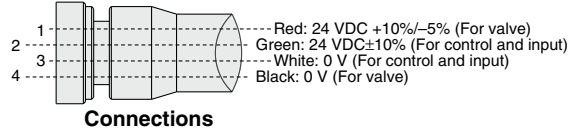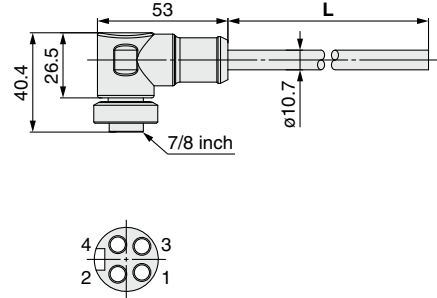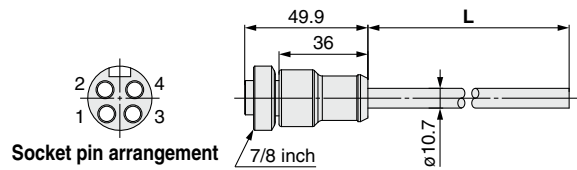
Item	Specifications
Cable O.D.	ø10.7 mm
Conductor nominal cross section	1.5 mm²/AWG16
Min. bending radius (Fixed)	94 mm

SMC

❷ Communication Cable

Connects field bus to the GW unit.

For PROFINET	For EtherNet/IP™

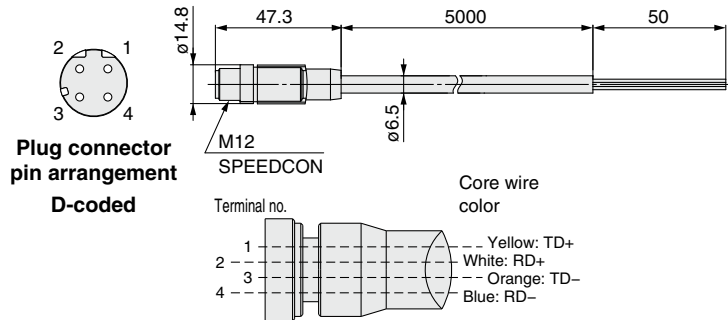### EX9-AC [020] EN-PSRJ (Plug/RJ-45 connector)

Cable length (L)

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

Plug connector pin arrangement D-coded

M12   ø14.8   Metal parts   ø6.4   Metal parts   RJ-45

47.3   L   44

Signal name	Terminal no.		Terminal no.	Core wire color
TD+	1		1	White/Orange
RD+	2		2	Orange
TD−	3		3	White/Green
RD−	4		4	
			5	
			6	Green
			7	
			8	

Metal parts   Shield   Metal parts

Plug connector pin arrangement

Connections (Straight cable)
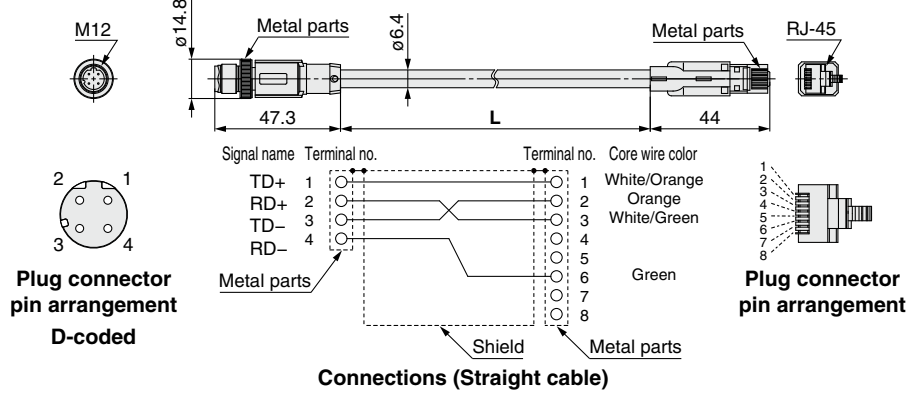
Item	Specifications
Cable O.D.	ø6.4 mm
Conductor nominal cross section	0.14 mm²/AWG20
Wire O.D. (Including insulator)	0.98 mm
Min. bending radius (Fixed)	26 mm

PCA-1446566 (Plug)

Plug connector pin arrangement D-coded

ø14.8   47.3   5000   50

M12 SPEEDCON   ø6.5

Made to Order

Made to Order

Change in the cable length	p. 90

Core wire color

Terminal no.	
1	Yellow: TD+
2	White: RD+
3	Orange: TD−
4	Blue: RD−

Connections

Item	Specifications
Cable O.D.	ø6.5 mm
Conductor nominal cross section	0.34 mm²/AWG22
Wire O.D. (Including insulator)	1.55 mm
Min. bending radius (Fixed)	19.5 mm

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

ø14.8   47.3   L   47.3   ø14.8

Metal parts   Metal parts

M12 SPEEDCON   ø6.5   M12 SPEEDCON

Plug connector pin arrangement D-coded

Terminal no.			Terminal no.	Core wire color	Signal name
1			1	Yellow	TD+
2			2	White	RD+
3			3	Orange	TD−
4			4	Blue	RD−

Metal parts   Shield   Metal parts

Connections (Straight cable)

Plug connector pin arrangement D-coded
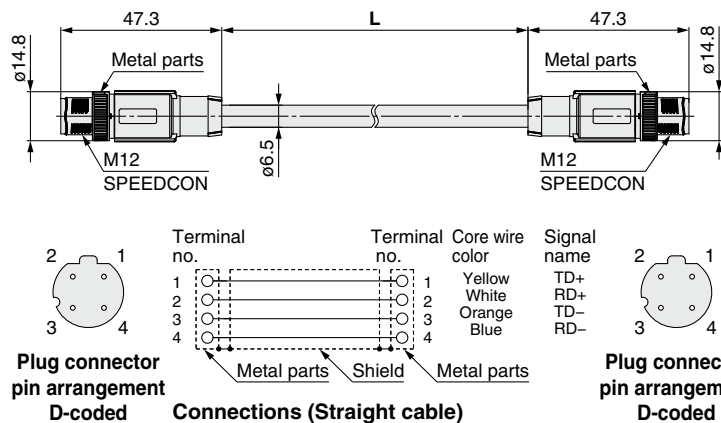
Item	Specifications
Cable O.D.	ø6.5 mm
Conductor nominal cross section	0.34 mm²/AWG22
Wire O.D. (Including insulator)	1.55 mm
Min. bending radius (Fixed)	19.5 mm

Side tabs:
Type 1: EX260, EX123/124/126
Type 2: EX500
Type 3: EX600, EX245, EX250
Type 1: EX120/121/122, EX140
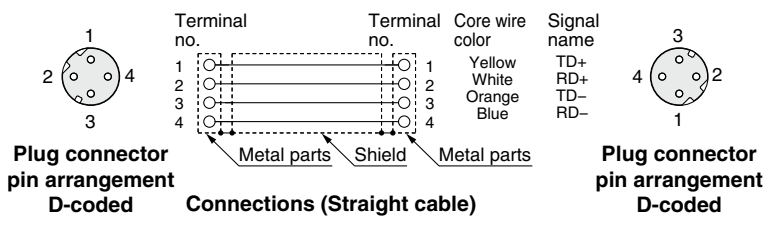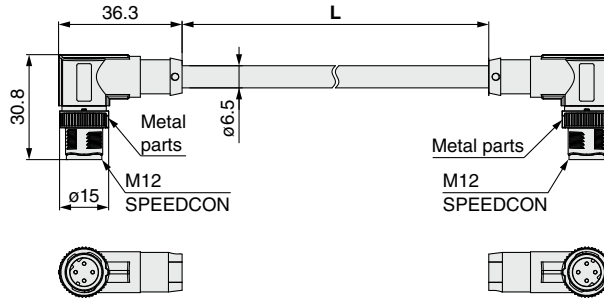EX180
Type 2: EX510
M8/M12
ATEX

EX500 Series

❷ Communication Cable

| For PROFINET | For EtherNet/IP™ |

EX9-AC 005 EN-PAPA (With angle 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

36.3   L

30.8   ø6.5

Metal parts   Metal parts

M12 SPEEDCON   M12 SPEEDCON

ø15

Plug connector pin arrangement D-coded

Plug connector pin arrangement D-coded

Terminal no.		Terminal no.	Core wire color	Signal name
1		1	Yellow	TD+
2		2	White	RD+
3		3	Orange	TD−
4		4	Blue	RD−

Metal parts   Shield   Metal parts

Connections (Straight cable)

Item	Specifications
Cable O.D.	ø6.5 mm
Conductor nominal cross section	0.34 mm²/AWG22
Wire O.D.(Including insulator)	1.55 mm
Min. bending radius (Fixed)	19.5 mm

❸ Field-wireable Communication Connector

| For PROFINET | For EtherNet/IP™ |

PCA-1446553
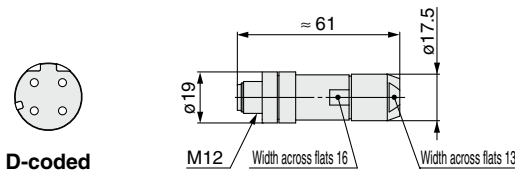
D-coded

≈ 61   ø17.5

ø19

M12   Width across flats 16   Width across flats 13

Applicable Cable

Item	Specifications
Cable O.D.	4.0 to 8.0 mm
Wire gauge (Stranded wire cross section)	0.14 to 0.34 mm²/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.

SMC

EX500 Series

❹ Branch Cable

Connects the GW unit and SI unit or input unit.

EX500-AC 030 - SSPS
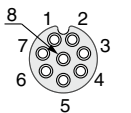
Cable length (L)

003	300 mm
005	500 mm
010	1000 mm
030	3000 mm
050	5000 mm
100	10000 mm

Connector specification

SSPS	Socket side: Straight, Plug side: Straight
SAPA	Socket side: Angle, Plug side: Angle
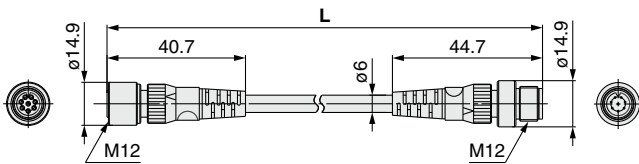
A-coded

Socket pin arrangement
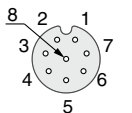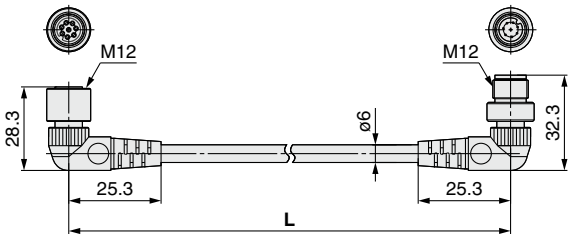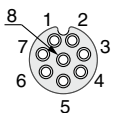
A-coded

Plug pin arrangement

A-coded

Socket pin arrangement

A-coded
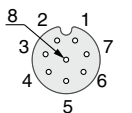
Plug pin arrangement

Item	Specifications
Cable O.D.	ø6 mm
Conductor nominal cross section	0.25 mm²
Wire O.D. (Including insulator)	1.27 mm
Min. bending radius (Fixed)	40 mm

❺ Y Branch Connector

Supplies separate power to valve manifold when it is connected to the SI unit.
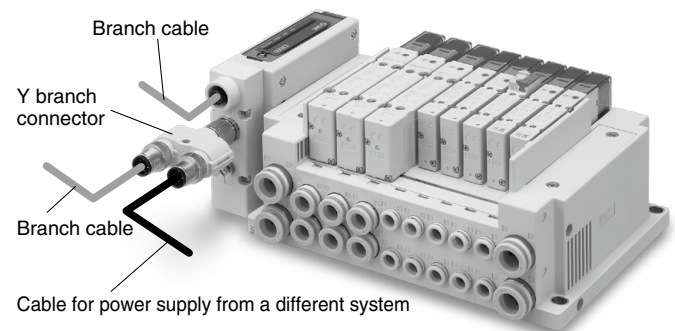
EX500-ACY01-S
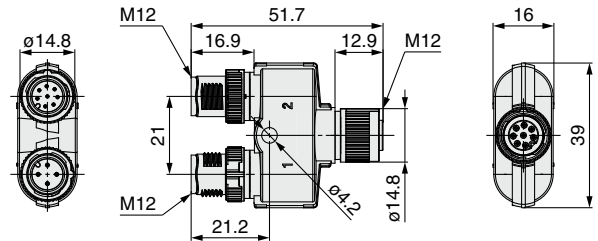
A-coded

Plug pin arrangement

Pin Layout of the Cable for Power Supply from a Different System

1	24 VDC +10%, −5% (for valve)
2	0 VDC (for valve)
3	Unused
4	Unused

<Example of use>

Branch cable

Y branch connector

Branch cable

Cable for power supply from a different system

SMC

❻ Cable for Power Supply from a Different System

Connect to Y branch connector to supply power.

