Reduced-wiring Fieldbus System — Applicable Protocols for Units

	Integrated type, for output					
Family model no.	EX120				EX140	EX180
Product part no.	EX120 EX121 EX122	EX123	EX124	EX126		
Page	P.1	P.4	P.4	P.4	P.7	P.9
Basic functions: No. of output points (Max.)	16-point output	16-point output			16-point output	32-point output
Basic functions: No. of input points (Max.)	—	—			—	
Basic functions: Power supply for communications and valves	Common/Separated	Common	Separated		Common/Separated	Separated

	Integrated type, for input/output			Decentralized type (GW system, 4-branch)	
Family model no.	EX240	EX250	EX600	EX500	EX510
Product part no.					
Page	P.12	P.15	P.28	P.54	P.67
Basic functions: No. of output points (Max.)	32-point output		512-point output	64-point output (16-point x 4-branch)	
Basic functions: No. of input points (Max.)	32-point input		512-point input	64-point input (16-point x 4-branch)	
Basic functions: Power supply for communications and valves	Separated	Common/Separated Note)	Separated	Separated	Separated

Complies with the open network (Offered by several manufacturers)	DeviceNet™	
	PROFIBUS DP	
	CC-Link	
	AS-Interface	
	CANopen	
	ControlNet™	
	EtherNet/IP™	
	CompoNet™	
Except the open network	OMRON Corp.	CompoBus/S
	SUNX Corp.	S-LINK
	NKE Corp.	Reduced-wiring system
		Reduced-wiring H system

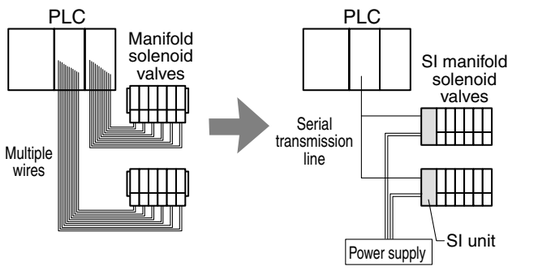
∗ DeviceNet™, CompoNet™ and EtherNet/IP™ are trademarks used under licence by ODVA.
∗ ControlNet™ is a trademark of ControlNet, International, Ltd.
∗ Product names listed in this catalog may be used as a trademark by manufacturers.

Note) 1 power supply system is compatible with some of the AS-Interface models only.

Glossary of terms — Serial transmission system and SI unit

A **serial transmission system** can control multiple solenoid valves by using only the communication line from the PLC's communication module (master module) or it can read the signal from the various sensors. This system can also be called a "Fieldbus system".
Wiring the coil of each solenoid valve, one by one, to the output unit on the PLC is called "Parallel wiring". Each valve in use needs to be connected. Therefore, wiring in accordance with the number of solenoid valves or sensors in use is required.
A **SI unit** is a device which can control the solenoid valve through serial communication.

<Conventional method> <Serial transmission method>



Glossary of terms — Number of outputs, Number of inputs Output compatibility, Input/Output compatibility

Number of outputs is the number of solenoid or output devices that can be controlled.
Number of inputs is the number of various sensors such as an auto switch, pressure switch, etc. that can be connected.
Output refers to the control device for turning on/off the solenoid coil, etc.
Input/Output refers to the ability for ON-OFF control (output) of a solenoid valve, as well as the reading (input) of a sensor signal, such as from an auto switch or pressure switch.

Protocol and Open network

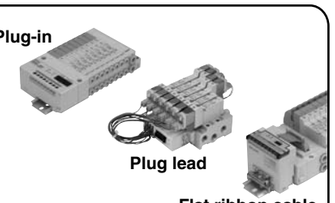
Protocol means the serial data is sent and/or received in accordance with a named specification.
Open network means a standard that has been made public and is widely accepted.

Glossary of terms — Integrated and Decentralized type (GW system)

The **integrated type** means the SI unit and solenoid valve's manifold are integrated. An SI unit is necessary for every protocol.
The **decentralized type** refers to the **GW (Gateway) system**.
From the **Gateway**, the solenoid valve's manifold and the input devices can be located remotely. The replacement of the Gateway enables changing between the various protocols.

Glossary of terms — Valve interface

The **valve interface** is the connection between the SI unit and the solenoid valve's manifold.
Plug-in: The connector on the SI unit and the solenoid valve's manifold directly plug into each other.
Plug lead: The SI unit and the solenoid coil are connected with wires having a connector.
Flat ribbon cable: The SI unit and solenoid valve's manifold are connected together with a flat ribbon cable having a MIL connector.



EX

Applicable Valve Series for Units

Family model no.			Integrated type, for output						Integrated type, for output		Integrated type, for input/output			Decentralized type (GW system, 4-branch)		Family model no.		
			EX120						EX140	EX180	EX240	EX250	EX600	EX500	EX510			
Product part no.			EX120	EX121	EX122	EX123	EX124	EX126								Product part no.		
Basic functions	Enclosure		IP20			IP65		IP67	IP20		IP65	IP67		IP65	IP20	Enclosure		Basic functions
	Operating environment and industry		Usable in locations where it is not exposed to water or dust. Automobile industry, semiconductor industry, etc.			Usable in locations where it may be exposed to water or dust. Automobile industry, machine tool industry, etc.			Usable in locations where it is not exposed to water or dust. Automobile industry, semiconductor industry, etc.		Usable in locations where it may be exposed to water or dust. Automobile industry, machine tool industry, etc.			Usable in locations where it may be exposed to water or dust. Automobile industry, machine tool industry, etc.	Usable in locations where it is not exposed to water or dust. Automobile industry, semiconductor industry, etc.	Operating environment and industry		
	Mounting		Direct	DIN rail		Direct			DIN rail		Direct/DIN rail			Direct/DIN rail	Direct/DIN rail	Mounting		
	Valve interface		Plug-in	Flat ribbon cable	Plug-in	Plug-in			Plug-in		Plug-in			Plug-in	Non plug-in (Plug lead), Flat ribbon cable	Valve interface		
Applicable valves	SV	Stacking type	1000	P.378					P.372				P.366		P.356	1000	Stacking type	SV
			2000	P.378					P.372				P.366		P.356	2000		
			3000	P.378					P.372				P.366		P.356	3000		
			4000	P.378											P.356	4000		
	SZ	Stacking type	3000							P.584					P.588	3000	Stacking type	SZ
	SY	Bar stock type	3000												P.164, 228	3000	Bar stock type	SY
			5000												P.164, 228	5000		
			7000												P.164, 228	7000		
		Stacking type	3000		P.305	P.302									P.264, 312	3000	Stacking type	
			5000		P.305	P.302									P.264, 312	5000		
			9000												P.170, 233	9000		
	SYJ	Bar stock type	3000												P.472, 473	3000	Bar stock type	SYJ
			5000												P.500, 501	5000		
			7000												P.532, 533	7000		
	SJ	Stacking type	2000							P.50					P.58	2000	Stacking type	SJ
			3000							P.50					P.58	3000		
	VQC	Stacking type	1000				P.858				P.858		P.858			1000	Stacking type	VQC
			2000				P.862				P.862		P.862			2000		
			4000				P.866			P.866	P.866		P.866			4000		
	SQ	Stacking type	1000							P.990					P.986	1000	Stacking type	SQ
			2000							P.1010					P.1006	2000		
	VQ	Stacking type	1000	P.726											P.722	1000	Stacking type	VQ
			2000	P.726		P.726	P.726				P.730				P.722	2000		
			4000			P.778	P.778				P.782					4000		
			5000			P.830	P.830									5000		
	VQZ	Bar stock type	1000												P.936, 969	1000	Bar stock type	VQZ
			2000												P.936, 969	2000		
			3000												P.936, 969	3000		
	S0700	Bar stock type	0700												P.662	0700	Bar stock type	S0700
		Stacking type	0700									P.620		P.618		0700	Stacking type	
	VFS	Stacking type	2000			P.1158	P.1158									2000	Stacking type	VFS
			3000			P.1178	P.1178									3000		
			4000			P.1198	P.1198									4000		
			5000			P.1214	P.1214									5000		
Power supply for communications and valves			Common/Separated			Common	Separated	Common										

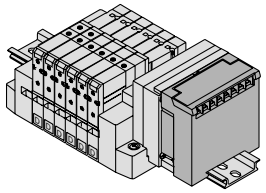
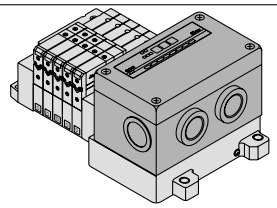
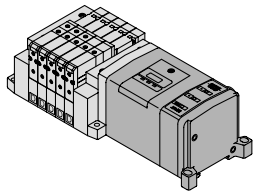
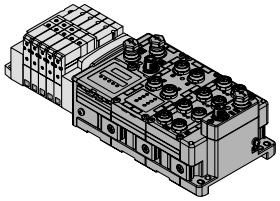
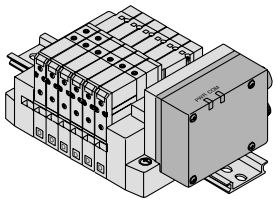
∗ For details about the applicable valves, refer to the pages of each valve.

EX

Applicable Valve Series 1

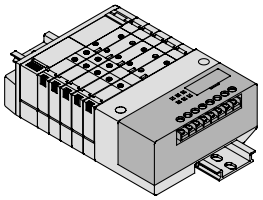
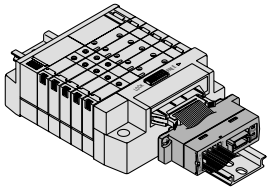
Series SV

● **Plug-in Type**

SI unit		Valve series		How to Order Valves
	**EX120** ▶P.1	**SV1000/2000**	Cassette base	▶P.378
		SV1000/2000/3000/4000	Tie-rod base	▶P.378
	**EX126** ▶P.4	**SV1000/2000/3000**	Tie-rod base	▶P.372
	**EX250** ▶P.15			▶P.366
	**EX600** ▶P.28			Catalog CAT.E02-24
	**EX500** ▶P.54	**SV1000/2000**	Cassette base	▶P.356
		SV1000/2000/3000/4000	Tie-rod base	▶P.356

Series SZ

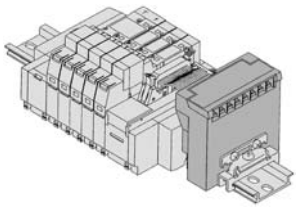
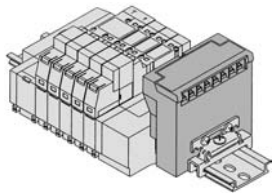
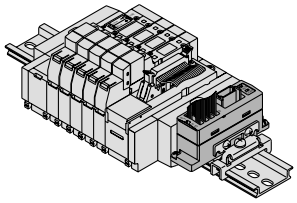
● **Plug-in Type**

SI unit		Valve series		How to Order Valves
	**EX140** ▶P.7	**SZ3000**	Body ported	▶P.584
	**EX510** ▶P.67			▶P.588

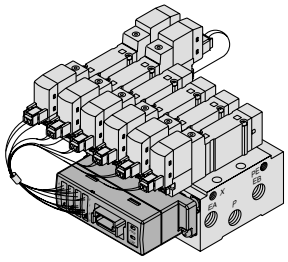
Applicable Valve Series 2

Series SY

● Plug-in Type

SI unit		Valve series		How to Order Valves
	**EX121** ▶P.1	**SY3000/5000**	Base mounted Stacking type SI unit separate type	▶P.305
	**EX122** ▶P.1		Base mounted Stacking type SI unit integrated type	▶P.302
	**EX510** ▶P.67		Base mounted Stacking type	▶P.312

● Non Plug-in Type (Plug Lead Type)

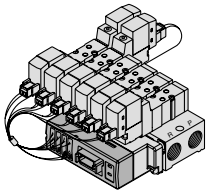
SI unit		Valve series		How to Order Valves
	**EX510** ▶P.67	**SY3000/5000/7000**	Body ported Bar stock type	▶P.164
			Base mounted Bar stock type	▶P.228
		SY3000/5000	Base mounted Stacking type	▶P.264
		SY9000	Body ported Stacking type	▶P.170
			Base mounted Stacking type	▶P.233

EX

Applicable Valve Series 3

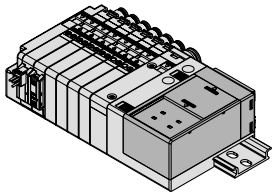
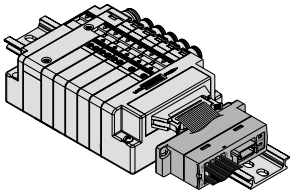
Series SYJ

● Non Plug-in Type (Plug Lead Type)

SI unit		Valve series		How to Order Valves
	**EX510** ▶P.67	**SYJ3000/5000/7000**	Body ported	▶P.472, 500, 532
			Base mounted	▶P.473, 501, 533

Series SJ

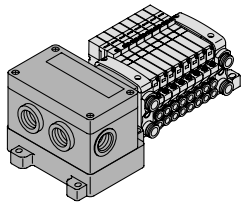
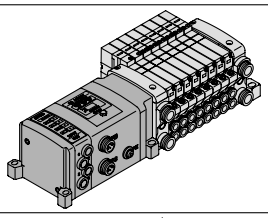
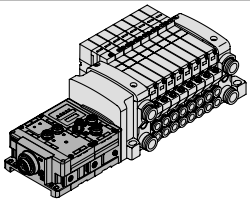
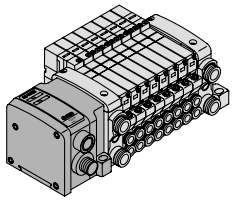
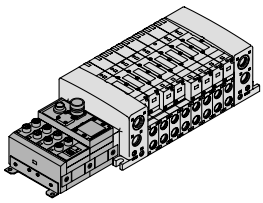
● Plug-in Type

SI unit		Valve series		How to Order Valves
	**EX180** ▶P.9	**SJ2000/3000**	Body ported	▶P.50
	**EX510** ▶P.67			▶P.58

Applicable Valve Series 4

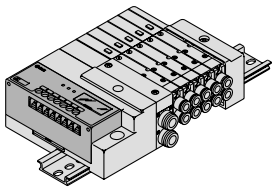
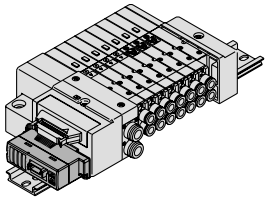
Series VQC

● **Plug-in Type**

SI unit		Valve series		How to Order Valves
	**EX126** ▶P.4	**VQC1000/2000/4000**	Base mounted	▶P.858, 862, 866
	**EX250** ▶P.15			▶P.858, 862, 866
	**EX600** ▶P.28			Catalog CAT.ES11-101
	**EX500** ▶P.54			▶P.858, 862, 866
	**EX240** ▶P.12	**VQC4000**		▶P.866

Series SQ

● **Plug-in Type**

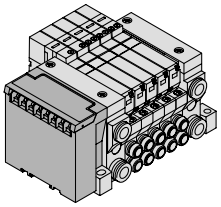
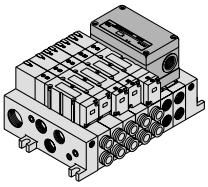
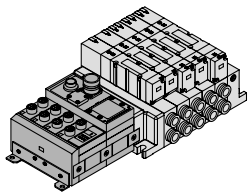
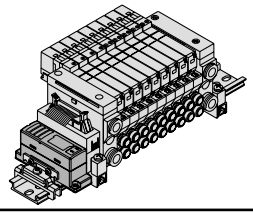
SI unit		Valve series		How to Order Valves
	**EX140** ▶P.7	**SQ1000/2000**	Body ported	▶P.990, 1010
	**EX510** ▶P.67			▶P.986, 1006

EX

Applicable Valve Series 5

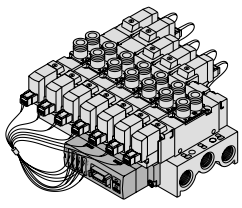
Series VQ

● Plug-in Type

SI unit		Valve series		How to Order Valves
	**EX120** ▶P.1	**VQ1000/2000**	Base mounted	▶P.726
	**EX123** **EX124** ▶P.4	**VQ2000/4000/5000**	Base mounted IP65-compliant	▶P.726, 778, 830
	**EX240** ▶P.12	**VQ2000/4000**		▶P.730, 782
	**EX510** ▶P.67	**VQ1000/2000**	Base mounted	▶P.722

Series VQZ

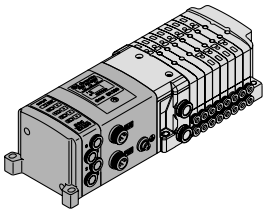
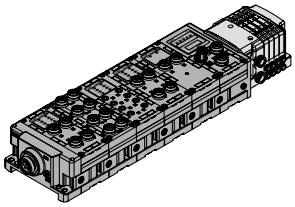
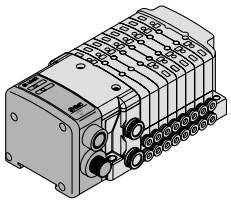
● Non Plug-in Type (Plug Lead Type)

SI unit		Valve series		How to Order Valves
	**EX510** ▶P.67	**VQZ1000/2000/3000**	Body ported	▶P.936
			Base mounted	▶P.969

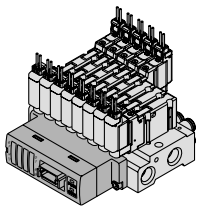
Applicable Valve Series 6

Series S0700

● Plug-in Type

SI unit		Valve series		How to Order Valves
	**EX250** ▶P.15	**S0700**	Base mounted	▶P.620
	**EX600** ▶P.28			Catalog CAT.ES11-88
	**EX500** ▶P.54			▶P.618

● Non Plug-in Type (Plug Lead Type)

SI unit		Valve series		How to Order Valves
	**EX510** ▶P.67	**S0700**	Base mounted	▶P.662

EX

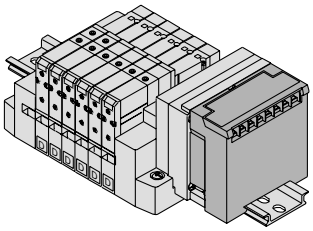
Reduced-wiring Fieldbus System (Serial Transmission)

Integrated Type/For Output
Series EX120/121/122

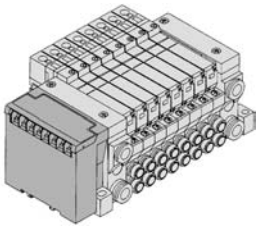
★Small unit compatible with maximum 16 outputs
★Compatible with a variety of communication networks

Series EX120

SV1000/2000/3000/4000

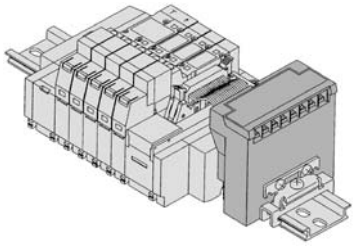


VQ1000/2000



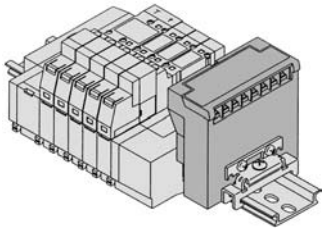
Series EX121

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/s^2, in each X, Y, Z direction, 3 times (De-energized)						
Standard			CE marking				—		
Accessory			Communication connector 1 pc., Power connector 1 pc.		—				

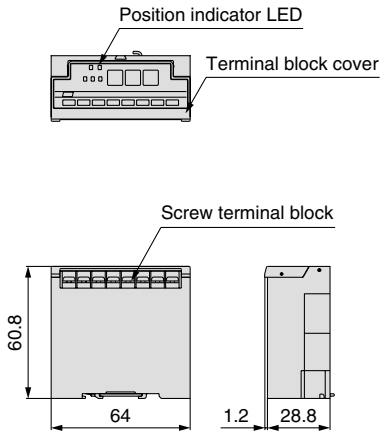
Note 1) Please note that the version is subject to change.
Note 2) Each file can be downloaded from SMC's website (http://www.smcworld.com/).
Note 3) For detailed specifications other than the above, refer to the separate technical operation manual that can be downloaded from SMC's website (http://www.smcworld.com/).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

EX

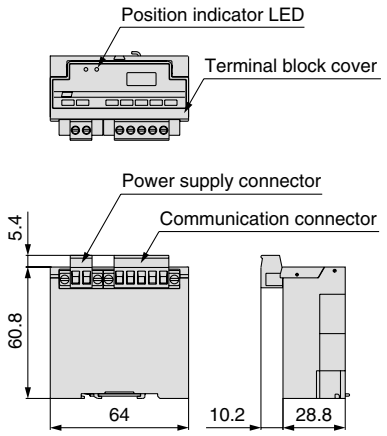
SI Unit Dimensions / Parts Description

EX120

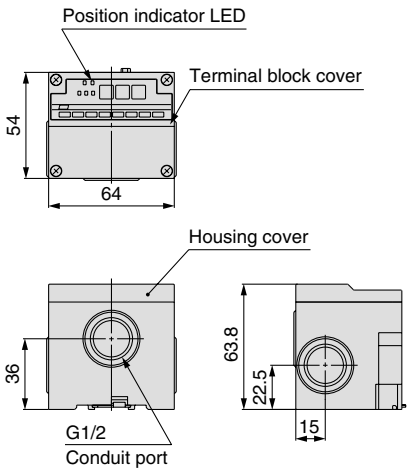
EX120-SMJ1, SCS□, SSL□, SUW1, SUH1



EX120-SDN1(-X26)

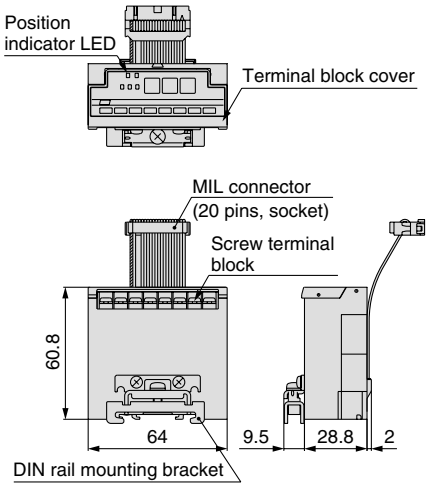


EX120-S□□□-XP

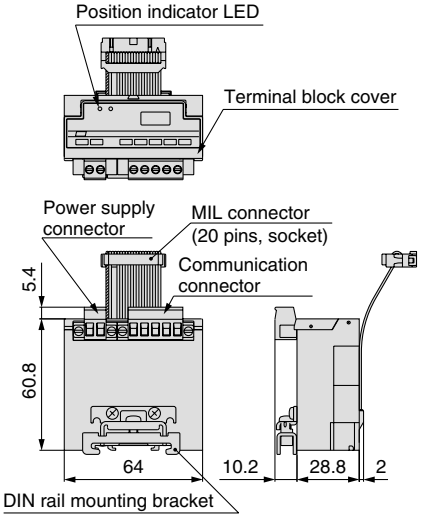


EX121

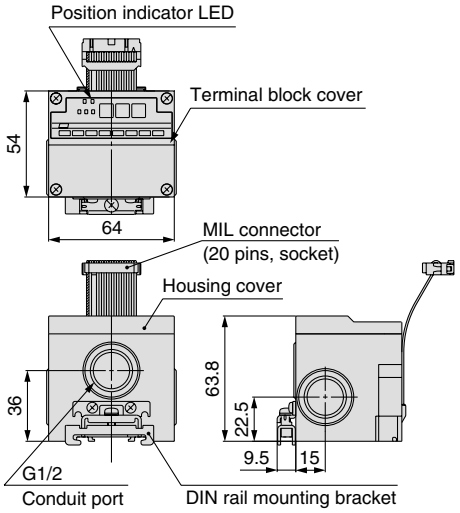
EX121-SMJ1, SCS□, SSL□, SUW1, SUH1



EX121-SDN1(-X26)

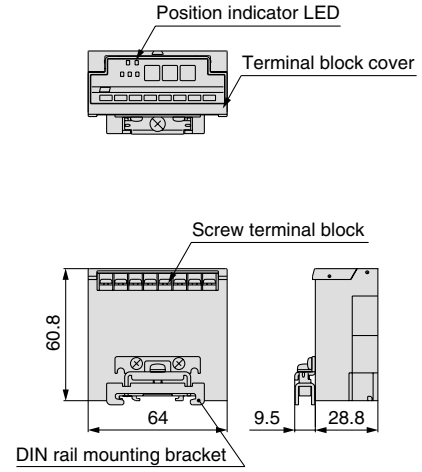


EX121-S□□□-XP

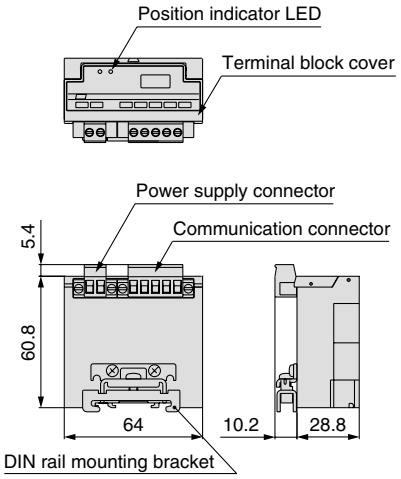


EX122

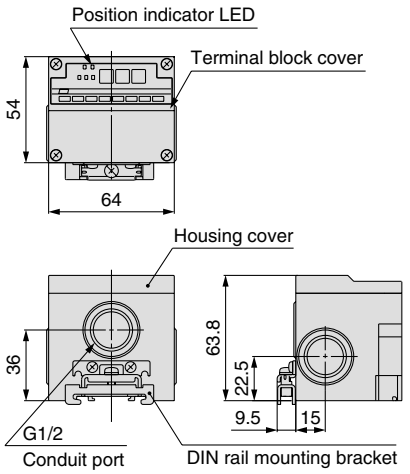
EX122-SMJ1, SCS□, SSL□, SUW1, SUH1



EX122-SDN1(-X26)



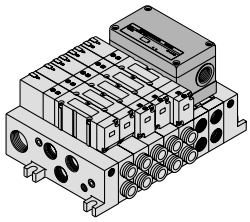
EX122-S□□□-XP



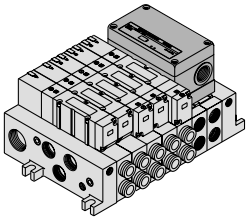
Integrated Type/For Output
Series EX123/124/126

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

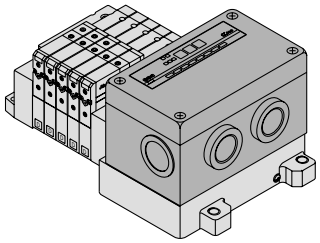
Series EX123
VQ2000/4000/5000



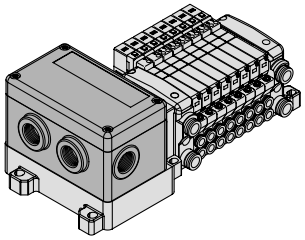
Series EX124
VQ2000/4000/5000



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

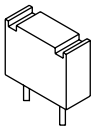
Fuse for replacement

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).

