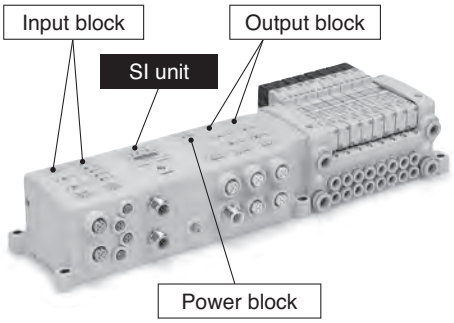
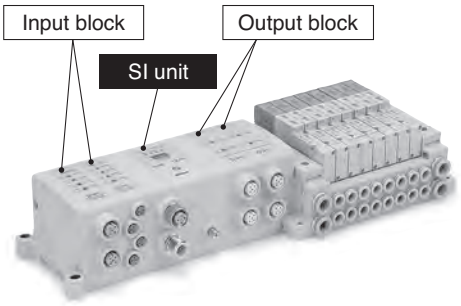
Serial Wiring with Input/Output Unit Series EX250

Features

- Wide choice of compatible valve series and sizes.
- 32 inputs and 32 outputs.
- Wide range of serial protocols.
- Switched output points are possible, up to 0.5A per point.
- IP67 enclosure protection.

SI Unit





How to Order SI Unit

EX250 – S DN1

Communication protocol

DN1	DeviceNet
PR1	PROFIBUS DP
MJ2	CC-Link
AS3	AS-i (8in/8out 31Slave Mode, 2 power supply system)
AS5	AS-i (4in/4out 31Slave Mode, 2 power supply system)
AS7	AS-i (8in/8out 31Slave Mode, 1 power supply system)
AS9	AS-i (4in/4out 31Slave Mode, 1 power supply system)
CA1A	CANopen
EN1	EtherNet/IP™
EN1-X156	EtherCat

How to Order Input Blocks

EX250 – IE 1

Block type

1	M12 connector, 2 inputs
2	M12 connector, 4 inputs
3	M8 connector, 4 inputs

How to Order End plate

EX250 – EA 1

Mounting specification

1	Direct mounting
2	DIN rail mounting

Product Recommendation SI Units

Stocked items for fast delivery

EX250-SDN1	EX250-SAS3	EX250-SAS7
EX250-SMJ2	EX250-SAS5	EX250-SAS9

Product Recommendation Input Blocks

Stocked items for fast delivery

EX250-IE1	EX250-IE2	EX250-IE3

Product Recommendation End Plate

Stocked items for fast delivery

EX250-EA1	EX250-EA2

Accessories and Related Products

(Accessories)
Series EX9 - Power Blocks / Output Blocks / End Plates - www.smc.eu
Series PCA - Cables / Connectors / Plugs - www.smc.eu

(Related Products)
Series SV1000/2000/3000 - Valves - page 20
Series VQC1000/2000/4000 - Valves - page 193, 211
Series S0700 - Valves - page XXX
Series SY3000/5000 - Valves - page 65

General Specifications

Model		EX250-SDN1	EX250-SPR1	EX250-SMJ2	EX250-SCA1A	EX250-SEN1	EX250-SEN1-X156	EX250-SAS3/5	EX250-SAS7/9
Protocol		DeviceNet	PROFIBUS DP	CC-Link	CANopen	EtherNet/IP	EtherCAT	AS-Interface (AS-i)	
Communication speed		125 k/250 k /500 kbps	9.6 k/19.2 k/ 45.45 k/93.75 k/ 187.5 k/500 kbps 1.5 M/3 M/ 6 M/12 Mbps	156 k/ 625 kbps 2.5 M/5 M/ 10 Mbps	10 k/20 k/ 50 k/125 k/ 250 k/500 k/ 800 kbps/ 1 Mbps	10 M/ 100 Mbps	100 Mbps	167 kbps	
Power supply for input and internal control	Power supply voltage	21.6 to 26.4 VDC						26.5 to 31.6 VDC Note 1)	
	Internal current consumption	—	100 mA or less					—	
Power supply for output	Power supply voltage	22.8 to 26.4 VDC							Note 1) 26.5 to 31.6 VDC
Power supply for communication	Power supply voltage	11 to 25 VDC	—					26.5 to 31.6 VDC Note 1)	
	Internal current consumption	100 mA or less	—					SAS3: 100 mA or less SAS5: 65 mA or less	SAS7: 100 mA or less SAS9: 65 mA or less
Input	Number of inputs	32 points (Based on input block connection)						SAS3: 8 points SAS5: 4 points	SAS7: 8 points SAS9: 4 points
	Supply voltage	24 VDC							
	Supply current	Max. 1.0 A						SAS3: max. 240 mA SAS5: max. 120 mA	Note 2)
Output	Output type	PNP output (–COM.)		NPN output (+COM.)	PNP output (–COM.)				
	Number of outputs	32 points						SAS3: 8 points SAS5: 4 points	SAS7: 8 points SAS9: 4 points
	Connection block	Solenoid valve (single, double), Output block, Power block							
	Supply voltage	24 VDC							
	Supply current	Max. 2.0 A						SAS3: max. 500 mA SAS5: max. 250 mA	Note 2)
Environmental resistance	Enclosure	IP67							
	Operating temperature range	Operating: 5 to 45°C Stored: –20 to 60°C (with no freezing and condensation)							
	Operating humidity range	Operating, Stored: 35 to 85%RH (with no condensation)					35 to 90%RH (no condensation)	Operating, Stored: 35 to 85%RH (with no condensation)	

Note 1) The EX250-SAS7/9 is powered by the single system spec., in which the communication power source is separated into input, power supply for internal control, and/or for output.
Note 2) The EX250-SAS7/9 is powered by the single system spec., that is separated for use depending on the aggregated values of input/output supply power as shown below.
Note 3) The maximum number of valve output points will be 24 if the power block is connected.

EX250-SAS7 ··· Max.240 mA, EX250-SAS9 ··· Max.120 mA

Input Block Specifications

Model		EX250-IE1	EX250-IE2	EX250-IE3
Input specification	Input type	PNP/NPN input (switched using a switch)		
	Number of inputs	2 points	4 points	
	Input device supply voltage	24 VDC		
	Input device supply current	Max. 30 mA/point Note 1)		
	Rated input current	Approx. 8 mA		
	Display	Green LED (Illuminated when the power supply for the SI unit input is applied), Yellow LED (Illuminated when the input signal is turned on.)		
	Connector on the input device side	M12 connector (4 pins, plug or 5 pins, plug)		M8 connector (3 pins, plug)
Environmental resistance	Enclosure	IP67		
	Operating temperature range	Operating: 5 to 45°C Stored: –20 to 60°C (with no freezing and condensation)		
	Operating humidity range	Operating, Stored: 35 to 85%RH (with no condensation)		
	Withstand voltage	500 VAC for 1 min. between whole charging part and case		
	Insulation resistance	10 M or more (500 VDC Mega) between whole charging part and case		
Standard		CE marking, UL (CSA)		
Weight		90 g		
Accessory	Tie-rod Note 2)	2 pcs.		

Note 1) When the maximum inputs for the SI unit is reached by adding an input block, pay attention not to exceed the supply current for the SI unit input.
Note 2) When an input block is integrated into a manifold, its tie-rods are also incorporated at the time of shipping.
Note 3) Every EX250-IE□ lis provided with two tie-rods for fixing the block.

End plate specifications

Reference model	EX250-EA1	EX250-EA2
Description	End plate (input side) for direct mounting	End plate (input side) for DIN rail mounting

Note) Reference EX250-EA1 includes two screws for mounting.

Accessories

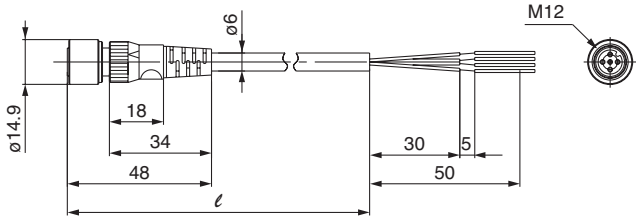
Power cable with connector (for SI unit)

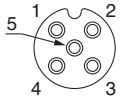
For PROFIBUS DP, EtherNet/IP™, EtherCAT type SI unit

EX500 – AP 050 – S

Cable length (ℓ)

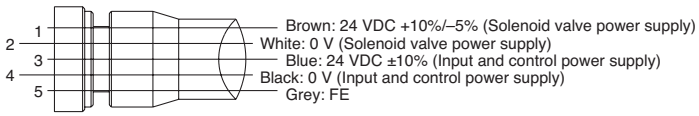
010	1000 [mm]
050	5000 [mm]





Socket connector pin arrangement

Terminal no. Core wire colours



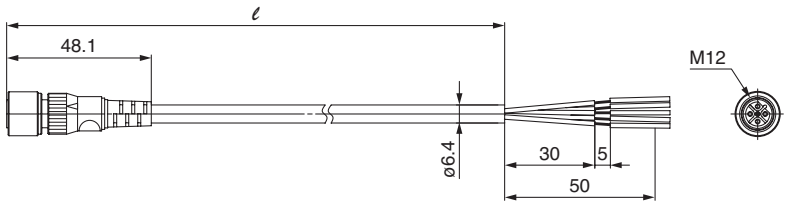
Connections

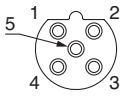
For DeviceNet™, CC-Link, CANopen type SI unit

EX9 – AC 050 – 1

Cable length (ℓ)

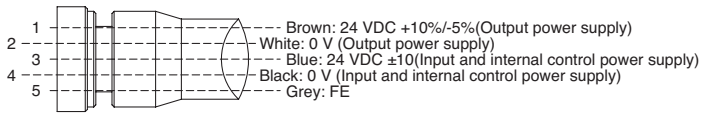
010	1000 [mm]
030	3000 [mm]
050	5000 [mm]





Socket connector pin arrangement

Terminal no. Core wire colours



Connections

Communication cable with connector

For EtherNet/IP™, EtherCAT

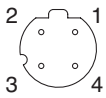
EX9 – AC 020 EN – PSRJ

Cable length (ℓ)

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

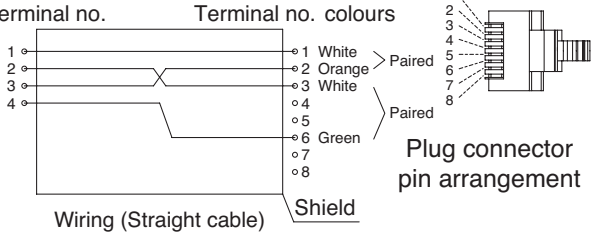
Connector specification

PSRJ	M12 plug (Straight), RJ-45 connector

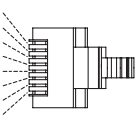


Plug connector pin arrangement

Terminal no. Terminal no. Core wire colours



Wiring (Straight cable)



Plug connector pin arrangement

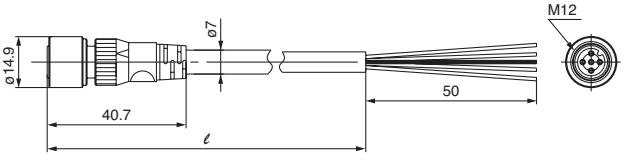
Communication connector

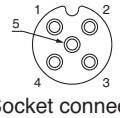
For DeviceNet™ type SI unit

EX500 – AC 050 – DN

Cable length (ℓ)

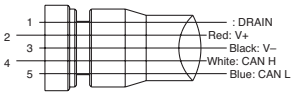
010	1000 [mm]
050	5000 [mm]





Socket connector pin arrangement

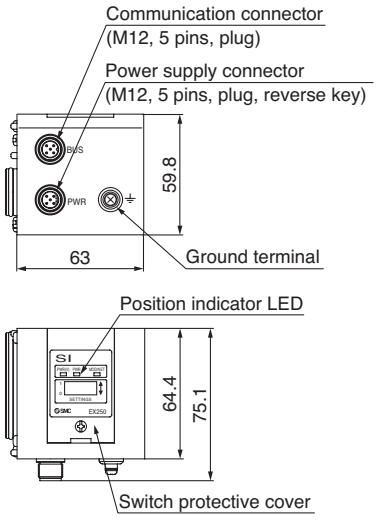
Terminal no. Core wire colours



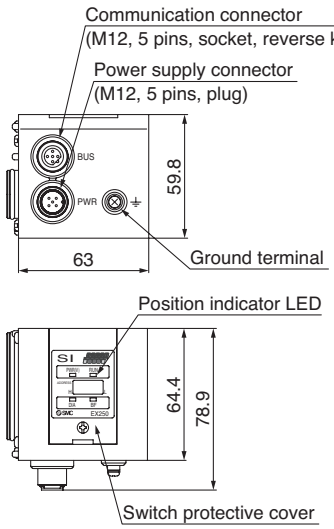
Connections

SI Unit Dimensions

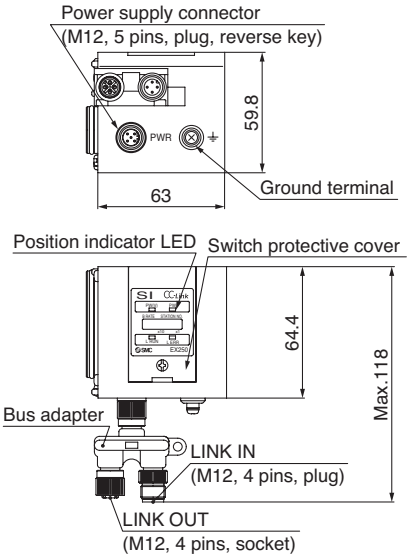
EX250-SDN1 (DeviceNet™)



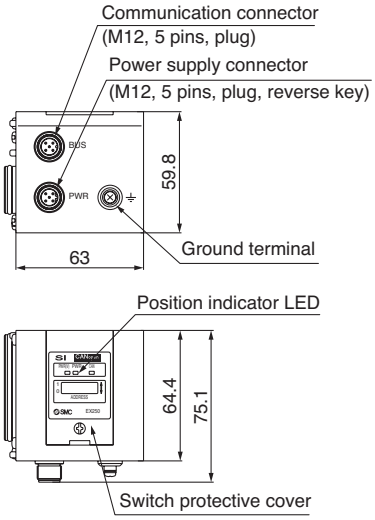
EX250-SPR1 (PROFIBUS DP)



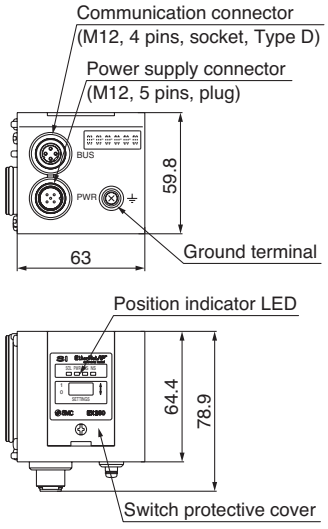
EX250-SMJ2 (CC-Link)



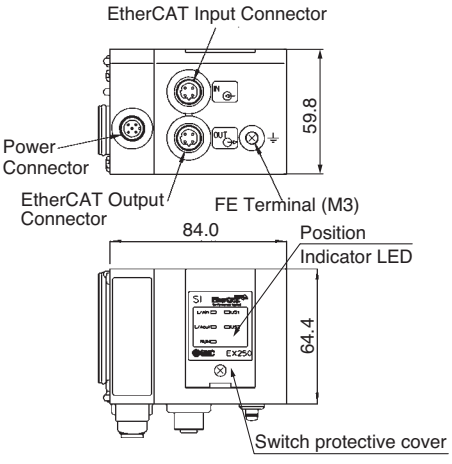
EX250-SCA1A (CANopen)



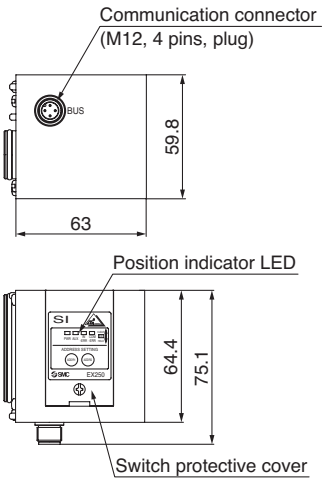
EX250-SEN1 (EtherNet/IP™)



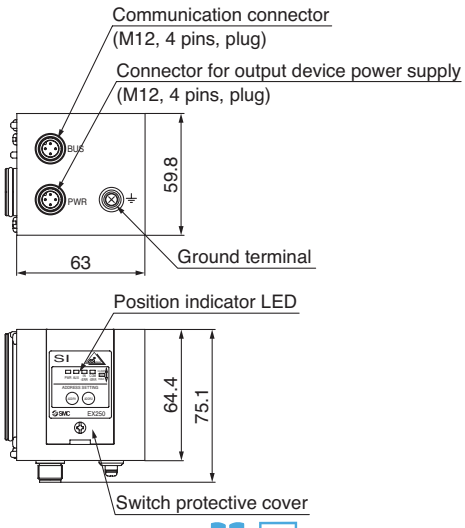
EX250-SEN1-X156 (EtherCAT)



AS-i
EX250-SAS7/9
(1 power supply system)



EX250-SAS3/5 (2 power supply system)