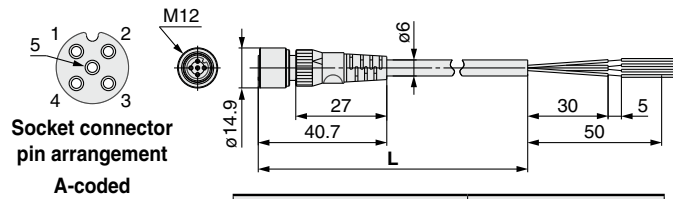| For PROFINET | For EtherNet/IP™ |

EX500-AP 050 - S
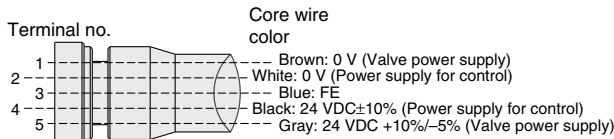
Cable length (L)

| 010 | 1000 mm |
| 050 | 5000 mm |

Connector specification

| S | Straight |
| A | Angle |

Straight connector type

M12

Socket connector
pin arrangement
A-coded

ø6

27
40.7
L
30
5
50

Item	Specifications
Cable O.D.	ø6 mm
Conductor nominal cross section	0.3 mm²/AWG22
Wire O.D. (Including insulator)	1.5 mm
Min. bending radius (Fixed)	40 mm

Angle connector type

M12

ø14.9
28.3
ø6

25.3
L
30
5
50

Socket connector
pin arrangement
A-coded

Item	Specifications
Cable O.D.	ø6 mm
Conductor nominal cross section	0.3 mm²/AWG22
Wire O.D. (Including insulator)	1.5 mm
Min. bending radius (Fixed)	40 mm

Terminal no.

Core wire color

1 — Brown: 0 V (Valve power supply)
2 — White: 0 V (Power supply for control)
3 — Blue: FE
4 — Black: 24 VDC±10% (Power supply for control)
5 — Gray: 24 VDC +10%/−5% (Valve power supply)

Connections (PROFINET)

Terminal no.

Core wire color

1 — Brown: 24 VDC +10%/−5% (valve power supply)
2 — White: 24 VDC±10% (power supply for control)
3 — Blue: 0 V (valve power supply)
4 — Black: 0 V (power supply for control)
5 — Gray: Not connected
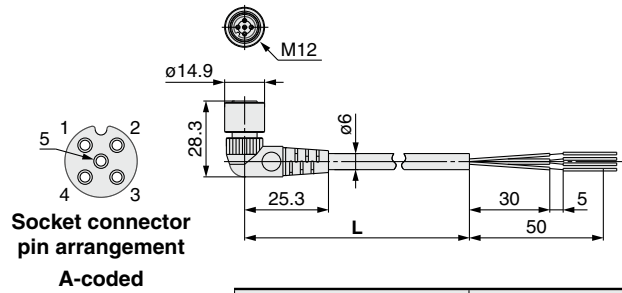
Connections (EtherNet/IP™)

Made to Order

| Cable length | 10000 mm | **p. 91** |

PCA- 1401804

Cable length (L)

1401804	1500 mm
1401805	3000 mm
1401806	5000 mm
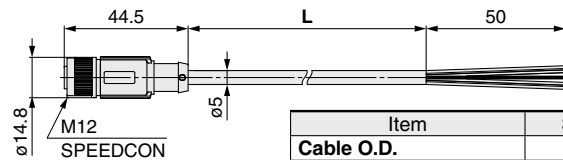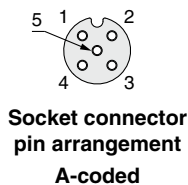
Socket connector
pin arrangement
A-coded

44.5
L
50
ø14.8
ø5
M12
SPEEDCON

Item	Specifications
Cable O.D.	ø5 mm
Conductor nominal cross section	0.34 mm²/AWG22
Wire O.D. (Including insulator)	1.27 mm
Min. bending radius (Fixed)	21.7 mm

Terminal no.

Core wire color

1 — Brown: 0 V (Valve power supply)
2 — White: 0 V (Power supply for control)
3 — Blue: FE
4 — Black: 24 VDC±10% (Power supply for control)
5 — Green/Yellow: 24 VDC +10%/−5% (Valve power supply)

Connections (PROFINET)

Terminal no.

Core wire color

1 — Brown: 24 VDC +10%/−5% (valve power supply)
2 — White: 24 VDC±10% (power supply for control)
3 — Blue: 0 V (valve power supply)
4 — Black: 0 V (power supply for control)
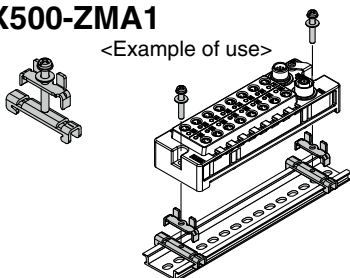5 — Green/Yellow: Not connected
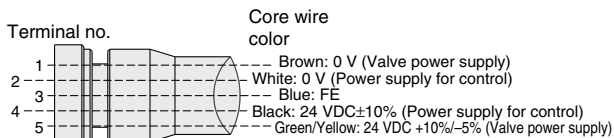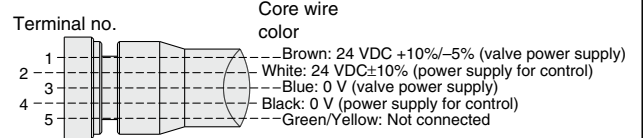
Connections (EtherNet/IP™)

❼ DIN Rail Bracket (2 pcs.)

Bracket for mounting the input unit (EX500-DXPA, EX500-DXPB) to DIN rail.
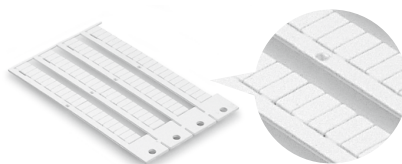
EX500-ZMA1

<Example of use>

❽ Marker (1 sheet, 88 pcs.)

Signal name of the input device such as a switch can be written on the marker and installed to the input unit.

EX600-ZT1

❾ Seal Cap (10 pcs.)

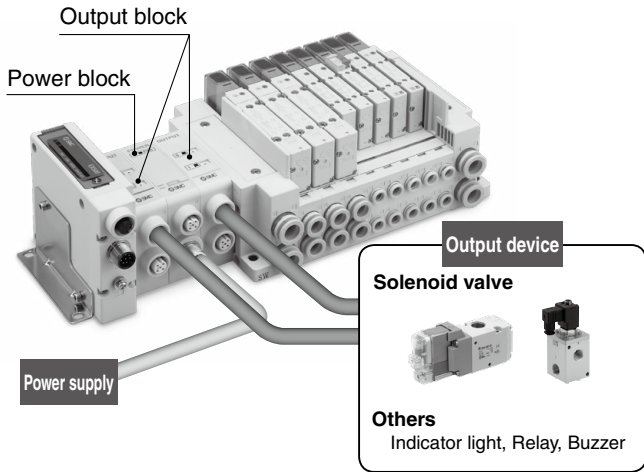Use with new connector. By using these seal caps, the new connector maintains IP65/67 enclosure.

EX9-AWES
For M8 connector socket

EX9-AWTS
For M12 connector socket

Type 1: EX260, EX123/124/126

Type 2: EX500

Type 3: EX600, EX245, EX250

EX120/121/122

Type 1: EX140, EX180

Type 2: EX510

M8/M12

ATEX

EX500 Series

Power block
Output block

Output device

Solenoid valve

Others
Indicator light, Relay, Buzzer
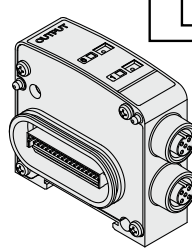
Power supply

● **Output devices other than valve manifold can be operated.**
● **By using the power block and output block for high watt load, operation up to 0.5 A/point can be performed.**
● **Possible to mount the output block and power block additionally between the SI unit and the valve (The surplus I/O points are used).**
● **2 point outputs per output block (M12 connector)**

You are requested to connect it to an SI unit and a valve manifold. For detailed specifications, refer to the operation manual that can be downloaded from SMC website, http://www.smcworld.com

❿ Output Block

EX9-OE[T]1

● **Output specification**

1	Source/PNP (Negative common)

● **Power supply type**

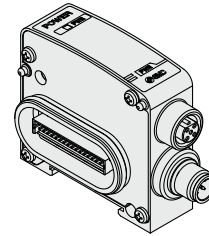| T	Internal power supply method (for low-wattage load)
P	Integrated power supply method (for high-wattage load) *1

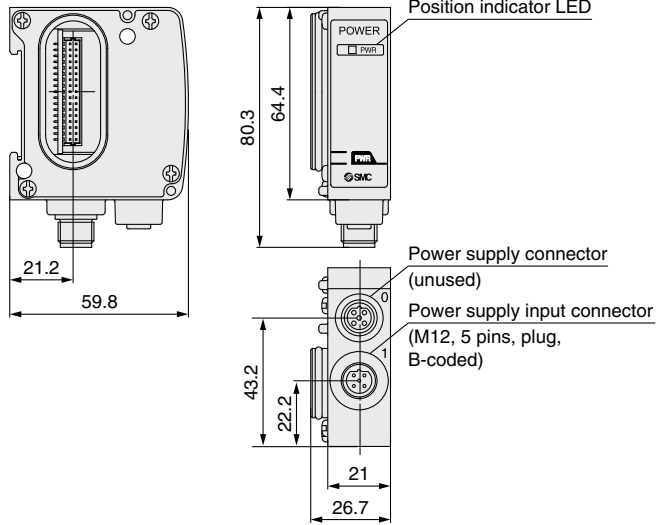*1 Required to connect with a power block

Dimensions/Parts Description

Position indicator LED

Connector for output device connection
(M12, 5 pins, socket, A-coded)

Specifications

Model	EX9-OET1	EX9-OEP1
Internal current consumption	40 mA or less	
Output Output type	Source/PNP (Negative common)	
Number of outputs	2 outputs	
Power supply method	Internal power supply method	Integrated power supply method (Power block: supplied from EX9-PE1)
Output device supply voltage	24 VDC	
Output device supply current	Max. 42 mA/point (1.0 W/point)	Max. 0.5 A/point (12 W/point)
Environmental resistance Enclosure	IP67	
Operating temperature range	−10 to 50°C	
Operating humidity range	35 to 85%RH (No condensation)	
Standards	CE marking, UL (CSA), RoHS compliant	
Weight	120 g	

⓫ Power Block

EX9-PE1

Dimensions/Parts Description

Position indicator LED

Power supply connector (unused)

Power supply input connector
(M12, 5 pins, plug, B-coded)

Specifications

Model	EX9-PE1
Connection block	Output block for high wattage load
Connection block stations	Output block: Max. 8 stations
Power supply for output and internal control Power supply voltage	22.8 to 26.4 VDC
Internal current consumption	20 mA or less
Supply current	Max. 3.1 A*1
Environmental resistance Enclosure	IP67
Operating temperature range	−10 to 50°C
Operating humidity range	35 to 85%RH (No condensation)
Standards	CE marking, UL (CSA), RoHS compliant
Weight	120 g
Enclosed parts	Seal cap (for M12 connector) 1 pc.