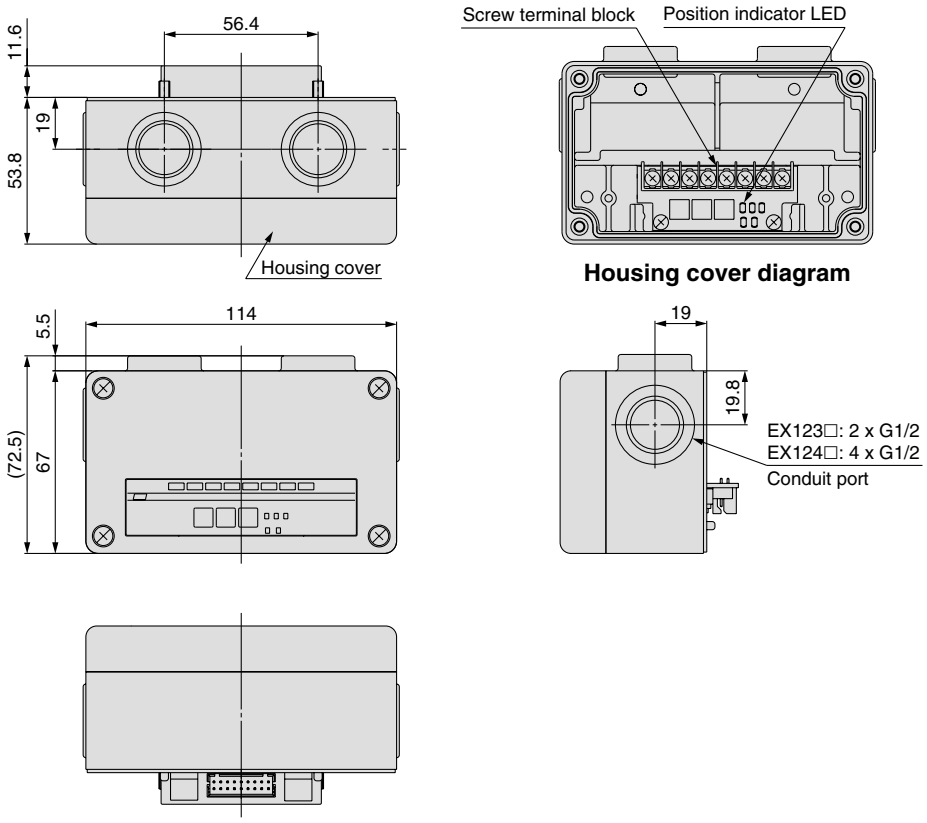
AXT100−B04A

SI Unit Specifications

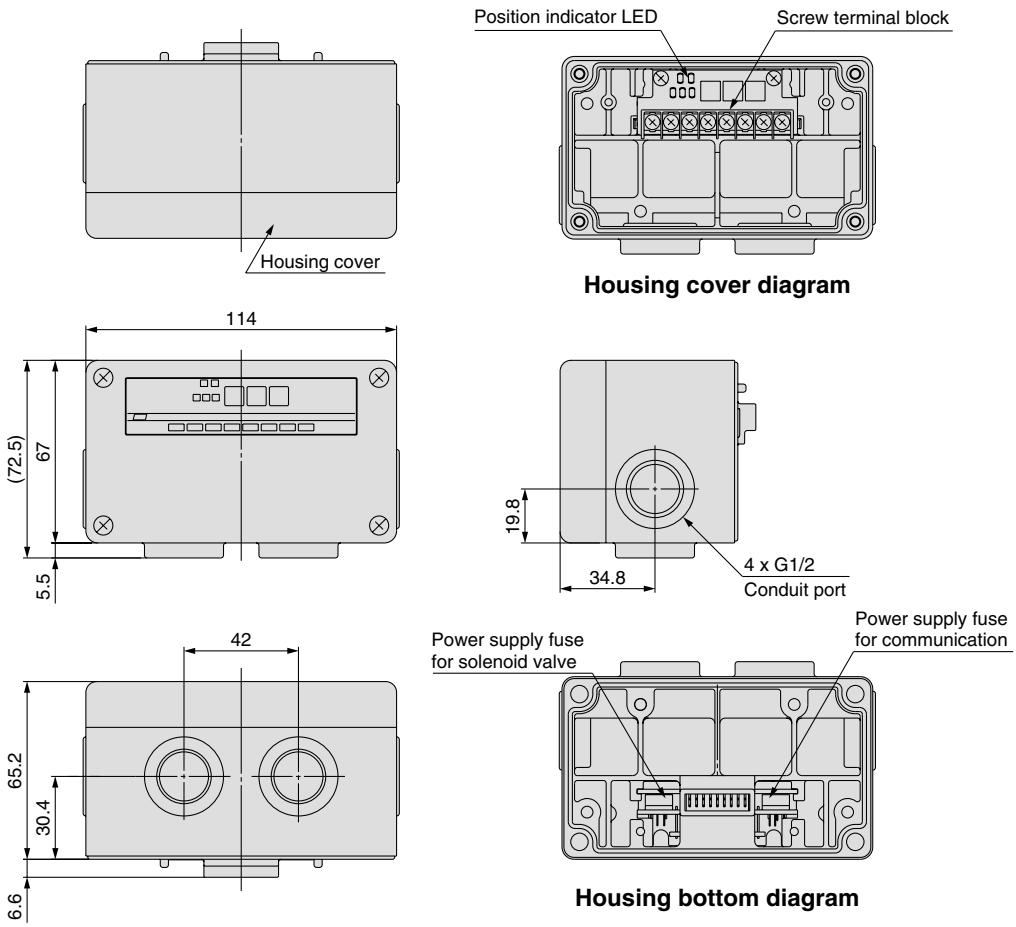
The electrical specification is the same for EX12□. Refer to page 2.
4 unit mounting screws (M4 x 10) are included when shipped.

SI Unit Dimensions/Parts Description

EX123□-S□□□, EX124□-S□□□



EX126D-SMJ1

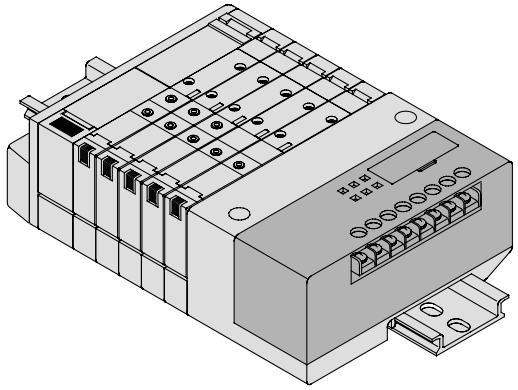


EX

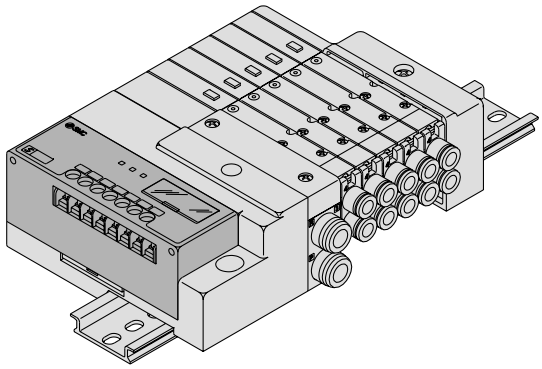
Integrated Type/For Output
Series EX140

★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

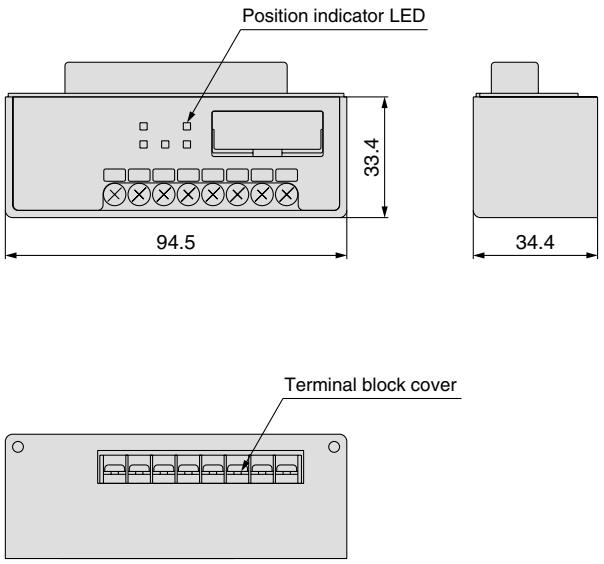
Model			EX140-SDN1	EX140-SMJ1	EX140-SCS1 EX140-SCS2	EX140-SSL1 EX140-SSL2	EX140-SUW1	EX140-SUH1
Communication specification	Applicable system	Protocol	DeviceNet™	CC-Link	OMRON Corp.: CompoBus/S	SUNX Corp.: S-Link	NKE Corp.: Uni-wire System	NKE Corp.: Uni-wire H System
		Version Note 1)	Release 2.0	Ver. 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/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/).

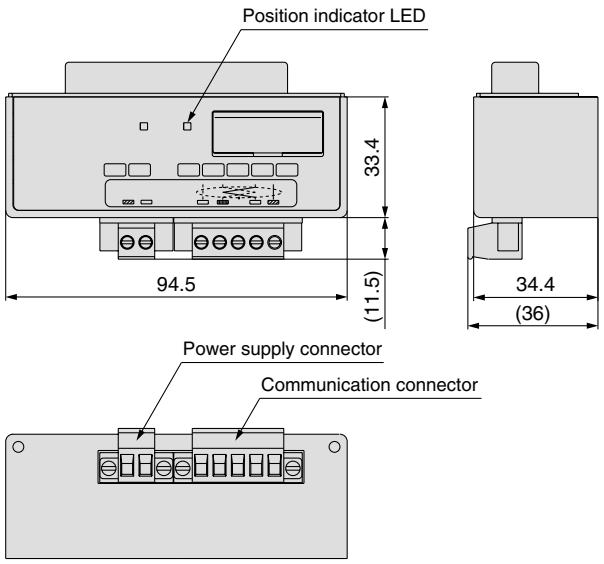
EX

SI Unit Dimensions / Parts Description

EX140-SMJ1, SCS□, SSL□, SUW1, SUH1



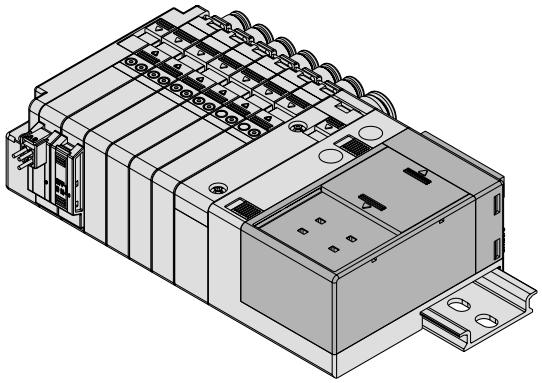
EX140-SDN1



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.

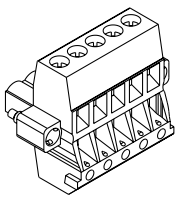
EX180 − C DN 1

Communication protocol

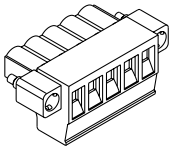
DN	For EX180-SDN☐
MJ	For EX180-SMJ1

Communication connector configuration

1	T branching type
2	Straight type



EX180-C☐☐1

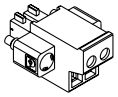


EX180-C☐☐2

Power supply connector

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

EX180 − CP1



SI Unit Specifications

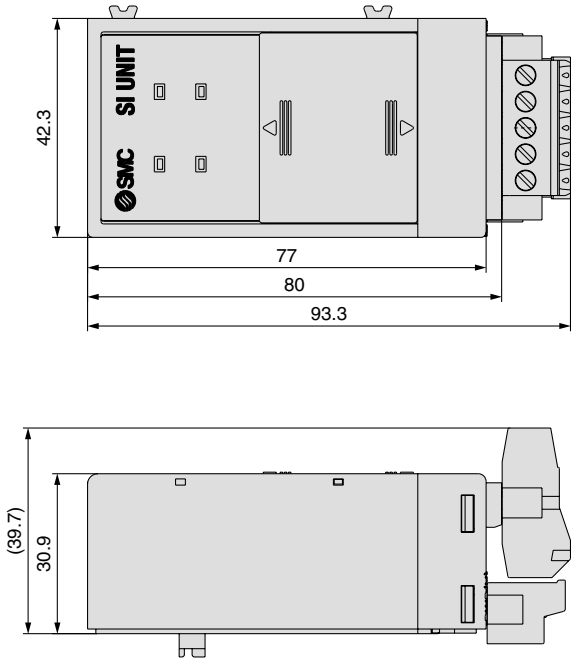
Model			EX180-SDN1 EX180-SDN2	EX180-SMJ1
Communication specification	Applicable system	Protocol	DeviceNet™	CC-Link
		Version Note 1)	Release 2.0	Ver. 1.10
	Communication speed		125 k/250 k/500 kbps	156 k/625 kbps 2.5 M/5 M/10 Mbps
	Specified file Note 2)		EDS file	—
	Occupied area (Number of inputs/outputs)		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/s², 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.

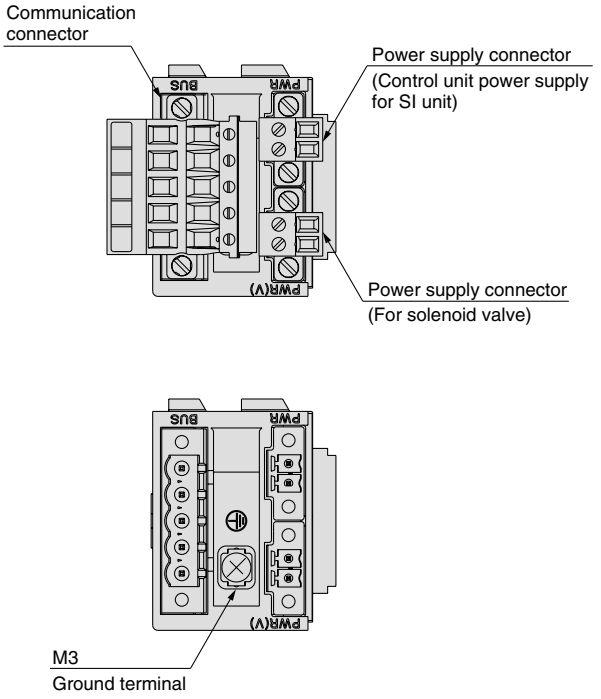
Note 1) Please note that the version is subject to change
Note 2) Each file can be downloaded from SMC's website (http://www.smcworld.com/).
Note 3) For detailed specifications other than the above, refer to the separate technical operation manual that can be downloaded from SMC's website (http://www.smcworld.com/).

EX

SI Unit Dimensions / Parts Description

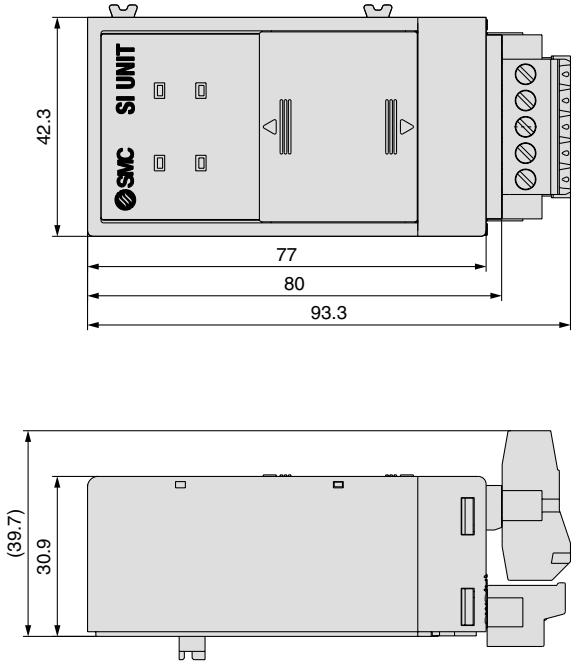
EX180-SMJ1

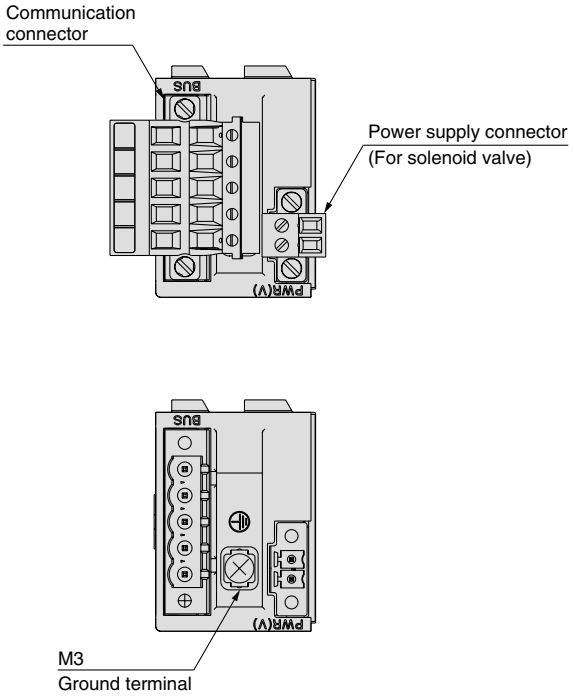




Before mounting connector (accessory)

EX180-SDN1, SDN2





Before mounting connector (accessory)

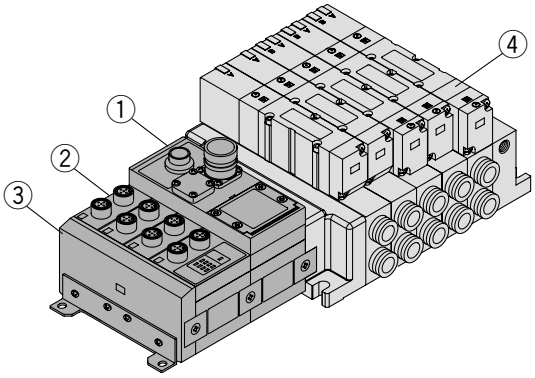
Integrated Type/ For Input/Output

Series EX240

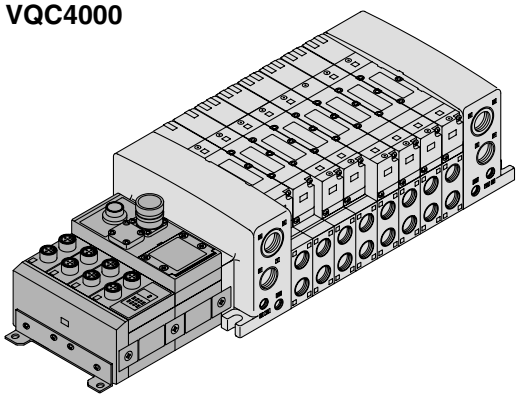
CE

★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

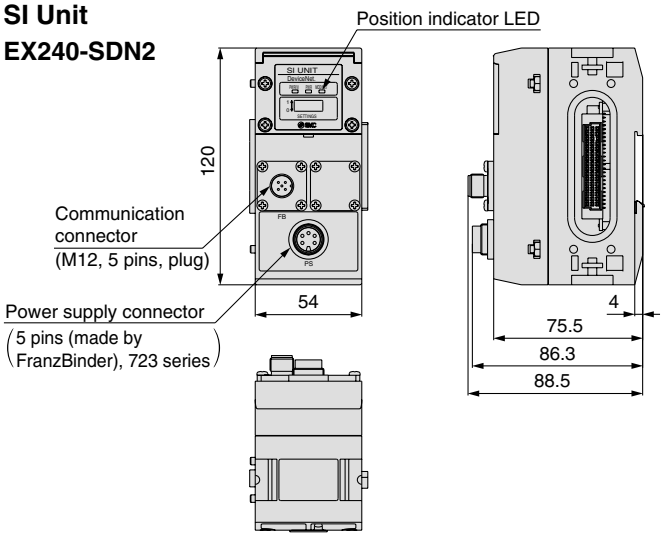
Model		EX240-IE1
Input specification	Input type	PNP/NPN sensor input (switched using a switch)
	Number of inputs	8 points
	Input device supply voltage	24 VDC
	Input device supply current	Max. 60 mA/point, 500 mA/unit Note 1)
	Rated input current	Approx. 8 mA
	Display	Green LED (Illuminated when the power 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/).

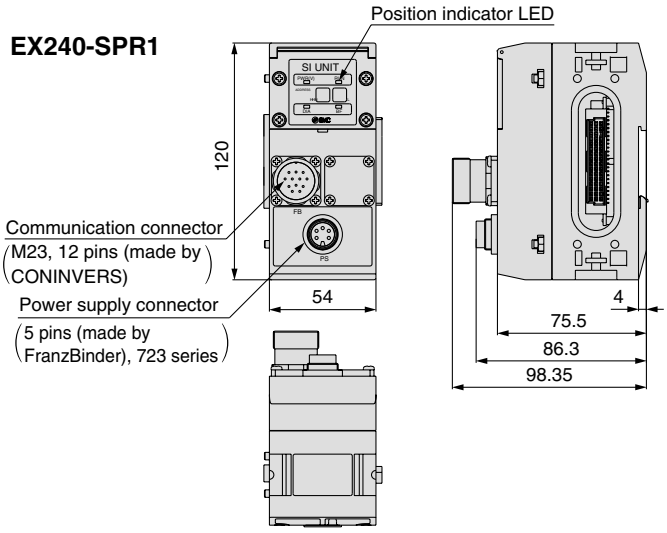
Dimensions

SI Unit

EX240-SDN2

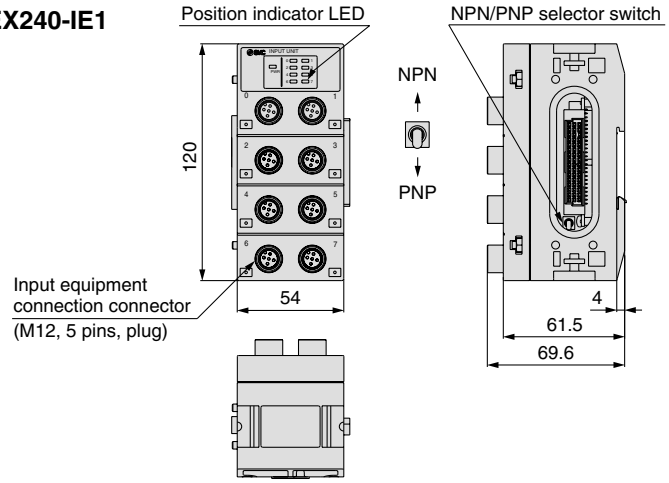


EX240-SPR1



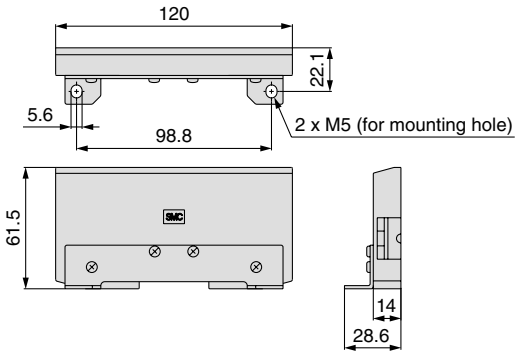
DI Unit

EX240-IE1

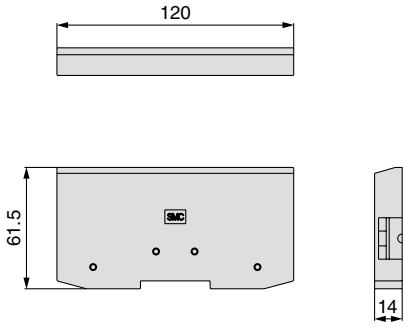


End Case Assembly

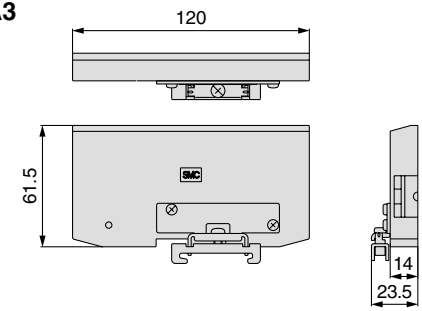
EX240-EA2



EX240-EA4



EX240-EA3



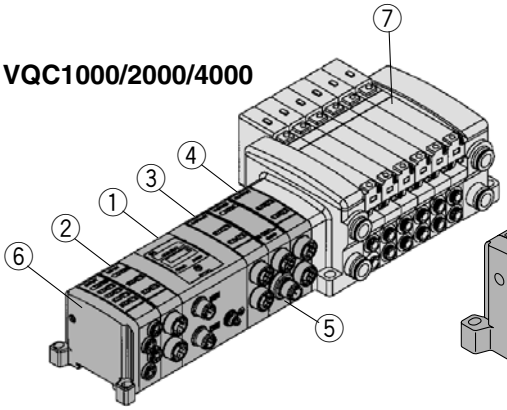
EX

Integrated Type/ For Input/Output

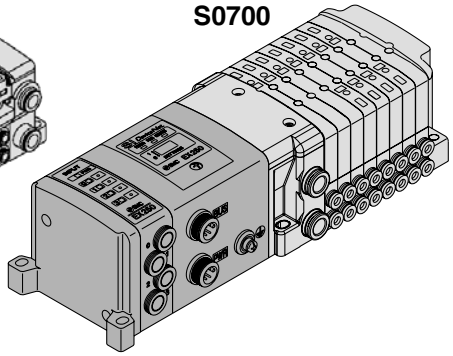
Series EX250

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

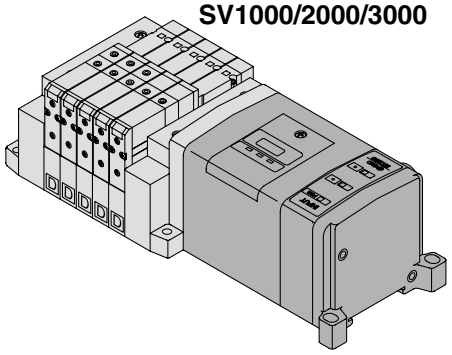
VQC1000/2000/4000



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 16 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 18 for details.)
(EX250-SAS7 ··· Max. 240 mA, EX250-SAS9 ··· Max. 120 mA)

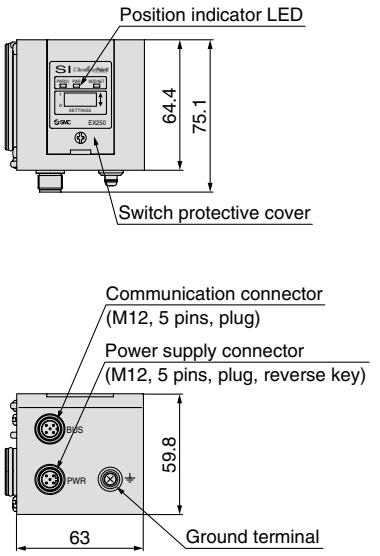
Note 6) When the SI unit is mounted to the manifold when shipped, accessories are shipped together with it.

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/).

