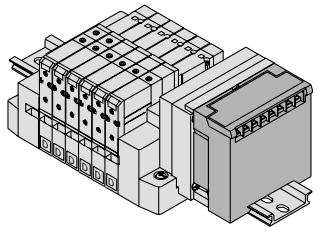
Integrated Type/For Output
Series EX120/121/122

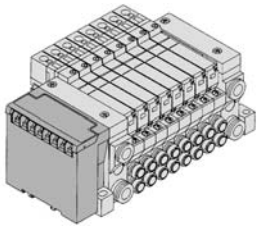
★Small unit compatible with maximum 16 outputs
★Compatible with a variety of communication networks

Series EX120

SV1000/2000/3000/4000

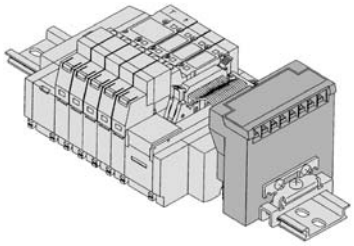


VQ1000/2000



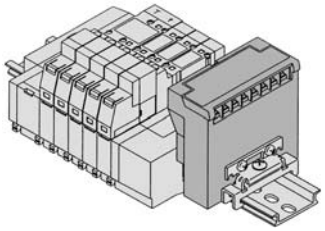
Series EX121

SY3000/5000



Series EX122

SY3000/5000



How to Order SI Unit

EX12 [0] – S [DN1] [ ]

Valve interface

0	Plug-in
1	Flat ribbon cable DIN rail mounting
2	Plug-in DIN rail mounting

Dustproof

Nil	Non-dustproof
-XP	Dustproof

Note) XP is not available for DN1 and DN1-X26.

Communication protocol

DN1	DeviceNet Note 1)
DN1-X26	DeviceNet Note 1)
MJ1	CC-Link
CS1	OMRON Corp.: CompoBus/S (16 outputs)
CS2	OMRON Corp.: CompoBus/S (8 outputs)
SL1	SUNX Corp.: S-LINK (16 outputs)
SL2	SUNX Corp.: S-LINK (8 outputs)
UW1	NKE Corp.: Uni-wire System
UH1	NKE Corp.: Uni-wire H System

Note 1) DN1's occupied points are 16 inputs and 16 outputs, while DN1-X26 has 0 inputs and 16 outputs.
Note 2) Please consult SMC for networks other than those mentioned above.

SI Unit Specifications

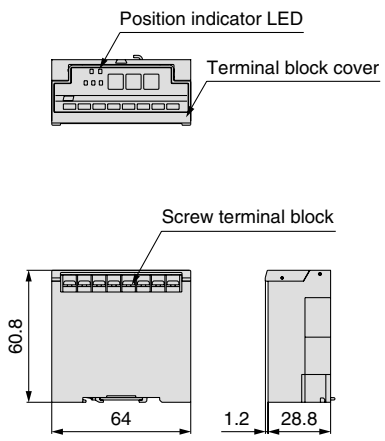
Model			EX12□-SDN1	EX12□-SDN1-X26 Note 4)	EX12□-SMJ1	EX12□-SCS1 EX12□-SCS2	EX12□-SSL1 EX12□-SSL2	EX12□-SUW1	EX12□-SUH1
Communication specification	Applicable system	Protocol	DeviceNet		CC-Link	OMRON Corp.: CompoBus/S	SUNX Corp.: S-Link	NKE Corp.: Uni-wire System	NKE Corp.: Uni-wire H System
		Version Note 1)	Release 2.0		Ver. 1.10	—	—	—	—
	Communication speed		125 k/250 k/500 kbps		156 k/625 kbps 2.5 M/5 M/10 Mbps	750 kbps	28.5 kbps	28.5 kbps	29.4 kbps
	Specified file Note 2)		EDS file		—				
	Occupied area (Number of inputs/outputs)		16/16	0/16	32/32 (1 station, remote I/O stations)	SCS1: 0/16 SCS2: 0/8	SSL1: 0/16 SSL2: 0/8	0/16	0/16
	Terminal resistor		Not applicable						
Power supply	For unit		11 to 25 VDC		15 to 30 VDC	14 to 26.4 VDC	24 VDC+10%/–5% (Common power supply)	24 VDC±10% (Common power supply)	
	For valve		24 VDC+10%/–5%						
Internal current consumption (Unit)			100 mA or less						
Output specification	Output type		NPN output (+COM.)						
	Number of outputs		16 points			SCS1/SSL1: 16 points SCS2/SSL2: 8 points		16 points	
	Connection load		SMC: Solenoid valve with light/surge voltage suppressor (24 VDC, 2.1 W or less)						
	Output when communication error occurs		Clear	Hold/Clear (Switch setting)	Clear	Hold/Clear (Switch setting)		Clear	
Environmental resistance	Enclosure		IP20						
	Operating temperature range		0 to +55°C (Valve 8 points ON) 0 to +50°C (Valve 16 points ON)						
	Operating humidity range		35 to 85%RH (With no condensation)						
	Withstand voltage		1500 VAC for 1 min. between external terminals and case						
	Insulation resistance		2 MΩ or more (500 VDC) between external terminals and case						
	Vibration resistance		10 to 55 Hz with a 0.5 mm amplitude in each X, Y, Z direction for 2 hrs (De-energized)						
	Impact resistance		98 m/s², in each X, Y, Z direction, 3 times (De-energized)						
Standard			CE marking				—		
Accessory			Communication connector 1 pc., Power connector 1 pc.		—				

Note 1) Please note that the version is subject to change.
Note 2) Each file can be downloaded from SMC's website (http://www.smcworld.com/).
Note 3) For detailed specifications other than the above, refer to the separate technical operation manual that can be downloaded from SMC's website (http://www.smcworld.com/).
Note 4) Since this is a special product, a manifold part number is not specified. Please consult SMC for the manifold integrated type.

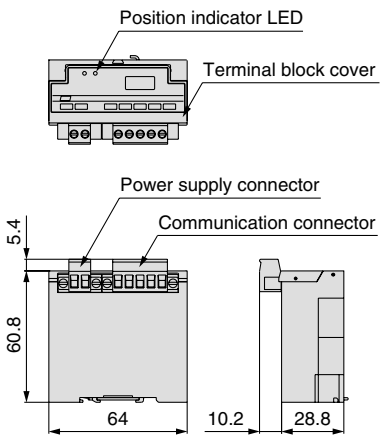
SI Unit Dimensions / Parts Description

EX120

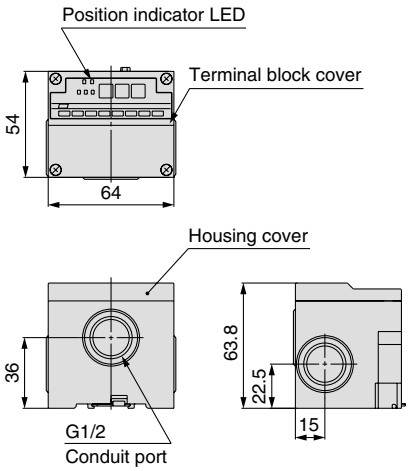
EX120-SMJ1, SCS□, SSL□, SUW1, SUH1



EX120-SDN1(-X26)

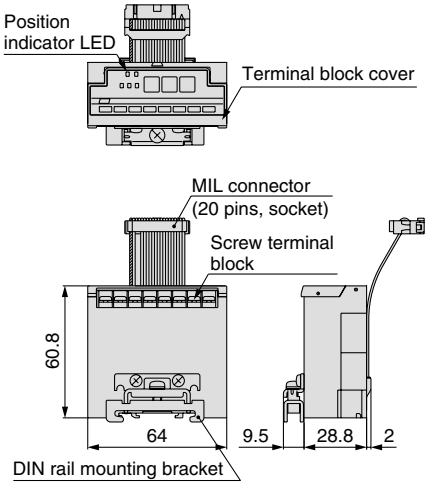


EX120-S□□□-XP

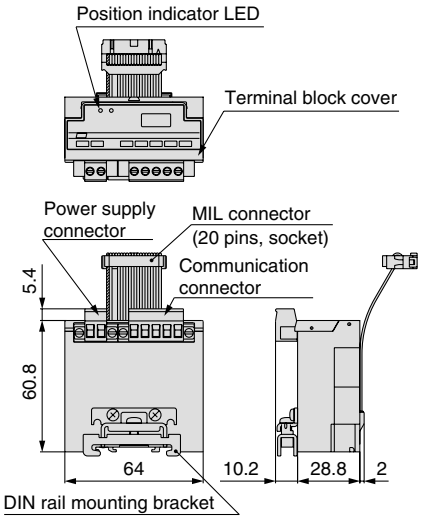


EX121

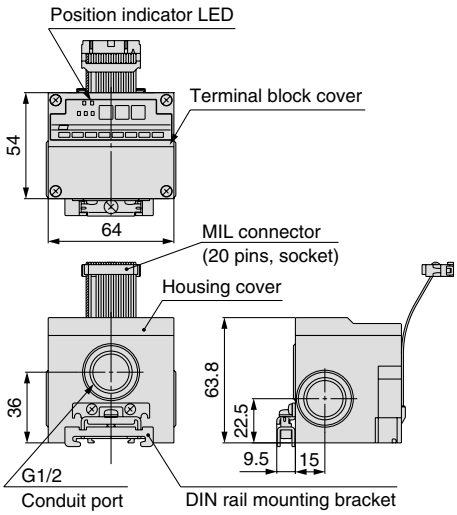
EX121-SMJ1, SCS□, SSL□, SUW1, SUH1



EX121-SDN1(-X26)

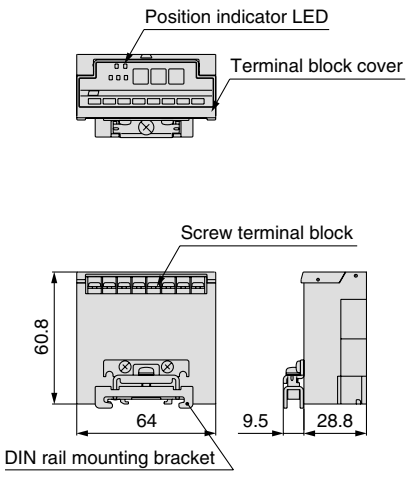


EX121-S□□□-XP

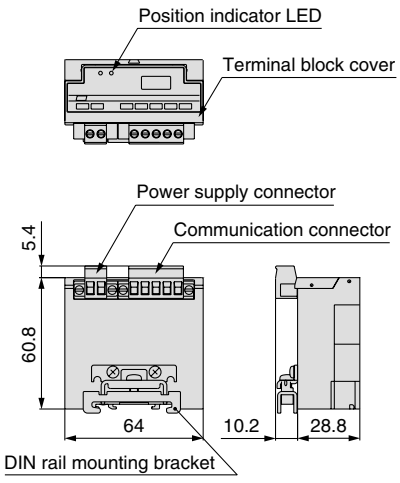


EX122

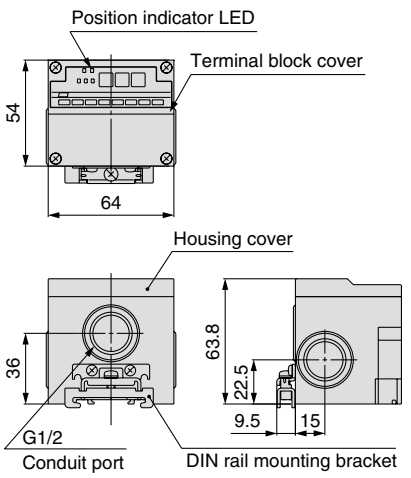
EX122-SMJ1, SCS□, SSL□, SUW1, SUH1



EX122-SDN1(-X26)



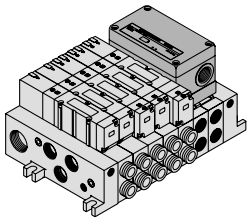
EX122-S□□□-XP



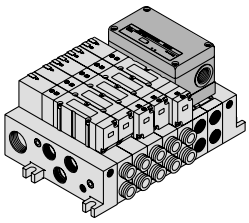
Integrated Type/For Output
Series EX123/124/126

★Enclosure IP65 (EX123, EX124), IP67 (EX126)
★Maximum 16 outputs

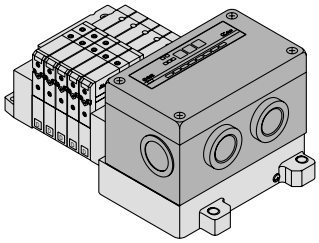
Series EX123
VQ2000/4000/5000



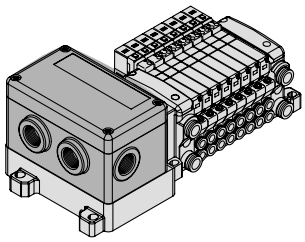
Series EX124
VQ2000/4000/5000



Series EX126
SV1000/2000/3000



VQC1000/2000/4000



How to Order SI Unit

EX12 3 U –S SL1

Unit specifications

3	Common power supply of unit and valve Enclosure IP65 Compatible with VQ valves

Mounting specifications

U	Mount a unit to the U side of the manifold
D	Mount a unit to the D side of the manifold

Communication protocol

SL1	SUNX Corp.: S-LINK (16 outputs)
SL2	SUNX Corp.: S-LINK (8 outputs)
UW1	NKE Corp.: Uni-wire System
UH1	NKE Corp.: Uni-wire H System

EX12 4 U –S DN1

Unit specifications

4	Separate power supply of unit and valve Enclosure IP65 Compatible with VQ valves

Mounting specifications

U	Mount a unit to the U side of the manifold
D	Mount a unit to the D side of the manifold

Communication protocol

DN1	DeviceNet Note)
DN1-X26	DeviceNet Note)
MJ1	CC-Link
CS1	OMRON Corp.: CompoBus/S (16 outputs)
CS2	OMRON Corp.: CompoBus/S (8 outputs)

Note) DN1's occupied points are 16 inputs and 16 outputs, while DN1-X26 has 0 inputs and 16 outputs.

EX12 6 D –S MJ1

Unit specifications

6	Separate power supply of unit and valve Enclosure IP67 Compatible with SV/VQC valves

Mounting specifications

D	Mount a unit to the D side of the manifold

Communication protocol

MJ1	CC-Link

EX

How to Order Option

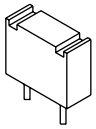
Fuse for replacement

A fuse for replacement used for EX126D-SMJ1.

EX9−FU20

Applicable model	EX126D-SMJ1
Rated current	2.0 A

Fuse



Dripproof plug assembly

Use for the unused conduit port (G1/2).

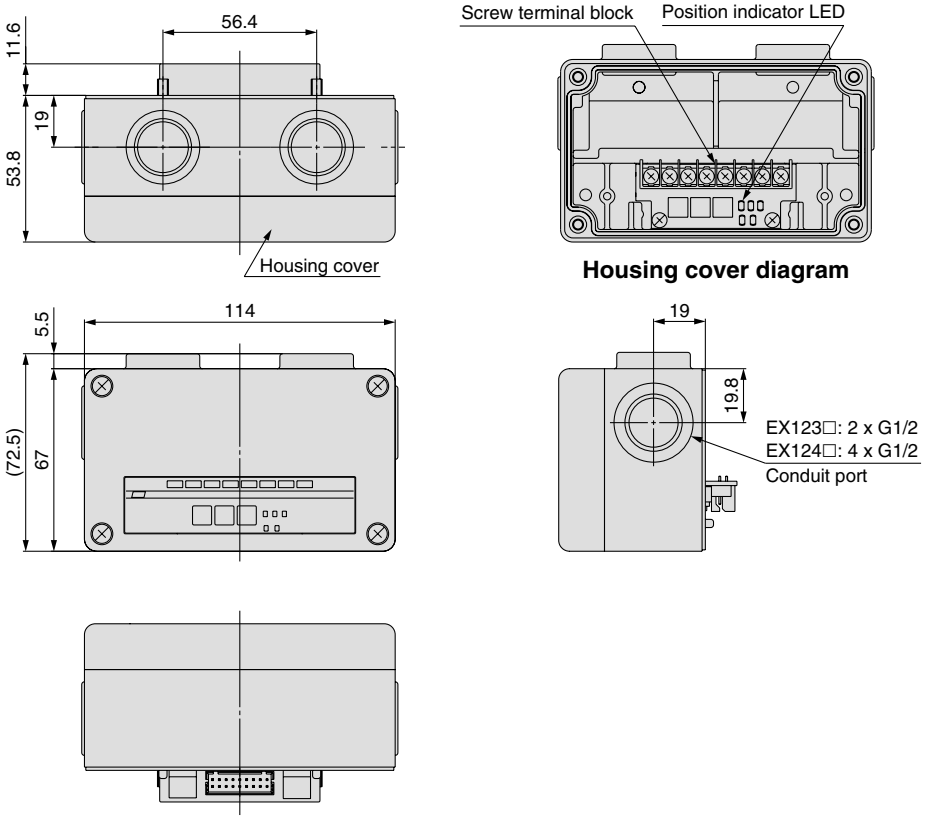
AXT100−B04A

SI Unit Specifications

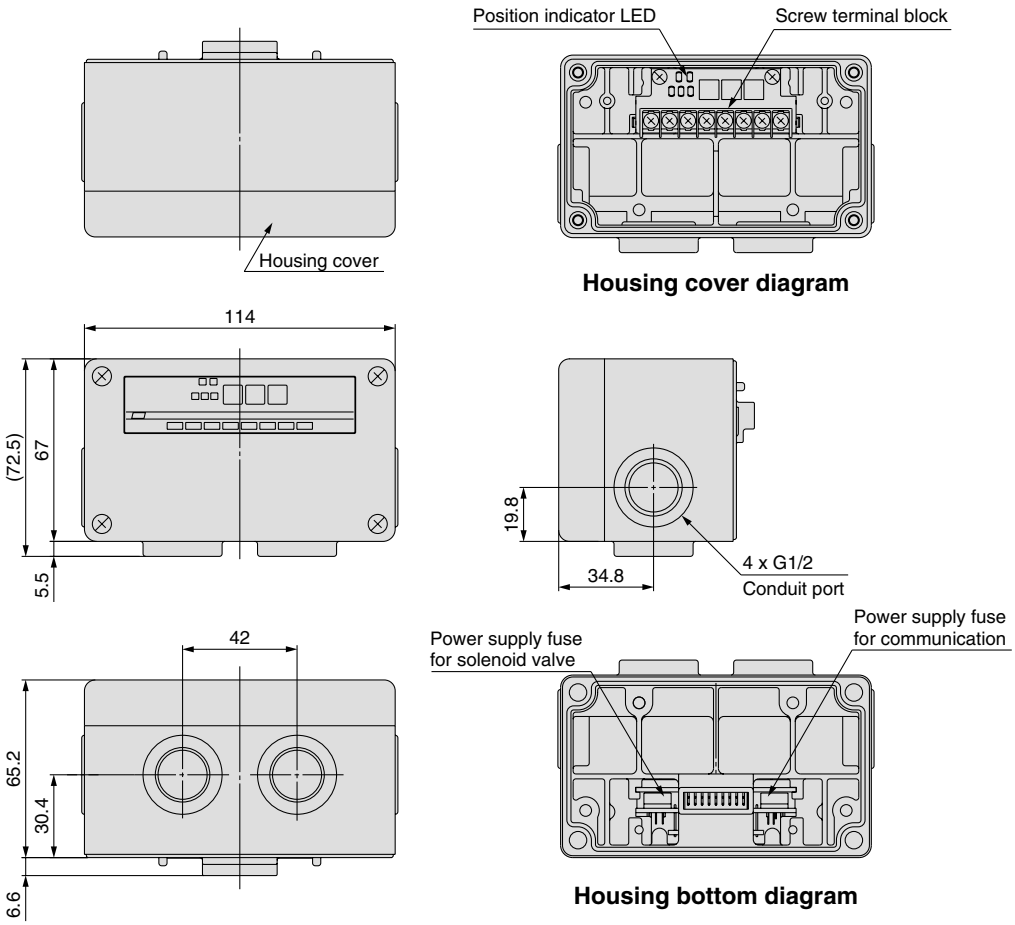
The electrical specification is the same for EX12□. Refer to page 1651.
4 unit mounting screws (M4 x 10) are included when shipped.

SI Unit Dimensions/Parts Description

EX123□-S□□□, EX124□-S□□□



EX126D-SMJ1

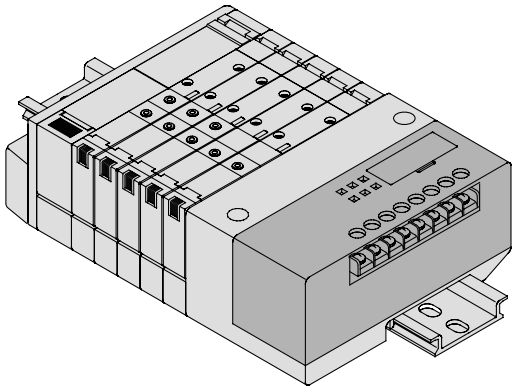


EX

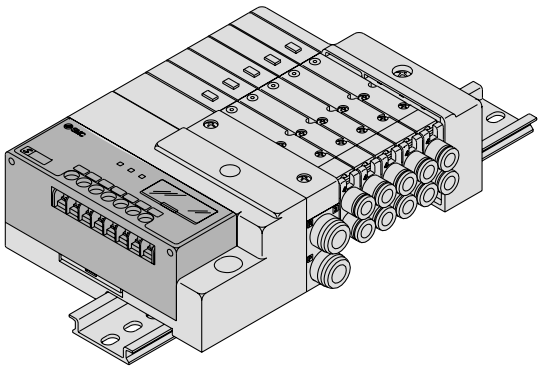
Integrated Type/For Output
Series EX140

★Thinner unit with low height
★Maximum 16 outputs

SZ3000



SQ1000/2000



How to Order SI Unit

EX140 − S DN1

Communication protocol

DN1	DeviceNet
MJ1	CC-Link
CS1	OMRON Corp.: CompoBus/S (16 outputs)
CS2	OMRON Corp.: CompoBus/S (8 outputs)
SL1	SUNX Corp.: S-LINK (16 outputs)
SL2	SUNX Corp.: S-LINK (8 outputs)
UW1	NKE Corp.: Uni-wire System
UH1	NKE Corp.: Uni-wire H System

Note) Please consult SMC for networks other than those mentioned above.

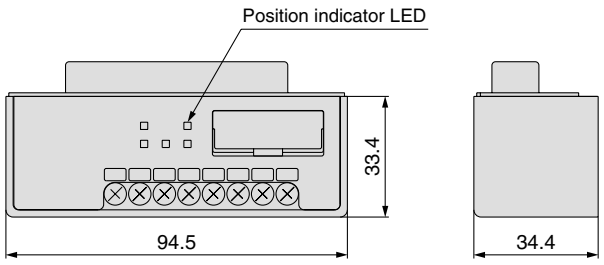
SI Unit Specifications

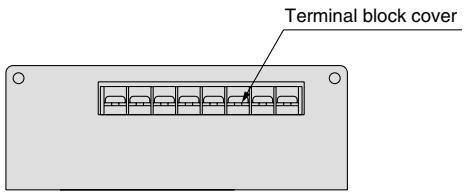
Model			EX140-SDN1	EX140-SMJ1	EX140-SCS1 EX140-SCS2	EX140-SSL1 EX140-SSL2	EX140-SUW1	EX140-SUH1
Communication specification	Applicable system	Protocol	DeviceNet	CC-Link	OMRON Corp.: CompoBus/S	SUNX Corp.: S-Link	NKE Corp.: Uni-wire System	NKE Corp.: Uni-wire H System
		Version Note 1)	Release 2.0	Ver. 1.10	—	—	—	—
	Communication speed		125 k/250 k/500 kbps	156 k/625 kbps 2.5 M/5 M/10 Mbps	750 kbps	28.5 kbps	28.5 kbps	29.4 kbps
	Specified file Note 2)		EDS file	—				
	Occupied area (Number of inputs/outputs)		0/16	32/32 (1 station, remote I/O stations)	SCS1: 0/16 SCS2: 0/8	SSL1: 0/16 SSL2: 0/8	0/16	
	Terminal resistor		Not applicable					
Power supply	For unit		11 to 25 VDC	15 to 30 VDC	14 to 26.4 VDC	24 VDC+10%/–5% (Common power supply)	24 VDC±10% (Common power supply)	
	For valve		24 VDC+10%/–5%					
Internal current consumption (Unit)			100 mA or less					
Output specification	Output type		NPN output (+COM.)					
	Number of outputs		16 points		SCS1/SSL1: 16 points SCS2/SSL2: 8 points		16 points	
	Connection load		SMC: Solenoid valve with light/surge voltage suppressor (24 VDC, 2.1 W or less)					
	Output when communication error occurs		Hold/Clear (Switch setting)				Clear	
Environmental resistance	Enclosure		IP20					
	Operating temperature range		0 to +55°C (Valve 8 points ON) 0 to +50°C (Valve 16 points ON)					
	Operating humidity range		35 to 85%RH (With no condensation)					
	Withstand voltage		1500 VAC for 1 min. between external terminals and case					
	Insulation resistance		2 MΩ or more (500 VDC) between external terminals and case					
	Vibration resistance		10 to 55 Hz with a 0.5 mm amplitude in each X, Y, Z direction for 2 hrs (De-energized)					
	Impact resistance		98 m/s^2, in each X, Y, Z direction, 3 times (De-energized)					
Standard			CE marking			—		
Accessory			Communication connector 1 pc., Power connector 1 pc.	—				

Note 1) Please note that the version is subject to change.
Note 2) Each file can be downloaded from SMC's website (http://www.smcworld.com/).
Note 3) For detailed specifications other than the above, refer to the separate technical operation manual that can be downloaded from SMC's website (http://www.smcworld.com/).

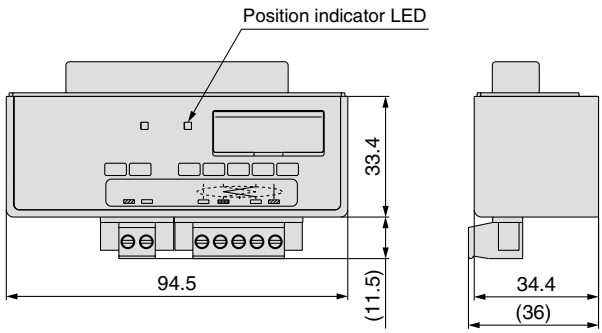
SI Unit Dimensions / Parts Description

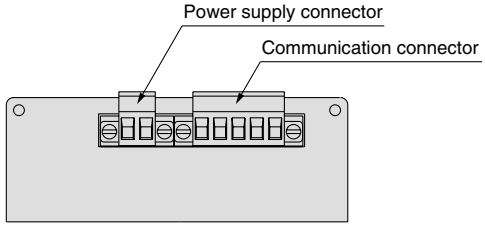
EX140-SMJ1, SCS□, SSL□, SUW1, SUH1





EX140-SDN1



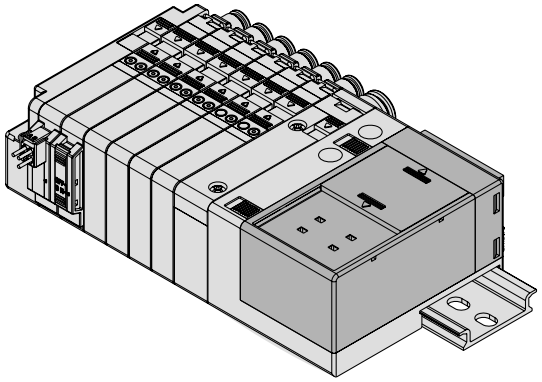


EX

Integrated Type/For Output
Series EX180

★Thinner unit with low height
★Maximum 32 outputs

SJ2000/3000



How to Order SI Unit

EX180 − S DN1 ☐

Communication protocol

DN1	DeviceNet (32 outputs)
DN2	DeviceNet (16 outputs)
MJ1	CC-Link (32 outputs)

Note) Please consult SMC for networks other than those mentioned above.

Communication connector configuration

Nil	T branching type
A	Straight type

Note) Communication and power supply connectors are included.

How to Order Option

Communication connector

This is a connector to connect to the network cable. This is included when shipped.

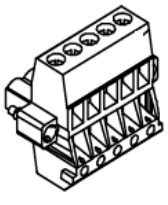
EX180 − C DN 1

Communication protocol

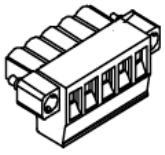
DN	For EX180-SDN☐
MJ	For EX180-SMJ1

Communication connector configuration

1	T branching type
2	Straight type



EX180-C☐☐1

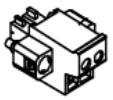


EX180-C☐☐2

Power supply connector

This is a connector to supply power. This is included when shipped.

EX180 − CP1



SI Unit Specifications

Model			EX180-SDN1 EX180-SDN2	EX180-SMJ1
Communication specification	Applicable system	Protocol	DeviceNet	CC-Link
		Version Note 1)	Release 2.0	Ver. 1.10
	Communication speed		125 k/250 k/500 kbps	156 k/625 kbps 2.5 M/5 M/10 Mbps
	Specified file Note 2)		EDS file	—
	Occupied area (Number of inputs/outputs)		SDN1: 0/32 SDN2: 0/16	32/32 (1 station, remote I/O stations)
	Terminal resistor		Not applicable	Built in the unit (Switch setting, 110 Ω)
Power supply	For unit		11 to 25 VDC	15 to 30 VDC
	For valve		24 VDC±10%/–5%	
Internal current consumption (Unit)			70 mA or less	50 mA or less
Output specification	Output type		NPN output (+COM.)	
	Number of outputs		SDN1: 32 points SDN2: 16 points	32 points
	Connection load		Series SJ2000/3000 manifold valves	
	Output when communication error occurs		Hold/Clear (Switch setting)	
Environmental resistance	Enclosure		IP20	
	Operating temperature range		–10 to 50°C	
	Operating humidity range		35 to 85%RH (With no condensation)	
	Withstand voltage		500 VAC for 1 min. between external terminals and FG	
	Insulation resistance		10 MΩ or more (500 VDC) between external terminals and FG	
	Vibration resistance		10 to 55 Hz with a 0.5 mm amplitude in each X, Y, Z direction for 2 hrs (De-energized)	
	Impact resistance		147 m/s^2, in each X, Y, Z direction, 3 times (De-energized)	
Standard			CE marking, UL (CSA)	
Accessory			Communication connector 1 pc., Power connector 1 pc.	Communication connector 1 pc., Power connector 2 pcs.

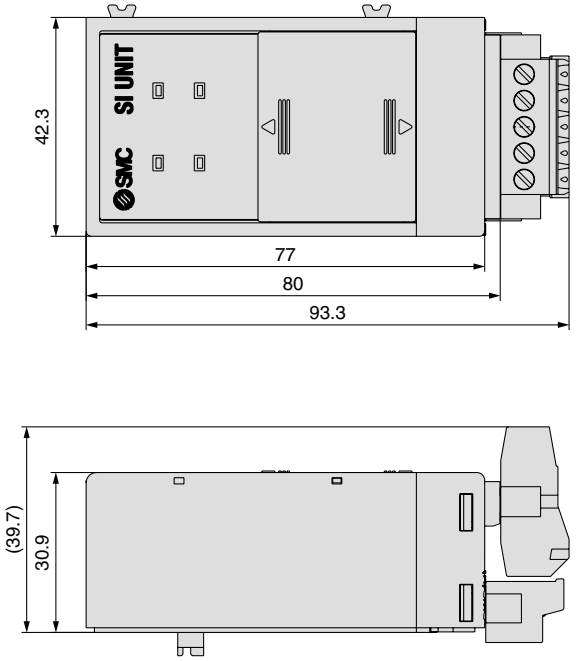
Note 1) Please note that the version is subject to change

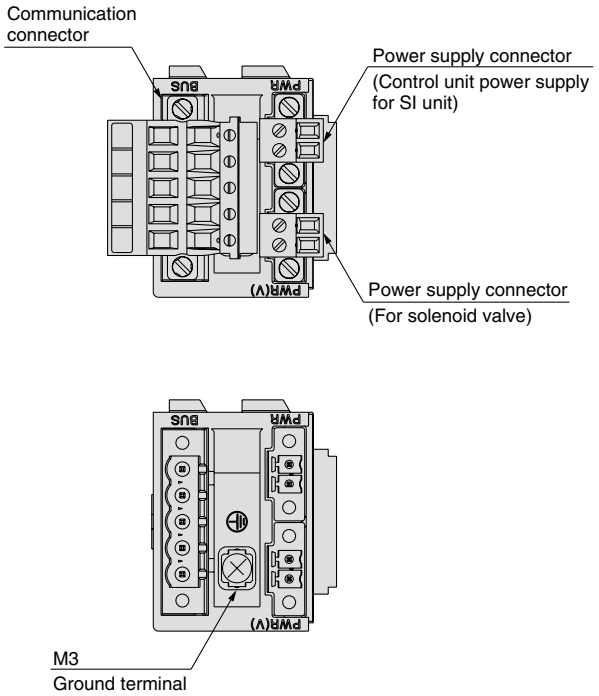
Note 2) Each file can be downloaded from SMC's website (http://www.smcworld.com/).

Note 3) For detailed specifications other than the above, refer to the separate technical operation manual that can be downloaded from SMC's website (http://www.smcworld.com/).

SI Unit Dimensions / Parts Description

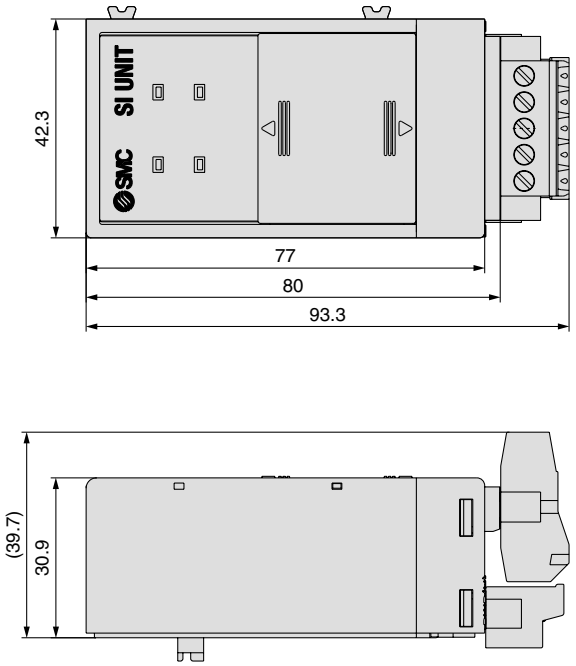
EX180-SMJ1

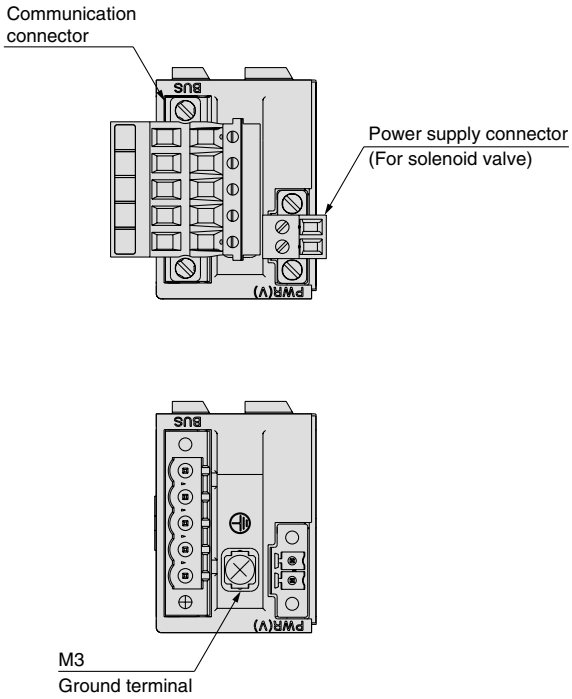




Before mounting connector (accessory)

EX180-SDN1, SDN2





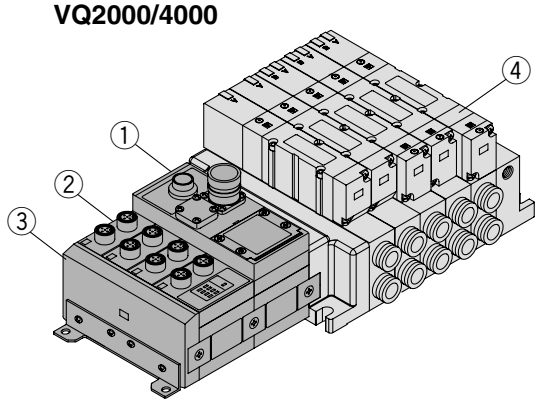
Before mounting connector (accessory)

Integrated Type/ For Input/Output

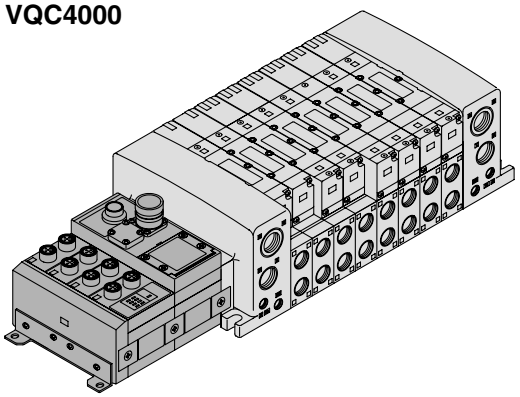
Series EX240

★Enclosure IP65
★Maximum 32 inputs/32 outputs
★Connection of sensors with M12 connectors is possible

VQ2000/4000



VQC4000



No.	Type	Function
1	**SI unit**	Compatible with various field buses
2	**DI unit**	Connection of sensors with M12 connectors, Max. 8 inputs/unit
3	**End case assembly**	Direct mounting, DIN rail mounting
4	**Manifold valve**	Max. 32 points actuation

EX

How to Order

SI unit

EX240 – S DN2

Communication protocol

DN2	DeviceNet
PR1	PROFIBUS DP

Note) Please consult SMC for the applicable networks other than the above.

End case assembly

EX240 – EA 2

Mounting specifications

2	Direct mounting
3	DIN rail mounting (For VQ valves)
4	Without mounting holes (Without DI unit)

DI unit

EX240 – IE1

How to Order Option

Cable with connector

This is a cable to supply power to the SI unit.

EX240 – AC30

Cable length	3 m

SI Unit Specifications

Model			EX240-SDN2	EX240-SPR1
Communication specification	Applicable system	Protocol	DeviceNet	PROFIBUS DP
		Version Note 1)	Release 2.0	DP-V0
	Communication speed		125 k/250 k/500 kbps	9.6 k/19.2 k/93.75 k/187.5 k/500 kbps 1.5 M/3 M/6 M/12 Mbps
	Specified file Note 2)		EDS file	GSD file
	Occupied area (Number of inputs/outputs)		32/32	
	Terminal resistor		Not applicable	
Power supply	For unit		11 to 25 VDC	24 VDC±20%
	For sensors		24 VDC±20%	
	For valve		24 VDC+10%/–5%	24 VDC+10%/–5%
Internal current consumption (Unit)			100 mA or less	200 mA or less
Input specification	Number of inputs		32 points (According to the number of DI unit connection)	
	Supply voltage		24 VDC	
	Supply current		2.0 A or less	
Output specification	Output type		NPN output (+COM.)	PNP (–COM.)
	Number of outputs		32 points	
	Connection load		SMC: Solenoid valve with light/surge voltage suppressor (24 VDC, 2.1 W or less)	
	Supply voltage		24 VDC	
	Supply current		3.2 A or less	
	Output when communication error occurs		Hold/Clear (Switch setting)	Clear
Environmental resistance	Enclosure		IP65	
	Operating temperature range		5 to 45°C	
	Operating humidity range		35 to 85%RH (With no condensation)	
	Withstand voltage		1500 VAC for 1 min. between external terminals and FG	
	Insulation resistance		10 MΩ or more (500 VDC) between external terminals and FG	
	Vibration resistance		10 to 150 Hz with a 0.35 mm amplitude or 49 m/s² in each X, Y, Z direction for 2 hrs (De-energized)	
	Impact resistance		147 m/s², in each X, Y, Z direction, 3 times (De-energized)	
Standard			CE marking	
Accessory Note 3)			Modular adopter assembly 2 pcs., Joint assembly 1 pc.	

Note 1) Please note that the version is subject to change
Note 2) Each file can be downloaded from SMC's website (http://www.smcworld.com/).
Note 3) When the SI unit is mounted to the manifold when shipped, accessories are shipped together with it.
Note 4) For detailed specifications other than the above, refer to the separate technical operation manual that can be downloaded from SMC's website (http://www.smcworld.com/).

DI Unit Specifications

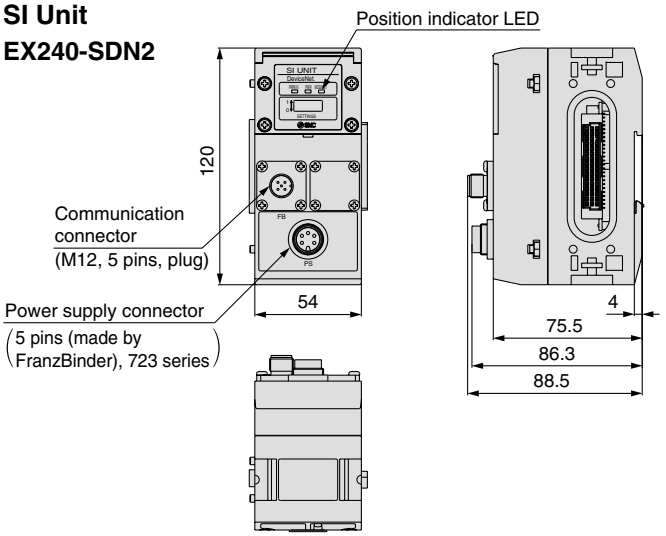
Model		EX240-IE1
Input specification	Input type	PNP/NPN sensor input (switched using a switch)
	Number of inputs	8 points
	Input device supply voltage	24 VDC
	Input device supply current	Max. 60 mA/point, 500 mA/unit Note 1)
	Rated input current	Approx. 8 mA
	Display	Green LED (Illuminated when the power supply for the SI unit sensor 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)
Environmental resistance	Enclosure	IP65
	Operating temperature range	5 to 45°C
	Operating humidity range	35 to 85%RH (With no condensation)
	Withstand voltage	1500 VAC for 1 min. between external terminals and FG
	Insulation resistance	10 MΩ or more (500 VDC) between external terminals and FG
	Vibration resistance	10 to 150 Hz with a 0.35 mm amplitude or 49 m/s² in each X, Y, Z direction for 2 hrs (De-energized)
	Impact resistance	147 m/s², in each X, Y, Z direction, 3 times (De-energized)
Standard		CE marking
Accessory Note 2)		Modular adopter assembly 2 pcs., Joint assembly 1 pc.

Note 1) Short circuit protection works at 600 mA per each DI unit, and sensor power supply stops.
Note 2) When the DI unit is mounted to the manifold when shipped, accessories are shipped together with it.
Note 3) For detailed specifications other than the above, refer to the separate technical operation manual that can be downloaded from SMC's website (http://www.smcworld.com/).

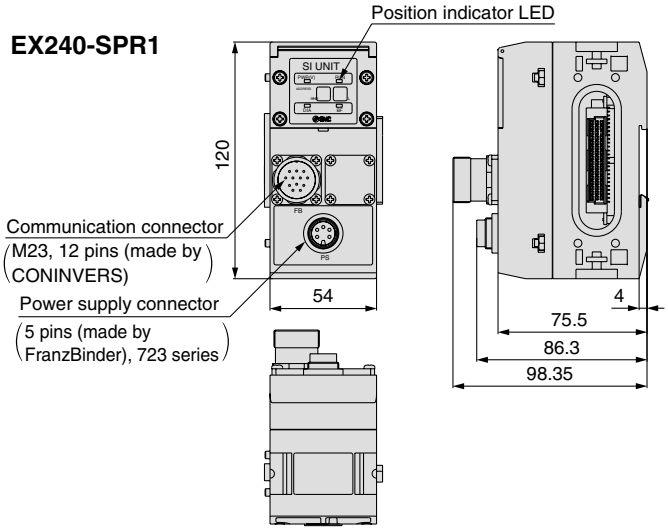
Dimensions

SI Unit

EX240-SDN2

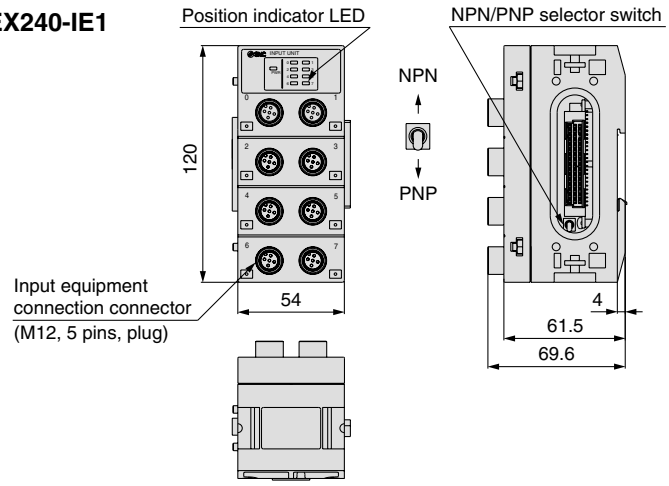


EX240-SPR1



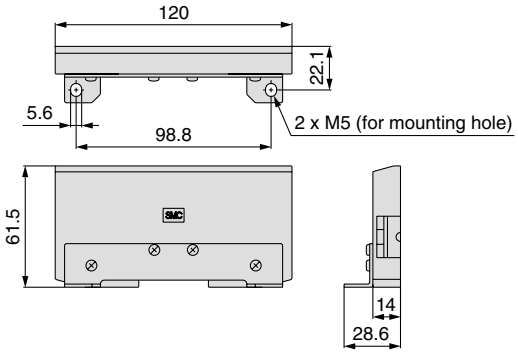
DI Unit

EX240-IE1

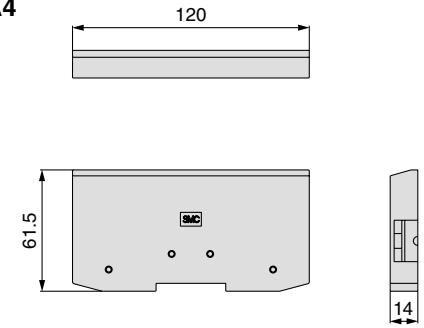


End Case Assembly

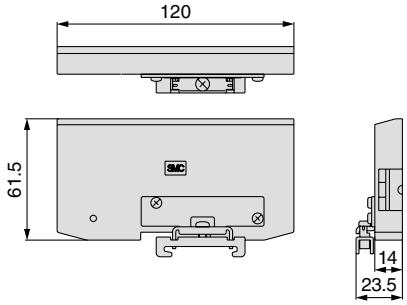
EX240-EA2



EX240-EA4



EX240-EA3



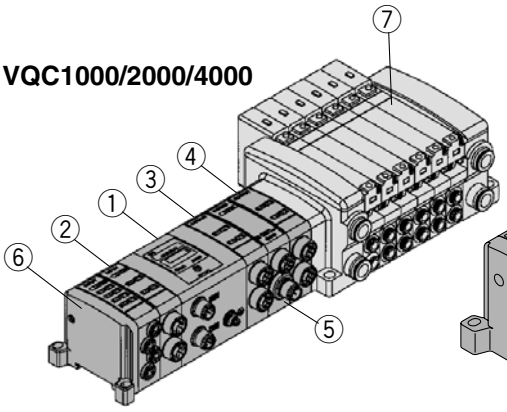
EX

Integrated Type/ For Input/Output

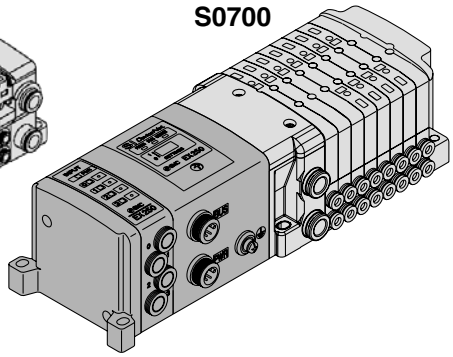
Series EX250

★Enclosure IP67
★Maximum 32 inputs/32 outputs
★Connection of sensors with M8/M12 connectors is possible

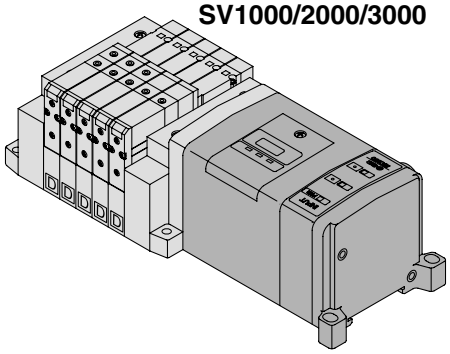
VQC1000/2000/4000



S0700



SV1000/2000/3000



No.	Type	Function
1	**SI unit**	Compatible with various field buses
2	**Input block**	Connection of sensors with M8, M12 connectors
3	**Output block** Note 1)	Output equipment connection with M12 connectors (For low watt load)
4	**Output block** Note 1)	Output equipment connection with M12 connectors (For high watt load)
5	**Power block** Note 1)	Power supply for output block (For high watt load)
6	**End plate assembly**	Direct mounting, DIN rail mounting
7	**Manifold valve**	Max. 32 points actuation

Note 1) A manifold part number is not specified for the output block and power block. Please consult SMC for the manifold integrated type.