*1 When using with 3.0 to 3.1 A, the ambient temperature should not exceed 40°C, and do not bundle the cable.

SMC

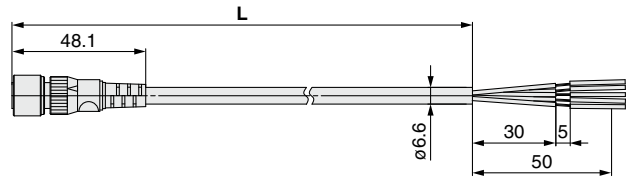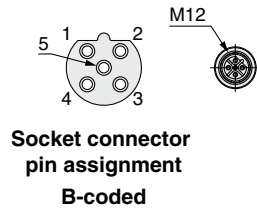## ⑫ Power Supply Cable (For power block)

Supplies power to the power block.

Straight connector type

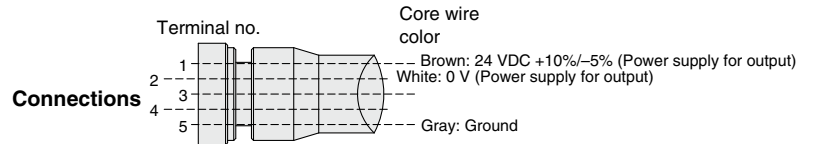### EX9-AC 050 -1

● **Cable length (L)**

010	1000 mm
030	3000 mm
050	5000 mm

Socket connector pin assignment B-coded

M12

L
48.1
ø6.6
30 5
50

Item	Specifications
Cable O.D.	ø6.6 mm
Conductor nominal cross section	0.3 mm²/AWG22
Wire O.D. (Including insulator)	1.65 mm
Min. bending radius (Fixed)	40 mm

Made to Order

Cable length	10000 mm	**p. 91**

Connections

Terminal no. / Core wire color

1 — Brown: 24 VDC +10%/−5% (Power supply for output)
2 — White: 0 V (Power supply for output)
3
4
5 — Gray: Ground

PCA- 1401807

● **Cable length (L)**

1401807	1500 mm
1401808	3000 mm
1401809	5000 mm

Socket connector pin assignment B-coded

44.5 L 50
ø14.8
M12
SPEEDCON
ø5

Item	Specifications
Cable O.D.	ø5 mm
Conductor nominal cross section	0.34 mm²/AWG22
Wire O.D. (Including insulator)	1.27 mm
Min. bending radius (Fixed)	21.7 mm

Connections

Terminal no. / Core wire color

1 — Brown: 24 VDC +10%/−5% (Power supply for output)
2 — White: 0 V (Power supply for output)
3
4
5 — Green/Yellow: Ground
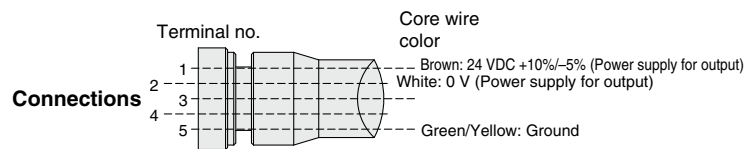
Type 1
EX260
EX123/124/126
Type 2
EX500
EX600
Type 3
EX245
EX250
EX120/121/122
Type 1
EX140
EX180
Type 2
EX510
M8/M12
ATEX

EX500 Series

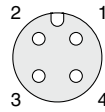## ⓭ Connector for Output Block Wiring

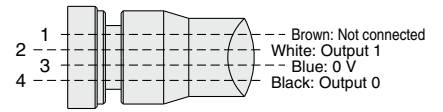Field-wireable connector for connecting an output device to an output block

PCA-1557743

(55)

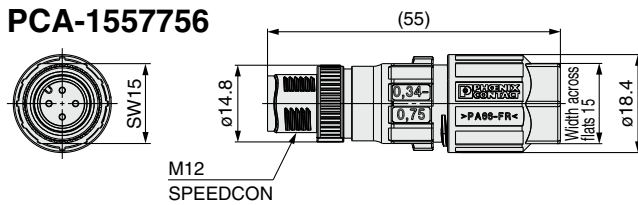ø14.8 ø16.3 Width across flats 13

M12 SPEEDCON

A-coded

2 | 1
3 | 4

Plug pin arrangement

1 — Brown: Not connected
2 — White: Output 1
3 — Blue: 0 V
4 — Black: Output 0
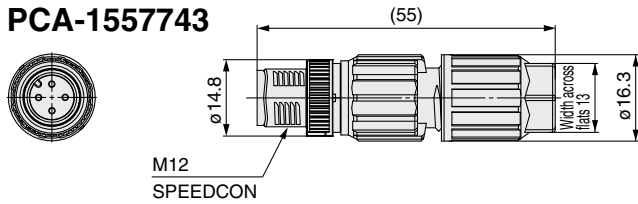
Connections

Applicable Cable

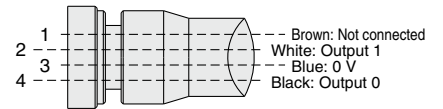| Item	Specifications
Cable O.D.	3.5 to 6.0 mm
Wire gauge (Stranded wire cross section)	0.14 to 0.34 mm²/AWG26 to 22
Core wire diameter (Including insulating material)	0.7 to 1.3 mm

PCA-1557756
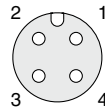
(55)

SW15 ø14.8 Width across flats 15 ø18.4

0.34 0.75 >PA66-FR<

M12 SPEEDCON

A-coded

2 | 1
3 | 4

Plug pin arrangement

1 — Brown: Not connected
2 — White: Output 1
3 — Blue: 0 V
4 — Black: Output 0

Connections

Applicable Cable

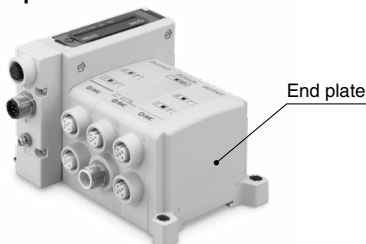| Item	Specifications
Cable O.D.	4.0 to 8.0 mm
Wire gauge (Stranded wire cross section)	0.34 to 0.75 mm²/AWG22 to 18
Core wire diameter (Including insulating material)	1.3 to 2.5 mm

⓮ End Plate

Use when an output block is not being used and a valve manifold is not connected.

EX9-EA03

66
12.5
2 x M4 Mounting hole
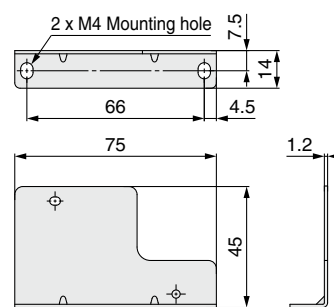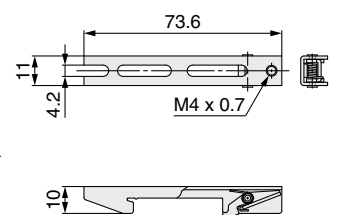10
60
13.2
75
6 18

<Example of use>

End plate
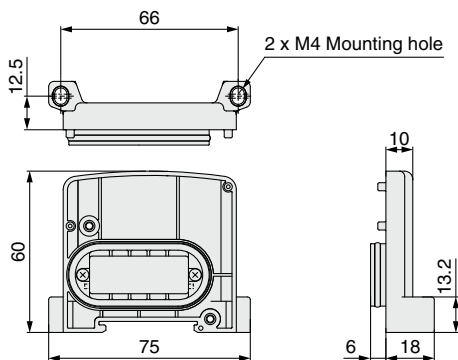
⓯ Bracket Plate/DIN Rail Mounting Bracket

A reinforcing brace used to mount an output block or power block onto an SI unit

To prevent connection failure between products due to deflection, use this bracket plate whenever an output block or power block is mounted.
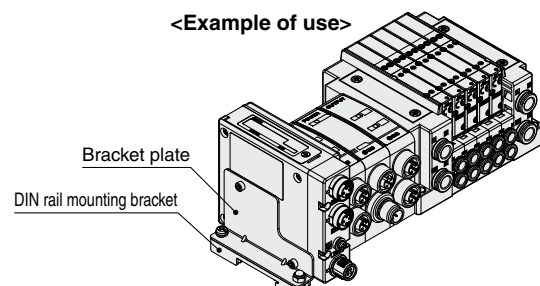
EX9-BP1

2 x M4 Mounting hole
7.5
14
66 4.5
75
45
1.2

Accessory

Description	Qty.
Hexagon socket head cap screw (M3 x 35)	2

EX9-BD1

73.6
11
4.2
M4 x 0.7
10

Accessory

Description	Qty.
Domed cap nut (M4)	1
Round head combination screw (M4 x 8)	1
Round head combination screw (M4 x 10)	1

<Example of use>

Bracket plate

DIN rail mounting bracket

SMC

		GW Unit	
		Gateway Decentralized System 2 (128 points) • EX500-GEN2 • EX500-GPN2	**Gateway Decentralized System (64 points)** • EX500-GDN1 • EX500-GPR1A
SI Unit Input Unit	Gateway Decentralized System 2 (128 points) • EX500-S103 • EX500-DX□□	Usable	Usable Same functions of Gateway Decentralized System (64 points)
	Gateway Decentralized System (64 points) • EX500-S001 • EX500-Q001/002 • EX500-Q101/102 • EEX500-IB1-□ (EX500-IB1)	Usable Same functions of Gateway Decentralized System (64 points)	Usable