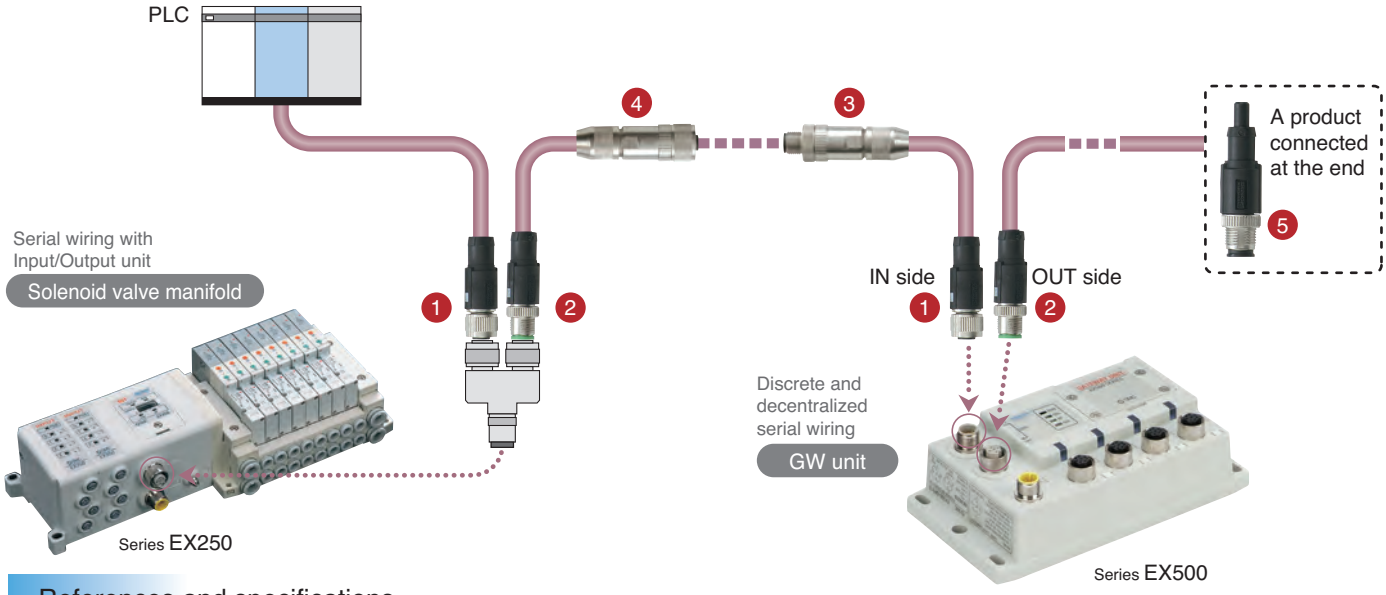


For more product options and details see our specific catalogues or on-line information.

Valves

Communication cables/connectors for PROFIBUS DP Accessories

Example of Connection

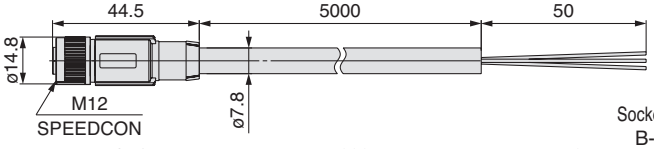


References and specifications

Description	Communication cable (With one side connector)		Fieldwireable connector		Terminal plug
Part no.	PCA-1557688	PCA-1557691	PCA-1557701	PCA-1557714	PCA-1557727
Product image	1 SPEEDCON Socket	2 SPEEDCON Plug	3 Plug	4 Socket	5 For PROFIBUS DP (Plug, B-coded)
Number of functional poles	M12: 2 poles		M12: 3 poles		M12: 4 poles
Key type	B-coded (Reverse key)				
Pin assignment	Plug, B-coded (Viewed from the plug/socket side)		1: — 2: A Line (Green) 3: — 4: B Line (Red) 5: —		1: VP 4: B Line 2: A Line 3: DGND 390 220 390
Fixed cable length	5 m		—		

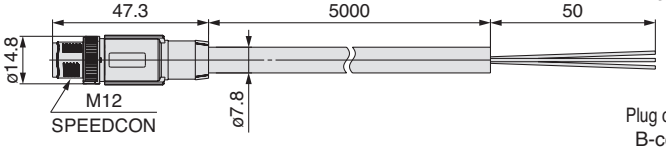
Communication cable (with one side connector)

1 PCA-1557688
For PROFIBUS DP
(Socket)



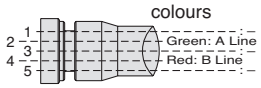
Socket connector pin assignment
B-coded (Reverse key)

2 PCA-1557691
For PROFIBUS DP
(Plug)



Plug connector pin assignment
B-coded (Reverse key)

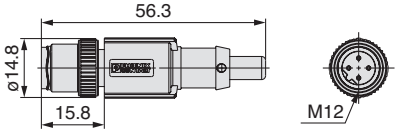
Cable wire colours



Shield line is connected to the knurl.
Wiring

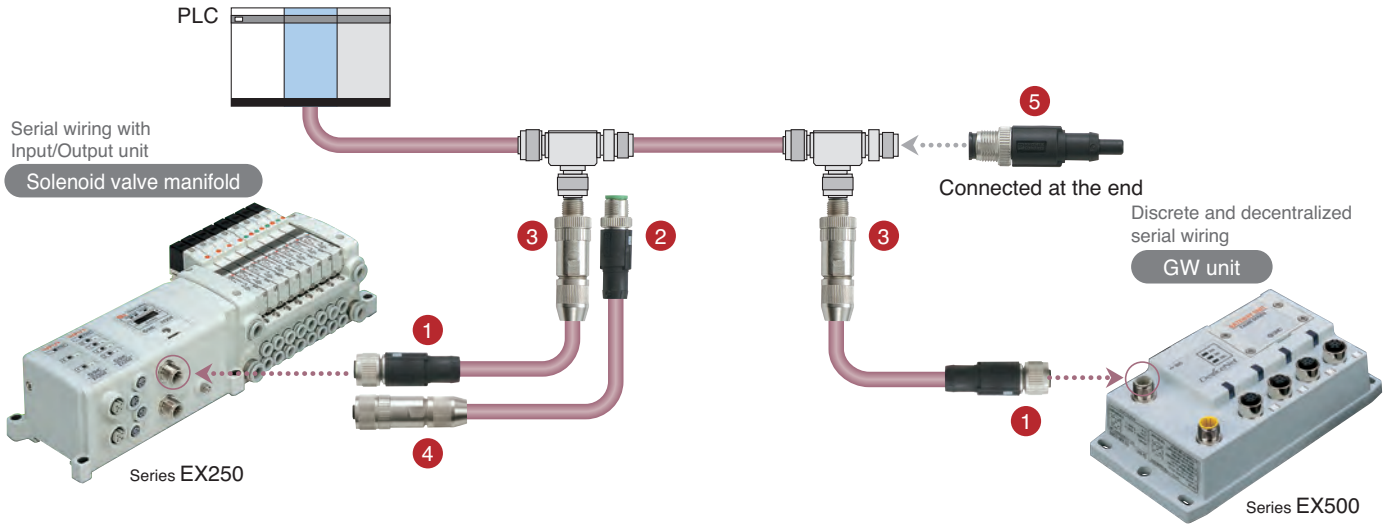
Terminal plug

5 PCA-1557727
Terminal resistor
for PROFIBUS DP



Communication cables/connectors for DeviceNet™ Accessories

Example of Connection

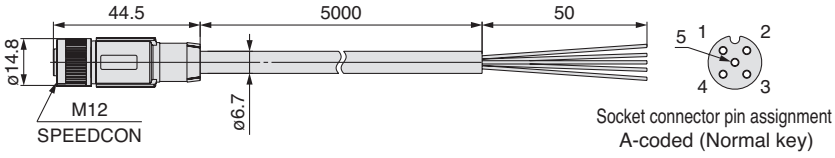


References and specifications

Description	Communication cable (With one side connector)		Fieldwireable connector		Terminal plug
Part no.	PCA-1557633	PCA-1557646	PCA-1557659	PCA-1557662	PCA-1557675
Product image	1 SPEEDCON Socket	2 SPEEDCON Plug	3 Plug	4 Socket	5 For DeviceNet™ (Plug, A-coded)
Number of functional poles	M12: 5 poles				
Key type	A-coded (Normal key)				
Pin assignment	Plug, A-coded / Socket, A-coded (Viewed from the plug/socket side)		DeviceNet™ 1: DRAIN 2: V+ (Red) 3: V– (Black) 4: CAN H (White) 5: CAN L (Blue)		1: DRAIN: NC 2: V+: NC 3: V–: NC 4: CAN H 5: CAN L
Fixed cable length	5 m		—		

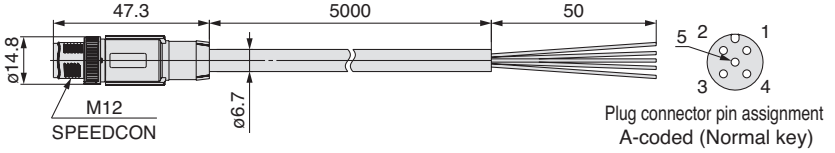
Communication cable (with one side connector)

1 PCA-1557633
For DeviceNet™
(Socket)

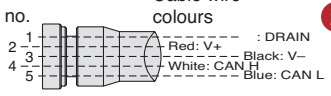


Socket connector pin assignment
A-coded (Normal key)

2 PCA-1557646
For DeviceNet™
(Plug)



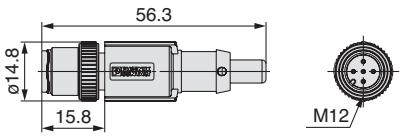
Plug connector pin assignment
A-coded (Normal key)



Wiring

Terminal plug

5 PCA-1557675
Terminal resistor
for DeviceNet™



For more product options and details see our specific catalogues or on-line information.

Valves

Serial Wiring for Outputs Series EX260

Features

- Wide choice of compatible valve series and sizes.
- 32 valve outputs.
- Compact size.
- Daisy-chain wiring communication.
- IP67 enclosure protection.

How to Order SI Unit

EX260 – S **PR1**

Communication protocol

Symbol	Protocol	Number of outputs	SI unit output polarity	Communication connector
DN1	DeviceNet™	32	Source/PNP (Negative common)	M12
DN2			Sink/NPN (Positive common)	
DN3		16	Source/PNP (Negative common)	
DN4			Sink/NPN (Positive common)	
PR1	PROFIBUS DP	32	Source/PNP (Negative common)	M12
PR2			Sink/NPN (Positive common)	
PR3		16	Source/PNP (Negative common)	
PR4			Sink/NPN (Positive common)	
PR5		32	Source/PNP (Negative common)	D-sub Note)
PR6			Sink/NPN (Positive common)	
PR7		16	Source/PNP (Negative common)	
PR8			Sink/NPN (Positive common)	
MJ1	CC-Link	32	Source/PNP (Negative common)	M12
MJ2			Sink/NPN (Positive common)	
MJ3		16	Source/PNP (Negative common)	
MJ4			Sink/NPN (Positive common)	
EC1	EtherCAT	32	Source/PNP (Negative common)	M12
EC2			Sink/NPN (Positive common)	
EC3		16	Source/PNP (Negative common)	
EC4			Sink/NPN (Positive common)	
PN1	PROFINET	32	Source/PNP (Negative common)	M12
PN2			Sink/NPN (Positive common)	
PN3		16	Source/PNP (Negative common)	
PN4			Sink/NPN (Positive common)	
EN1	EtherNet/IP™	32	Source/PNP (Negative common)	M12
EN2			Sink/NPN (Positive common)	
EN3		16	Source/PNP (Negative common)	
EN4			Sink/NPN (Positive common)	

Note) Enclosure is IP40 when the communication connector is D-sub.

Product Recommendation

Stocked items for fast delivery

EX260-SDN1	EX260-SPR1	EX260-SPR5	EX260-SEC1
EX260-SDN3	EX260-SPR3	EX260-SPR7	EX260-SEC3

Accessories and Related Products

(Accessories)
Series PCA - Cables / Connectors / Plugs - www.smc.eu

(Related Products)
Series SV1000/2000/3000 - Valves - page 20
Series VQC1000/2000/4000 - Valves - page 193, 211
Series SY3000/5000 - Valves - page 65
Series S0700 - Valves - page XXX

Specifications SI Unit

Model		EX260-SPR1/3	EX260-SPR2/4	EX260-SPR5/7	EX260-SPR6/8	EX260-SDN1/3	EX260-SDN2/4	EX260-SMJ1/3	EX260-SMJ2/4
Applicable system	Protocol	PROFIBUS DP				DeviceNet™		CC-Link	
	Version Note 1)	DP-V0				Volume 1(Edition 3.5) Volume 3(Edition 1.5)		Ver.1.10	
	Configuration file	GSD file				EDS file		—	
I/O occupation area (Inputs/Outputs)		SPR1: 0/32 SPR3: 0/16	SPR2: 0/32 SPR4: 0/16	SPR5: 0/32 SPR7: 0/16	SPR6: 0/32 SPR8: 0/16	SDN1: 0/32 SDN3: 0/16	SDN2: 0/32 SDN4: 0/16	SMJ1: 32/32 SMJ3: 32/32 (1 station, remote I/O stations)	SMJ2: 32/32 SMJ4: 32/32 (1 station, remote I/O stations)
Communication speed		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				125 k/250 k/ 500 kbps		156 k/625 k/ 2.5 M/5 M/10 Mbps	
Power supply for control	Power supply voltage	21.6 to 26.4 VDC				—		21.6 to 26.4 VDC	
	Internal current consumption	100 mA or less				—		100 mA or less	
Power supply for output	Power supply voltage	22.8 to 26.4 VDC							
Power supply for communication	Power supply voltage	—				11 to 25 VDC		—	
	Internal current consumption	—				100 mA		—	
Communication connector specification		M12		D-sub		M12			
Terminating resistor switch		Built-in		None				Built-in	
Output	Output type	Source/PNP (Negative common)	Sink/NPN (Positive common)	Source/PNP (Negative common)	Sink/NPN (Positive common)	Source/PNP (Negative common)	Sink/NPN (Positive common)	Source/PNP (Negative common)	Sink/NPN (Positive common)
	Number of outputs	SPR1: 32 points SPR3: 16 points	SPR2: 32 points SPR4: 16 points	SPR5: 32 points SPR7: 16 points	SPR6: 32 points SPR8: 16 points	SDN1: 32 points SDN3: 16 points	SDN2: 32 points SDN4: 16 points	SMJ1: 32 points SMJ3: 16 points	SMJ2: 32 points SMJ4: 16 points
	Load	Solenoid valve with surge voltage suppressor 24 VDC, 1.5 W or less (SMC)							
	Supplied voltage	24 VDC							
	Supplied current	SPR1: Max. 2.0 A SPR3: Max. 1.0 A	SPR2: Max. 2.0 A SPR4: Max. 1.0 A	SPR5: Max. 2.0 A SPR7: Max. 1.0 A	SPR6: Max. 2.0 A SPR8: Max. 1.0 A	SDN1: Max. 2.0 A SDN3: Max. 1.0 A	SDN2: Max. 2.0 A SDN4: Max. 1.0 A	SMJ1: Max. 2.0 A SMJ3: Max. 1.0 A	SMJ2: Max. 2.0 A SMJ4: Max. 1.0 A
Environmental resistance	Enclosure	IP67		IP40		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 whole live part and case							
	Insulation resistance	10 MΩ or more (500 VDC) between whole live part and case							
Standards		CE marking, UL (CSA) compatible							
Weight		200 g							
Accessories	Mounting screw	2 pcs.							
	Seal cap (for M12 connector socket)	EX9-AWTS (1 pc.)		—		EX9-AWTS (1 pc.)			

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

Specifications SI Unit

Model		EX260-SEC1/3	EX260-SEC2/4	EX260-SPN1/3	EX260-SPN2/4	EX260-SEN1/3	EX260-SEN2/4
Applicable system	Protocol	EtherCAT Note 2)		PROFINET Note 2)		EtherNet/IP™ Note 2)	
	Version Note 1)	Conformance Test Record V.1.1		PROFINET Specification Version 2.2		Volume 1(Edition 3.8) Volume 2(Edition 1.9)	
	Configuration file Note 3)	XML file		GSD file		EDS file	
I/O occupation area (Inputs/Outputs)		SEC1: 0/32 SEC3: 0/16	SEC2: 0/32 SEC4: 0/16	SPN1: 0/32 SPN3: 0/16	SPN2: 0/32 SPN4: 0/16	SEN1: 16/32 SEN3: 16/16	SEN2: 16/32 SEN4: 16/16
Communication speed		100 Mbps Note 2)				10 M/100 Mbps Note 2)	
Power supply for control	Power supply voltage	21.6 to 26.4 VDC					
	Internal current consumption	100 mA or less					
Power supply for output	Power supply voltage	22.8 to 26.4 VDC					
Power supply for communication	Power supply voltage	—					
	Internal current consumption	—					
Communication connector specification		M12					
Terminating resistor switch		None					
Output	Output type	Source/PNP (Negative common)	Sink/NPN (Positive common)	Source/PNP (Negative common)	Sink/NPN (Positive common)	Source/PNP (Negative common)	Sink/NPN (Positive common)
	Number of outputs	SEC1: 32 points SEC3: 16 points	SEC2: 32 points SEC4: 16 points	SPN1: 32 points SPN3: 16 points	SPN2: 32 points SPN4: 16 points	SEN1: 32 points SEN3: 16 points	SEN2: 32 points SEN4: 16 points
	Load	Solenoid valve with protective circuit for surge voltage of 24 VDC/1.5 W or less (SMC)		Solenoid valve with protective circuit for surge voltage of 24 VDC/1.0 W or less (SMC)		Solenoid valve with protective circuit for surge voltage of 24 VDC/1.5 W or less (SMC)	
	Supplied voltage	24 VDC					
	Supplied voltage	SEC1: Max. 2.0 A SEC3: Max. 1.0 A	SEC2: Max. 2.0 A SEC4: Max. 1.0 A	SPN1: Max. 2.0 A SPN3: Max. 1.0 A	SPN2: Max. 2.0 A SPN4: Max. 1.0 A	SEN1: Max. 2.0 A SEN3: Max. 1.0 A	SEN2: Max. 2.0 A SEN4: Max. 1.0 A
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					
Standards		CE marking, UL (CSA) compatible					
Weight		200 g					
Accessories	Mounting screw	2 pcs.					
	Seal cap (for M12 connector socket)	EX9-AWTS (1 pc.)					