How to Order SI Unit

EX250 – S DN1

Communication protocol

DN1	DeviceNet
DN1-X102 Note 1)	DeviceNet
PR1	PROFIBUS DP
MJ2	CC-Link
AS3	AS-i (8in/8out 31Slave Mode, 2 power supply systems)
AS5	AS-i (4in/4out 31Slave Mode, 2 power supply systems)
AS7	AS-i (8in/8out 31Slave Mode, 1 power supply system)
AS9	AS-i (4in/4out 31Slave Mode, 1 power supply system)
CA1A	CANopen
CN1 Note 2)	ControlNet
EN1	EtherNet/IP

Note 1) Refer to the SI unit specifications on page 1665 for the special order specifications.
Note 2) The enclosure rating is IP40 for the SI unit compatible with ControlNet.
Note 3) Please consult SMC for the applicable networks other than the above.

SI Unit Specifications

Model			EX250-SDN1	EX250-SDN1-X102 (Note 1)	EX250-SPR1	EX250-SMJ2	EX250-SCA1A	EX250-SCN1	EX250-SEN1	EX250-SAS3/5	EX250-SAS7/9
Communication specification	Applicable system	Protocol	DeviceNet		PROFIBUS DP	CC-Link	CANopen	ControlNet	EtherNet/IP	AS-Interface	
		Version (Note 2)	Release 2.0		DP-V0	Ver.1.10	CiA DS-301 V4.02 CiA DS-401	V2.0 Errata 3 adapter class	Release 1.0	Version 2.11 Standard Address Mode	
	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	156 k/625 k/ 2.5 M/5 M/ 10 Mbps	10 k/20 k/50 k/ 125 k/250 k/ 500 k/800 k/ 1 Mbps	5 Mbps	10 M/100 Mbps	167 kbps	
	Specified file (Note 3)		EDS file	EDS file	GSD file	—	EDS file	EDS file	EDS file	—	—
	Occupied area (Number of inputs/outputs)		32/32	48/32	32/32	64/64 (2 stations, remote device station)	32/32	48/32	48/32	SAS3: 8/8 (2 slave units) SAS5: 4/4	SAS7: 8/8 (2 slave units) SAS9: 4/4
	Terminal resistor		Not applicable								
Power supply	For unit		11 to 25 VDC (Supplied by DeviceNet circuit)		24 VDC±20%		18 V to 30 VDC (Supplied by CANopen circuit)	24 VDC±20%		26.5 to 31.6 VDC (Supplied by AS-i circuit)	Note 4) 26.5 to 31.6 VDC (Supplied by AS-i circuit)
	For sensors		24 VDC±20%				24 VDC±20%				
	For valve		24 VDC+10%/–5%								
Internal current consumption (Unit)			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 specification	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		1.0A or less							SAS3: 240 mA or less SAS5: 120 mA or less	Note 5)
Output specification	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 load		SMC: Solenoid valve with light/surge voltage suppressor (24 VDC, 1.5 W or less) Output block Power block								
	Supply voltage		24 VDC								
	Supply current		2.0 A or less							SAS3: 500 mA or less SAS5: 250 mA or less	Note 5)
	Output when communication error occurs		Hold/Clear (Switch setting)		Clear		Hold/Clear (Switch setting)				
Environmental resistance	Enclosure		IP67					IP40	IP67		
	Operating temperature range		5 to 45°C				–10 to 50°C	5 to 45°C			
	Operating humidity range		35 to 85%RH (With no condensation)								
	Withstand voltage		500 VAC for 1 min. between external terminals and FG								
	Insulation resistance		10 MΩ or more (500 VDC) between external terminals and FG								
	Vibration resistance		10 to 150 Hz with a 0.35 mm amplitude or 49 m/s² in each X, Y, Z direction for 2 hrs (De-energized)								
	Impact resistance		147 m/s² in each X, Y, Z direction, 3 times (De-energized)								
Standard			CE marking, UL (CSA)								
Accessory (Note 6)			Tie-rod 2 pcs.								

Note 1) This is a specification to transmit the diagnostic information of voltage drop of the valve power supply and input block fuse blowout as an input data to the master. EX250-SDN1 becomes I/O connection time out when the diagnostic information is detected, but not EX250-SDN1-X102.
Since this is a special product, a manifold part number is not specified. Please consult SMC for the manifold integrated type.

Note 2) Please note that the version is subject to change.

Note 3) Each file can be downloaded from SMC's website (http://www.smcworld.com/).

Note 4) Since EX250-SAS7/9 is compatible with the 1 power supply system, the power supply for units is divided into two: the power supply for sensors and for valves.

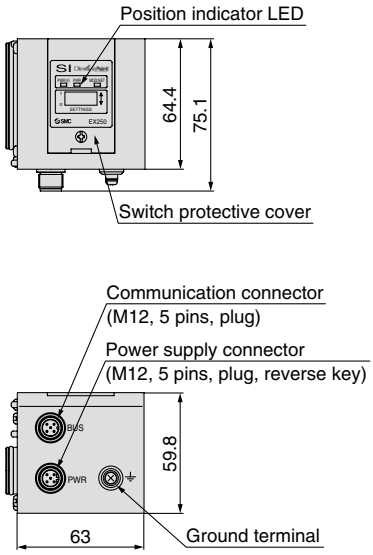
Note 5) Since EX250-SAS7/9 is compatible with the 1 power supply system, the power supply must be divided in accordance with the values below. (Refer to page 1667 for details.)
(EX250-SAS7 ··· Max. 240 mA, EX250-SAS9 ··· Max. 120 mA)

Note 6) When the SI unit is mounted to the manifold when shipped, accessories are shipped together with it.

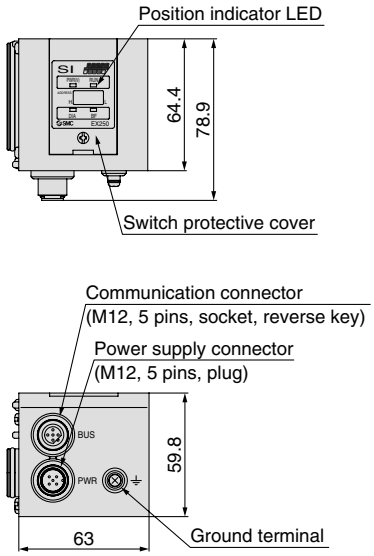
Note 7) For detailed specifications other than the above, refer to the separate technical operation manual that can be downloaded from SMC's website (http://www.smcworld.com/).

SI Unit Dimensions / Parts Description

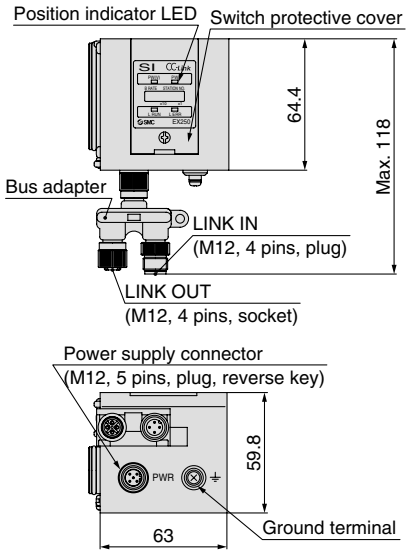
EX250-SDN1 (DeviceNet)



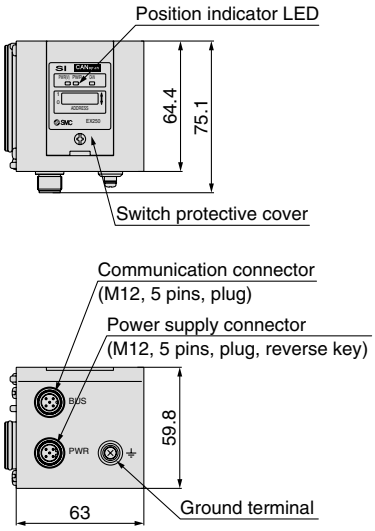
EX250-SPR1 (PROFIBUS DP)



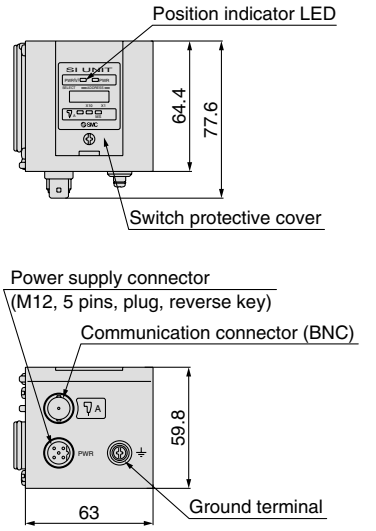
EX250-SMJ2 (CC-Link)



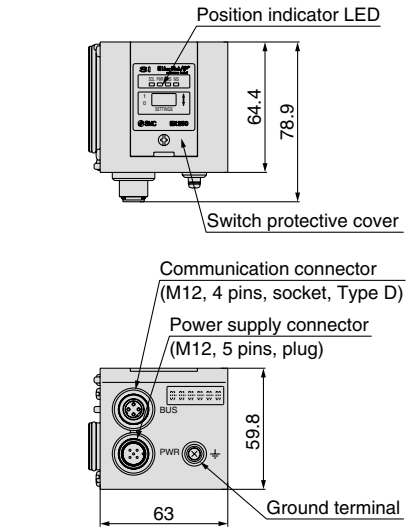
EX250-SCA1A (CANopen)



EX250-SCN1 (ControlNet)

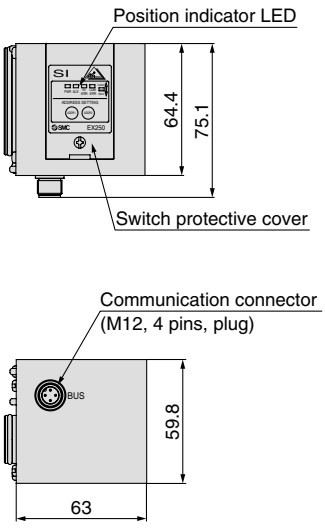


EX250-SEN1 (EtherNet/IP)

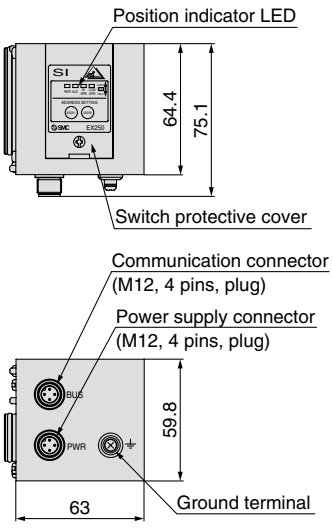


AS-Interface

EX250-SAS7/9 (1 power supply system)



EX250-SAS3/5 (2 power supply systems)



Series EX250
Precautions
Be sure to read before handling.

When one AS-Interface power supply system is used

⚠ Caution

		EX250-SAS7	EX250-SAS9
Power supply voltage		Supplied from AS-Interface circuit, 26.5 to 31.6 VDC Note 1)	
Internal current consumption		Max. 100 mA	Max. 65 mA
Input/output specification	**Number of inputs**	8	4
	Number of outputs	8	4
	Supply voltage	24 VDC	
	Supply current Note 2)	Max. 240 mA	Max. 120 mA

Note 1) For communication power supply, use a power supply dedicated to AS-Interface. For details, please refer to instruction manuals provided by the respective manufacturers.

Note 2) The AS-Interface circuit provides current to the internal parts of the SI unit and all connected equipment.
Since there is a limit on the possible supply current to all connected equipment, select the equipment connected to the input/output device to stay within the possible supply current.

Example) When EX250-SAS9 is used

Valve: VQC1100NY – 5 (low-wattage type of 0.5 W) x 4 pcs.

0.5 [W] ÷ 24 [V] x 4 [pcs.] = 84 [mA] (4 outputs simultaneously ON)

The maximum possible supply current of EX250-SAS9 is 120 mA. Therefore, the possible supply current to the sensor is

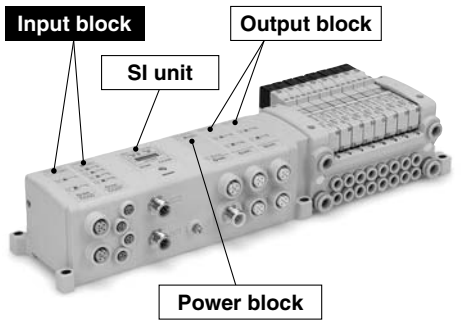
120 [mA] – 84 [mA] = 36 [mA]

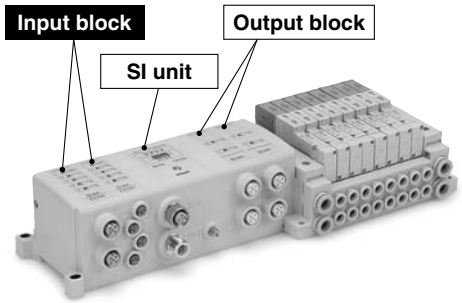
Use of low-wattage type valves by minimizing the maximum number of simultaneous outputs, and low current consumption sensors (2-wire sensor, etc.) is recommended.

Maximum number of AS-Interface compatible input blocks

SI unit specifications		Input block type		Input block maximum stations
EX250-SAS3	AS-Interface 8in/8out 31SlaveMode, 2 power supply systems	**1**	M12/2 inputs	4 stations
		2	M12/4 inputs	2 stations
		3	M8/4 inputs	2 stations
EX250-SAS5	AS-Interface 4in/4out 31SlaveMode, 2 power supply systems	**1**	M12/2 inputs	2 stations
		2	M12/4 inputs	1 station
		3	M8/4 inputs	1 station
EX250-SAS7	AS-Interface 8in/8out 31SlaveMode, 1 power supply system	**1**	M12/2 inputs	4 stations
		2	M12/4 inputs	2 stations
		3	M8/4 inputs	2 stations
EX250-SAS9	AS-Interface 4in/4out 31SlaveMode, 1 power supply system	**1**	M12/2 inputs	2 stations
		2	M12/4 inputs	1 station
		3	M8/4 inputs	1 station

Input Block





How to Order Input Block

EX250 – IE 1

Block type

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

For options, refer to pages 1670 to 1678.

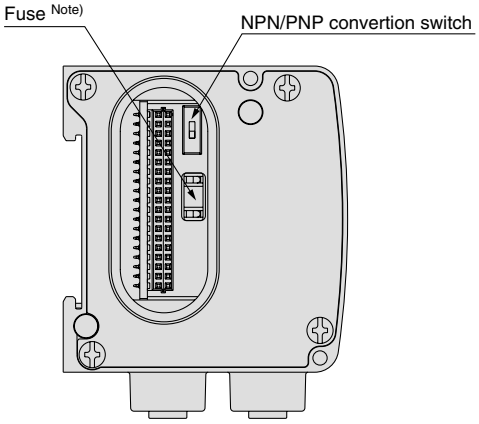
Input Block Specifications

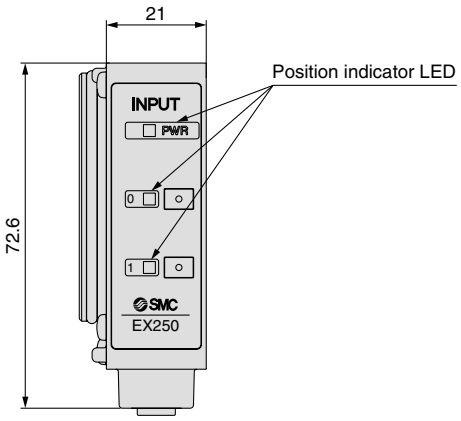
Model		EX250-IE1	EX250-IE2	EX250-IE3
Input specification	Input type	PNP/NPN sensor input (switched using a switch)		
	Number of inputs	2 points	4 points	
	Input device supply voltage	24 VDC		
	Input device supply current	Max. 30 mA/point Note 1)		
	Rated input current	Approx. 8 mA		
	Display	Green LED (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	–10 to 50°C		
	Operating humidity range	35 to 85%RH (with no condensation)		
	Withstand voltage	500 VAC for 1 min. between external terminals and FG		
	Insulation resistance	10 MΩ or more (500 VDC) between external terminals and FG		
	Vibration resistance	10 to 150 Hz with a 0.35 mm amplitude or 49 m/s^2 in each X, Y, Z direction for 2 hrs (De-energized)		
	Impact resistance	147 m/s^2, in each X, Y, Z direction, 3 times (De-energized)		
Standard		CE marking, UL (CSA)		
Accessory Note 2)		Tie-rod 2 pcs.		

Note 1) When the maximum inputs to 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 the SI unit is integrated into manifold, its tie-rod is also incorporated at the time of shipping.
Note 3) For detailed specifications other than the above, refer to the separate technical operation manual that can be downloaded from SMC's website (http://www.smcworld.com/).

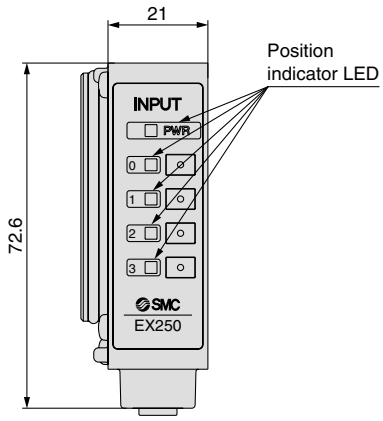
Input Block Dimensions / Parts Description

EX250-IE1, EX250-IE2

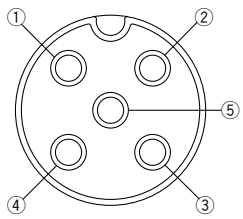




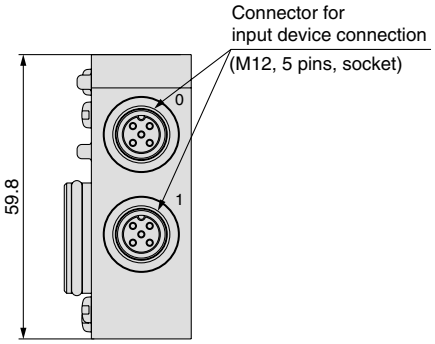
EX250-IE1

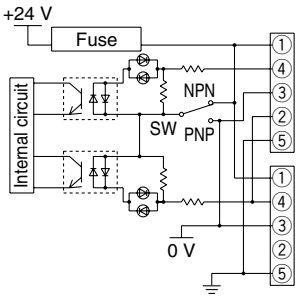


EX250-IE2



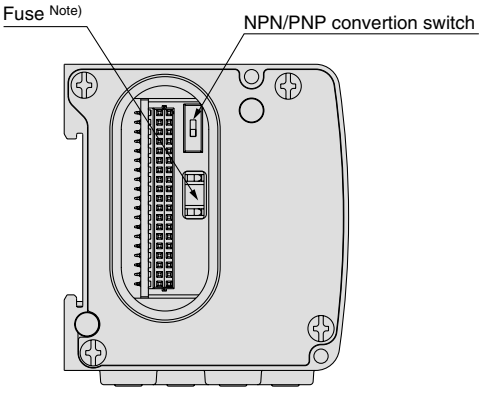
Connector's pin assignment for the input device connection (M12, 5 pins, socket)

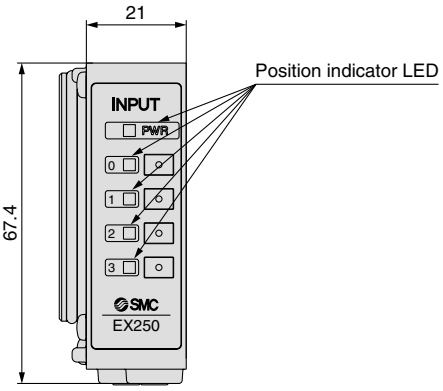


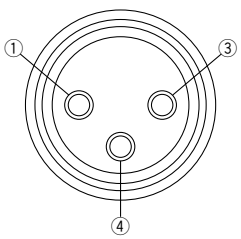


Circuit diagram: EX250-IE1

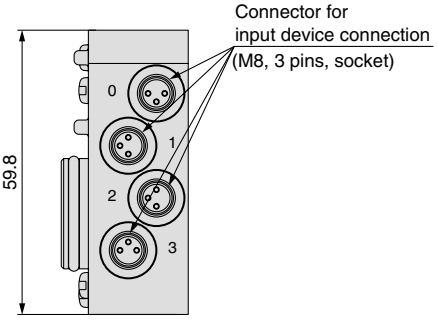
EX250-IE3

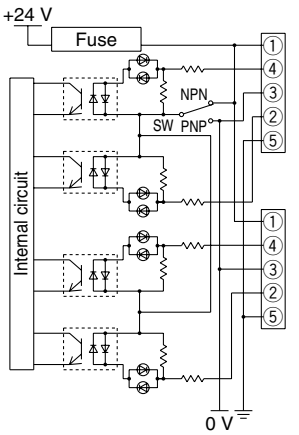




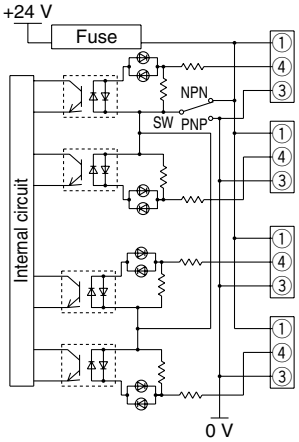


Connector's pin assignment for the input device connection (M8, 3 pins, socket)





Circuit diagram: EX250-IE2



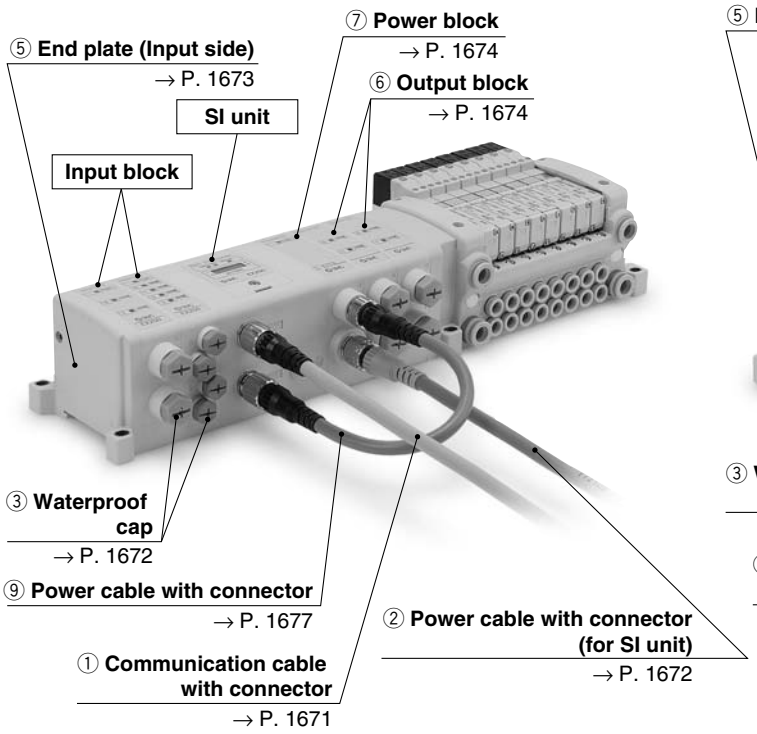
Circuit diagram: EX250-IE3

Note) Fuse for overcurrent protection
If addressing the possible cause of a problem, even when the fuse is blown, it can be reinstated by replacing with a fuse as shown in options, page 1673.

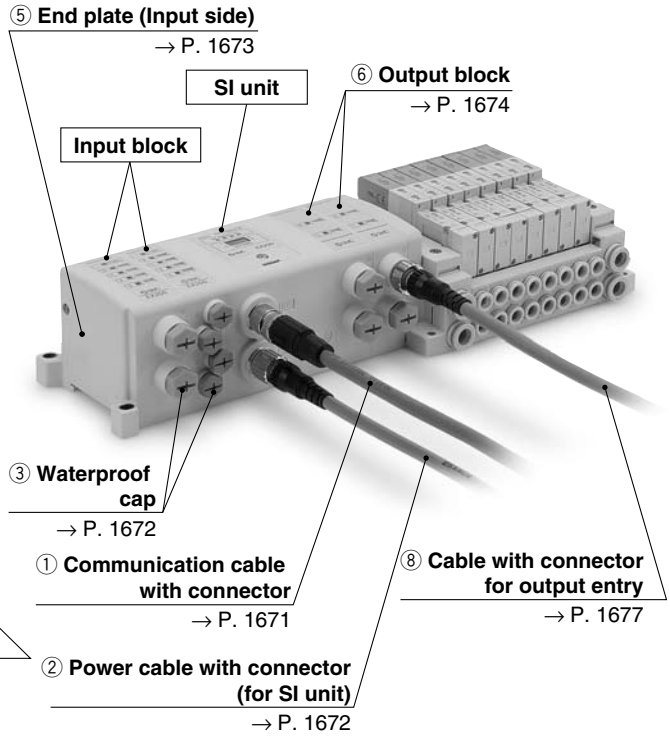
Options

Example of connections

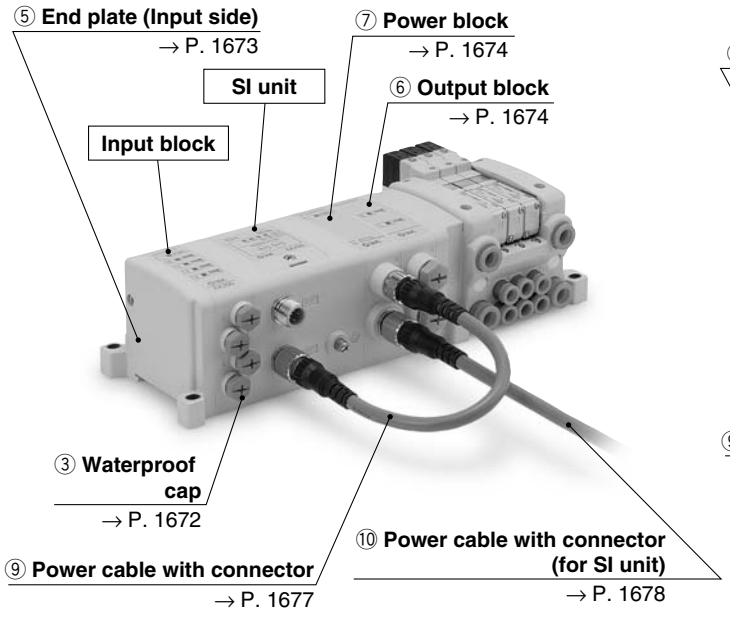
Connection example of the SI unit compliant with DeviceNet



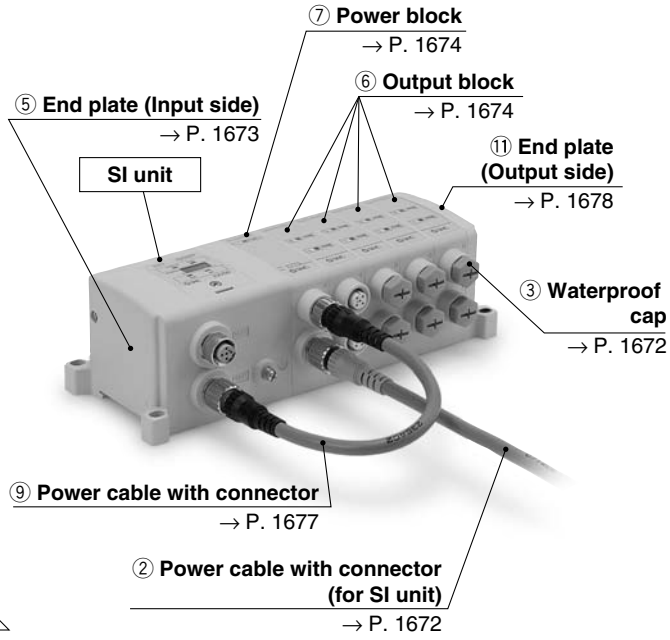
Connection example of the SI unit compliant with EtherNet/IP



Connection example of the SI unit compliant with AS-Interface



Connection example of the SI unit compliant with PROFIBUS DP



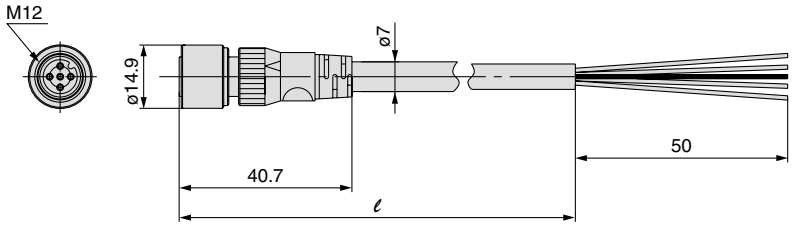
① Communication cable with connector

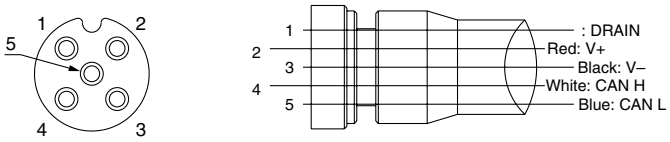
For DeviceNet type SI unit

EX500−AC 050 −DN

Cable length (ℓ)

010	1000 [mm]
050	5000 [mm]





Socket connector pin arrangement

Connections

For EtherNet/IP type SI unit

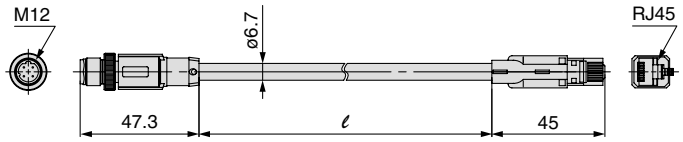
EX9−AC 020 EN− PSRJ

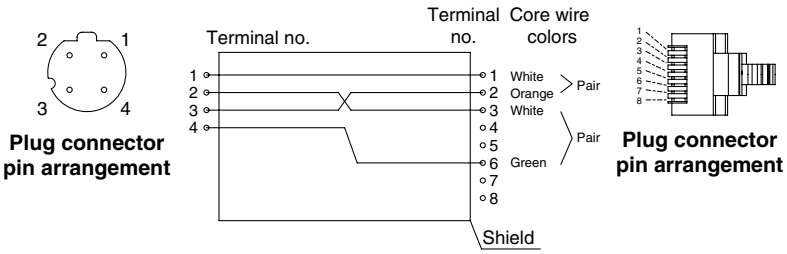
Cable length (ℓ)

020	2000 [mm]

Connector specification

PSRJ	M12 plug (straight)⇔RJ45 connector





Plug connector pin arrangement

Plug connector pin arrangement

Connections (Straight cable)

EX

Options

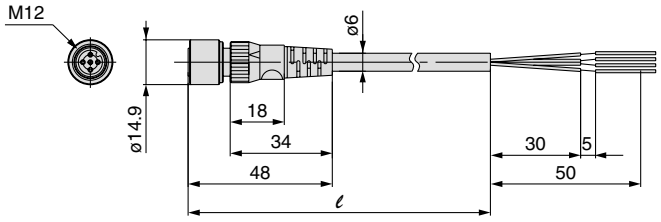
② Power cable with connector (for SI unit)

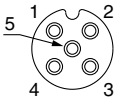
For PROFIBUS DP, EtherNet/IP type SI unit

EX500−AP 050 −S

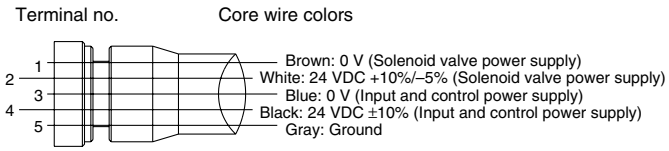
Cable length (ℓ)

010	1000 [mm]
050	5000 [mm]





Socket connector pin arrangement



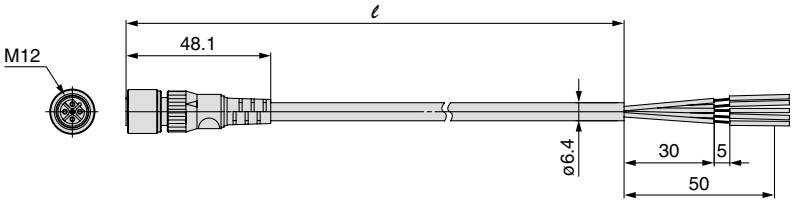
Connections

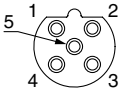
For the SI unit (except for PROFIBUS DP, AS-Interface, EtherNet/IP) and power block

EX9−AC 050 −1

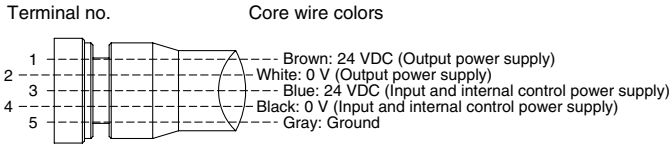
Cable length (ℓ)

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





Socket connector pin arrangement Reverse keyway



Connections

③ Waterproof cap: M8, M12 connector (for socket)

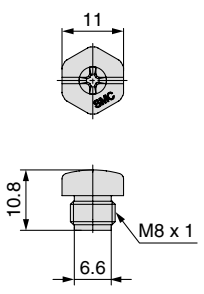
Use this on ports that are not being used for M8 and M12 connectors (socket).
Use of this waterproof cap maintains the integrity of the IP67 enclosure.

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

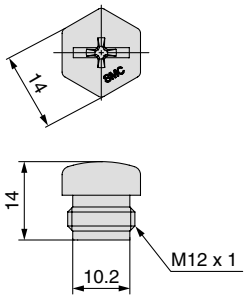
EX500−AW

Connector type

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



M8 connector (for socket)



M12 connector (for socket)

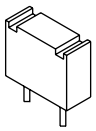
④ Replacement fuse

Replacement fuse required when the fuse for the input block (EX250-IE□) overcurrent protection is blown.

EX9−FU05

Model	EX9-FU05
Applicable model	EX250-IE□
Rated current	0.5 A
Rated insulation capacity	48 VAC/DC 50 A
Fuse resistance value	0.36 Ω

Fuse



⑤ End plate (Input side)

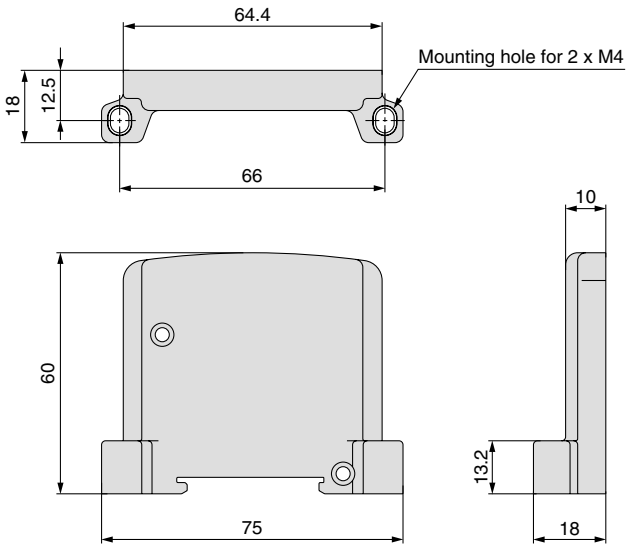
EX250−EA 1

Mounting specification

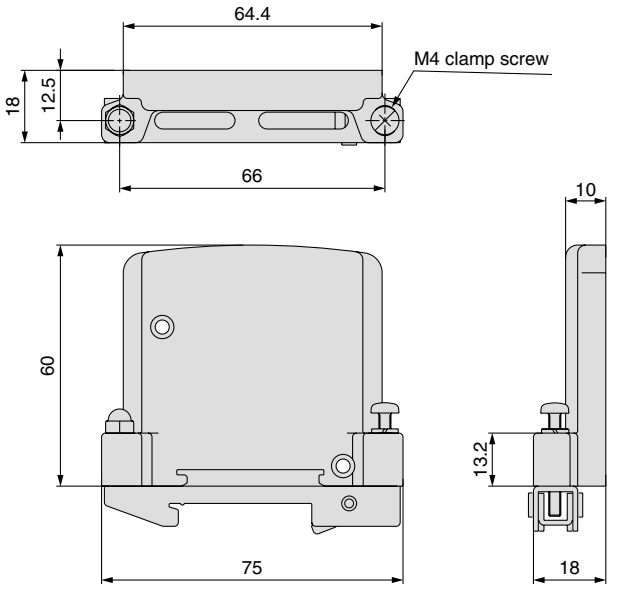
1	Direct mounting
2	DIN rail mounting

Accessory
Hexagon socket head cap screw (M3 x 10): 2 pcs.

EX250-EA1



EX250-EA2



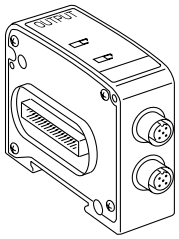
EX

Options

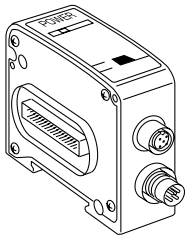
⑥ Output block / ⑦ Power block

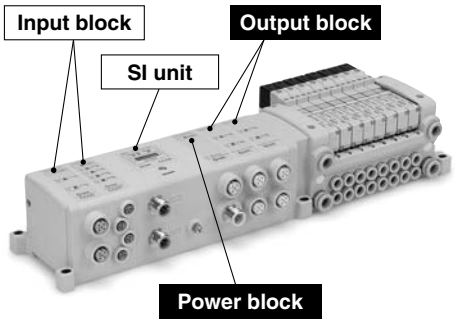
Features:
- **Able to retrofit to the valve manifold, using the unused points.**
- **2-output (M12 connector)**
- **+ common / – common are standardized.**
- **Able to drive by 0.5 A per point.**

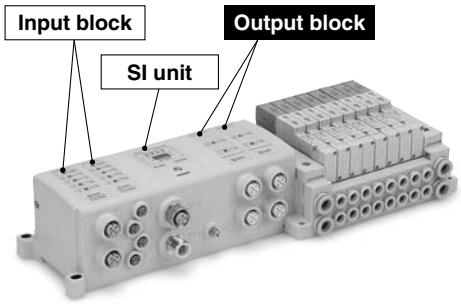
Output block



Power block







How to Order Output Block

EX9 – OE T 1

Output specification

1	PNP output (–COM.)
2	NPN output (+COM.)

Power supply type

T	Internal power supply method (for low-wattage load)
P	Integrated power supply method (for high-wattage load) Note)

Note) Required to connect with a power block.

SI Unit Part No.

SI unit part no.	Output	Applicable model
EX250-SDN1 **EX250-SPR1** **EX250-SAS□** **EX250-SCA1A** **EX250-SCN1** **EX250-SEN1**	PNP output (–COM.)	EX9-OET1 EX9-OEP1
EX250-SMJ2	NPN output (+COM.)	EX9-OET2 EX9-OEP2

Option/Part No.

Description	Part no.	Applicable model		Note
		OET□	OEP□	
Waterproof cap	**EX500-AWTS**	○	○	Refer to page 1672. Order separately: 10 pcs. included
Cable with connector for output entry	**EX9-AC□-7**	○	○	Refer to page 1677. Order separately.
Power block	**EX9-PE1**		○	Refer to the right page. Order separately.

How to Order Power Block

EX9 – PE1

Option/Part No.

Description	Part no.	Note
Waterproof cap	**EX500-AWTS**	Refer to page 1672. Order separately: 10 pcs. included
Power cable with connector	**EX9-AC□-1**	Refer to page 1672, Order separately.
Cable with connector for between SI unit and power block	**EX9-AC002-2** **EX9-AC002-3** **EX9-AC002-4**	Refer to page 1677, Order separately.
AS-Interface power supply cable	**EX9-AC□-5**	Refer to page 1678, Order separately.

Output Block Specifications

Model		EX9-OET1	EX9-OET2	EX9-OEP1	EX9-OEP2
Output connector		M12 connector (5 pins)			
Internal current consumption		40 mA or less			
Output specification	**Output type**	PNP output (–COM.)	NPN output (+COM.)	PNP output (–COM.)	NPN output (+COM.)
	Number of outputs	2 points			
	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. 62 mA/point (1.5 W/point)		Max. 0.5 A/point (12 W/point)	
	Display	Yellow LED (Lights when power is turned ON.)			
	Connector on the output device side	M12 connector (5 pins, plug)			
Environmental resistance	**Enclosure**	IP67			
	Operating temperature range	–10 to 50°C			
	Operating humidity range	35 to 85%RH (with no condensation)			
	Withstand voltage	1500 VAC for 1 min. between external terminals and FG			
	Insulation resistance	10 MΩ or more (500 VDC) between external terminals and FG			
	Vibration resistance	10 to 150 Hz with a 0.35 mm amplitude or 49 m/s^2 in each X, Y, Z direction for 2 hrs (De-energized)			
	Impact resistance	98 m/s^2 in each X, Y, Z direction, 3 times (De-energized)			
Standard		CE marking, UL (CSA)			
Accessory	**Tie-rod**	2 pcs.			

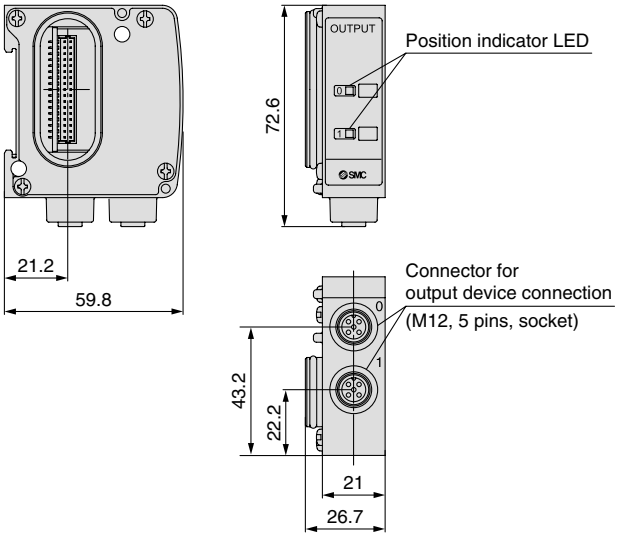
Power Block Specifications

Model		EX9-PE1
Connection block		Output block (EX9-OEP□)
Connection block stations		Output block: Max. 9 stations (excluding input blocks) Note 1)
Power supply for output and internal control	**Power supply voltage**	22.8 to 26.4 VDC
	Internal power consumption	20 mA or less
Supply current		Max. 3.1 A (When using with 3.0 to 3.1 A, the ambient temperature should not exceed 40°C, and do not bundle the cable.)
Environmental resistance	**Enclosure**	IP67
	Operating temperature range	–10 to 50°C
	Operating humidity range	35 to 85%RH (with no condensation)
	Withstand voltage	1500 VAC for 1 min. between external terminals and FG
	Insulation resistance	10 MΩ or more (500 VDC) between external terminals and FG
	Vibration resistance	10 to 150 Hz with a 0.35 mm amplitude or 49 m/s^2 in each X, Y, Z direction for 2 hrs (De-energized)
	Impact resistance	98 m/s^2 in each X, Y, Z direction, 3 times (De-energized)
Standard		CE marking, UL (CSA)
Accessory	**Tie-rod**	2 pcs.
	Waterproof cap (for M12 connector socket)	1 pc. (EX500-AWTS)

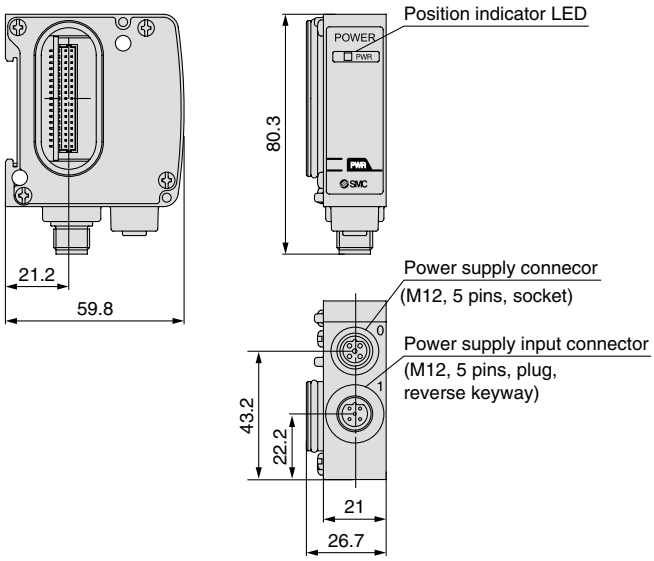
Note 1) The total number of connectable input/output/power block to the EX250 series SI unit (except for AS-Interface compliant) is 10 stations at the maximum.
Note 2) For detailed specifications other than the above, refer to the separate technical operation manual that can be downloaded from SMC's website (http://www.smcworld.com/).

Options

Output Block Dimension

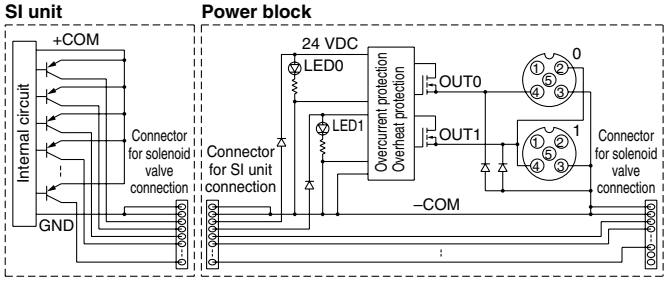


Power Block Dimension

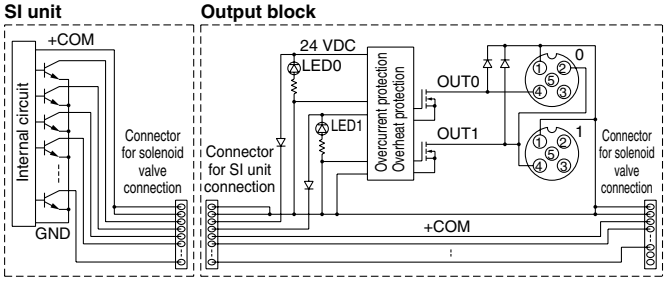


Circuit Diagram

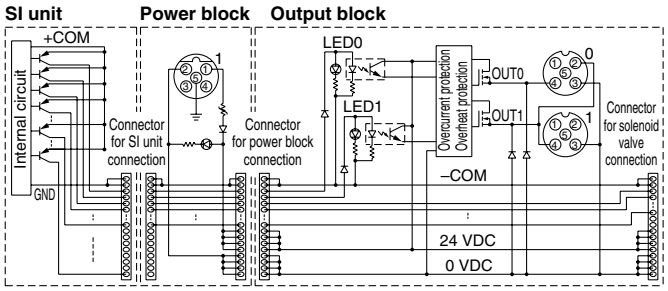
EX9-OET1



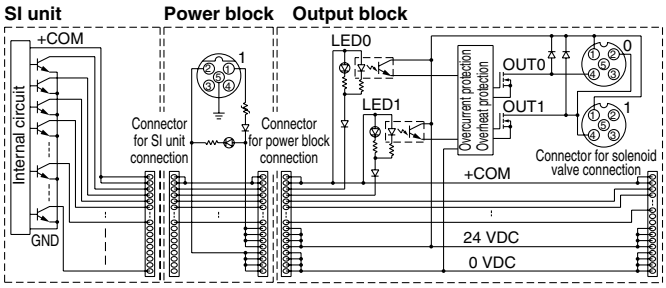
EX9-OET2



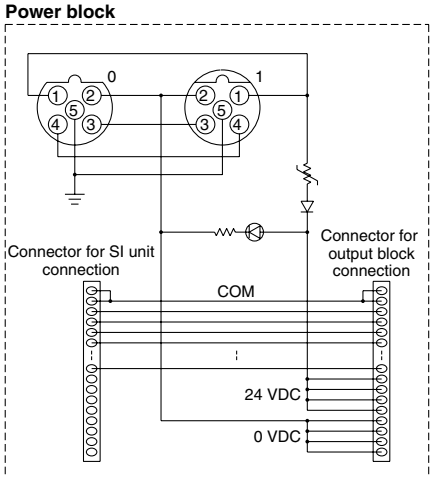
EX9-OEP1



EX9-OEP2



EX9-PE1



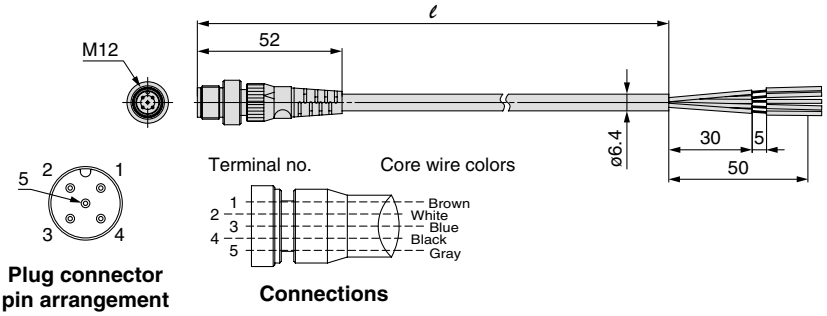
We sell this product individually. Please place an order separately. You are requested to connect it to an SI unit and a valve manifold. When using the output block only (valve manifold is unused.), place an order for an end plate (⑪ EX9-EA□) separately for connection.
Refer to the separate technical instruction manual for connection, wiring, installation, optional goods and cable, etc.