EX260

EX123/124/126

Type 1

EX500

Type 2

EX600

EX245

Type 3

EX250

EX120/121/122

EX140

Type 1

EX180

EX510

Type 2

M8/M12

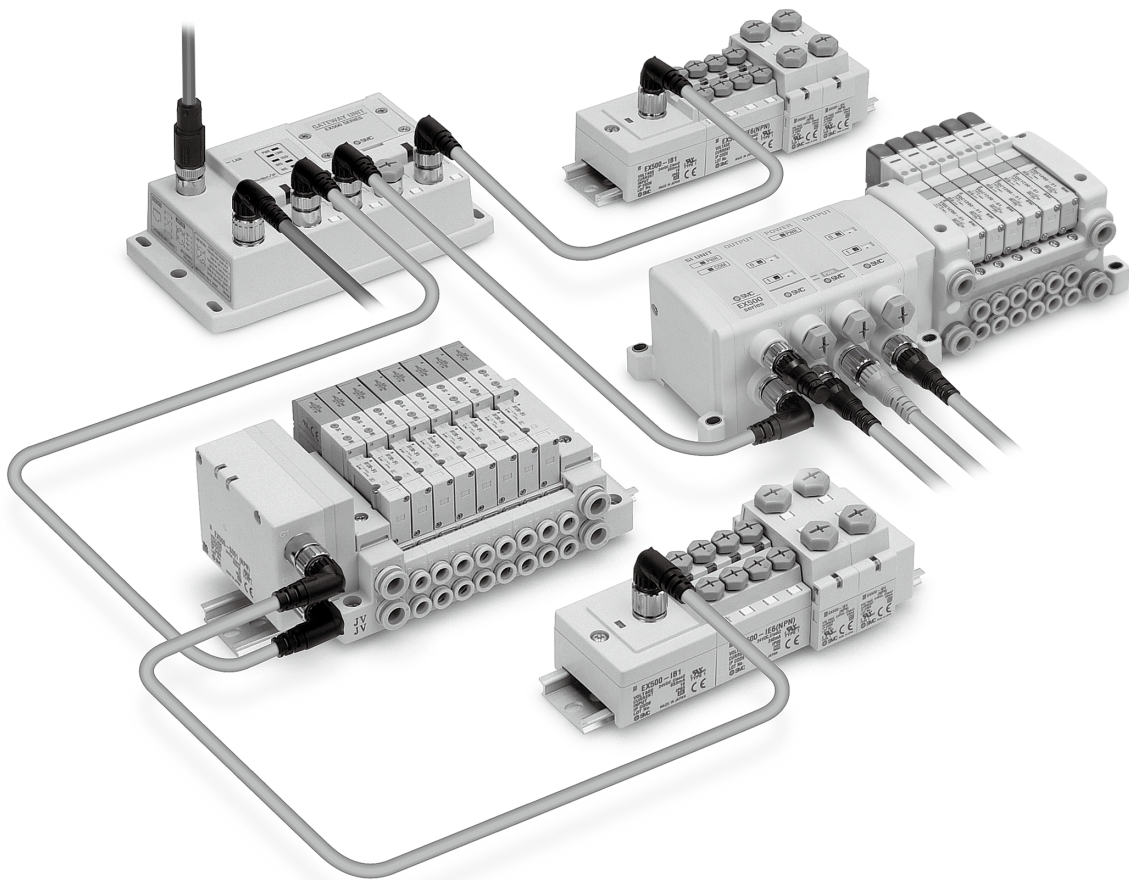ATEX

74

Fieldbus System
Gateway Decentralized System (64 Points)
EX500 Series C E c UL US

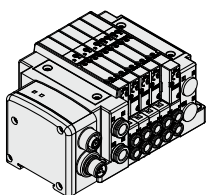∗ Only the SY and SV valves are UL-compliant.

RoHS

★ **Valve manifolds and input units can be connected around the GW (Gateway) unit.**

★ **Compatible with other protocols by replacing the GW unit**

★ **Number of inputs/outputs = 64 points/64 points. The number of outputs (solenoids) per branch is 16 points.**

★ **Number of valve manifold connections = Max. 4 units, Number of input unit connections = Max. 4 units, Cable length = Max. 10 m**

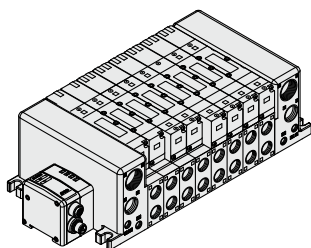★ **No need to set the address for the valve manifolds or input units**
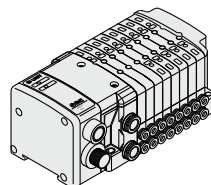

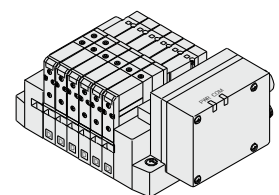## Manifold Solenoid Valves

SY3000/5000/7000	VQC1000/2000/4000/5000	S0700	SV1000/2000/3000

SMC

EX260
EX123/124/126
EX500
EX600
EX245
EX250
EX120/121/122
EX140
EX180
EX510
M8/M12
ATEX

Type 1
Type 2
Type 3
Type 1
Type 2

EX500 Series

Gateway Decentralized System (64 Points)
GW Unit

CE c ®UL US

∗ Only the SY and SV valves are UL-compliant.

RoHS

How to Order

EX500－G DN1

Protocol

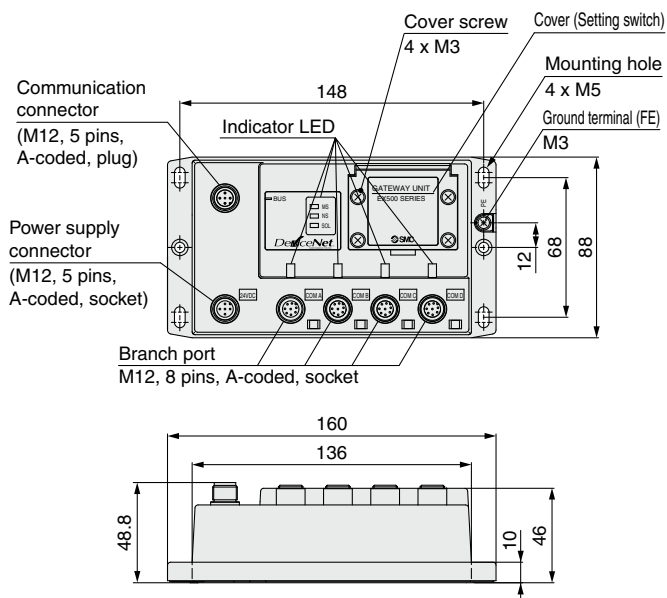| DN1 | DeviceNet™ (Input/Output = 64 points/64 points) |
| PR1A | PROFIBUS DP (Input/Output = 64 points/64 points) |

Specifications

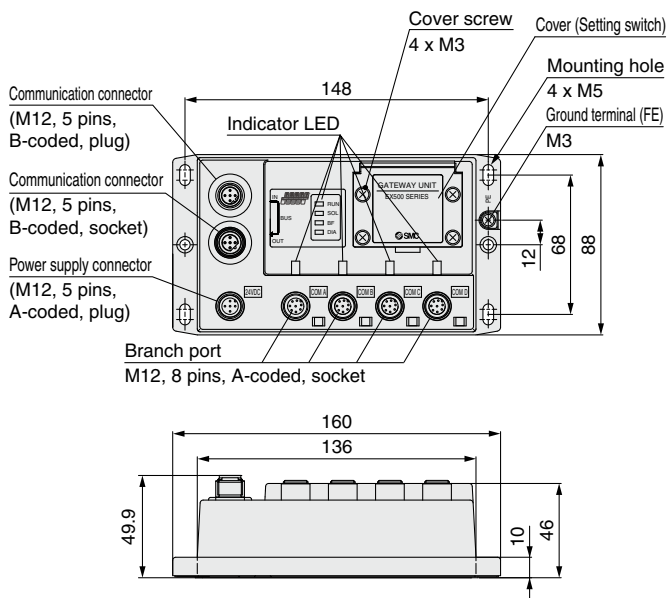| Model		EX500-GDN1	EX500-GPR1A
Communication	Protocol	DeviceNet™	PROFIBUS DP
	Version∗1	Release 2.0	DP-V0
	Communication speed	125 k/250 k/500 kbps	9.6 k/19.2 k/45.45 k/ 93.75 k/187.5 k/500 k/ 1.5 M/3 M/6 M/12 Mbps
	Configuration file∗2	EDS file	GSD file
	Number of inputs/outputs (I/O occupation area)	64 inputs/64 outputs (8 bytes/8 bytes)	
	Terminating resistor	Not provided	Built into the unit
	Applicable function	QuickConnect™	—
Power supply voltage	For control	11 to 25 VDC (Supplied by DeviceNet™ circuit, 50 mA or less)	24 VDC ±10%
	For input device	24 VDC ±10%	
	For valve	24 VDC +10%, −5%	
Current consumption	For input and control	3.0 A or less (Max. 0.7 A per branch x 4 branches + GW unit internal current consumption: 0.2 A or less)	
	For valve	3.0 A or less (Max. 0.75 A per branch x 4 branches)	
Branch port	Number of branch ports	4 ports	
	Number of inputs and outputs	16 inputs/16 outputs per branch	
	Branch cable length	5 m or less between connected devices (10 m or less per branch)	
Environmental resistance	Enclosure	IP65	
	Operating temperature range	Operating: 5 to 45°C, Stored: −25 to 70°C (No freezing or condensation)	
	Operating humidity range	Operating, Stored: 35 to 85%RH (No condensation)	
Standards		CE marking (EMC directive/ RoHS directive), UL (CSA)	
Weight		470 g	
Enclosed parts		Seal cap (for M12 connector) 4 pcs.	Seal cap (for M12 connector) 5 pcs.

∗1 Please note that the version is subject to change.
∗2 The setting file can be downloaded from SMC website, http://www.smcworld.com

Dimensions/Parts Description

EX500-GDN1 (DeviceNet™)

Cover screw 4 x M3
Cover (Setting switch)
Communication connector (M12, 5 pins, A-coded, plug)
Mounting hole 4 x M5
Ground terminal (FE) M3
Indicator LED
Power supply connector (M12, 5 pins, A-coded, socket)
Branch port M12, 8 pins, A-coded, socket

148
68
88
12
160
136
48.8
10
46

EX500-GPR1A (PROFIBUS DP)

Cover screw 4 x M3
Cover (Setting switch)
Communication connector (M12, 5 pins, B-coded, plug)
Mounting hole 4 x M5
Ground terminal (FE) M3
Indicator LED
Communication connector (M12, 5 pins, B-coded, socket)
Power supply connector (M12, 5 pins, A-coded, plug)
Branch port M12, 8 pins, A-coded, socket

148
68
88
12
160
136
49.9
10
46

SMC

76 Ⓐ

Gateway Decentralized System (64 Points)
SI Unit

Output unit for valve manifold connection

CE | cULus | RoHS

For SV1000/2000/3000/4000

How to Order

EX500－S001

● **Applicable valve: SV series**
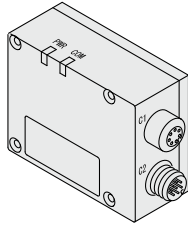
Specifications

Model		EX500-S001
Output	**Number of outputs**	16 outputs
	Output type	Sink/NPN (Positive common)
	Supply current	Max. 0.65 A
	Rated voltage	24 V
Internal current consumption		100 mA or less
Environmental resistance	**Enclosure**	IP67
	Operating temperature range	Operating: 5 to 45°C, Stored: –25 to 70°C (No freezing or condensation)
	Operating humidity range	Operating, Stored: 35 to 85%RH (No condensation)
Standards		CE marking, UL (CSA), RoHS compliant
Weight		115 g
Enclosed parts		Seal cap (for M12 connector socket) 1 pc.