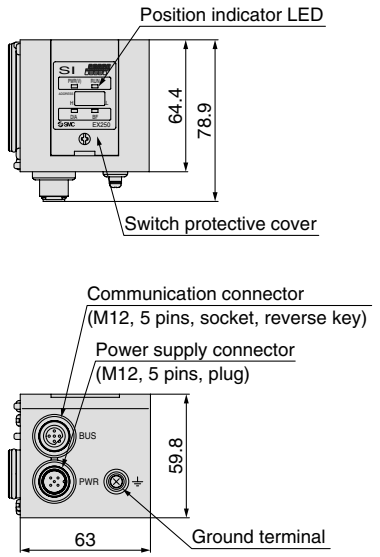
EX

SI Unit Dimensions / Parts Description

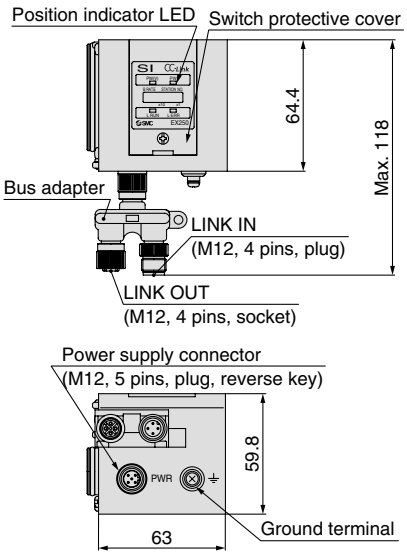
EX250-SDN1 (DeviceNet™)



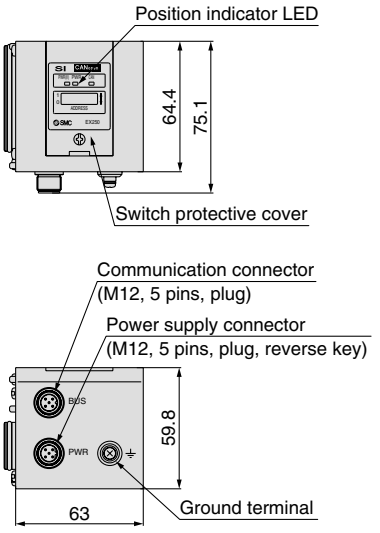
EX250-SPR1 (PROFIBUS DP)



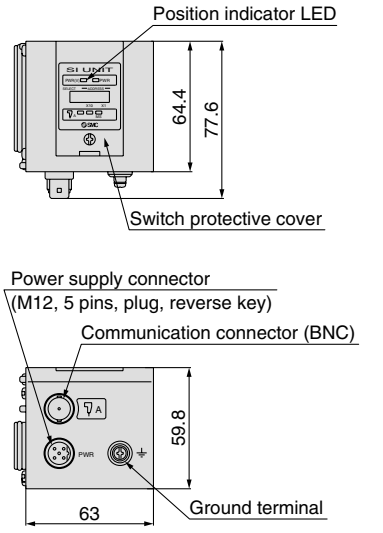
EX250-SMJ2 (CC-Link)



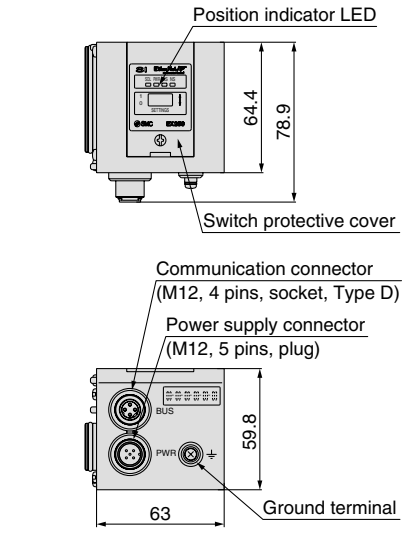
EX250-SCA1A (CANopen)



EX250-SCN1 (ControlNet™)

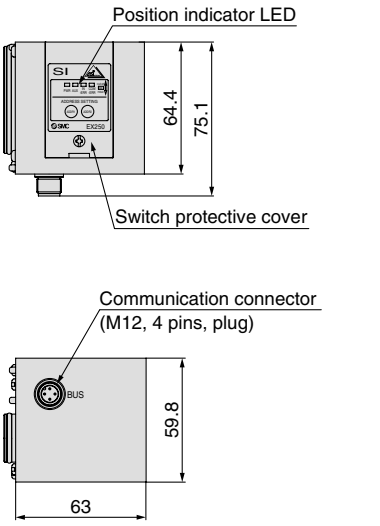


EX250-SEN1 (EtherNet/IP™)

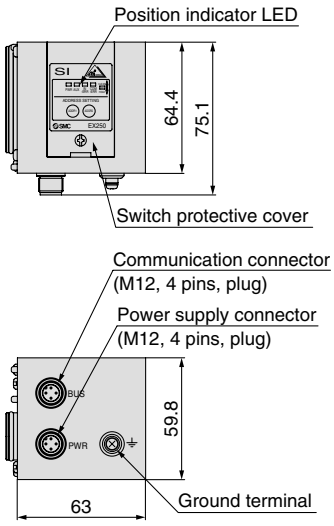


AS-Interface

EX250-SAS7/9 (1 power supply system)



EX250-SAS3/5 (2 power supply systems)



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

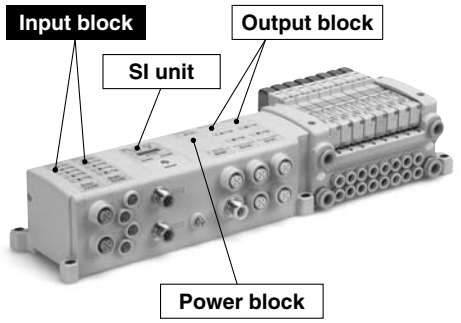
120 [mA] – 84 [mA] = 36 [mA]

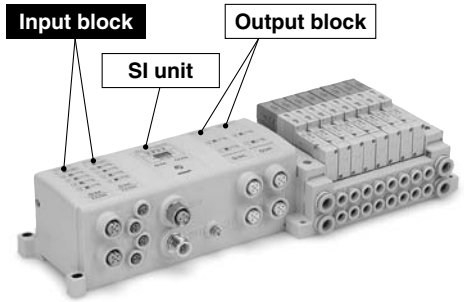
Use of low-wattage type valves by minimizing the maximum number of simultaneous outputs, and low current consumption sensors (2-wire sensor, etc.) is recommended.

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 21 to 26.

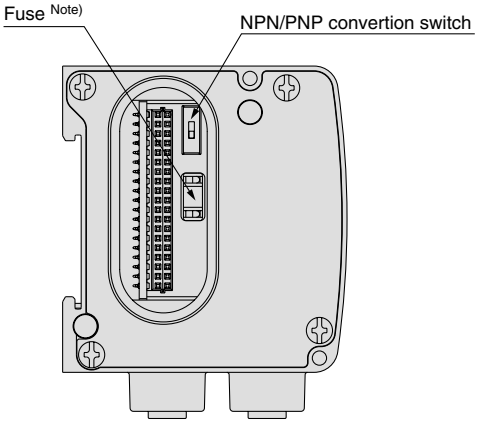
Input Block Specifications

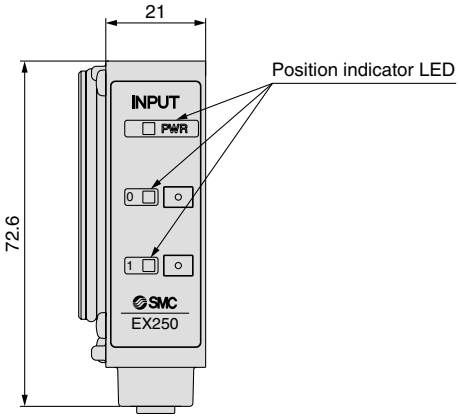
Model		EX250-IE1	EX250-IE2	EX250-IE3
Input specification	Input type	PNP/NPN sensor input (switched using a switch)		
	Number of inputs	2 points	4 points	
	Input device supply voltage	24 VDC		
	Input device supply current	Max. 30 mA/point Note 1)		
	Rated input current	Approx. 8 mA		
	Display	Green LED (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/).

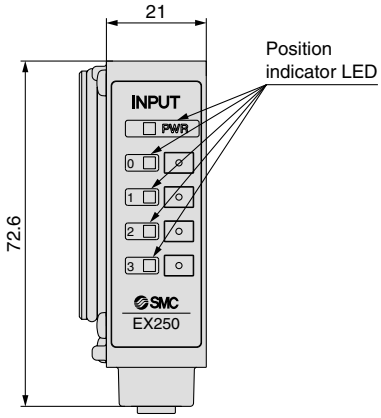
Input Block Dimensions / Parts Description

EX250-IE1, EX250-IE2

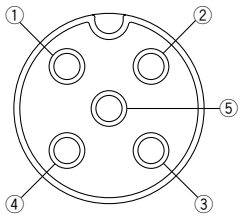




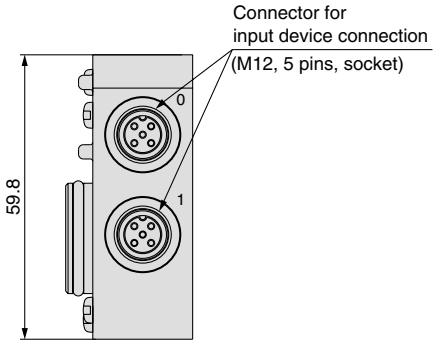
EX250-IE1

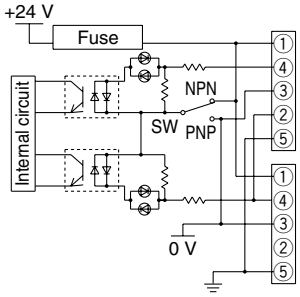


EX250-IE2



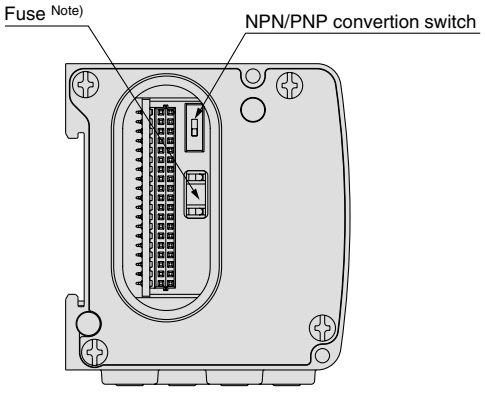
Connector's pin assignment for the input device connection (M12, 5 pins, socket)

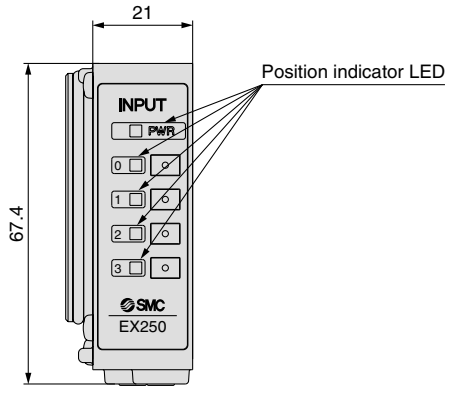


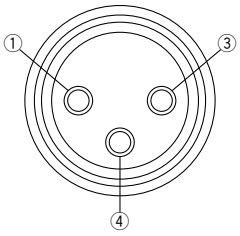


Circuit diagram: EX250-IE1

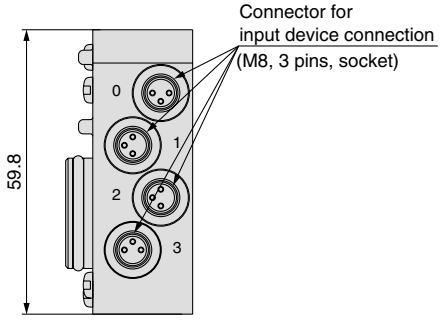
EX250-IE3

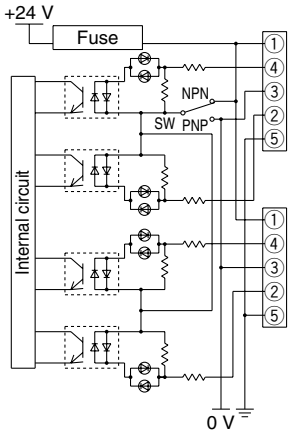




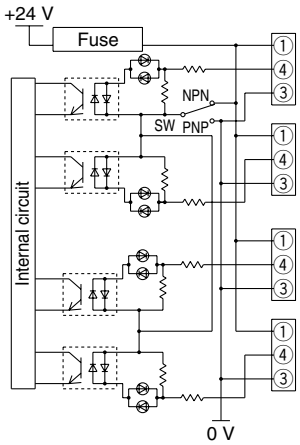


Connector's pin assignment for the input device connection (M8, 3 pins, socket)





Circuit diagram: EX250-IE2



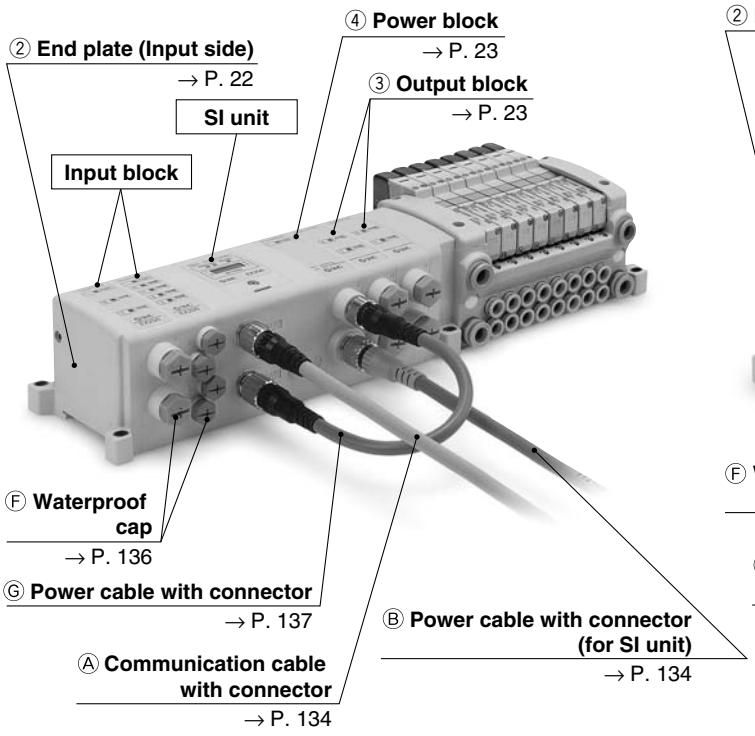
Circuit diagram: EX250-IE3

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 22.

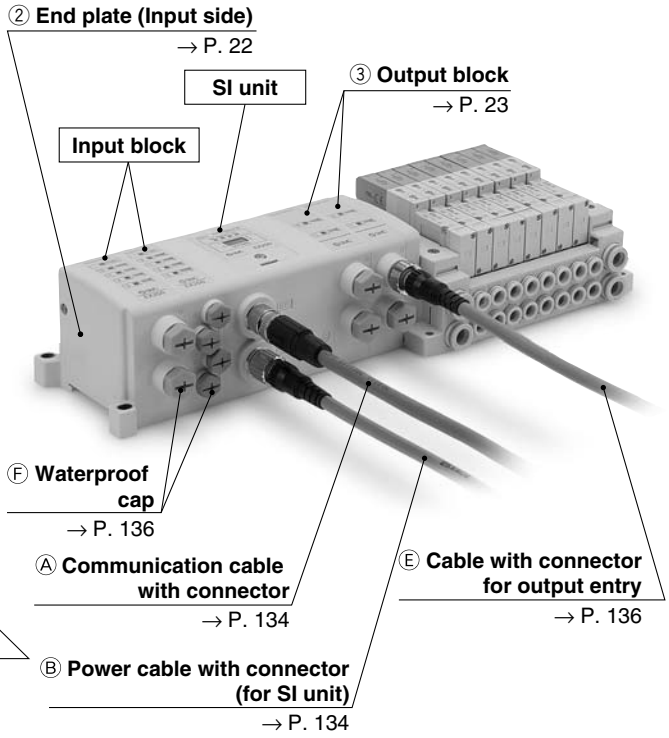
Options

Example of connections

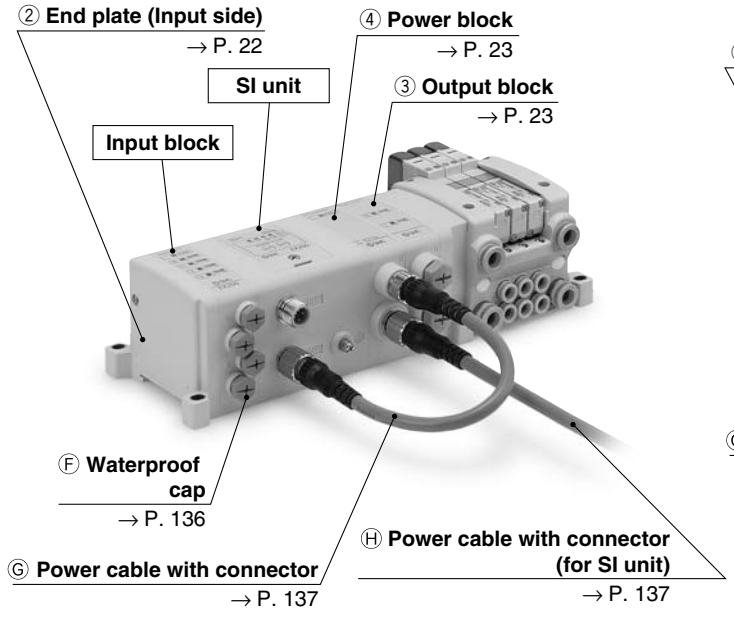
Connection example of the SI unit compliant with DeviceNet™



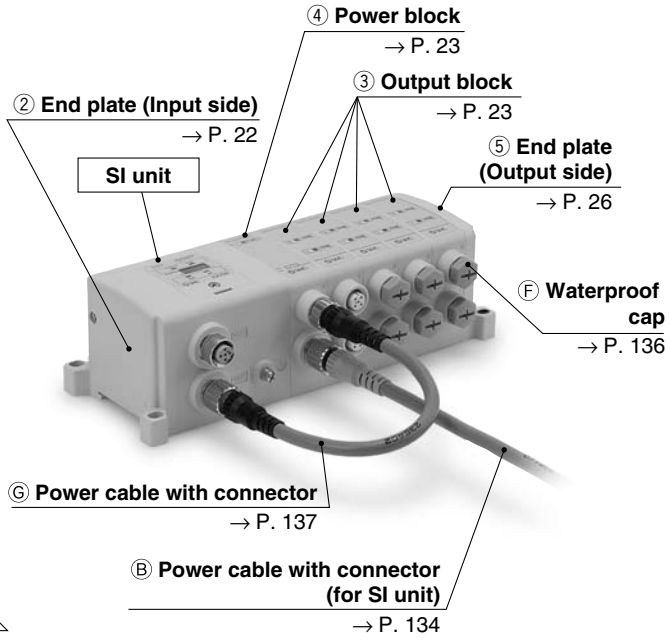
Connection example of the SI unit compliant with EtherNet/IP™



Connection example of the SI unit compliant with AS-Interface



Connection example of the SI unit compliant with PROFIBUS DP



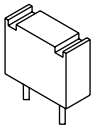
① Replacement fuse

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



② End plate (Input side)

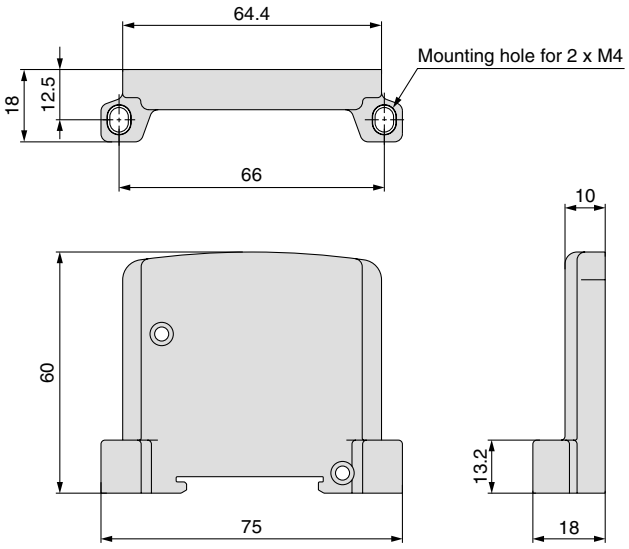
EX250−EA 1

Mounting specification

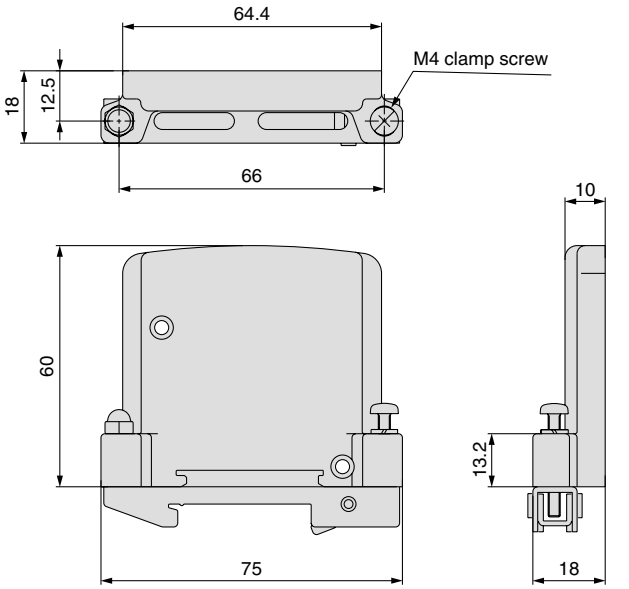
1	Direct mounting
2	DIN rail mounting

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

EX250-EA1



EX250-EA2



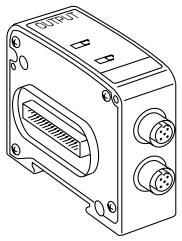
EX

Options

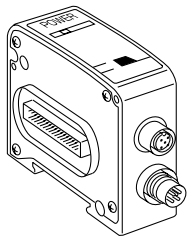
③ Output block / ④ Power block

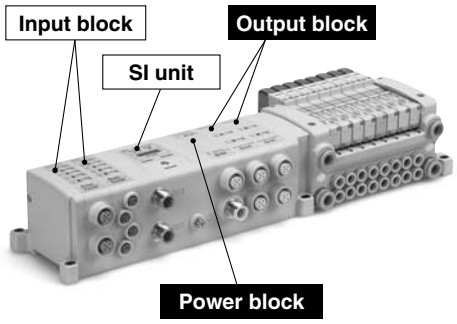
Features:
- **Able to retrofit to the valve manifold, using the unused points.**
- **2-output (M12 connector)**
- **+ common / – common are standardized.**
- **Able to drive by 0.5 A per point.**

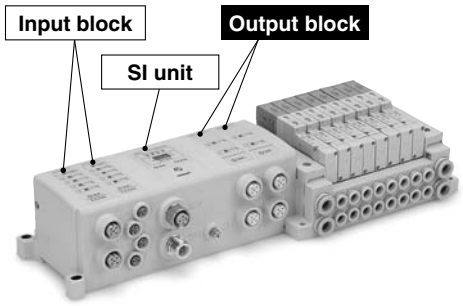
Output block



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 136. Order separately: 10 pcs. included
Cable with connector for output entry	**EX9-AC□-7**	○	○	Refer to page 136. 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 136. Order separately: 10 pcs. included
Power cable with connector	**EX9-AC□-1**	Refer to page 135. Order separately.
Cable with connector for between SI unit and power block	**EX9-AC002-2** **EX9-AC002-3** **EX9-AC002-4**	Refer to page 137. Order separately.
AS-Interface power supply cable	**EX9-AC□-5**	Refer to page 137. 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/s² 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, UL (CSA)			
Accessory	**Tie-rod**	2 pcs.			

Power Block Specifications

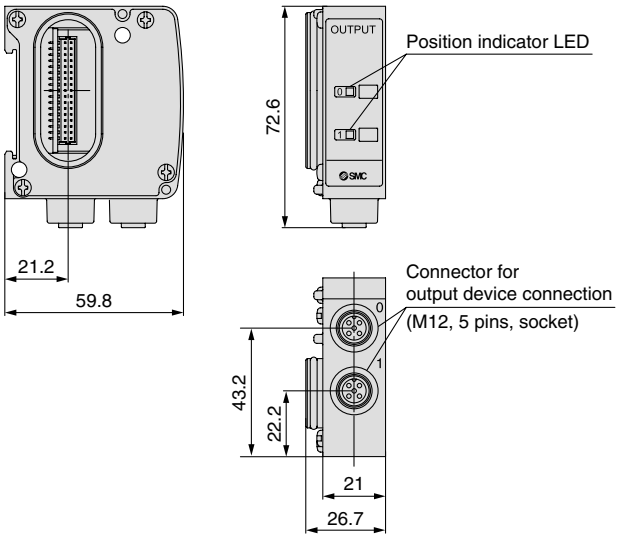
Model			EX9-PE1
Connection block			Output block (EX9-OEP□)
Connection block stations			Output block: Max. 9 stations (excluding input blocks) Note 1)
Power supply for output and internal control		**Power supply voltage**	22.8 to 26.4 VDC
		Internal power consumption	20 mA or less
Supply current			Max. 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/s² 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, UL (CSA)
Accessory		**Tie-rod**	2 pcs.
		Waterproof cap (for M12 connector socket)	1 pc. (EX9-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/).

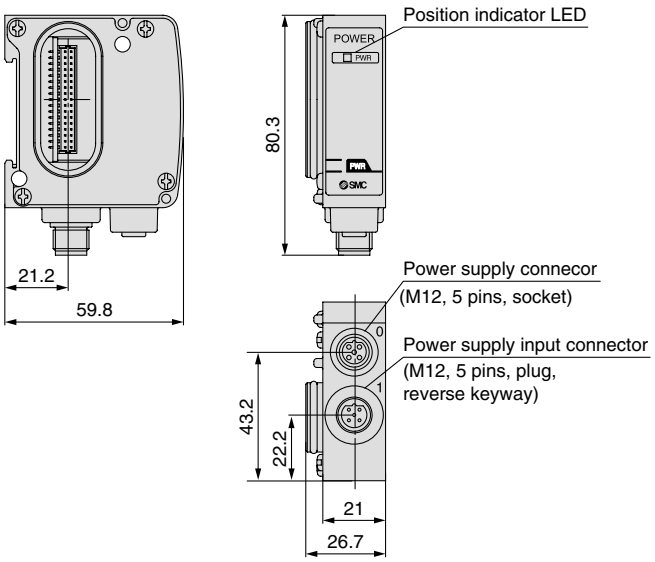
EX

Options

Output Block Dimension

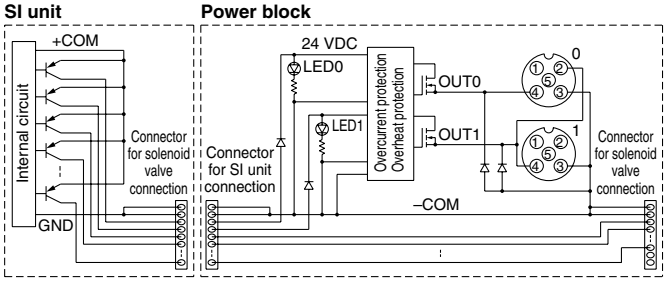


Power Block Dimension

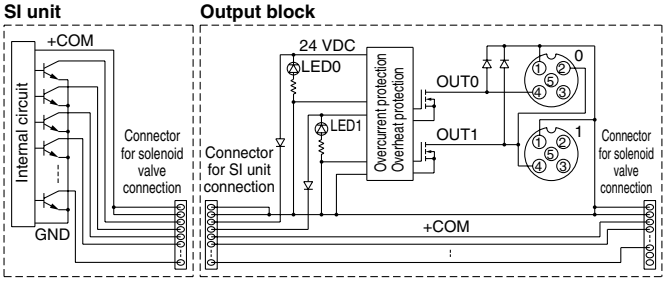


Circuit Diagram

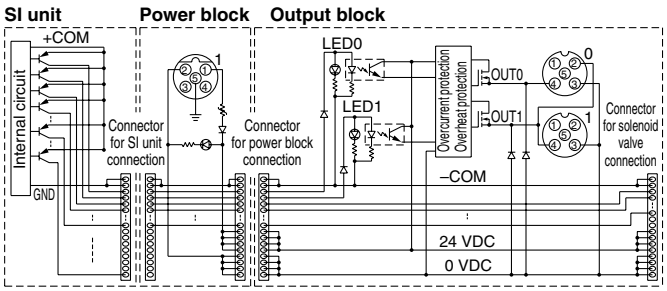
EX9-OET1



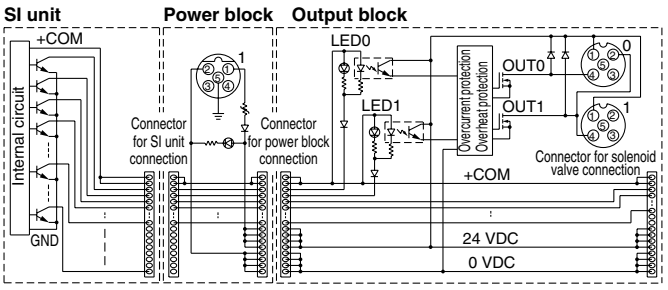
EX9-OET2



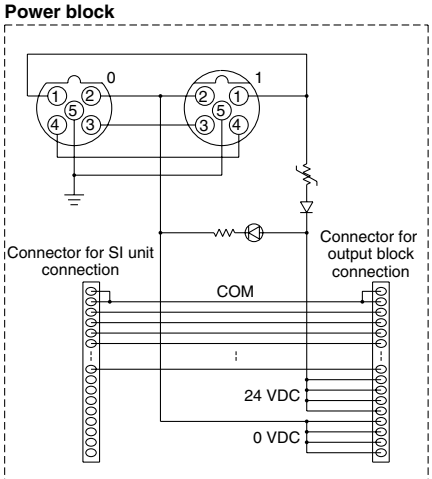
EX9-OEP1



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 (⑤ EX9-EA□) separately for connection.
Refer to the separate technical instruction manual for connection, wiring, installation, optional goods and cable, etc.