⑧ Cable with connector for output entry

EX9−AC030−7

Cable length (ℓ)

010	1000 [mm]
030	3000 [mm]



Note) Wiring to the output devices differs depending on the output style of the output block.
For details, please refer to the technical documentation for the output block.

⑨ Power cable with connector

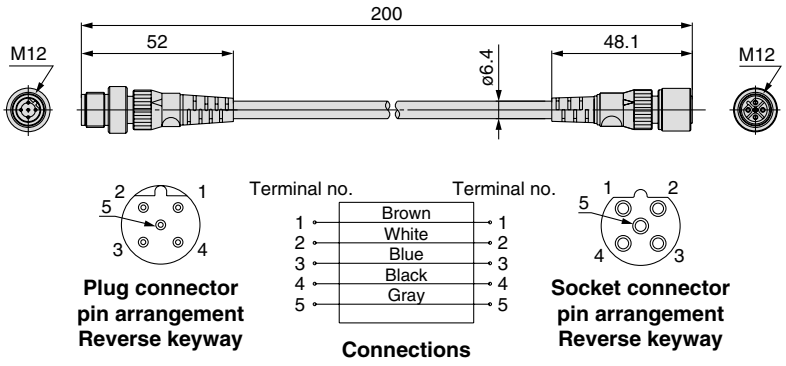
Connects between the power supply connector for the power block and the SI unit power supply connector, bridging the external power supply, which is supplied with the power block, to the SI unit.

EX9−AC002−2

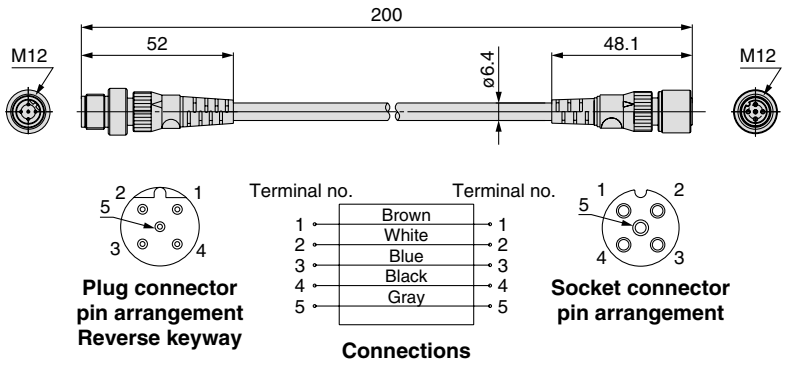
SI unit type

2	EX250-SDN1 EX250-SMJ2 EX250-SCA1A EX250-SCN1	Compliant
3	EX250-SPR1 EX250-SEN1	Compliant
4	EX250-SAS3/5	Compliant

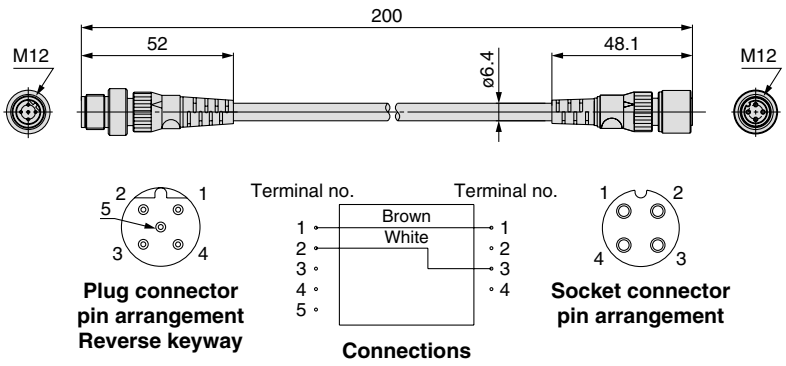
EX9-AC002-2



EX9-AC002-3



EX9-AC002-4



EX

Options

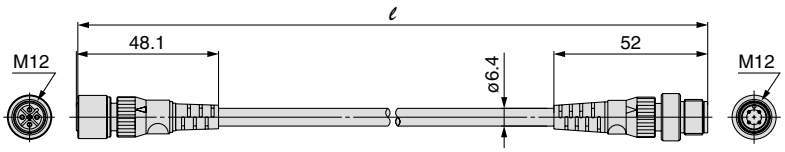
⑩ AS-Interface power cable

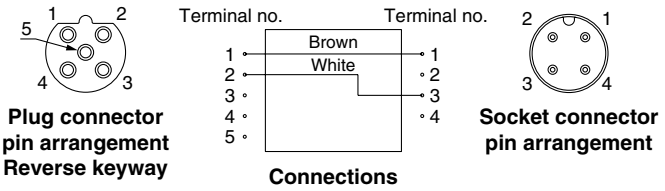
Cable connecting between AS-Interface power supply line (for external devices) branch connector (M12) and the power block's power supply input connector.

EX9−AC 010 −5

Cable length (ℓ)

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





Plug connector pin arrangement Reverse keyway

Connections

Socket connector pin arrangement

⑪ End plate (Output side)

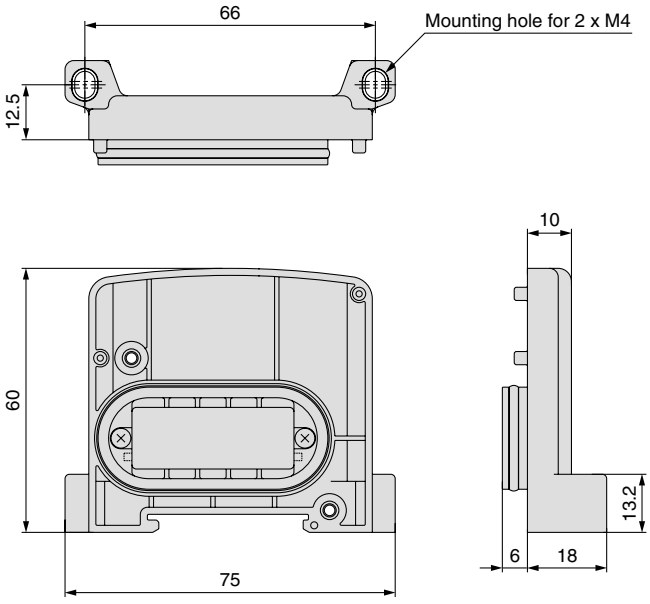
The plate connected on the output block side in order to connect or fix between the SI unit and the input/output/power block when the valve manifold is not used.

EX9−EA 03

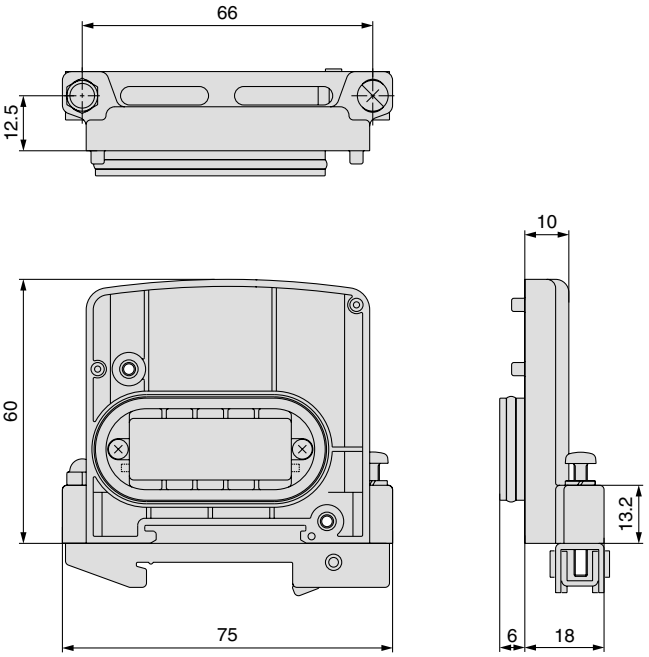
Mounting specification

03	Direct mounting
04	DIN rail mounting

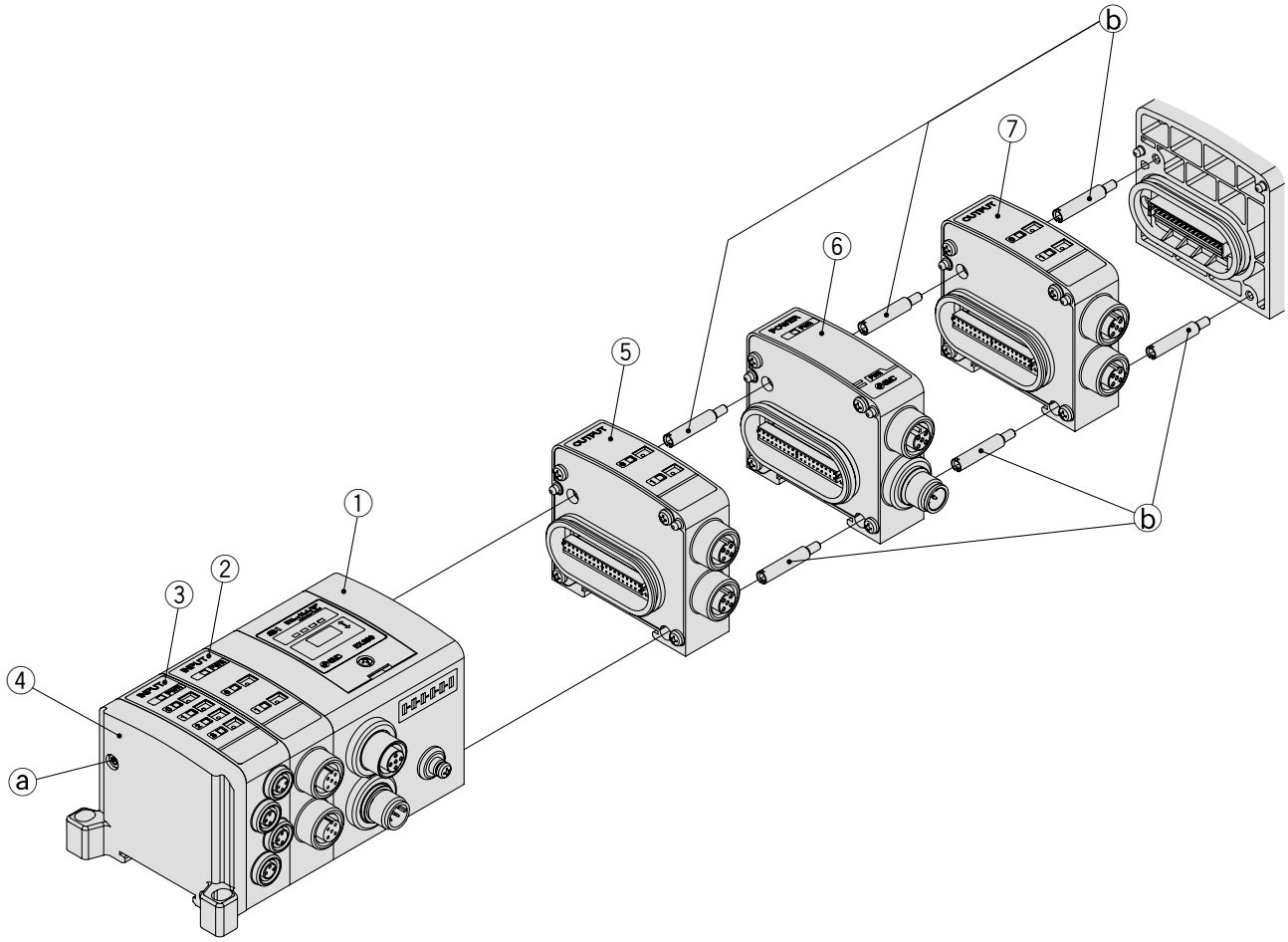
EX9-EA03



EX9-EA04



How to Increase Input/Output Blocks, Procedure Drawing



EX

Parts List

No.	Description	Part no.	Note
1	**SI unit**	EX250-S□	For details, refer to pages 1664 to 1667.
2	**Input block (M12, 2 inputs)**	EX250-IE1	PNP/NPN switchable
3	**Input block (M8, 4 inputs)**	EX250-IE3	PNP/NPN switchable
4	**End plate (Input side)**	EX250-EA1	EA2: DIN rail mounting
5	**Output block (For low-wattage load)**	EX9-OET□	1: PNP output, 2: NPN output Note)
6	**Power block**	EX9-PE1	For EX9-OEP□
7	**Output block (For high-wattage load)**	EX9-OEP□	1: PNP output, 2: NPN output Note)

Note) Refer to page 1674 for the applicable SI unit for each output block.

How to increase the input block, and output block (power block)

① Loosen the hexagon socket head cap screws ⓐ (2 locations) which are fixing the end plate of the valve manifold.
② Separate the section to be installed additionally.
③ Add and increase the attached tie-rod ⓑ (2 pcs per block) to the increased block respectively and pass through a block by the tie-rod.

Increased section: Input block ····· Between the left side of the SI unit and the end plate
: Output (power) block ····· Between the right side of the SI unit and the valve

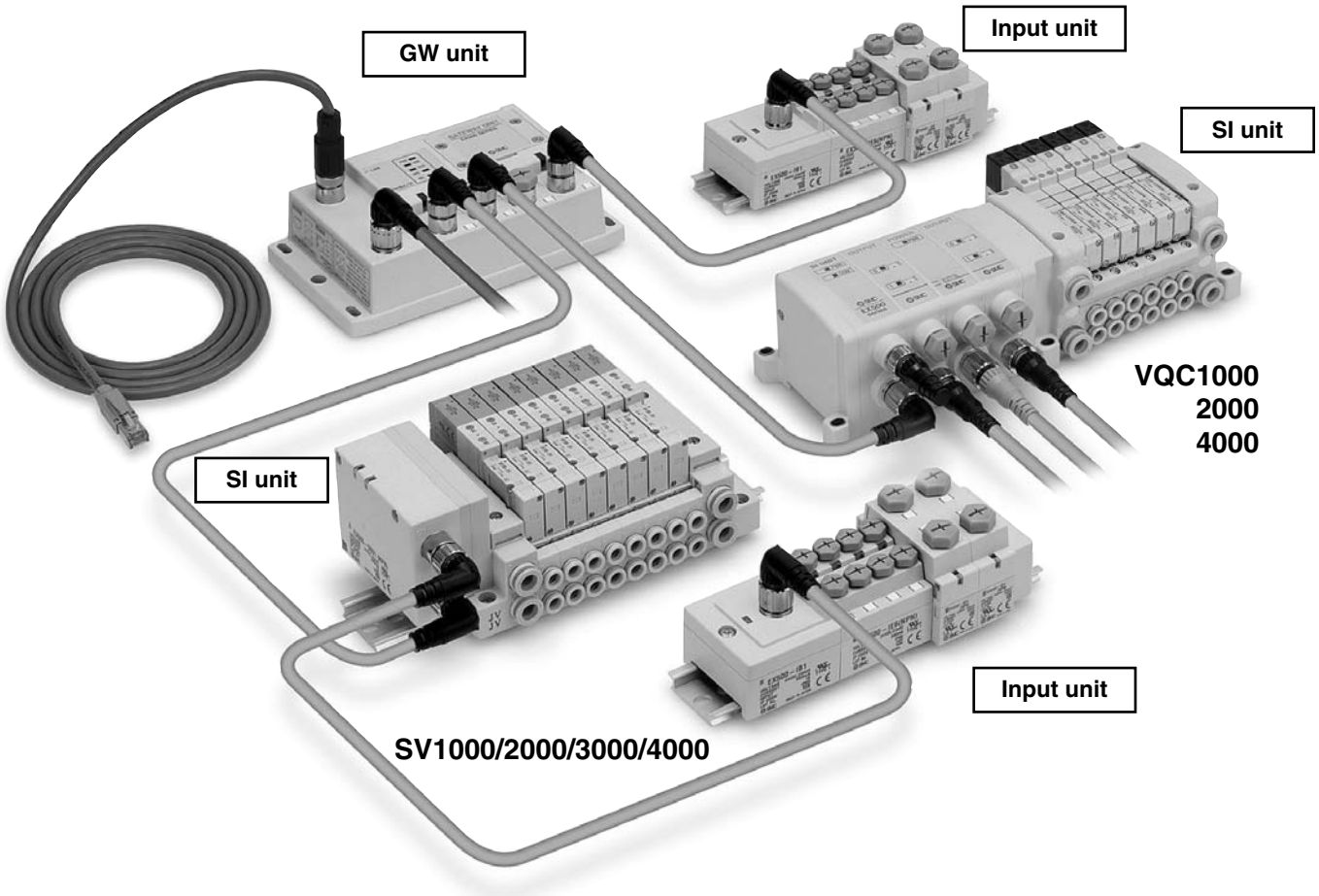
④ Fix by loosening the hexagon socket head cap screw ⓐ, paying attention to avoid the gap between eack block. (0.6 N·m)

∗ In the case of the DIN rail manifold, prepare the DIN rail long enough to ensure the extended length, because the length of the manifold is increased by a 21 mm per block addition. Please contact SMC for the DIN rail's part number and its specifications.

Decentralized Serial Wiring (GW System, 4 Branches)

Series EX500

★Valve manifold and input unit manifold can be connected around the GW unit.
★Compatible with various protocols by replacing the GW unit.
★Compatible with 64-digital-outputs (16 points x 4 branches) and 64-digital-inputs (16 points x 4 branches).
★GW unit, Input unit manifold: IP65
★Valve manifold including SI unit: IP67



GW Unit

How to Order GW Unit

EX500 − G DN1

● Communication protocol

DN1	DeviceNet
PR1A	PROFIBUS DP
MJ1	CC-Link
EN1	EtherNet/IP

GW Unit Specifications

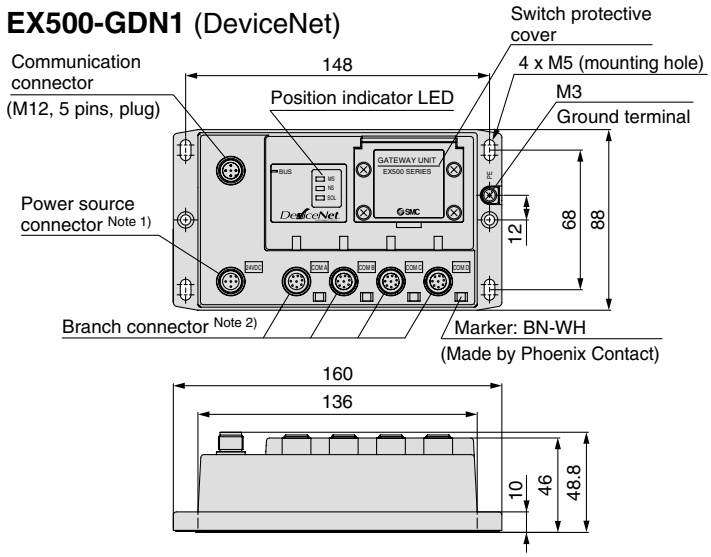
Model			EX500-GDN1	EX500-GPR1A	EX500-GMJ1	EX500-GEN1
Communication specification	Applicable system	Protocol	DeviceNet	PROFIBUS DP	CC-Link	EtherNet/IP
		Version Note 1)	Release 2.0	DP-V0	Ver. 1.10	Release 1.0
	Communication speed		125k/250k/500kbps	9.6 k/19.2 k/45.45 k/ 93.75 k/187.5 k/500 k/ 1.5 M/3 M/6 M/12 Mbps	156 k/625 k/ 2.5 M/5 M/10 Mbps	10 M/100 Mbps
	Specified file Note 2)		EDS file	GSD file	—	EDS file
	Occupied area (Number of inputs/outputs)		64/64	64/64	96/96 (3 stations, remote device station)	128/128
	Terminal resistor		Not applicable	Built in the unit (Switch setting)	Not applicable	
Power supply	For unit		11 to 25 VDC (Supplied by DeviceNet circuit, 50 mA or less)	24 VDC±20%		
	For sensors		24 VDC±20%			
	For valve		24 VDC±10%/–5%			
Internal current consumption (Unit)			200 mA or less (GW unit)			
Input specification	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 specification	Number of outputs		64 points (16 points x 4 branches)			
	Connection output device		The EX500 series SI unit manifold (connection from communication port A to D)			
	Supply voltage		24 VDC			
	Supply current		Max. 3.0 A (Max. 0.75 A per branch)			
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			
	Vibration resistance		10 to 150 Hz with a 0.7 mm amplitude or 50 m/s^2 in each X, Y, Z direction for 2 hrs (De-energized)			
	Impact resistance		150 m/s^2 in each X, Y, Z direction, 3 times (De-energized)			
Standard			CE marking, UL (CSA)			
Mass			470 g			
Accessory: Waterproof cap (for M12 connector socket)			EX500-AWTS (4 pcs.)	EX500-AWTS (5 pcs.)	EX500-AWTS (4 pcs.)	EX500-AWTS (5 pcs.)

Note 1) Please note that the version is subject to change.
Note 2) Each file can be downloaded from SMC's website (http://www.smcworld.com/).
Note 3) For detailed specifications other than the above, refer to the separate technical operation manual can be downloaded from SMC's website (http://www.smcworld.com/).

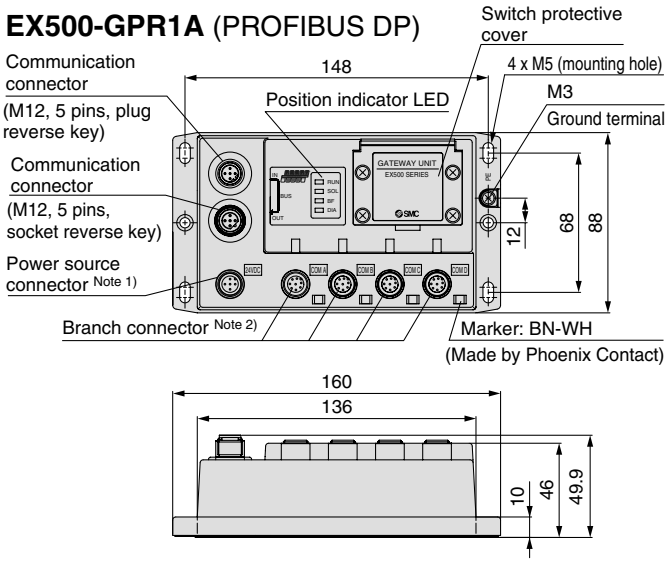
EX

GW Unit Dimensions / Parts Description

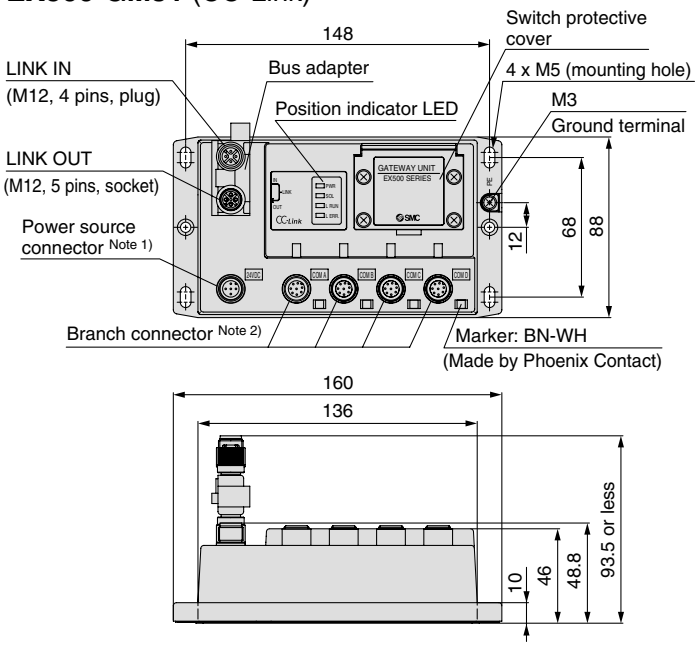
EX500-GDN1 (DeviceNet)



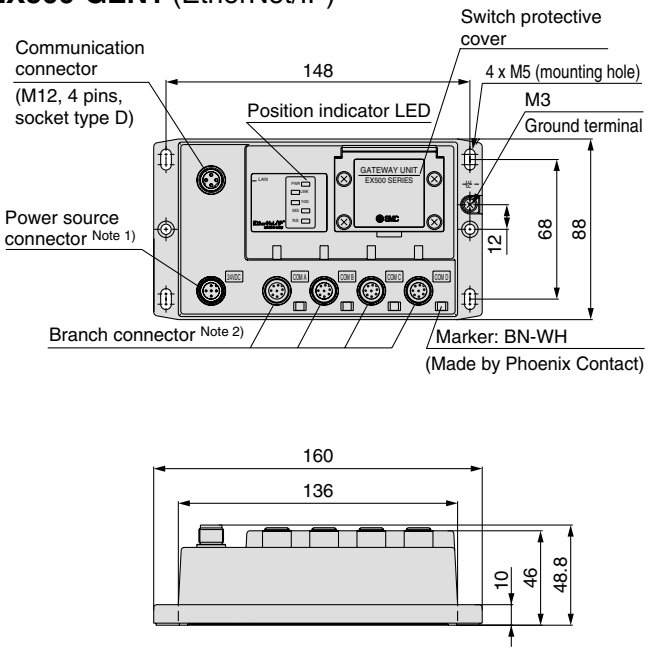
EX500-GPR1A (PROFIBUS DP)



EX500-GMJ1 (CC-Link)



EX500-GEN1 (EtherNet/IP)



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

Input Unit Manifold

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

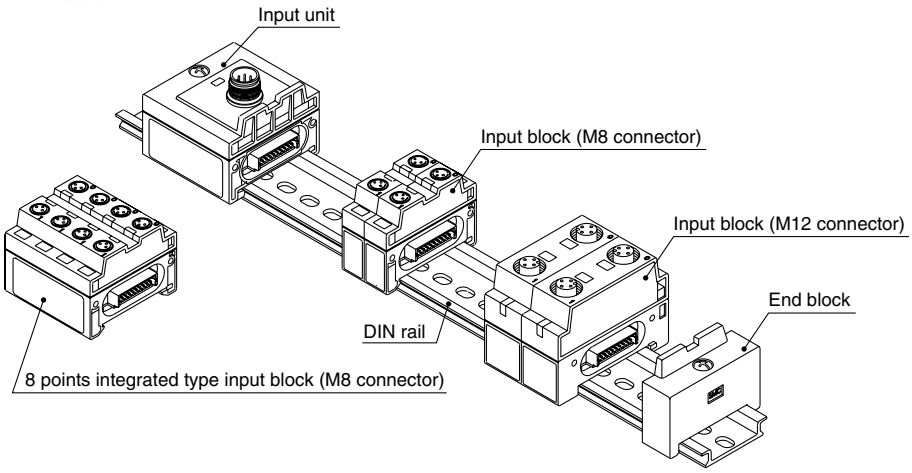
How to Order Input Block

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

For options, refer to pages 1689 to 1694.

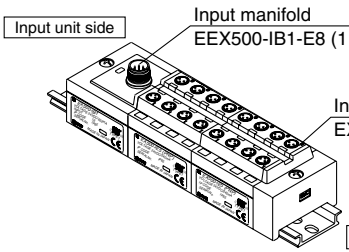


How to Order Input Unit Manifold [Ordering Example]

When ordering an input unit manifold, enter the Input manifold part no. + Input block part no. .
The Input unit , End block and DIN rail are included in the input manifold. Refer to the indications below.

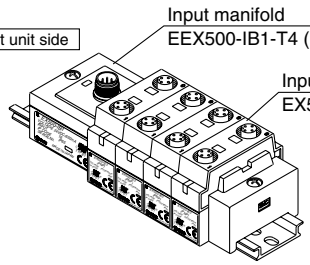
Block part no. entry
Input unit side
↓
End block side

Example 1) M8 input block only

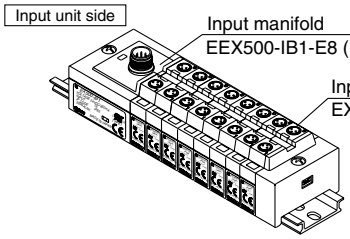


EEX500-IB1-E8 ····· 1 set
∗ EX500-IE5 ····· 2 sets

Example 2) M12 input block only

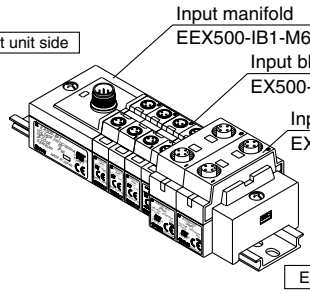


EEX500-IB1-T4 ····· 1 set
∗ EX500-IE4 ····· 4 sets

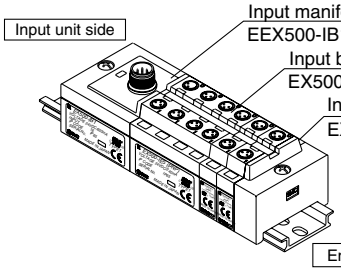


EEX500-IB1-E8 ····· 1 set
∗ EX500-IE1 ····· 8 sets

Example 3) M8, M12 mixed



EEX500-IB1-M6 ····· 1 set
∗ EX500-IE1 ····· 4 sets
∗ EX500-IE3 ····· 2 sets



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

Note) • Since the 8 points integrated type input block is equivalent to the length of four stations on an M8 input block, pay attention to the number of stations on an input manifold.
• When an input block layout becomes complicated, indicate in the input unit manifold specification sheet.

Input Unit Specifications

Model		EX500-IB1
Internal current consumption		100 mA or less
Input specification	Number of inputs	16 points
	Connection block	The 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 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
	Vibration resistance	10 to 150 Hz with a 0.7 mm amplitude or 50 m/s^2 in each X, Y, Z direction for 2 hrs (De-energized)
	Impact resistance	150 m/s^2 in each X, Y, Z direction, 3 times (De-energized)
Standard		CE marking, UL (CSA)
Mass		100 g (Input unit + End block)

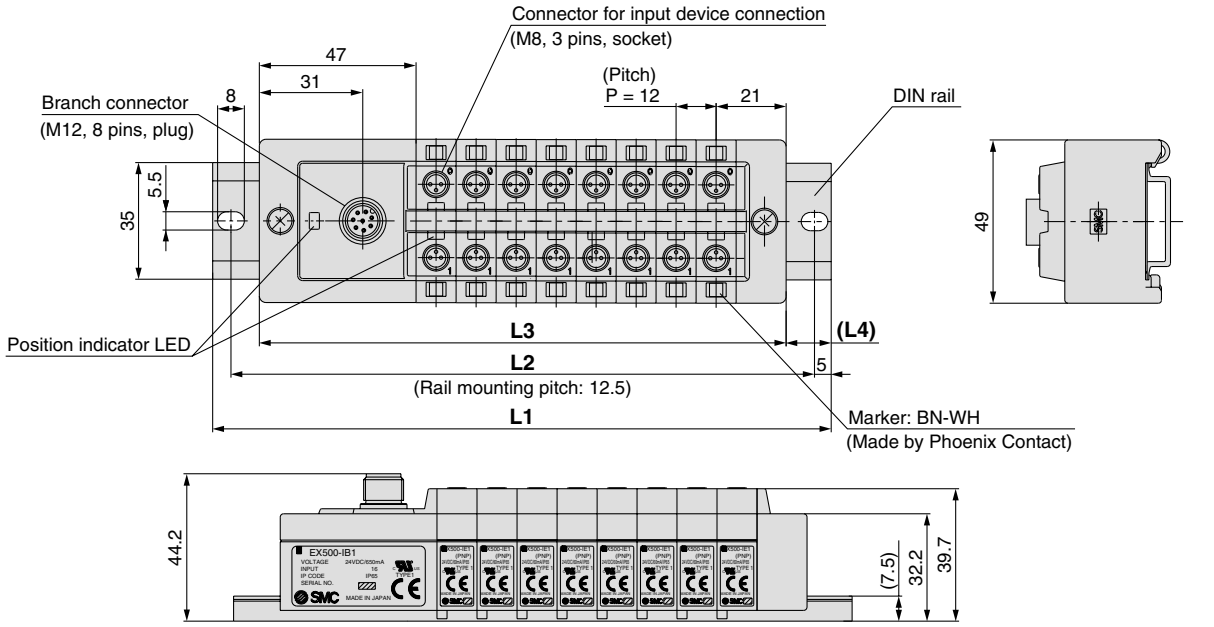
Input Block Specifications

Model		EX500-IE1	EX500-IE2	EX500-IE3	EX500-IE4	EX500-IE5	EX500-IE6
Input specification	Input type	PNP sensor input	NPN sensor input	PNP sensor input	NPN sensor input	PNP sensor input	NPN sensor 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 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					
	Vibration resistance	10 to 150 Hz with a 0.7 mm amplitude or 50 m/s^2 in each X, Y, Z direction for 2 hrs (De-energized)					
	Impact resistance	150 m/s^2 in each X, Y, Z direction, 3 times (De-energized)					
Standard		CE marking, UL (CSA)					
Mass		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.)		—	

Note) For detailed specifications other than the above, refer to the separate technical operation manual that can be downloaded from SMC's website (http://www.smcworld.com/).

Input Unit Manifold Dimensions / Parts Description

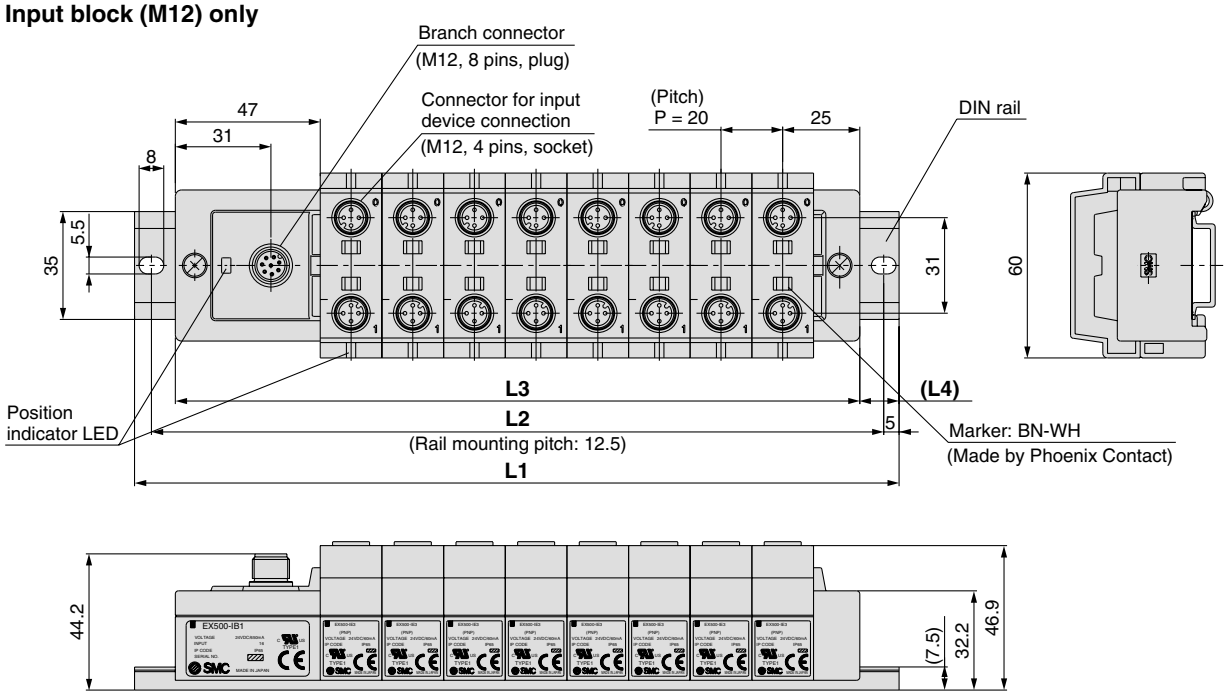
Input block (M8) only



(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

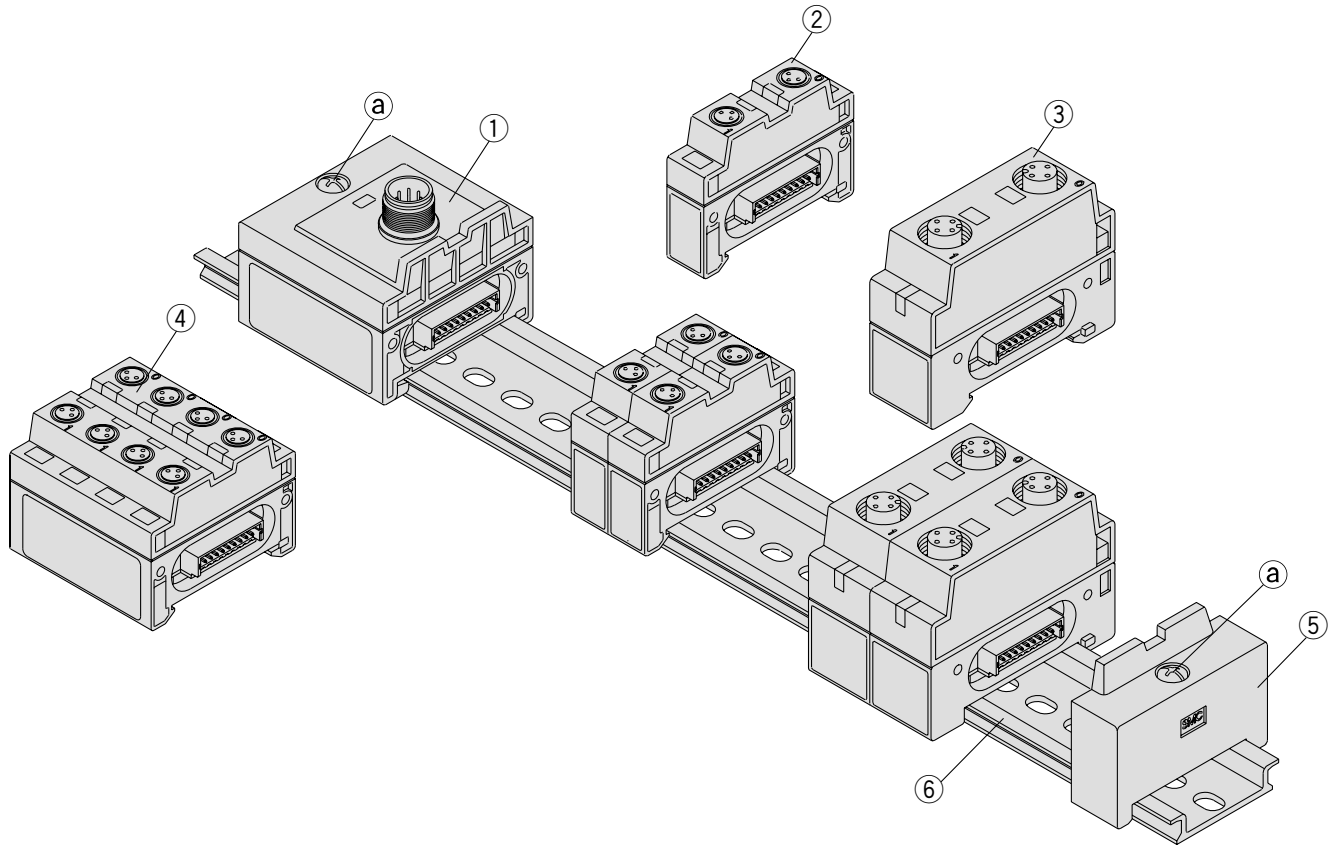
Input block (M12) only



(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

Input Unit Manifold Exploded View



Parts List

No.	Description	Part no.	Note
		For standard	
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-□	□: No. based on L dimension (Refer to the table below.)

How to add input block stations

1 Loosen the 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 screws ⓐ.
Note: Be sure to tighten the round head combination screw with the prescribed tightening torque. (0.6 N·m)

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)

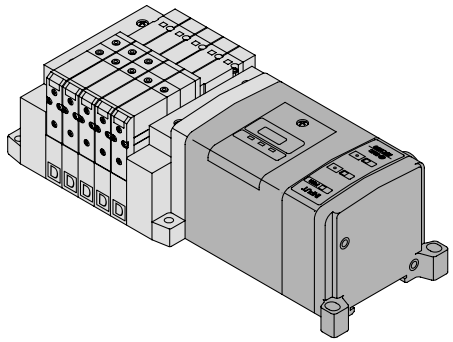
L dimensions

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		

How to Order SI Unit

SI Unit

SV1000/2000/3000/4000



EX500 − S001

Applicable solenoid valve: SV series

For options, refer to pages 1689 to 1694.

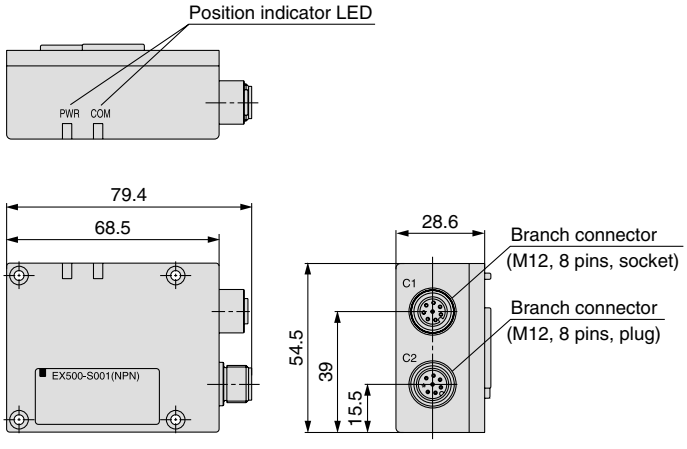
SI Unit Specifications (EX500-S001)

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
	Vibration resistance	10 to 150 Hz with a 0.7 mm amplitude or 50 m/s² in each X, Y, Z direction for 2 hrs (De-energized)
	Impact resistance	150 m/s² in each X, Y, Z direction, 3 times (De-energized)
Standard		CE marking, UL (CSA)
Mass		115 g
Accessory: Waterproof cap (for M12 connector socket)		EX500-AWTS (1 pc.)

Note) For detailed specifications other than the above, refer to the separate technical operation manual that can be downloaded from SMC's website (http://www.smcworld.com/).

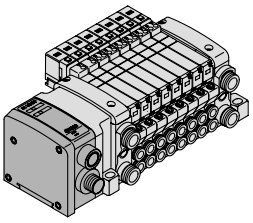
SI Unit Dimensions / Parts Description

EX500-S001

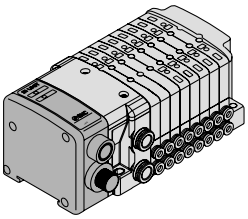


SI Unit

VQC1000/2000/4000



S0700



How to Order SI Unit

EX500 − Q 0 0 1

Applicable solenoid valve: VQC/S0700 series

SI unit COM.

0	+COM.
1	–COM.

SI unit type

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

For options, refer to page 1689 to 1694.

SI Unit Specifications (EX500-Q□0□)

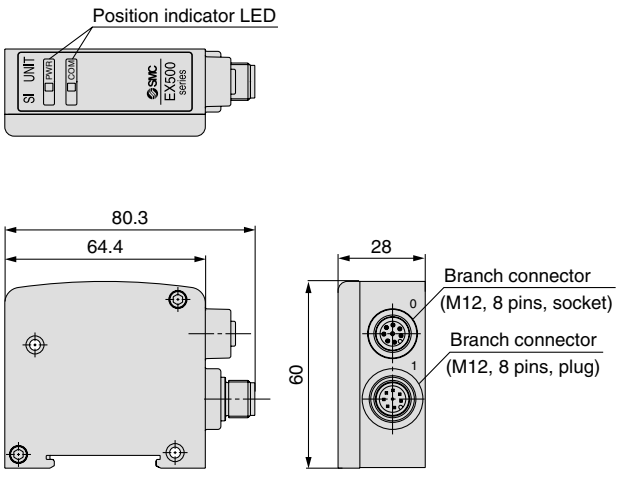
Model		EX500-Q001	EX500-Q101	EX500-Q002	EX500-Q102
Internal current consumption		100 mA or less			
Output specification	Number of outputs	16 points			
	Output type	NPN output (sink type)	PNP output (source type)	NPN output (sink type)	PNP output (source type)
	Connection block	+COM. Solenoid valve (single, double)	–COM. Solenoid valve (single, double)	+COM. Note) Output block, power block Solenoid valve (single, double)	–COM. Note 1) 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			
	Vibration resistance	10 to 150 Hz with a 0.7 mm amplitude or 50 m/s² in each X, Y, Z direction for 2 hrs (De-energized)			
	Impact resistance	150 m/s² in each X, Y, Z direction, 3 times (De-energized)			
Standard		CE marking, UL (CSA)			
Mass		105 g			
Accessory: Waterproof cap (for M12 connector socket)		EX500-AWTS (1 pc.)			

Note 1) For details of output block and power block, refer to page 1692.

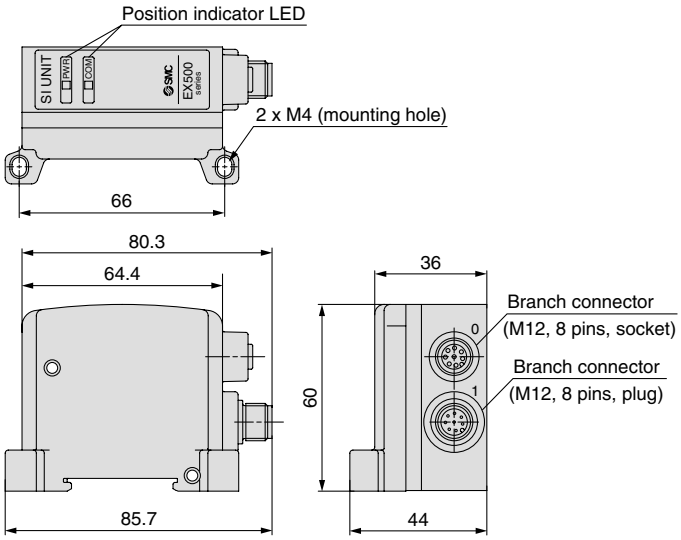
Note 2) For detailed specifications other than the above, refer to the separate technical operation manual that can be downloaded from SMC's website (http://www.smcworld.com/).