Dimensions/Parts Description

EX500-S001

Position indicator LED

PWR   COM

79.4
68.5
54.5
39
15.5
28.6

Branch connector (C1)
(M12, 8 pins, A-coded, socket)

C1

Branch connector (C2)
(M12, 8 pins, A-coded, plug)

C2

SMC
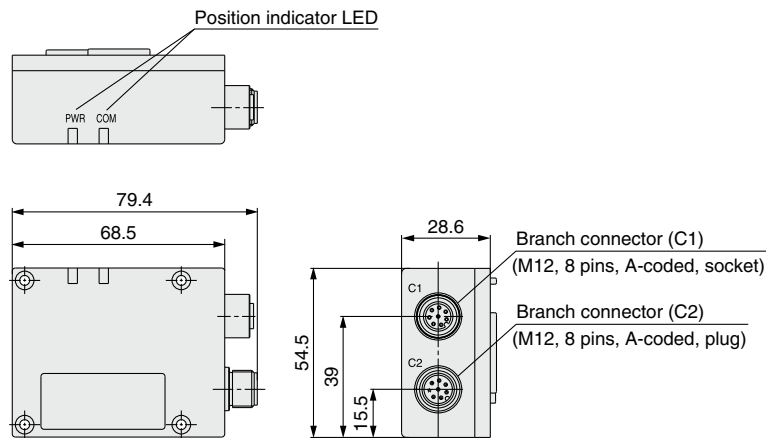
For SY3000/5000/7000, VQC1000/2000/4000/5000, S0700

How to Order
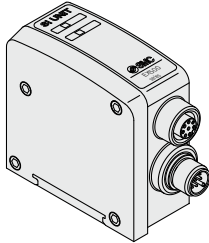
EX500-Q001

Applicable valve:
SY/VQC/S0700 series

Output specification

0	NPN (Positive common)
1	PNP (Negative common)

SI unit type

1	For without EX9 output block
2	For EX9 output block mounting

Specifications

Model		EX500-Q001	EX500-Q101	EX500-Q002	EX500-Q102
Output	Number of outputs	16 outputs			
	Output type	Sink/NPN (Positive common)	Source/PNP (Negative common)	Sink/NPN (Positive common)	Source/PNP (Negative common)
	Rated voltage	24 VDC			
	Supply current	Max. 0.75 A			
Internal current consumption		100 mA or less			
Environmental resistance	Enclosure	IP67			
	Operating temperature range	Operating: 5 to 45°C, Stored: –25 to 70°C (No freezing or condensation)			
	Operating humidity range	Operating, Stored: 35 to 85%RH (No condensation)			
Standards		CE marking, RoHS compliant			
Weight		105 g			
Enclosed parts		Seal cap (for M12 connector socket) 1 pc.			

Dimensions/Parts Description

EX500-Q□01
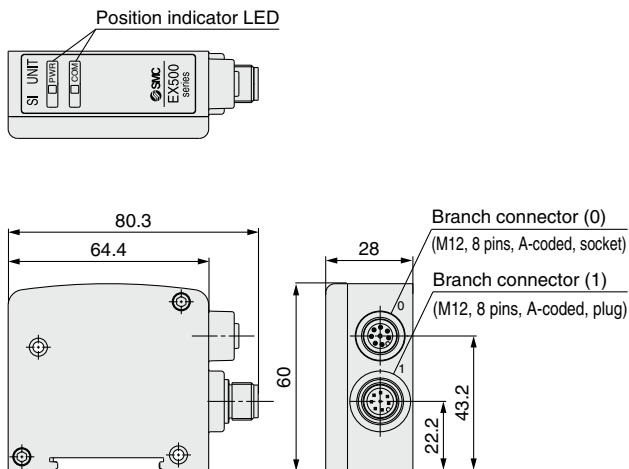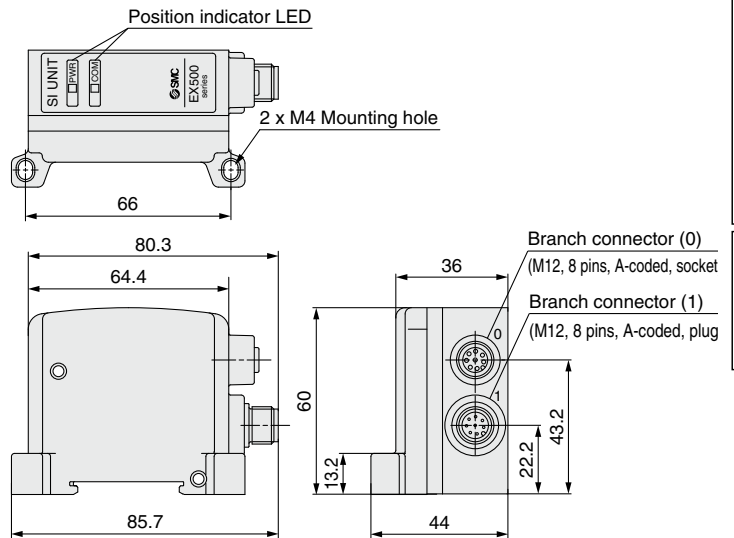
Position indicator LED

80.3
64.4
28
60
43.2
22.2

Branch connector (0)
(M12, 8 pins, A-coded, socket)

Branch connector (1)
(M12, 8 pins, A-coded, plug)

EX500-Q□02

Position indicator LED

2 x M4 Mounting hole

66

80.3
64.4
36
60
43.2
22.2
13.2
85.7
44

Branch connector (0)
(M12, 8 pins, A-coded, socket

Branch connector (1)
(M12, 8 pins, A-coded, plug

Type 1 · EX260
EX123/124/126
Type 2 · EX500
EX600
Type 3 · EX245
EX250
EX120/121/122
Type 1 · EX140
EX180
Type 2 · EX510
M8/M12
ATEX

78

Gateway Decentralized System (64 Points)
Input Manifold

CE $_C$ $\mathbf{\Re}_{US}$ RoHS

How to Order Input Manifold

EEX500-IB1-E 8

Connector type

E	M8 connector
T	M12 connector
M	M8, M12 mixed

Stations

1	1 station
:	:
8	8 stations

How to Order Input Block

EX500-IE 1

Block type

1	M8 connector, 2 inputs, PNP specification
2	M8 connector, 2 inputs, NPN specification
3	M12 connector, 2 inputs, PNP specification
4	M12 connector, 2 inputs, NPN specification
5	M8 connector, 8 points integrated type, PNP specification
6	M8 connector, 8 points integrated type, NPN specification

Input Manifold

Input unit

Input block (M8 connector)

Input block (M12 connector)

End block

DIN rail

Input block (M8 connector) 8 points integrated type
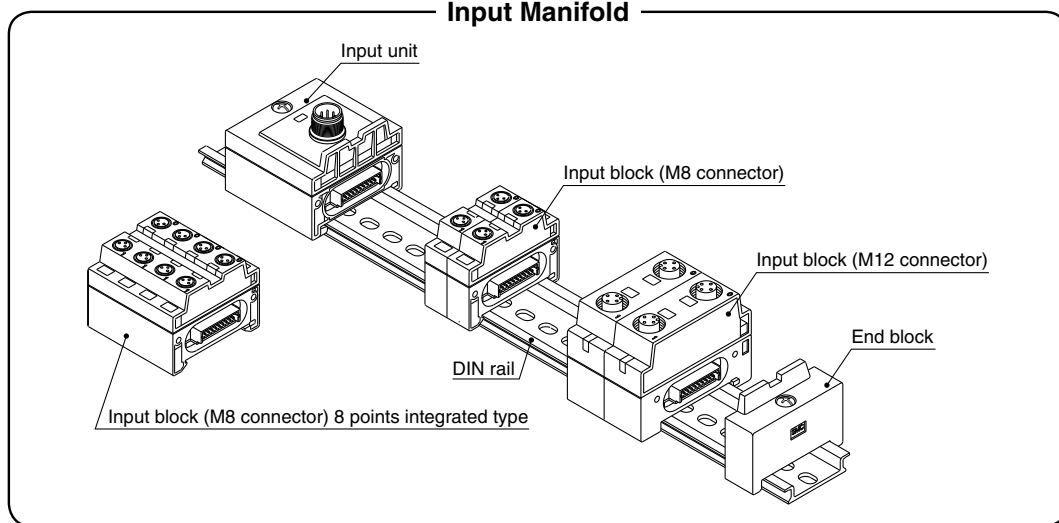
How to Order Input Manifold [Ordering Example]

When ordering an input unit manifold, enter the Input manifold part number + Input block part number.

Please mention the connected input block part numbers in order from the input unit side under the input manifold part number.

When an input block layout becomes complicated, indicate in the input unit manifold specification sheet.
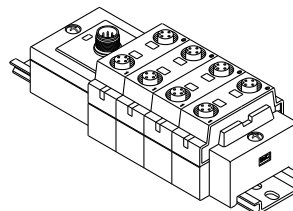
∗ The Input unit, End block and DIN rail are included in the input manifold.
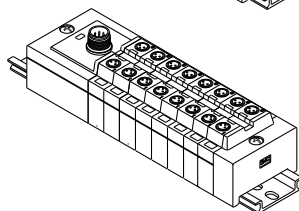
Example 1) M8 Input block only
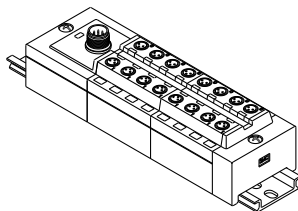
EEX500-IB1-E8 ········· 1 set
∗ EX500-IE5 ·············· 2 sets*1

EEX500-IB1-E8 ········· 1 set
∗ EX500-IE1 ·············· 8 sets

EEX500-IB1-E6 ········· 1 set
∗ EX500-IE5 ·············· 1 set*1
∗ EX500-IE1 ·············· 2 sets

Example 2) M12 Input block only

EEX500-IB1-T4 ········· 1 set
∗ EX500-IE4 ·············· 4 sets

Example 3) M8, M12 mixed
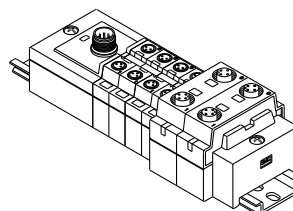
EEX500-IB1-M6 ········· 1 set
∗ EX500-IE1 ··············4 sets
∗ EX500-IE3 ··············2 sets

∗1 8-point integrated type input block (EX500-IE5/6) is equivalent to
4 stations of 2-point input block (EX500-IE1/2).

79

SMC

Specifications (Input Unit)

Model		EX500-IB1
Input	**Number of inputs**	16 inputs
	Connection block	EX500-IE□ (Mixed combination is possible.)
	Connection block stations	2-input, input block: Max. 8 stations 8-input, input block: Max. 2 stations
Internal current consumption		100 mA or less
Environmental resistance	**Enclosure**	IP65
	Operating temperature range	Operating: 5 to 45°C, Stored: −25 to 70°C (No freezing or condensation)
	Operating humidity range	Operating, Stored: 35 to 85%RH (No condensation)
Standards		CE marking, UL (CSA), RoHS compliant
Weight		100 g (Input unit + End block)

Specifications (Input Block)

	Model	EX500-IE1	EX500-IE2	EX500-IE3	EX500-IE4	EX500-IE5	EX500-IE6
Input	**Connector type**	M8 (3 pins)		M12 (4 pins)		M8 (3 pins)	
	Input type	PNP sensor input	NPN sensor input	PNP sensor input	NPN sensor input	PNP sensor input	NPN sensor input
	Number of inputs	2 inputs				8 inputs	
	Input device supply voltage	24 VDC					
	Input device supply current	Max. 480 mA/Input unit manifold					
	Rated input current	Approx. 5 mA					
Environmental resistance	**Enclosure**	IP65					
	Operating temperature range	Operating: 5 to 45°C, Stored: −25 to 70°C (No freezing and condensation)					
	Operating humidity range	Operating, Stored: 35 to 85%RH (No condensation)					
Standards		CE marking, UL (CSA), RoHS compliant					
Weight		20 g		40 g		55 g	
Enclosed parts		Seal cap (for M8 connector) 2 pcs.		Seal cap (for M12 connector) 2 pcs.		Seal cap (for M8 connector) 8 pcs.	