Note 1) Please note that the version is subject to change.
Note 2) Use a CAT5 or higher transmission cable for EtherCAT, PROFINET, EtherNet/IP™.
Note 3) Each file can be downloaded from the SMC website, http://www.smcworld.com

Accessories

Power cable with connector (for SI units)

For SI units compatible with PROFIBUS DP, DeviceNet™, EtherCAT, PROFINET, Ethernet/IP™

EX500 – AP 050 – S

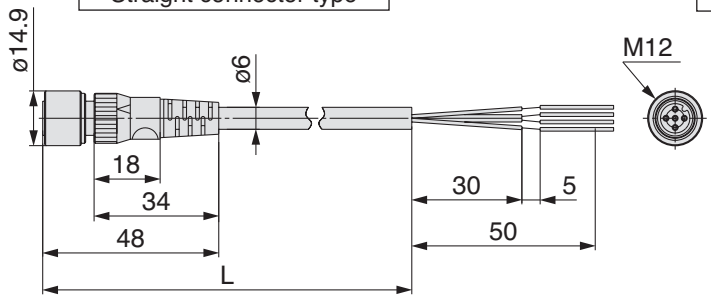
Cable length (L)

010	1000 [mm]
050	5000 [mm]

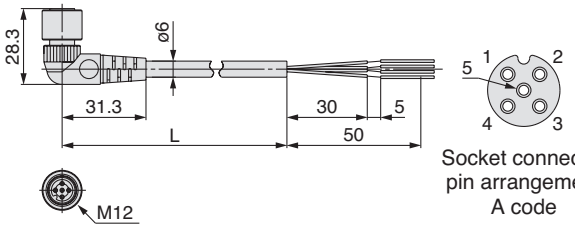
Connector specification

S	Straight
A	Angle

Straight connector type



Angle connector type

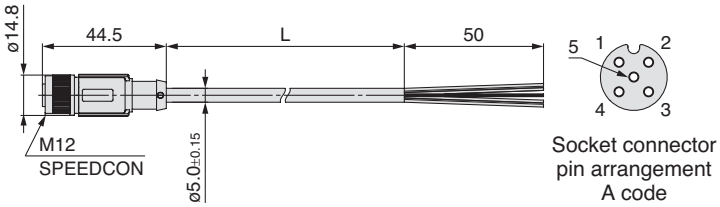


Socket connector pin arrangement
A code

PCA 1401804

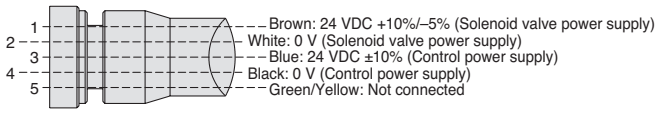
Cable length (L)

1401804	1500 [mm]
1401805	3000 [mm]
1401806	5000 [mm]



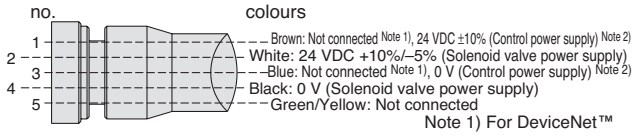
Socket connector pin arrangement
A code

Terminal no. / Core wire colours



Connections (PROFIBUS DP/EtherCAT)

Terminal no. / Core wire colours



Connections (DeviceNet™, EtherNet/IP™)

Note 1) For DeviceNet™
Note 2) For EtherNet/IP™

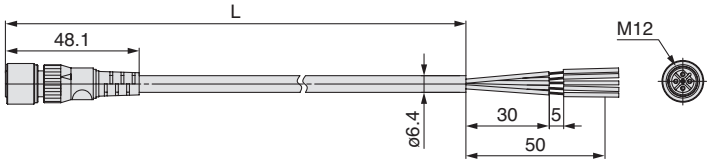
For SI units compatible with CC-Link

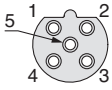
EX9 – AC 030 – 1

Cable length (L)

010	1000 [mm]
030	3000 [mm]
050	5000 [mm]

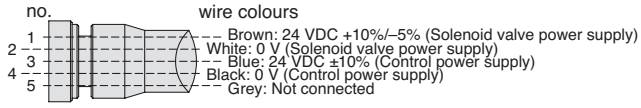
Straight connector type





Socket connector pin arrangement

Terminal no. / Cable core wire colours



Connections

PCA 1401807

Cable length (L)

1401807	1500 [mm]
1401808	3000 [mm]
1401809	5000 [mm]

For more product options and details see our specific catalogues or on-line information.

Valves

Accessories

Communication cable with connector

For SI units compatible with EtherCAT, PROFINET, EtherNet/IP™, PROFIBUS DP, DeviceNet™, CC-Link

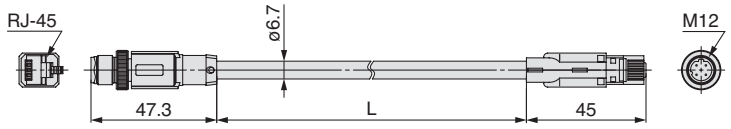
EX9–AC 020 EN–PSRJ

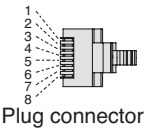
Cable length (L)

010	1000 [mm]
020	2000 [mm]
030	3000 [mm]
050	4000 [mm]
100	5000 [mm]

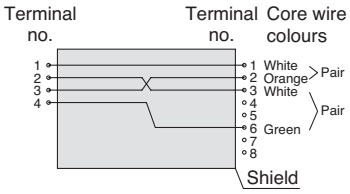
Connector specification

PSRJ	M12 plug (straight) ⇔ RJ-45 connector





Plug connector pin arrangement



Connections (Straight cable)

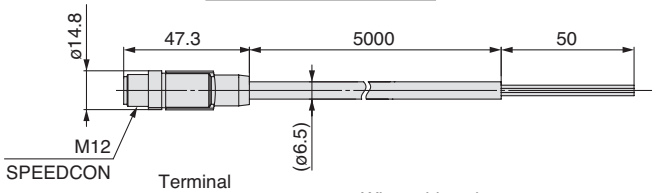
Plug connector pin arrangement

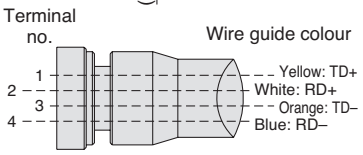
For SI units compatible with EtherCAT, PROFINET, EtherNet/IP™

PCA–1446566

Cable length

1446566	5000 [mm]





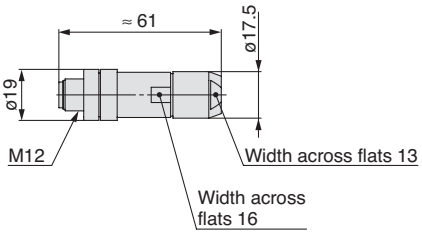
Connections

Plug connector pin arrangement

For SI units compatible with EtherCAT, PROFINET, EtherNet/IP™

Fieldwireable connector

PCA–1446553

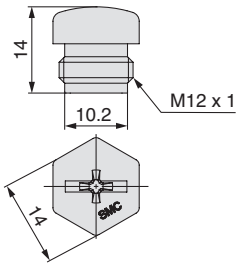


Plug connector pin arrangement

EX9–AW TS

Connector type

TS	For M12 connector socket (10 pcs.)



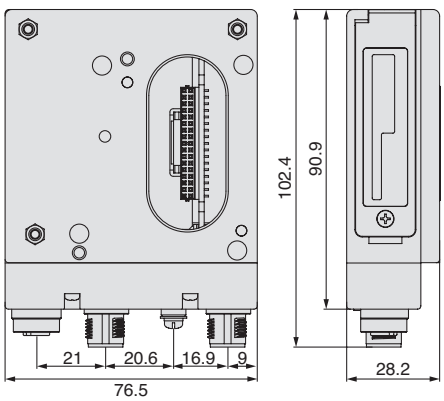
For M12 connector socket

Seal cap: For M12 connector socket

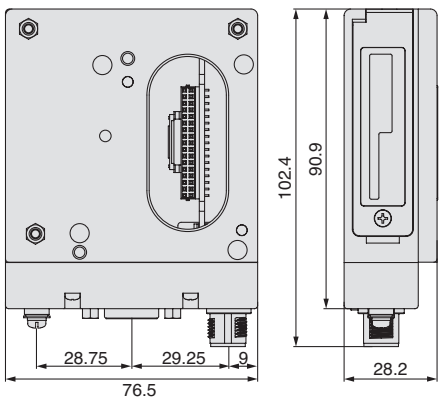
Use this on ports that are not being used for communication connector (M12 connector socket).
Use of this seal cap maintains the integrity of the IP67 enclosure.
Note) Tighten the seal cap with the prescribed tightening torque. (For M12: 0.1 N·m)

SI Unit Dimensions

M12 communication connector type

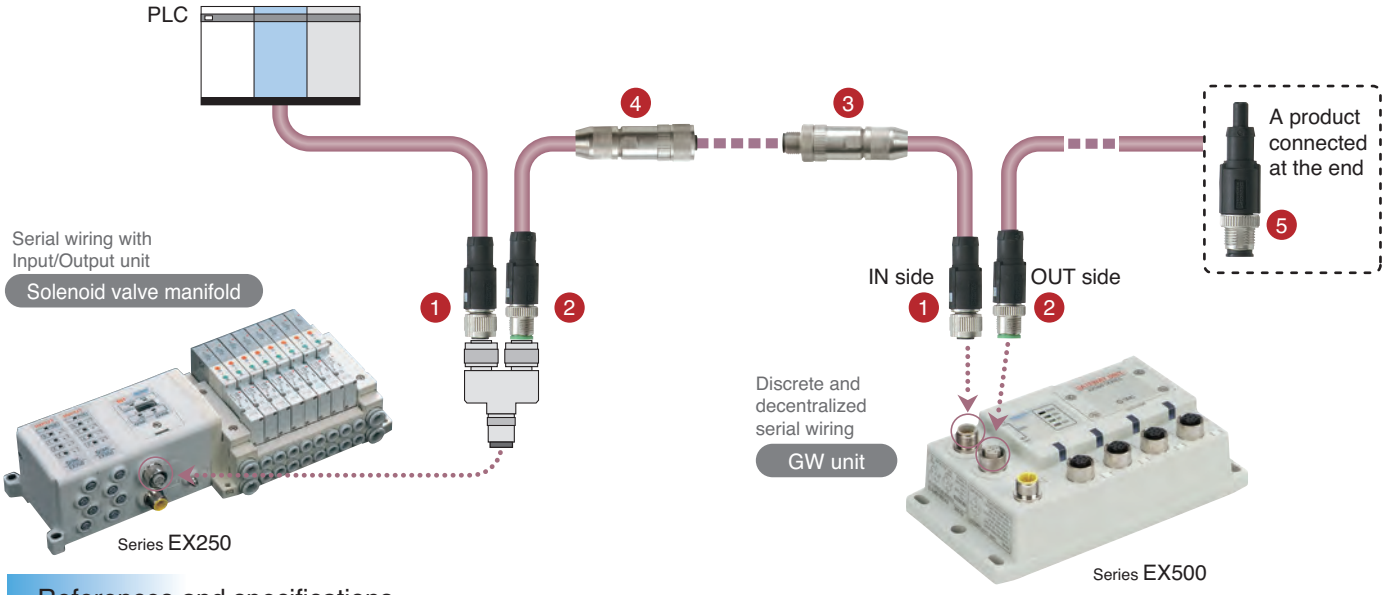


D-sub communication connector type



Communication cables/connectors for PROFIBUS DP Accessories

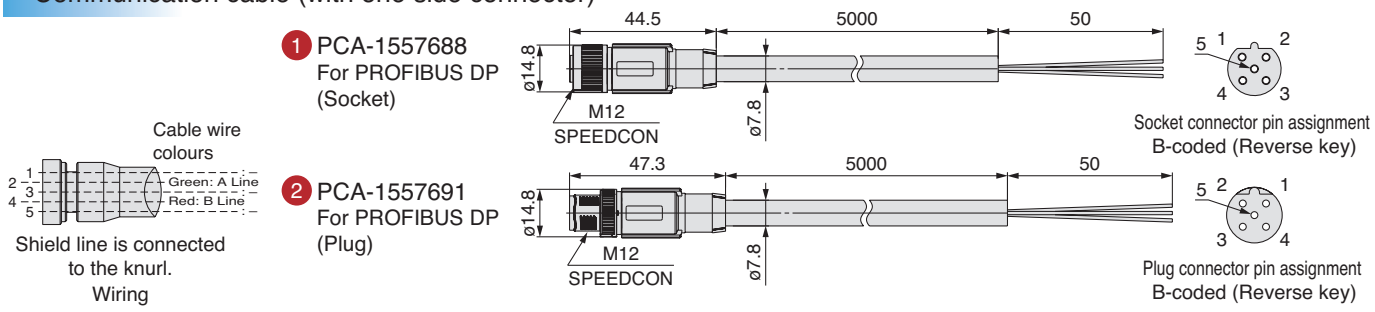
Example of Connection



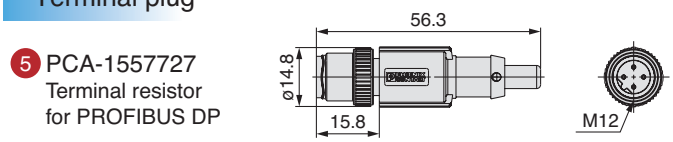
References and specifications

Description	Communication cable (With one side connector)		Fieldwireable connector		Terminal plug
Part no.	PCA-1557688	PCA-1557691	PCA-1557701	PCA-1557714	PCA-1557727
Product image	1 SPEEDCON Socket	2 SPEEDCON Plug	3 Plug	4 Socket	5 For PROFIBUS DP (Plug, B-coded)
Number of functional poles	M12: 2 poles		M12: 3 poles		M12: 4 poles
Key type	B-coded (Reverse key)				
Pin assignment	Plug, B-coded (Viewed from the plug/socket side)		Plug, B-coded (Viewed from the plug/socket side)		1: VP, 4: B Line, 2: A Line, 3: DGND (390, 220, 390)
			1: — 2: A Line (Green) 3: — 4: B Line (Red) 5: —		
Fixed cable length	5 m		—		

Communication cable (with one side connector)



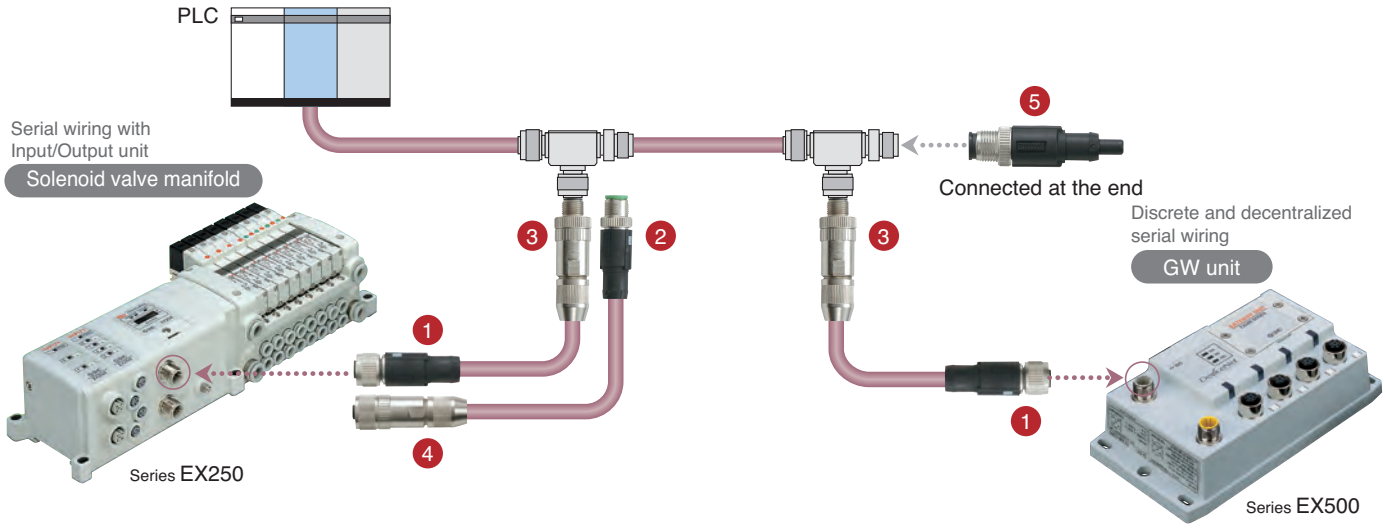
Terminal plug



For more product options and details see our specific catalogues or on-line information.