SI Unit Dimensions / Parts Description

EX500-Q□01

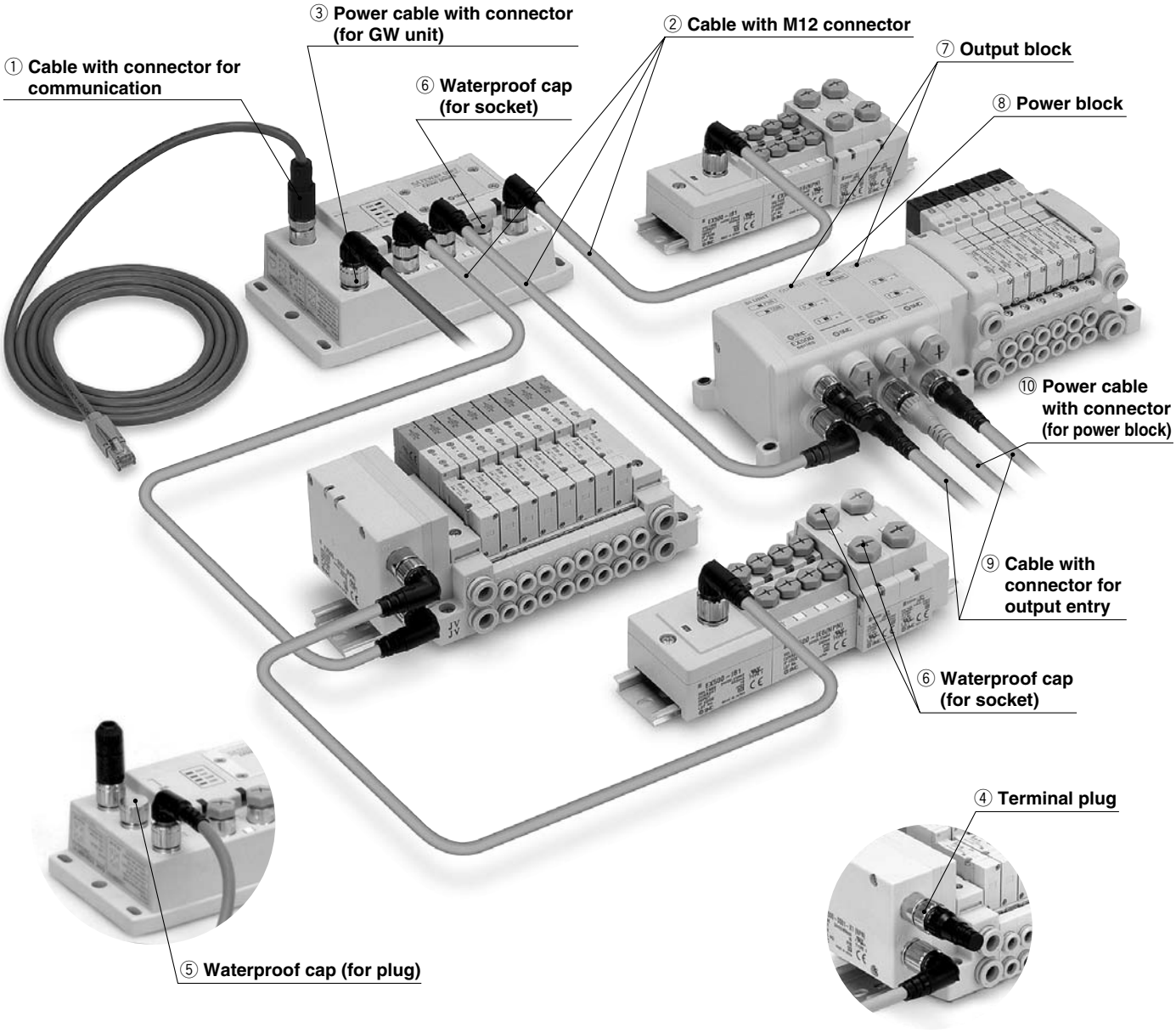


EX500-Q□02



SMC

Options


① Cable with connector for communication
③ Power cable with connector (for GW unit)
② Cable with M12 connector
⑦ Output block
⑥ Waterproof cap (for socket)
⑧ Power block
⑩ Power cable with connector (for power block)
⑨ Cable with connector for output entry
⑥ Waterproof cap (for socket)
④ Terminal plug
⑤ Waterproof cap (for plug)

EX

Options

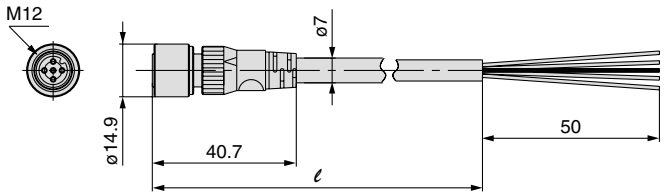
① Cable with communication connector

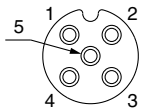
For DeviceNet type GW unit

EX500−AC 050 −DN

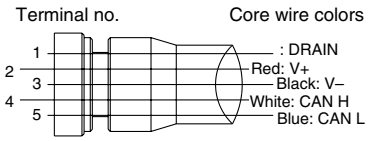
Cable length (ℓ)

010	1000 [mm]
050	5000 [mm]





Socket connector pin arrangement



Connections

For EtherNet/IP type GW unit

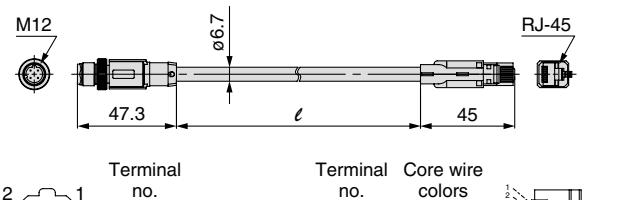
EX9−AC 020 EN− PSRJ

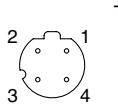
Cable length (ℓ)

020	2000 [mm]

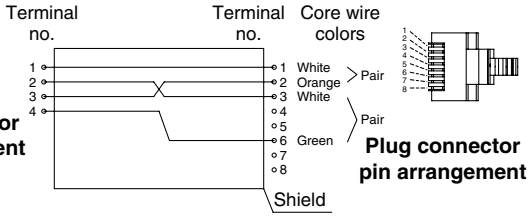
Connector specification

PSRJ	M12 plug (straight)⇔RJ-45 connector





Plug connector pin arrangement



Plug connector pin arrangement

Connections (Straight cable)

② Cable with M12 connector

EX500−AC 030 − SSPS

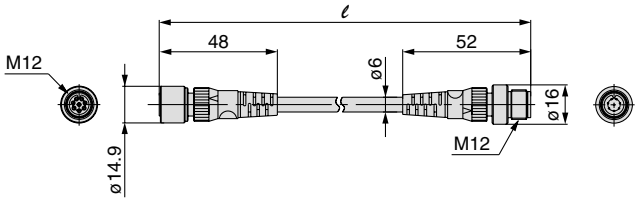
Cable length (ℓ)

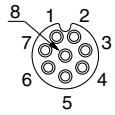
003	300 [mm]
005	500 [mm]
010	1000 [mm]
030	3000 [mm]
050	5000 [mm]

Connector specification

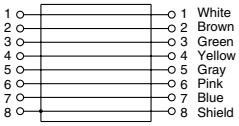
SSPS	Socket side: Straight, Plug side: Straight
SAPA	Socket side: Angle, Plug side: Angle

Straight connector type

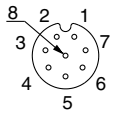




Socket connector pin arrangement

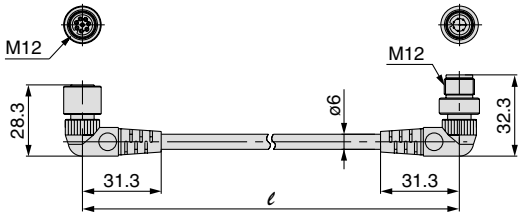


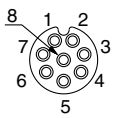
Connections



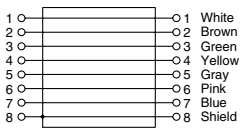
Plug connector pin arrangement

Angle connector type

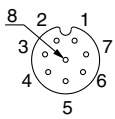




Socket connector pin arrangement



Connections



Plug connector pin arrangement

③ Power cable with connector (for GW unit)

EX500 − AP 050 − S

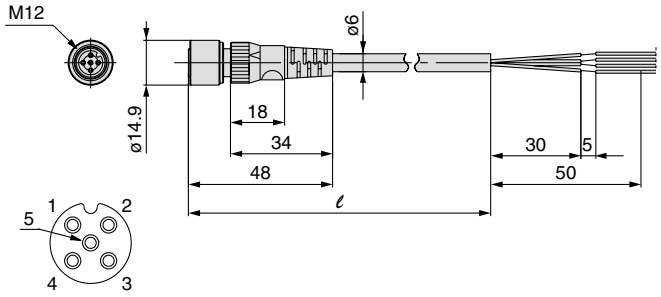
Cable length (ℓ)

010	1000 [mm]
050	5000 [mm]

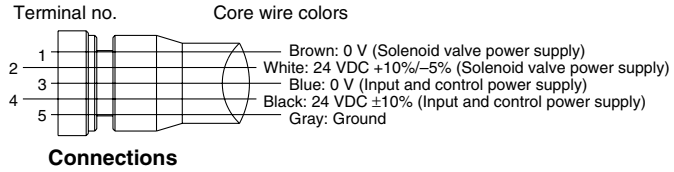
Connector specification

S	Straight
A	Angle

Straight connector type

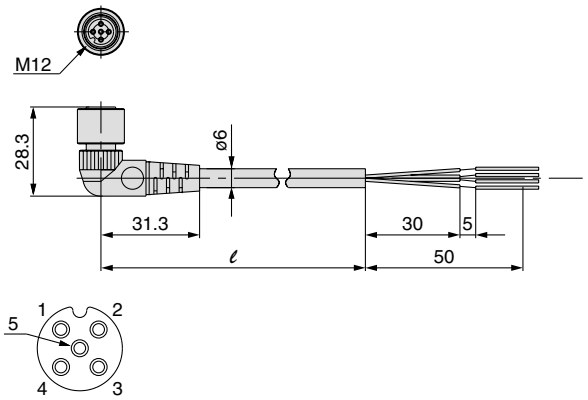


Socket connector pin arrangement

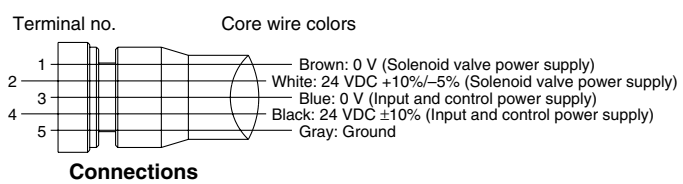


Connections

Angle connector type



Socket connector pin arrangement

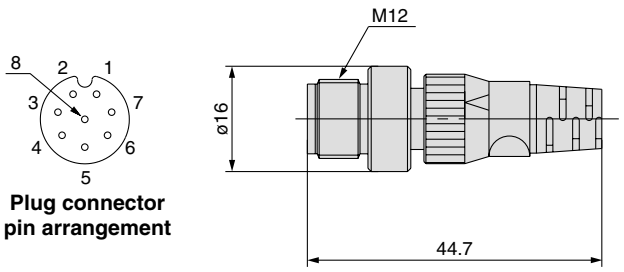


Connections

④ Terminal plug

This is used when an input manifold (input unit/input block) is not being used.
(If a terminal plug is not used, the GW unit is COM LED will not light up.)

EX500 − AC000 − S



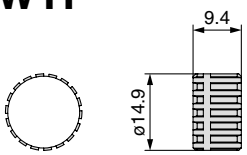
Plug connector pin arrangement

⑤ Waterproof cap: M12 connector (for plug)

Use this on ports that are not being used for an M12 connector (plug). Use of this waterproof cap maintains the integrity of the IP65 enclosure.

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

EX500 − AWTP



⑥ Waterproof cap: M8, M12 connector (for socket) / Accessory

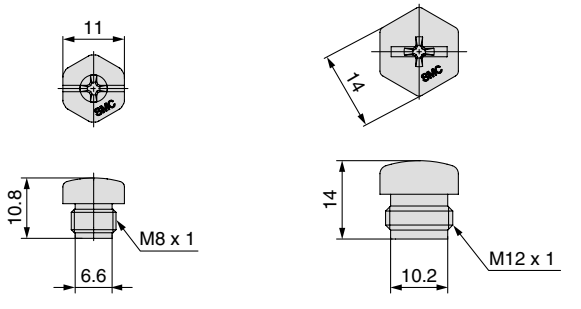
Use this on ports that are not being used for M8 and M12 connectors (socket).
Use of this waterproof cap maintains the integrity of the IP65 enclosure. (Included with each unit.)

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.

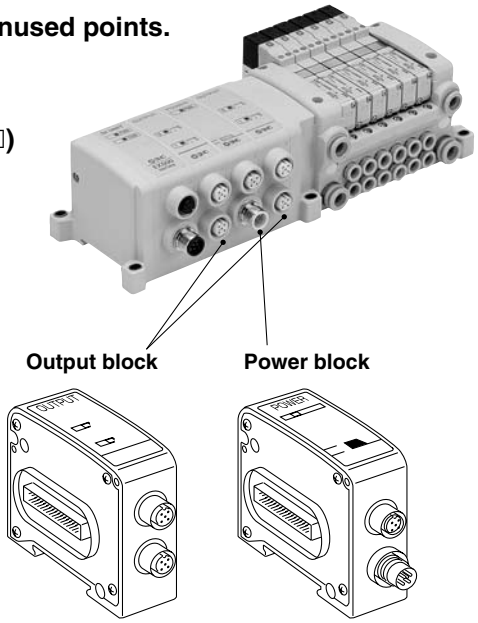


M8 connector (for socket) **M12 connector (for socket)**

Options

⑦ Output block / ⑧ Power block

Features:
- **Able to retrofit to the valve manifold, using the unused points.**
- **2-output / 1-output block (M12 connector)**
- **+ common / – common are standardized.**
- **Able to drive by max. 0.5 A per point. (EX9-OEP□)**



How to Order Output Block

EX9 – OE T 1

Output specification

1	PNP output (–COM.)
2	NPN output (+COM.)

Power supply type

T	Internal power supply method (for low-wattage load)
P	Integrated power supply method (for high-wattage load) Note)

Note) Required to connect with a power block.

SI Unit Part No.

SI unit part no.	Output	Applicable model
EX500-Q002	PNP output (+COM.)	EX9-OET2, EX9-OEP2
EX500-Q102	NPN output (–COM.)	EX9-OET1, EX9-OEP1

Option/Part No.

Description	Part no.	Applicable model		Note
		OET□	OEP□	
Waterproof cap	**EX500-AWTS**	○	○	Refer to page1691. Order separately: 10 pcs.
Cable with connector for output entry	**EX9-AC□-7**	○	○	Refer to page 1677. Order separately.
Power block	**EX9-PE1**		○	Refer to the right page. Order separately.

How to Order Power Block

EX9 – PE1

Option/Part No.

Description	Part no.	Note
Waterproof cap	**EX500-AWTS**	Refer to page 1691. When ordering separately: 10 pcs.
Power cable with connector	**EX9-AC□-1**	Refer to page 1672, Order separately.

Output Block Specifications

Model		EX9-OET1	EX9-OET2	EX9-OEP1	EX9-OEP2
Output connector		M12 connector (5 pins)			
Internal current consumption		40 mA or less			
Output specification	**Output type**	PNP output (–COM.)	NPN output (+COM.)	PNP output (–COM.)	NPN output (+COM.)
	Number of outputs	2 points			
	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) Note)		Max. 0.5 A/point (12 W/point)	
	Display	Yellow LED (Lights when power is turned ON.)			
	Connector on the output device side	M12 connector (5 pins, plug)			
Environmental resistance	**Enclosure**	IP67			
	Operating temperature range	–10 to 50°C			
	Operating humidity range	35 to 85%RH (with no condensation)			
	Withstand voltage	1500 VAC for 1 min. between external terminals and FG			
	Insulation resistance	10 MΩ or more (500 VDC) between external terminals and FG			
	Vibration resistance	10 to 150 Hz with a 0.35 mm amplitude or 49 m/s^2 in each X, Y, Z direction for 2 hrs (De-energized)			
	Impact resistance	98 m/s^2 in each X, Y, Z direction, 3 times (De-energized)			
Standard		CE marking, UL (CSA)			
Mass		120 g			

Note) The rated load current varies due to the output capability of the SI unit when connected to EX500.

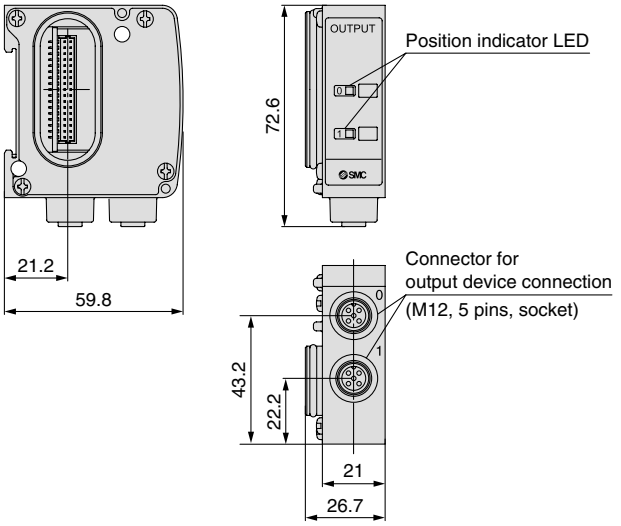
Power Block Specifications

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 power consumption	20 mA or less
Supply current		Max. 3.1 A (When using with 3.0 to 3.1 A, the ambient temperature should not exceed 40°C, and do not bundle the cable.)
Environmental resistance	**Enclosure**	IP67
	Operating temperature range	–10 to 50°C
	Operating humidity range	35 to 85%RH (with no condensation)
	Withstand voltage	1500 VAC for 1 min. between external terminals and FG
	Insulation resistance	10 MΩ or more (500 VDC) between external terminals and FG
	Vibration resistance	10 to 150 Hz with a 0.35 mm amplitude or 49 m/s^2 in each X, Y, Z direction for 2 hrs (De-energized)
	Impact resistance	98 m/s^2 in each X, Y, Z direction, 3 times (De-energized)
Standard		CE marking, UL (CSA)
Mass		120 g
Accessory: Waterproof cap (for M12 connector socket)		EX500-AWTS (1 pc.)

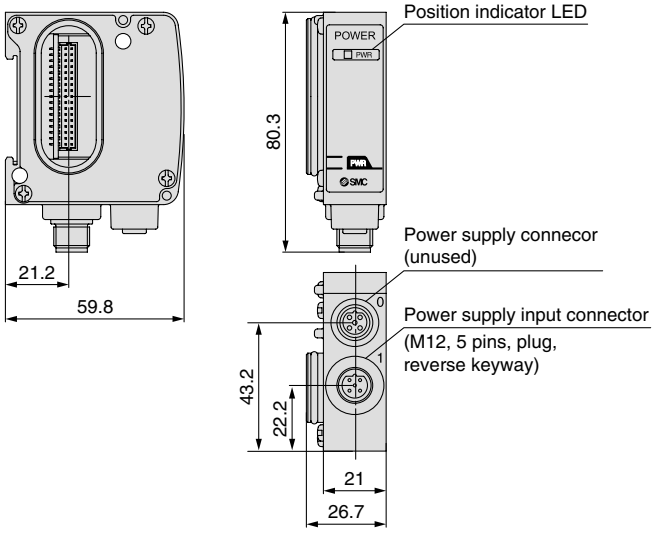
Note) For detailed specifications other than the above, refer to the separate technical operation manual that can be downloaded from SMC's website (http://www.smcworld.com/).

Options

Output Block Dimension



Power Block Dimension



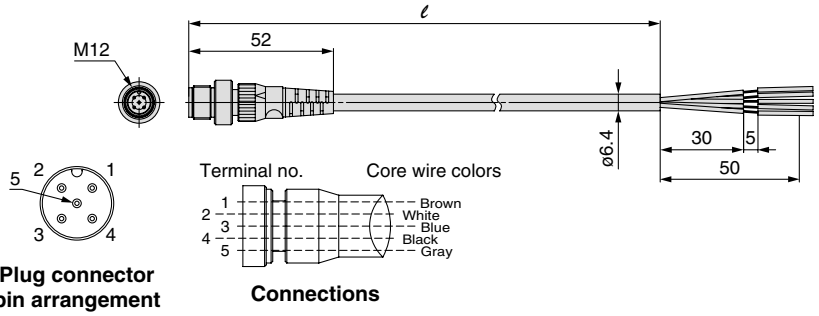
We sell this product individually. Please place an order separately.
You are requested to connect it to an SI unit and a valve manifold.
When using the output block only (valve manifold is unused.), place an order for an end plate (⑪ EX9-EA03) separately for connection.
Refer to the separate technical instruction manual for connection, wiring, installation, optional goods and cable, etc.

⑨ Cable with connector for output entry

EX9－AC 030 －7

Cable length (ℓ)

010	1000 [mm]
030	3000 [mm]



Plug connector pin arrangement

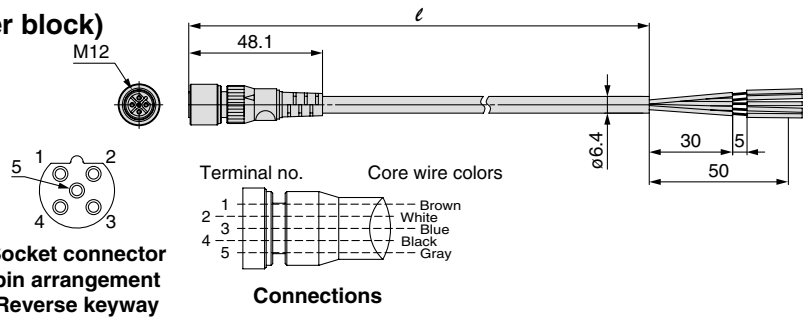
Connections

⑩ Power cable with connector (for power block)

EX9－AC 050 －1

Cable length (ℓ)

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

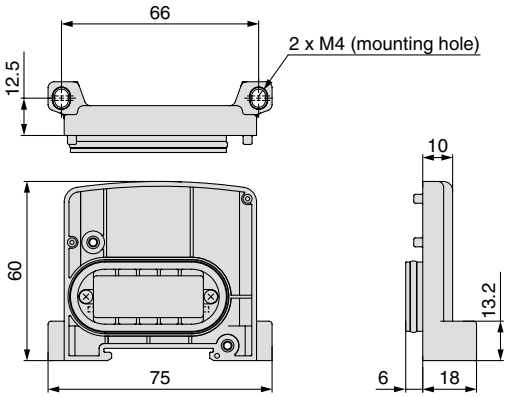


Socket connector pin arrangement Reverse keyway

Connections

⑪ End plate

EX9－EA03



Decentralized Serial Wiring (GW System, 4 Branches)

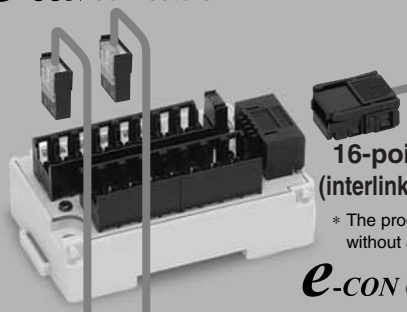
Series EX510

Compatible communication network

CC-Link
DeviceNet™
PROFIBUS PROCESS FIELD BUS

∗ Input units with covers

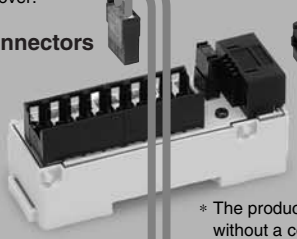
e-CON connectors



16-point input unit (interlinks 16 connectors)

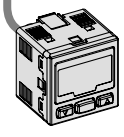
∗ The product is shown without a cover.

e-CON connectors

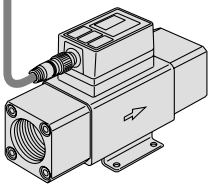


16-point input unit (interlinks 8 connectors)

∗ The product is shown without a cover.

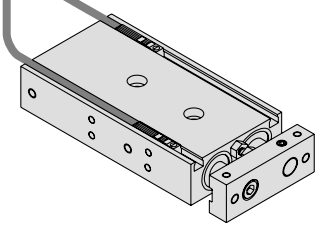


Pressure switch



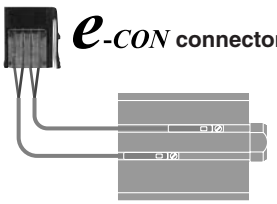
Flow switch

Input device



Auto switch

Two 2-wire auto switches can be connected to a single connector.



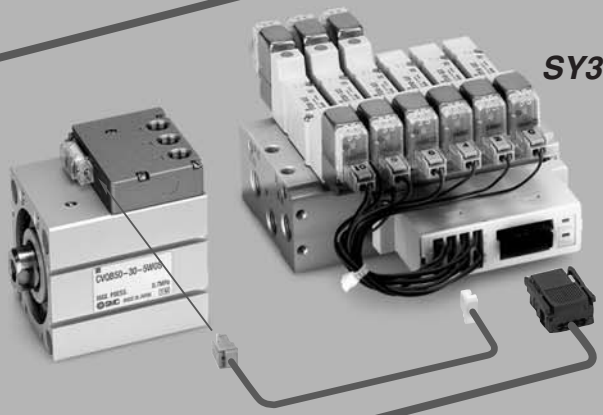
SMC

Including SI unit manifold valve

VQZ1000/2000/3000

S0700

SY3000/5000/7000/9000

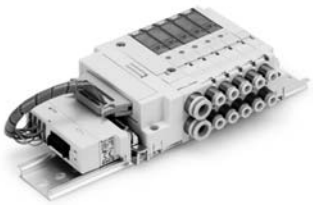


Output unit

SY3000/5000 (Plug-in)

SYJ3000/5000/7000

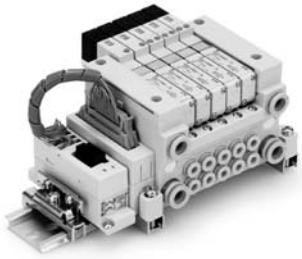
SJ2000/3000



SZ3000

SQ1000/2000

VQ1000/2000



Output equipment

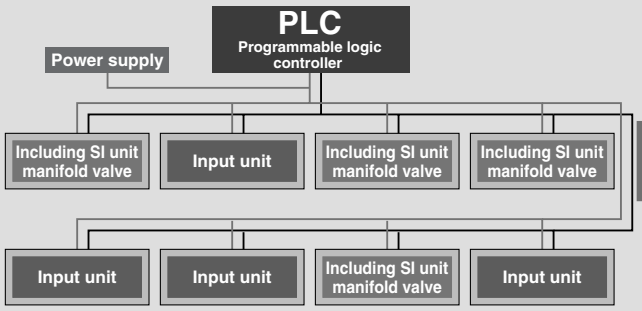
Valve, indicator light, relay, buzzer, etc. can be connected.

2 port solenoid valve

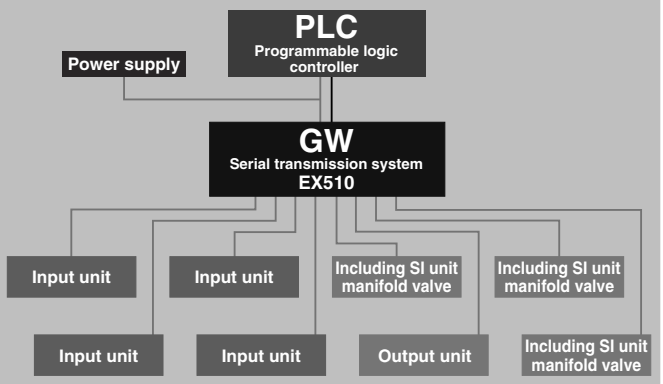
EX

Features of Series EX510

Conventional



Adoption of Series EX510



Feature 1 More valves and sensors can be connected.

- The introduction of the **EX510** series makes it possible to connect more valves and sensors.

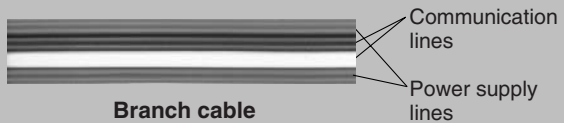
Compatible protocol	Conventional SI unit model
CC-Link	3 master stations 3 manifold
DeviceNet	1 node 1 manifold
PROFIBUS DP	1 node 1 manifold

Compatible protocol	Series EX510
CC-Link	**3 master stations** **4 manifold/4-input unit**
DeviceNet	**1 node** **4 manifold/4-input unit**
PROFIBUS DP	**1 node** **4 manifold/4-input unit**

Feature 2 Connector cables result in wire-savings. (including power supply cable)

- A power supply cable for each slave unit was required in the past.

- **With the introduction of the EX510 series, only a power supply cable to the GW unit is required.**
  Connected to each unit is a branch cable which combines the cables for communication and power supply.



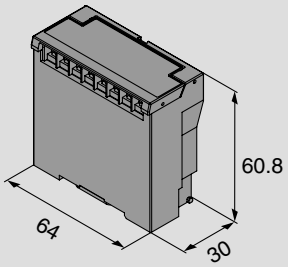
Feature 3 There is no need to set the address for the SI unit, output unit and input unit.

- Setting the address for each unit was required in the past.

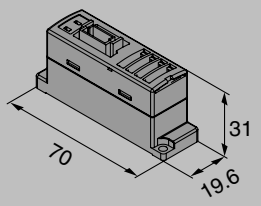
- **It is okay to set the address for the GW unit only.**

Feature 4 Compact SI unit

- The SI unit which connects output devices such as a solenoid valve has a compact design, compared with a conventional model. (Compactness: volume ratio more than 60%)



Conventional model (Series EX120)



Series EX510

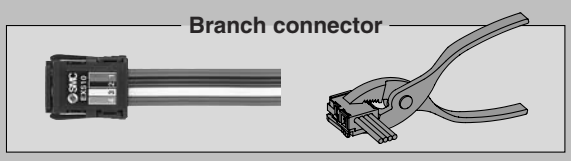
Feature 5 Can flexibly change to Field Bus.

- In the past, all the part numbers of slave units were needed to be changed by returning it to the manufacturer and reordering (re-estimate, delivery time) it.

- **After the introduction of the EX510 series, only the GW unit needs to be changed.**

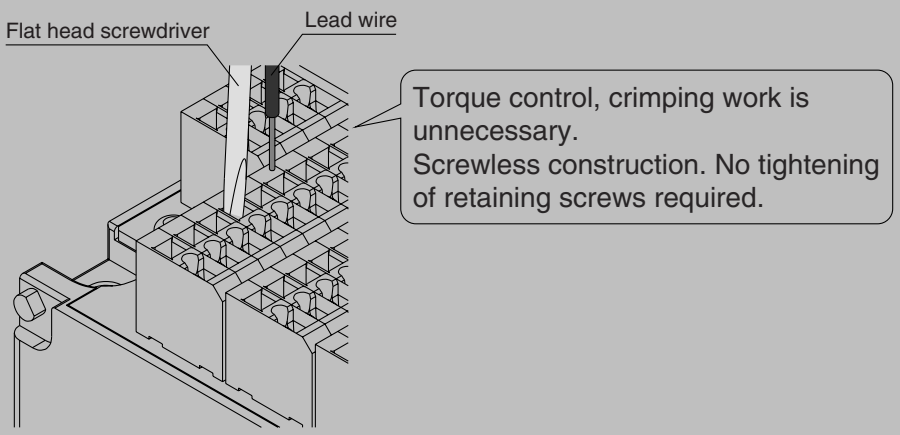
Feature 6 Adoption of connectors which do not require any special tools for installation

No special tools are required for press-fitting the connectors for branch cable connections and the e-con connectors for sensor connections.



No need to strip the wire **Only pliers are required for clamping.**

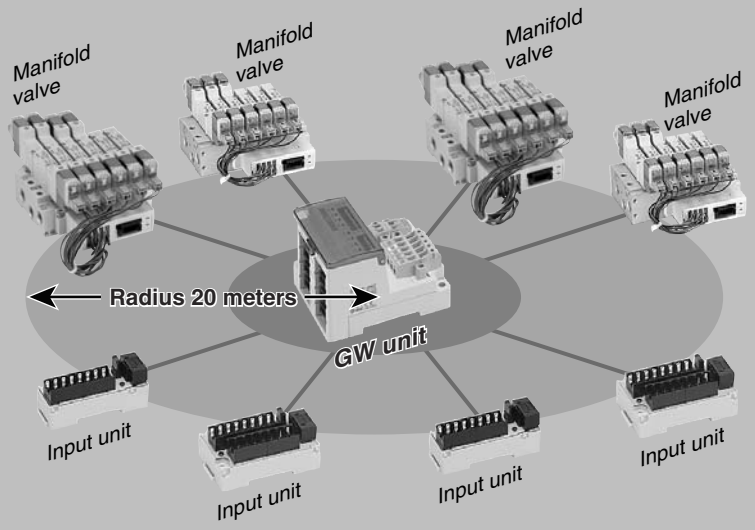
The output unit adopts a spring type terminal box, eliminating the need to tighten any retaining screws.



EX

Feature 7 Cable length of up to 20 meters is available.

Various units can be connected within a radius of 20 meters around the GW unit.



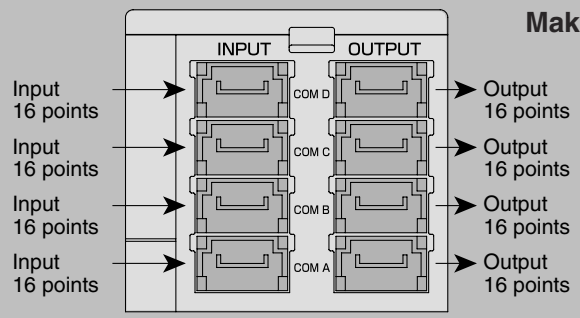
Feature 8 Delay in transmission of 1 ms or less

The delay in transmission between the GW unit and SI unit/Output unit/Input unit is 1 ms or less.

Feature 9 Making I/O flexible

The occupying number of points in the GW unit can be configured flexibly by setting a switch.

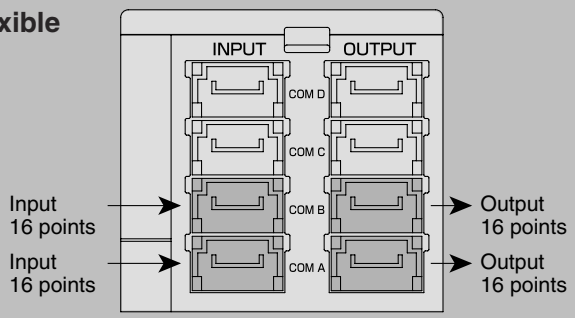
Input 64 points/Output 64 points (Initial setting)



(Side view of the GW unit) ▭ are parts in use.

Making I/O flexible

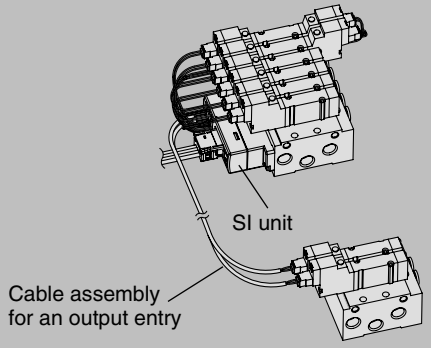
Example) Input 32 points/Output 32 points



∗ Setting is different depending on the respective protocol. Refer to the specifications for details.

Feature 10 Effectively using the unused points of the SI unit

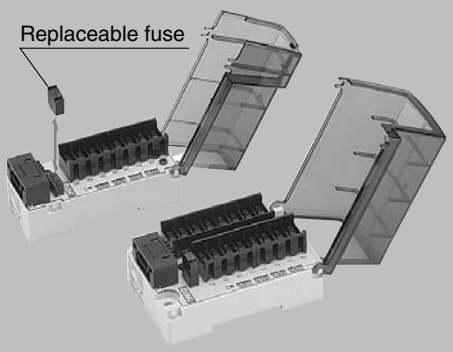
Valves which are independent from the manifold can be converted to serial transmission without purchasing new SI units.



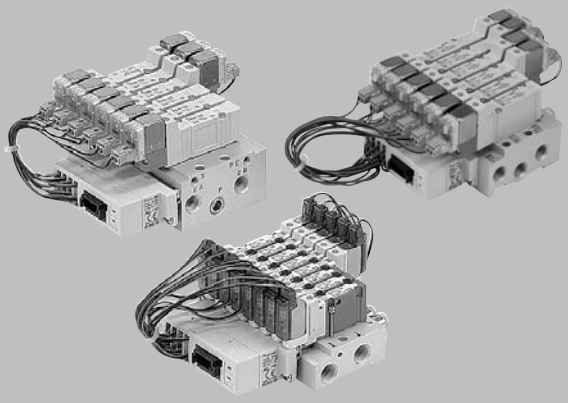
Feature 11 Protection

Each unit is protected against a short-circuit from a power supply load.

Input / Output unit fuses are replaceable.



The short circuit protection is integrated for the SI unit.

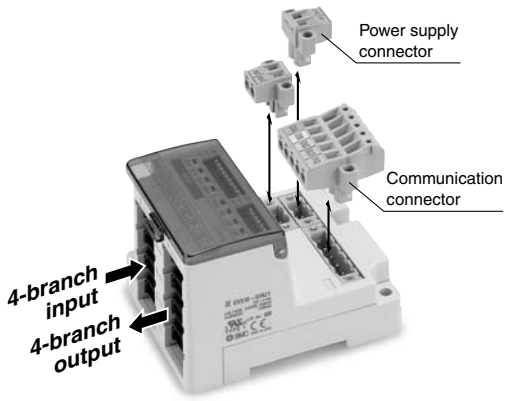


EX

Decentralized Serial Wiring (GW System, 4 Branches)

Series EX510

GW Unit



How to Order

EX510-G MJ1

Communication protocol

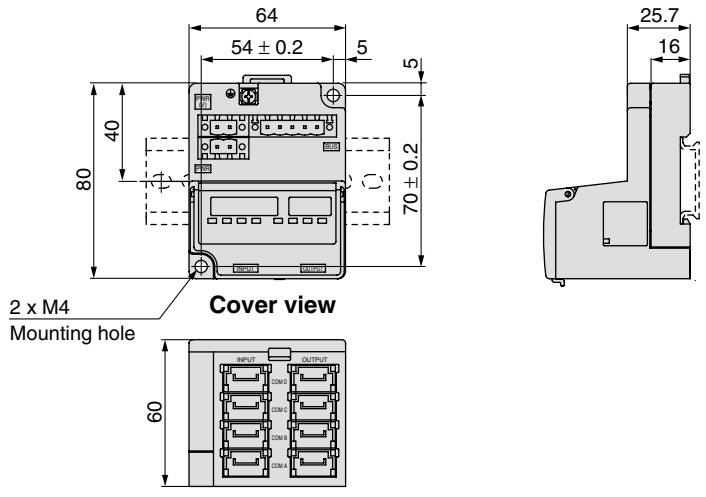
MJ1	CC-Link
DN1	DeviceNet
PR1	PROFIBUS DP

Specifications

Model			EX510-GMJ1	EX510-GDN1	EX510-GPR1
Communication specification	Applicable system	Protocol	CC-Link	DeviceNet	PROFIBUS DP
		Version Note 1)	Ver. 1.10	Release 2.0	DP-V0
	Communication speed		156 k/625 k/ 2.5 M/5 M/10 Mbps	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
	Specified file Note 2)		—	EDS file	GSD file
	Occupied area (Number of inputs/outputs)		96/96 (3 stations, remote device station) ∗ Possible to change depending on the switch setting	64/64 ∗ Possible to change depending on the switch setting	
	Terminal resistor		Not applicable		Applicable
Power supply	For unit		24 VDC±20%	11 to 25 VDC (Supplied by DeviceNet circuit, 50 mA or less)	24 VDC±20%
	For sensors			24 VDC±20%	
	For valve		24 VDC±10%/–5%		
Internal current consumption			100 mA or less (single GW unit)		
Input specification	Number of inputs		64 points (16 points x 4 branches) ∗ Possible to change depending on the switch setting		
	Connection input device		The EX510 series input unit (connection from communication port A to D)		
	Supply voltage		24 VDC		
	Supply current		Max. 4A (Max. 1 A per branch)		
Output specification	Number of outputs		64 points (16 points x 4 branches) ∗ Possible to change depending on the switch setting		
	Connection output device		The EX510 series SI unit manifold and output unit (connection from communication port A to D)		
	Supply voltage		24 VDC		
	Supply current		Max. 6 A (Max. 1.5 A per branch)		
Branch cable length			20 m or less		
Environmental resistance	Enclosure		IP20		
	Operating temperature range		–10 to 50°C		
	Operating humidity range		35 to 85%RH (with no condensation)		
	Withstand voltage		500 VAC for 1 min. between external terminals and FG		
	Insulation resistance		10 MΩ or more (500 VDC) between external terminals and FG		
	Vibration resistance		10 to 150 Hz with a 0.035 mm amplitude or 4.9 m/s² in each X, Y, Z direction for 2 hrs (De-energized)		
	Impact resistance		147 m/s² in each X, Y, Z direction, 3 times (De-energized)		
Standard			CE marking, UL (CSA)		
Accessory			Communication connector 1 pc., Power suppy connector 2 pcs.		Communication connector 1 pc., Power suppy connector 2 pcs., Terminal resistor 1 pc.

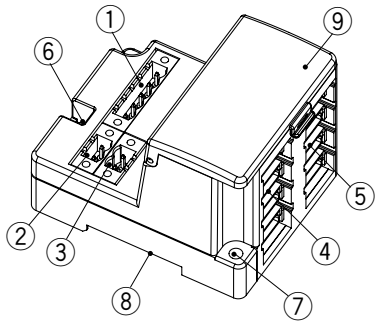
Note 1) Please note that the version is subject to change.
Note 2) Each file can be downloaded from SMC's website (http://www.smcworld.com/).
Note 3) For detailed specifications other than the above, refer to the separate technical operation manual that can be downloaded from SMC's website (http://www.smcworld.com/).

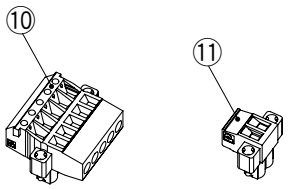
Dimensions



SMC

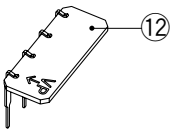
Parts Description





Communication connector (1 pc.)

Power supply connector (2 pcs.)



Terminal resistor (1 pc.)
∗ Attached to EX510-GPR1 only.

Accessories

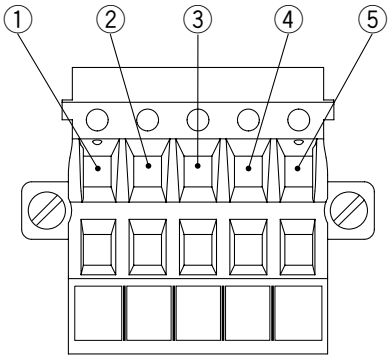
GW Unit

No.	Description	Applications
1	**Communication socket (BUS)**	For connecting with a network, using the communication connector (⑩), which is part of the accessories.
2	**Power supply socket (PWR(V))**	Supplies power for output devices, which have a power supply connector (⑪), such as a solenoid valve.
3	**Power supply socket (PWR)**	Supplies power for input devices, which have a power supply connector (⑪), such as a sensor.
4	**Branch connector (for input) on GW unit side**	Connects input units, etc., using a branch cable (EX510-FC□□).
5	**Branch connector (for output) on GW unit side**	Connects the SI unit (manifold valves) etc., using the branch cable (EX510-FC□□).
6	**FG terminal**	Used for grounding.
7	**Mounting hole**	Used for mounting the unit with two M4 screws.
8	**Mounting groove for DIN rail**	Used for mounting the unit to a DIN rail.
9	**Display, Switch setting part**	Displays the LED corresponding to the unit's condition, address setting, and the communication speed for the switches.
10	**Communication connector**	Used for connecting the network cable.
11	**Power supply connector**	Used for connecting the power supply cable.
12	**Terminal resistor**	Connects the terminal resistor to both ends of a unit in the transmission route.

EX

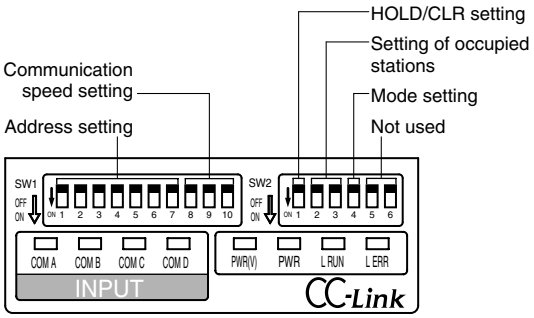
Communication Connector Pin Assignment

Part no.	Communication protocol	Pin assignment and the corresponding wire color				
		①	②	③	④	⑤
EX510-GMJ1	CC-Link	DA (Blue)	DB (White)	DG (Yellow)	SLD	FG
EX510-GDN1	DeviceNet	V- (Black)	CAN_L (Blue)	Drain	CAN_H (White)	V+ (Red)
EX510-GPR1	PROFIBUS DP	VP	RxD/TxD-N (Green)	DGND	RxD/TxD-P (Red)	SHIELD



EX510-GMJ1 (CC-Link compatible)

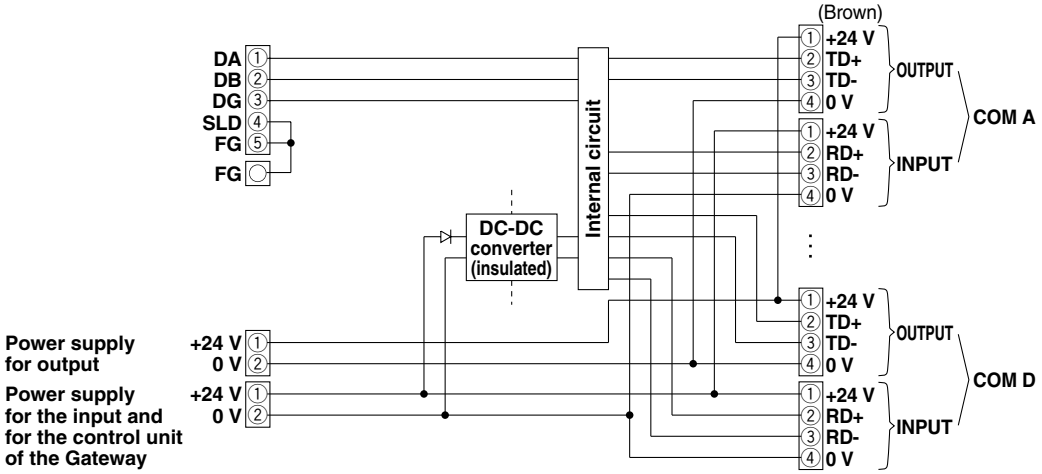
Display Setting



Display	Contents	Indicator light condition
PWR(V)	The output power supply voltage is supplied as specified. The output power supply voltage is not supplied as specified.	Light is turned on. Light is turned off.
PWR	When the input and the power for the Gateway is being supplied. When the input and the power for the Gateway is not being supplied.	Light is turned on. Light is turned off.
L RUN	When transmission is working properly. When transmission is interrupted.	Light is turned on. Light is turned off.
L ERR	When there is an error in the transmission. When setting the station number while being energized. When the transmission speed setting switch is changed. When the transmission is working properly.	Light is turned on. Light is turned on. (Blinks at 0.4 second intervals) Light is turned off.
COM A to D	When COM A to D are receiving data. When COM A to D are not receiving data.	Light is turned on.* Light is turned off.

* Input unit (Input device) is connected and will illuminate when communication is working properly.

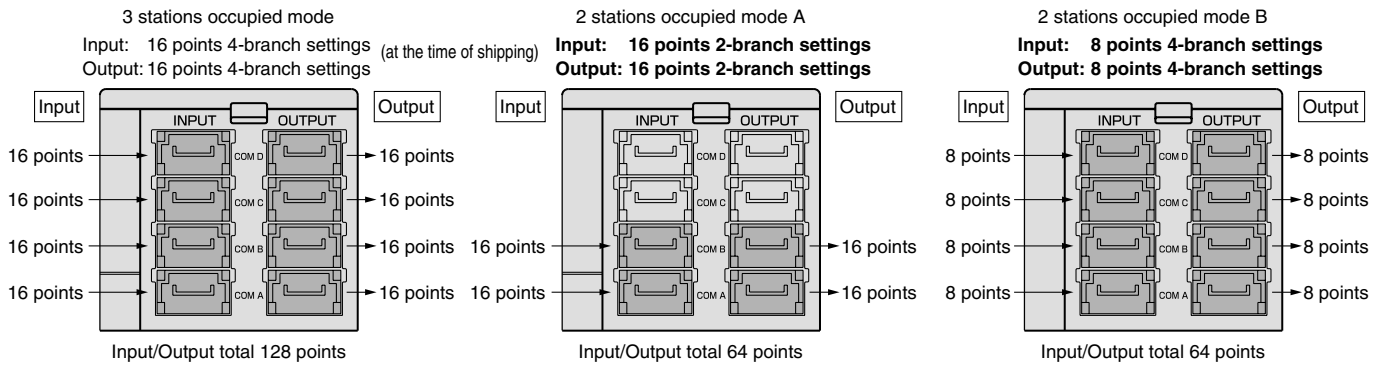
Internal Circuit



Flexible I/O Setting Examples

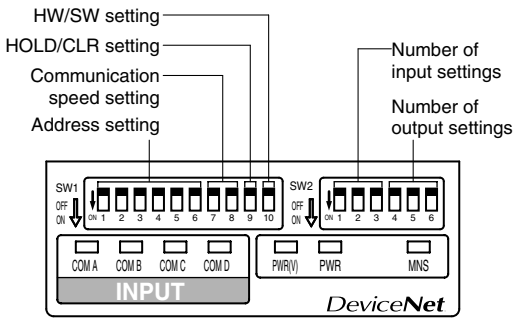
The occupying number of the Gateway units can be changed flexibly by setting a switch.
Consult the instruction manual for details.

(Side view of the Gateway unit ▭ are parts in use.)



EX510-GDN1 (DeviceNet compatible)

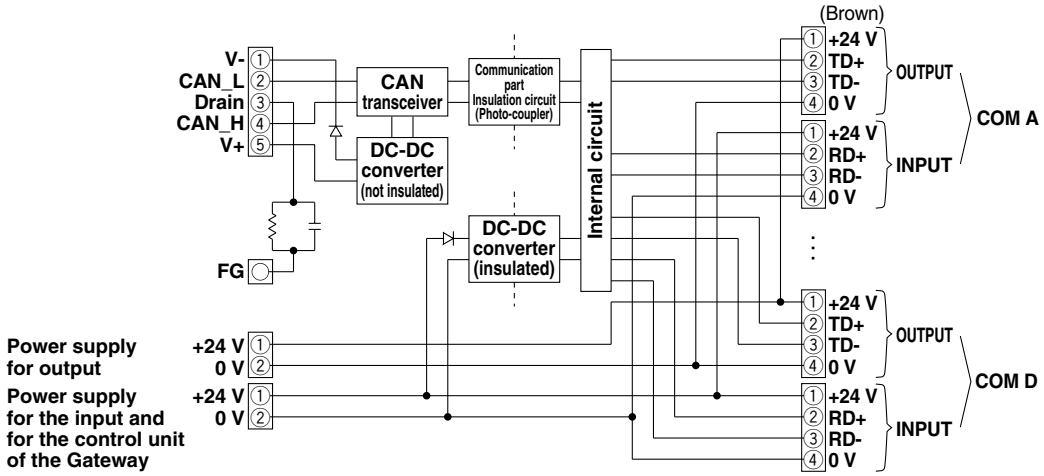
Display Setting



Display	Contents	Indicator light condition
PWR(V)	The output power supply voltage is supplied as specified. The output power supply voltage is not supplied as specified.	Light is turned on. Light is turned off.
PWR	When the input and the power for the Gateway is being supplied. When the input and the power for the Gateway is not being supplied.	Light is turned on. Light is turned off.
MNS	When the power supply is OFF, off-line, or checking the MAC ID duplication. When I/O connection is on stand by. (On-line state) I/O connection installation is completed. (On-line state) I/O connection, time-out (communication irregularity in light degrees) MAC ID duplication error, or BUS OFF error (communication error in serious conditions)	Light is turned off. Green light blinks. Green light is turned on. Red light blinks. Red light is turned on.
COM A to D	When COM A to D are receiving data. When COM A to D are not receiving data.	Light is turned on.* Light is turned off.