⑤ End plate (Output side)

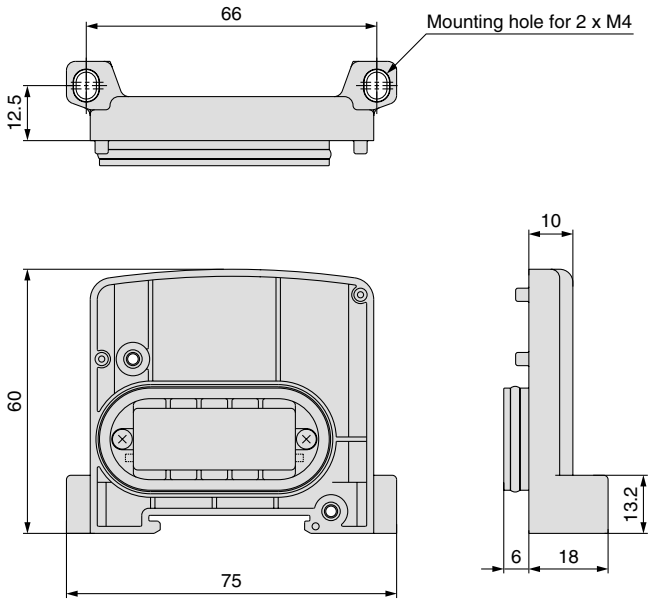
The plate connected on the output block side in order to connect or fix between the SI unit and the input/output/power block when the valve manifold is not used.

EX9−EA 03

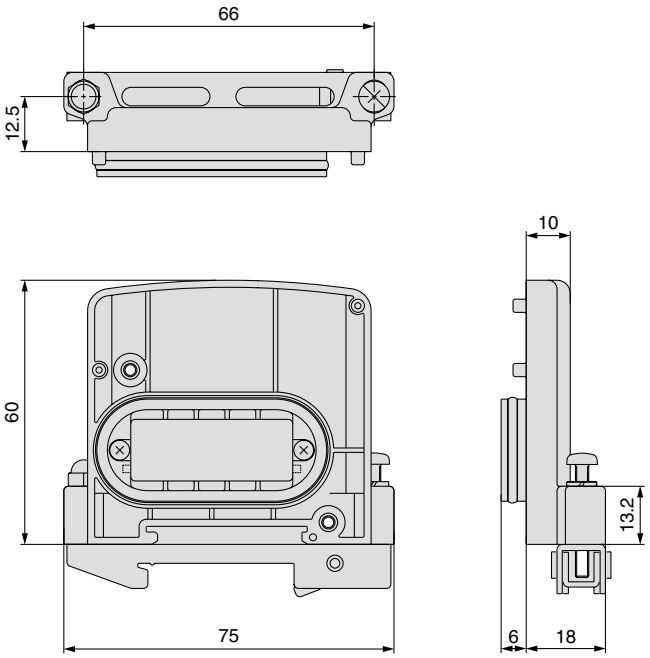
Mounting specification

03	Direct mounting
04	DIN rail mounting

EX9-EA03

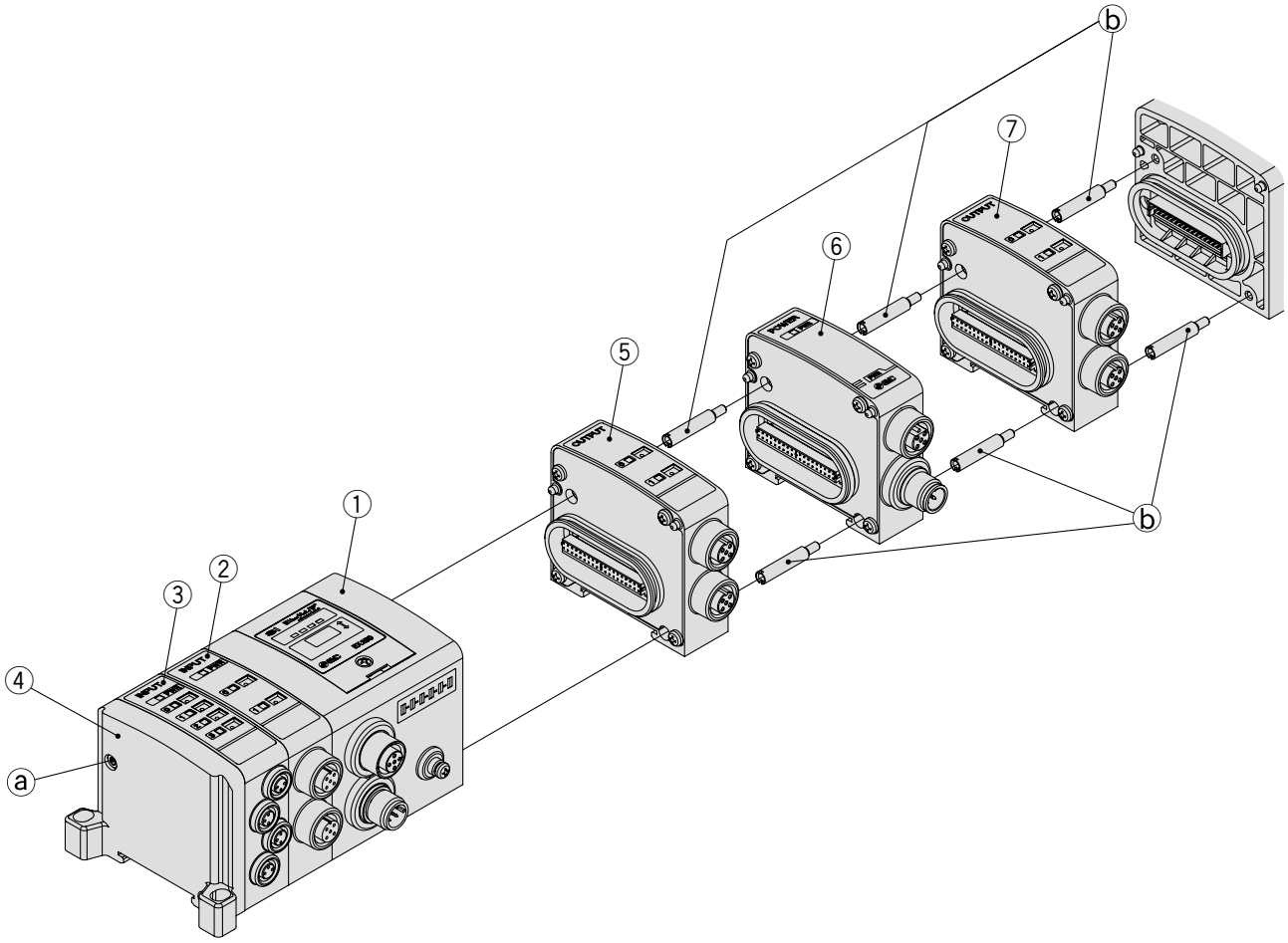


EX9-EA04



EX

How to Increase Input/Output Blocks, Procedure Drawing



Parts List

No.	Description	Part no.	Note
1	**SI unit**	EX250-S□	For details, refer to pages 15 to 18.
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 23 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

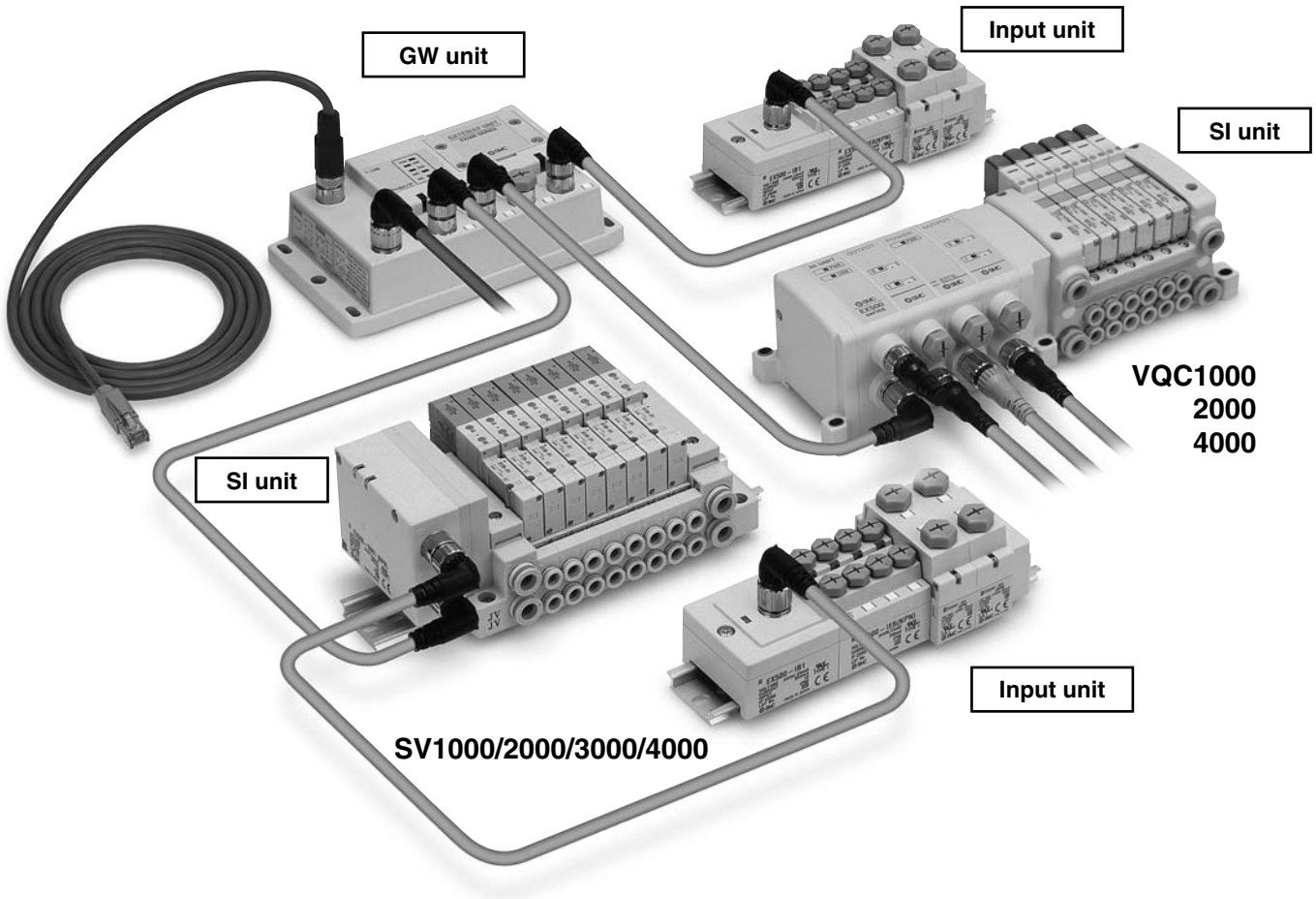
④ Fix by loosening the hexagon socket head cap screw ⓐ, paying attention to avoid the gap between each block. (0.6 N·m)

∗ 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



EX

Decentralized Serial Wiring (GW System, 4 Branches)

Series EX500

GW Unit

How to Order GW Unit

EX500 − G DN1

Communication protocol

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

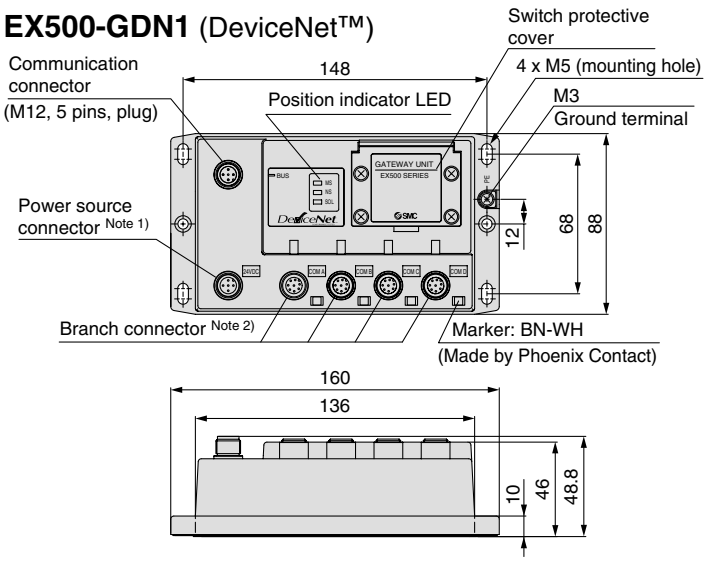
GW Unit Specifications

Model			EX500-GDN1	EX500-GPR1A	EX500-GMJ1	EX500-GEN1
Communication specification	Applicable system	Protocol	DeviceNet™	PROFIBUS DP	CC-Link	EtherNet/IP™
		Version Note 1)	Release2.0	DP-V0	Ver.1.10	Release1.0
	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 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	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/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			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.)

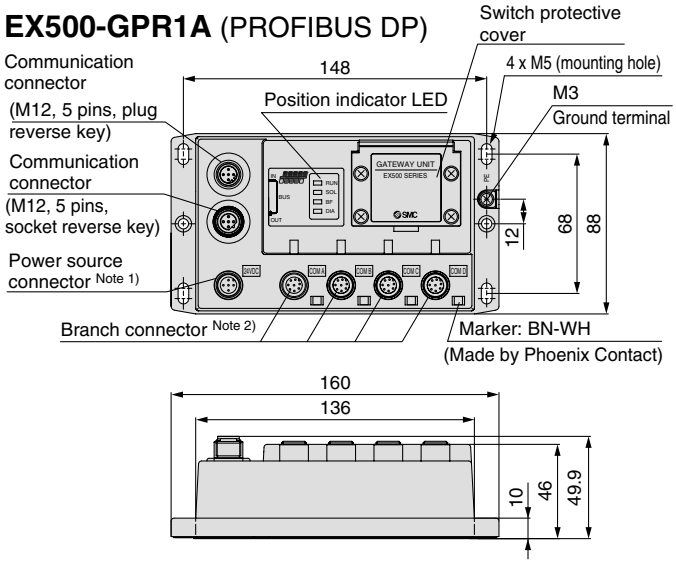
Note 1) Please note that the version is subject to change.
Note 2) Each file can be downloaded from SMC's website (http://www.smcworld.com/).
Note 3) For detailed specifications other than the above, refer to the separate technical operation manual can be downloaded from SMC's website (http://www.smcworld.com/).

GW Unit Dimensions / Parts Description

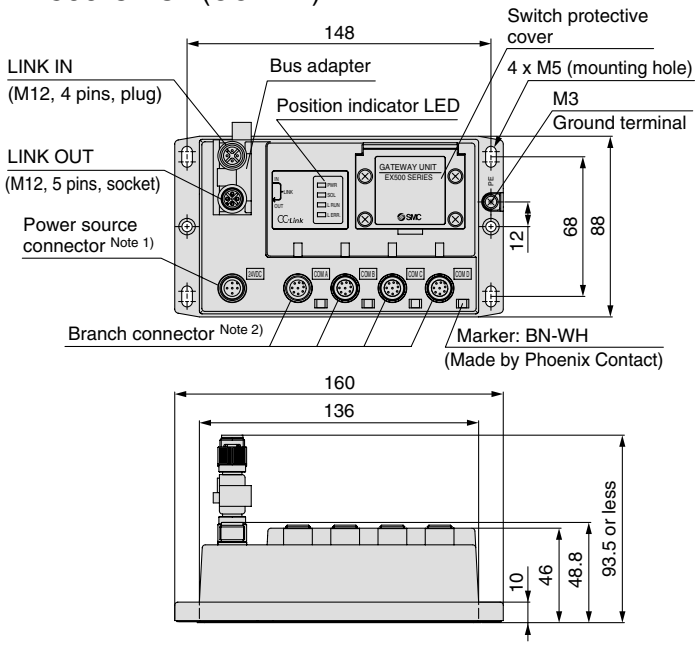
EX500-GDN1 (DeviceNet™)



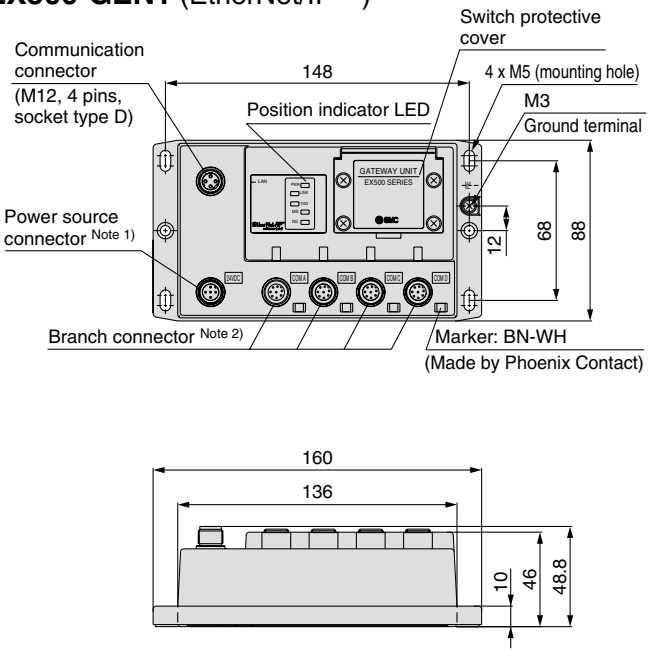
EX500-GPR1A (PROFIBUS DP)



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)

EX

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

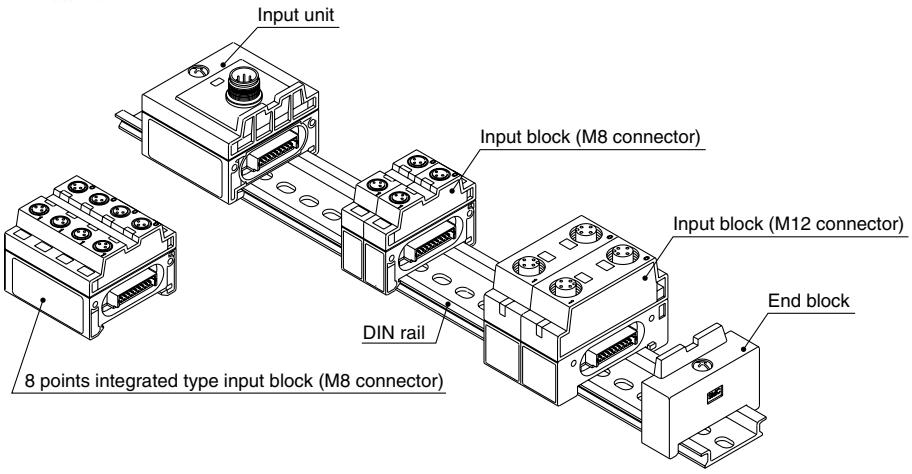
How to Order Input Block

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 63 to 65.

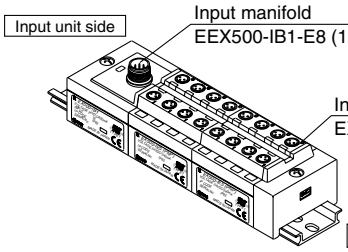


How to Order Input Unit Manifold [Ordering Example]

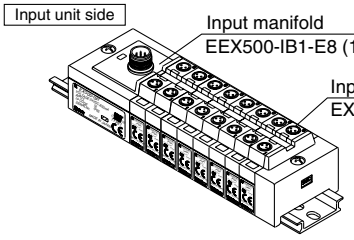
When ordering an input unit manifold, enter the Input manifold part no. + Input block part no.
The Input unit, End block and DIN rail are included in the input manifold. Refer to the indications below.

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

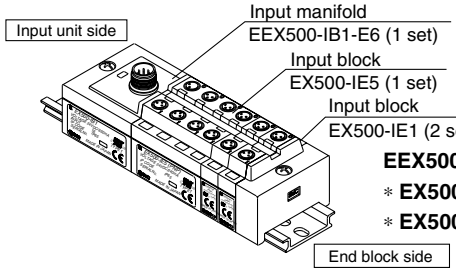
Example 1) M8 input block only



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

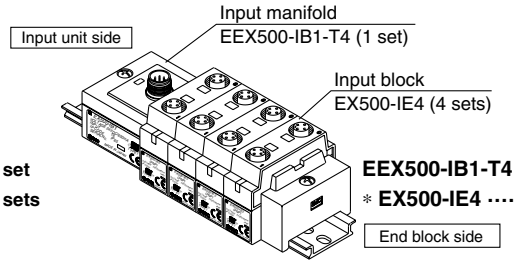


EEX500-IB1-E8 ····· 1 set
∗ EX500-IE1 ····· 8 sets



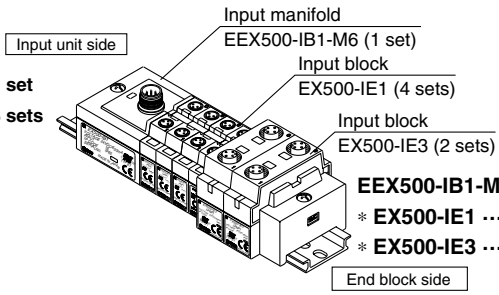
EEX500-IB1-E6 ····· 1 set
∗ EX500-IE5 ····· 1 set
∗ EX500-IE1 ····· 2 sets

Example 2) M12 input block only



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

Example 3) M8, M12 mixed



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

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

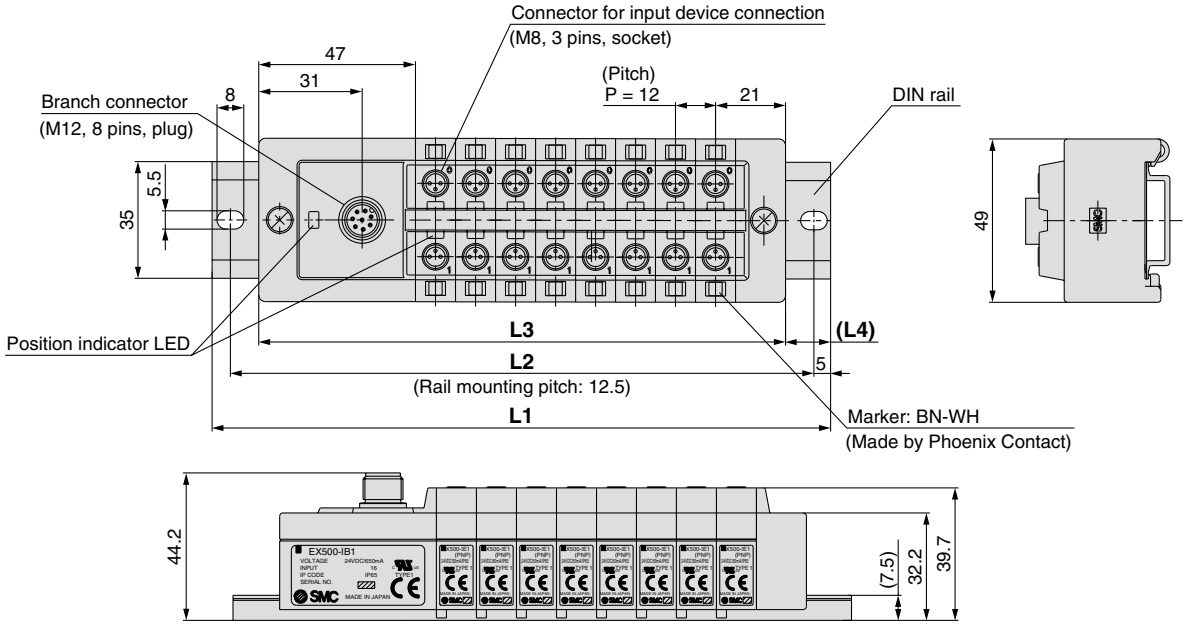
Model		EX500-IE1	EX500-IE2	EX500-IE3	EX500-IE4	EX500-IE5	EX500-IE6
Input specification	**Input type**	PNP sensor input	NPN sensor input	PNP sensor input	NPN sensor input	PNP sensor input	NPN sensor input
	Number of inputs	2 points				8 points	
	Input device supply voltage	24 VDC					
	Input device supply 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/).