Type 1 EX260
EX123/124/126
Type 2 EX500
EX600
Type 3 EX245
EX250
EX120/121/122
Type 1 EX140
EX180
Type 2 EX510
M8/M12
ATEX

80

EX500 *Series*

Dimensions/Parts Description

Input block (M8) only

Branch connector
(M12, 8 pins, A-coded, plug)

Sensor connector
(M8, 3 pins, socket)

(Pitch)
P = 12

DIN rail

Position indicator LED

L3
L2
(Rail mounting pitch: 12.5)
L1

(L4)

[mm]
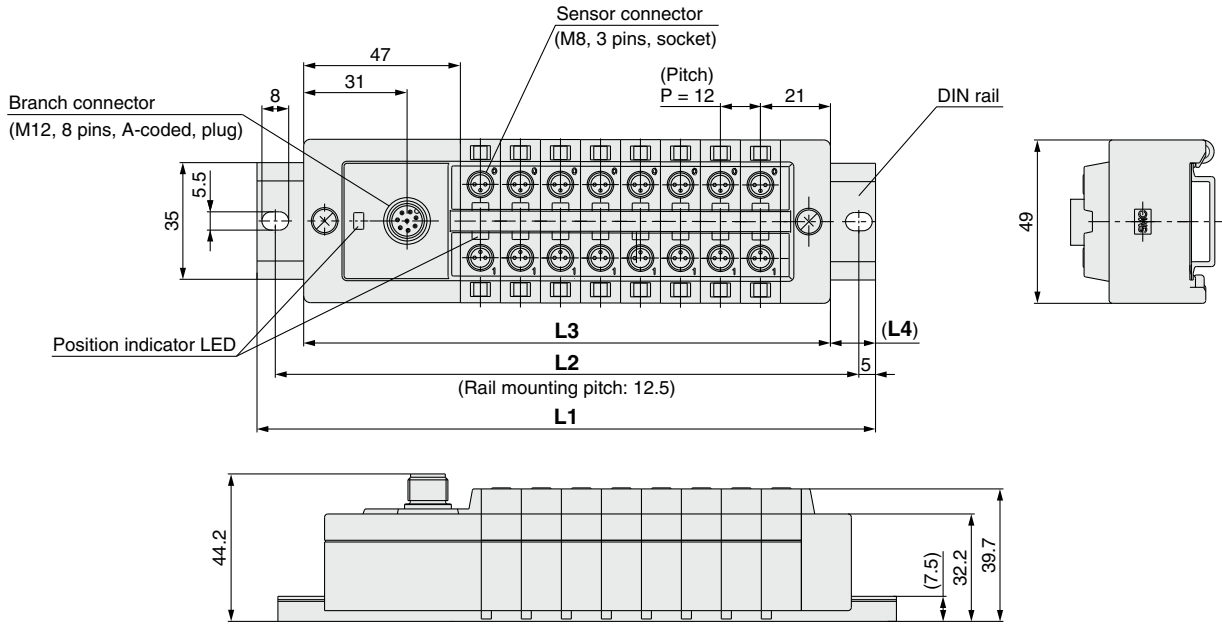
Stations	1	2	3	4	5	6	7	8
Rail length L1	98	110.5	123	135.5	148	160.5	173	185.5
Mounting pitch L2	87.5	100	112.5	125	137.5	150	162.5	175
Manifold length L3	74	86	98	110	122	134	146	158
L4	12	12	12.5	12.5	13	13	13.5	13.5

Input block (M12) only

Branch connector
(M12, 8 pins, A-coded, plug)

Sensor connector
(M12, 4 pins, socket)

(Pitch)
P = 20

DIN rail

Position indicator LED

L3
L2
(Rail mounting pitch: 12.5)
L1

(L4)

[mm]
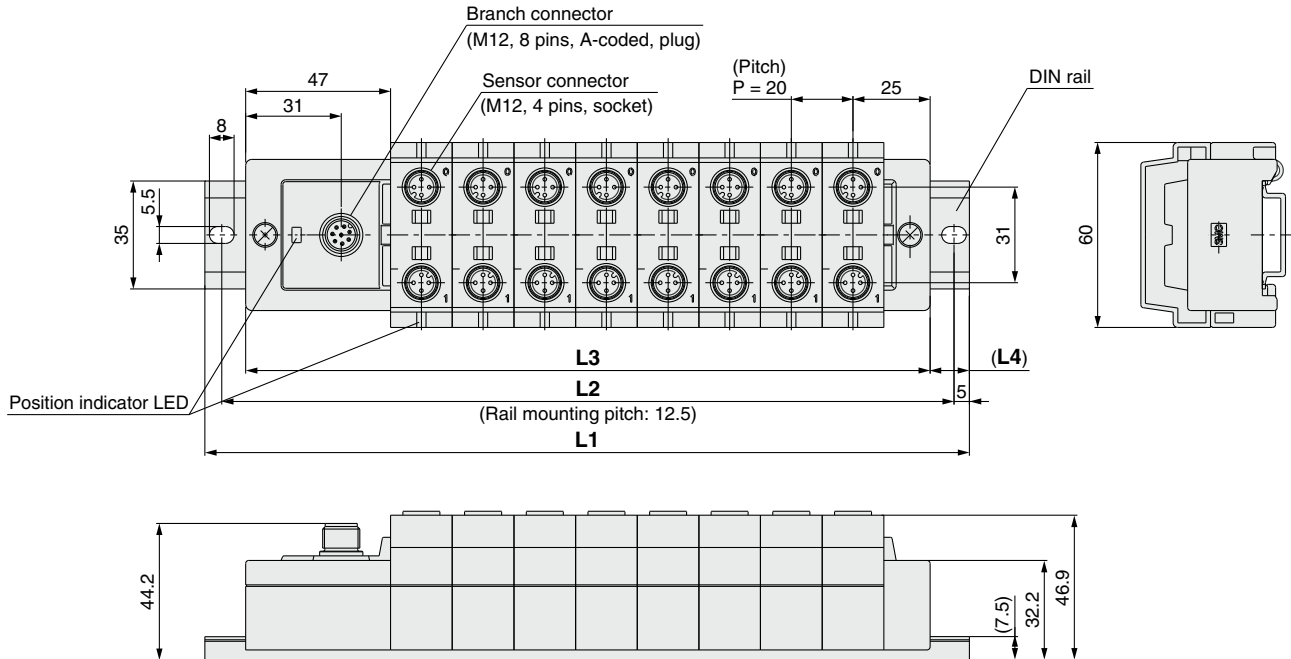
Stations	1	2	3	4	5	6	7	8
Rail length L1	110.5	123	148	173	185.5	210.5	223	248
Mounting pitch L2	100	112.5	137.5	162.5	175	200	212.5	237.5
Manifold length L3	82	102	122	142	162	182	202	222
L4	12	12	12.5	12.5	13	13	13.5	13.5

SMC

How to Add Input Block Stations

How to add input block stations

1. Loosen the round head combination screws (2 places) that hold the end block.

2. Separate the blocks at the locations where stations are to be added.

3. Attach the additional blocks to the DIN rail, and connect the blocks so that they fit together securely.

4. While holding the blocks together so that there are no gaps between them, secure them to the DIN rail by tightening the round head combination screws.
Note: Be sure to tighten the round head combination screw with the prescribed tightening torque. (0.6 N·m)
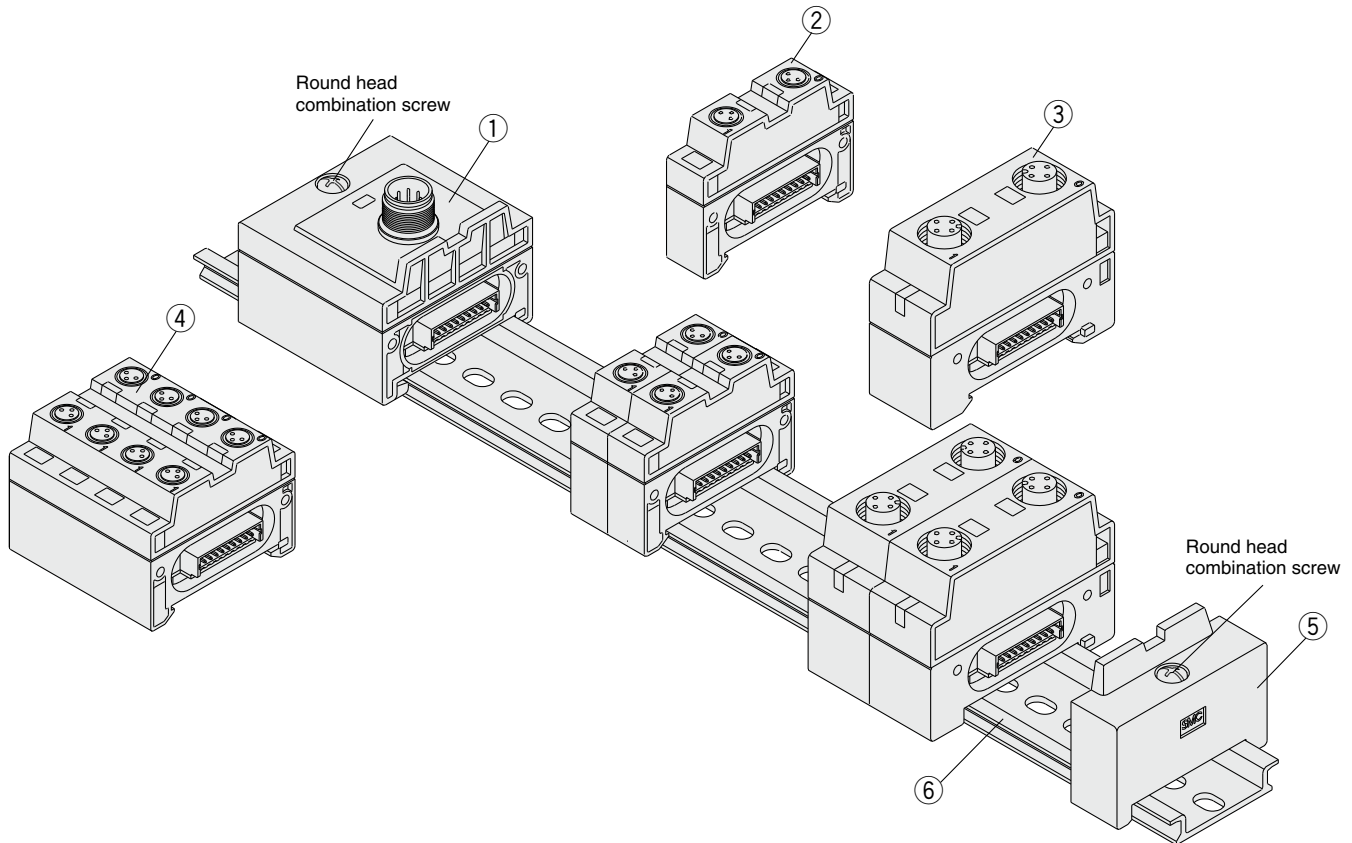
Parts List

No.	Description	Part number For standard	Note
①	**Input unit**	EX500-IB1	
②	**Input block (M8 connector)**	EX500-IE□	PNP Specification···□: 1, NPN Specification···□: 2
③	**Input block (M12 connector)**	EX500-IE□	PNP Specification···□: 3, NPN Specification···□: 4
④	**Input block (M8 connector) 8 points integrated type**	EX500-IE□	PNP Specification···□: 5, NPN Specification···□: 6
⑤	**End block**	EX500-EB1	
⑥	**DIN rail**	VZ1000-11-1-□	□: Number based on L dimension (Refer to the table below.)