∗ Input unit (Input device) is connected and will illuminate when communication is working properly.

Internal Circuit

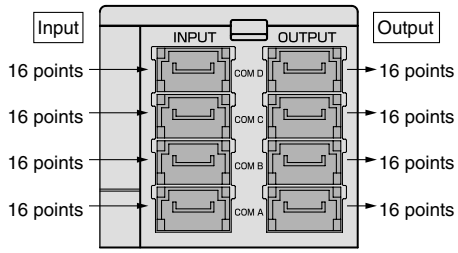


Flexible I/O Setting Examples

The occupying number of points in the Gateway units can be changed flexibly by setting a switch.
The occupying number of inputs and outputs can be set respectively. (Figures below are examples of the flexibility of setting the output occupied numbers.)
Consult the instruction manual for details.

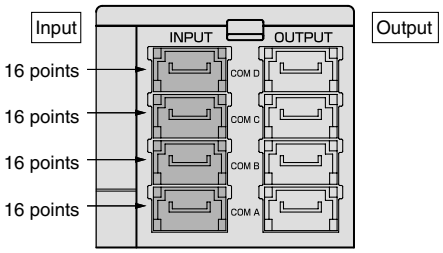
Side view of the Gateway unit
■ are parts in use.

Input: 16 points 4-branch settings
Output: 16 points 4-branch settings (at the time of shipping)



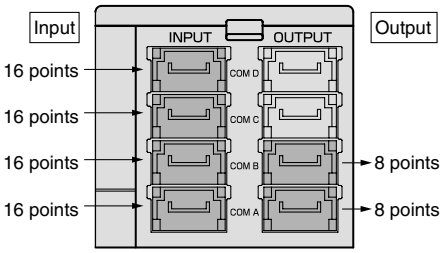
Input/Output total 128 points

Input: 16 points 4-branch settings
Output: Unused settings



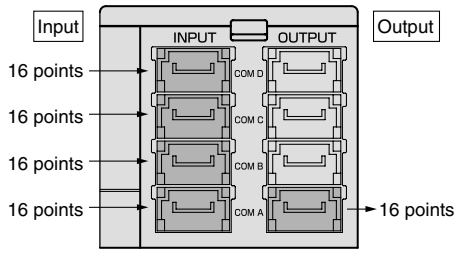
Input/Output total 64 points

Input: 16 points 4-branch settings
Output: 8 points 2-branch settings



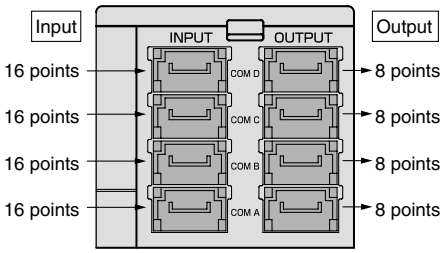
Input/Output total 80 points

Input: 16 points 4-branch settings
Output: 16 points 1-branch setting



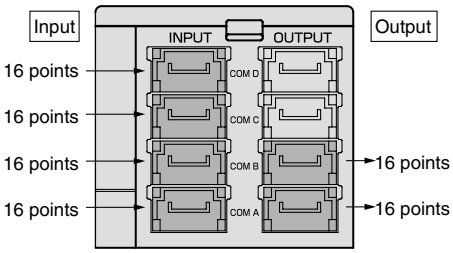
Input/Output total 80 points

Input: 16 points 4-branch settings
Output: 8 points 4-branch settings



Input/Output total 96 points

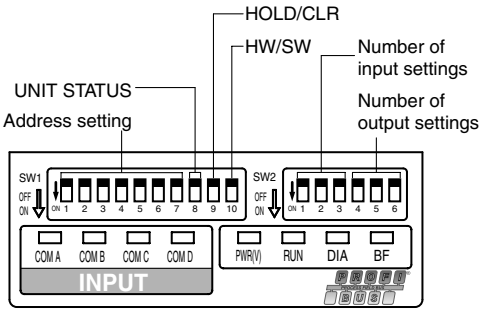
Input: 16 points 4-branch settings
Output: 16 points 2-branch settings



Input/Output total 96 points

EX510-GPR1 (PROFIBUS DP compatible)

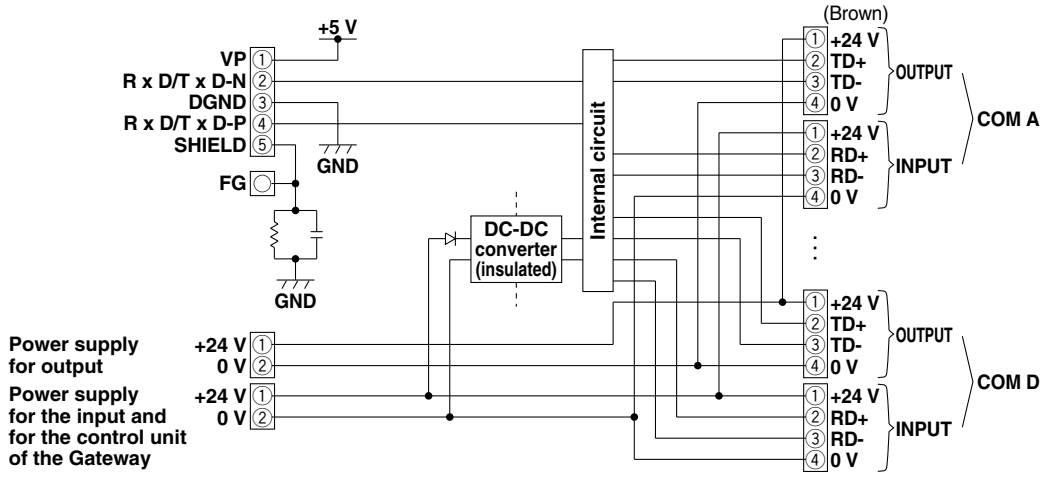
Display Setting



Display	Contents	Indicator light condition
PWR(V)	The output power supply voltage is supplied as specified. The output power supply voltage is not supplied as specified.	Light is turned on. Light is turned off.
RUN	When the input and the power for the Gateway is being supplied. When the input and the power for the Gateway is not being supplied.	Light is turned on. Light is turned off.
DIA	When the extended diagnostic information is available. When the extended diagnostic informatiion is not available.	Light is turned on. Light is turned off.
BF	When PROFIBUS DP communication is working improperly. When PROFIBUS DP communication is working properly.	Light is turned on. Light is turned off.
COM A to D	When COM A to D are receiving data. When COM A to D are not receiving data.	Light is turned on.* Light is turned off.

* Input unit (Input device) is connected will illuminate when communication is working properly.

Internal Circuit

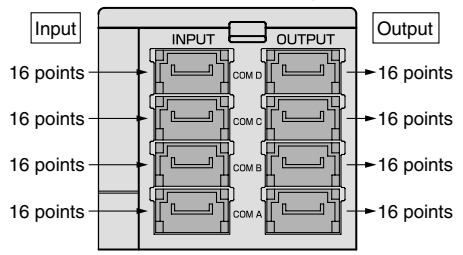


Flexible I/O Setting Examples

The occupying number of points in the Gateway units can be changed flexibly by setting a switch.
The occupying number of inputs and outputs can be set respectively. (Figures below are examples of the flexibility of setting the output occupied numbers.)
Consult the instruction manual for details.

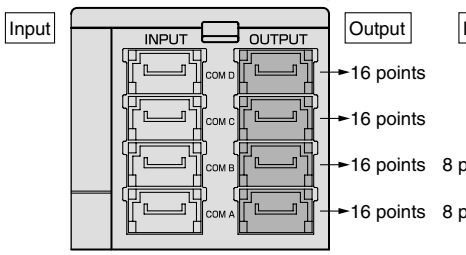
Side view of the Gateway unit
■ are parts in use.

Input: 16 points 4-branch settings (at the time of shipping)
Output: 16 points 4-branch settings



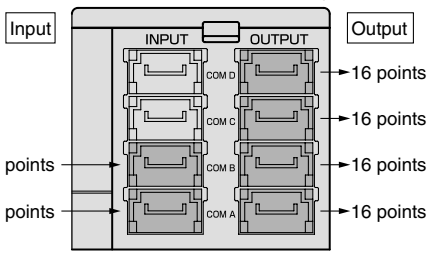
Input/Output total 128 points

Input: Unused settings
Output: 16 points 4-branch settings



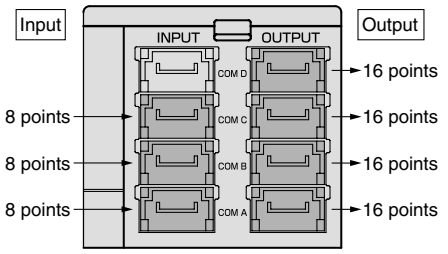
Input/Output total 64 points

Input: 8 points 2-branch settings
Output: 16 points 4-branch settings



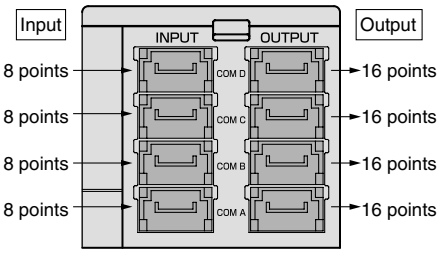
Input/Output total 80 points

Input: 8 points 3-branch settings
Output: 16 points 4-branch settings



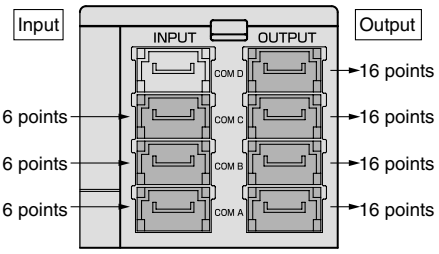
Input/Output total 88 points

Input: 8 points 4-branch settings
Output: 16 points 4-branch settings



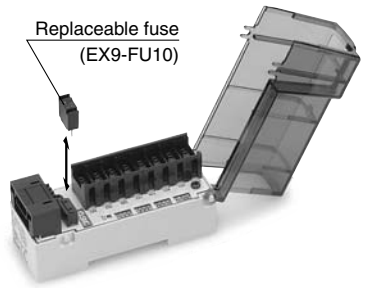
Input/Output total 96 points

Input: 16 points 3-branch settings
Output: 16 points 4-branch settings



Input/Output total 112 points

Input Unit



1 connector, 2-input type

1 connector, 1 input type

How to Order

EX510-DX N 1

Compliant sensor

N	NPN output
P	PNP output
B	2-wire type

Unit type

1	1 connector, 2-input type
2	1 connector, 1 input type

Note) B (2-wire type) is available with 1 connector, 2-input type only.

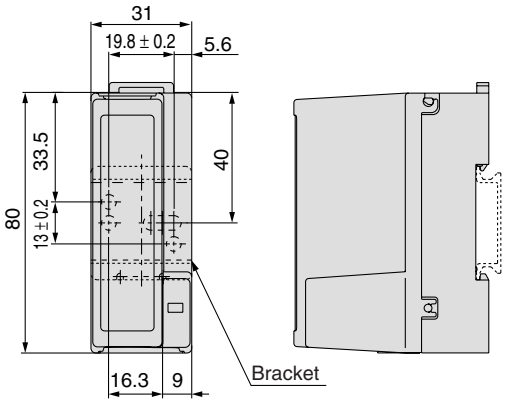
Specifications

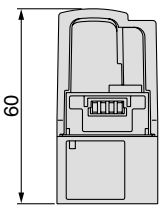
Model		EX510-DXN□	EX510-DXP□, DXB1
Input type		NPN sensor input	PNP sensor input
Number of inputs		16 points	
Sensor supply voltage		24 VDC	
Max. sensor supply current		0.2 A per point, 0.9 A per unit	
Consumption current		100 mA (Input unit internal parts)	
Input resistance		5.6 kΩ	
Rated input current		Approx. 4 mA	
ON voltage/ON current		17 V or greater/2.5 mA or greater (Between input terminal and for sensor + 24 VDC)	17 V or greater/2.5 mA or greater (Between input terminal and for sensor 0 VDC)
OFF voltage/OFF current		7 V or less/1 mA or less (Between input terminal and for sensor + 24 VDC)	7 V or less/1 mA or less (Between input terminal and for sensor 0 VDC)
Display		Green LED (illuminated when turned ON)	
Environmental resistance	**Enclosure**	IP10	
	Operating temperature range	–10 to 50°C	
	Operating humidity range	35 to 85%RH (with no condensation)	
	Withstand voltage	500 VAC for 1 min. between external terminals and FG	
	Insulation resistance	10 MΩ or more (500 VDC) between external terminals and FG	
	Vibration resistance	10 to 150 Hz with a 0.035 mm amplitude or 4.9 m/s² in each X, Y, Z direction for 2 hrs (De-energized)	
	Impact resistance	147 m/s² in each X, Y, Z direction, 3 times (De-energized)	
Standard		CE marking, UL (CSA)	
Mass		EX510-DX□1: 90 g EX510-DX□2: 110 g (including accessories)	

EX

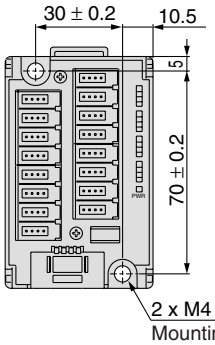
Dimensions

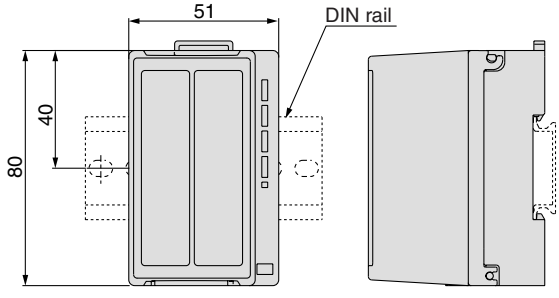
EX510-DX□1



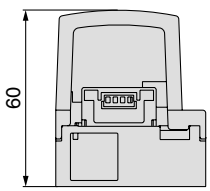


EX510-DX□2



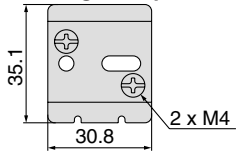


Shown with cover removed.

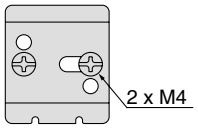


Bracket (accessory for EX510-DX□1)

Mounting example 1

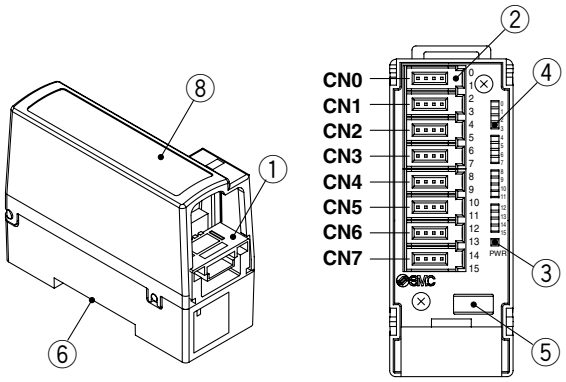


Mounting example 2



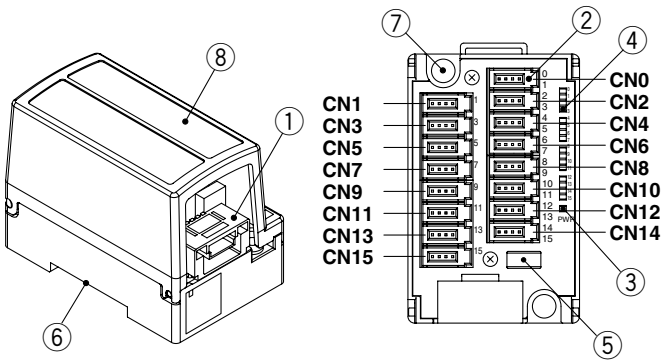
Parts Description

EX510-DX□1



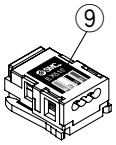
Shown with cover removed.

EX510-DX□2

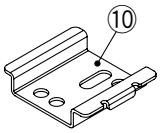


Shown with cover removed.

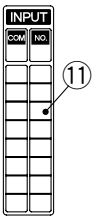
Accessories



Branch connector (2 pcs.)
(EX510-LC1)



Bracket
∗ Attached to
EX510-DX□1 only



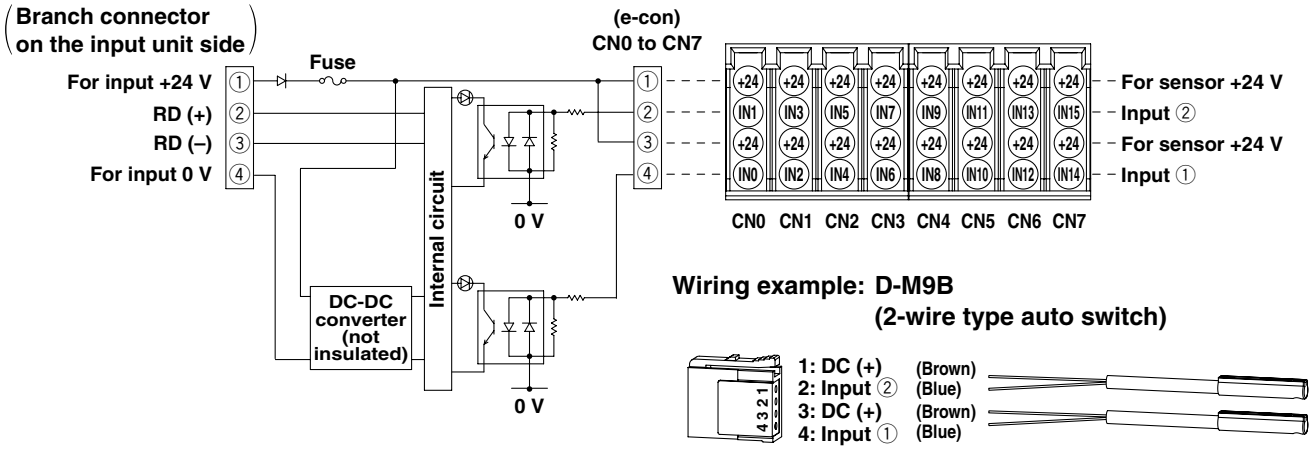
Marker label

Input Unit

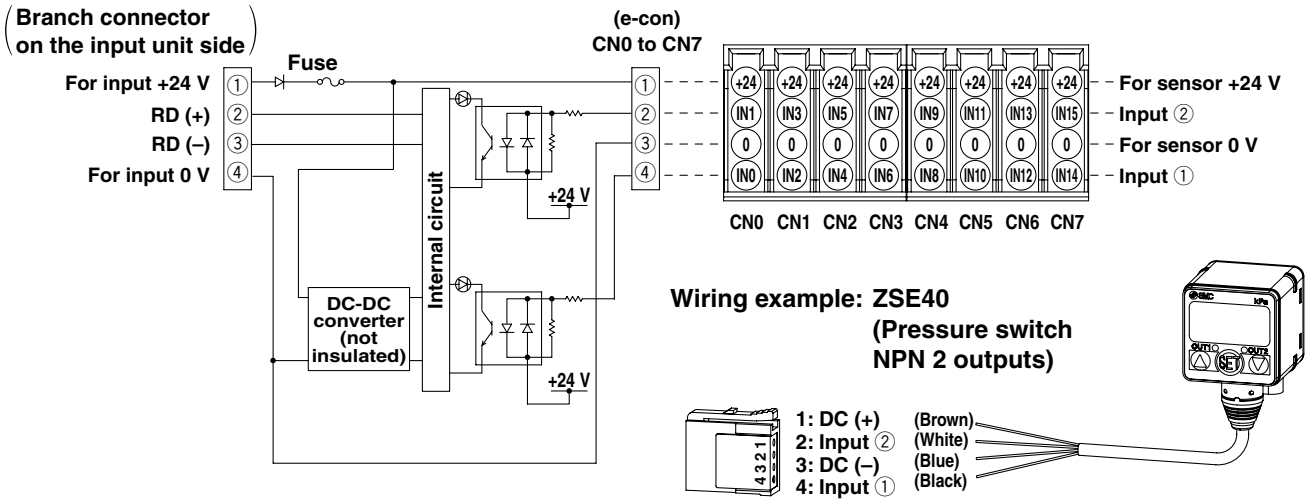
No.	Description	Applications
1	**Branch connector on the input unit side**	For press-fitting the branch connector (⑨) to the branch cable (EX510-FC□□) for connecting with the GW unit.
2	**e-con connector**	Connecting sensor, etc.
3	**LED for power supply**	Light ON: Power supply ON (Normal) state Light OFF: Power supply OFF state
4	**LED for display**	Light ON: When the input for sensor signal is turned ON. Light OFF: When the input for sensor signal is turned OFF.
5	**Fuse**	Replaceable fuse (EX9-FU10)
6	**Mounting groove for DIN rail**	For attaching to a DIN rail or when mounting with screws to an accessory bracket (⑩).
7	**Mounting hole**	Used for mounting the unit with two M4 screws.
8	**Cover**	For protecting the sensor cables. Place a marker label (⑪) on the top of the body.

Internal Circuits and Wiring Examples

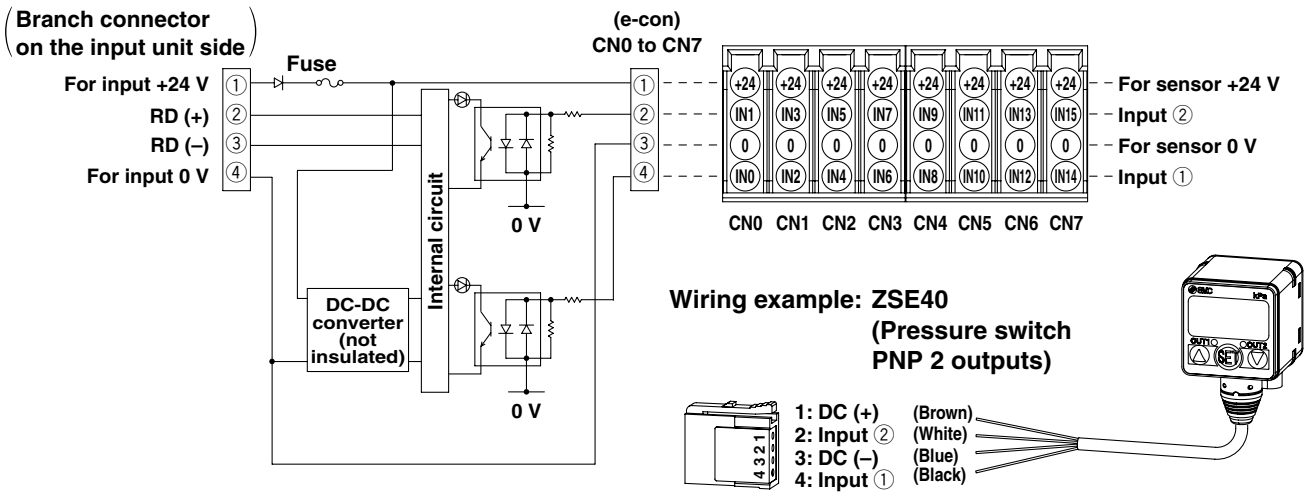
• EX510-DXB1 ··· Input unit for 2-wire type (1 connector, 2-input type)



• EX510-DXN1 ··· Input unit for NPN (1 connector, 2-input type)



• EX510-DXP1 ··· Input unit for PNP (1 connector, 2-input type)



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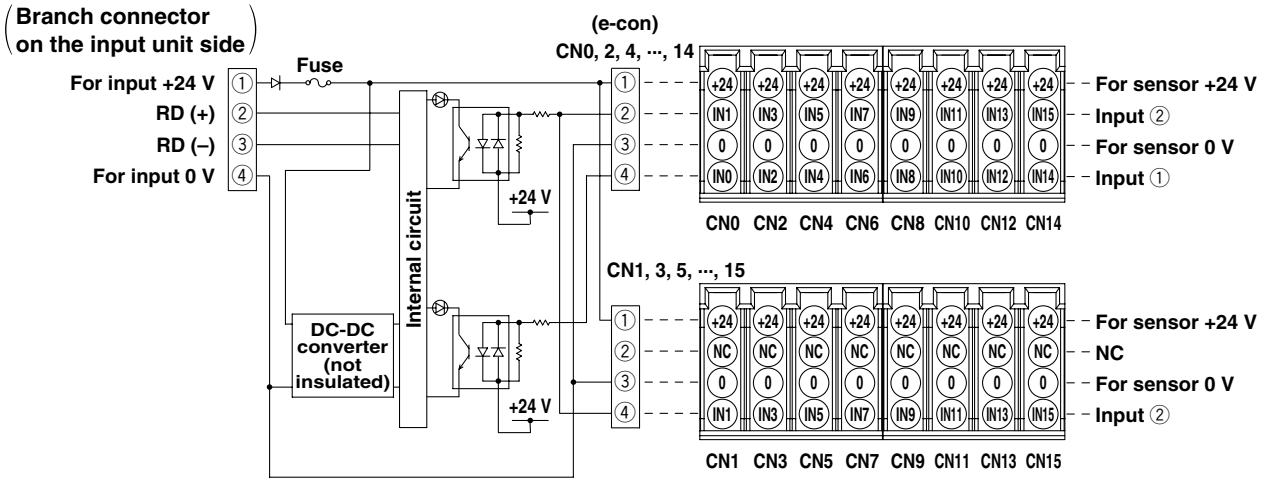
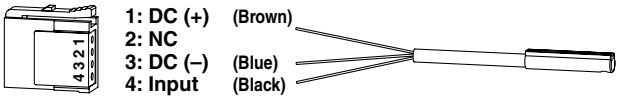
Internal Circuits and Wiring Examples

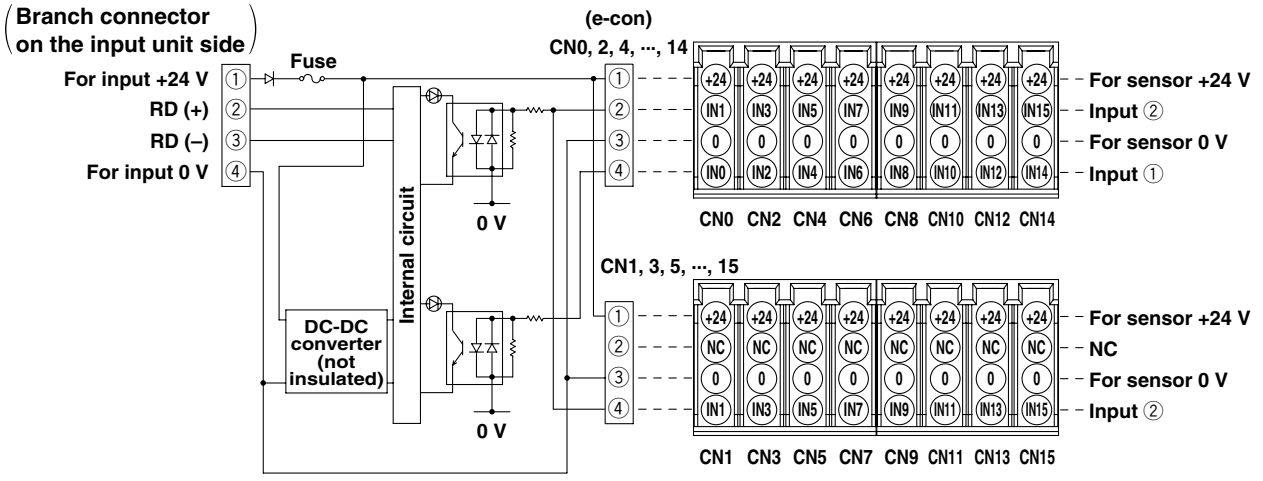
• EX510-DXN2 ··· Input unit for NPN (1 connector, 1 input type)



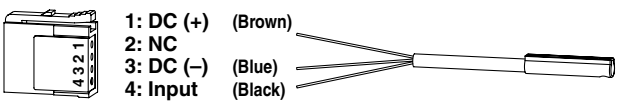
Wiring example: D-M9N
(3-wire type auto switch, NPN output)



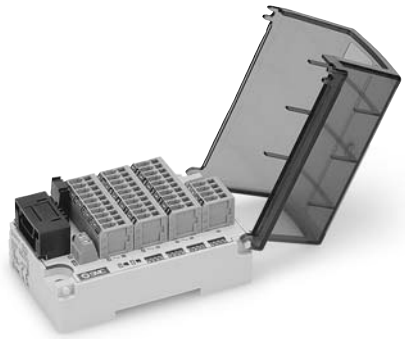
• EX510-DXP2 ··· Input unit for PNP (1 connector, 1 input type)



Wiring example: D-M9P
(3-wire type auto switch, PNP output)



Output Unit



How to Order

EX510-DY P 3

Output specification

N	NPN output
P	PNP output

Connector type

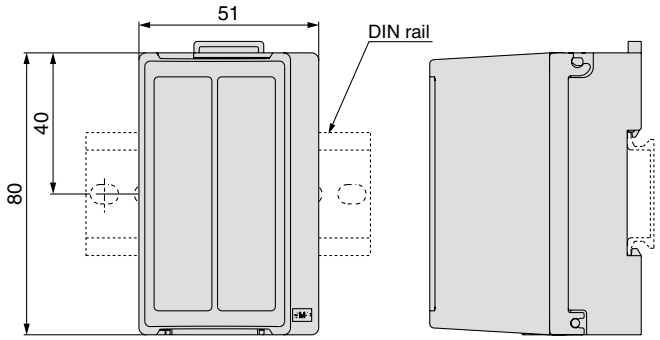
3	Terminal box type (Internal power supply)
4	Terminal box type (External power supply)

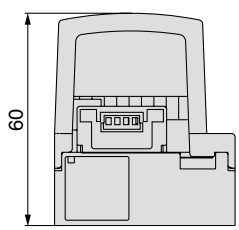
Specifications

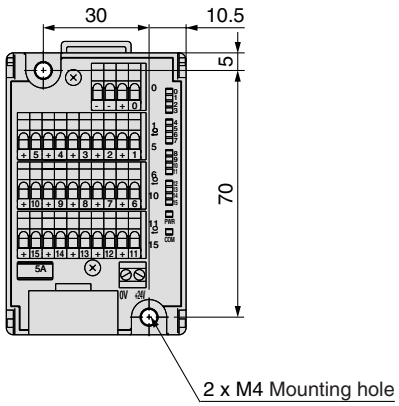
Model		EX510-DYN3	EX510-DYP3	EX510-DYN4	EX510-DYP4
Output type		NPN output (sink type)	PNP output (source type)	NPN output (sink type)	PNP output (source type)
Rated load voltage		24 VDC			
Power supply type		Internal power supply (supplied by GW unit)		External power supply (supplied by power supply connector)	
Applicable cable for power supply connector		—		0.14 to 1.5 mm² (AWG16 to 26)	
Number of outputs		16 points			
Output connector type		Spring type			
Applicable cable		0.08 to 1.5 mm² (AWG16 to 28)			
Max. load current		Meet the following 3 conditions: 1. 0.5 A or less per point 2. 1 A or less per unit 3. The total current for OUT0 to 7 must be 1 A or less. The total current for OUT8 to 15 must be 1 A or less.		Meet the following 3 conditions: 1. 0.5 A or less per point 2. 3 A or less per unit 3. The total current for OUT0 to 7 must be 1.5 A or less. The total current for OUT8 to 15 must be 1.5 A or less.	
Protection		Built-in short circuit protection			
Current consumption		50 mA or less (inside a unit)			
Environmental resistance	**Enclosure**	IP10			
	Operating temperature range	–10 to 50°C			
	Operating humidity range	35 to 85%RH (with no condensation)			
	Withstand voltage	500 VAC for 1 min. between external terminals and FG			
	Insulation resistance	10 MΩ or more (500 VDC) between external terminals and FG			
	Vibration resistance	10 to 150 Hz with a 0.035 mm amplitude or 4.9 m/s² in each X, Y, Z direction for 2 hrs (De-energized)			
	Impact resistance	147 m/s² in each X, Y, Z direction, 3 times (De-energized)			
Standard		CE marking, UL (CSA)			
Mass		130 g (including accessories)			

Dimensions

EX510-DY□□

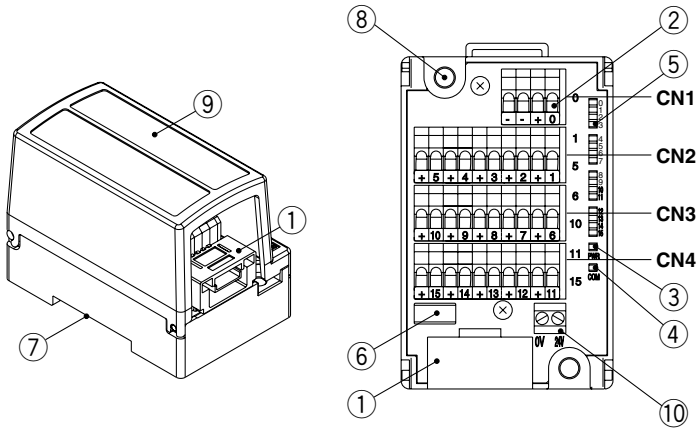






Shown with cover removed.

Parts Description

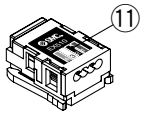


Shown with cover removed.

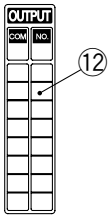
Output Unit

No.	Description	Applications
1	**Branch connector on the output unit side**	For press-fitting the branch connector (⑪) to the branch cable (EX510-FC□□) for connecting with GW unit.
2	**Output terminal box**	Connect the output load, etc.
3	**LED for power supply**	Light ON: Power supply ON (Normal) state Light OFF: Power supply OFF state
4	**LED for communications**	Light ON: When receiving data Light OFF: When there is no communication data.
5	**LED for display**	Light ON: When the output signal is turned on. Light OFF: When the output signal is turned off.
6	**Fuse**	Replaceable fuse
7	**Mounting groove**	Used for mounting the unit on the DIN rail.
8	**Mounting hole**	Used for mounting the unit with two M4 screws.
9	**Cover**	For protecting the output load cable. Place a marker label (⑫) on the top of the body.
10	**Terminal box for external power supply**	Terminal for power supply (EX510-DYN4, EX510-DYP4 only)

Accessories



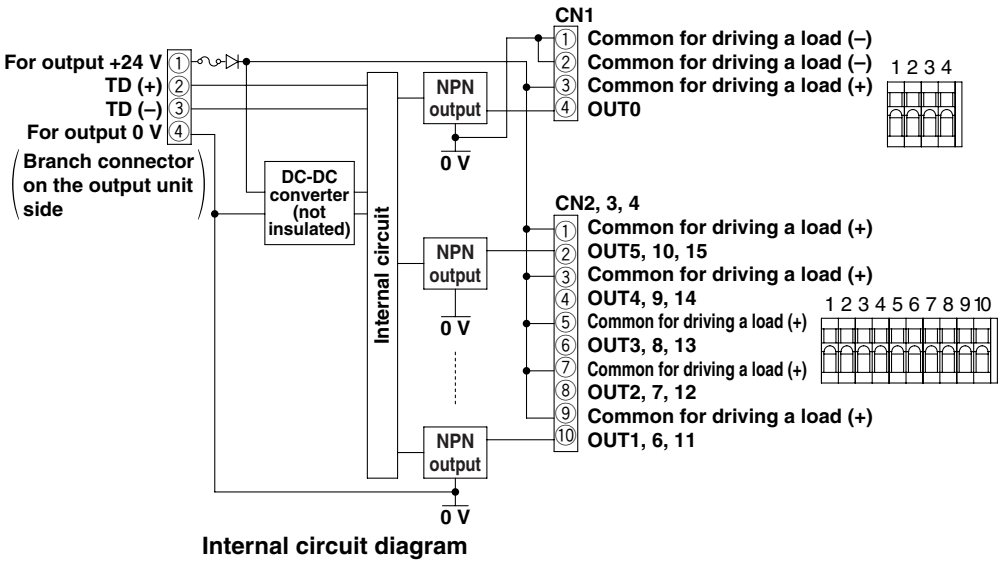
Branch connector (2 pcs.)
(EX510-LC1)



Marker label

Internal Circuits and Wiring Examples

• EX510-DYN3 ··· Output unit for NPN (Internal power supply type)



Internal circuit diagram

Terminal Block Connector (CN1)

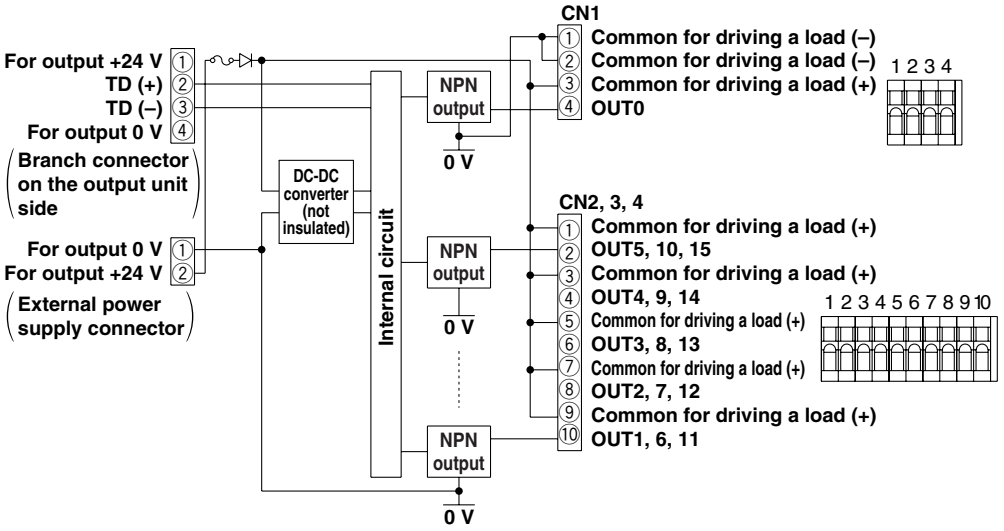
No.	Description	Functions
		CN1
1	**COM**	Common for driving a load (–)
2	**COM**	
3	**COM**	Common for driving a load (+)
4	**Output**	OUT0

Terminal Block Connector (CN2, CN3, CN4)

No.	Description	Functions		
		CN2	CN3	CN4
1	**COM**	Common for driving a load (+)		
2	**Output**	OUT5	OUT10	OUT15
3	**COM**	Common for driving a load (+)		
4	**Output**	OUT4	OUT9	OUT14
5	**COM**	Common for driving a load (+)		
6	**Output**	OUT3	OUT8	OUT13
7	**COM**	Common for driving a load (+)		
8	**Output**	OUT2	OUT7	OUT12
9	**COM**	Common for driving a load (+)		
10	**Output**	OUT1	OUT6	OUT11

Internal Circuits and Wiring Examples

• EX510-DYN4 ··· Output unit for NPN (External power supply type)



Internal circuit diagram

Terminal Block Connector (CN1)

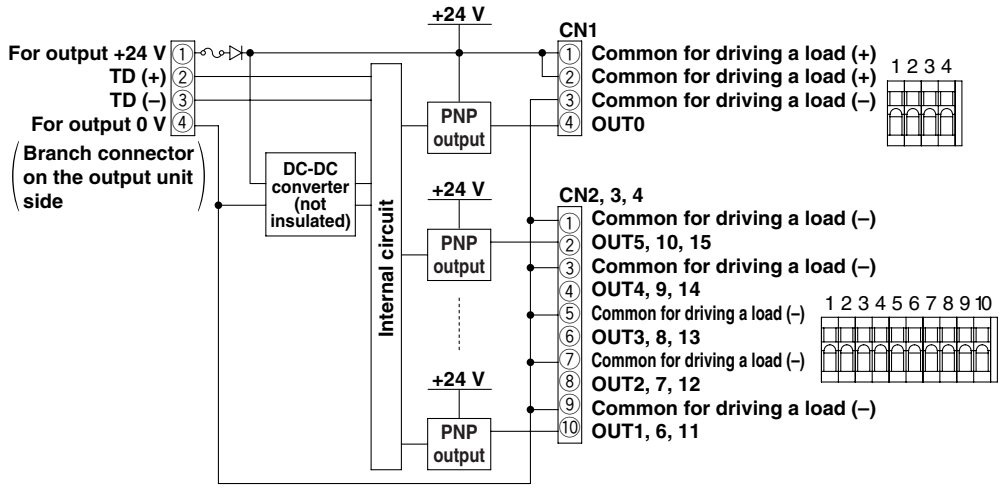
No.	Description	Functions
		CN1
1	COM	Common for driving a load (–)
2	COM	
3	COM	Common for driving a load (+)
4	Output	OUT0

Terminal Block Connector (CN2, CN3, CN4)

No.	Description	Functions		
		CN2	CN3	CN4
1	COM	Common for driving a load (+)		
2	Output	OUT5	OUT10	OUT15
3	COM	Common for driving a load (+)		
4	Output	OUT4	OUT9	OUT14
5	COM	Common for driving a load (+)		
6	Output	OUT3	OUT8	OUT13
7	COM	Common for driving a load (+)		
8	Output	OUT2	OUT7	OUT12
9	COM	Common for driving a load (+)		
10	Output	OUT1	OUT6	OUT11

EX

• EX510-DYP3 ··· Output unit for PNP (Internal power supply type)



Internal circuit diagram

Terminal Block Connector (CN1)

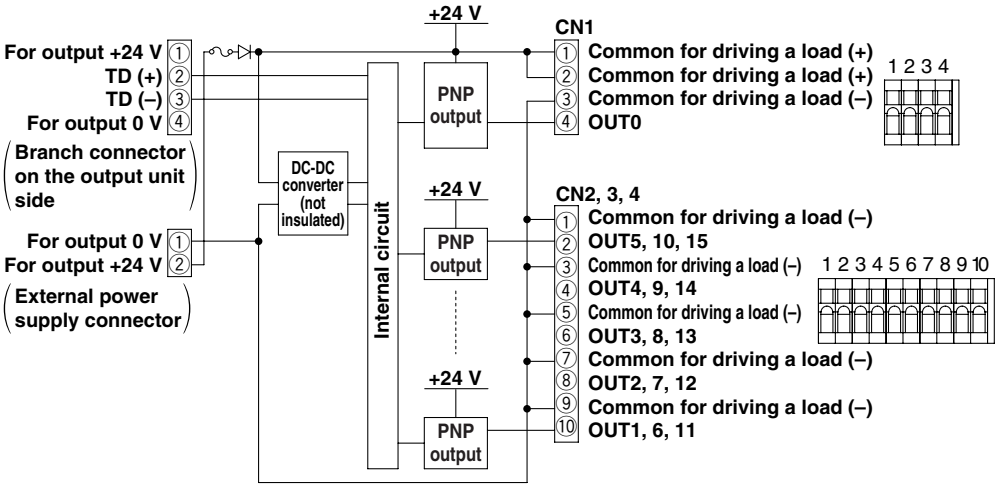
No.	Description	Functions
		CN1
1	COM	Common for driving a load (+)
2	COM	
3	COM	Common for driving a load (–)
4	Output	OUT0

Terminal Block Connector (CN2, CN3, CN4)

No.	Description	Functions		
		CN2	CN3	CN4
1	COM	Common for driving a load (–)		
2	Output	OUT5	OUT10	OUT15
3	COM	Common for driving a load (–)		
4	Output	OUT4	OUT9	OUT14
5	COM	Common for driving a load (–)		
6	Output	OUT3	OUT8	OUT13
7	COM	Common for driving a load (–)		
8	Output	OUT2	OUT7	OUT12
9	COM	Common for driving a load (–)		
10	Output	OUT1	OUT6	OUT11

Internal Circuits and Wiring Examples

• EX510-DYP4 ··· Output unit for PNP (External power supply type)



Internal circuit diagram

Terminal Block Connector (CN1)

No.	Description	Functions
		CN1
1	COM	Common for driving a load (+)
2	COM	
3	COM	Common for driving a load (–)
4	Output	OUT0

Terminal Block Connector (CN2, CN3, CN4)

No.	Description	Functions		
		CN2	CN3	CN4
1	COM	Common for driving a load (–)		
2	Output	OUT5	OUT10	OUT15
3	COM	Common for driving a load (–)		
4	Output	OUT4	OUT9	OUT14
5	COM	Common for driving a load (–)		
6	Output	OUT3	OUT8	OUT13
7	COM	Common for driving a load (–)		
8	Output	OUT2	OUT7	OUT12
9	COM	Common for driving a load (–)		
10	Output	OUT1	OUT6	OUT11

Connection to Output Equipment

The output unit can be connected to 2-port solenoid valves such as the VX, VCW, VDW series and other 3-port valves. Pay attention to the applicable cable and maximum load current for selecting a solenoid valve. The 2-port valves other than shown below can be used as long as they meet the conditions; operating environment (enclosure, etc.), applicable cable and the **maximum load current**. Shown below is the typical 2-port solenoid valve.
Additionally, we recommend a model with surge voltage suppressor is used for the 2-port solenoid valve.

Example) In the case of using 5 VX23 series (rated voltage: 24 VDC / power consumption: 10.5 W) (calculated under the condition with 5 valves turned on simultaneously)

Operating current per point for a valve
10.5 (W) ÷ 24 (V) = **0.44 (A)** ..... Meets the output unit **load current requirement 1**.

Therefore, the total current of the output unit is:
10.5 (W) ÷ 24 (V) x 5 (pcs.) = **2.2 (A)** ..... Only the external power supply type can meet the **requirement 2**. The internal power supply type cannot be used.

Based on the **requirment 3**, The total current for OUT0 to 7 and OUT8 to 15 are **1.5 (A)** respectively.
Therefore, 3 VX valves are wired for either 3 points of OUT0 to 7. (**1.32 (A)** for OUT0 to 7)
2 VX valves are wired for either 2 points of OUT8 to 15. (**0.88 (A)** for OUT8 to 15)

Other outputs can be made available by reducing the total number of the occupied points for simultaneous operation.

Load Current Requirement

Model	EX510-DYN3	EX510-DYP3	EX510-DYN4	EX510-DYP4
Output type	NPN output (sink type)	PNP output (source type)	NPN output (sink type)	PNP output (source type)
Power supply type	Internal power supply (supplied by GW unit)		External power supply (supplied by power supply connector)	
Max. load current	Meet the following 3 conditions: 1. 0.5 A or less per point 2. 1 A or less per unit 3. Total current for OUT 0 to 7 must be 1 A or less. Total current for OUT 8 to 15 must be 1 A or less.		Meet the following 3 conditions: 1. 0.5 A or less per point 2. 3 A or less per unit 3. Total current for OUT 0 to 7 must be 1.5 A or less. Total current for OUT 8 to 15 must be 1.5 A or less.	

Direct Operated 2 Port Solenoid Valve

VX

Series	Material		Valve type	Port size	Orifice diameter [mmø]	Rated voltage [V]	Power consumption [W]
	Body	Seal					
VX21	C37 Stainless steel	NBR FKM EPDM PTFE	N.C. N.O.	1/8 to 1/2	2 to 10	DC 24	4.5
VX22							7.0
VX23							10.5

VCW

Series	Material		Valve type	Port size	Orifice diameter [mmø]	Rated voltage [V]	Power consumption [W]
	Body	Seal					
VCW20	C37 Stainless steel	NBR FKM EPDM PTFE	N.C. N.O.	1/8 to 3/4	2 to 10	DC 24	6.0
VCW30							8.0
VCW40							11.5

VDW

Series	Material		Valve type	Port size	Orifice diameter [mmø]	Rated voltage [V]	Power consumption [W]
	Body	Seal					
VDW10	C37 Stainless steel	NBR FKM	N.C.	M5 to 1/4	1 to 4	DC 24	2.5
VDW20							3.0
VDW30							3.0

SI Unit

How to Order

EX510-S 0 0 1 ☐

Output specification

0	NPN output (+COM)
1	PNP output (–COM)

Applicable valve manifold

1	Plug-lead manifold
2	Plug-in manifold

Mounting specification

Nil	Screw mounting
A	Mounting on DIN rail vertically
B	Mounting on DIN rail horizontally
C	Mounting on DIN rail horizontally (Dedecated for the SJ manifold) Note)

Note) Applicable for EX510-S☐02 only.