EX

Input Unit Manifold Dimensions / Parts Description

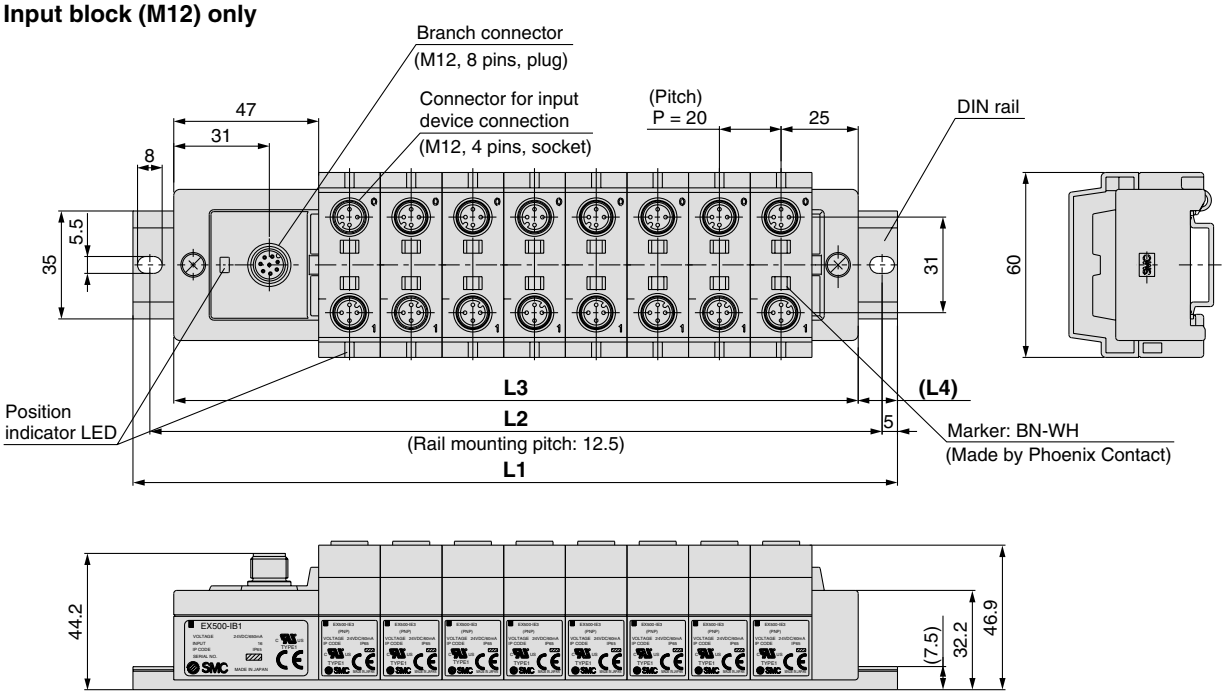
Input block (M8) only



(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

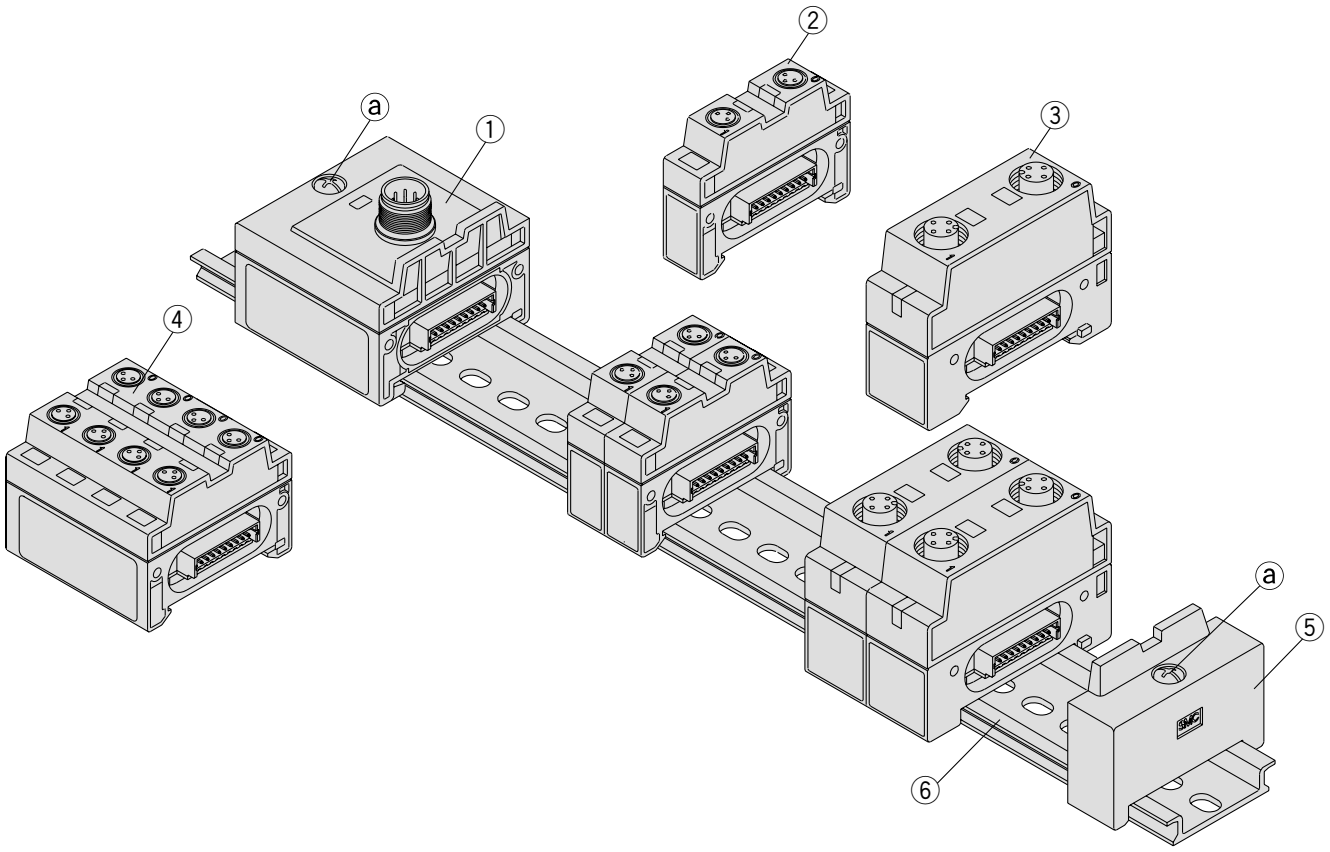
Input block (M12) only



(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.)

EX

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)

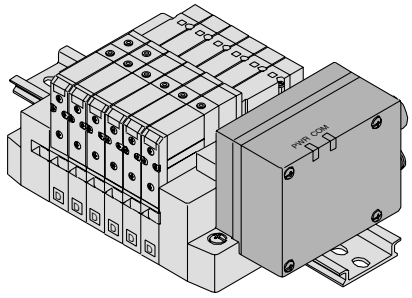
Connector type
For E (m = 1 to 8)

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		

SI Unit

SV1000/2000/3000/4000



How to Order SI Unit

EX500－S001

Applicable solenoid valve: SV series

For options, refer to pages 63 to 65.

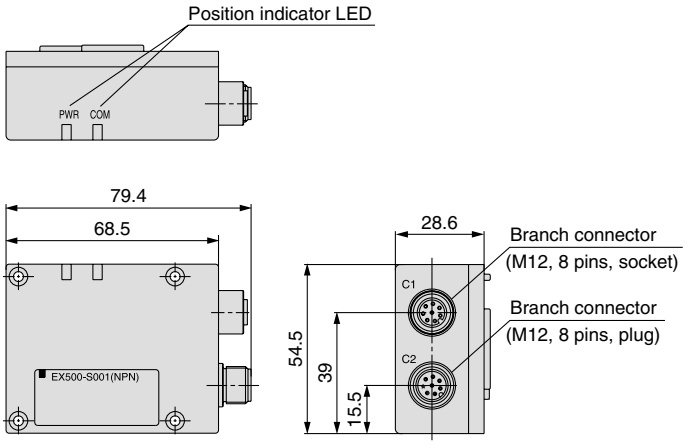
SI Unit Specifications (EX500-S001)

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/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		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/).

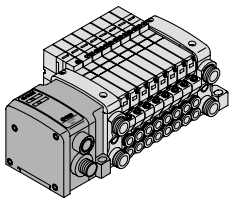
SI Unit Dimensions / Parts Description

EX500-S001

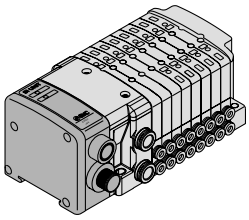


SI Unit

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 pages 63 to 65.

SI Unit Specifications (EX500-Q□0□)

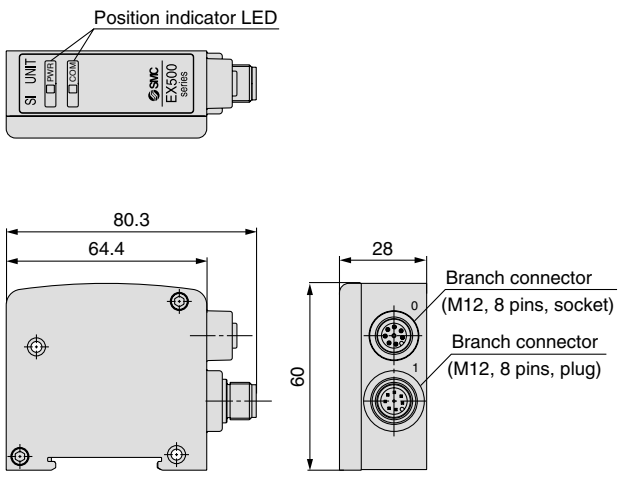
Model		EX500-Q001	EX500-Q101	EX500-Q002	EX500-Q102
Internal current consumption		100 mA or less			
Output specification	**Number of outputs**	16 points			
	Output type	NPN output (sink type)	PNP output (source type)	NPN output (sink type)	PNP output (source type)
	Connection block	+COM. Solenoid valve (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 63.

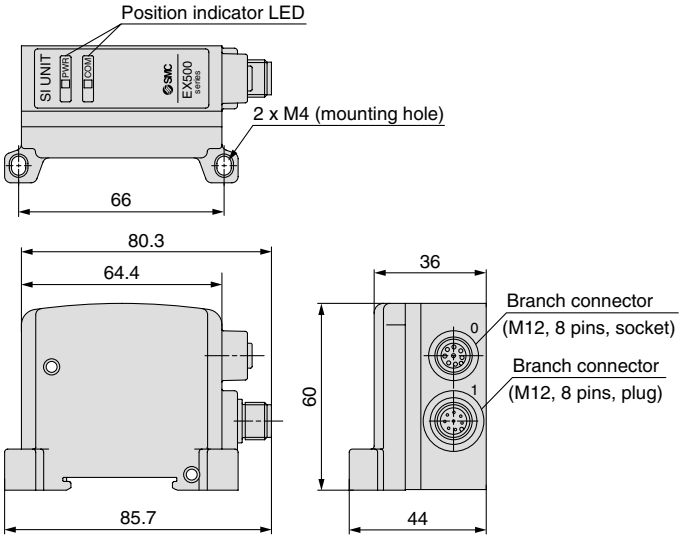
Note 2) For detailed specifications other than the above, refer to the separate technical operation manual that can be downloaded from SMC's website (http://www.smcworld.com/).

SI Unit Dimensions / Parts Description

EX500-Q□01



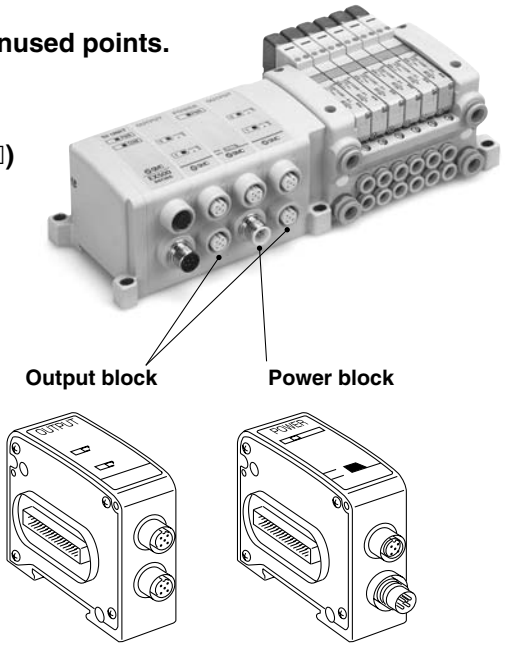
EX500-Q□02



Options

●Output block / ●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 page 136. Order separately: 10 pcs.
Cable with connector for output entry	**EX9-AC□-7**	○	○	Refer to page 136. 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 136. When ordering separately: 10 pcs.
Power cable with connector	**EX9-AC□-1**	Refer to page 135. 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

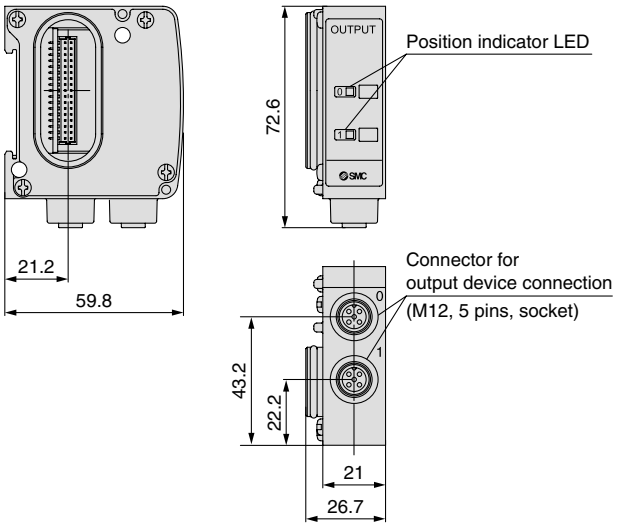
Model		EX9-PE1
Connection block		Output block (for high-wattage load)
Connection block stations		Output block: Max. 8 stations
Power supply for output and internal control	**Power supply voltage**	22.8 to 26.4 VDC
	Internal power consumption	20 mA or less
Supply current		Max. 3.1 A (When using with 3.0 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/).

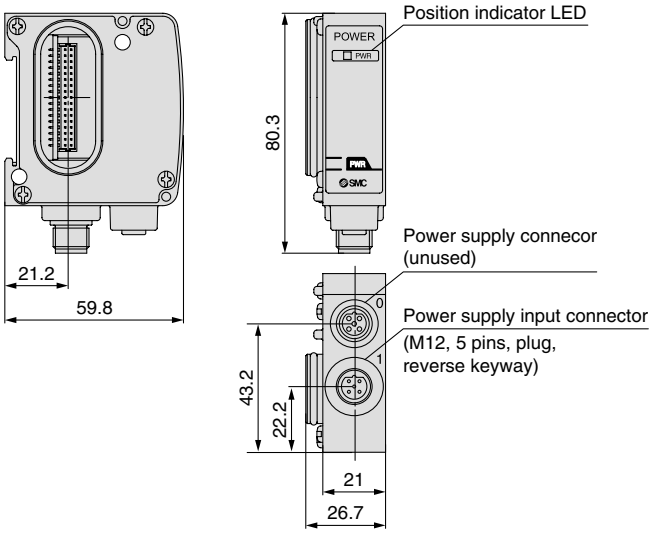
EX

Options

Output Block Dimension



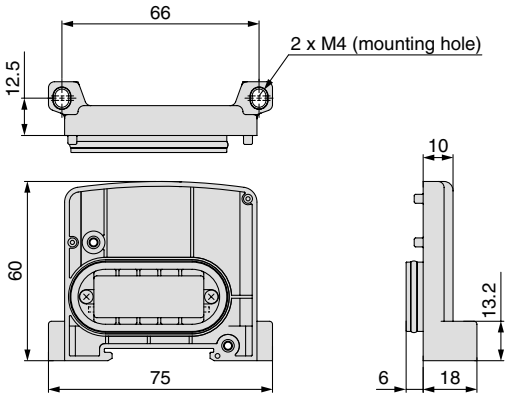
Power Block Dimension



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 (● EX9-EA03) separately for connection.
Refer to the separate technical instruction manual for connection, wiring, installation, optional goods and cable, etc.

●End plate

EX9－EA03



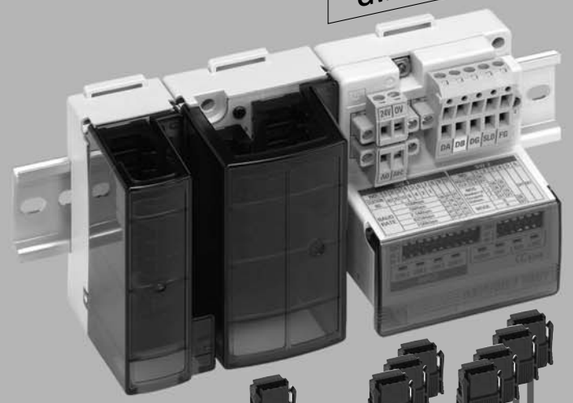
Decentralized Serial Wiring (GW System, 4 Branches)

Series EX510

Compatible communication network

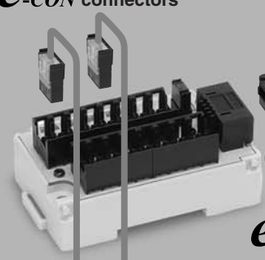
CC-Link
DeviceNet™
PROFIBUS PROCESS FIELD BUS

GW unit



* Input units with covers

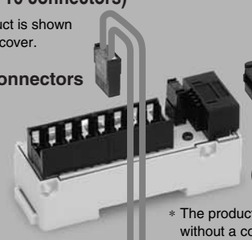
e-CON connectors



16-point input unit
(interlinks 16 connectors)

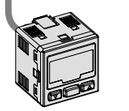
* The product is shown without a cover.

e-CON connectors

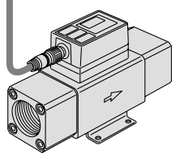


16-point input unit
(interlinks 8 connectors)

* The product is shown without a cover.

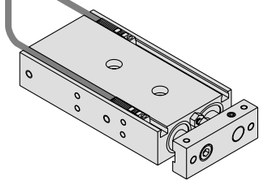


Pressure switch



Flow switch

Input device



Auto switch

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

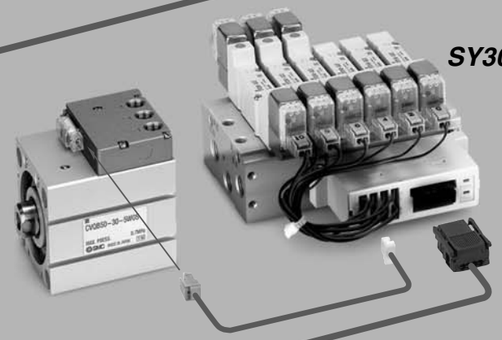
e-CON connectors

Including SI unit manifold valve

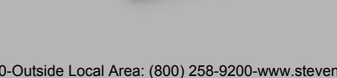
VQZ1000/2000/3000

S0700

SY3000/5000/7000/9000



Output unit

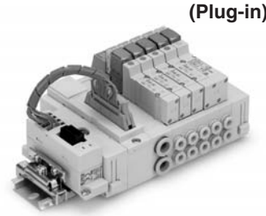


Output equipment

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

2 port solenoid valve

SY3000/5000 (Plug-in)



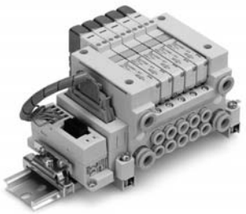
SYJ3000/5000/7000

SJ2000/3000

SZ3000

SQ1000/2000

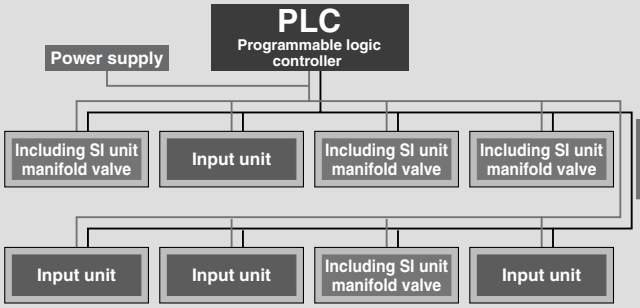
VQ1000/2000



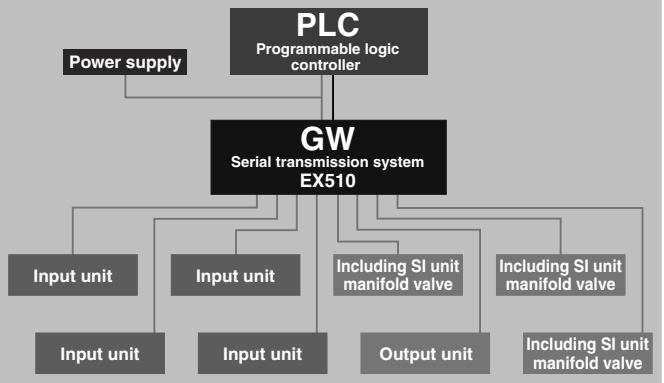
EX

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.

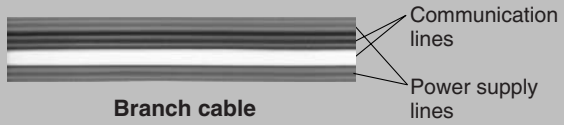
Compatible protocol	Conventional SI unit model
CC-Link	3 master stations 3 manifold
DeviceNet™	1 node 1 manifold
PROFIBUS DP	1 node 1 manifold

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.



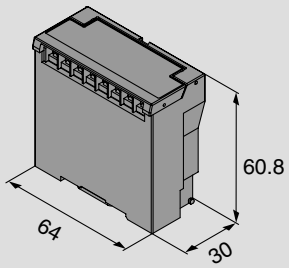
Feature 3 There is no need to set the address for the SI unit, output unit and input unit.

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

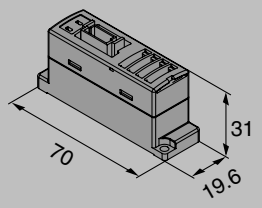
- **It is okay to set the address for the GW unit only.**

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

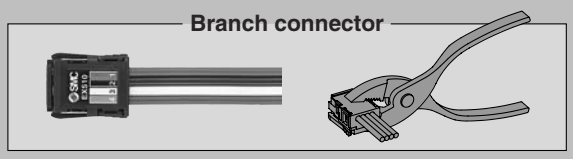
Feature 5 Can flexibly change to Fieldbus.

- 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.**

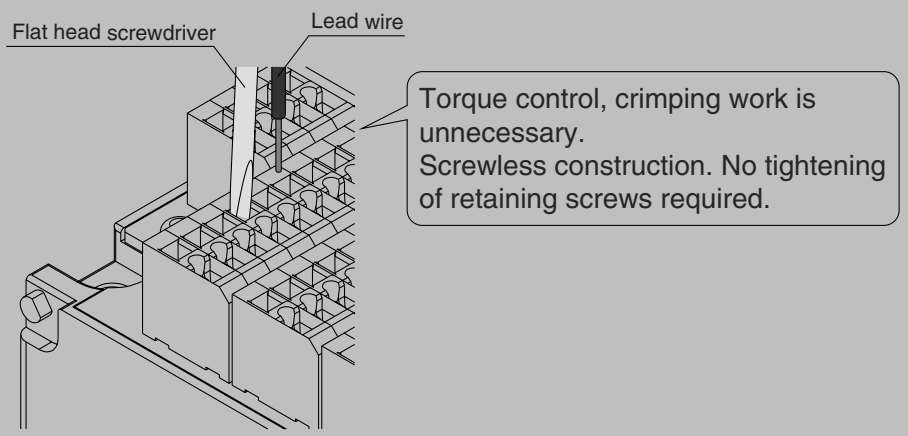
Feature 6 Adoption of connectors which do not require any special tools for installation

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.**

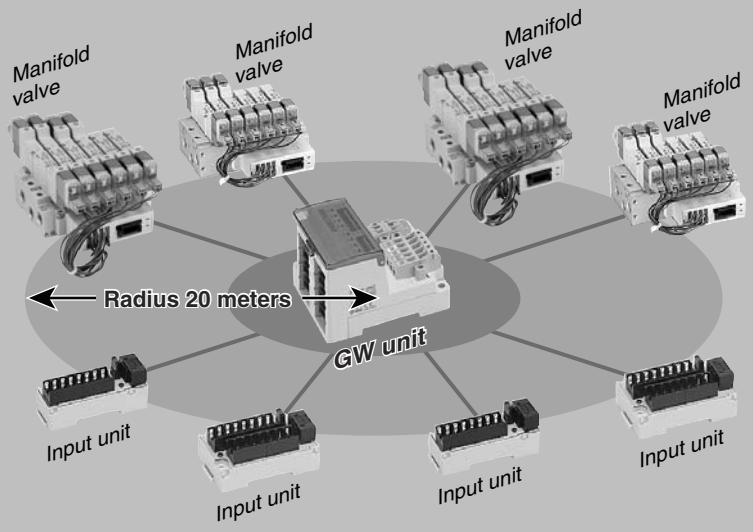
The output unit adopts a spring type terminal box, eliminating the need to tighten any retaining screws.



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.



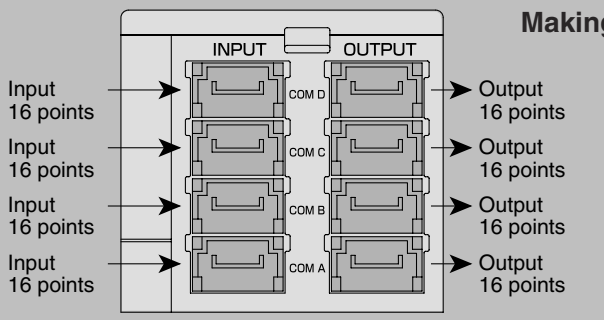
Feature 8 Delay in transmission of 1 ms or less

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.

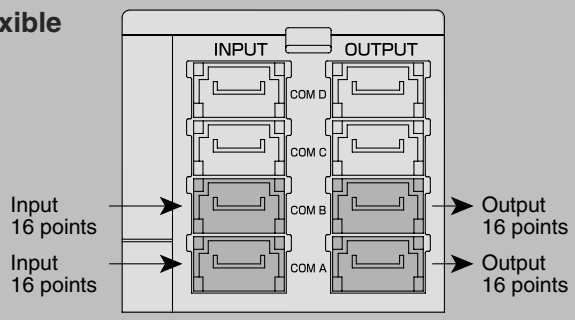
Input 64 points/Output 64 points (Initial setting)



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

Making I/O flexible

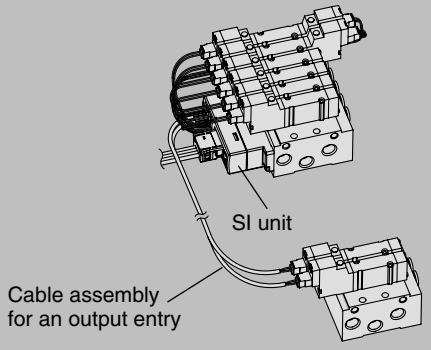
Example) Input 32 points/Output 32 points



∗ 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

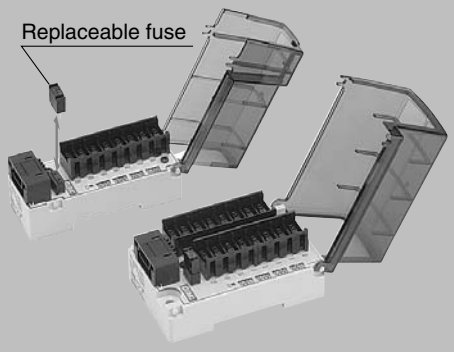
Valves which are independent from the manifold can be converted to serial transmission without purchasing new SI units.



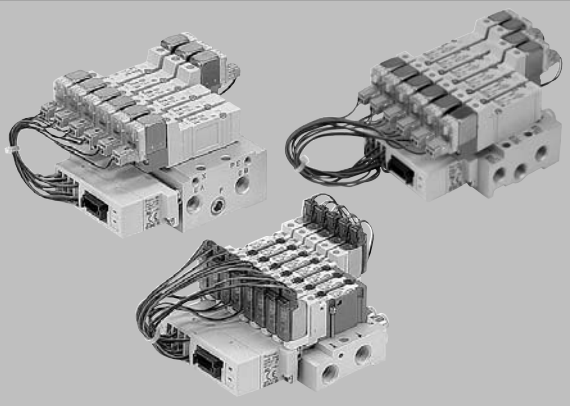
Feature 11 Protection

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.