DIN Rail L Dimensions [mm]

Stations		M8 input block (m)								
		0	1	2	3	4	5	6	7	8
M12 input block (n)	0		0	1	2	3	4	5	6	7
	1	1	2	3	4	5	6	7	8	
	2	2	3	4	5	6	7	8		
	3	4	5	6	7	8	9			
	4	6	7	8	9	10				
	5	7	8	9	10					
	6	9	10	11						
	7	10	11							
	8	12								

Connector type
For T (n = 1 to 8)

Connector type
For M (m + n = 2 to 8)

Connector type
For E (m = 1 to 8)

L dimensions

No.	L dimension	No.	L dimension
0	98	7	185.5
1	110.5	8	198
2	123	9	210.5
3	135.5	10	223
4	148	11	235.5
5	160.5	12	248
6	173		

82

EX500 **Series**

LED Indicator

EX500-GDN1

MS: GW unit state
NS: Network state
SOL: Power supply for valve

GATEWAY UNIT
EX500 SERIES

BUS
MS
NS
SOL

DeviceNet

SMC

24VDC   COM A   COM B   COM C   COM D

COM A to D:
Input data receiving state

EX500-GPR1A

RUN: Power supply for control
SOL: Power supply for valve
BF: Network state
DIA: Power cable connection state

IN
BUS
OUT

RUN
SOL
BF
DIA

GATEWAY UNIT
EX500 SERIES

PE

SMC

24VDC   COM A   COM B   COM C   COM D

COM A to D:
Input data receiving state

EX500-Q□0□

PWR: Power supply
for input and control

COM:
Communication state

SI UNIT

PWR
COM

SMC
EX500
series

EX500-S001

PWR: Power supply
for input and control

COM:
Communication state

PWR COM

EX500-IB1

COM:
Communication state

EX500-IE□

0, 1: Sensor signal state

Gateway Decentralized System (64 Points)
Accessories

❶ **Communication Cable**

| For DeviceNet™ |

EX500-AC[050]-DN
(Socket)

Cable length (L) ●
| 010 | 1000 mm |
| 050 | 5000 mm |
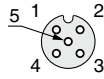
Socket connector pin assignment A-coded (Normal key)

M12 ø7

ø14.9 40.7 L 50

Connections

Red: V+ : DRAIN
White: CAN H Black: V-
Blue: CAN L
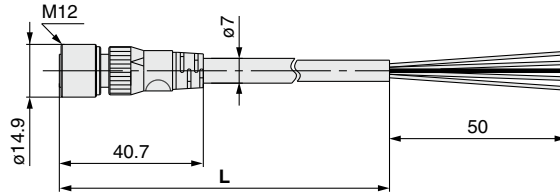
Item		Specifications
Cable O.D.		ø7 mm
Conductor nominal cross section	Power pair	0.3 mm²/AWG22
	Data pair	0.2 mm²/AWG24
Wire O.D. (Including insulator)	Power pair	1.5 mm
	Data pair	1.9 mm
Min. bending radius (Fixed)		60 mm

PCA-1557633
(Socket)

Socket connector pin assignment A-coded (Normal key)

44.5 5000 50
22.5
ø14.8 ø6.7
M12 SPEEDCON Marker tag Marker tag

PCA-1557646
(Plug)

Plug connector pin assignment A-coded (Normal key)

47.3 5000 50
22.5
ø14.8 ø6.7
M12 SPEEDCON Marker tag Marker tag

Terminal no. Core wire color

Red: V+ : DRAIN
White: CAN H Black: V-
Blue: CAN L

Connections

Item		Specifications
Cable O.D.		ø6.7 mm
Conductor nominal cross section	Power pair	0.34 mm²/AWG22
	Data pair	0.25 mm²/AWG24
Wire O.D. (Including insulator)	Power pair	1.4 mm
	Data pair	2.05 mm
Min. bending radius (Fixed)		67 mm

Made to Order

| Cable length | 10000 mm | **p. 89** |

EX260
EX123/124/126
EX500
EX600
EX245
EX250
EX120/121/122
EX140
EX180
EX510
M8/M12
ATEX

Type 1
Type 2
Type 3
Type 1
Type 2

SMC

EX500 *Series*

❶ Communication Cable

EX9-AC 005 DN-SSPS (With connector on both sides (Socket/Plug))

● Cable length (L)

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

44.5   L   47.3

ø14.8   ø14.8

Metal parts   22.5   Metal parts

ø6.7

M12 SPEEDCON   Marker tag   Marker tag   M12 SPEEDCON

Socket connector pin arrangement A-coded (Normal key)

Terminal no.		Terminal no.	Core wire color	Signal name DeviceNet™
1		1	Shield	DRAIN
2		2	Red	V+
3		3	Black	V−
4		4	White	CAN H
5		5	Blue	CAN L

Metal parts   Shield   Metal parts

Connections

Plug connector pin arrangement A-coded (Normal key)

Item		Specifications
Cable O.D.		ø6.7 mm
Conductor nominal cross section	Power pair	0.34 mm²/AWG22
	Data pair	0.25 mm²/AWG24
Wire O.D. (Including insulator)	Power pair	1.4 mm
	Data pair	2.05 mm
Min. bending radius (Fixed)		67 mm

EX9-AC 005 DN-SAPA (With angle connector on both sides (Socket/Plug))

● Cable length (L)

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

36.3   L   36.3

22.5

30   27.5

ø6.7

ø14.8   Marker tag   Metal parts   Marker tag   Metal parts   ø14.8

M12 SPEEDCON   M12 SPEEDCON

Plug connector pin arrangement A-coded (Normal key)

Terminal no.		Terminal no.	Core wire color	Signal name DeviceNet™
1		1	Shield	DRAIN
2		2	Red	V+
3		3	Black	V−
4		4	White	CAN H
5		5	Blue	CAN L

Metal parts   Shield   Metal parts

Connections

Socket connector pin arrangement A-coded (Normal key)

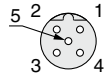| Item		Specifications
Cable O.D.		ø6.7 mm
Conductor nominal cross section	Power pair	0.34 mm²/AWG22
	Data pair	0.25 mm²/AWG24
Wire O.D. (Including insulator)	Power pair	1.4 mm
	Data pair	2.05 mm
Min. bending radius (Fixed)		67 mm

SMC

EX500 Series

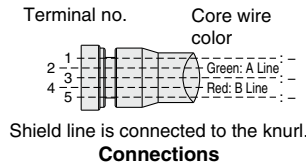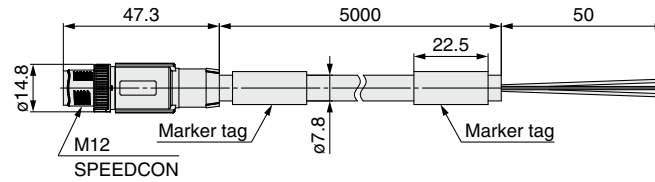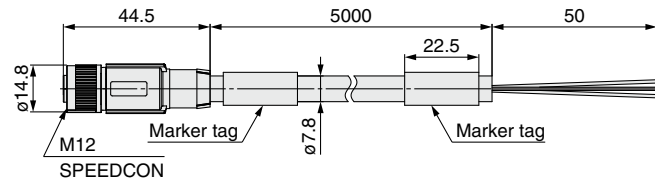## ❶ Communication Cable

For PROFIBUS DP

PCA-1557688
(Socket)
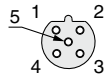
Socket connector
pin assignment
B-coded (Reverse key)

PCA-1557691
(Plug)

Plug connector
pin assignment
B-coded (Reverse key)

Terminal no.   Core wire
color

Green: A Line
Red: B Line

Shield line is connected to the knurl.
Connections

Item	Specifications
Cable O.D.	ø7.8 mm
Conductor nominal cross section	0.34 mm²/AWG22
Wire O.D. (Including insulator)	2.55 mm
Min. bending radius (Fixed)	78 mm

❷ Field-wireable Communication Connector

Plug

For DeviceNet™
PCA-1075528

A-coded
(Normal key)

Applicable Cable

Item	Specifications
Cable O.D.	4.0 to 8.0 mm
Wire gauge (Stranded wire cross section)	0.14 to 0.75 mm²/AWG26 to 18 (Solid cable/Flexible cable) 0.08 to 0.5 mm²/AWG28 to 20 (With ferrule)

For PROFIBUS DP
PCA-1075530

B-coded
(Reverse key)

Applicable Cable

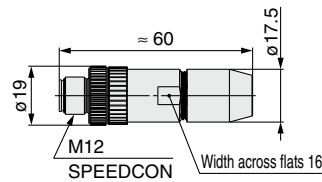| Item	Specifications
Cable O.D.	4.0 to 8.0 mm
Wire gauge (Stranded wire cross section)	0.14 to 0.75 mm²/AWG26 to 18 (Solid cable/Flexible cable) 0.08 to 0.5 mm²/AWG28 to 20 (With ferrule)

Socket

For DeviceNet™
PCA-1075529

A-coded
(Normal key)

Applicable Cable

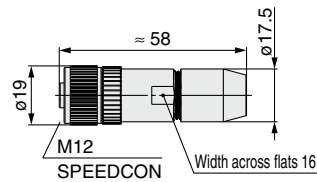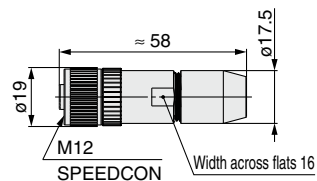| Item	Specifications
Cable O.D.	4.0 to 8.0 mm
Wire gauge (Stranded wire cross section)	0.14 to 0.75 mm²/AWG26 to 18 (Solid cable/Flexible cable) 0.08 to 0.5 mm²/AWG28 to 20 (With ferrule)

For PROFIBUS DP
PCA-1075531

B-coded
(Reverse key)

Applicable Cable

Item	Specifications
Cable O.D.	4.0 to 8.0 mm
Wire gauge (Stranded wire cross section)	0.14 to 0.75 mm²/AWG26 to 18 (Solid cable/Flexible cable) 0.08 to 0.5 mm²/AWG28 to 20 (With ferrule)

SMC

❸ Power Supply Cable
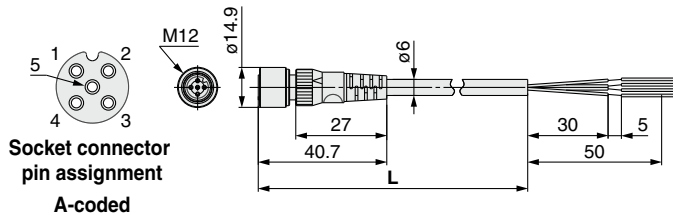
| For PROFIBUS DP | For DeviceNet™ |

EX500-AP 050 - S

Cable length (L)

| 010 | 1000 mm |
| 050 | 5000 mm |

Connector specification

| S | Straight |
| A | Angle |

Straight connector type

Socket connector
pin assignment
A-coded

27
40.7
L
30
5
50
ø14.9
ø6
M12

Item	Specifications
Cable O.D.	ø6 mm
Conductor nominal cross section	0.3 mm²/AWG22
Wire O.D. (Including insulator)	1.5 mm
Min. bending radius (Fixed)	40 mm

Terminal no.

Core wire color

1 — Brown: 0 V (Valve power supply)
2 — White: 24 VDC +10%/–5% (Valve power supply)
3 — Blue: 0 V (Power supply for control)
4 — Black: 24 VDC±10% (Power supply for control)
5 — Gray: No connected

Connections (PROFIBUS DP)

Angle connector type

Socket connector
pin assignment
A-coded

ø14.9
28.3
25.3
L
ø6
30
5
50
M12

Item	Specifications
Cable O.D.	ø6 mm
Conductor nominal cross section	0.3 mm²/AWG22
Wire O.D. (Including insulator)	1.5 mm
Min. bending radius (Fixed)	40 mm

Terminal no.

Core wire color

1 — Brown: 0 V (Valve power supply)
2 — White: 24 VDC +10%/–5% (Valve power supply)
3 — Blue: 0 V (Power supply for control)
4 — Black: 24 VDC±10% (Power supply for control)
5 — Gray: Ground

Connections (DeviceNet™)

Made to Order

| Cable length | 10000 mm | **p. 91** |

Side tabs: EX260, EX123/124/126, EX500, EX600, EX245, EX250, EX120/121/122, EX140, EX180, EX510, M8/M12, ATEX

EX500 *Series*

❹ Branch Cable

Connects the GW unit and SI unit or input unit.