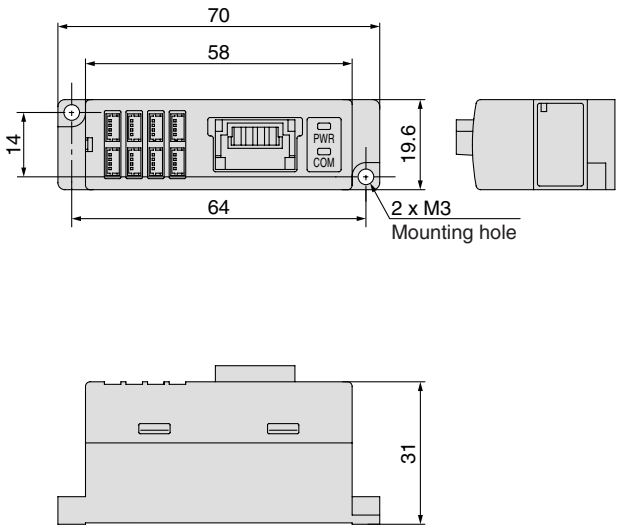
Specifications

Model		EX510-S001☐, S002☐	EX510-S101☐, S102☐
Output type		NPN output (sink type)	PNP output (source type)
Number of outputs		16 points	
Rated load voltage		24 VDC	
Max. load current		Meet the following 3 conditions: 1. 0.25 A or less per point 2. 1.4 A or less per unit 3. Total current for OUT 0 to 7 must be 1 A or less. Total current for OUT 8 to 15 must be 1 A or less.	
Enclosure		Built-in short circuit protection	
Current consumption		50 mA or less (SI unit internal parts)	
Environmental resistance	**Enclosure**	IP20	
	Operating temperature range	–10 to 50°C	
	Operating humidity range	35 to 85%RH (with no condensation)	
	Withstand voltage	500 VAC for 1 min. between external terminals and FG	
	Insulation resistance	10 MΩ or more (500 VDC) between external terminals and FG	
	Vibration resistance	10 to 150 Hz with a 0.035 mm amplitude or 4.9 m/s^2 in each X, Y, Z direction for 2 hrs (De-energized)	
	Impact resistance	147 m/s^2 in each X, Y, Z direction, 3 times (De-energized)	
Standard		CE marking, UL (CSA)	
Mass		EX510-S☐01: 40 g EX510-S☐01A ,B: 80 g EX510-S☐02: 50 g EX510-S☐02A, B, C: 90 g (including accessories)	

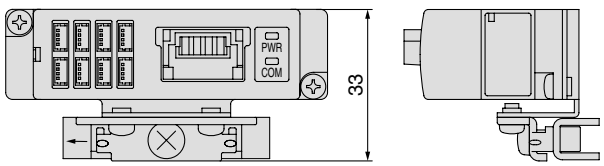
EX

Dimensions

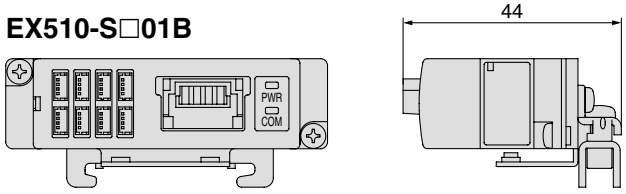
EX510-S☐01



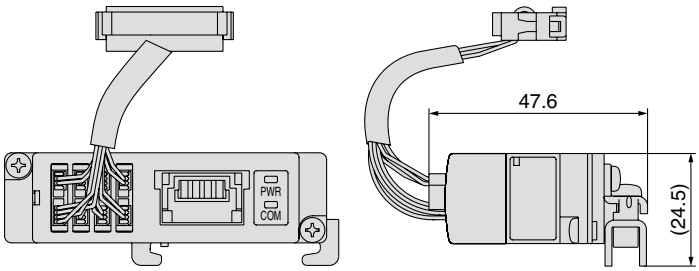
EX510-S☐01A



EX510-S☐01B



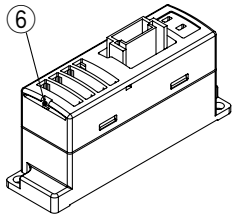
EX510-S☐02C



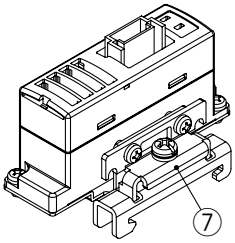
Parts Description

You can place an order for the manifold (valve series mentioned below) with the SI unit. For further information, please refer to the individual valve/manifold catalog. Also, you can change the system of your device by retrofitting the SI unit with the manifold already purchased.

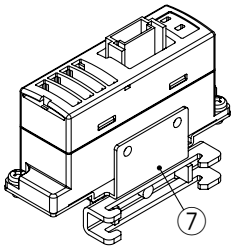
EX510-S□01
(Series SY, SYJ, S0700, VQZ)



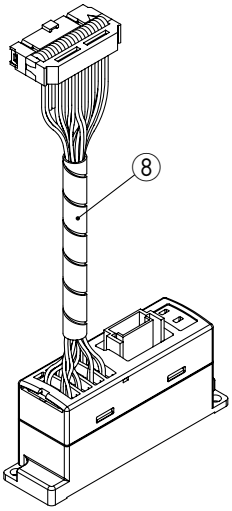
EX510-S□01A
(Series SY (Type 45))



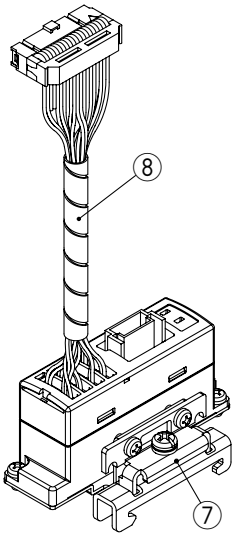
EX510-S□01B



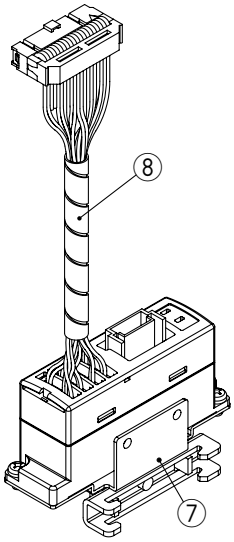
EX510-S□02



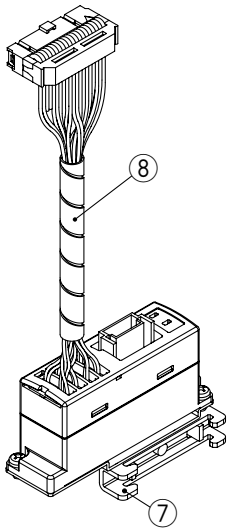
EX510-S□02A
(Series SY, VQ)



EX510-S□02B
(Series SZ, SQ)

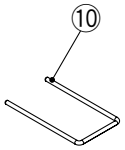


EX510-S□02C
(Series SJ)

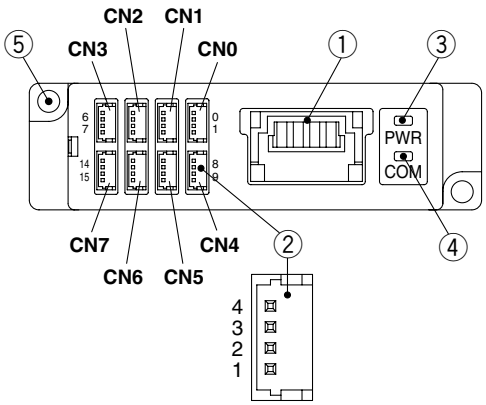


Accessories

Branch connector (2 pcs.)
(EX510-LC1)



Connector lock pin
(1 pc.)

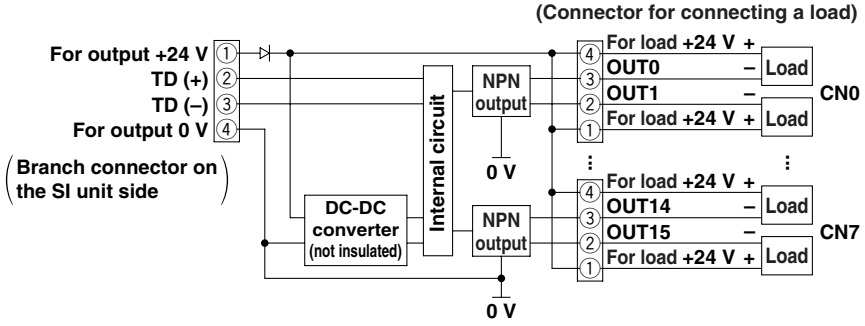


SI Unit

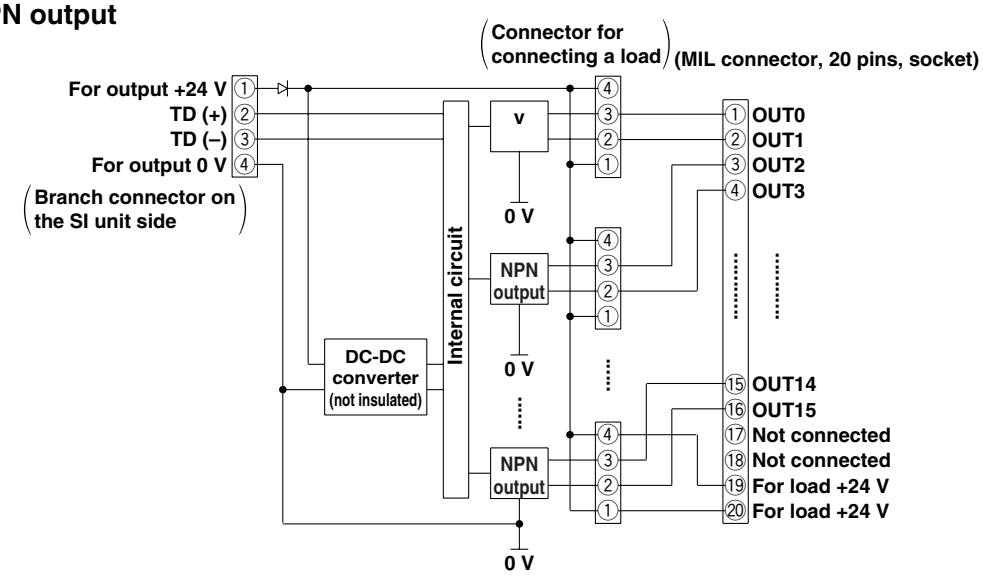
No.	Description	Applications
1	**Branch connector on the SI side unit**	For press-fitting the branch connector (⑨) to the branch cable (EX510-FC□□) for connecting with the GW unit.
2	**Connector for connecting a load**	Connects an output device such as a solenoid valve.
3	**LED for power supply**	Light ON: Power supply ON (Normal) state Light OFF: Power supply OFF state
4	**LED for communications**	Light ON: When receiving data Light OFF: When there is no communication data.
5	**Mounting hole**	Used for mounting the unit with two M3 screws.
6	**Connector lock pin insertion part**	Used for attaching a unit with a connector lock pin (⑩). (EX510-S□02□ is inserted.)
7	**Mounting bracket**	Can be mounted on DIN rail.
8	**Coversion cable assembly**	The cable assembly used for connecting to the plug-in valve manifold. (MIL connector, 20 pins, socket)

Internal Circuits and Wiring Examples

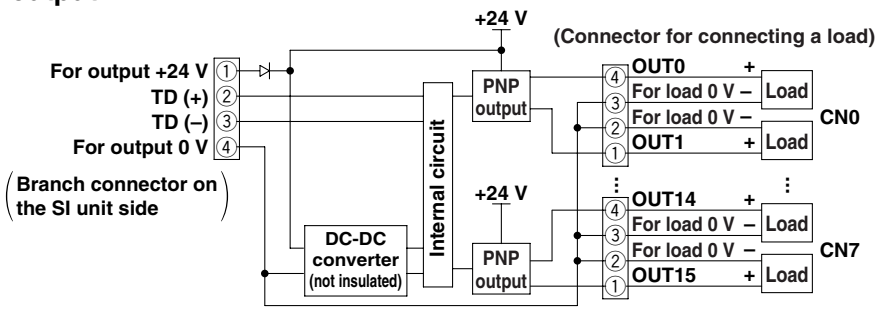
EX510-S001/NPN output



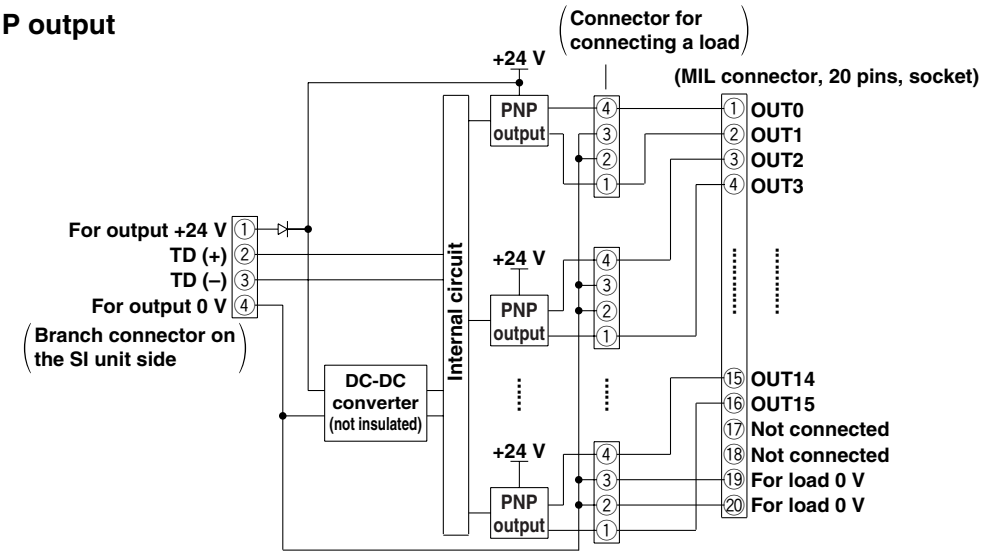
EX510-S002/NPN output



EX510-S101/PNP output



EX510-S102/PNP output



EX

EX510 Serial Wiring Compatible
5 Port Solenoid Valves

Plug-lead Type Manifold

SY

Series	Sonic conductance: C [dm³/(s•bar)] (representative value)	Applicable cylinder size (reference)	Port size for A, B ports												
			Piping with one-touch fittings									Thread piping			
			Metric size					Inch size							
			ø4	ø6	ø8	ø10	ø12	ø5/32"	ø1/4"	ø5/16"	ø3/8"	M5	1/8	1/4	3/8
SY3000	1.1	ø**40**	●	●				●	●			●	●		
SY5000	2.8	ø**63**	●	●	●			●	●	●			●	●	
SY7000	4.5	ø**80**			●	●				●	●			●	
SY9000	10.0	ø**100**			●	●	●			●	●			●	●

SYJ

Series	Sonic conductance: C [dm³/(s•bar)] (representative value)	Applicable cylinder size (reference)	Port size for A, B ports								
			Piping with one-touch fittings						Thread piping		
			Metric size			Inch size					
			ø4	ø6	ø8	ø5/32"	ø1/4"	ø5/16"	M3	M5	1/8
SYJ3000	0.46	ø**25**	●			●			●	●	
SYJ5000	0.83	ø**40**	●	●		●	●			●	
SYJ7000	2.9	ø**50**		●	●		●	●			●

S0700

Series	Sonic conductance: C [dm³/(s•bar)] (representative value)	Applicable cylinder size (reference)	Port size for A, B ports				
			Piping with one-touch fittings				Thread piping
			Metric size		Inch size		
			ø3.2	ø4	ø1/8"	ø5/32"	M5
S0700	0.36	ø**20**	●	●	●	●	●

VQZ

Series	Sonic conductance: C [dm³/(s•bar)] (representative value)	Applicable cylinder size (reference)	Port size for A, B ports												
			Piping with one-touch fittings									Thread piping			
			Metric size					Inch size							
			ø3.2	ø4	ø6	ø8	ø10	ø1/8"	ø5/32"	ø1/4"	ø5/16"	ø3/8"	M5	1/8	1/4
VQZ1000	1.2	ø**40**	●	●	●			●	●	●			●		
VQZ2000	2.0	ø**63**		●	●	●			●	●	●			●	
VQZ3000	3.9	ø**80**			●	●	●			●	●	●			●

For details, refer to the catalog of each product.

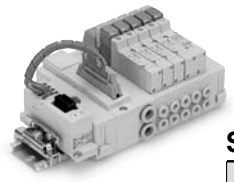
Plug-in Type Manifold

SJ

Series	Sonic conductance: C [dm³/(s•bar)] (representative value)	Applicable cylinder size (reference)	Port size for A, B ports				
			Piping with one-touch fittings			Thread piping	
			Metric size				
			ø2	ø4	ø6	M3	M5
SJ2000	0.36	ø**25**	●	●		●	
SJ3000	0.56	ø**32**	●	●	●		●

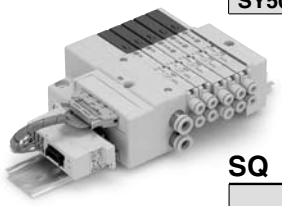
SZ

Series	Sonic conductance: C [dm³/(s•bar)] (representative value)	Applicable cylinder size (reference)	Port size for A, B ports				
			Piping with one-touch fittings				Thread piping
			Metric size		Inch size		
			ø4	ø6	ø5/32"	ø1/4"	M5
SZ3000	0.77	ø**32**	●	●	●	●	●



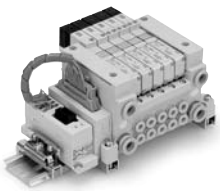
SY

Series	Sonic conductance: C [dm³/(s•bar)] (representative value)	Applicable cylinder size (reference)	Port size for A, B ports					
			Piping with one-touch fittings					
			Metric size			Inch size		
			ø4	ø6	ø8	ø5/32"	ø1/4"	ø5/16"
SY3000	1.1	ø**40**	●	●		●	●	
SY5000	2.8	ø**63**	●	●	●	●	●	●



SQ

Series	Sonic conductance: C [dm³/(s•bar)] (representative value)	Applicable cylinder size (reference)	Port size for A, B ports									
			Piping with one-touch fittings								Thread piping	
			Metric size				Inch size					
			ø3.2	ø4	ø6	ø8	ø1/8"	ø5/32"	ø1/4"	ø5/16"	M5	10-32UNF
SQ1000	0.83	ø**32**	●	●	●		●	●	●		●	●
SQ2000	2.9	ø**63**		●	●	●		●	●	●		



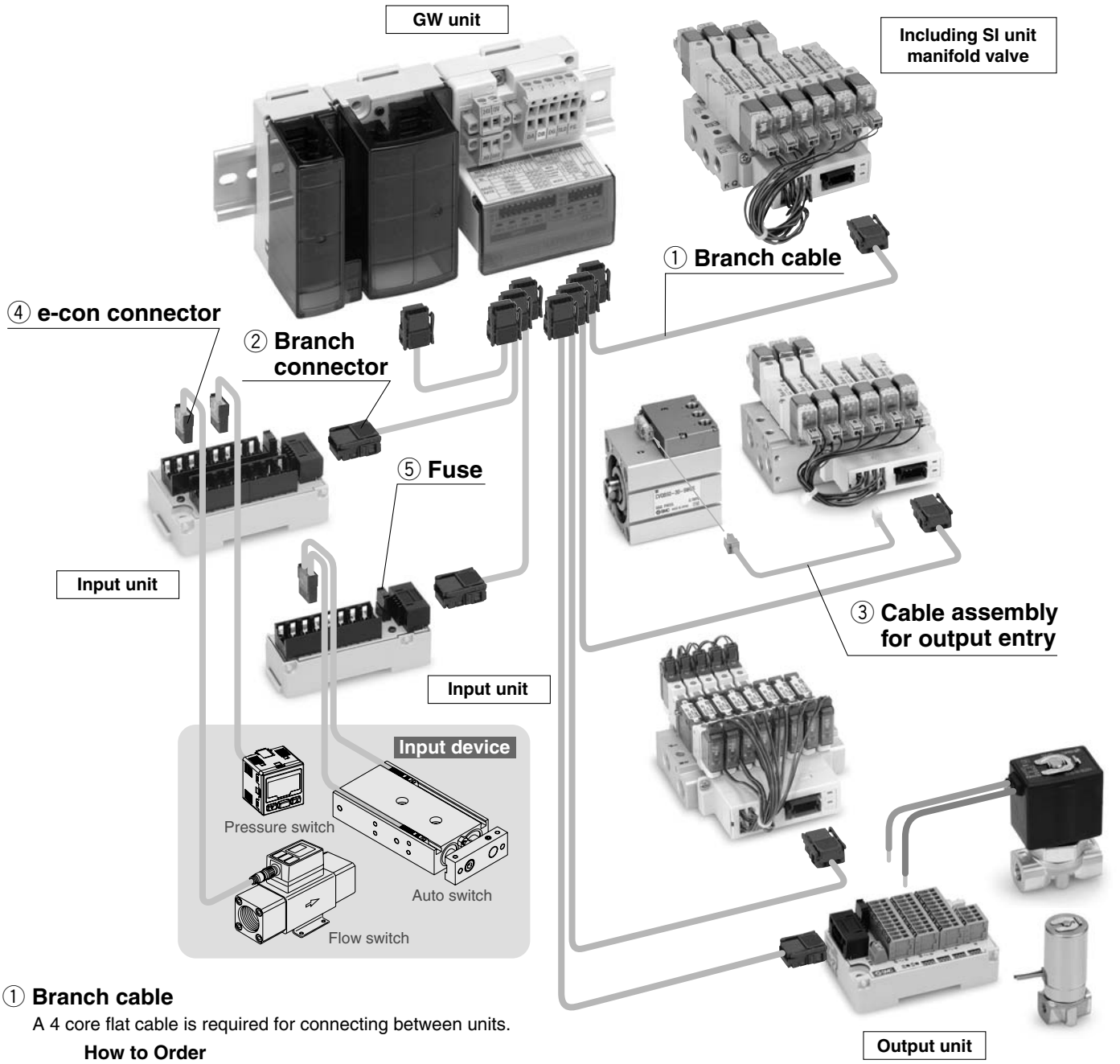
VQ

Series	Sonic conductance: C [dm³/(s•bar)] (representative value)	Applicable cylinder size (reference)	Port size for A, B ports									
			Piping with one-touch fittings								Thread piping	
			Metric size				Inch size					
			ø3.2	ø4	ø6	ø8	ø1/8"	ø5/32"	ø1/4"	ø5/16"	M5	10-32UNF
VQ1000	1.0	ø**40**	●	●	●		●	●	●		●	●
VQ2000	3.2	ø**63**		●	●	●		●	●	●		

For details, refer to the catalog of each product.

EX

System Composition / Options



① Branch cable

A 4 core flat cable is required for connecting between units.

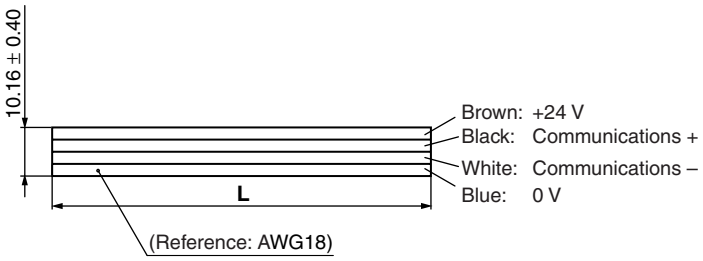
How to Order

EX510-FC 10

Cable length (L)

01	1 m
02	2 m
05	5 m
10	10 m
20	20 m
60 Note)	60 m

Note) Branch cable length is a maximum of 20 m. Use the cable by cutting it into lengths of 20 m or shorter.

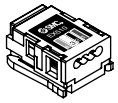


② Branch connector (Unit 1 pc.)

Connector required for connecting a branch cable to each unit.
Two branch cables are attached to the SI unit, the input unit and the output unit respectively.

How to Order

EX510-LC1



(When press-fitting)

Electrical specifications	
Rated voltage	24 VDC
Rated current	Max. 5.0 A
Contact resistance	20 mΩ or less
Withstand voltage	1000 VAC 1 minute (Leak current 1 mA or less)

③ Cable assembly for outputting

Cable assembly for connecting the unused outputs in the SI unit.

How to Order

EX510-V S 10 S

Output

S	1 point
W	2 points

Cable length (L)

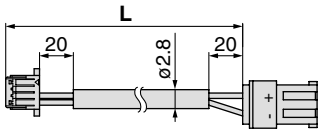
10	1 m
30	3 m

Valve connector

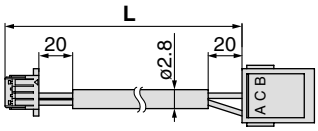
Nil	None
S	For SY, SYJ series
Q	For VQ, VQZ series Note)

Note) VQ is compatible with the positive common only.

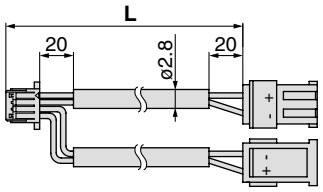
EX510-VS□S



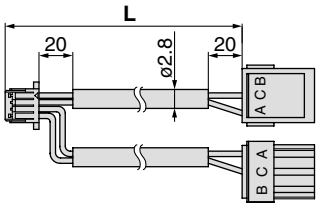
EX510-VS□Q



EX510-VW□S



EX510-VW□Q



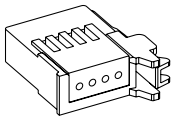
④ e-con connector

Connector for connecting a sensor to the input unit (EX510-DX□□).
Refer to the connector part numbers which are applicable for each sensor.

How to Order

ZS-28-C □-□

e-con



Product	Switch series	e-con part number			
		Tyco Electronics AMP K.K.		Sumitomo 3M Limited	
		SMC part no.	Manufacturer's part no.	SMC part no.	Manufacturer's part no.
Auto switch	**D-A9□**	ZS-28-CA-2	1-1473562-4	ZS-28-C	37104-3101-000FL
	D-M9□	ZS-28-CA-2	1-1473562-4	ZS-28-C	37104-3101-000FL
	D-Y□	ZS-28-CA-3	1473562-4	ZS-28-C	37104-3101-000FL
	D-Z73	ZS-28-CA-2	1-1473562-4	ZS-28-C	37104-3101-000FL
	D-Z76	ZS-28-CA-3	1473562-4	ZS-28-C-1	37104-3122-000FL
	D-Z80	ZS-28-CA-3	1473562-4	ZS-28-C-1	37104-3122-000FL
Pressure switch	**Z/ISE1** Note 1)	ZS-28-CA-3	1473562-4	ZS-28-C-1	37104-3122-000FL
	Z/ISE2 Note 1)	ZS-28-CA-3	1473562-4	ZS-28-C-1	37104-3122-000FL
	Z/ISE30	ZS-28-CA-3	1473562-4	ZS-28-C-1	37104-3122-000FL
	Z/ISE40 Note 2)	ZS-28-CA-3	1473562-4	ZS-28-C-1	37104-3122-000FL
	Z/ISE50 Note 2)	ZS-28-CA-3	1473562-4	ZS-28-C-1	37104-3122-000FL
	Z/ISE60 Note 2)	ZS-28-CA-3	1473562-4	ZS-28-C-1	37104-3122-000FL
	ISE7□	ZS-28-CA-4	2-1473562-4	ZS-28-C-1	37104-3122-000FL
Flow switch	**PF2A7□**	ZS-28-CA-4	2-1473562-4	ZS-28-C-1	37104-3122-000FL
	PF2W7□	ZS-28-CA-4	2-1473562-4	ZS-28-C-1	37104-3122-000FL

Note 1) Grommet type only
Note 2) Connect 2 outputs. Avoid connecting an analog output and an auto shift input to a connector. These need to be wired separately. Please consult SMC for applicable connector part numbers other than shown above.

Refer to each connector manufacturer for detailed information on the *e-CON* connectors.

Applicable Wire

SMC part no. (1 pc.)	Cover color	Compliant wire diameter (ø)	Nominal cross sectional area (mm^2)	Tyco Electronics AMP K.K. part no.
ZS-28-CA-1	Orange	0.6 to 0.9	0.1 to 0.5 (AWG26 to 20)	3-1473562-4
ZS-28-CA-2	Red	0.9 to 1.0		1-1473562-4
ZS-28-CA-3	Yellow	1.0 to 1.15		1473562-4
ZS-28-CA-4	Blue	1.15 to 1.35		2-1473562-4
ZS-28-CA-5	Green	1.35 to 1.60		4-1473562-4

SMC part no. (1 pc.)	Cover color	Compliant wire diameter (ø)	Nominal cross sectional area (mm^2)	Sumitomo 3M Ltd. part no.
ZS-28-C	Red	0.8 to 1.0	0.14 to 0.3 (AWG26 to 24)	37104-3101-000FL
ZS-28-C-1	Yellow	1.0 to 1.2		37104-3122-000FL
ZS-28-C-2	Orange	1.2 to 1.6		37104-3163-000FL
ZS-28-C-3	Green	1.0 to 1.2	0.3 to 0.5 (AWG22 to 20)	37104-2124-000FL
ZS-28-C-4	Blue	1.2 to 1.6		37104-2165-000FL
ZS-28-C-5	Gray	1.6 to 2.0		37104-2206-000FL

SMC part no. (1 pc.)	Cover color	Compliant wire diameter (ø)	Nominal cross sectional area (mm^2)	OMRON Corp. part no.
—	Clear	UP to 1.5	0.08 to 0.5 (AWG28 to 20)	XN2A-1430*

* The cable may be pulled out if the pulling force is 12 N or greater.

⑤ Replacement fuse

Replacement fuse for the input unit (EX510-DX□□) and the output unit (EX510-DY□□).

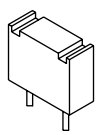
How to Order

EX9-FU 10

Fuse rated current

10	1 A
50	5 A

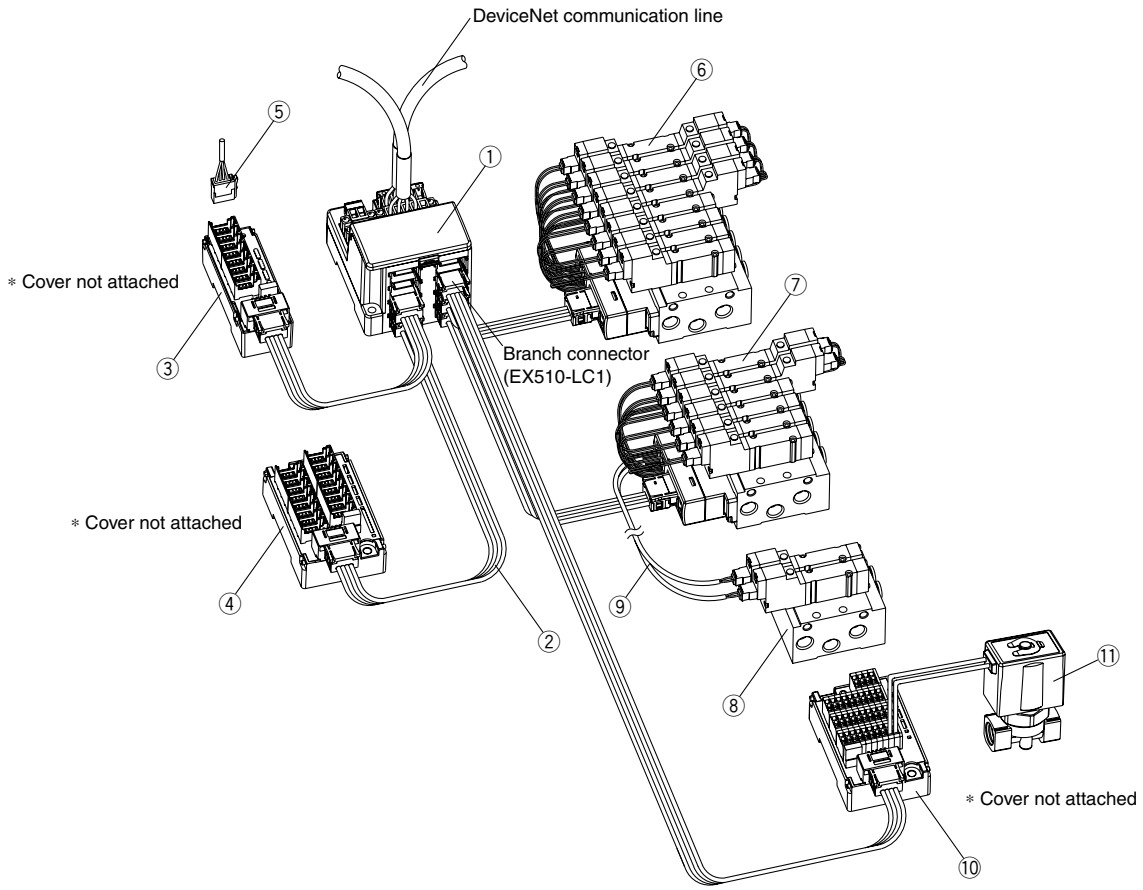
Fuse



Electrical specifications		
Part no.	**EX9-FU10**	**EX9-FU50**
Applicable model	**EX510-DX□□ EX510-DY□3**	**EX510-DY□4**
Rated current	1 A	5 A
Rated insulation capacity	48 VAC/DC 50 A	
Fuse resistance value	0.145 Ω	18 mΩ

Ordering Examples

Shown is an example for ordering the EX510 series.



① Gateway unit (DeviceNet compatible)	EX510-GDN1	1 unit
② Branch cable 20 meters	EX510-FC20	1 roll
∗ ③ Input unit (1 connector, 2-input type NPN input)	EX510-DXN1	1 unit
∗ ④ Input unit (1 connector, 1 input type NPN input)	EX510-DXN2	1 unit
⑤ e-con	ZS-28-C□	24 pcs.
∗ ⑥ SY series manifold	SS5Y3-42SA-08-C6	1 unit
	∗ SY3140-5LOZ	4 units
	∗ SY3240-5LOZ	4 units
∗ ⑦ VQZ series manifold	VV5QZ15-SA06C6	1 unit
	∗ VQZ1150-5LO1	4 units
	∗ VQZ1250-5LO1	2 units
⑧ SY series manifold	SS5Y3-42-02-C6	1 unit
	∗ SY3140-5LOZ	2 units
⑨ Cable assembly for output entry	EX510-VW10S	1 pc.
∗ ⑩ Output unit	EX510-DYN3	1 unit
⑪ 2 port solenoid valve	VX2120-02-5GS1	1 pc.

∗ **Two branch connectors are attached to the manifold including the SI unit and two are attached to the input unit and the output unit respectively.**
The branch connector (EX510-LC1) is used to connect the individual units.

Series EX510
Specific Product Precautions 1

Be sure to read before handling.

Design and Selection

⚠ Warning

1. Use within the allowable voltage range.

Using beyond the allowable voltage range is likely to cause the units and connecting devices to be damaged or to malfunction.

2. Do not use beyond the specification range.

Using beyond the specification range is likely to cause a fire, malfunction, or breakdown in the units and connecting devices. Check the specifications before handling.

3. Establish a backup system beforehand, which employs fail-safe concepts such as multiple equipment and devices to prevent breakage or malfunction of this product.

4. Provide an external emergency stop circuit that will immediately stop an operation and cut off the power supply.

5. When using for an interlock circuit:

- Provide a double interlock which is operated by another system (such as mechanical protection function).
- Perform an inspection to check that it is working properly because it can cause possible injuries.

⚠ Caution

1. Keep the surrounding space free for maintenace.

When designing a system, take into consideration the amount of free space needed for performing maintenance.

2. Use the UL-certified products below for combined direct current power supply.

(1) Circuit in which voltage and current are controlled in accordance with UL508
Circuit which makes the winding wire in the secondary side of the insulation transformer (which meets the following conditions) to be as the power supply

- Maximum voltage (with no load):
  30 Vrms (42.4 V at peak) or less
- Maximum current:
  1. 8 A or less (including short-circuited)
  2. and in case of being controlled by circuit protection devices (fuse, etc) which meets the below rated voltages.

Voltage with no load (V peak)	Maximum rated current
0 to 20 (V)	5.0
Exceeding 20 (V) up to 30 (V)	100
	Voltage figure at peak

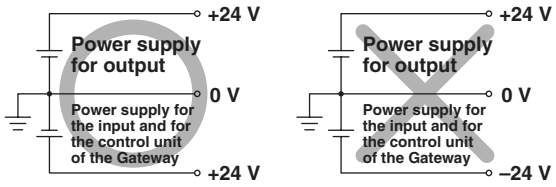
(2) Class 2 power supply unit in accordance with UL1310 or circuit (Class 2 circuit) in accordance with UL1585, that is powered by Class 2 transformer with the maximum of 30 Vrms (42.4 V at peak)

3. This product is one of the components to be equipped into a final equipment. Confirm the adaptability to the EMC directive as the whole equipment by customers themselves.

Design and Selection

⚠ Caution

4. The power supply for the Gateway unit should be 0 V as the standard for both power supply for outputs as well as inputs and for the control unit of the Gateway.



Mounting

⚠ Caution

1. Do not drop, bump, or apply excessive impact.

Otherwise, the unit can become damaged, malfunction, or fail to function.

2. Hold the body while handling this product.

Otherwise, the unit can become damaged, malfunction, or fail to function.

3. Observe the tightening torque range

Tightening outside of the allowable torque range will likely damage the product.

4. Do not install a unit in a place where it can be used as a scaffold.

Applying any excessive load such as stepping on the unit by mistake or placing a foot on it, will cause it to break.

EX

Series EX510
Specific Product Precautions 2

Be sure to read before handling.

Wiring

⚠ Warning

1. Avoid miswiring.

If miswired, there is a probability of damaging units or connecting devices.

2. Do not wire while energizing the product.

It is likely to damage the units or connecting devices.

3. Avoid wiring the power line and high pressure line in parallel.

Noise or surge produced by signal line resulting from the power line or high pressure line could cause a malfunction. Wiring of the reduced-wiring system and the power line or high pressure line should be separated from each other.

4. Confirm the wiring insulation.

Inferior insulation (contact with other circuit, insulation between terminals, etc.) will likely cause damage to the units or connecting devices due to excessive voltage or the influx of current.

⚠ Caution

1. Take measures to avoid applying repeated bending force or pulling force to the cable.

Also, pay attention not to place any heavy matter on the cable or clipping. It is likely to cause a broken wire.

2. Confirm grounding to maintain the safety of the reduced wiring system and for anti-noise performance.

Grounding should be close to units and keep the grounding distance short.

Operating Environment

⚠ Warning

1. Do not use this product in the presence of dust, particles, water, chemicals, and oil.

Use with such materials is likely to cause a malfunction or breakage.

2. Do not use this product in the presence of a magnetic field.

Use in such an environment is likely to cause a malfunction.

3. Do not use this product in an atmosphere containing an inflammable gas, explosive gas, or corrosive gas.

Use in such an atmosphere is likely to cause a fire, explosion, or corrosion.
This reduced-wiring system is not explosion-proof.

4. Do not use this product in places where there are cyclic temperature changes.

In case that the cyclic temperature is beyond normal temperature changes, the internal unit is likely to be adversely effected.

5. Do not use this product in places where there is radiated heat around it.

Such a place is likely to cause a malfunction or breakage.

Operating Environment

⚠ Warning

6. Do no use this product near sources that generate a surge which exceeds the benchmark test, even though this product is CE-marked certified.

The internal circuit components are likely to deteriorate or become damaged when there are equipment (solenoid type lifter, high frequency guided furnace, motor, etc.) which generate a large surge around the reduced-wiring system. Take measures to prevent an electrical surge and avoid having the wires touch each other.

7. Use the product type that has an integrated-surge absorption element when directly driving a load which generates surge voltage by relay or solenoid valves.

8. The reduced wiring system should be installed in places with no vibration or shock.

If installed in a place with vibration or shock, a malfunction or breakage is likely to occur.

Adjustment and Operation

⚠ Warning

1. Do not short-circuit a load.

If a load is short-circuited, excessive can cause damage to the connected devices. The fuse of the input unit will melt and below. The output and SI unit will activate its overcurrent protection function. However, they cannot cover all modes, so damage is likely to occur.

2. Do not manipulate or perform settings with wet hands.

Performing such activity will likely cause an electrical shock.

⚠ Caution

1. DIP switches should be set with a small watchmaker's screwdriver.

Maintenance

⚠ Warning

1. Do not disassemble, modify (including circuit board replacement) or repair this product.

Such actions are likely to cause injuries or breakage.

2. Perform periodic inspection.

Confirm that wiring or screws are not loose.
Otherwise, unpredicted malfunction in the system composition devices is likely to occur.

3. When an inspection is performed.

- Turn off the power supply.
- Stop the supplied fluid and discharge the fluid in the piping and confirm the release to the atmosphere before performing an inspection. It is likely to cause injuiries.

⚠ Caution

1. Do not wipe this product with chemicals such as benzine or thinner.

Using such chemicals is likely to cause damage.

Fieldbus System
Series EX600

SI Unit

EX600-SDN□ EX600-SMJ□ EX600-SPR□

How to Order

EX600 – S DN 1

SI Unit

Fieldbus protocol

DN	DeviceNet™
MJ	CC-Link
PR	PROFIBUS DP

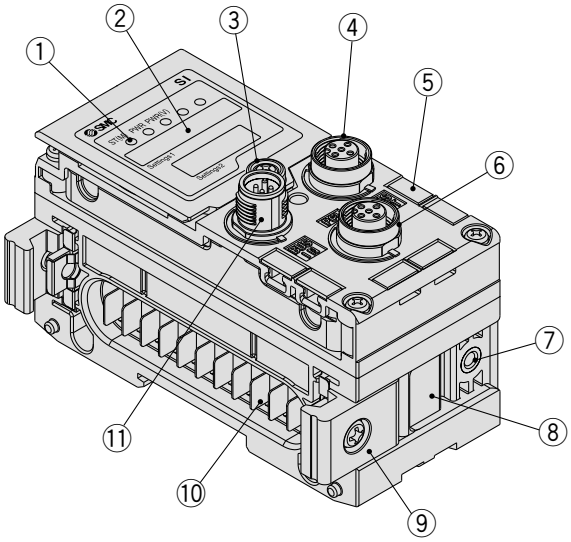
SI Unit COM.

1	PNP (–COM.)
2	NPN (+COM.)

Specifications

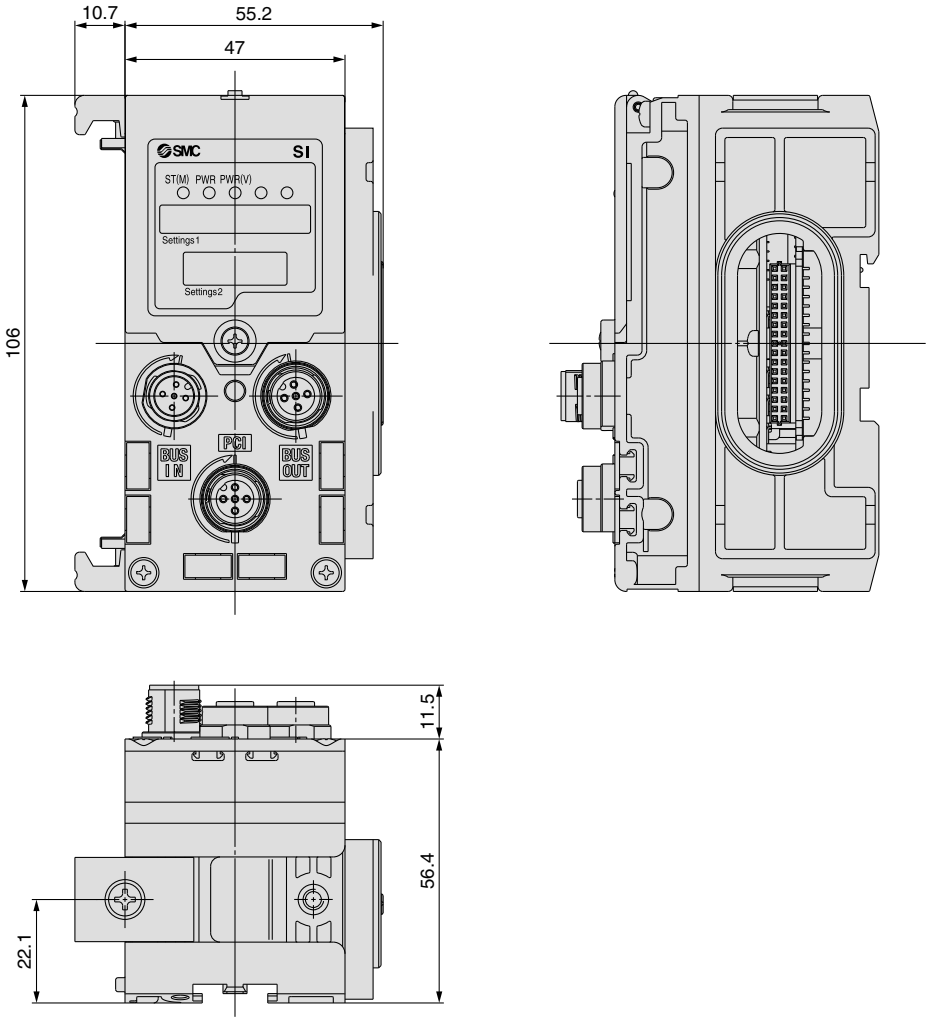
Model		EX600-SDN1	EX600-SDN2	EX600-SMJ1	EX600-SMJ2	EX600-SPR1	EX600-SPR2
Communication	**Protocol**	DeviceNet™ Volume 1 (Edition 2.1) Volume 3 (Edition 1.1)		CC-Link (Ver. 1.10, Ver. 2.00)		PROFIBUS DP (DP-V0)	
	Device type	Group 2 Only Server		Remote Device Station		DP Slave	
	Communication speed	125/250/500 kbps		156/625 kbps 2.5/5/10 Mbps		9.6/19.2/45.45/93.75/ 187.5/500 kbps 1.5/3/6/12 Mbps	
	Configuration file	EDS file		—		GSD file	
	I/O occupation area (Inputs/Outputs)	Max. (512 inputs/512 outputs)		Max. (512 inputs/512 outputs) 1/2/3/4 stations		Max. (512 inputs/512 outputs)	
Terminator		—				Internally implemented	
DeviceNet™ power supply		11 to 25 VDC		—			
Internal current consumption (Power supply for Control and Input)		55 mA or less		75 mA or less		80 mA or less	
Valve output	**Output type**	PNP	NPN	PNP	NPN	PNP	NPN
	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)					
	Fail safe	HOLD/CLEAR					
	Protection	Short-circuit protection					
Environmental resistance	**Enclosure**	IP67 (Manifold assembly)					
	Operating temperature range	–10 to 50°C					
	Operating humidity range	35 to 85% RH (No dew condensation)					
	Withstand voltage	500 VAC for 1 minute between external terminals and FE					
	Insulation resistance	500 VDC, 10 MΩ or more between external terminals and FE					
	Vibration resistance	10 to 57 Hz with constant amplitude of 0.75 mm p-p 57 to 150 Hz with constant acceleration of 49 m/s² for 2 hours in each direction of X, Y and Z direction (During de-energizing)					
	Impact resistance	147 m/s² 3 times in each direction of X, Y and Z (During de-energizing)					
Standards		CE marking, UL (CSA) recognition					
Mass		300 g					

Parts Description



No.	Description
1	**Status indication LED**
2	**Indication cover**
3	**Indication cover set screw**
4	**Connector (BUS OUT)**
5	**Marker groove**
6	**Connector (for Handheld Terminal)**
7	**Valve plate mounting holes**
8	**Valve plate mounting groove**
9	**Joint bracket**
10	**Connector for unit (Plug)**
11	**Connector (BUS IN)**

Dimensions



How to Order

Digital Input Unit


EX600-DX□B


EX600-DX□C/C1


EX600-DX□D

EX600 – DX N D

Digital Input Unit

Input type

P	PNP
N	NPN

Connector, number of inputs, and open circuit detection

Symbol	Connector	Number of inputs	Open circuit detection
B	4 x M12 (5 pins)	8 inputs	No
C	8 x M8 (3 pins)	8 inputs	No
C1	8 x M8 (3 pins)	8 inputs	Yes
D	8 x M12 (5 pins)	16 inputs	No

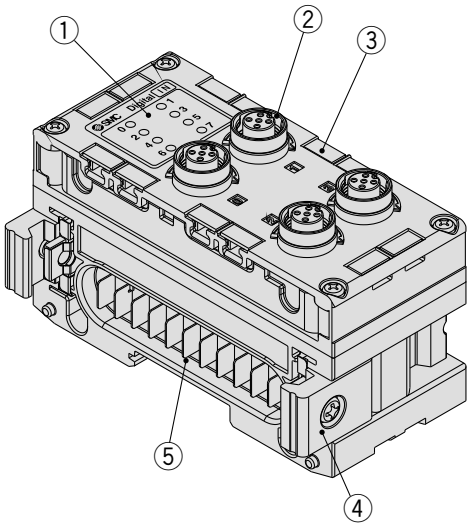
Specifications

Model			EX600-DXPB	EX600-DXNB	EX600-DXPC□	EX600-DXNC□	EX600-DXPD	EX600-DXND
Input specifications	**Input type**		PNP	NPN	PNP	NPN	PNP	NPN
	Input connector		M12 (5 pins) Note 1)		M8 (3 pins)		M12 (5 pins) Note 1)	
	Number of inputs		8 inputs (2 inputs/connector)		8 inputs (1 input/connector)		16 inputs (2 inputs/connector)	
	Sensor supplied voltage		24 VDC (Supplied from power supply for control and input)					
	Maximum sensor 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 resistance		2.7 kΩ					
	Rated input current		9 mA or less					
	ON voltage/ON current		17 V or more / 5 mA or more (At NPN input, between the pin for input terminal and for sensor supplied voltage of +24 V) (At PNP input, between the pin for input terminal and for sensor supplied voltage of 0 V)					
	OFF voltage/OFF current		5 V or less / 1 mA or less (At NPN input, between the pin for input terminal and for sensor supplied voltage of +24 V) (At PNP input, between the pin for input terminal and for sensor supplied voltage of 0 V)					
	Open circuit detection current Note 2)	**2 wires**	—		0.5 mA or less/input Note 2)		—	
		3 wires	—		0.5 mA or less/connector Note 2)		—	
Current consumption			50 mA or less		55 mA or less		70 mA or less	
Indicator			Green LED on (When input is ON.) Red LED on (When short circuit is detected at sensor's power supply.) Red LED flashing (ON/OFF counter is exceeded, or open circuit is detected. Note 2))					
Environmental resistance	**Enclosure**		IP67 (Manifold assembly)					
	Operating temperature range		–10 to 50°C					
	Operating humidity range		35 to 85% RH (No dew condensation)					
	Withstand voltage		500 VAC for 1 minute between external terminals and FE					
	Insulation resistance		500 VDC, 10 MΩ or more between external terminals and FE					
	Vibration resistance		10 to 57 Hz with constant amplitude of 0.75 mm p-p 57 to 150 Hz with constant acceleration of 49 m/s^2 for 2 hours in each direction of X, Y and Z direction (During de-energizing)					
	Impact resistance		147 m/s^2 3 times in each direction of X, Y and Z (During de-energizing)					
Standards			CE marking, UL (CSA) recognition					
Mass			300 g		275 g		340 g	

Note 1) M12 (4 pin) connector can be connected.
Note 2) Applicable only for unit with open circuit detection function.