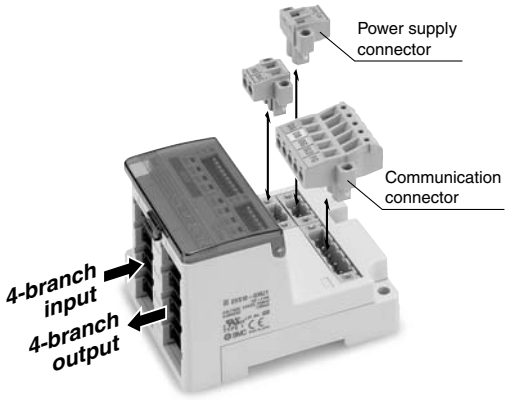


EX

Decentralized Serial Wiring (GW System, 4 Branches)

Series EX510

GW Unit



How to Order

EX510-G MJ1

Communication protocol

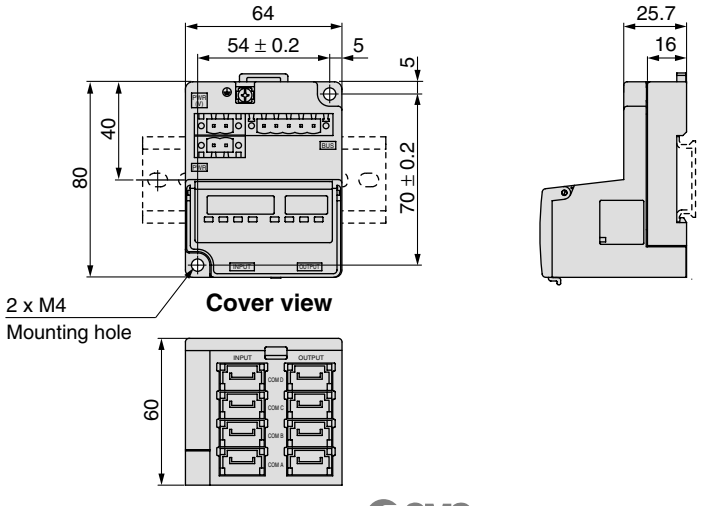
MJ1	CC-Link
DN1	DeviceNet™
PR1	PROFIBUS DP

Specifications

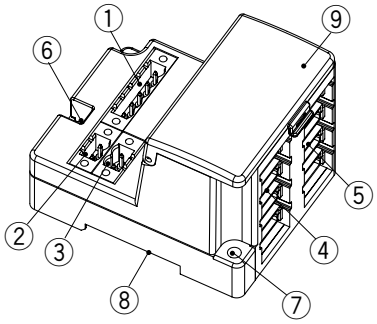
Model			EX510-GMJ1	EX510-GDN1	EX510-GPR1
Communication specification	Applicable system	Protocol	CC-Link	DeviceNet™	PROFIBUS DP
		Version Note 1)	Ver. 1.10	Release 2.0	DP-V0
	Communication speed		156 k/625 k/ 2.5 M/5 M/10 Mbps	125 k/250 k/ 500 kbps	9.6 k/19.2 k/45.45 k/ 93.75 k/187.5 k/500 k/ 1.5 M/3 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.

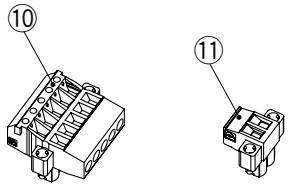
Note 1) Please note that the version is subject to change.
Note 2) Each file can be downloaded from SMC's website (http://www.smcworld.com/).
Note 3) For detailed specifications other than the above, refer to the separate technical operation manual that can be downloaded from SMC's website (http://www.smcworld.com/).

Dimensions



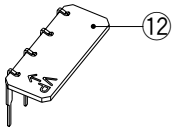
Parts Description





Communication connector (1 pc.)

Power supply connector (2 pcs.)



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

Accessories

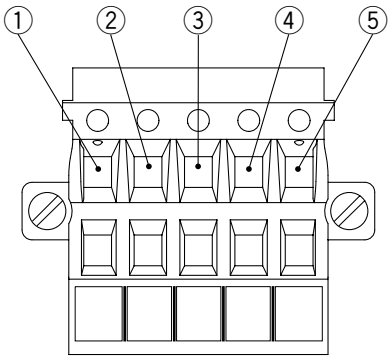
GW Unit

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

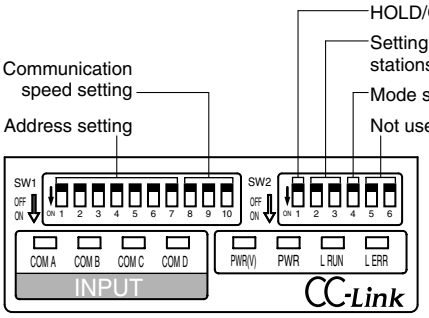
Communication Connector Pin Assignment

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)

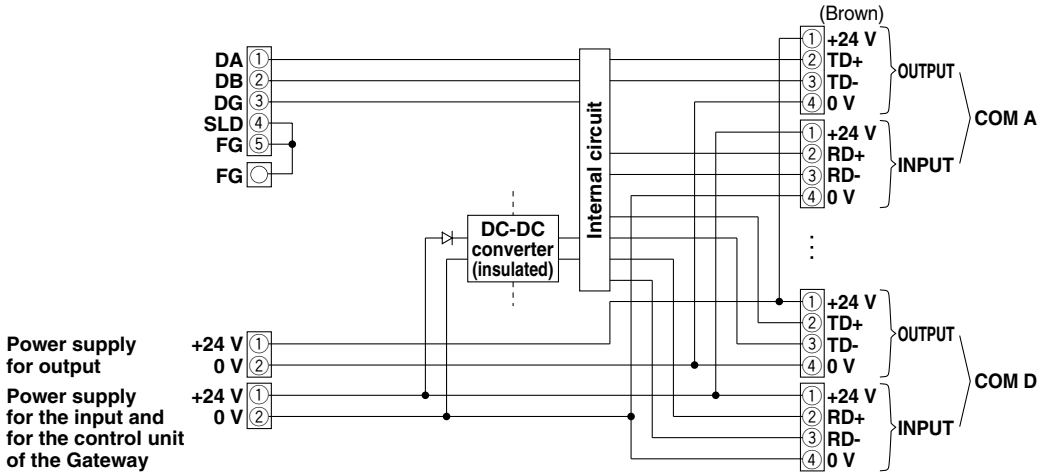
Display Setting



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.

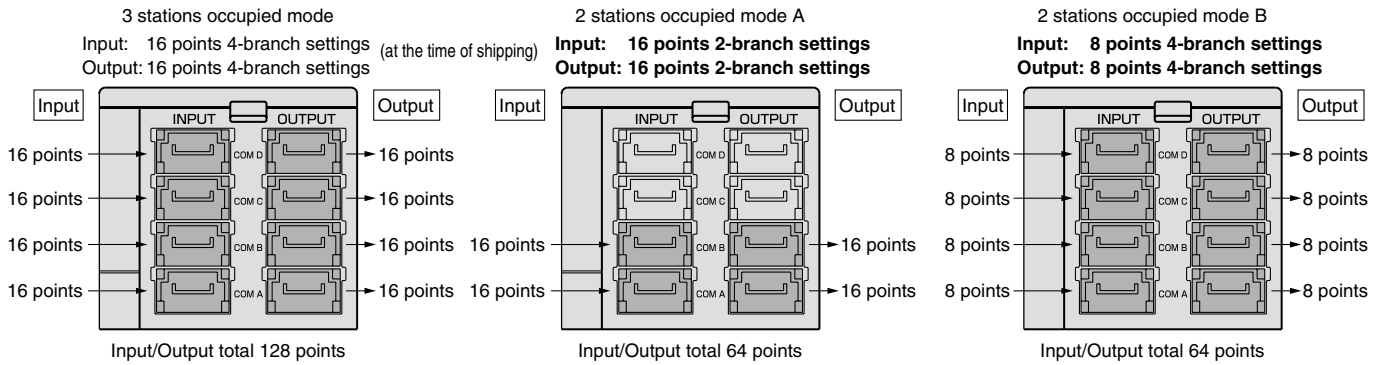
Internal Circuit



Flexible I/O Setting Examples

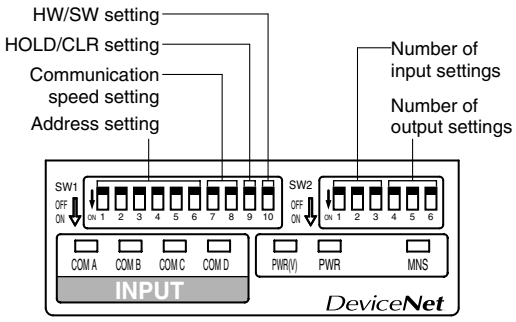
The occupying number of the Gateway units can be changed flexibly by setting a switch.
Consult the instruction manual for details.

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



EX510-GDN1 (DeviceNet™ compatible)

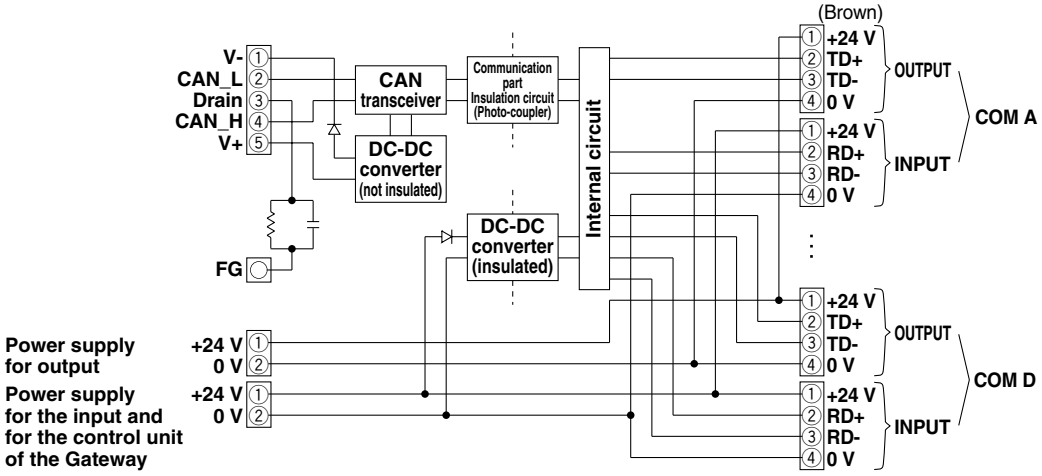
Display Setting



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

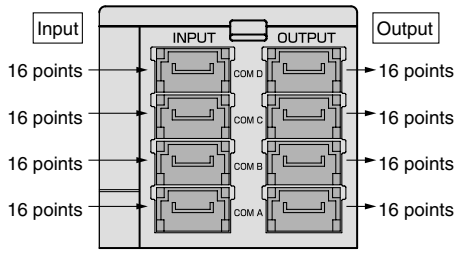


Flexible I/O Setting Examples

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.

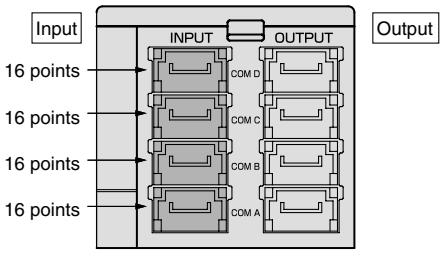
Side view of the Gateway unit
■ are parts in use.

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



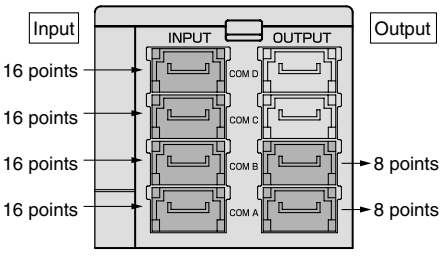
Input/Output total 128 points

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



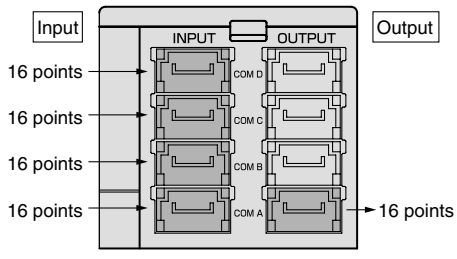
Input/Output total 64 points

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



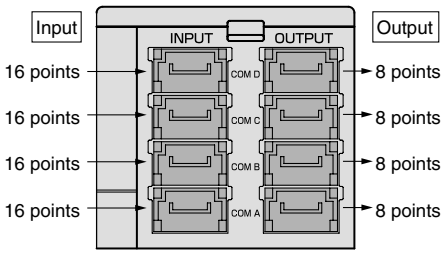
Input/Output total 80 points

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



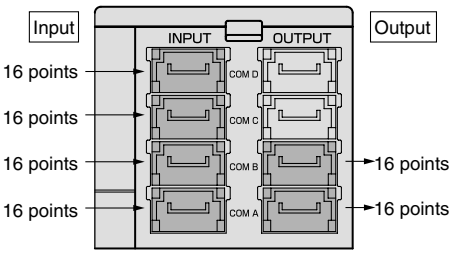
Input/Output total 80 points

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



Input/Output total 96 points

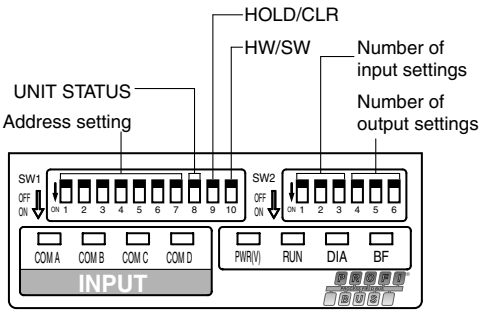
Input: 16 points 4-branch settings
Output: 16 points 2-branch settings



Input/Output total 96 points

EX510-GPR1 (PROFIBUS DP compatible)

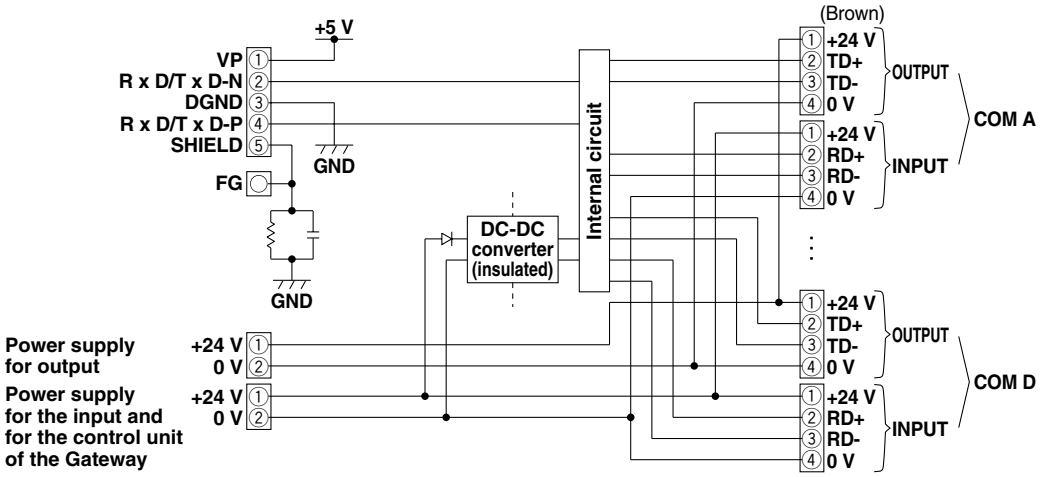
Display Setting



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

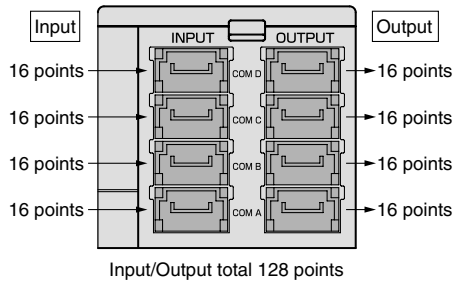


Flexible I/O Setting Examples

Side view of the Gateway unit
are parts in use.

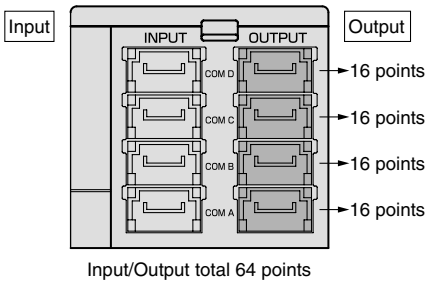
The occupying number of points in the Gateway units can be changed flexibly by setting a switch.
The occupying number of inputs and outputs can be set respectively. (Figures below are examples of the flexibility of setting the output occupied numbers.)
Consult the instruction manual for details.

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



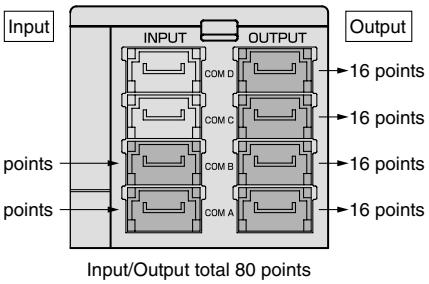
Input/Output total 128 points

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



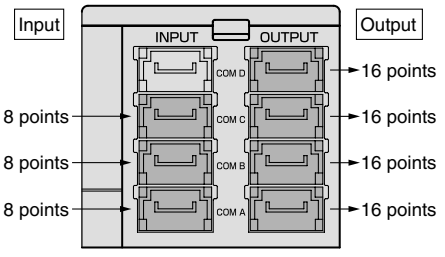
Input/Output total 64 points

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



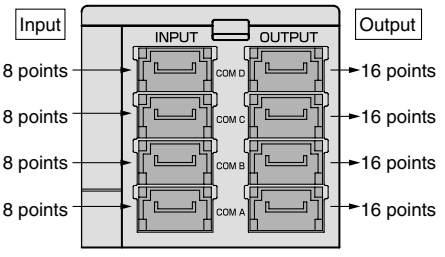
Input/Output total 80 points

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



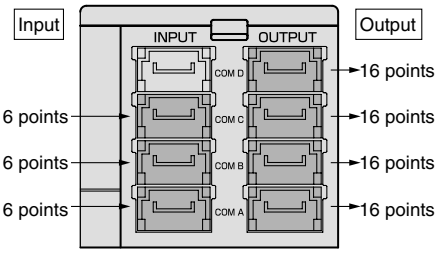
Input/Output total 88 points

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



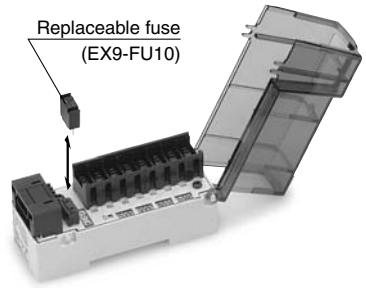
Input/Output total 96 points

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.

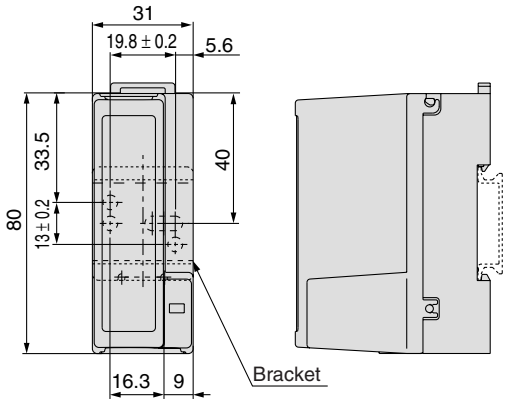
Specifications

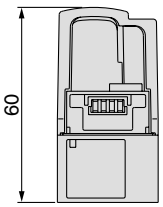
Model		EX510-DXN□	EX510-DXP□, DXB1
Input type		NPN sensor input	PNP sensor input
Number of inputs		16 points	
Sensor supply voltage		24 VDC	
Max. sensor supply current		0.2 A per point, 0.9 A per unit	
Consumption current		100 mA (Input unit internal parts)	
Input resistance		5.6 kΩ	
Rated input current		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

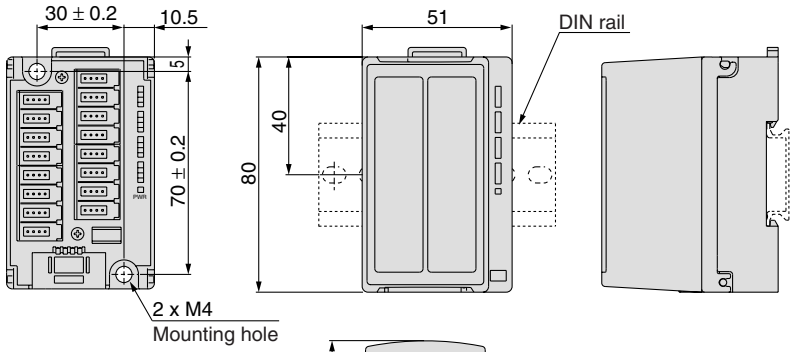
Dimensions

EX510-DX□1

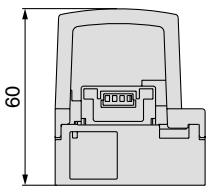




EX510-DX□2

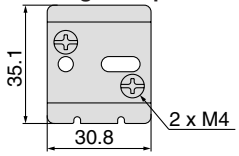


Shown with cover removed.

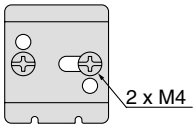


Bracket (accessory for EX510-DX□1)

Mounting example 1

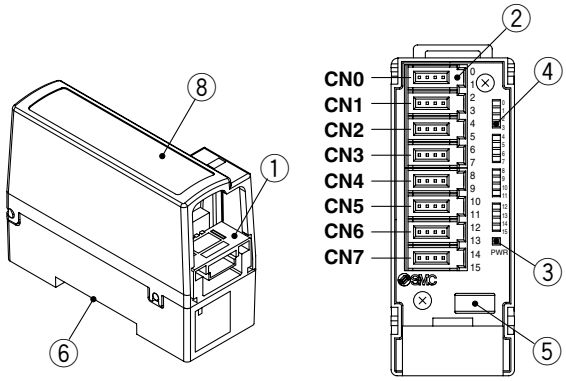


Mounting example 2



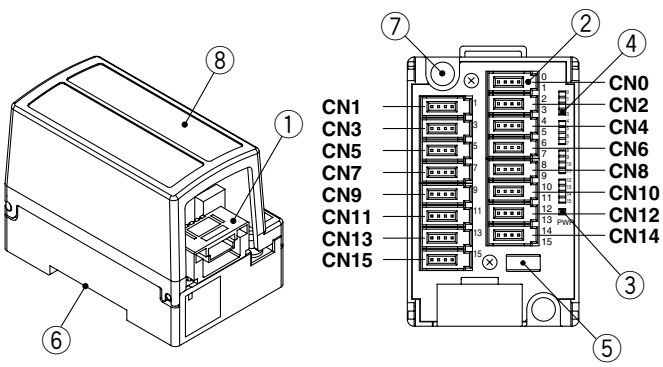
Parts Description

EX510-DX□1



Shown with cover removed.

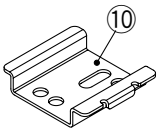
EX510-DX□2



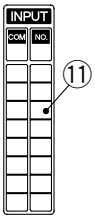
Shown with cover removed.

Accessories

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



Bracket
∗ Attached to
EX510-DX□1 only



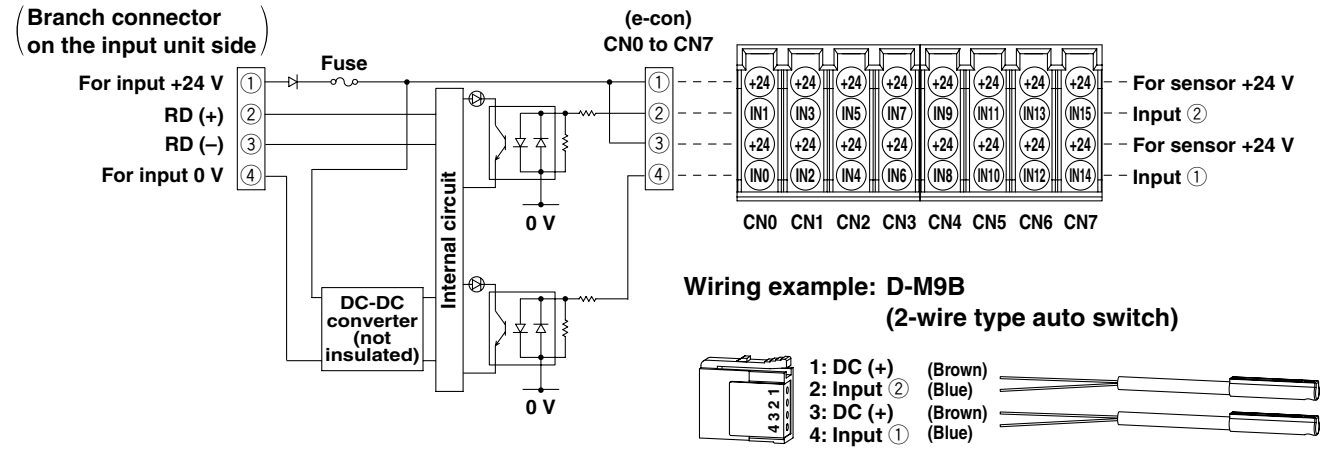
Marker label

Input Unit

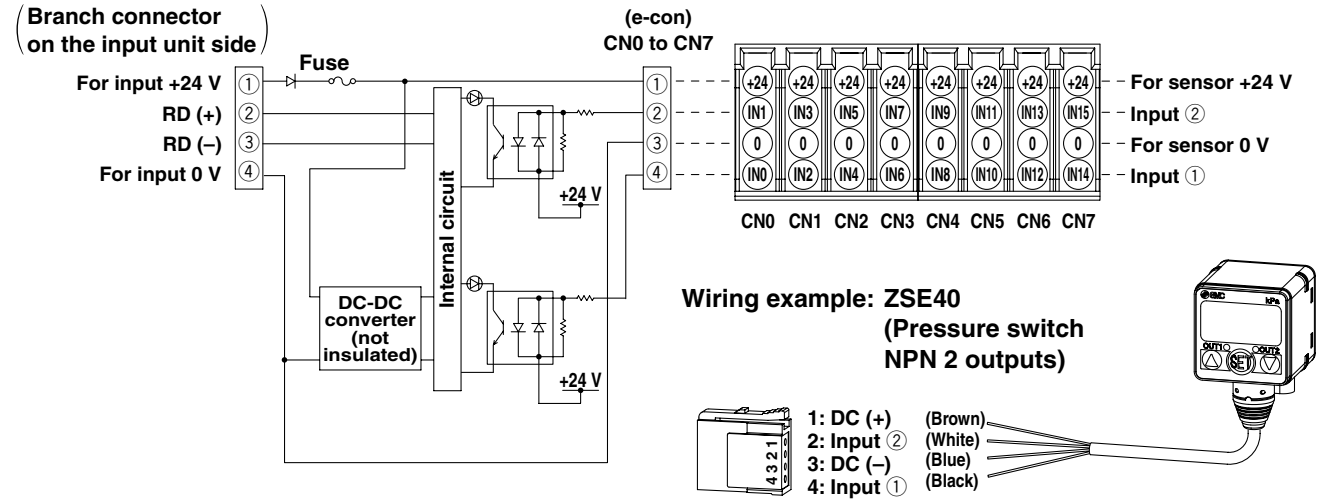
No.	Description	Applications
1	**Branch connector on the input unit side**	For press-fitting the branch connector (⑨) to the branch cable (EX510-FC□□) for connecting with the GW unit.
2	**e-con connector**	Connecting sensor, etc.
3	**LED for power supply**	Light ON: Power supply ON (Normal) state Light 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

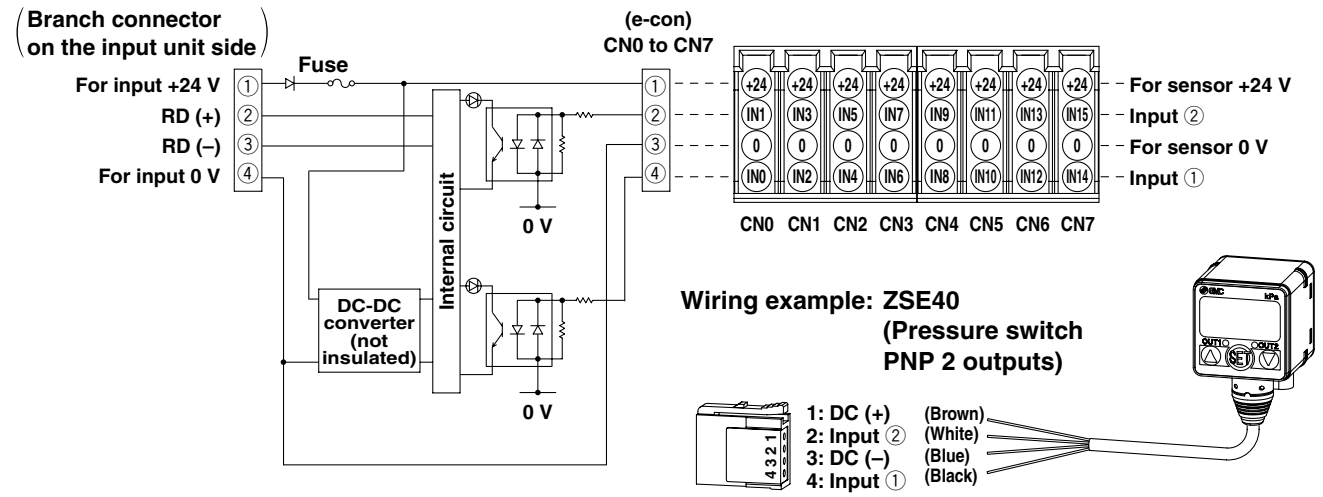
• EX510-DXB1 ··· Input unit for 2-wire type (1 connector, 2-input type)