Communication cables/connectors for DeviceNet™ Accessories

Example of Connection

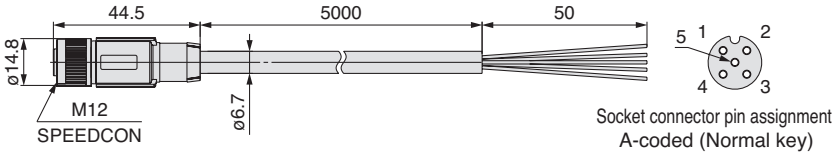


References and specifications

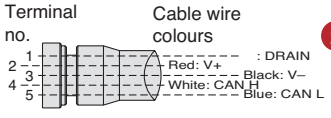
Description	Communication cable (With one side connector)		Fieldwireable connector		Terminal plug
Part no.	PCA-1557633	PCA-1557646	PCA-1557659	PCA-1557662	PCA-1557675
Product image	1 SPEEDCON Socket	2 SPEEDCON Plug	3 Plug	4 Socket	5 For DeviceNet™ (Plug, A-coded)
Number of functional poles	M12: 5 poles				
Key type	A-coded (Normal key)				
Pin assignment	Plug, A-coded / Socket, A-coded (Viewed from the plug/socket side)		DeviceNet™ 1: DRAIN 2: V+ (Red) 3: V– (Black) 4: CAN H (White) 5: CAN L (Blue)		1: DRAIN: NC 2: V+: NC 3: V–: NC 4: CAN H 5: CAN L
Fixed cable length	5 m		—		

Communication cable (with one side connector)

1 PCA-1557633
For DeviceNet™
(Socket)

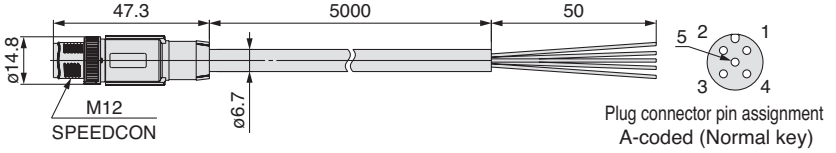


Socket connector pin assignment
A-coded (Normal key)



Wiring

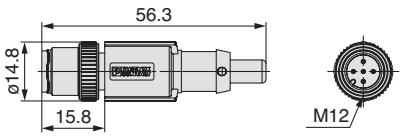
2 PCA-1557646
For DeviceNet™
(Plug)



Plug connector pin assignment
A-coded (Normal key)

Terminal plug

5 PCA-1557675
Terminal resistor
for DeviceNet™



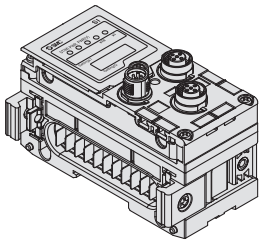
Serial Wiring for Inputs and Outputs Series EX600

Features

- Wide choice of compatible valve series and sizes.
- 2 valve outputs, with 144 digital I/O points or 18 analogue inputs and 18 analogue outputs. A mixture is also possible between digitan and analogue.
- Wide range of input/output connection variations.
- Easy maintenance with self-diagnosis function.
- IP67 enclosure protection.

How to Order

SI Unit



EX600 – S [PR] [1] [ ]

Protocol

Symbol	Description
PR	PROFIBUS DP
DN	DeviceNet™
MJ	CC-Link
EN	EtherNet/IP™ Note 1)
EC	EtherCAT Note 1)

Version

Symbol	Description
–	When MJ, EN or EC is selected
A	When PR or DN is selected

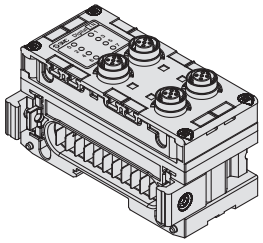
Output type

Symbol	Description
1	PNP (Negative common)
2	NPN (Positive common)

Stocked items for fast delivery

EX600-SPR1A	EX600-SDN1A	EX600-SMJ1	EX600-SEN1

Digital Input Unit



EX600 – DX [P] [B]

Input type

Symbol	Description
P	PNP
N	NPN

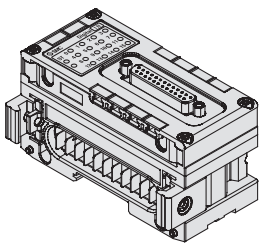
Number of inputs, open circuit detection, and connector

Symbol	Number of inputs	Open circuit detection	Connector
B	8 inputs	No	M12 connector (5 pins) 4 pcs.
C	8 inputs	No	M8 connector (3 pins) 8 pcs.
C1	8 inputs	Yes	M8 connector (3 pins) 8 pcs.
D	16 inputs	No	M12 connector (5 pins) 8 pcs.
E	16 inputs	No	D-sub connector (25 pins) Note1) 2)
F	16 inputs	No	Spring type terminal block (32 pins) Note1) 2)

Stocked items for fast delivery

EX600-DXNC	EX600-DXPB	EX600-DXPC1	EX600-DXPE
EX600-DXND	EX600-DXPC	EX600-DXPD	EX600-DXPF

Digital Output Unit



EX600 – DY [P] [B]

Output type

Symbol	Description
P	PNP
N	NPN

Number of outputs and connector

Symbol	Number of outputs	Connector
B	8 outputs	M12 connector (5 pins) 4 pcs.
E	16 outputs	D-sub connector (25 pins) Note1) 2)
F	16 outputs	Spring type terminal block (32 pins) Note1) 2)

Stocked items for fast delivery

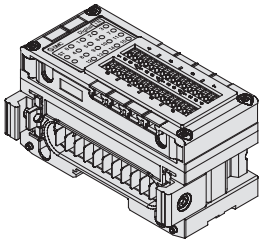
EX600-DYPB	EX600-DYPE	EX600-DYPF

Note 1) Cannot be connected with EX600-HT1-□.
Note 2) Cannot be connected with EX600-SPR1, EX600-SPR2, EX600-SDN1, or EX600-SDN2.

For more product options and details see our specific catalogues or on-line information.

How to Order

Digital Input/Output Unit



EX600 – DM [P] [E]

Input/Output type

Symbol	Description
P	PNP
N	NPN

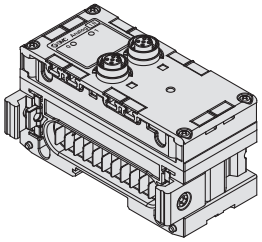
Number of inputs/outputs and connector

Symbol	Number of inputs	Number of outputs	Connector
E	8 inputs	8 outputs	D-sub connector (25 pins) Note1) 2)
F	8 inputs	8 outputs	Spring type terminal block (32 pins) Note1) 2)

Stocked items for fast delivery

EX600-DMPE | EX600-DMPF

Analogue Input Unit



EX600 – AX [A]

Analogue input

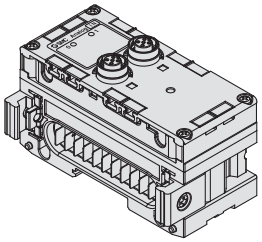
Number of input channels and connector

Symbol	Number of input channels	Connector
A	2 channels	M12 connector (5 pins) 2 pcs.

Stocked items for fast delivery

EX600-AXA

Analogue Output Unit



EX600 – AY [A]

Analogue output

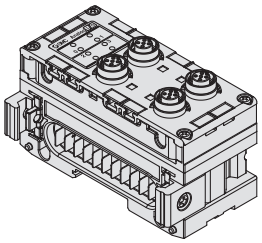
Number of output channels and connector

Symbol	Number of output channels	Connector
A	2 channels	M12 connector (5 pins) 2 pcs. Note1) 2)

Stocked items for fast delivery

EX600-AYA

Analogue Input/Output Unit



EX600 – AM [B]

Analogue input/output

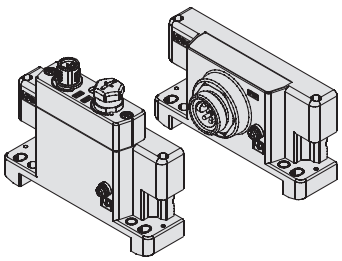
Number of input/output channels and connector

Symbol	Number of input channels	Number of output channels	Connector
B	2 channels	2 channels	M12 connector (5 pins) 4 pcs. Note1) 2)

Stocked items for fast delivery

EX600-AMB

End Plate



EX600 – ED [2] – [ ]

Power connector

Symbol	Connector
2	M12 (5 pins)
3	7/8 inch (5 pins)

Mounting method

Symbol	Description
–	Without DIN rail mounting bracket
2	With DIN rail mounting bracket
3	With DIN rail mounting bracket (Specialized for Series SY)

Stocked items for fast delivery

EX600-ED2 | EX600-ED2-2 | EX600-ED3

Note 1) Cannot be connected with EX600-HT1-□.
Note 2) Cannot be connected with EX600-SPR1, EX600-SPR2, EX600-SDN1, or EX600-SDN2.

Accessories and Related Products

(Accessories)
EX600-HT1A - Handheld Terminal - www.smc.eu
Series PCA - Cables / Connectors / Plugs - www.smc.eu

(Related Products)
Series SY3000/5000 - Valves - page 65
Series SV1000/2000/3000 - Valves - page 20
Series VQC1000/2000/4000 - Valves - page 193, 211

SI Unit Specifications

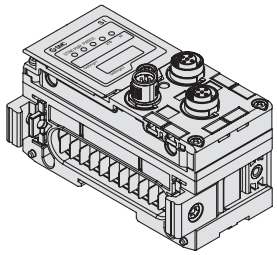
All Units Common Specifications

Environmental resistance	Operating temperature range	–10 to 50°C
	Storage temperature range	–20 to 60°C
	Operating humidity range	35 to 85% RH (No dew condensation)
	Withstand voltage Note)	500 VAC for 1 minute between external terminals and FE
	Insulation resistance Note)	500 VDC, 10 M or more between external terminals and FE

Note) Except Handheld Terminals

SI Unit (EX600-SPR□A)

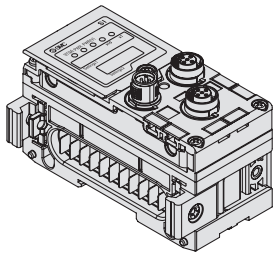
Model		EX600-SPR1A	EX600-SPR2A
Communication	Protocol	PROFIBUS DP (DP-V0)	
	Device type	PROFIBUS DP Slave	
	Communication speed	9.6/19.2/45.45/93.75/187.5/500 kbps 1.5/3/6/12 Mbps	
	Configuration file	GSD file	
	I/O occupation area (Inputs/Outputs)	Max. (512 inputs/512 outputs)	
Terminator		Internally implemented	
Internal current consumption (Power supply for Control/Input)		80 mA or less	
Output	Output type	PNP (Negative common)	NPN (Positive common)
	Number of outputs	32 outputs (8/16/24/32 outputs selectable)	
	Load	Solenoid valve with light/surge voltage suppressor 24 VDC, 1.5 W or less (SMC)	
	Power supply	24 VDC, 2 A	
	Fail safe	HOLD/CLEAR/Forced power ON	
	Protection	Short-circuit protection	
Enclosure		IP67 (Manifold assembly)	
Weight		300 g	



EX600-SPR□A

SI Unit (EX600-SDN□A)

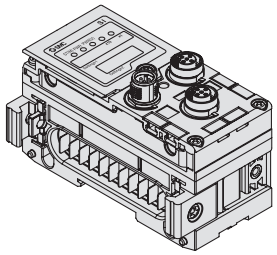
Model		EX600-SDN1A	EX600-SDN2A
Communication	Protocol	DeviceNet™: Volume 1 (Edition 2.1), Volume 3 (Edition 1.1)	
	Device type	Group 2 Only Server	
	Communication speed	125/250/500 kbps	
	Configuration file	EDS file	
	I/O occupation area (Inputs/Outputs)	Max. (512 inputs/512 outputs)	
	Applicable messages	Duplicate MAC ID Check Message Group 2 Only Unconnected Explicit Message Explicit Message (Group 2) Poll I/O Message (Predefined M/S Connection set)	
DeviceNet™ power supply		11 to 25 VDC	
Internal current consumption (Power supply for Control/Input)		55 mA or less	
Output	Output type	PNP (Negative common)	NPN (Positive common)
	Number of outputs	32 outputs (8/16/24/32 outputs selectable)	
	Load	Solenoid valve with light/surge voltage suppressor 24 VDC, 1.5 W or less (SMC)	
	Power supply	24 VDC, 2 A	
	Fail safe	HOLD/CLEAR/Forced power ON	
	Protection	Short-circuit protection	
Enclosure		IP67 (Manifold assembly)	
Weight		300 g	



EX600-SDN□A

SI Unit (EX600-SMJ□)

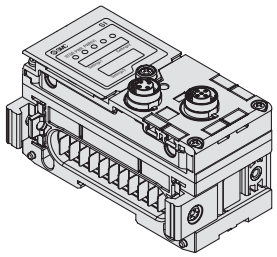
	Model	EX600-SMJ1	EX600-SMJ2
Communication	Protocol	CC-Link (Ver. 1.10, Ver. 2.00)	
	Station type	Remote Device Station	
	Communication speed	156/625 kbps 2.5/5/10 Mbps	
	I/O occupation area (Inputs/Outputs)	Max. (512 inputs/512 outputs) 1/2/3/4 stations occupied	
Internal current consumption (Power supply for Control/Input)		75 mA or less	
Output	Output type	PNP (Negative common)	NPN (Positive common)
	Number of outputs	32 outputs (8/16/24/32 outputs selectable)	
	Load	Solenoid valve with surge voltage suppressor 24 VDC, 1.5 W or less (SMC)	
	Power supply	24 VDC, 2 A	
	Fail safe	HOLD/CLEAR/Forced power ON	
	Protection	Short-circuit protection	
Enclosure		IP67 (Manifold assembly)	
Weight		300 g	



EX600-SMJ□

SI Unit (EX600-SEN□)

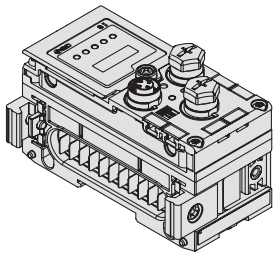
	Model	EX600-SEN1	EX600-SEN2
Communication	Protocol	EtherNet/IP™ (Conformance version: Composite 6)	
	Media	100 BASE-TX	
	Communication speed	10/100 Mbps (Automatic/Manual)	
	Communication method	Full duplex/Half duplex (Automatic/Manual)	
	Configuration file	EDS file	
	I/O occupation area (Inputs/Outputs)	Max. (512 inputs/512 outputs)	
	IP address setting range	SI Unit switch settings: 192.168.0 or 1.1 to 254 Through DHCP server: Optional address	
	Device information	Vendor ID: 7 (SMC Corporation) Product type: 12 (Communication Adapter) Product code: 126	
Internal current consumption (Power supply for Control/Input)		120 mA or less	
Output	Output type	PNP (Negative common)	NPN (Positive common)
	Number of outputs	32 outputs (8/16/24/32 outputs selectable)	
	Load	Solenoid valve with surge voltage suppressor 24 VDC, 1.5 W or less (SMC)	
	Power supply	24 VDC, 2 A	
	Fail safe	HOLD/CLEAR/Forced power ON	
	Protection	Short-circuit protection	
Enclosure		IP67 (Manifold assembly)	
Weight		300 g	



EX600-SEN□

SI Unit (EX600-SEC□)

	Model	EX600-SEC1	EX600-SEC2
Communication	Protocol	EtherCAT (Conformance Test Record V.1.2)	
	Communication speed	100 Mbps	
	Configuration file	XML file	
	I/O occupation area (Inputs/Outputs)	Max. (512 inputs/512 outputs)	
Internal current consumption (Power supply for Control/Input)		100 mA or less	
Output	Output type	PNP (Negative common)	NPN (Positive common)
	Number of outputs	32 outputs (8/16/24/32 outputs selectable)	
	Load	Solenoid valve with surge voltage suppressor 24 VDC, 1.5 W or less (SMC)	
	Power supply	24 VDC, 2 A	
	Fail safe	HOLD/CLEAR/Forced power ON	
	Protection	Short-circuit protection	
Enclosure		IP67 (Manifold assembly)	
Weight		300 g	

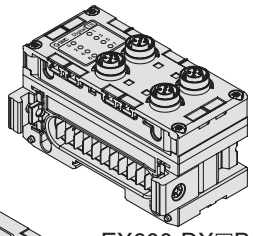


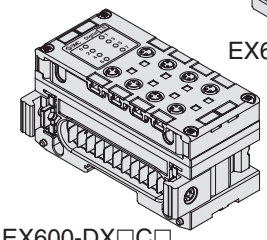
EX600-SEC□

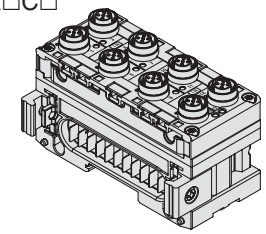
Digital Input Unit

	Model		EX600-DXPB	EX600-DXNB	EX600-DXPC□	EX600-DXNC□	EX600-DXPD	EX600-DXND
Input	Input type		PNP	NPN	PNP	NPN	PNP	NPN
	Input connector		M12 (5-pin) socket Note 1)		M8 (3-pin) socket		M12 (5-pin) socket Note 1)	
	Number of inputs		8 inputs (2 inputs/connector)		8 inputs (1 input/connector)		16 inputs (2 inputs/connector)	
	Supplied voltage		24 VDC					
	Max. supplied voltage		0.5 A/connector 2 A/unit		0.25 A/connector 2 A/unit		0.5 A/connector 2 A/unit	
	Protection		Short-circuit protection					
	Input current (at 24 VDC)		9 mA or less					
	ON voltage		17 V or more (At NPN input, between the pin for input terminal and supplied voltage of +24 V) (At PNP input, between the pin for input terminal and supplied voltage of 0 V)					
	OFF voltage		5 V or less (At NPN input, between the pin for input terminal and supplied voltage of +24 V) (At PNP input, between the pin for input terminal and supplied voltage of 0 V)					
	Open circuit detection current	2 wires	—		0.5 mA/input Note 2)		—	
		3 wires	—		0.5 mA/connector Note 2)		—	
Current consumption			50 mA or less		55 mA or less		70 mA or less	
Enclosure			IP67 (Manifold assembly)					
Weight			300 g		275 g		340 g	

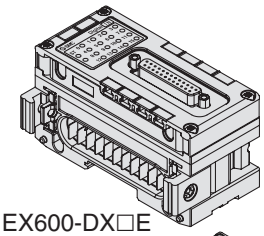
Note 1) M12 (4-pin) connector can be connected.
Note 2) Function only applies to EX600-DX□C1.