EX500-AC [030] - [SSPS]

● **Connector specification**

SSPS	Socket side: Straight, Plug side: Straight
SAPA	Socket side: Angle, Plug side: Angle

● **Cable length (L)**

003	300 mm
005	500 mm
010	1000 mm
030	3000 mm
050	5000 mm
100	10000 mm
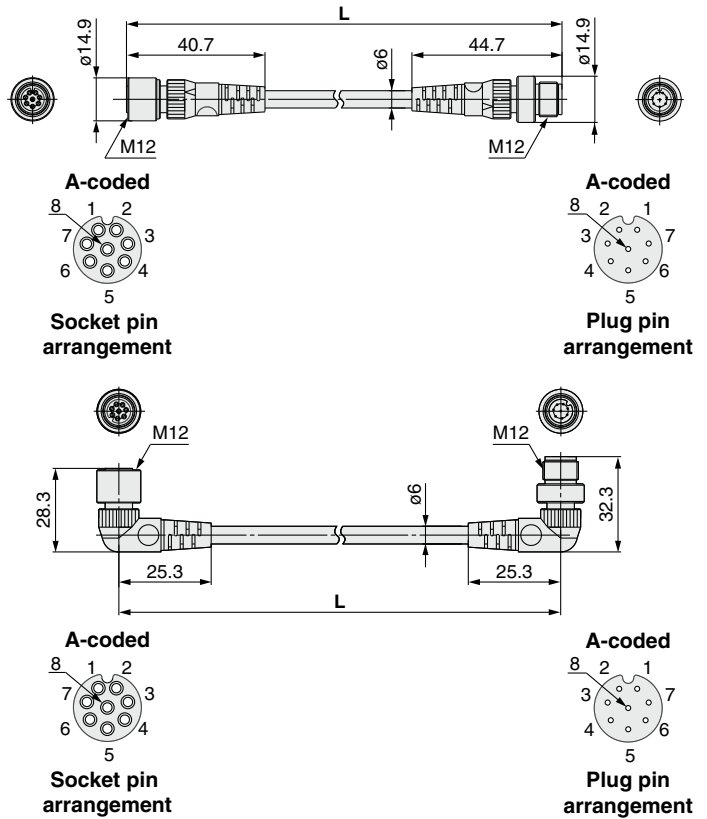
A-coded

Socket pin arrangement

A-coded

Plug pin arrangement

A-coded

Socket pin arrangement

A-coded

Plug pin arrangement

Item	Specifications
Cable O.D.	ø6 mm
Conductor nominal cross section	0.25 mm²
Wire O.D. (Including insulator)	1.27 mm
Min. bending radius (Fixed)	40 mm

❺ Terminal Plug

Use this where an input unit manifold is not being used. (If a terminal plug is not used, the GW unit's COM LED will not light up.)
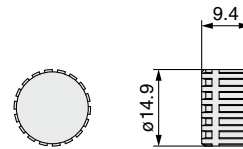
EX500-AC000-S

A-coded

Plug pin arrangement
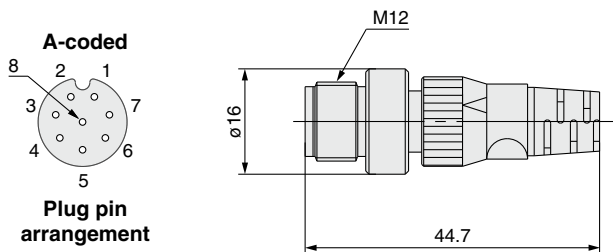
❻ Seal Cap (1 pc.)

Use with new connector (plug). By using these seal caps, the new connector maintains IP65/67 enclosure.

EX500-AWTP

❼ Seal Cap (10 pcs.)

Use with new connector. By using these seal caps, the new connector maintains IP65/67 enclosure.

EX9-AWES
For M8 connector socket

EX9-AWTS
For M12 connector socket

● Refer to page 71 for details about output block and power block.

SMC

ATEX

M8/M12

Type 2
EX510

Type 1
EX180
EX140
EX120/121/122

EX250

Type 3
EX245
EX600

Type 2
EX500

Type 1
EX123/124/126
EX260

SMC

EX500 Series

Communication Cable

With connector on one side (Socket)
Cable length: 10000 mm

For DeviceNet™

EX9-AC100DN-X12

Dimensions

M12
SPEEDCON

**Socket connector
pin assignment
A-coded (Normal key)**
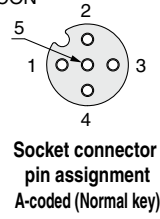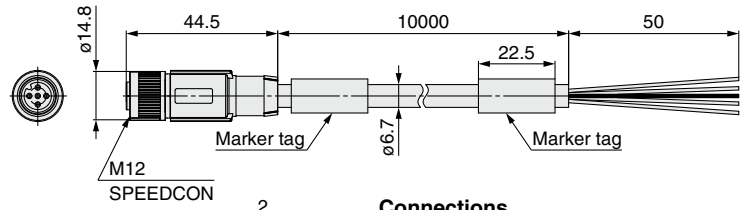
Connections

Terminal no.	Core wire colors: Signal name (DeviceNet™)
1	Shield: DRAIN
2	Red: V+
3	Black: V–
4	White: CAN H
5	Blue: CAN L

Item		Specifications
Cable O.D.		ø6.7 mm
Conductor nominal cross section	Power pair	0.34 mm²/AWG22
	Data pair	0.25 mm²/AWG24
Wire O.D. (Including insulator)	Power pair	1.4 mm
	Data pair	2.05 mm
Min. bending radius (Fixed)		67 mm

SMC

ATEX

M8/M12

EX510

EX180

EX140

EX120/121/122

EX250

EX245

EX600

EX500

EX123/124/126

EX260

SMC

EX500 *Series*

Power Supply Cable

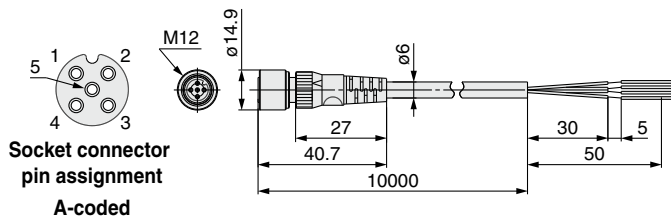① **With connector on one side (Socket)**
　　Cable length: 10000 mm

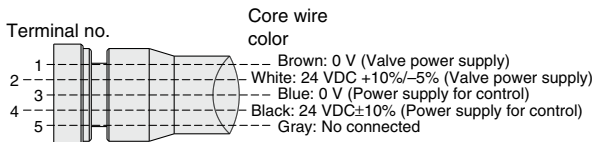| For PROFIBUS DP | For DeviceNet™ |

EX500-AP100-[S]-X1

●**Connector specification**

S	Straight
A	Angle

Straight connector type

5 1 2
4 3

M12

ø14.9
ø6

27
40.7
30
5
50
10000

**Socket connector
pin assignment
A-coded**

Item	Specifications
Cable O.D.	ø6 mm
Conductor nominal cross section	0.3 mm²/AWG22
Wire O.D. (Including insulator)	1.5 mm
Min. bending radius (Fixed)	40 mm

Terminal no.　　　Core wire color

1 — Brown: 0 V (Valve power supply)
2 — White: 24 VDC +10%/–5% (Valve power supply)
3 — Blue: 0 V (Power supply for control)
4 — Black: 24 VDC±10% (Power supply for control)
5 — Gray: No connected

Connections (PROFIBUS DP)

Angle connector type

M12

ø14.9
28.3
ø6

5 1 2
4 3

25.3
30
5
10000
50

**Socket connector
pin assignment
A-coded**

Item	Specifications
Cable O.D.	ø6 mm
Conductor nominal cross section	0.3 mm²/AWG22
Wire O.D. (Including insulator)	1.5 mm
Min. bending radius (Fixed)	40 mm

Terminal no.　　　Core wire color

1 — Brown: 0 V (Valve power supply)
2 — White: 24 VDC +10%/–5% (Valve power supply)
3 — Blue: 0 V (Power supply for control)
4 — Black: 24 VDC±10% (Power supply for control)
5 — Gray: Ground
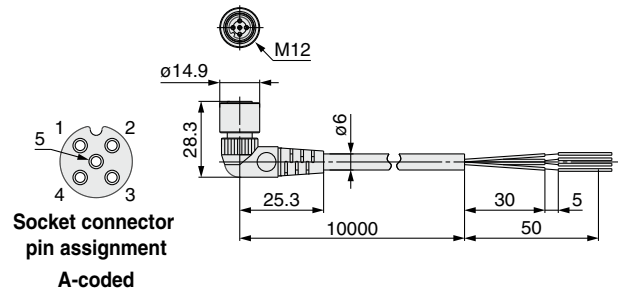
Connections (DeviceNet™)

② **With connector on one side (Socket)**
　　Cable length: 10000 mm

| For Power block |

Straight connector type

EX9-AC100-1-X16
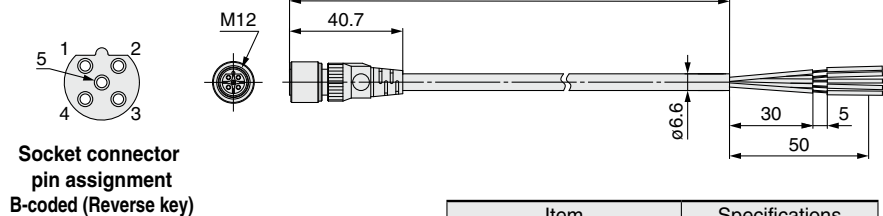
5 1 2
4 3

M12

40.7
10000

ø6.6
30
5
50

**Socket connector
pin assignment
B-coded (Reverse key)**

Item	Specifications
Cable O.D.	ø6.6 mm
Conductor nominal cross section	0.3 mm²/AWG22
Wire O.D. (Including insulator)	1.65 mm
Min. bending radius (Fixed)	40 mm

Terminal no.　　　Core wire color

1 — Brown: 24 VDC +10%/–5% (Power supply for output)
2 — White: 0 V (Power supply for output)
3
4
5 — Gray: Ground

Connections

SMC
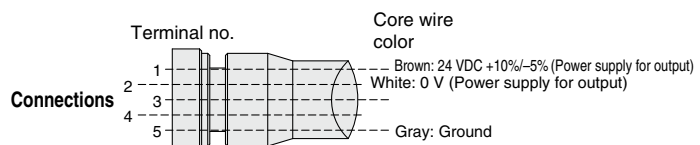
EX500 *Series*
Specific Product Precautions

Be sure to read this before handling the products. Refer to page 277 for safety instructions. For fieldbus system precautions, refer to pages 278 to 280 and the "Operation Manual" on the SMC website: http://www.smcworld.com

---

Operating Environment

⚠ Caution

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

IP65/67 is achieved when the following conditions are met.

1) Provide appropriate wiring between the products using electrical wiring cables, communication connectors and cables with M12 connectors.

2) Suitable mounting of the product 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.

Adjustment / Operation

⚠ Warning

<Web server function>

1. The valve operation test is a function which forcibly changes the signal status. Please check safety of the ambient environment and the device before using this function.

This may cause injuries or equipment damage.

2. If the communication line and PC are shut down during a valve operation test, the valve output status will be held (It remains in the output status before the communication line and/or PC was shut down). Please check safety of the ambient environment and the device when performing this function.

This may cause injuries or equipment damage.

■ **Trademark**
DeviceNet™ is a trademark of ODVA.
EtherNet/IP™ is a trademark of ODVA.
QuickConnect™ is a trademark of ODVA.

Type 1	EX260
Type 1	EX123/124/126
Type 2	EX500
	EX600
Type 3	EX245
	EX250
	EX120/121/122
Type 1	EX140
	EX180
Type 2	EX510
	M8/M12
	ATEX

SMC