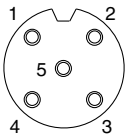
Parts Description

EX600-DX□B



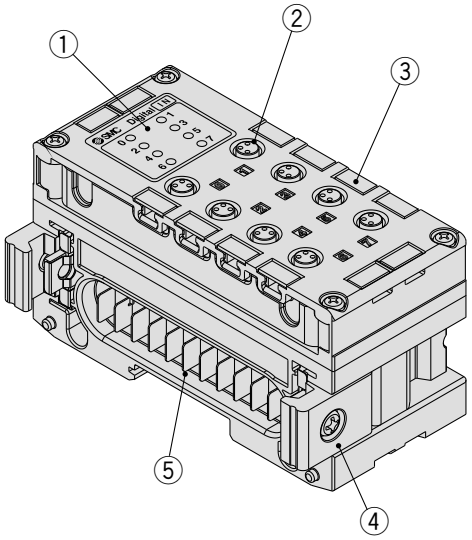
No.	Description
1	**Status indication LED**
2	**Connector (Input)**
3	**Marker groove**
4	**Joint bracket**
5	**Connector for unit (Plug)**

Connector (Input) Pin Assignment



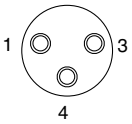
Pin No.	Signal name
1	24 V (for control/input)
2	Input ②
3	0 V (for control/input)
4	Input ①
5	FE

EX600-DX□C□



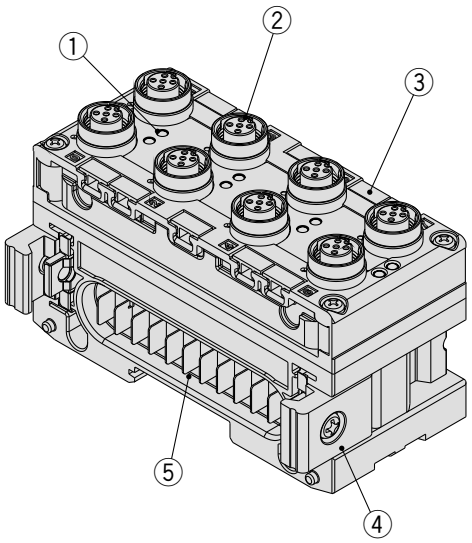
No.	Description
1	**Status indication LED**
2	**Connector (Input)**
3	**Marker groove**
4	**Joint bracket**
5	**Connector for unit (Plug)**

Connector (Input) Pin Assignment



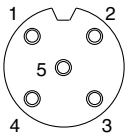
Pin No.	Signal name
1	24 V (for control/input)
3	0 V (for control/input)
4	Input

EX600-DX□D



No.	Description
1	**Status indication LED**
2	**Connector (Input)**
3	**Marker groove**
4	**Joint bracket**
5	**Connector for unit (Plug)**

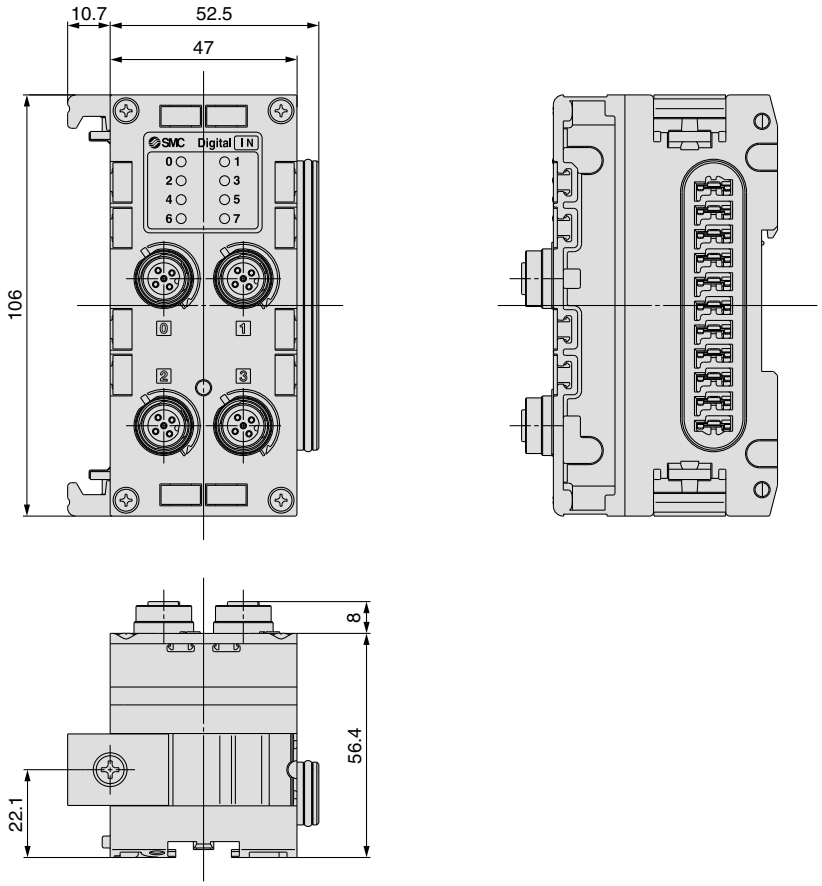
Connector (Input) Pin Assignment



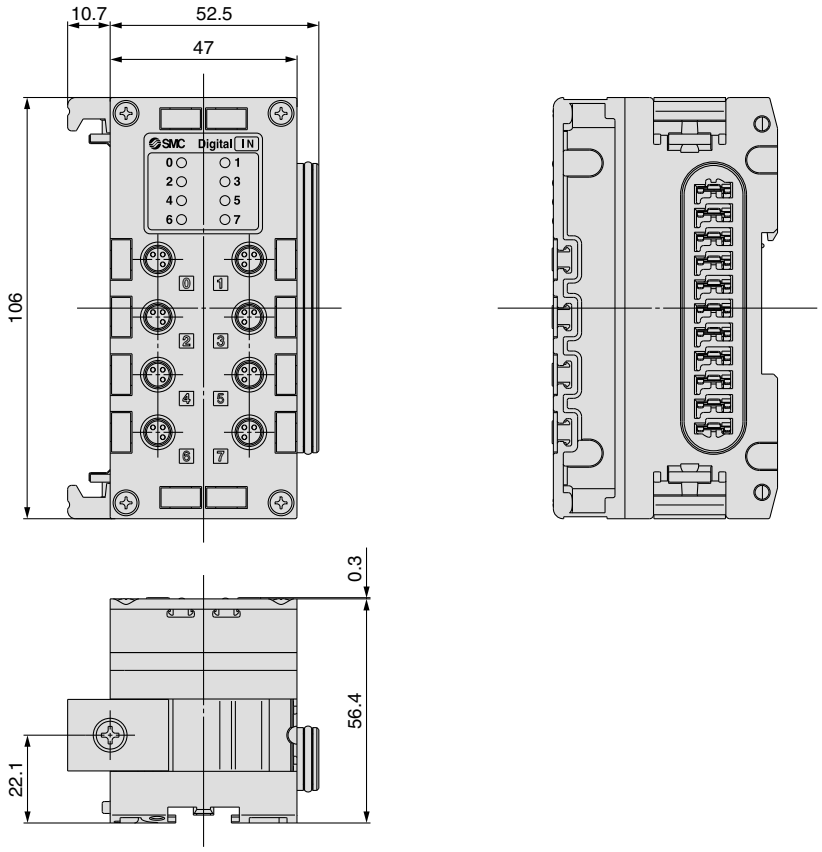
Pin No.	Signal name
1	24 V (for control/input)
2	Input ②
3	0 V (for control/input)
4	Input ①
5	FE

Dimensions

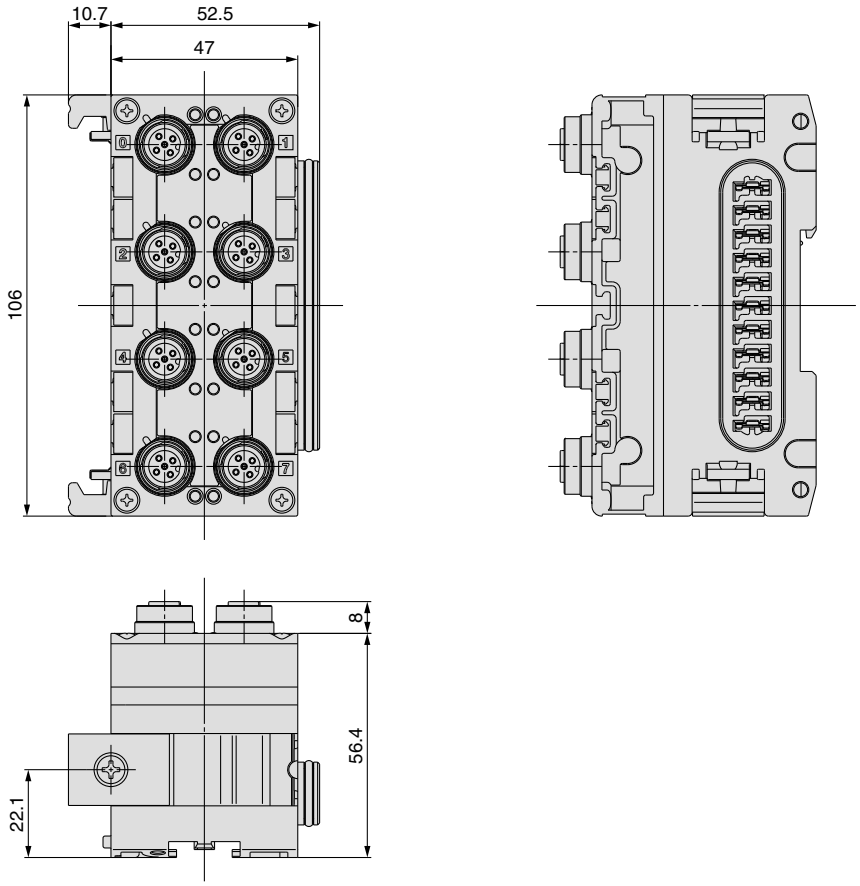
EX600-DX□B



EX600-DX□C□



EX600-DX□D



Digital Output Unit

How to Order

EX600 – DY P B

Digital Output Unit

Output type

P	PNP
N	NPN

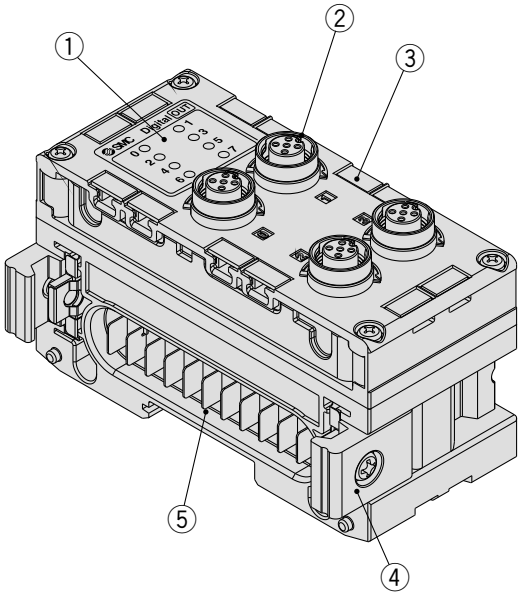
Connector and number of outputs

Symbol	Connector	Number of outputs
B	4 x M12 (5 pins)	8 outputs

Specifications

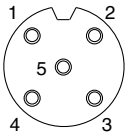
Model		EX600-DYPB	EX600-DYNB
Output specifications	**Output type**	PNP	NPN
	Output connector	M12 (5 pins)	
	Number of outputs	8 outputs (2 outputs/connector)	
	Rated load voltage	24 VDC (Supplied from power supply for output)	
	Maximum load current	0.5 A/1 output, 2 A/unit	
	Protection	Short-circuit protection	
Current consumption		50 mA or less	
Indicator		Green LED on (When output is ON.) Red LED on (When short circuit is detected at load.) Red LED flashing (Open circuit is detected, or ON/OFF counter is exceeded.)	
Environmental resistance	**Enclosure**	IP67 (Manifold assembly)	
	Operating temperature range	–10 to 50°C	
	Operating humidity range	35 to 85% RH (No dew condensation)	
	Withstand voltage	500 VAC for 1 minute between external terminals and FE	
	Insulation resistance	500 VDC, 10 MΩ or more between external terminals and FE	
	Vibration resistance	10 to 57 Hz with constant amplitude of 0.75 mm p-p 57 to 150 Hz with constant acceleration of 49 m/s^2 for 2 hours in each direction of X, Y and Z direction (During de-energizing)	
	Impact resistance	147 m/s^2 3 times in each direction of X, Y and Z (During de-energizing)	
Standards		CE marking, UL (CSA) recognition	
Mass		300 g	

Parts Description



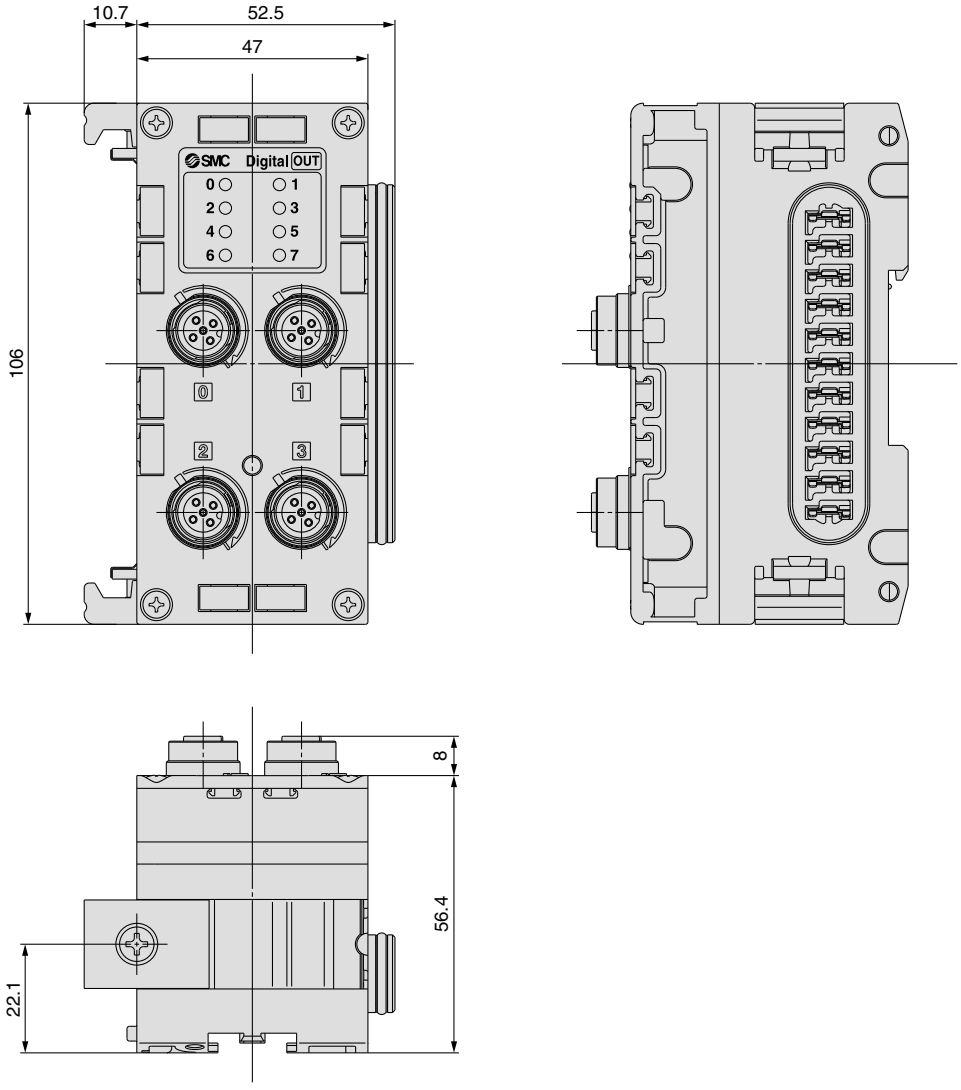
No.	Description
1	**Status indication LED**
2	**Connector (Output)**
3	**Marker groove**
4	**Joint bracket**
5	**Connector for unit (Plug)**

Connector (Output) Pin Assignment



Pin No.	Signal name	
	EX600-DYPB	EX600-DYNB
1	NC	24 V (for output)
2	Output ②	Output ②
3	0 V (for output)	NC
4	Output ①	Output ①
5	FE	FE

Dimensions



Analog Input Unit

How to Order

EX600 – AX A

Analog Input Unit

Connector and input channel

Symbol	Connector	Input channel
A	2 x M12 (5 pins)	2 channels

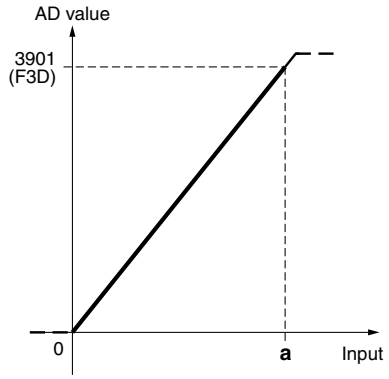
Specifications

Model			EX600-AXA	
Input specifications	**Input type**		Voltage input	Current input
	Input connector		M12 (5 pins)	
	Input channel		2 channels (1 channel/connector) Note)	
	Sensor supplied voltage		24 VDC (Supplied from power supply for control and input)	
	Maximum sensor supplied voltage		0.5 A/channel	
	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 10 V (Factory default setting) –5 to 5 V	–20 to 20 mA
	Maximum input signal		±15 V	±40 mA
	Input impedance		100 kΩ	50 Ω
	Linearity		±0.05% F.S. or less	
	Repeatability		±0.15% F.S. or less	
	Absolute accuracy		±0.5% F.S. or less	±0.6% F.S. or less
Current consumption			70 mA or less	
Indicator			Green LED on (When input is ON.) Red LED on (When short circuit is detected at sensor's power supply.) Red LED flashing (Analogue input exceeds measurement range or user setting range.)	
Environmental resistance	**Enclosure**		IP67 (Manifold assembly)	
	Operating temperature range		–10 to 50°C	
	Operating humidity range		35 to 85% RH (No dew condensation)	
	Withstand voltage		500 VAC for 1 minute between external terminals and FE	
	Insulation resistance		500 VDC, 10 MΩ or more between external terminals and FE	
	Vibration resistance		10 to 57 Hz with constant amplitude of 0.75 mm p-p 57 to 150 Hz with constant acceleration of 49 m/s^2 for 2 hours in each direction of X, Y and Z direction (During de-energizing)	
	Impact resistance		147 m/s^2 3 times in each direction of X, Y and Z (During de-energizing)	
Standards			CE marking, UL (CSA) recognition	
Mass			290 g	

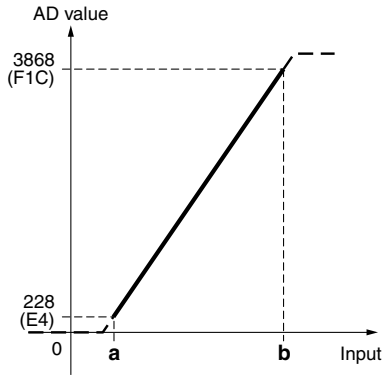
Note) 32 channels are occupied per one unit.
Considering influence of noise, etc. from outside source to the Analog Input Unit, when connecting a sensor that has ground connected at one end (SMC sensor uses this method), please connect sensor's ground line to unit connector's Input (–) terminal.

Analog Characteristics

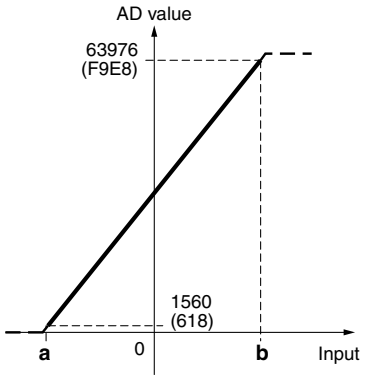
Offset Binary Data Format



Input signal range	a
0 to 10 V	10 V
0 to 5 V	5 V
0 to 20 mA	20 mA



Input signal range	a	b
1 to 5 V	1 V	5 V
4 to 20 mA	4 mA	20 mA



Input signal range	a	b
–10 to 10 V	–10 V	10 V
–5 to 5 V	–5 V	5 V
–20 to 20 mA	–20 mA	20 mA

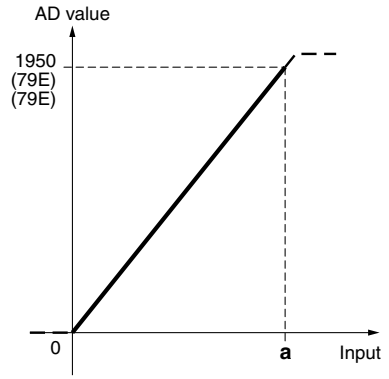
Regarding AD value

In the above graph, 2 AD values are explained as below.

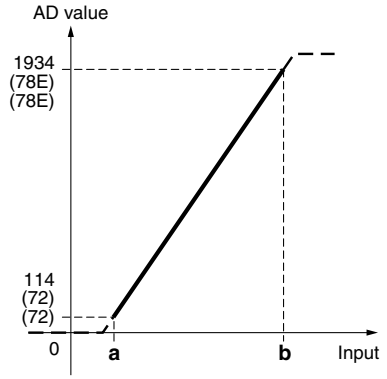
3901 : AD value [Decimal value]

(F3D): Offset Binary type [Hexadecimal value]

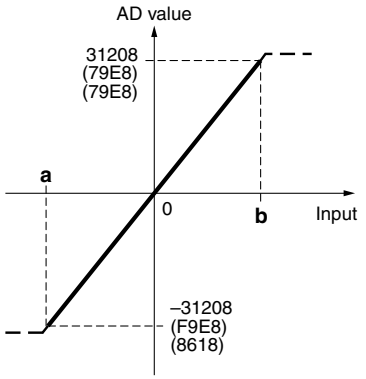
Signed Binary & 2's Complements Data Format



Input signal range	a
0 to 10 V	10 V
0 to 5 V	5 V
0 to 20 mA	20 mA



Input signal range	a	b
1 to 5 V	1 V	5 V
4 to 20 mA	4 mA	20 mA



Input signal range	a	b
–10 to 10 V	–10 V	10 V
–5 to 5 V	–5 V	5 V
–20 to 20 mA	–20 mA	20 mA

Regarding AD value

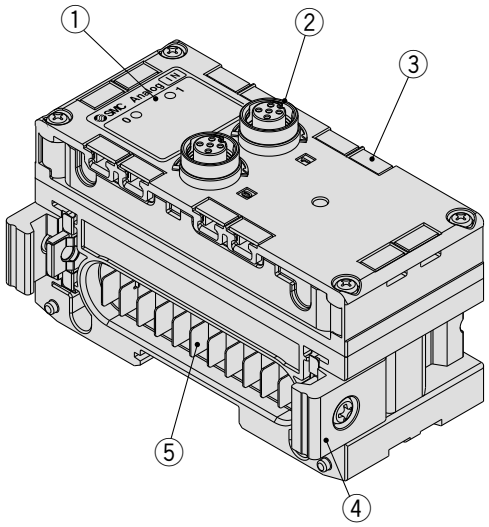
In the above graph, 3 AD values are explained as below.

–31208 : AD value [Decimal value]

(F9E8): Signed Binary type [Hexadecimal value]

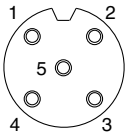
(8618) : 2's complements [Hexadecimal value]

Parts Description



No.	Description
1	**Status indication LED**
2	**Connector (Analog input)**
3	**Marker groove**
4	**Joint bracket**
5	**Connector for unit (Plug)**

Connector (Analog Input) Pin Assignment

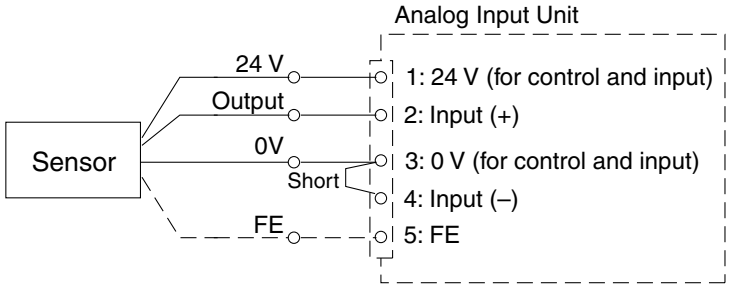


Pin No.	Signal name
1	24 V (for control/input)
2	Input +
3	0 V (for control/input)
4	Input –
5	FE

When connecting analogue input device, wiring method differs depending on which type of sensor is used. Refer to below diagram for wiring method example.

Especially when connecting [3-wire output type sensor] and [2-wire current output type sensor], short the pin no 3 and the pin no 4. Otherwise, it will not be correctly detected.

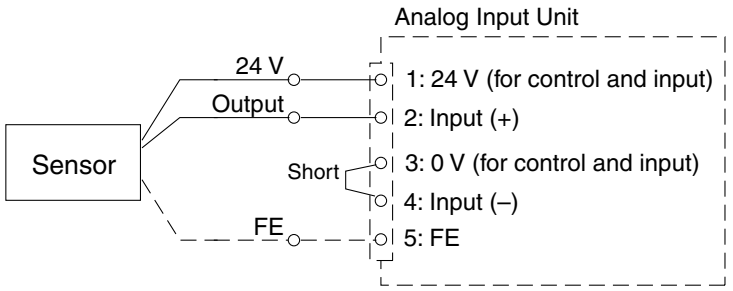
When 3-wire output type sensor is used



Compatible SMC Products

Pressure sensor: Series PSE53□
Series PSE54□
Series PSE550
Series PSE56□
Flow sensor: Series PFM5□
Series PFMV5□
Series PF2A5□
Series PF2D5□
Series PF2W5□

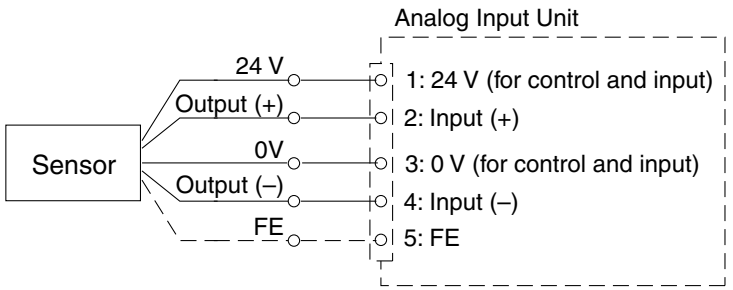
When 2-wire current output type sensor is used



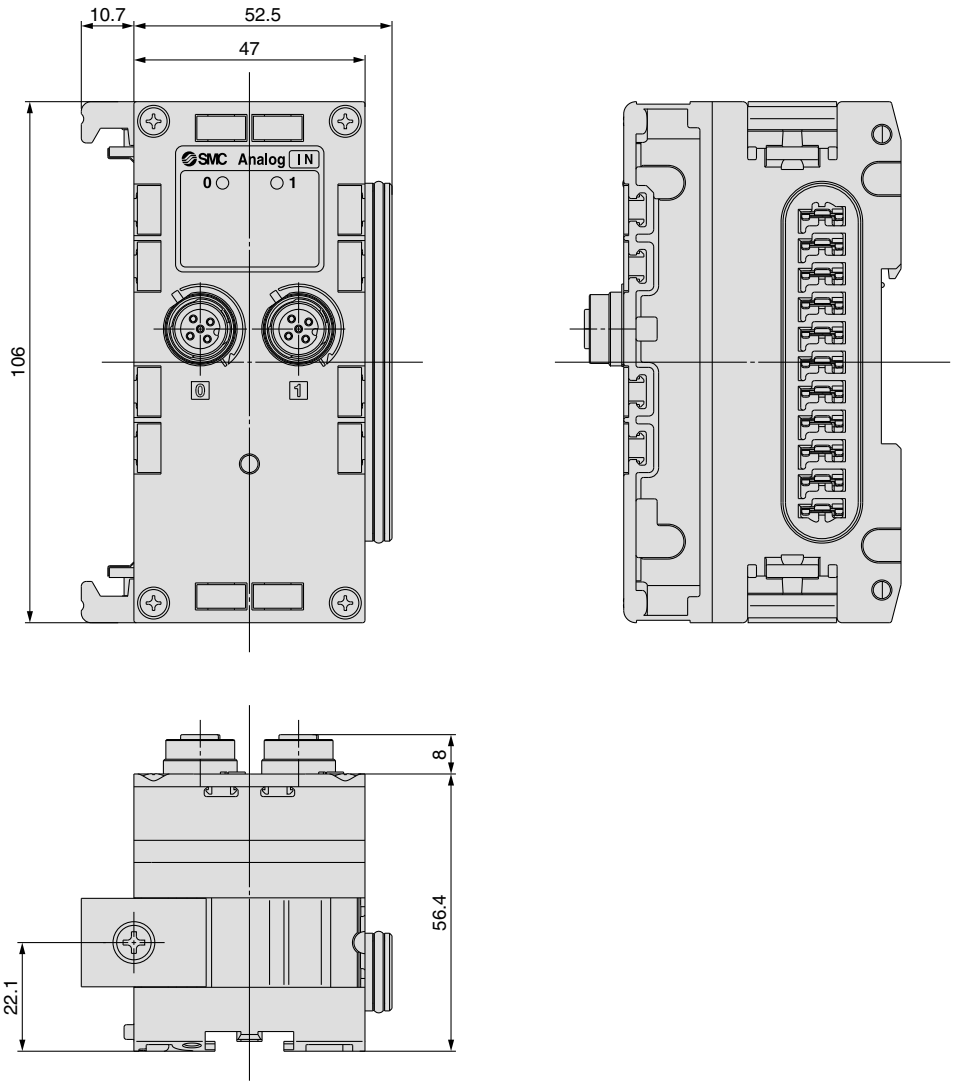
Compatible SMC Products

Pressure sensor: Series PSE550-28
Series PSE56□-□-28

When 4-wire output type sensor is used



Dimensions



End Plate

EX600-ED2 EX600-ED3

How to Order

EX600 – ED 3 – 2

End Plate on D side

Connector

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

Mounting method

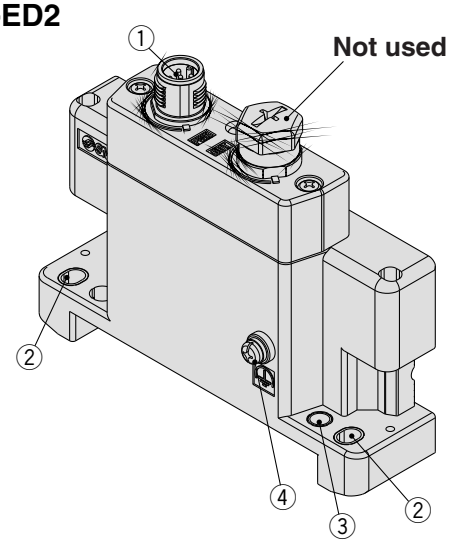
Nil	No DIN rail mounting plate
2	With DIN rail mounting plate for manifold solenoid valve

Specifications

Model		EX600-ED2	EX600-ED3
Input specifications	**Power connector**	M12 (5 pins) plug	7/8 inch (5 pins) plug
	Power supply for control/input	24 VDC ±10% Max. supply current 2 A	24 VDC ±10% Max. supply current 8 A
	Power supply for output	24 VDC +10%/–5% Max. supply current 2 A	24 VDC +10%/–5% Max. supply current 8 A
Environmental resistance	**Enclosure**	IP67 (Manifold assembly)	
	Operating temperature range	–10 to 50°C	
	Operating humidity range	35 to 85% RH (No dew condensation)	
	Withstand voltage	500 VAC for 1 minute between external terminals and FE	
	Insulation resistance	500 VDC, 10 MΩ or more between external terminals and FE	
	Vibration resistance	10 to 57 Hz with constant amplitude of 0.75 mm p-p 57 to 150 Hz with constant acceleration of 49 m/s² for 2 hours in each direction of X, Y and Z direction (During de-energizing)	
	Impact resistance	147 m/s² 3 times in each direction of X, Y and Z (During de-energizing)	
Standards		CE marking, UL (CSA) recognition	
Mass		170 g	175 g

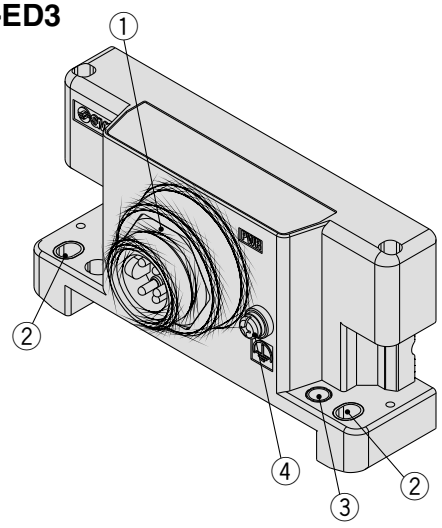
Parts Description

EX600-ED2



No.	Description
1	**Power connector**
2	**Fixing hole for direct mounting**
3	**DIN rail fixing hole**
4	**FE terminal**

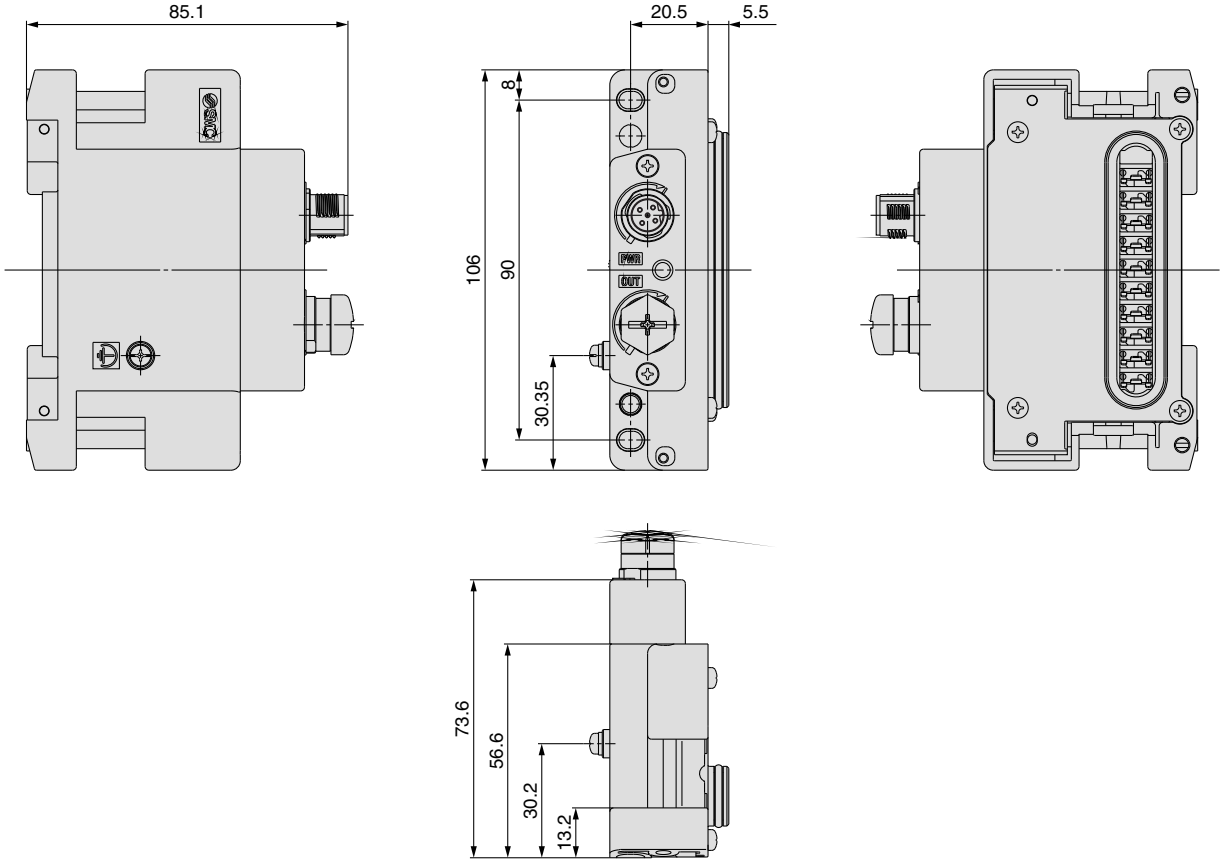
EX600-ED3



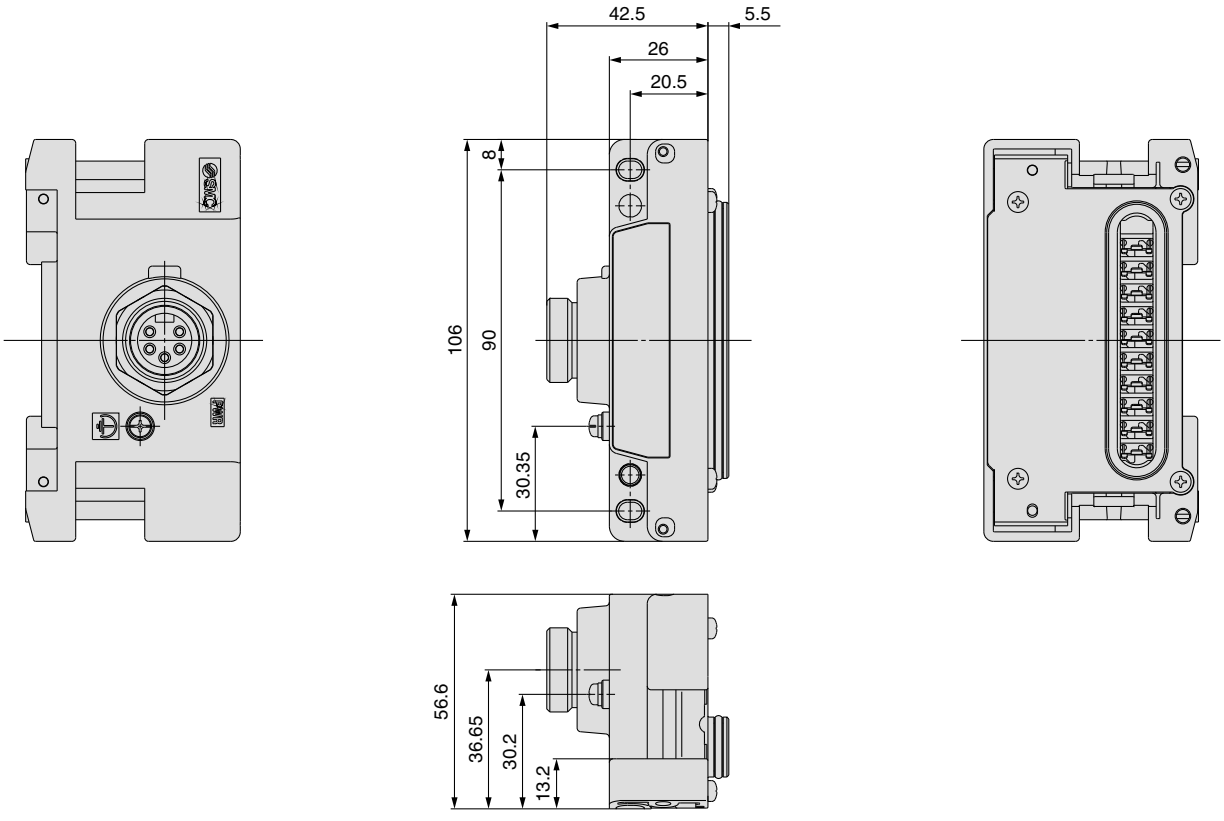
No.	Description
1	**Power connector**
2	**Fixing hole for direct mounting**
3	**DIN rail fixing hole**
4	**FE terminal**

Dimensions

EX600-ED2



EX600-ED3



Handheld Terminal

How to Order

EX600 – HT 1 – 1

- **HT**: Handheld Terminal
- **1**: Cable length for Handheld Terminal

Nil	No cable
1	1 m
3	3 m

● Option

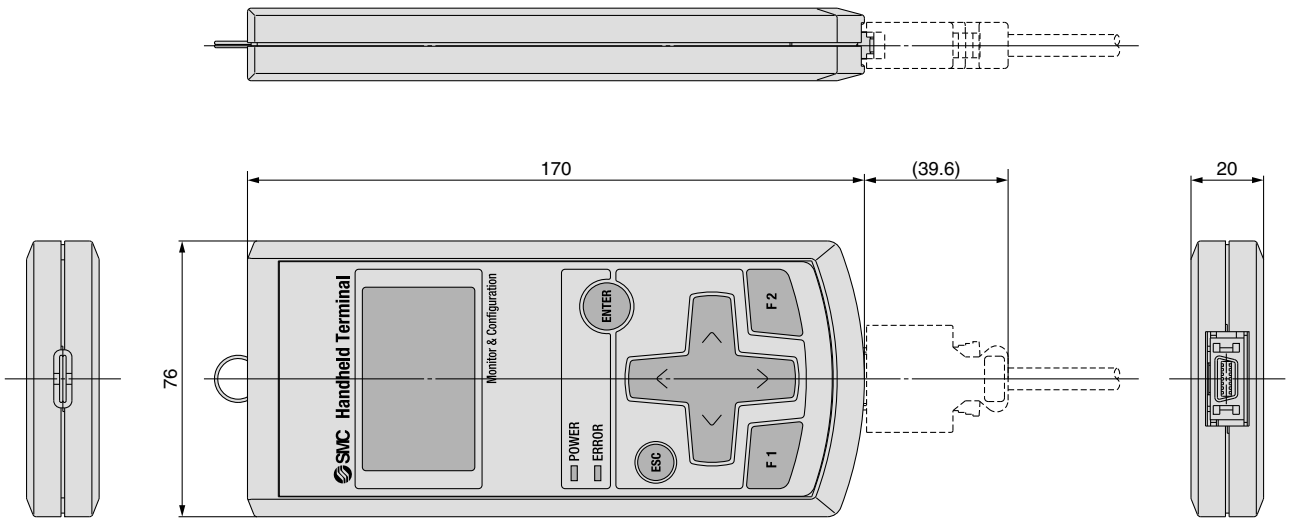
When option item is needed separately, please order using below part number.

Description	Model
Handheld Terminal cable 1 m	**EX600-AC010-1**
Handheld Terminal cable 3 m	**EX600-AC030-1**

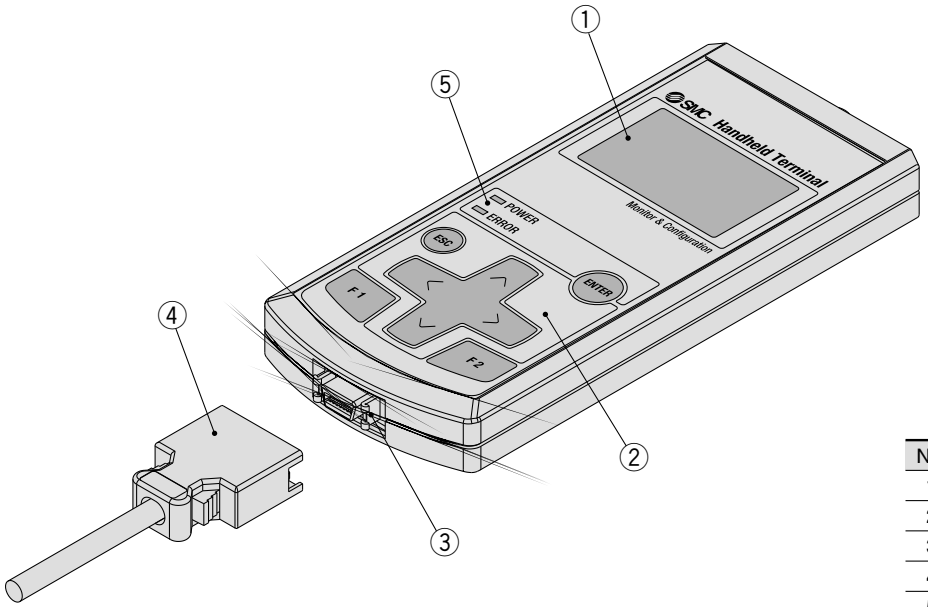
Specifications

Model		EX600-HT1
Communication method		RS232C
Baud rate		9600 bps
Power supply		Power supplied from SI Unit connector (24 VDC)
Current consumption		50 mA or less
Display		LCD with backlight
Resolution		128 x 64 dots
Connector		14-pin connector
Environmental resistance	**Protective structure**	IP20
	Operating temperature	–10 to 50°C
	Operating humidity	35 to 85% RH (No dew condensation)
	Withstand voltage	500 VAC for 1 minute between external terminals and frame
	Insulation resistance	500 VDC, 10 MΩ or more between external terminals and frame
	Vibration resistance	10 to 57 Hz: Constant amplitude 0.75 mm p-p 57 to 150 Hz: Constant acceleration 49 m/s^2 for 2 hours in each direction (During de-energizing)
	Impact resistance	300 m/s^2 3 times for each X, Y, Z direction (During de-energizing)
Standard		CE marking
Mass		160 g

Dimensions

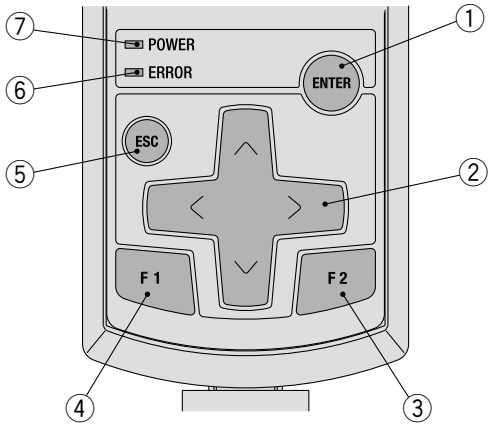


Parts Description



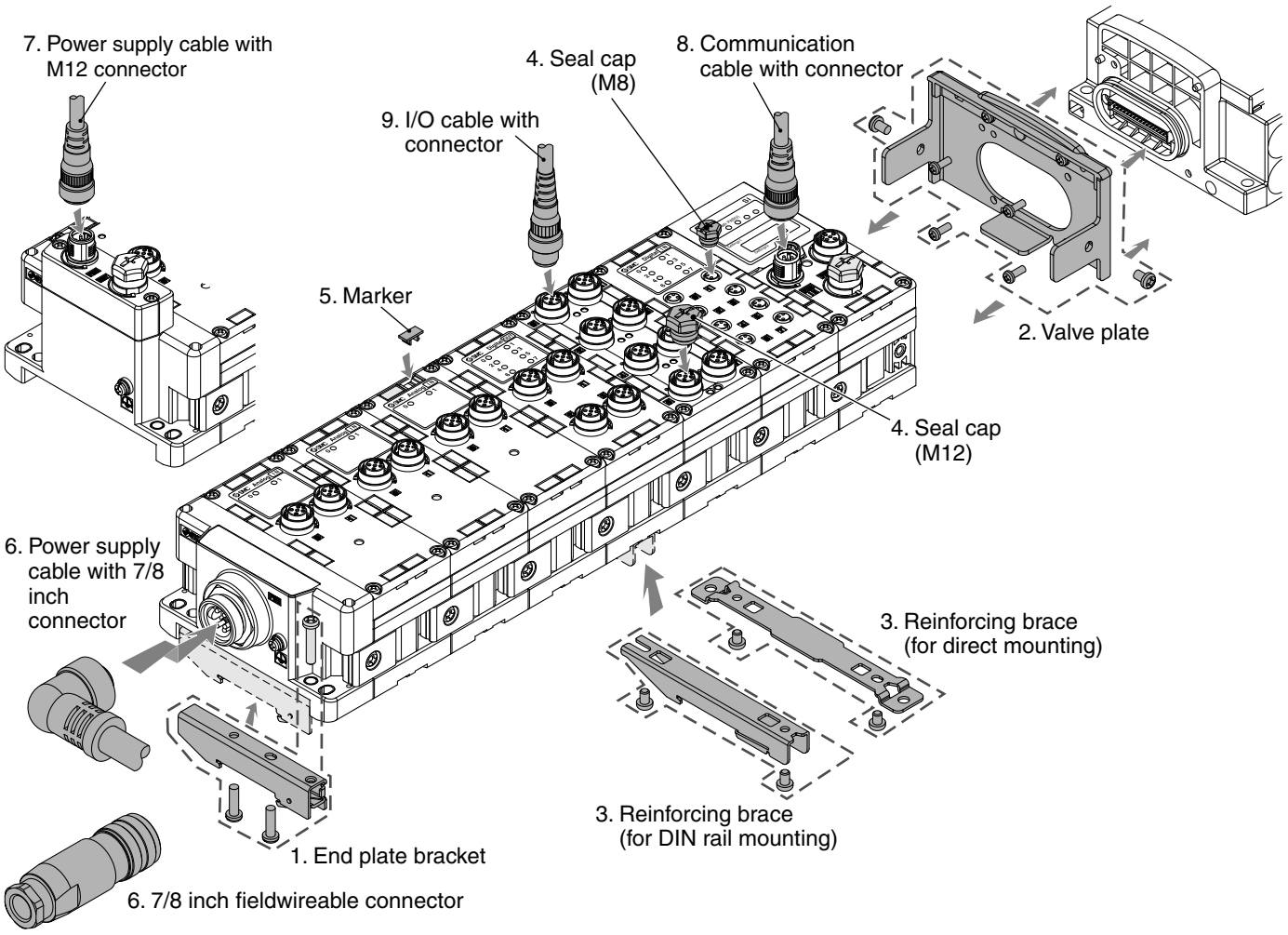
No.	Description
1	**LCD display**
2	**Operation button**
3	**Connector**
4	**Handheld Terminal cable**
5	**Status display LED**

Operation Button and LED Details



No.	Description
1	**ENTER button**
2	**Cursor button**
3	**F2 button**
4	**F1 button**
5	**Escape button**
6	**ERROR status LED**
7	**POWER status LED**

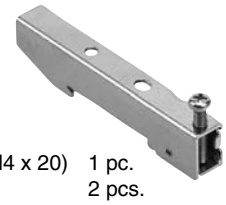
Accessories



1. End plate bracket

This bracket is used for the end plate of DIN rail mounting.