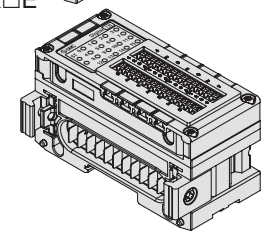

EX600-DX□B


EX600-DX□C□


EX600-DX□D

	Model	EX600-DXPE	EX600-DXNE	EX600-DXPF	EX600-DXNF
Input	Input type	PNP	NPN	PNP	NPN
	Input connector	D-sub socket (25 pins) Lock screw: No.4-40 UNC		Spring type terminal block (32 pins)	
	Number of inputs	16 inputs		16 inputs (2 inputs x 8 blocks)	
	Supplied voltage	24 VDC			
	Max. supplied voltage	2 A/unit		0.5 A/block 2 A/unit	
	Protection	Short-circuit protection			
	Input current (at 24 VDC)	5 mA or less			
	ON voltage	17 V or more (At NPN input, between the pin for input terminal and supplied voltage of +24 V) (At PNP input, between the pin for input terminal and supplied voltage of 0 V)			
	OFF voltage	5 V or less (At NPN input, between the pin for input terminal and supplied voltage of +24 V) (At PNP input, between the pin for input terminal and supplied voltage of 0 V)			
Applicable wire		—		0.08 to 1.5 mm² (AWG16 to 28)	
Current consumption		50 mA or less		55 mA or less	
Enclosure		IP40 (Manifold assembly)			
Weight		300 g			

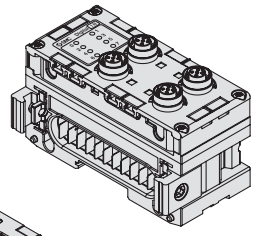

EX600-DX□E

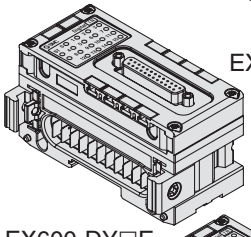

EX600-DX□F

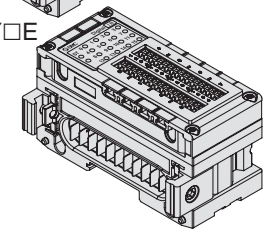
Digital Output Unit

	Model	EX600-DYPB	EX600-DYNB	EX600-DYPE	EX600-DYNE	EX600-DYPF	EX600-DYNF
Output	Output type	PNP	NPN	PNP	NPN	PNP	NPN
	Output connector	M12 (5-pin) socket Note)		D-sub socket (25 pins) Lock screw: No.4-40 UNC		Spring type terminal block (32 pins)	
	Number of outputs	8 outputs (2 outputs/connector)		16 outputs		16 outputs (2 outputs x 8 blocks)	
	Supplied voltage	24 VDC					
	Maximum load current	0.5 A/output 2 A/unit					
	Protection	Short-circuit protection					
Applicable wire		—		—		0.08 to 1.5 mm² (AWG16 to 28)	
Current consumption		50 mA or less					
Enclosure		IP67 (Manifold assembly)		IP40 (Manifold assembly)			
Weight		300 g					

Note) M12 (4-pin) connector can be connected.

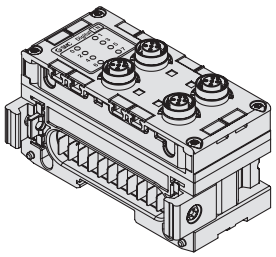

EX600-DY□B


EX600-DY□E

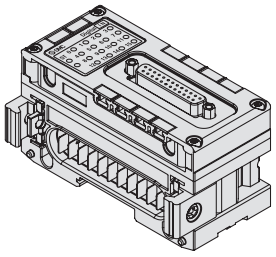

EX600-DY□F

Digital Input/Output Unit

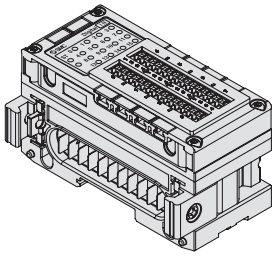
Model		EX600-DMPE	EX600-DMNE	EX600-DMPF	EX600-DMNF
Input/Output type		PNP	NPN	PNP	NPN
Connector		D-sub socket (25 pins) Lock screw: No.4-40 UNC		Spring type terminal block (32 pins)	
Input	Number of inputs	8 inputs		8 inputs (2 inputs x 4 blocks)	
	Supplied voltage	24 VDC			
	Max. supplied voltage	2 A/unit		0.5 A/block 2 A/unit	
	Protection	Short-circuit protection			
	Input current (at 24 VDC)	5 mA or less			
	ON voltage	17 V or more (At NPN input, between the pin for input terminal and supplied voltage of +24 V) (At PNP input, between the pin for input terminal and supplied voltage of 0 V)			
	OFF voltage	5 V or less (At NPN input, between the pin for input terminal and supplied voltage of +24 V) (At PNP input, between the pin for input terminal and supplied voltage of 0 V)			
Output	Number of outputs	8 outputs		8 outputs (2 outputs x 4 blocks)	
	Supplied voltage	24 VDC			
	Maximum load current	0.5 A/output 2 A/unit			
	Protection	Short-circuit protection			
Applicable wire		—		0.08 to 1.5 mm^2 (AWG16 to 28)	
Current consumption		50 mA or less		60 mA or less	
Enclosure		IP40 (Manifold assembly)			
Weight		300 g			



EX600-DY□B



EX600-DY□E
EX600-DM□E

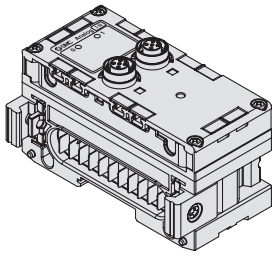


EX600-DY□F
EX600-DM□F

Analogue Input Unit

Model			EX600-AXA	
Input	Input type		Voltage input	Current input
	Input connector		M12 (5-pin) socket Note 1)	
	Input channel		2 channels (1 channel/connector)	
	Supplied voltage		24 VDC	
	Max. supplied current		0.5 A/connector	
	Protection		Short-circuit protection	
	Input signal range	12 bit resolution	0 to 10 V, 1 to 5 V, 0 to 5 V	0 to 20 mA, 4 to 20 mA
		16 bit resolution	–10 to 10V, –5 to 5V	–20 to 20 mA
	Max. rated input signal		±15 V	±22 mA Note 2)
	Input impedance		100 kΩ	50 Ω
	Linearity (25°C)		±0.05% F.S.	
	Repeatability (25°C)		±0.15% F.S.	
	Absolute accuracy (25°C)		±0.5% F.S.	±0.6% F.S.
Current consumption			70 mA or less	
Enclosure			IP67 (Manifold assembly)	
Weight			290 g	

Note 1) M12 (4-pin) connector can be connected.
Note 2) When input signal exceeds 22 mA, the protection function activates and the input signal is interrupted.

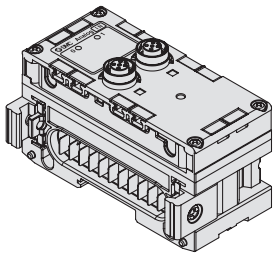


EX600-AXA

Analogue Output Unit

Model			EX600-AYA	
Output	Output type		Voltage output	Current output
	Output connector		M12 (5-pin) socket Note)	
	Output channel		2 channels (1 channel/connector)	
	Supplied voltage		24 VDC	
	Maximum load current		0.5 A/connector	
	Protection		Short-circuit protection	
	Output signal range	12 bit resolution	0 to 10 V, 1 to 5 V, 0 to 5 V	0 to 20 mA, 4 to 20 mA
	Load impedance		1 kΩ or more	600 Ω or less
	Linearity (25°C)		±0.05% F.S.	
	Repeatability (25°C)		±0.15% F.S.	
	Absolute accuracy (25°C)		±0.5% F.S.	±0.6% F.S.
Current consumption			70 mA or less	
Enclosure			IP67 (Manifold assembly)	
Weight			290 g	

Note) M12 (4-pin) connector can be connected.

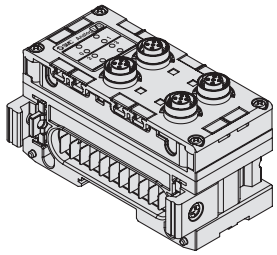


EX600-AYA

Analogue Input/Output Unit

Model			EX600-AMB	
Input	Input type		Voltage input	Current input
	Input connector		M12 (5-pin) socket Note 1)	
	Input channel		2 channels (1 channel/connector)	
	Supplied voltage		24 VDC	
	Max. supplied current		0.5 A/connector	
	Protection		Short-circuit protection	
	Input signal range	12 bit resolution	0 to 10 V, 1 to 5 V, 0 to 5 V	0 to 20 mA, 4 to 20 mA
	Max. rated input signal		±15 V	±22 mA Note 2)
	Input impedance		100 kΩ	250 Ω
	Linearity (25°C)		±0.05% F.S.	
	Repeatability (25°C)		±0.15% F.S.	
	Absolute accuracy (25°C)		±0.5% F.S.	±0.6% F.S.
Output	Output type		Voltage output	Current output
	Output connector		M12 (5-pin) socket Note 1)	
	Output channel		2 channels (1 channel/connector)	
	Supplied voltage		24 VDC	
	Max. load voltage		0.5 A/connector	
	Protection		Short-circuit protection	
	Output signal range	12 bit resolution	0 to 10 V, 1 to 5 V, 0 to 5 V	0 to 20 mA, 4 to 20 mA
	Load impedance		1 kΩ or more	600 Ω or less
	Linearity (25°C)		±0.05% F.S.	
	Repeatability (25°C)		±0.15% F.S.	
	Absolute accuracy (25°C)		±0.5% F.S.	±0.6% F.S.
Current consumption			100 mA or less	
Enclosure			IP67 (Manifold assembly)	
Weight			300 g	

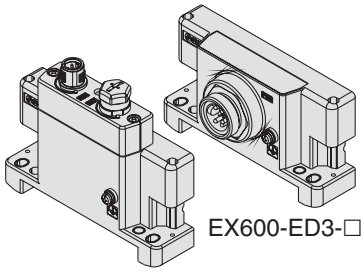
Note 1) M12 (4-pin) connector can be connected.
Note 2) When input signal exceeds 22 mA, the protection function activates and the input signal is interrupted.



EX600-AMB

End Plate

Model		EX600-ED2-□	EX600-ED3-□
Power specification	Power connector	M12 (5-pin) plug	7/8 inch (5-pin) plug
	Power supply (for Control/Input)	24 VDC ±10%, Class 2, 2 A	24 VDC ±10%, 8 A
	Power supply (for Output)	24 VDC +10/–5%, Class 2, 2 A	24 VDC +10/–5%, 8 A
Enclosure		IP67 (Manifold assembly)	
Weight		170 g	175 g



EX600-ED3-□

EX600-ED2-□

For more product options and details see our specific catalogues or on-line information.

Accessories

● Power supply cable with M12 connector (5-pin B-coded)

SPEEDCON and Its Related Parts

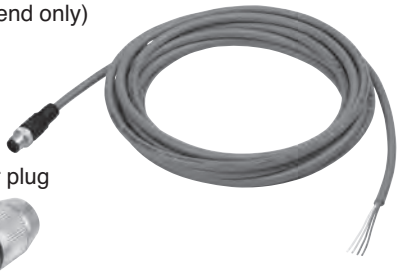
PCA-1564927	Straight 2 m
PCA-1564930	Straight 6 m
PCA-1564943	Right angle 2 m
PCA-1564969	Right angle 6 m

Note) For M12 connector, description of B-coded for a reverse type is used as a connector shape.

Communication cable with connector/
Communication connector For EtherNet/IP™ and EtherCAT

● Communication cable (with connector on one end only)

Straight 5 m
PCA-1446566



● Fieldwireable connector plug

PCA-1446553

The communication cable with connector and the communication connector that can be used on this series other than EtherNet/IP™ and EtherCAT are found in the M8/M12 connector catalog.

● Power supply cable with 7/8 inch connector

PCA-1558810	Straight 2 m
PCA-1558823	Straight 6 m
PCA-1558836	Right angle 2 m
PCA-1558849	Right angle 6 m

● 7/8 inch fieldwireable connector [compatible to AWG22-16]

PCA-1578078	Plug
PCA-1578081	Socket

● Communication cable

EX9 — AC [020] EN — [PSRJ]

Cable length (ℓ)

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

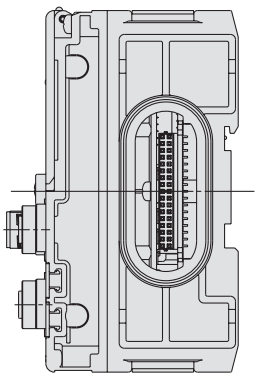
Connector specification

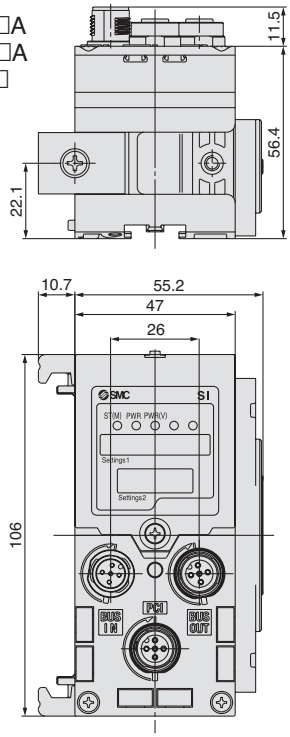
PSRJ	M12 plug (straight) RJ-45 connector