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

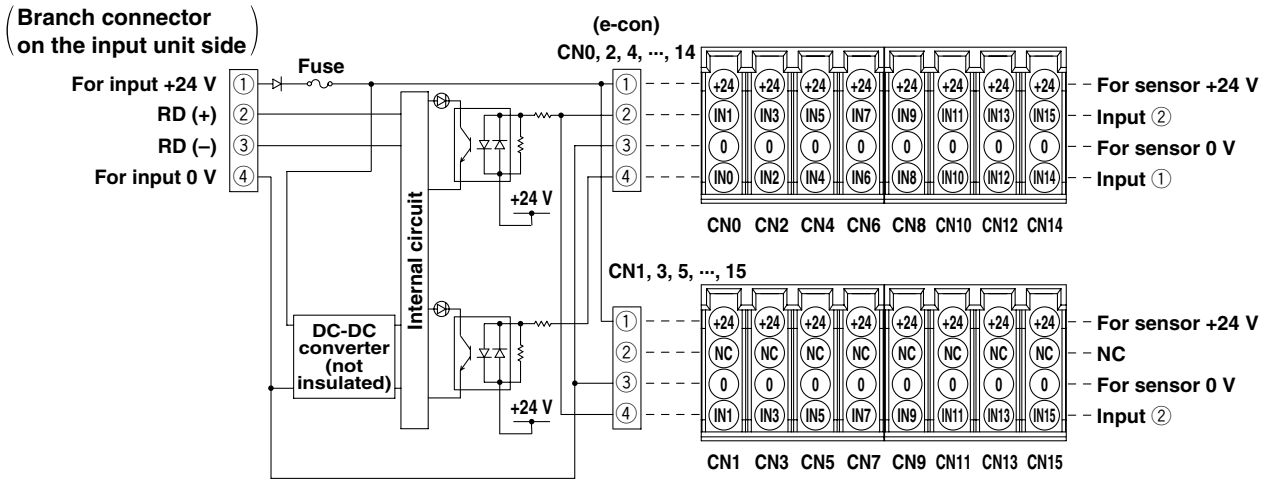


• EX510-DXP1 ··· Input unit for PNP (1 connector, 2-input type)

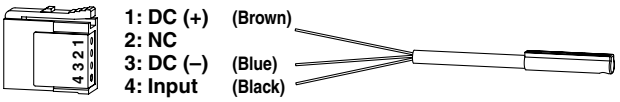


Internal Circuits and Wiring Examples

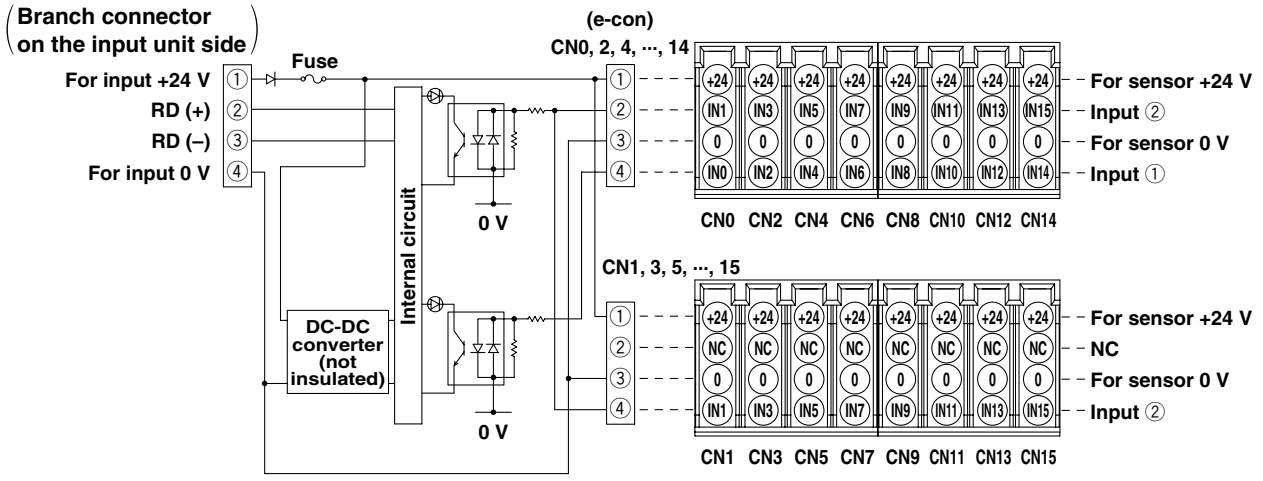
• EX510-DXN2 ··· Input unit for NPN (1 connector, 1 input type)



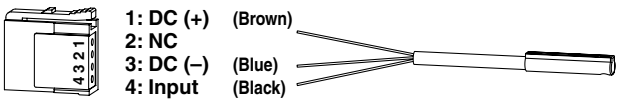
Wiring example: D-M9N
(3-wire type auto switch, NPN output)



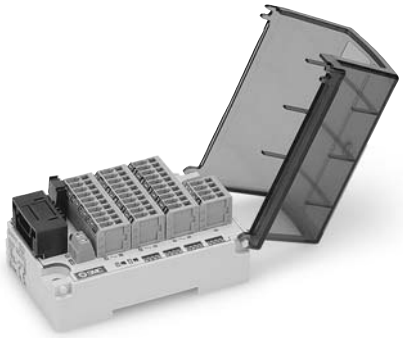
• EX510-DXP2 ··· Input unit for PNP (1 connector, 1 input type)



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

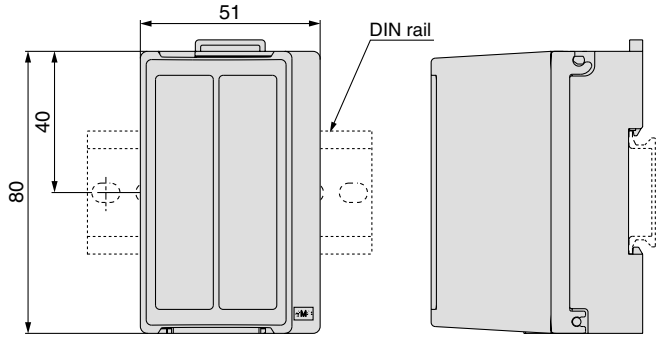
3	Terminal box type (Internal power supply)
4	Terminal box type (External power supply)

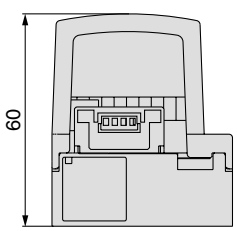
Specifications

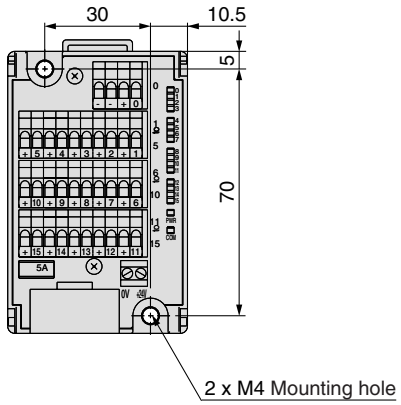
Model		EX510-DYN3	EX510-DYP3	EX510-DYN4	EX510-DYP4
Output type		NPN output (sink type)	PNP output (source type)	NPN output (sink type)	PNP output (source type)
Rated load voltage		24 VDC			
Power supply type		Internal power supply (supplied by GW unit)		External power supply (supplied by power supply connector)	
Applicable cable for power supply connector		—		0.14 to 1.5 mm^2 (AWG16 to 26)	
Number of outputs		16 points			
Output connector type		Spring type			
Applicable cable		0.08 to 1.5 mm^2 (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/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		130 g (including accessories)			

Dimensions

EX510-DY□□







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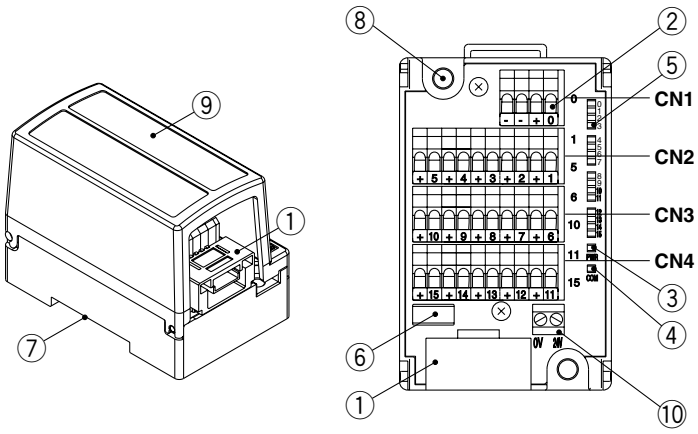
EX

Parts Description

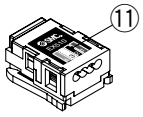


Shown with cover removed.

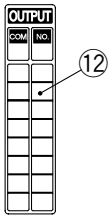
Output Unit

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



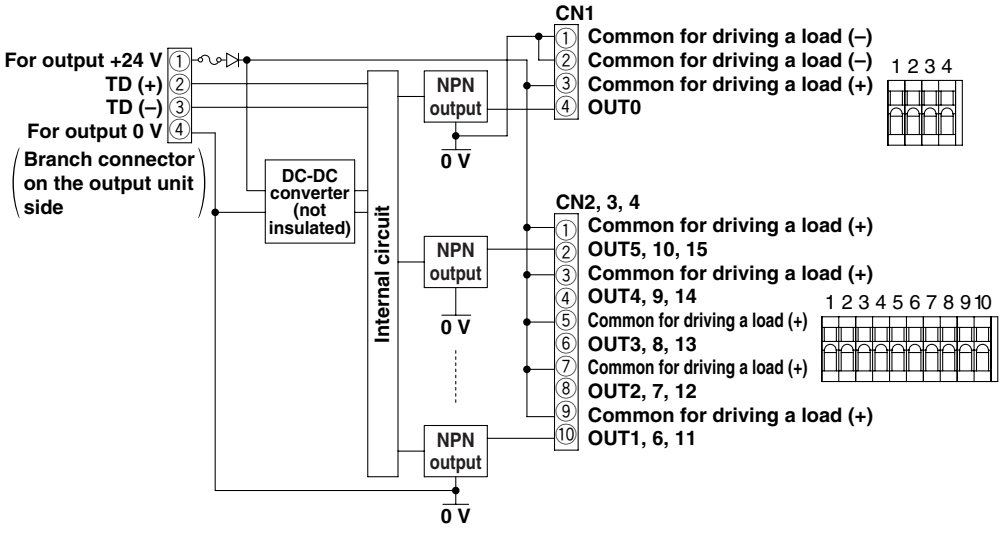
Branch connector (2 pcs.)
(EX510-LC1)



Marker label

Internal Circuits and Wiring Examples

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



Internal circuit diagram

Terminal Block Connector (CN1)

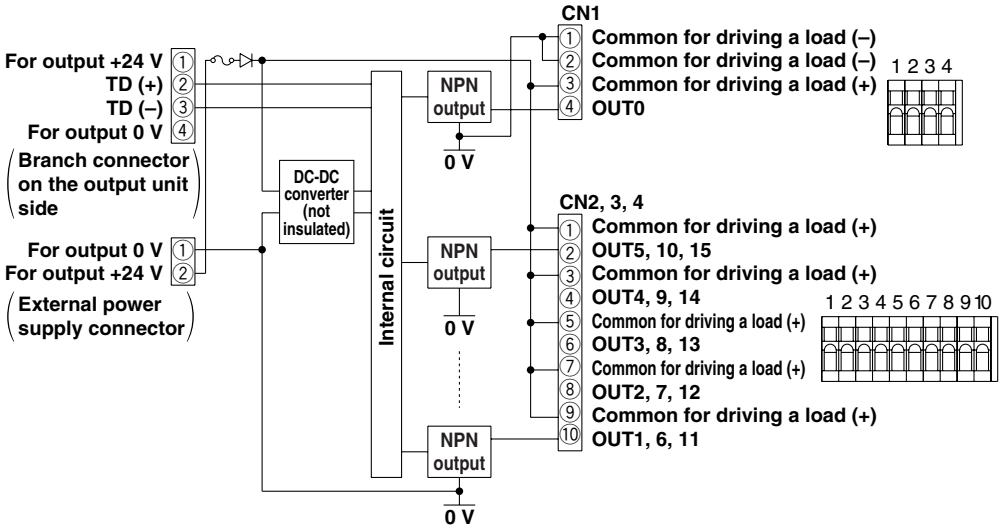
No.	Description	Functions
		CN1
1	**COM**	Common for driving a load (–)
2	**COM**	
3	**COM**	Common for driving a load (+)
4	**Output**	OUT0

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)

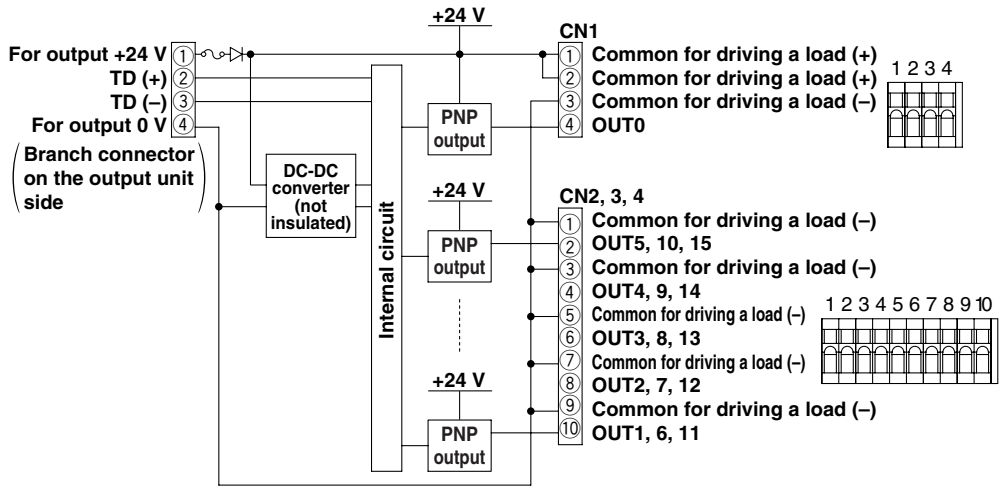
No.	Description	Functions
		CN1
1	COM	Common for driving a load (–)
2	COM	
3	COM	Common for driving a load (+)
4	Output	OUT0

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)

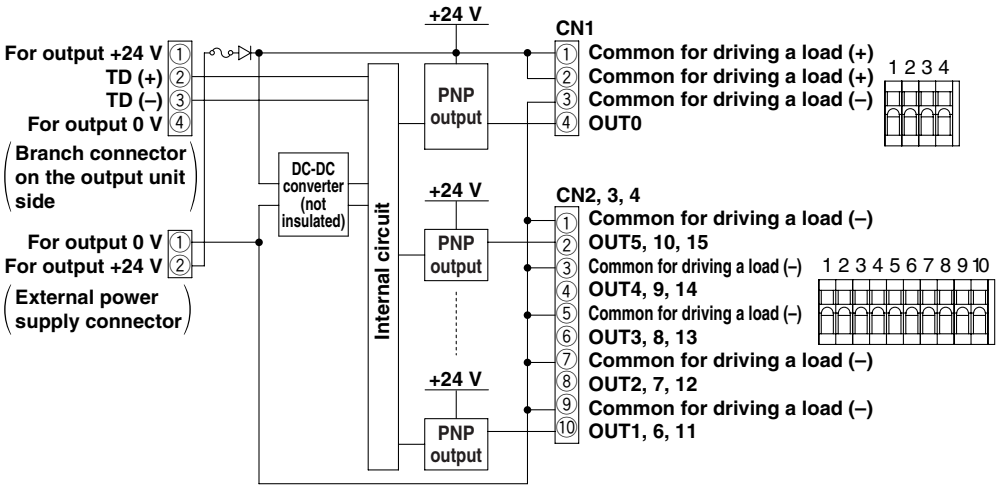
No.	Description	Functions
		CN1
1	COM	Common for driving a load (+)
2	COM	
3	COM	Common for driving a load (–)
4	Output	OUT0

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.

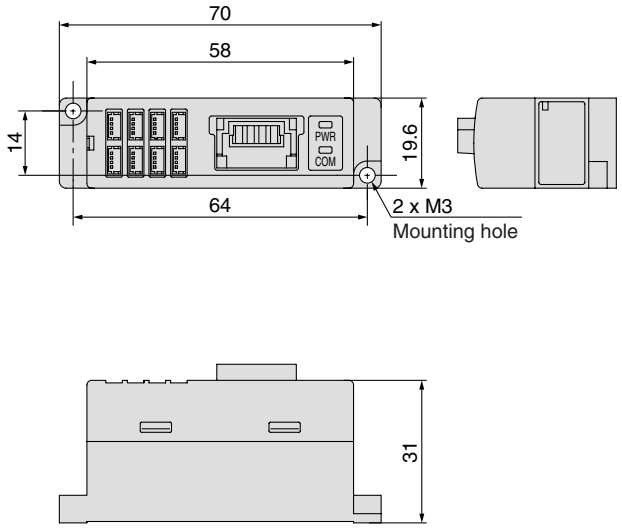
Specifications

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/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-S☐01: 40 g EX510-S☐01A ,B: 80 g EX510-S☐02: 50 g EX510-S☐02A, B, C: 90 g (including accessories)	

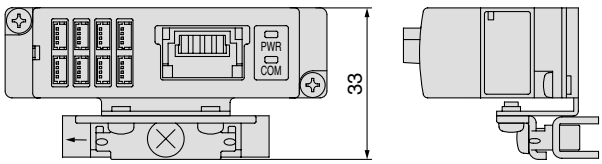
EX

Dimensions

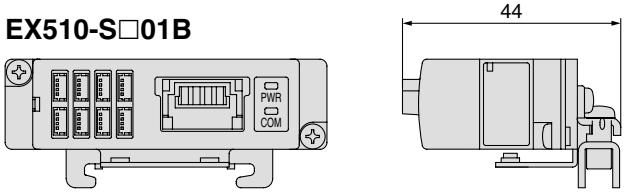
EX510-S☐01



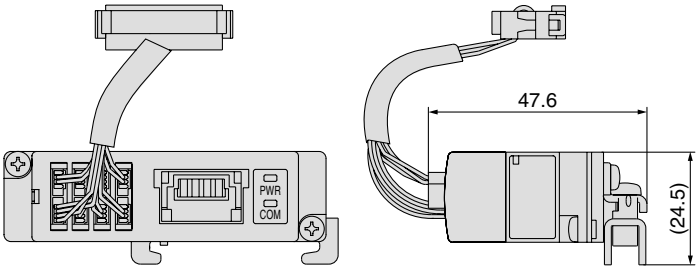
EX510-S☐01A



EX510-S☐01B



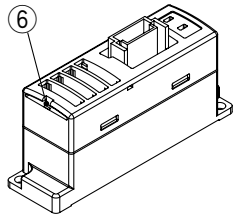
EX510-S☐02C



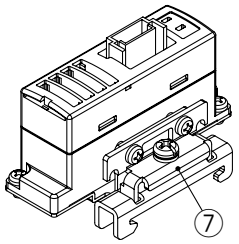
Parts Description

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.

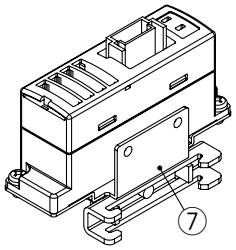
EX510-S□01
(Series SY, SYJ, S0700, VQZ)



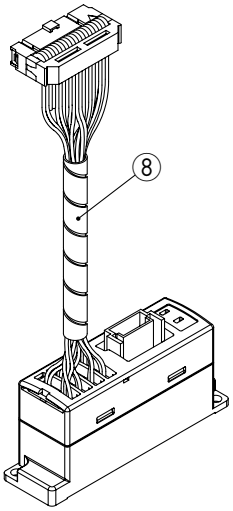
EX510-S□01A
(Series SY (Type 45))



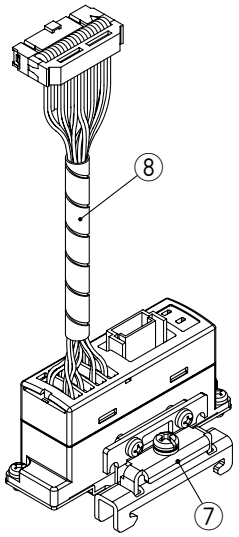
EX510-S□01B



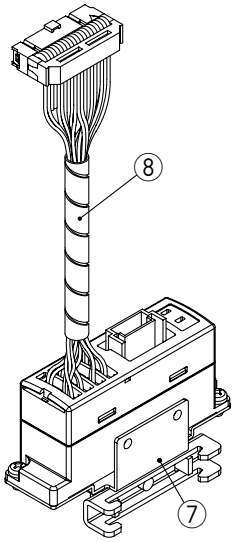
EX510-S□02



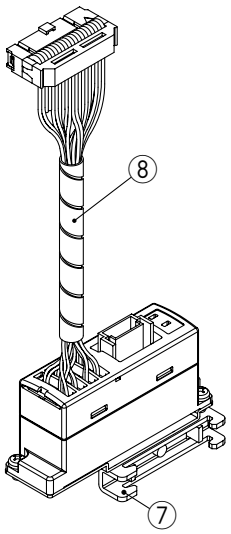
EX510-S□02A
(Series SY, VQ)



EX510-S□02B
(Series SZ, SQ)

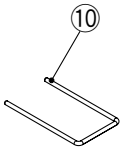


EX510-S□02C
(Series SJ)

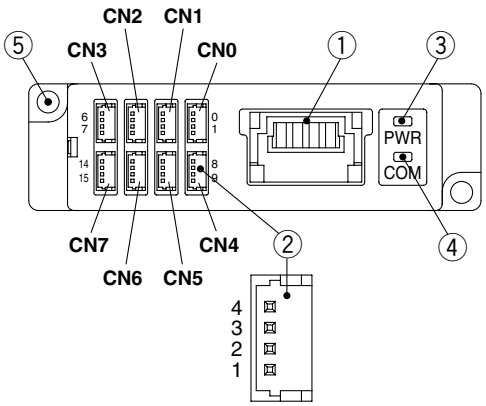


Accessories

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



Connector lock pin
(1 pc.)

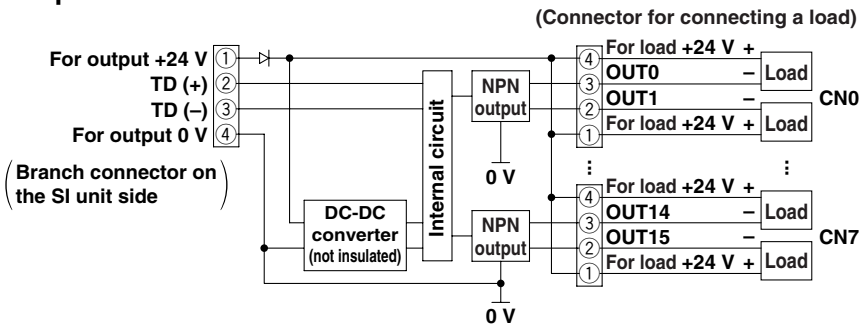


SI Unit

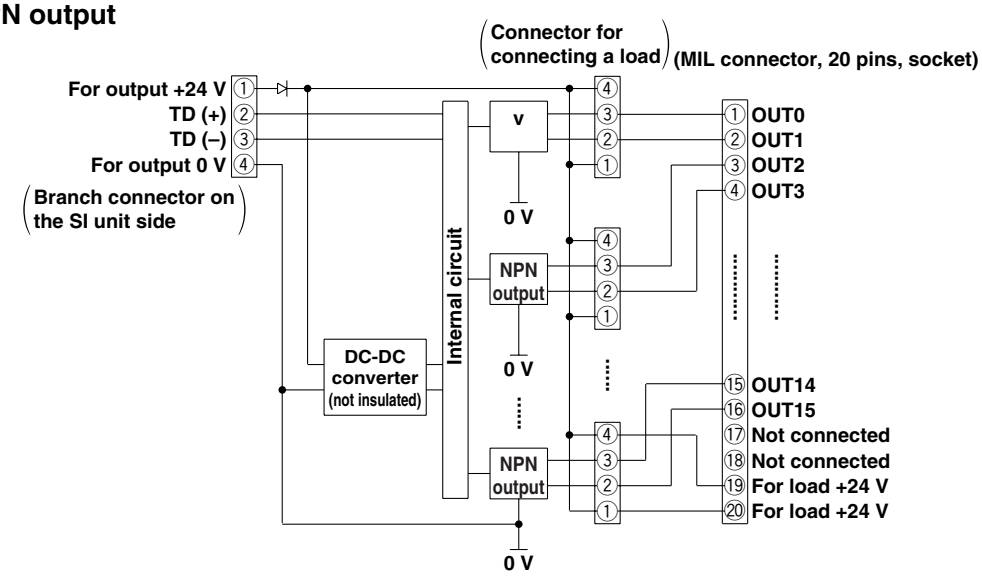
No.	Description	Applications
1	**Branch connector on the SI side unit**	For press-fitting the branch connector (⑨) to the branch cable (EX510-FC□□) for connecting with the GW unit.
2	**Connector for connecting a load**	Connects an output device such as a solenoid valve.
3	**LED for power supply**	Light 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

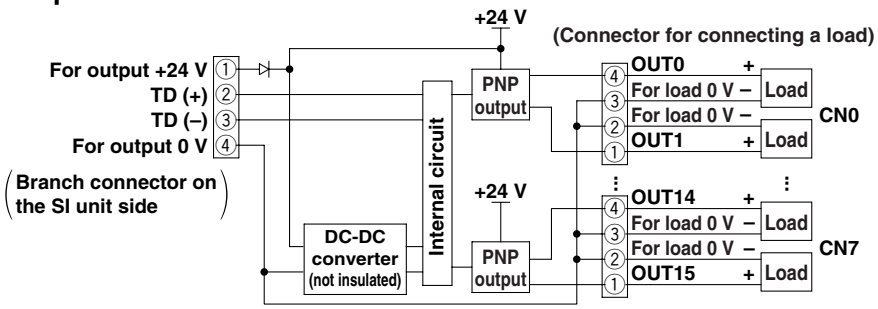
EX510-S001/NPN output



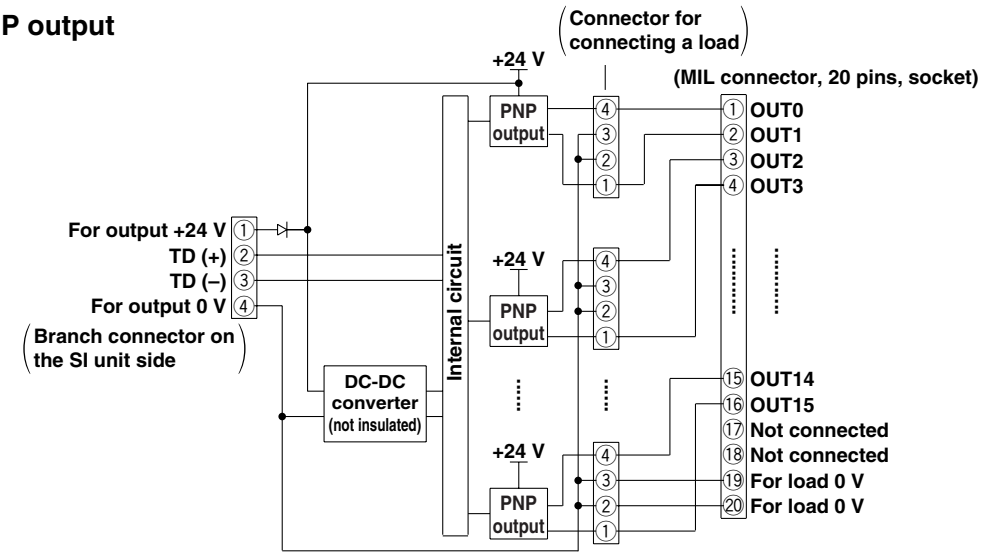
EX510-S002/NPN output



EX510-S101/PNP output



EX510-S102/PNP output



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

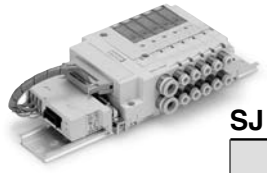
Series	Sonic conductance: C [dm³/(s•bar)] (representative value)	Applicable cylinder size (reference)	Port size for A, B ports				
			Piping with one-touch fittings				Thread piping
			Metric size		Inch size		
			ø3.2	ø4	ø1/8"	ø5/32"	M5
S0700	0.36	ø**20**	●	●	●	●	●