EX600-ZMA2

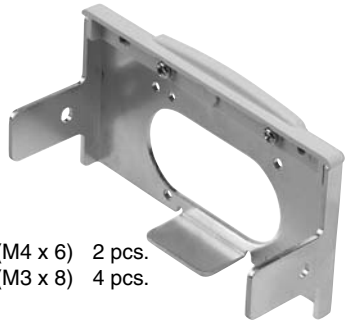


Enclosed parts

Round head screw (M4 x 20)	1 pc.
P-tight screw (4 x 14)	2 pcs.

2. Valve plate

EX600-ZMV1



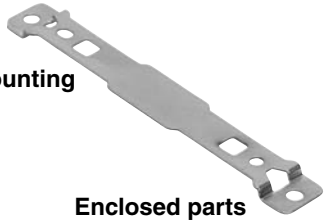
Enclosed parts

Round head screw (M4 x 6)	2 pcs.
Round head screw (M3 x 8)	4 pcs.

3. Reinforcing brace

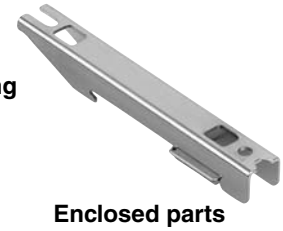
This bracket is used on the bottom of the unit at the intermediate position for connecting 6 or more units.

For direct mounting
EX600-ZMB1



Enclosed parts
Round head screw (M4 x 5) 2 pcs.

For DIN rail mounting
EX600-ZMB2



Enclosed parts
Round head screw (M4 x 6) 2 pcs.

4. Seal cap (10 pcs.)

The seal cap needs to be placed the unused I/O connector. The specified protection cannot be maintained.

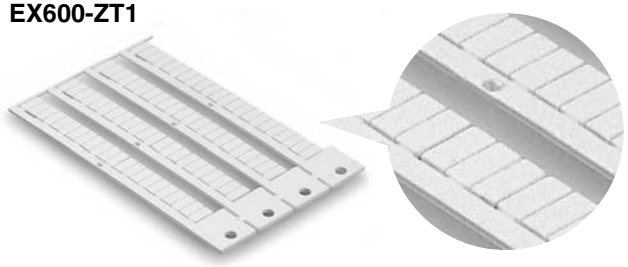
EX9-AWES
For M8

EX9-AWTS
For M12

5. Marker (1 sheet, 88 pcs.)

The signal name of I/O device and each unit address can be entered and mounted on each unit.

EX600-ZT1



6. 7/8 inch connector and its related parts

• **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-1558797	Plug
PCA-1558807	Socket

■ SPEEDCON and its related parts

7. Power supply cable with M12 connector (5 pins B-coded)

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 A-coded for a normal type and B-coded for a reverse type is used as a connector shape respectively.

8. Communication cable with connector / Communication connector

The communication cable with connector and communication connector available to this series are found in page 43 through to 46.

9. I/O cable with connector / I/O connector

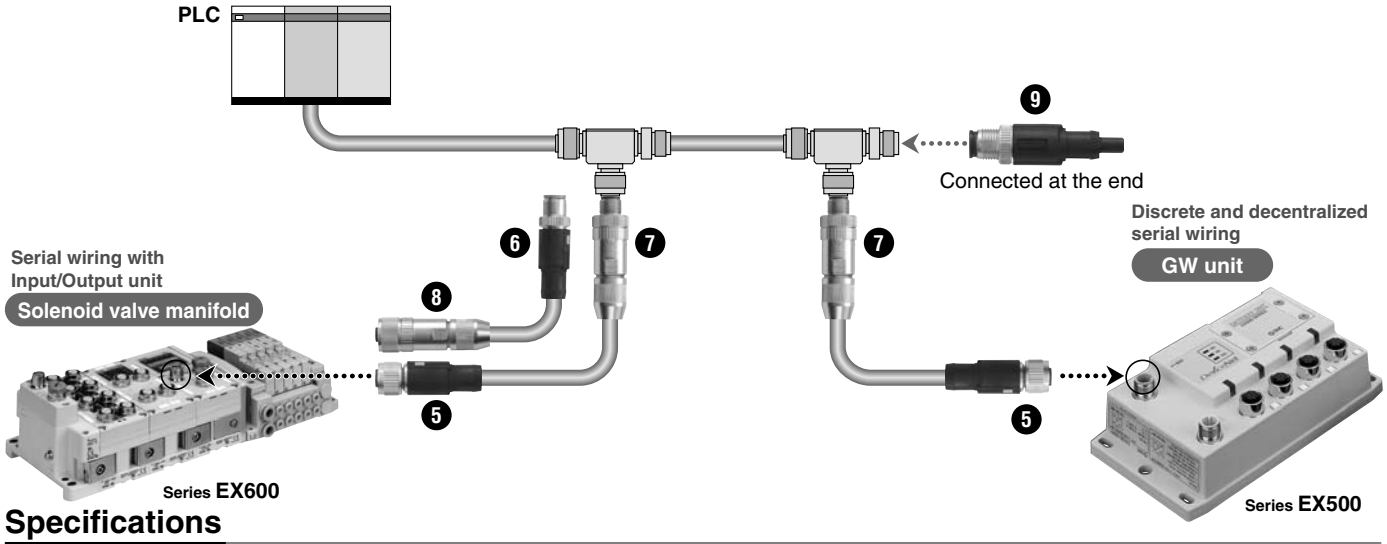
The I/O cable with connector and I/O connector available to this series are found in page 47 through to 49.

Communication Cable/Connector

M12

DeviceNet™

Example of Connection



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			5 SPEEDCON Socket	6 SPEEDCON Plug	7 Plug	8 Socket	9 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 121 Ω 5: CAN L
Wiring specifications Note)	Fixed cable length		5 m		—		
	Cable O.D.		6.70 ±0.3 mm		Applicable cable	4.0 to 8.0 mm	—
	Wire gauge (Stranded wire cross section)	Power pair	0.33 mm²/AWG22			0.14 to 0.5 mm²/AWG26 to 20	—
		Data pair	0.2 mm²/AWG24				
	Wire outer diameter (Including insulating material)	Power pair	1.4 ±0.05 mm		—		
		Data pair	2.05 ±0.10 mm				
	Connection type		—		Spring-cage connection		—
Rating/Performance	Rated current		4 A				—
	Rated voltage		48 V				
	Contact resistance		≤5 mΩ				
	Insulation resistance		≥100 MΩ				—
	Withstand voltage		1.0 kV				—
	Ambient temperature	Connector	–25 to 90°C		–40 to 85°C		–25 to 90°C
		Cable: Operating	–20 to 75°C		—		
		Cable: Fixed	–40 to 80°C		—		
	Protection class		IP67 (Only with screw tightened)				
	Allowable repeated insertion/withdrawal		200				
	Cable retaining force		150 N/15 sec.		—		
	Vibration resistance		10 to 500 Hz/98 m/s²				
Material	Material of knurl		Zinc for die casting		Brass		Zinc for die casting
	Contact (Surface treatment)		CuSn (Au plating (Ni plating))				
	Insulating material		Thermoplastic polyurethane (TPU)		Polyamide (PA6.6)		Thermoplastic polyurethane (TPU)
	Material of sheath		Polyurethane (PUR)		—		
Weight (Mass)			Approx. 308 g	Approx. 306 g	Approx. 47 g	Approx. 53 g	Approx. 12 g

Note) The shaded parts show the specifications for the applicable cable. Adaptation for the connector may vary on account of the conductor construction of the electric wire.

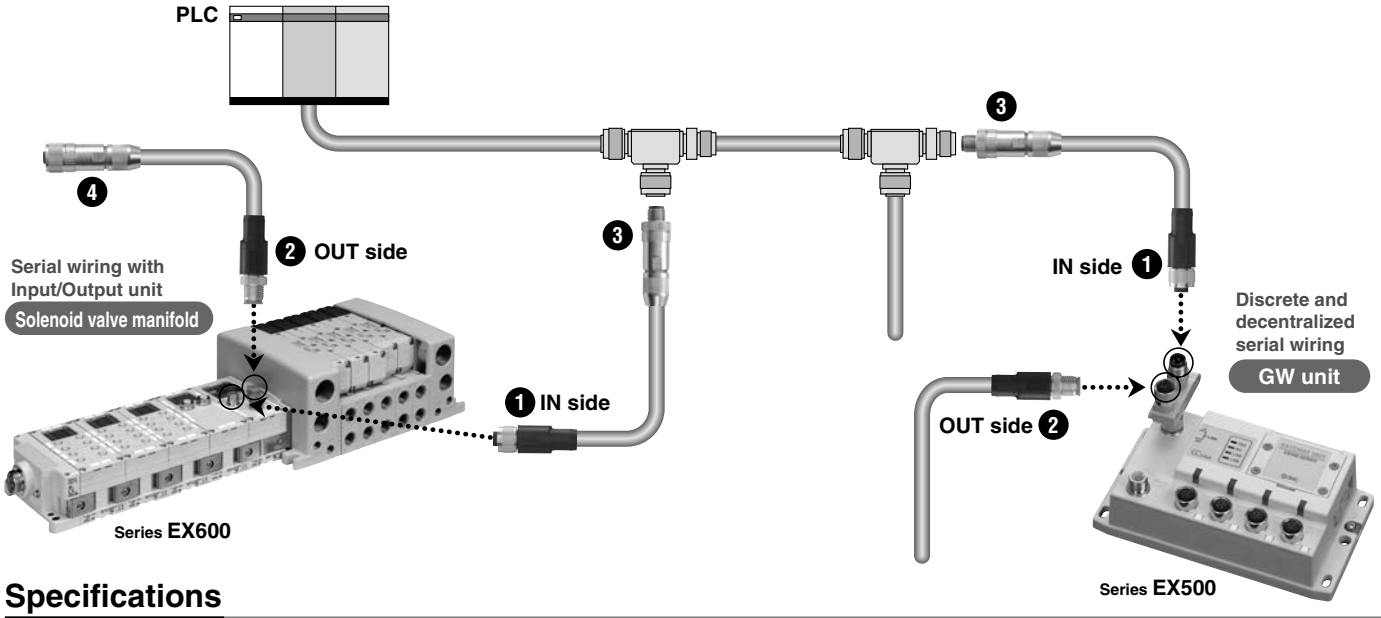
SMC

Communication Cable/Connector

M12

CC-Link

Example of Connection



Specifications

Description			Communication cable (With one side connector)		Fieldwireable connector	
Part no.			PCA-1567720	PCA-1567717	PCA-1557617	PCA-1557620
Product image			1 SPEEDCON Socket	2 SPEEDCON Plug	3 Plug	4 Socket
Number of functional poles			M12: 4 poles			
Key type			A-coded (Normal key)			
Pin assignment			Plug, A-coded / Socket, A-coded (Viewed from the plug/socket side)		1: SLD (Shield wire) 2: DB (White) 3: DG (Yellow) 4: DA (Blue)	
Wiring specifications Note)	Fixed cable length		5 m		—	
	Cable O.D.		7.7 ±0.3 mm		Applicable cable	4.0 to 8.0 mm
	Wire gauge (Stranded wire cross section)		0.5 mm²/AWG20			0.14 to 0.5 mm²/AWG26 to 20
	Wire outer diameter (Including insulating material)		2.55 ±0.07 mm		—	
	Connection type		—		Spring-cage connection	
Rating/Performance	Rated current		4 A			
	Rated voltage		250 V		48 V	
	Contact resistance		≤5 mΩ			
	Insulation resistance		≥100 MΩ			
	Withstand voltage		1.4 kV			
	Ambient temperature	Connector	–25 to 90°C		–40 to 85°C	
		Cable: Operating	–20 to 60°C		—	
		Cable: Fixed	–20 to 60°C		—	
	Protection class		IP67 (Only with screw tightened)			
	Allowable repeated insertion/withdrawal		200			
	Cable retaining force		150 N/15 sec.		—	
	Vibration resistance		10 to 500 Hz/98 m/s²			
Material	Material of knurl		Zinc for die casting		Brass	
	Contact (Surface treatment)		CuSn (Au plating (Ni plating))			
	Insulating material		Thermoplastic polyurethane (TPU)		Polyamide (PA6.6)	
	Material of sheath		Polyvinyl chloride (PVC)		—	
Weight (Mass)			Approx. 306 g	Approx. 308 g	Approx. 48 g	Approx. 53 g

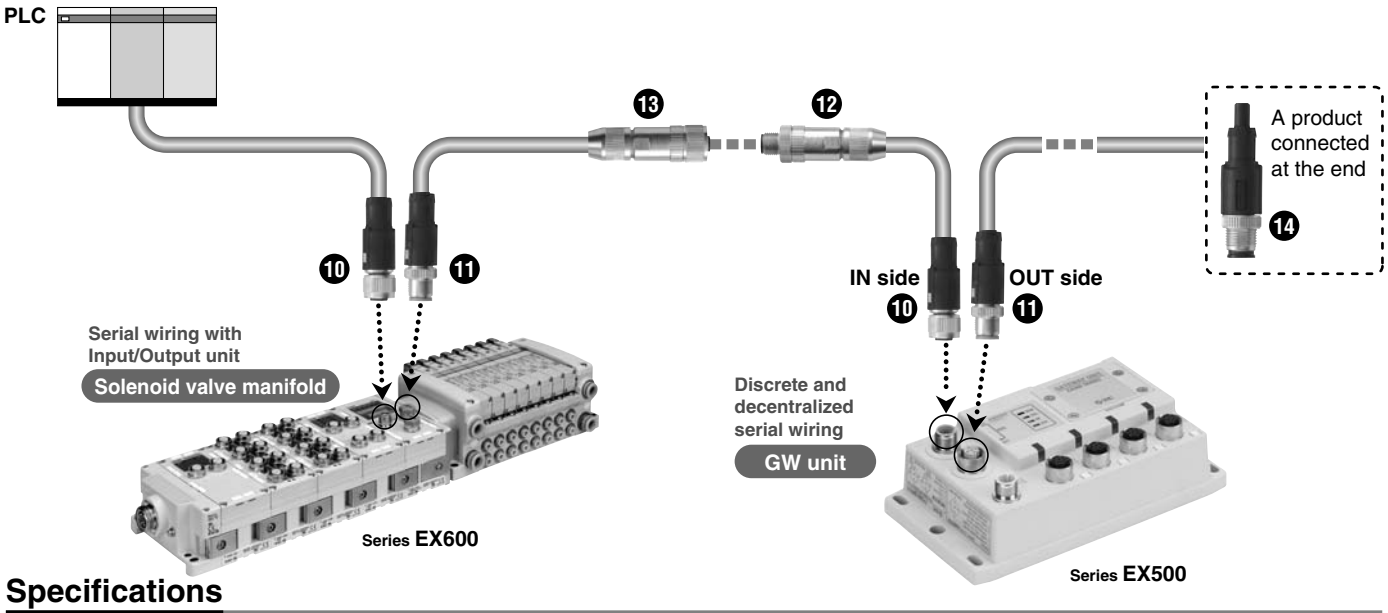
Note) The shaded parts show the specifications for the applicable cable. Adaptation for the connector may vary on account of the conductor construction of the electric wire.

Communication Cable/Connector

M12

PROFIBUS PROCESS FIELD BUS

Example of Connection



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			⓾ SPEEDCON Socket	⓫ SPEEDCON Plug	⓬ Plug	⓭ Socket	⓮ 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: — 2: A Line (Green) 3: — 4: B Line (Red) 5: —
							1: VP 4: B Line 2: A Line 3: DGND (390 Ω, 220 Ω, 390 Ω)
Wiring specifications (Note)	Fixed cable length		5 m		—		
	Cable O.D.		7.80 ±0.2 mm		Applicable cable: 4.0 to 8.0 mm		—
	Wire gauge (Stranded wire cross section)		0.34 mm²/AWG22		Applicable cable: 0.14 to 0.5 mm²/AWG26 to 20		—
	Wire outer diameter (Including insulating material)		2.55 ±0.07 mm		—		
	Connection type		—		Spring-cage connection		—
Rating/Performance	Rated current		4 A				—
	Rated voltage		60 V		48 V		60 V
	Contact resistance		≤5 mΩ				
	Insulation resistance		≥100 MΩ				—
	Withstand voltage		1.4 kV				—
	Ambient temperature	Connector	–25 to 90°C		–40 to 85°C		–25 to 90°C
		Cable: Operating	–20 to 80°C		—		
		Cable: Fixed	–40 to 85°C		—		
	Protection class		IP67 (Only with screw tightened)				
	Allowable repeated insertion/withdrawal		200				
	Cable retaining force		150 N/15 sec.		—		
	Vibration resistance		10 to 500 Hz/98m/s²				
Material	Material of knurl		Zinc for die casting		Brass		Zinc for die casting
	Contact (Surface treatment)		CuSn (Au plating (Ni plating))				
	Insulating material		Polyamide (PA6.6)				Thermoplastic polyurethane (TPU)
	Material of sheath		Polyurethane (PUR)		—		
Weight (Mass)			Approx. 343 g	Approx. 356 g	Approx. 48 g	Approx. 54 g	Approx. 12 g

Note) The shaded parts show the specifications for the applicable cable. Adaptation for the connector may vary on account of the conductor construction of the electric wire.

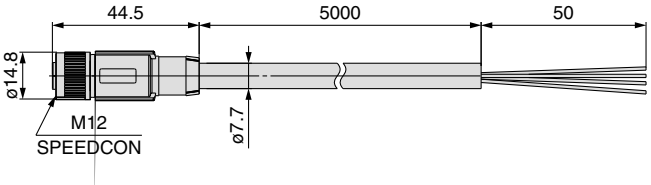
SMC

Dimensions

Communication cable (With one side connector)

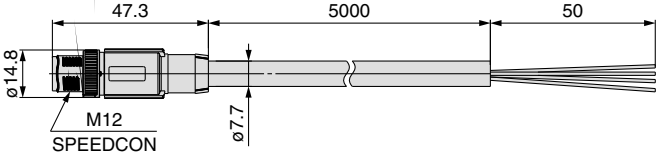
❶ PCA-1567720
For CC-Link
(Socket)

Socket connector pin assignment
A-coded (Normal key)

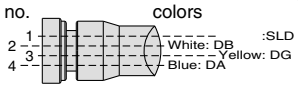


❷ PCA-1567717
For CC-Link
(Plug)

Plug connector pin assignment
A-coded (Normal key)

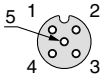


Terminal no. / Cable wire colors

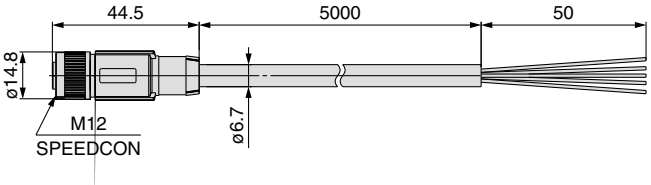


Wiring

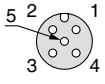
❺ PCA-1557633
For DeviceNet™
(Socket)



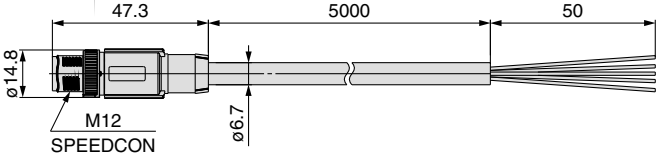
Socket connector pin assignment
A-coded (Normal key)



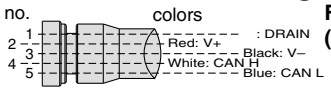
❻ PCA-1557646
For DeviceNet™
(Plug)



Plug connector pin assignment
A-coded (Normal key)

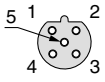


Terminal no. / Cable wire colors

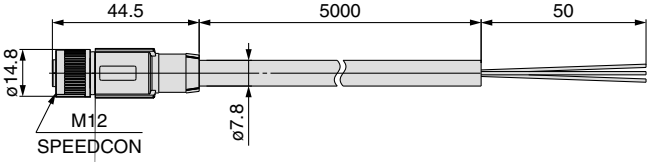


Wiring

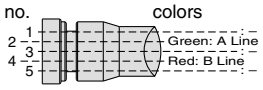
❿ PCA-1557688
For PROFIBUS DP
(Socket)



Socket connector pin assignment
B-coded (Reverse key)



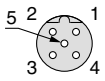
Terminal no. / Cable wire colors



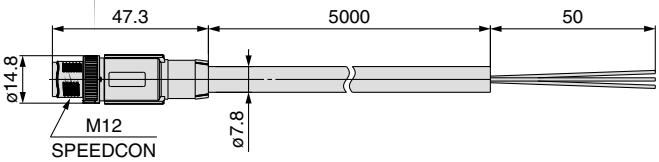
Shield line is connected to the knurl.

Wiring

⓫ PCA-1557691
For PROFIBUS DP
(Plug)



Plug connector pin assignment
B-coded (Reverse key)



Fieldwireable connector

Plug

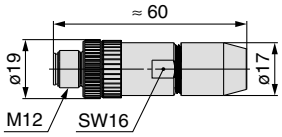
❸ PCA-1557617
For CC-Link

A-coded (Normal key)

❼ PCA-1557659
For DeviceNet™

B-coded (Reverse key)

⓬ PCA-1557701
For PROFIBUS DP



Socket

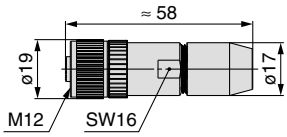
❹ PCA-1557620
For CC-Link

A-coded (Normal key)

❽ PCA-1557662
For DeviceNet™

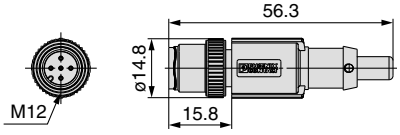
B-coded (Reverse key)

⓭ PCA-1557714
For PROFIBUS DP

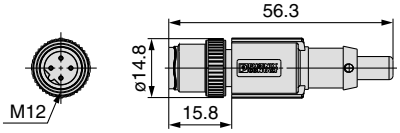


Terminal plug

❾ PCA-1557675
Terminal resistor for DeviceNet™



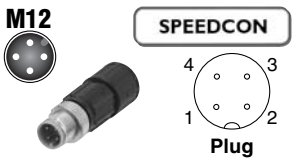
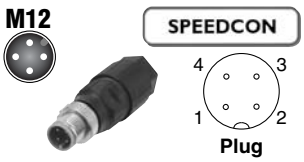
⓮ PCA-1557727
Terminal resistor for PROFIBUS DP



Between Sensor/Switch and Input Device

Fieldwireable Connector

Specifications

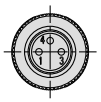
Part no.			PCA-1557730	PCA-1557743	PCA-1557756
Product image/Pin assignment					
Number of functional poles			M8: 3 poles	M12: 4 poles	
Key type			—	A-coded (Normal key)	
Wiring specifications (Note)	Applicable cable	Cable O.D.	3.0 to 5.0 mm	3.5 to 6.0 mm	4.0 to 8.0 mm
		Wire gauge (Stranded wire cross section)	0.14 to 0.25 mm²/AWG26 to 24 0.25 to 0.34 mm²/AWG24 to 22	0.14 to 0.34 mm²/AWG26 to 22	0.34 to 0.75 mm²/AWG22 to 18
		Core wire diameter (Including insulating material)	1.0 to 1.6 mm	0.7 to 1.3 mm	1.3 to 2.5 mm
	Connection type		Piercecon® connection	QUICKON-ONE connection	
Rating/Performance	Rated current		4 A		
	Rated voltage		60 V	250 V	
	Contact resistance		≤5 mΩ		
	Insulation resistance		≥100 MΩ		
	Withstand voltage		1.0 kV	1.4 kV	
	Ambient temperature		–40 to 85°C	–25 to 80°C	
	Protection class		IP67 (Only with screw tightened)		
	Allowable repeated insertion/withdrawal		100	200	
	Allowable number of repeated connection between conductors of the same cross section		10		
	Vibration resistance		10 to 500 Hz/98 m/s²		
Material	Material of knurl		Brass	Zinc for die casting	
	Contact (Surface treatment)		CuZn (Au plating (Ni plating))		
	Insulating material		Polyamide (PA6.6)		
Weight (Mass)			Approx. 14 g	Approx. 13 g	Approx. 15 g

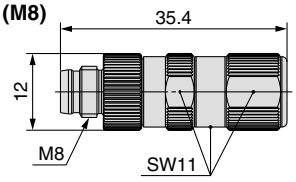
Note) The shaded parts show the specifications for the applicable cable. Adaptation for the connector may vary on account of the conductor construction of the electric wire.

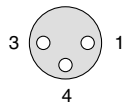
Dimensions

PCA-1557730

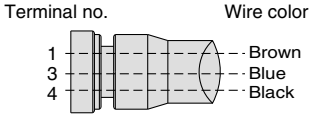
Fieldwireable connector (M8)







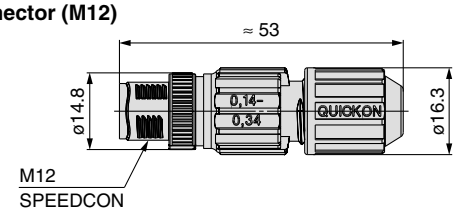
Plug connector pin assignment

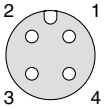


Wiring

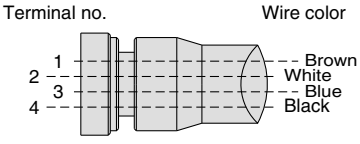
PCA-1557743

Fieldwireable connector (M12)





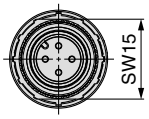
Plug connector pin assignment A-coded (Normal key)

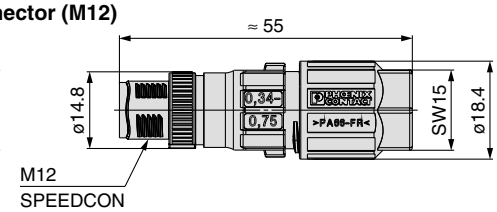


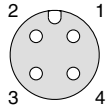
Wiring

PCA-1557756

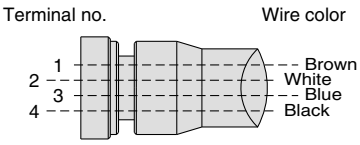
Fieldwireable connector (M12)







Plug connector pin assignment A-coded (Normal key)



Wiring

Between Sensor/Switch and Input Device

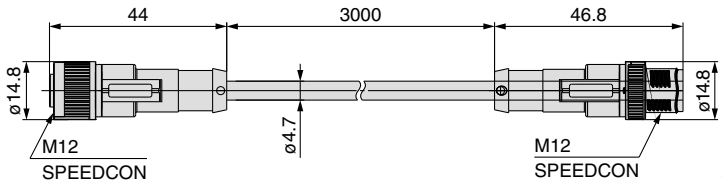
Cable with Connector

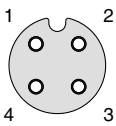
Specifications

Part no.				PCA-1557769	PCA-1557772
Product image					
Number of functional poles				M12: 4 poles	M8: 3 poles
Key type				A-coded (Normal key)	—
Wiring specifications	Fixed cable length			3 m	
	Cable O.D.			4.7 ±0.15 mm	4.4 ±0.15 mm
	Wire gauge (Stranded wire cross section)			0.34 mm²/AWG22	0.25 mm²/AWG24
Rating/Performance	Rated current			4 A	
	Rated voltage			250 V	60 V
	Contact resistance			≤5 mΩ	
	Insulation resistance			≥100 MΩ	
	Withstand voltage			1.4 kV	1.0 kV
	Ambient temperature	Connector		–25 to 90°C	
		Cable	Operating	–5 to 80°C	
			Fixed	–40 to 80°C	
	Protection class			IP67 (Only with screw tightened)	
	Allowable repeated insertion/withdrawal			200	
	Cable retaining force			150 N/15 sec.	250 N/15 sec.
	Vibration resistance			10 to 500 Hz/98 m/s²	
Material	Material of knurl			Zinc for die casting	
	Contact (Surface treatment)			CuSn (Au plating (Ni plating))	
	Insulating material			Thermoplastic polyurethane (TPU)	
	Material of sheath			Polyurethane Black (PUR Black)	
Weight (Mass)				Approx. 111 g	Approx. 80 g

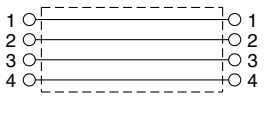
Dimensions

PCA-1557769
Cable with M12 connector (4 poles)

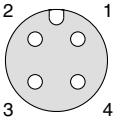




Socket connector pin assignment A-coded (Normal key)

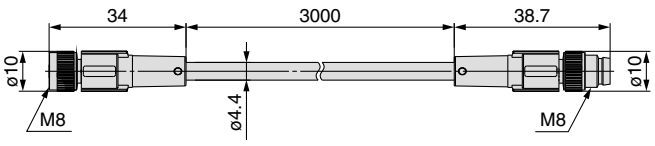


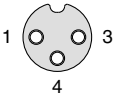
Wiring



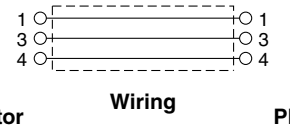
Plug connector pin assignment A-coded (Normal key)

PCA-1557772
Cable with M8 connector (3 poles)

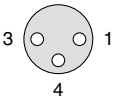




Socket connector pin assignment



Wiring



Plug connector pin assignment

Between Sensor/Switch and Input Device

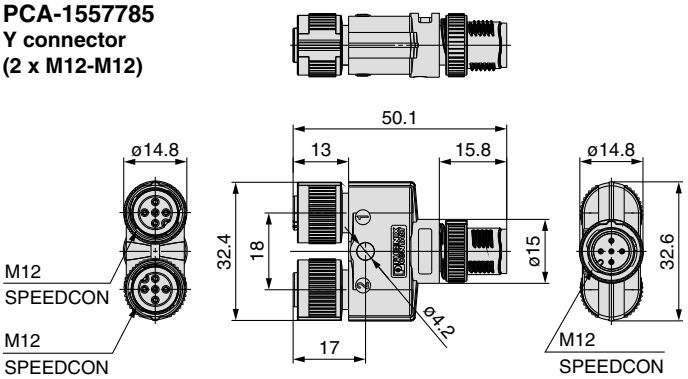
Y Connector

Specifications

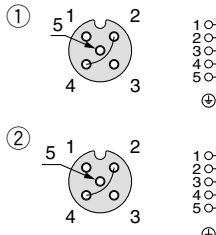
Part no.		PCA-1557785
Product image		
Number of functional poles		2 x M12: 4 poles + PE – M12: 4 poles + PE
Key type		A-coded (Normal key)
Rating/Performance	Rated current	4 A
	Rated voltage	60 V
	Contact resistance	≤5 mΩ
	Insulation resistance	≥100 MΩ
	Withstand voltage	1.0 kV
	Ambient temperature	–25 to 90°C
	Protection class	IP67 (Only with screw tightened)
	Allowable repeated insertion/withdrawal	200
	Vibration resistance	10 to 500 Hz/98 m/s²
Material	Material of knurl	Zinc for die casting
	Contact (Surface treatment)	CuZn (Au plating (Ni plating))
	Insulating material	Thermoplastic polyurethane (TPU)
Weight (Mass)		Approx. 29 g

Dimensions

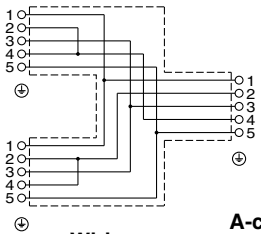
PCA-1557785
Y connector
(2 x M12-M12)



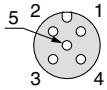
Socket connector pin assignment A-coded (Normal key)



Socket connector pin assignment A-coded (Normal key)



Wiring



Plug connector pin assignment A-coded (Normal key)

Connection image

Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of **"Caution," "Warning"** or **"Danger."** They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC), Japan Industrial Standards (JIS)*1) and other safety regulations*2).

* 1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1992: Manipulating industrial robots -Safety.
JIS B 8370: General rules for pneumatic equipment.
JIS B 8361: General rules for hydraulic equipment.
JIS B 9960-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
JIS B 8433-1993: Manipulating industrial robots - Safety.
etc.
* 2) Labor Safety and Sanitation Law, etc.

⚠ Caution: Operator error could result in injury or equipment damage.

⚠ Warning: Operator error could result in serious injury or loss of life.

⚠ Danger : In extreme conditions, there is a possibility of serious injury or loss of life.

⚠ Warning

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

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

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

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

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

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

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

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

Safety Instructions

⚠Caution

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

Limited Warranty and Disclaimer/Compliance Requirements

The product used is subject to the following “Limited Warranty and Disclaimer” and “Compliance Requirements”. Read and accept them before using the product.

Limited Warranty and Disclaimer

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

∗ **3) Vacuum pads are excluded from this 1 year warranty.**
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

When the product is exported, strictly follow the laws required by the Ministry of Economy, Trade and Industry (Foreign Exchange and Foreign Trade Control Law).

Series EX600
Specific Product Precautions 1

Be sure to read this before handling.
Refer to back pages 1 and 2 for Safety Instructions, "Handling Precautions for SMC Products" (M-E03-3) for 3/4/5 Port Solenoid Valves Precautions.

Design / Selection

⚠Warning

1. Use this product within the specification range.
Using beyond the specified specifications range can cause fire, malfunction, or damage to the system.
Confirm the specifications when operating.

2. When using for an interlock circuit:
- **Provide a multiple interlock system which is operated by another system (such as mechanical protection function).**
- **Perform an inspection to check that it is working properly.**

This may cause possible injury due to malfunction.

⚠Caution

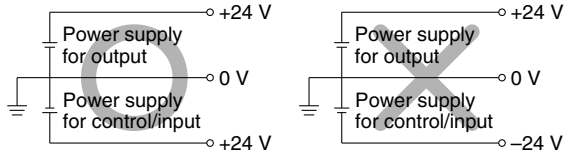
1. Use the UL-certified products below for combined direct current power supply.
(1) Circuit in which voltage and current are controlled in accordance with UL508
Circuit which makes the winding wire in the secondary side of the insulation transformer (which meets the following conditions) to be as the power supply
- Maximum voltage (with no load):
  30 Vrms (42.4 V at peak) or less
- Maximum current:
  1. 8 A or less (including short-circuited)
  2. and in case of being controlled by circuit protection devices (fuse, etc) which meets the below rated voltages.

Voltage with no load (V peak)	Maximum rated current
0 to 20 (V)	5.0
Exceeding 20 (V) up to 30 (V)	$\frac{100}{\text{Voltage figure at peak}}$

(2) Class 2 power supply unit in accordance with UL1310 or circuit (Class 2 circuit) in accordance with UL1585, that is powered by Class 2 transformer with the maximum of 30 Vrms (42.4 V at peak)

2. Use this product within the specified voltage range.
Using beyond the specified voltage range is likely to cause the units and connecting devices to be damaged or to malfunction.

3. The power supply for the unit should be 0 V as the standard for both power supply for output as well as power supply for control/input.



4. Do not install a unit in a place where it can be used as a foothold.
Applying any excessive load such as stepping on the unit by mistake or placing a foot on it, will cause it to break.

5. Keep the surrounding space free for maintenance.
When designing a system, take into consideration the amount of free space needed for performing maintenance.

6. Do not remove the name plate.
Improper maintenance or incorrect use of instruction manual can cause failure and malfunction. Also, there is a risk of losing conformity with safety standards.

7. Beware of inrush current when the power supply is turned on.
Some connected loads can apply an initial charge current which will trigger the over current protection function, causing the unit to malfunction.

Mounting

⚠Caution

1. When handling and assembling units:
- **Do not touch the sharp metal parts of the connector or plug.**
- **Do not apply excessive force to the unit.**
  The connecting portions of the unit are firmly joined with seals.
- **When joining units, take care not to get fingers caught between units.**
  Injury can result.

2. Do not drop, bump, or apply excessive impact.
Otherwise, the unit can become damaged, malfunction, or fail to function.

3. Observe the tightening torque range.
Tightening outside of the allowable torque range will likely damage the product.
IP67 protection class cannot be guaranteed if the screws are not tightened to the specified torque.

4. When lifting a large size manifold solenoid valve unit, take care to avoid causing stress to the valve connection joint.
The connection parts of the unit may be damaged.
Because the unit may be heavy, carrying and installation should be performed by more than one operator to avoid strain or injury.

5. When placing a manifold, mount it on a flat surface.
Torsion in the whole manifold can lead to trouble such as air leakage or defective insulation.

Wiring

⚠Caution

1. Confirm grounding to maintain the safety of the reduced wiring system and for anti-noise performance.
Provide a specific grounding as close to the unit as possible to minimize the distance to grounding.

2. Avoid repeatedly bending or stretching the cable and applying a heavy object or force to it.
Wiring applying repeated bending and tensile stress to the cable can break the circuit.

3. Avoid miswiring.
If miswired, there is a danger of malfunction or damage to the reduced wiring system.

4. Do not wire while energizing the product.
There is a danger of malfunction or damage to the reduced wiring system or input/output equipment.

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Series EX600
Specific Product Precautions 2

Be sure to read this before handling.
Refer to back pages 1 and 2 for Safety Instructions, "Handling Precautions for SMC Products" (M-E03-3) for 3/4/5 Port Solenoid Valves Precautions.

Wiring

⚠Caution

5. Avoid wiring the power line and high pressure line in parallel.

Noise or surge produced by signal line resulting from the power line or high pressure line could cause malfunction.
Wiring of the reduced wiring system or input/output device and the power line or high pressure line should be separated from each other.

6. Confirm the wiring insulation.

Defective insulation (contact with other circuits, improper insulation between terminals, etc.) may cause damage to the reduced wiring system or input/output device due to excessive voltage or current.

7. When a reduced wiring system is installed in machinery/equipment, provide adequate protection against noise by using noise filters, etc.

Noise in signal lines may cause malfunction.

8. When connecting wires of input/output device or handheld terminal, prevent water, solvent or oil from entering inside from the connecter section.

This can cause damage, equipment failure or malfunction.

9. Avoid wiring patterns in which excessive stress is applied to the connector.

This may cause malfunction or damage to the unit due to contact failure.

Operating Environment

⚠Warning

1. Do not use in an atmosphere containing an inflammable gas or explosive gas.

Use in such an atmosphere is likely to cause a fire or explosion. This system is not explosion-proof.

⚠Caution

1. Select the proper type of protection according to the environment of operation.

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

1) The units are connected properly with connector.
2) Suitable mounting of each unit and manifold valve.
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.
Also, the Handheld Terminal confirms to IP20, so prevent foreign matter from entering inside, and water, solvent or oil from coming in direct contact with it.

Operating Environment

⚠Caution

2. Provide adequate protection when operating in locations such as the following.

Failure to do so may cause damage or malfunction.
The effect of countermeasures should be checked in individual equipment and machine.

1) Where noise is generated by static electricity, etc.
2) Where there is a strong electric field
3) Where there is a danger of exposure to radiation
4) When in close proximity to power supply lines

3. Do not use in an environment where oil and chemicals are used.

Operating in environments with coolants, cleaning solvents, various oils or chemicals may cause adverse effects (damage, malfunction) to the unit even in a short period of time.

4. Do not use in an environment where the product could be exposed to corrosive gas or liquid.

This may damage the unit and cause it to malfunction.

5. Do not use in locations with sources of surge generation.

Installation of the unit in an area around the equipment (electromagnetic lifters, high frequency induction furnaces, welding machine, motors etc.), which generates the large surge voltage could cause to deteriorate an internal circuitry element of the unit or result in damage. Implement countermeasures against the surge from the generating source, and avoid touching the lines with each other.

6. Use the product type that has an integratedsurge absorption element when directly driving a load which generates surge voltage by relay, solenoid valves or lamp.

When a surge generating load is directly driven, the unit may be damaged.

7. The product is CE marked, but not immune to lightning strikes. Take measures against lightning strikes in your system.

8. Keep dust, wire scraps and other extraneous material from getting inside the product.

This may cause malfunction or damage.

9. Mount the unit in such locations, where no vibration or shock is affected.

This may cause malfunction or damage.

10. Do not use in places where there are cyclic temperature changes.

In case that the cyclic temperature is beyond normal temperature changes, the internal unit is likely to be adversely effected.

11. Do not use in direct sunlight.

Do not use in direct sunlight. It may cause malfunction or damage.

12. Use this product within the specified ambient temperature range.

This may cause malfunction.

13. Do not use in places where there is radiated heat around it.

Such a place is likely to cause malfunction.

Series EX600
Specific Product Precautions 3

Be sure to read this before handling.
Refer to back pages 1 and 2 for Safety Instructions, "Handling Precautions for SMC Products" (M-E03-3) for 3/4/5 Port Solenoid Valves Precautions.

Adjustment / Operation

⚠Warning

1. Do not perform operation or setting with wet hands.
There is a risk of electrical shock.

<Handheld Terminal>

2. Do not apply pressure to the LCD display.
There is a possibility of the crack of LCD display and injuring.

3. The forced input/output function is used to change the signal status forcibly. When operating this function, be sure to check the safety of the surroundings and installation.
Otherwise, injury or equipment damage could result.

4. Incorrect setting of parameters can cause malfunction. Be sure to check the settings before use.
This may cause injury or equipment damage.

⚠Caution

1. Use a watchmaker's screwdriver with thin blade for the setting of each switch of the SI unit.
When setting the switch, do not touch other unrelated parts.
This may cause parts damage or malfunction due to a short circuit.

2. Provide adequate setting for the operating conditions.
Failure to do so could result in malfunction.
Refer to the instruction manual for setting of the switches.

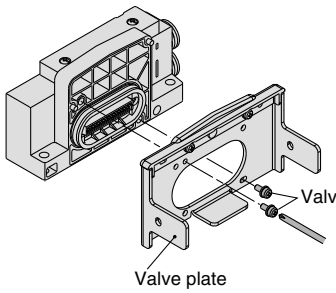
3. For the details of programming and address setting, refer to the manual from the PLC manufacturer.
The content of programming related to protocol is designed by the manufacturer of the PLC used.

<Handheld Terminal>

4. Do not press the setting buttons with a sharp pointed object.
This may cause damage or malfunction.

5. Do not apply excessive load and impact to the setting buttons.
This may cause damage, equipment failure or malfunction.

When the order does not include the SI unit, the valve plate to connect the manifold and SI unit is not mounted. Use attached valve fixing screws and mount the valve plate.
(Tightening torque: 0.6 to 0.7 N·m)



Screw tightened parts
Series SV: 2 places
Series S0700: 2 places
Series VQC1000: 2 places
Series VQC2000: 3 places
Series VQC4000: 4 places

Maintenance

⚠Warning

1. Do not disassemble, modify (including circuit board replacement) or repair this product.
Such actions are likely to cause injuries or breakage.

2. When an inspection is performed,
- **Turn off the power supply.**
- **Stop the air supply, exhaust the residual pressure in piping and verify that the air is released before performing maintenance work.**

Unexpected malfunction of system components and injury can result.

⚠Caution

1. When handling and replacing the unit:
- **Do not touch the sharp metal parts of the connector or plug.**
- **Do not apply excessive force to the unit.**
The connecting portions of the unit are firmly joined with seals.
- **When joining units, take care not to get fingers caught between units.**
Injury can result.

2. Perform periodic inspection.
Unexpected malfunction in the system composition devices is likely to occur due to malfunction of machinery or equipment.

3. After maintenance, make sure to perform an appropriate functionality inspection.
In cases of abnormality such as faulty operation, stop operation. Unexpected malfunction in the system composition devices is likely to occur.

4. Do not use benzene and thinner for cleaning units.
Damage to the surface or erasure of the display can result. Wipe off any stains with a soft cloth.
If the stain is persistent, wipe off with a cloth soaked in a dilute solution of neutral detergent and wrung out tightly, and then finish with a dry cloth.

Other

⚠Caution

1. Refer to the catalog of each series for Common Precautions and Specific Product Precautions on manifold solenoid valves.

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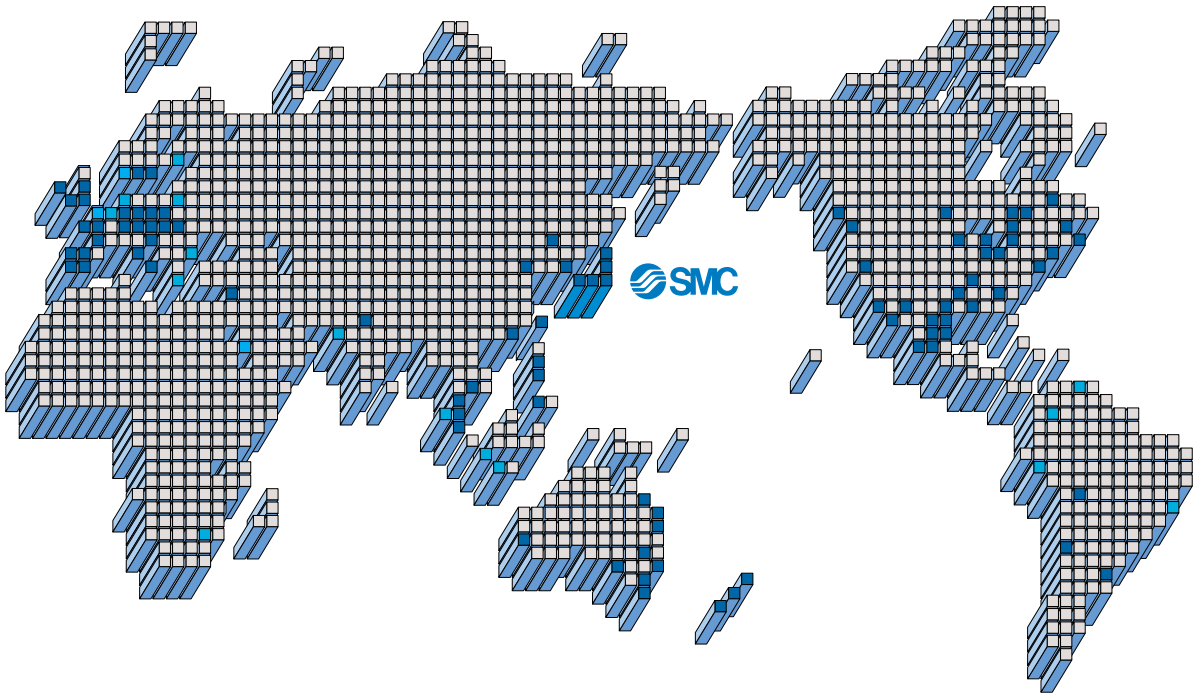
SMC'S GLOBAL MANUFACTURING, DISTRIBUTION AND SERVICE NETWORK



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⚠ Safety Instructions	Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

SMC Corporation

Akihabara UDX 15F,
4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, JAPAN
Phone: 03-5207-8249 Fax: 03-5298-5362
URL http://www.smcworld.com

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