Dimensions

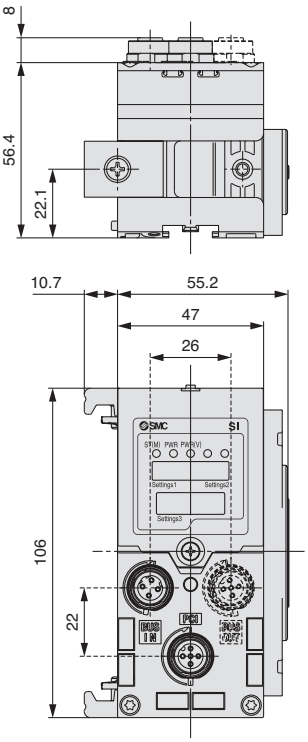
SI Unit

EX600-SPR□A
EX600-SDN□A
EX600-SMJ□



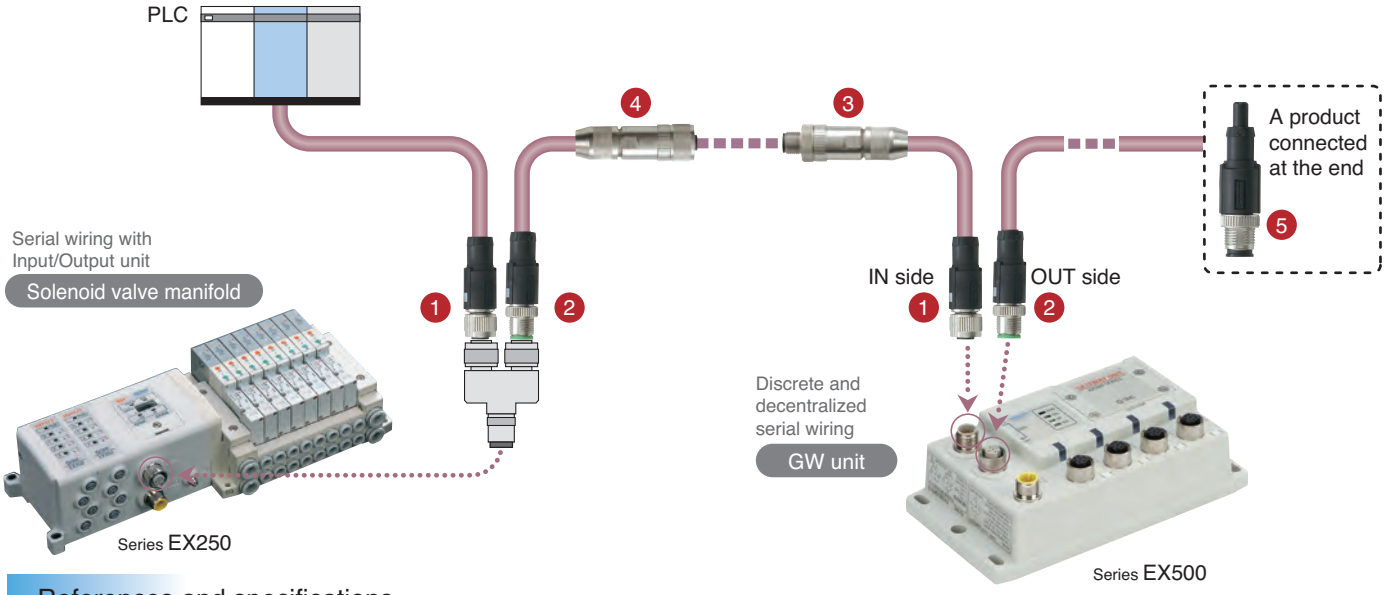


EX600-SEN□
EX600-SEC□



Communication cables/connectors for PROFIBUS DP Accessories

Example of Connection

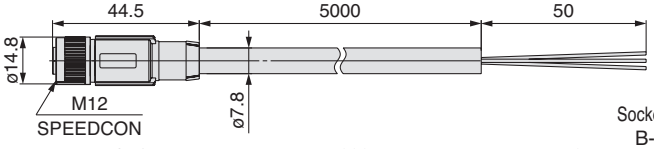


References and specifications

Description	Communication cable (With one side connector)		Fieldwireable connector		Terminal plug
Part no.	PCA-1557688	PCA-1557691	PCA-1557701	PCA-1557714	PCA-1557727
Product image	1 SPEEDCON Socket	2 SPEEDCON Plug	3 Plug	4 Socket	5 For PROFIBUS DP (Plug, B-coded)
Number of functional poles	M12: 2 poles		M12: 3 poles		M12: 4 poles
Key type	B-coded (Reverse key)				
Pin assignment	Plug, B-coded (Viewed from the plug/socket side)		Plug, B-coded (Viewed from the plug/socket side)		1: VP, 4: B Line, 2: A Line, 3: DGND (390 Ω, 220 Ω, 390 Ω)
			1: — 2: A Line (Green) 3: — 4: B Line (Red) 5: —		
Fixed cable length	5 m		—		

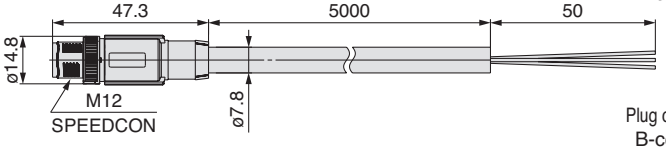
Communication cable (with one side connector)

1 PCA-1557688
For PROFIBUS DP
(Socket)



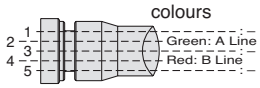
Socket connector pin assignment
B-coded (Reverse key)

2 PCA-1557691
For PROFIBUS DP
(Plug)



Plug connector pin assignment
B-coded (Reverse key)

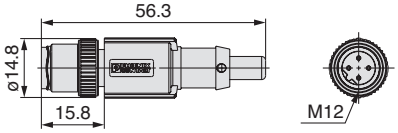
Cable wire colours



Shield line is connected to the knurl.
Wiring

Terminal plug

5 PCA-1557727
Terminal resistor
for PROFIBUS DP

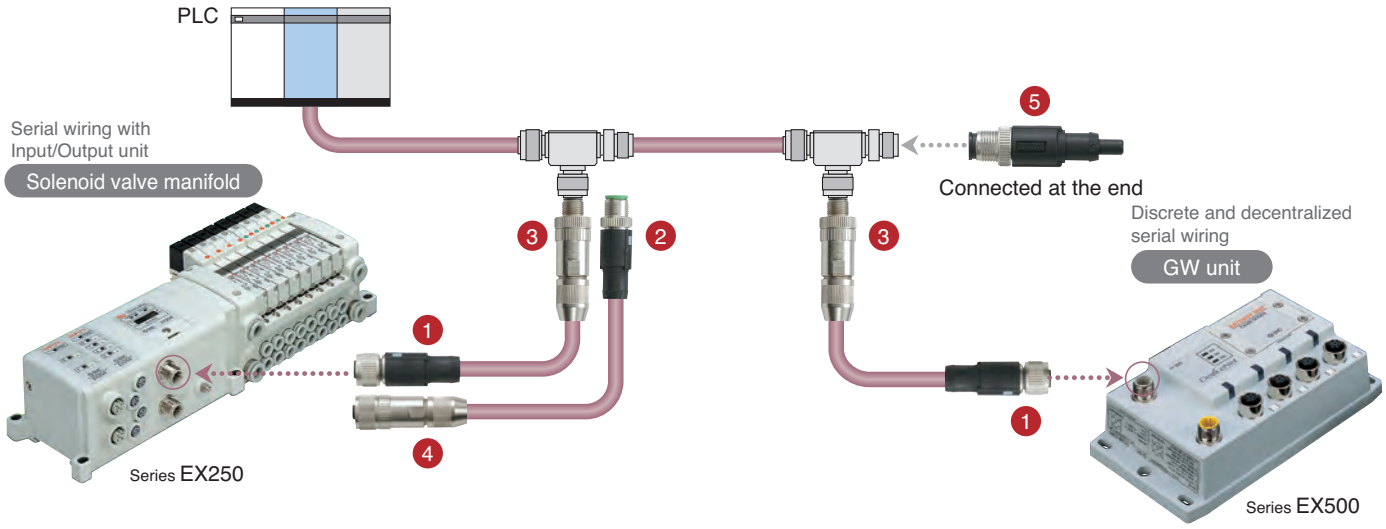


For more product options and details see our specific catalogues or on-line information.

Valves

Communication cables/connectors for DeviceNet™ Accessories

Example of Connection

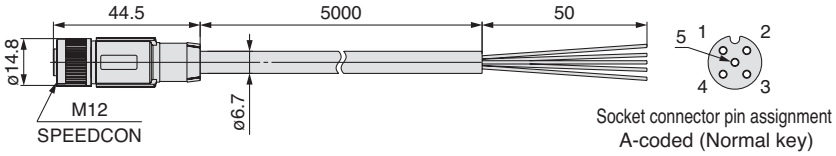


References and specifications

Description	Communication cable (With one side connector)		Fieldwireable connector		Terminal plug
Part no.	PCA-1557633	PCA-1557646	PCA-1557659	PCA-1557662	PCA-1557675
Product image	1 SPEEDCON Socket	2 SPEEDCON Plug	3 Plug	4 Socket	5 For DeviceNet™ (Plug, A-coded)
Number of functional poles	M12: 5 poles				
Key type	A-coded (Normal key)				
Pin assignment	Plug, A-coded / Socket, A-coded (Viewed from the plug/socket side)		DeviceNet™ 1: DRAIN 2: V+ (Red) 3: V– (Black) 4: CAN H (White) 5: CAN L (Blue)		1: DRAIN: NC 2: V+: NC 3: V–: NC 4: CAN H 5: CAN L
Fixed cable length	5 m		—		

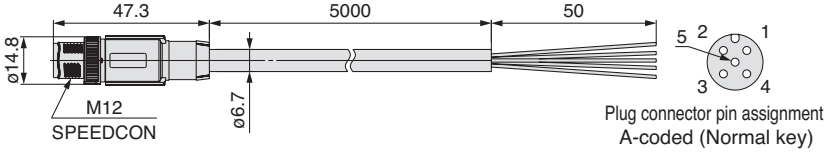
Communication cable (with one side connector)

1 PCA-1557633
For DeviceNet™
(Socket)

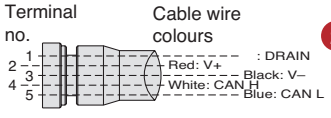


Socket connector pin assignment
A-coded (Normal key)

2 PCA-1557646
For DeviceNet™
(Plug)

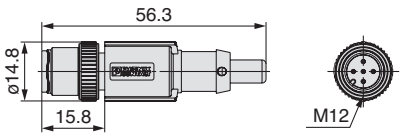


Plug connector pin assignment
A-coded (Normal key)

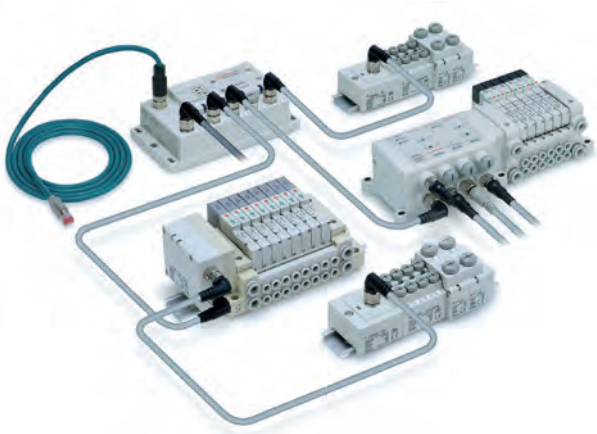


Terminal plug

5 PCA-1557675
Terminal resistor
for DeviceNet™

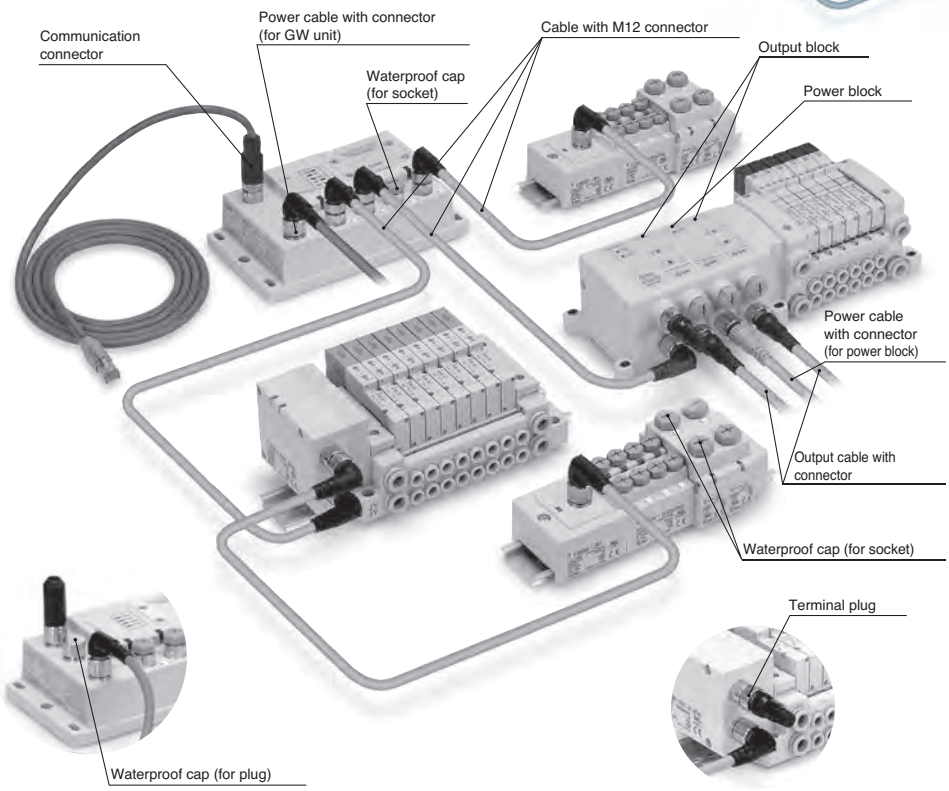


Serial Wiring for Inputs and Outputs Series EX500



Features

- IP67 enclosure protection for the valves, and IP65 for Input unit manifolds and the gateway unit.
- Wide choice of compatible valve series and sizes.
- valve/digital outputs, with 64 digital output points.
- Distributed I/O manifolds, for shorter piping and wiring.



How to Order

GW Unit

How to Order GW Unit

EX500 – G **DN1**

Communication protocol

DN1	DeviceNet™
PR1A	PROFIBUS DP
EN1	EtherNet/IP™

Product Recomendation

Stocked items for fast delivery

EX500-GDN1 | EX500-GPR1A | EX500-GEN1

SI Unit

How to Order SI Unit

EX500 – **Q** **0** 0 **1**

Applicable solenoid valve

S	SV Series
Q	VQC Series

SI unit COM.

0	+COM.
1	–COM. Note)

SI unit type

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

Note) Options only available for VQC series

Product Recomendation

Stocked items for fast delivery

EX500-S001 | EX500-Q101

For more product options and details see our specific catalogues or on-line information.

Input Unit Manifold / Block

How to Order Input Manifolds

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 Blocks

EX500 – IE [1]

Block type

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

Other Units

Input Unit	EX500-IB1
End Block	EX500-EB2

Product Recommendation

Stocked items for fast delivery

EEX500-IB1-E1	EEX500-IB1-E5	EEX500-IB1-M8	EX500-IE3
EEX500-IB1-E2	EEX500-IB1-E6	EEX500-IB1-T8	EX500-IE5
EEX500-IB1-E3	EEX500-IB1-E7	EX500-IB1	EX500-IE6
EEX500-IB1-E4	EEX500-IB1-E8	EX500-IE1	EX500-EB1

Accessories and Related Products

(Accessories)
Series PCA - Cables / Connectors / Plugs - www.smc.eu
Series EX9 - Power Blocks / Output Blocks / End Plates - www.smc.eu

(Related Products)
Series SV1000/2000/3000/4000 - Valves - page 20
Series VQC1000/2000/4000 - Valves - page 193, 211
Series S0700 - Valves - page XXX
Series SY3000/5000 - Valves - page 65
Series EX250 - Fieldbus System - page 467

GW Unit Specifications

Model		EX500-GDN1	EX500-GPR1A	EX500-GEN1
Applicable PLC/ Communication protocol		DeviceNet™ Release2.0	PROFIBUS DP (IEC61158, IEC61784)	EtherNet/IP™ Release1.0
Communication speed		125 k/250 k/ 500 kbit/sec	9.6 k/19.2 k/ 45.45 k/93.75 k/ 187.5 k/500 kbit/sec 1.5 M/3 M/ 6 M/12 Mbit/sec	10 M/100 Mbit/sec
Power supply for input and internal control	Power supply voltage	21.6 to 26.4 VDC		
	Internal current consumption	200 mA or less (GW unit)		
Power supply for output	Power supply voltage	22.8 to 26.4 VDC		
Power supply for communication	Power supply voltage	11 to 25 VDC	—	
	Internal current consumption	50 mA or less	—	
Input	Number of inputs	64 points (16 points x 4 branches)		
	Connection input device	The EX500 series input unit manifold (connection from communication port A to D)		
	Supply voltage	24 VDC		
	Supply current	Max. 2.8 A (Max. 0.7 A per branch)		
Output	Number of outputs	64 points (16 points x 4 branches)		
	Connection output device	The EX500 series manifold including SI unit (connection from communication port A to D)		
	Supply voltage	24 VDC		
	Supply current	Max. 3.0 A		
Branch cable length		5 m or less between connected devices (total extension 10 m or less)		
Environmental resistance	Enclosure	IP65		
	Operating temperature range	Operating: 5 to 45°C Stored: –25 to 70°C (with no freezing and condensation)		
	Operating humidity range	Operating, Stored: 35 to 85%RH (with no condensation)		
	Withstand voltage	1000 VAC for 1 min. between whole charging part and case		
	Insulation resistance	2 MΩ or more (500 VDC Mega) between whole charging part and case		
Standard		CE marking (CSA)		
Weight		470 g		
Accessory: Waterproof cap (for M12 connector socket)		EX500-AWTS (4 pcs.)	EX500-AWTS (5 pcs.)	EX500-AWTS (5 pcs.)

Input Unit Specifications

Model		EX500-IB1
Internal current consumption		100 mA or less
Input specification	Number of inputs	16 points
	Connection block	EX500 series input block (possible to be positioned with others)
	Connection block stations	2-input, input block: Max. 8 stations 8-input, input block: Max. 2 stations
Environmental resistance	Enclosure	IP65
	Operating temperature range	Operating: 5 to 45C Stored: –25 to 70ºC (with no freezing and condensation)
	Operating humidity range	Operating, Stored: 35 to 85%RH (with no condensation)
	Withstand voltage	1000 VAC for 1 min. between whole charging part and case
	Insulation resistance	2 MΩ or more (500 VDC Mega) between whole charging part and case
Standard		CE marking, UL (CSA)
Weight		100 g (Input unit + End block)

Input Block Specifications

Model		EX500-IE1	EX500-IE2	EX500-IE3	EX500-IE4	EX500-IE5	EX500-IE6
Input specification	Input type	PNP input	NPN input	PNP input	NPN input	PNP input	NPN input
	Number of inputs	2 points				8 points	
	Input device supply voltage	24 VDC					
	Input device supply current	Max. 480 mA/Input unit manifold					
	Rated input current	Approx. 5 mA					
	Display	Green LED (Lights when power is turned ON.)					
	Connector on the input device side	M8 connector (3 pins, plug)		M12 connector (4 pins, plug)		M8 connector (3 pins, plug)	
Environmental resistance	Enclosure	IP65					
	Operating temperature range	Operating: 5 to 45ºC Stored: –25 to 70ºC (with no freezing and condensation)					
	Operating humidity range	Operating, Stored: 35 to 85%RH (with no condensation)					
	Withstand voltage	1000 VAC for 1 min. between whole charging part and case					
	Insulation resistance	2 MΩ or more (500 VDC Mega) between whole charging part and case					
Standard		CE marking, UL (CSA)					
Weight		20 g		40 g		55 g	
Accessory: Waterproof cap	(for M8 connector socket)	EX500-AWES (2 pcs.)		—		EX500-AWES (8 pcs.)	
	(for M12 connector socket)	—		EX500-AWTS (2 pcs.)		—	

SI Unit Specifications (SV)

Model		EX500-S001
Internal current consumption		100 mA or less
Output specification	Number of outputs	16 points
	Connection block	Solenoid valve (single, double) Relay output module (1 ouput, 2 outputs)
	Connection block stations	Double solenoid valve, relay output module (2 outputs): Max. 8 stations Single solenoid valve, relay output module (1 output): Max. 16 stations
	Connection block supply current	Max. 0.65 A
Environmental resistance	Enclosure	IP67
	Operating temperature range	Operating: 5 to 45°C Stored: –25 to 70°C (with no freezing and condensation)
	Operating humidity range	Operating, Stored: 35 to 85%RH (with no condensation)
	Withstand voltage	1000 VAC for 1 min. between whole charging part and case
	Insulation resistance	2 MΩ or more (500 VDC Mega) between whole charging part and case
Standard		CE marking, UL (CSA)
Weight		115 g
Accessory: Waterproof cap (for M12 connector socket)		EX500-AWTS (1 pc.)

SI Unit Specifications (VQC)

Model		EX500-Q001	EX500-Q101	EX500-Q002	EX500-Q102
Internal current consumption		100 mA or less			
Output specification	Number of outputs	16 points			
	Output type	NPN output (sink type)	PNP output (source type)	NPN output (sink type)	PNP output (source type)
	Connection block	+COM. Solenoid valve (single, double)	–COM. Solenoid valve (single, double)	+COM. Note) Output block, power block Solenoid valve (single, double)	–COM. Note) Output block, power block Solenoid valve (single, double)
	Connection block stations	Double solenoid valve: Max. 8 stations Single solenoid valve: Max. 16 stations		Double solenoid valve, output block: Max. 8 stations Single solenoid valve: Max. 16 stations ∗ Power block is not included.	
	Connection block supply current	Max. 0.75 A			
Environmental resistance	Enclosure	IP67			
	Operating temperature range	Operating: 5 to 45°C Stored: –25 to 70°C (with no freezing and condensation)			
	Operating humidity range	Operating, Stored: 35 to 85%RH (with no condensation)			
	Withstand voltage	1000 VAC for 1 min. between whole charging part and case			
	Insulation resistance	2 MΩ or more (500 VDC Mega) between whole charging part and case			
Standard		CE marking, UL (CSA)			
Weight		105 g			
Accessory: Waterproof cap (for M12 connector socket)		EX500-AWTS (1 pc.)			

Note) For details of output block and power block.

Accessories

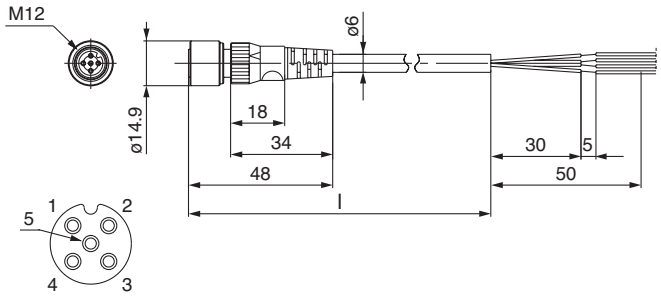
Power cable with connector (for GW unit)

EX500 – AP [050] – [S]

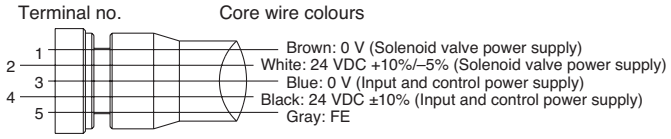
Cable length (L)	
010	1000 [mm]
050	5000 [mm]

Connector specification	
S	Straight
A	Angle

Straight connector type

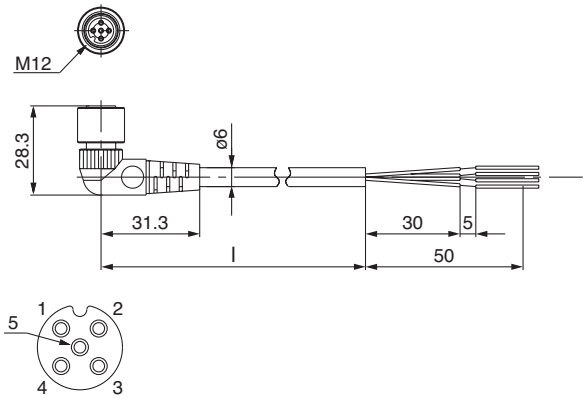


Socket connector pin arrangement

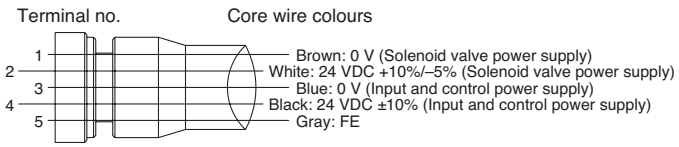


Connections

Angle connector type



Socket connector pin arrangement

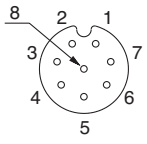


Connections

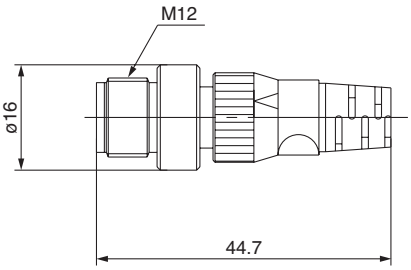
Terminal plug

Used where a manifold input unit/input block is not being used.
(If a terminal plug is not used, GW unit COM LED will not light up.)

EX500 – AC000 – S



Plug connector pin arrangement

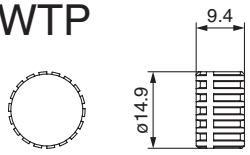


Waterproof cap: M12 connector (for plug)

On M12 connector ports that are not being used.
Waterproof cap maintains the integrity of IP65 enclosure.

Note) Tighten the waterproof cap with the prescribed tightening torque.
(For M12: 0.1 N•m)

EX500 – AWTP



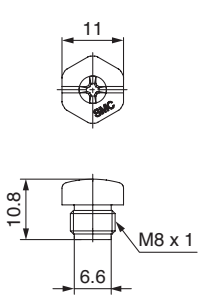
Waterproof cap: M8, M12 connector (for socket) / Accessory

Use M8 and M12 connectors (socket) on ports that are not being used.
Use of this waterproof cap maintains the integrity of IP65 enclosure.
(Included with each unit.)

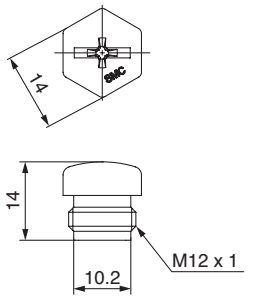
Note) Tighten the waterproof cap with the prescribed tightening torque. (For M8: 0.05 N•m, For M12: 0.1 N•m)

EX500 – AW □

Connector type	
ES	M8 connector (for socket), 10 pcs.
TS	M12 connector (for socket), 10 pcs.



M8 connector (for socket)



M12 connector (for socket)

Accessories

Communication cable / Connector

Cable with M12 connector

EX500 – AC [030] – [SSPS]

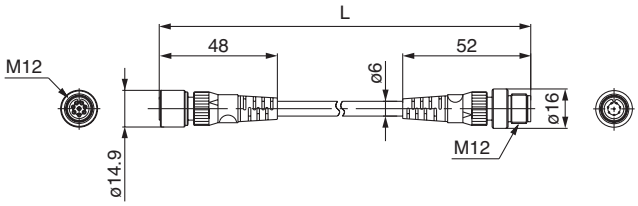
Cable length (L)

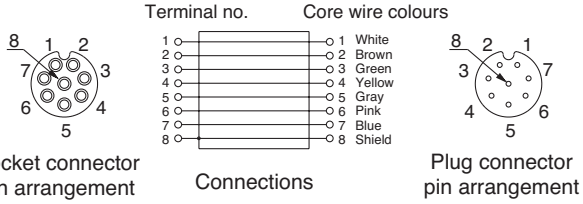
003	300 [mm]
005	500 [mm]
010	1000 [mm]
030	3000 [mm]
050	5000 [mm]

Connector specification

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

Straight connector type



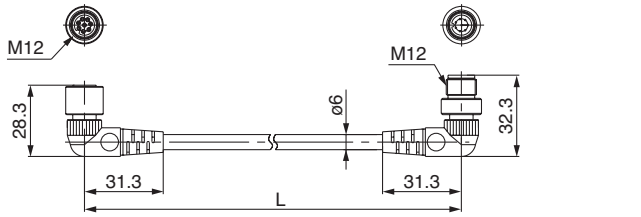


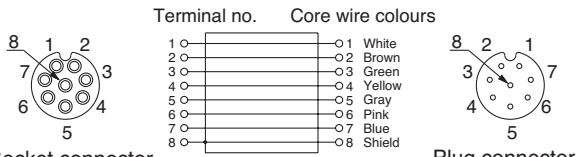
Socket connector pin arrangement

Connections

Plug connector pin arrangement

Angle connector type





Socket connector pin arrangement

Connections

Plug connector pin arrangement

For EtherNet/IP™ type GW unit

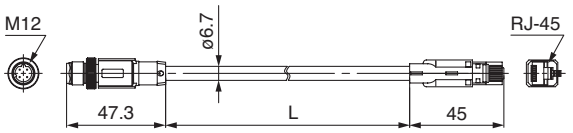
EX9 – AC [020] EN – [PSRJ]

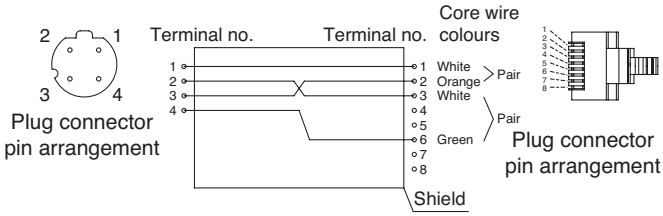
Cable length (L)

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

Connector specification

PSRJ	M12 plug (straight) €RJ-45 connector





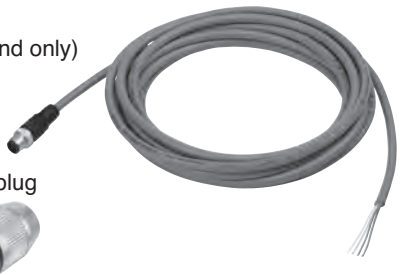
Connections (Straight cable)

For EtherNet/IP™

- Communication cable (with connector on one end only)

  Straight 5 m

  PCA-1446566



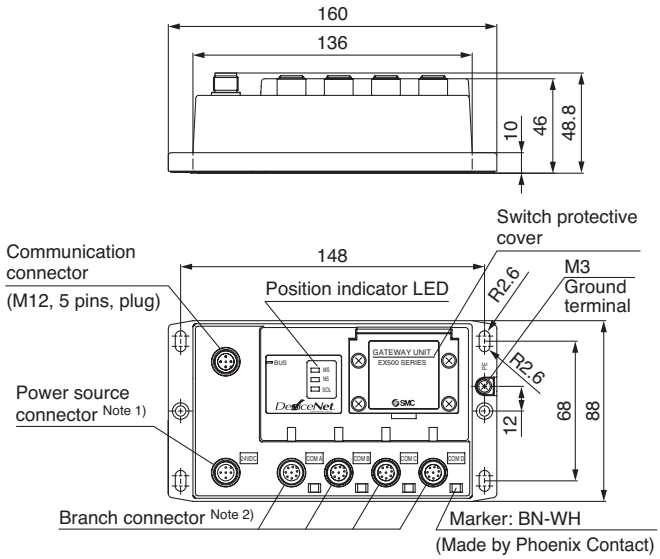
- Fieldwireable connector plug

  PCA-1446553

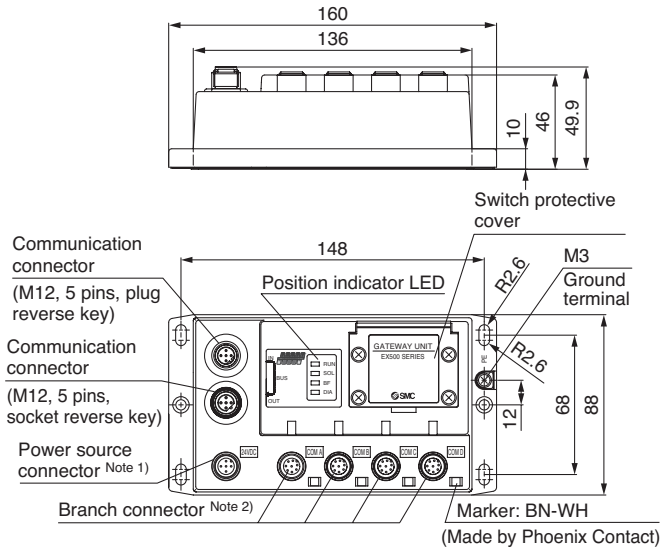
The communication cable with connector and the communication connector that can be used on this series other than EtherNet/IP™ are found in the M8/M12 connector catalogue.

GW Unit Dimensions

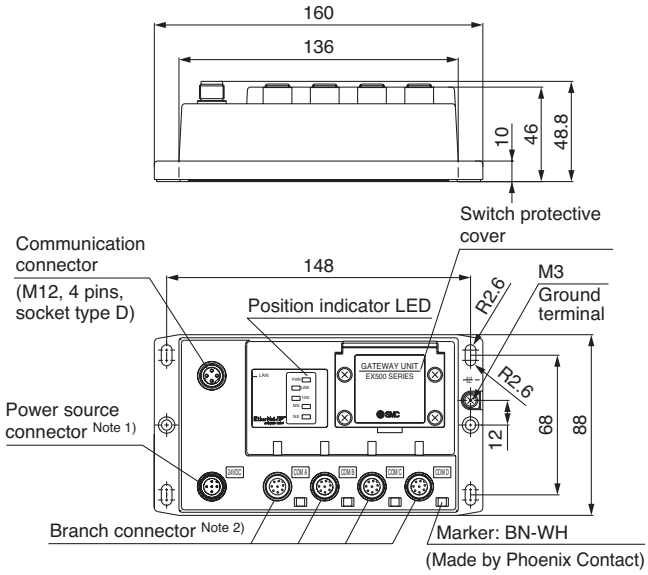
EX500-GDN1 (DeviceNet™)



EX500-GPR1A (PROFIBUS DP)



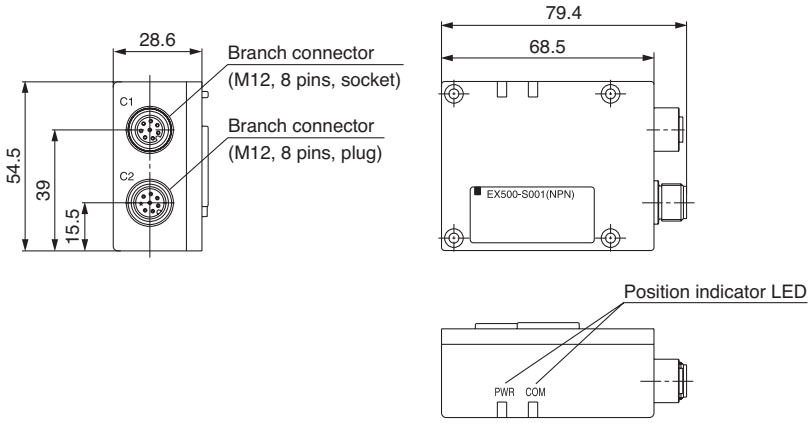
EX500-GEN1 (EtherNet/IP™)



Note 1) Power supply connector specification
(M12, 5 pins, plug)
Note 2) Branch connector specification
(M12, 8 pins, socket)

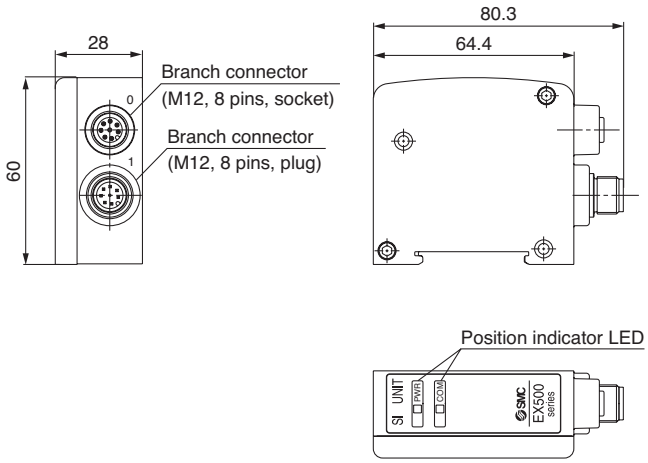
SI Unit Dimensions / Parts Description

EX500-S001

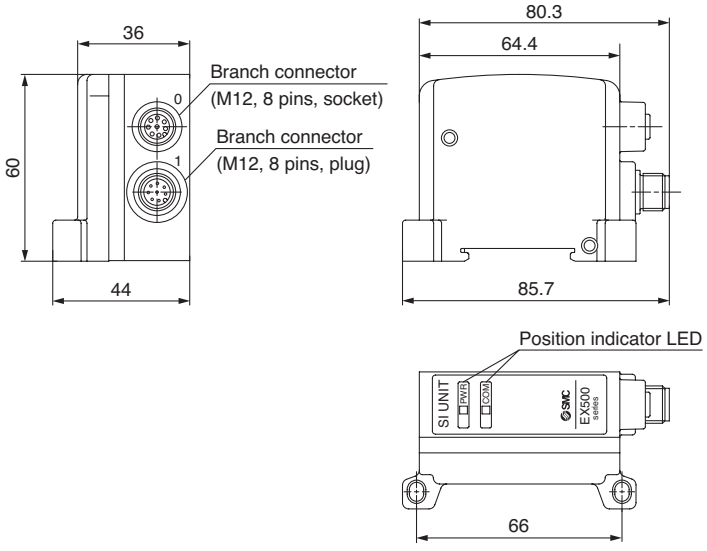


SI Unit Dimensions / Parts Description

EX500-Q□01

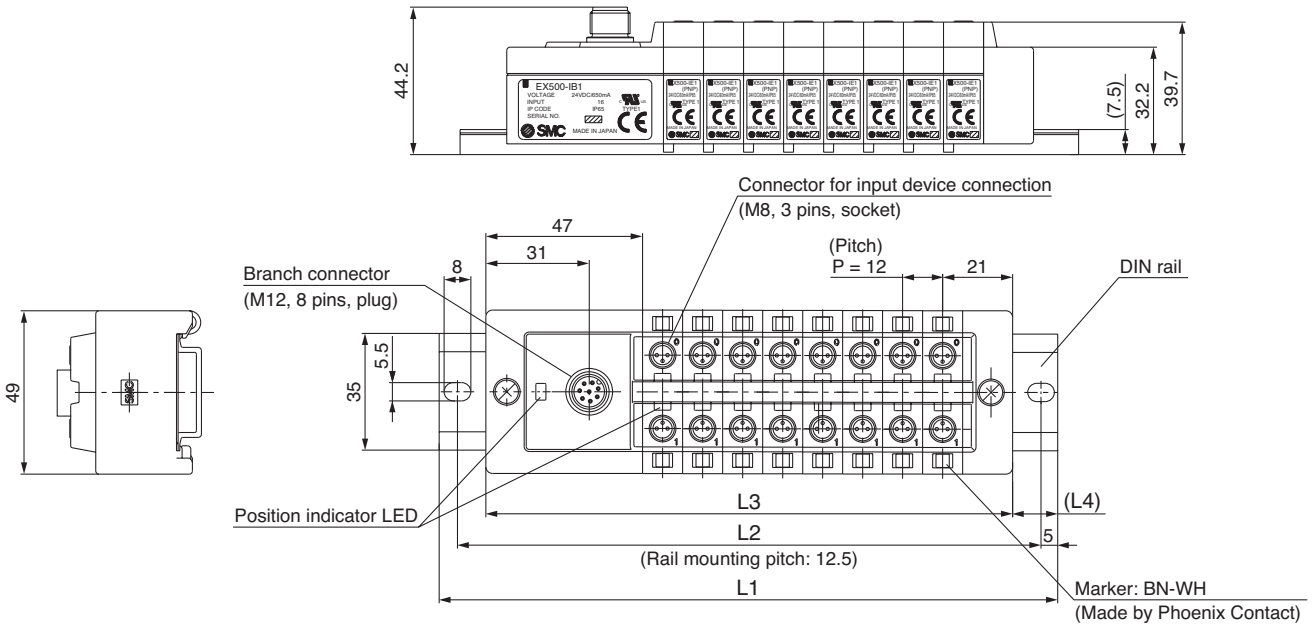


EX500-Q□02



Input Unit Manifold Dimensions

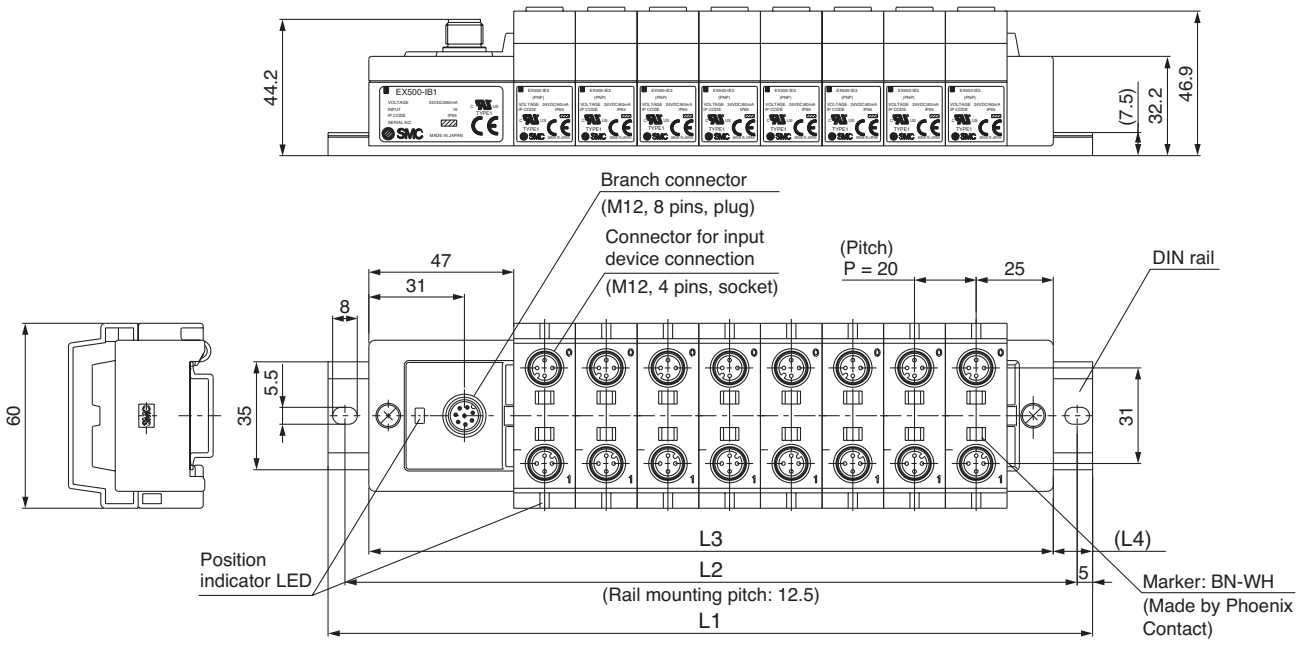
Input block (M8) only



[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

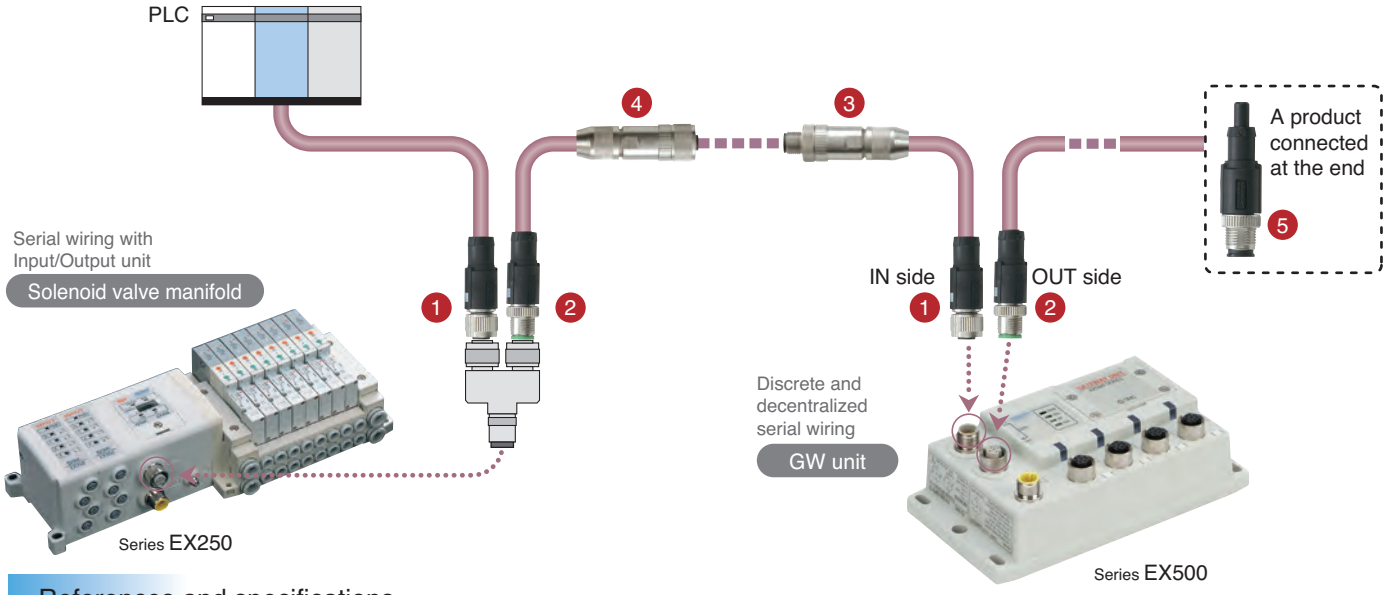


[mm]

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

Communication cables/connectors for PROFIBUS DP Accessories

Example of Connection

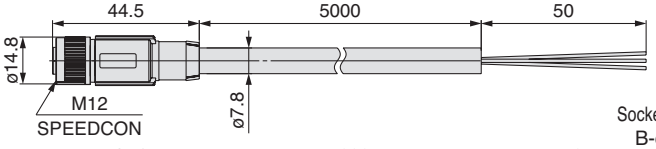


References and specifications

Description	Communication cable (With one side connector)		Fieldwireable connector		Terminal plug
Part no.	PCA-1557688	PCA-1557691	PCA-1557701	PCA-1557714	PCA-1557727
Product image	1 SPEEDCON Socket	2 SPEEDCON Plug	3 Plug	4 Socket	5 For PROFIBUS DP (Plug, B-coded)
Number of functional poles	M12: 2 poles		M12: 3 poles		M12: 4 poles
Key type	B-coded (Reverse key)				
Pin assignment	Plug, B-coded (Viewed from the plug/socket side)		1: — 2: A Line (Green) 3: — 4: B Line (Red) 5: —		1: VP 4: B Line 2: A Line 3: DGND 390 220 390
Fixed cable length	5 m		—		

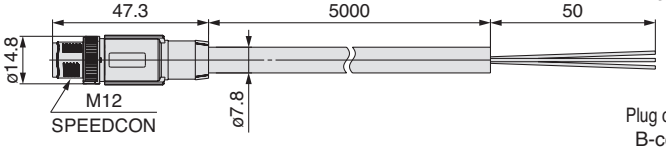
Communication cable (with one side connector)

1 PCA-1557688
For PROFIBUS DP
(Socket)



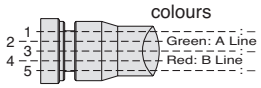
Socket connector pin assignment
B-coded (Reverse key)

2 PCA-1557691
For PROFIBUS DP
(Plug)



Plug connector pin assignment
B-coded (Reverse key)

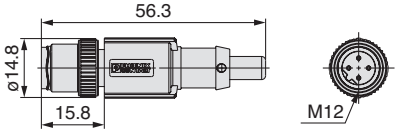
Cable wire colours



Shield line is connected to the knurl.
Wiring

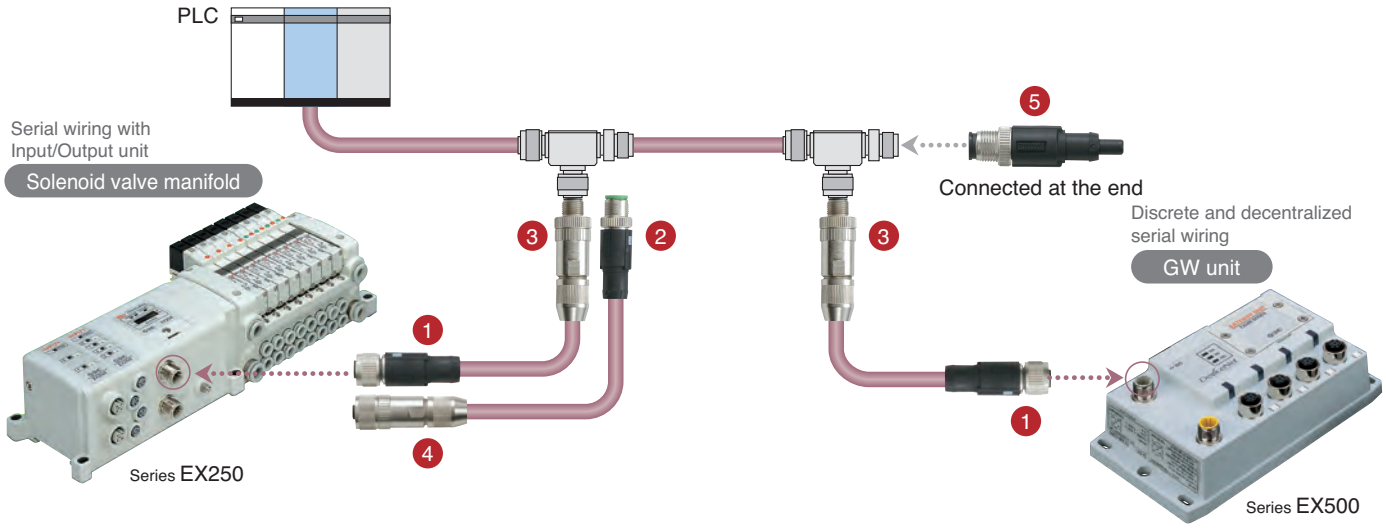
Terminal plug

5 PCA-1557727
Terminal resistor
for PROFIBUS DP



Communication cables/connectors for DeviceNet™ Accessories

Example of Connection

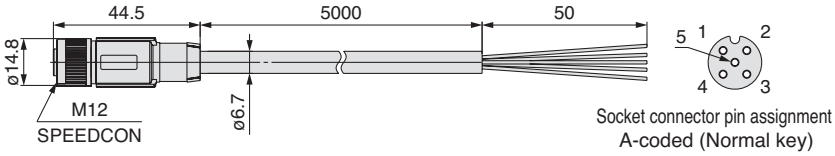


References and specifications

Description	Communication cable (With one side connector)		Fieldwireable connector		Terminal plug
Part no.	PCA-1557633	PCA-1557646	PCA-1557659	PCA-1557662	PCA-1557675
Product image	1 SPEEDCON Socket	2 SPEEDCON Plug	3 Plug	4 Socket	5 For DeviceNet™ (Plug, A-coded)
Number of functional poles	M12: 5 poles				
Key type	A-coded (Normal key)				
Pin assignment	Plug, A-coded / Socket, A-coded (Viewed from the plug/socket side)		DeviceNet™ 1: DRAIN 2: V+ (Red) 3: V– (Black) 4: CAN H (White) 5: CAN L (Blue)		1: DRAIN: NC 2: V+: NC 3: V–: NC 4: CAN H 5: CAN L
Fixed cable length	5 m		—		

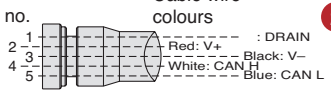
Communication cable (with one side connector)

1 PCA-1557633
For DeviceNet™
(Socket)



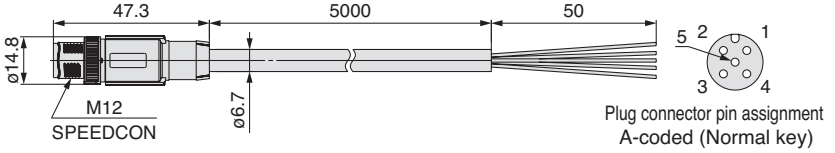
Socket connector pin assignment
A-coded (Normal key)

Terminal no. / Cable wire colours



Wiring

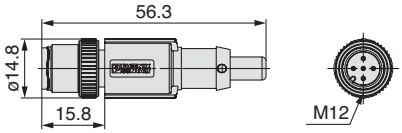
2 PCA-1557646
For DeviceNet™
(Plug)



Plug connector pin assignment
A-coded (Normal key)

Terminal plug

5 PCA-1557675
Terminal resistor
for DeviceNet™



For more product options and details see our specific catalogues or on-line information.

Valves