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

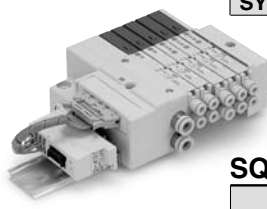
Series	Sonic conductance: C [dm³/(s•bar)] (representative value)	Applicable cylinder size (reference)	Port size for A, B ports				
			Piping with one-touch fittings			Thread piping	
			Metric size				
			ø2	ø4	ø6	M3	M5
SJ2000	0.36	ø**25**	●	●		●	
SJ3000	0.56	ø**32**	●	●	●		●

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**	●	●	●	●	●

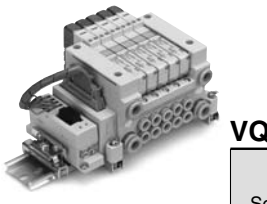
SY

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**		●	●	●		●	●	●		



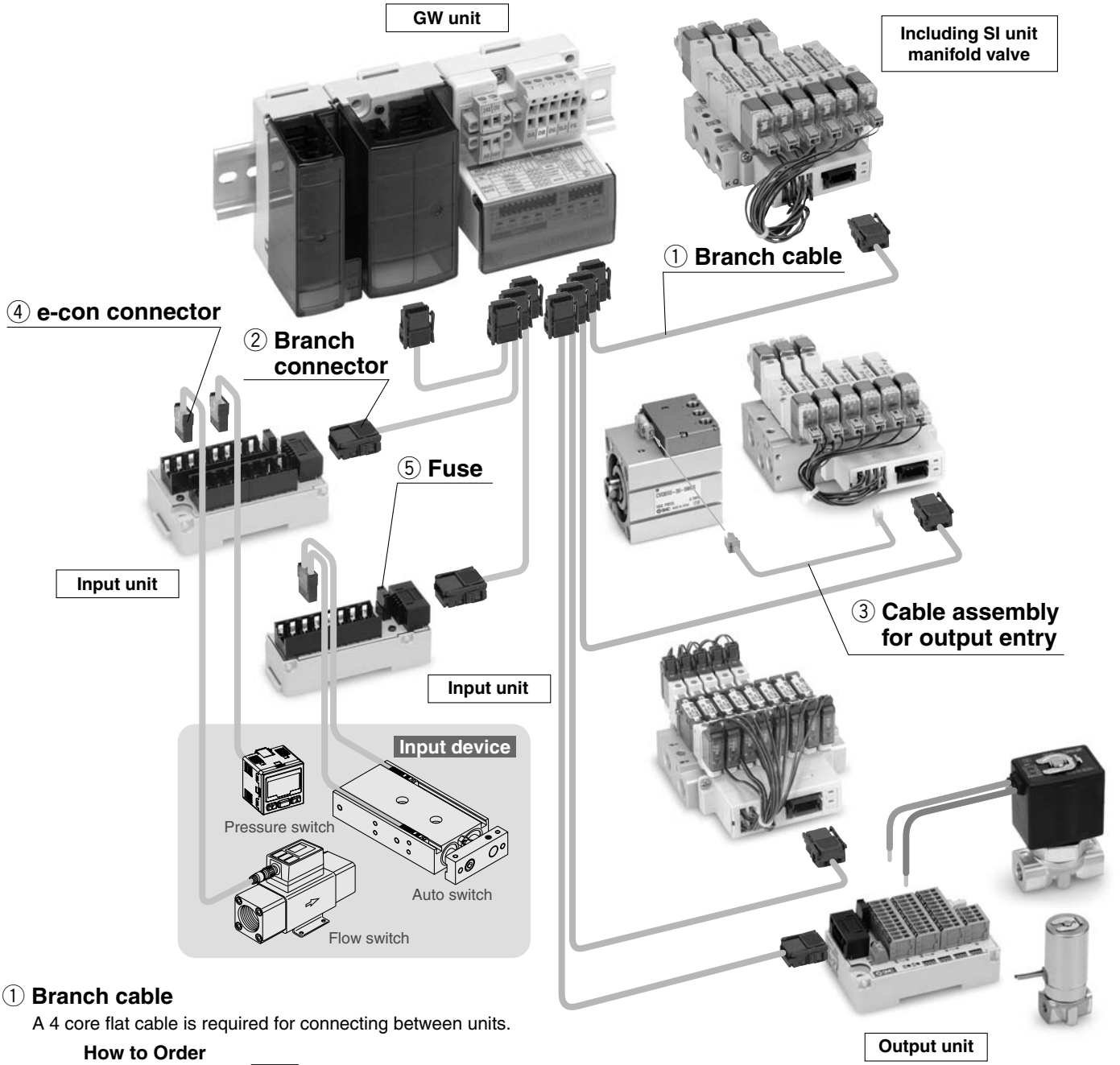
VQ

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.

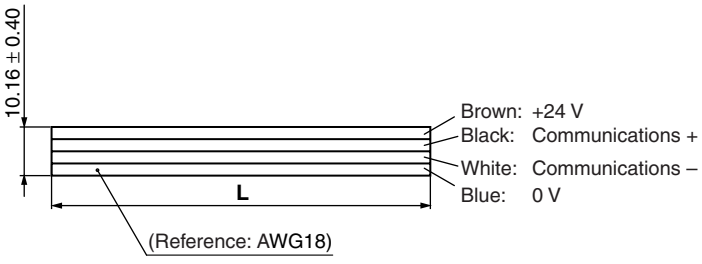
How to Order

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.

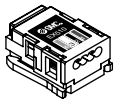


② Branch connector (Unit 1 pc.)

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)

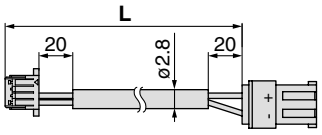
10	1 m
30	3 m

Valve connector

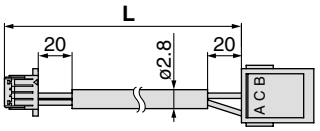
Nil	None
S	For SY, SYJ series
Q	For VQ, VQZ series Note)

Note) VQ is compatible with the positive common only.

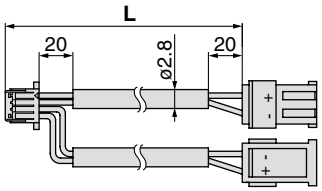
EX510-VS□S



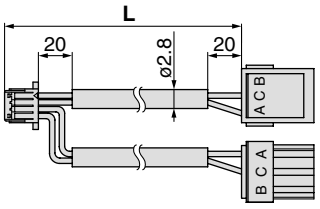
EX510-VS□Q



EX510-VW□S



EX510-VW□Q



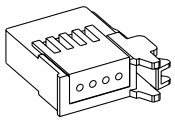
④ e-con connector

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 (mm²)	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 (mm²)	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 (mm²)	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□□).

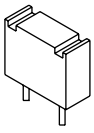
How to Order

EX9-FU 10

Fuse rated current

10	1 A
50	5 A

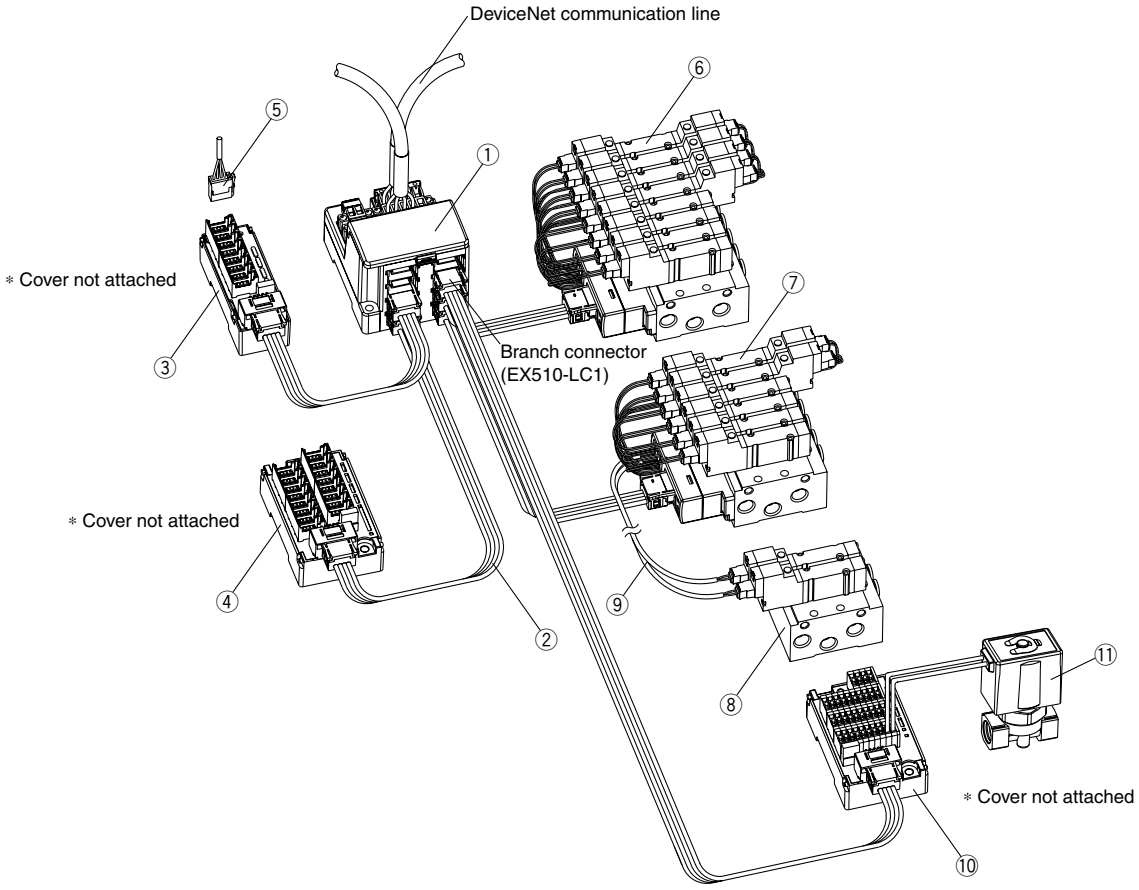
Fuse



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 ∗ SY3140-5LOZ ∗ SY3240-5LOZ	1 unit 4 units 4 units
∗ ⑦	VQZ series manifold	VV5QZ15-SA06C6 ∗ VQZ1150-5LO1 ∗ VQZ1250-5LO1	1 unit 4 units 2 units
⑧	SY series manifold	SS5Y3-42-02-C6 ∗ SY3140-5LOZ	1 unit 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. 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

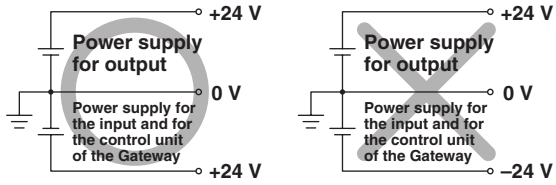
(2) Class 2 power supply unit in accordance with UL1310 or circuit (Class 2 circuit) in accordance with UL1585, that is powered by Class 2 transformer with the maximum of 30 Vrms (42.4 V at peak)

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.

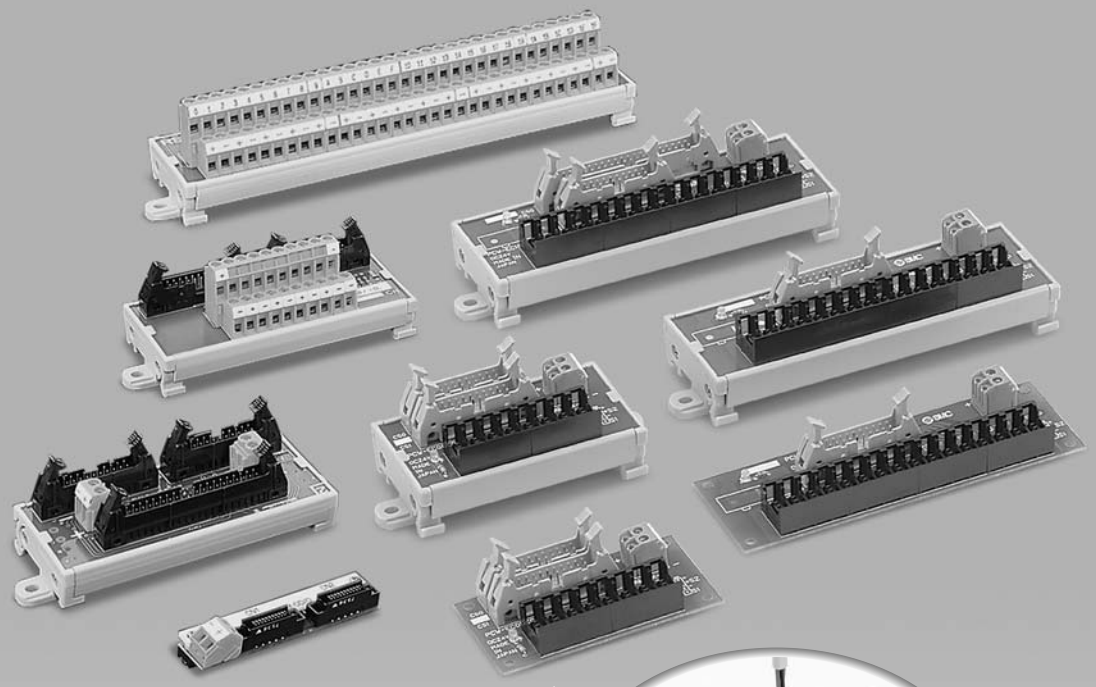
⚠ Caution

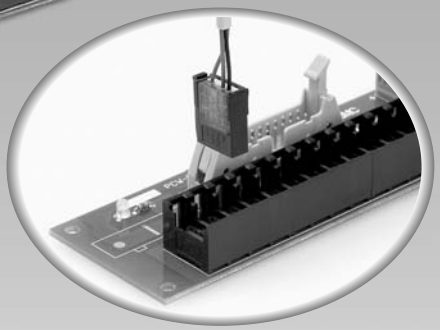
1. Do not wipe this product with chemicals such as benzine or thinner.

Using such chemicals is likely to cause damage.

PC Wiring System

Series PCW





e-con type is newly added!
One-touch connection reduces wiring labor.

EX

Branch unit offers commonality

- Branch unit separates each manufacturer's 32 point Input/Output (I/O) into 16 point common pin layout.
- Conversion to a common pin layout, allows connection of the pin to SMC manifold solenoid valves and other manufacturers' relay terminals without restriction.
- Power can be supplied to the PLC I/O unit.
- Compatible branch units are available for each PLC manufacturer's I/O.

Simple parallel wiring type

- Without time delay unlike serial transmission.
- Easy visual understanding at a glance, offering simple start-up, de-bug and trouble shooting maintenance.

Improved wiring efficiency and ease of operation

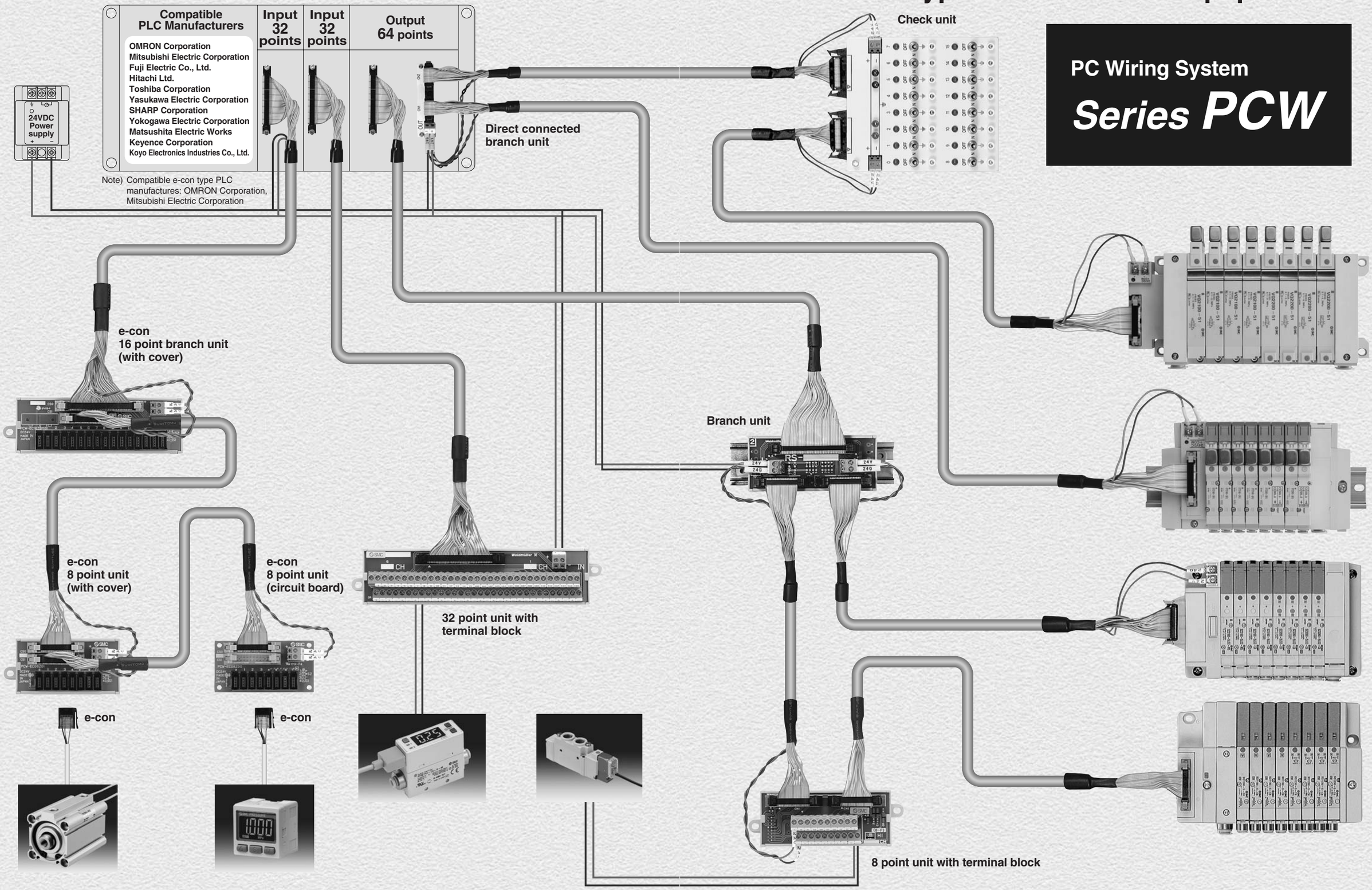
- Dedicated cable reduces wiring-equivalent to a serial transmission system.
- One-touch type connector offers standardized wiring to prevent incorrect connection and vastly improved operational efficiency.

A revolutionary new wiring system...

The PC wiring system simplifies wiring between a PLC and all types of connected equipment.

PC Wiring System

Series PCW



Note) Compatible e-con type PLC manufactures: OMRON Corporation, Mitsubishi Electric Corporation

EX

Standardized pin layout

Once 32 point terminal block unit or branch unit is replaced, no further wiring/design is necessary.

Company A's PLC I/O card
Connector pin assignment (pin layout)

+	+	-	-	2F	2E	2D	2C	2B	2A	29	28	27	26	25	24	23	22	21	20
+	+	-	-	1F	1E	1D	1C	1B	1A	19	18	17	16	15	14	13	12	11	10

△

General purpose terminal block unit
Terminal block layout

+	+	-	-	2F	2E	2D	2C	2B	2A	29	28	27	26	25	24	23	22	21	20
+	+	-	-	1F	1E	1D	1C	1B	1A	19	18	17	16	15	14	13	12	11	10

Change of PLC manufactures
(Company A to Company B)

Terminal block layout requires alteration.

Company B's PLC I/O card
Connector pin assignment (pin layout)

11	13	15	17	19	1B	1D	1F	+	-	21	23	25	27	29	2B	2D	2F	+	-
10	12	14	16	18	1A	1C	1E	+	-	20	22	24	26	28	2A	2C	2E	+	-

△

General purpose terminal block unit
Terminal block layout

11	13	15	17	19	1B	1D	1F	+	-	21	23	25	27	29	2B	2D	2F	+	-
10	12	14	16	18	1A	1C	1E	+	-	20	22	24	26	28	2A	2C	2E	+	-

Poor performance in maintenance.
Wiring must be redesigned again.

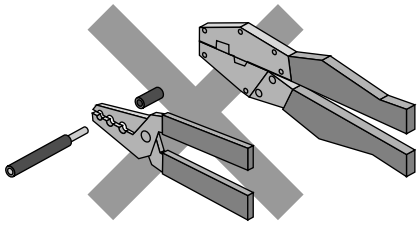
PC wiring 32 point terminal block unit
Terminal block layout

Input device (sensor)/ output device (solenoid valve, etc.) to be connected.

10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F	20	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F
+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-

PC Wiring system brings common layout.

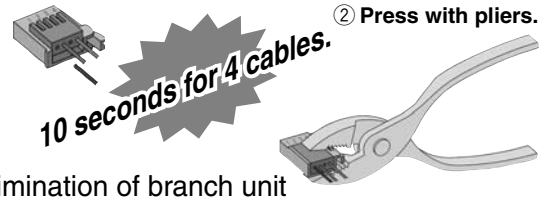
Adoption of e-con type eliminates the need for special tools and wire stripping.



[Promoted or evaluated by]
Mitsubishi Electric Corporation, OMRON Corporation, Fuji Electric Co., Ltd., Keyence Corporation, SUNX, Anywire Corporation, NKE, Kuroda Precision Industries Ltd., 3M, AMP, SMC

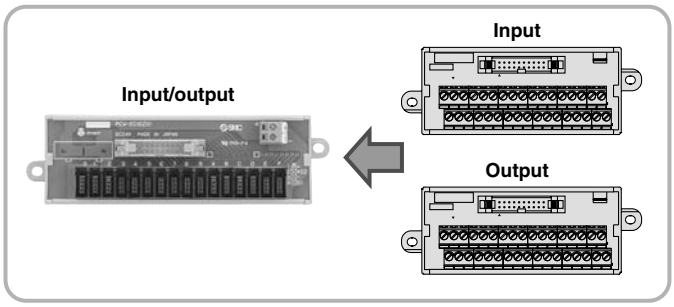
① **Insert the electric cables into the cover.**

② **Press with pliers.**



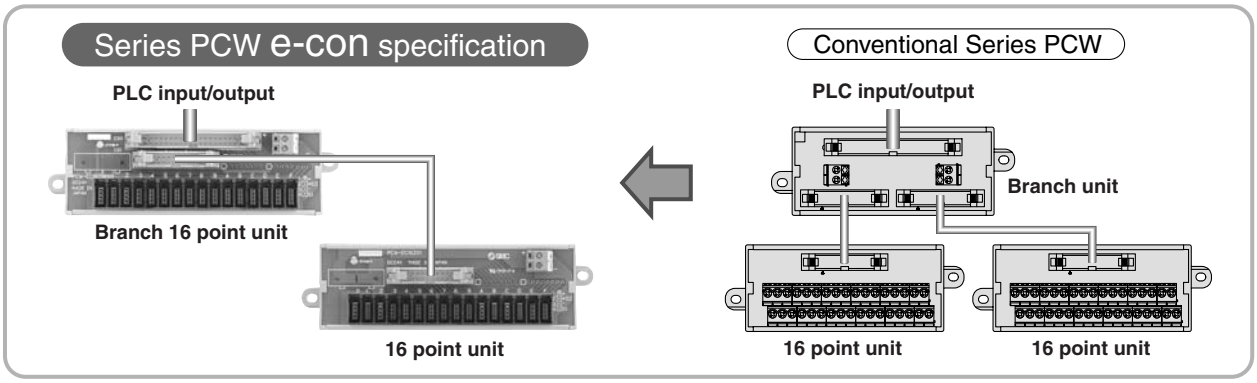
Common unit can be used.

Reduced spare parts enabling easier stock control.



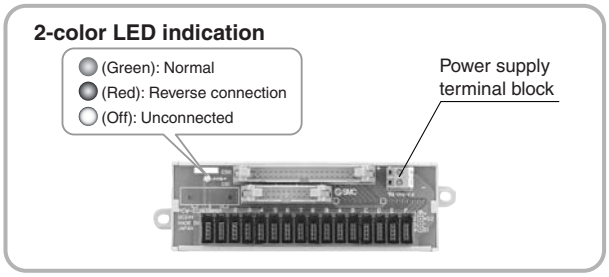
Elimination of branch unit

The function of a branch unit is built-in a 16 point unit, allowing reduction of the number of units.

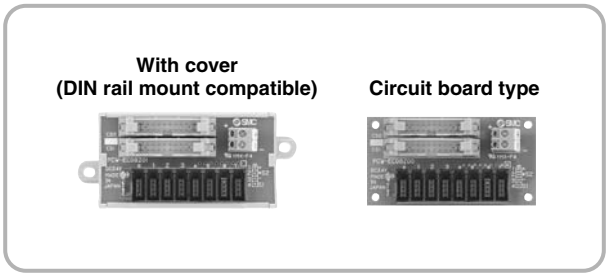


Reverse connection detection function

Visual indication of incorrect wiring of power supply terminal block and power supply status is provided.

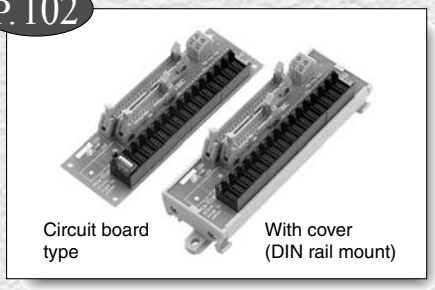


Each unit available with cover compatible with DIN rail mounting or as circuit board.



PC Wiring / *Series PCW-EC* (e-con Type)

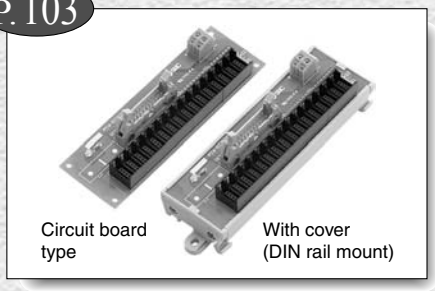
P. 102



16 point branch I/O unit

Unit with e-con combines branch unit with 16 point unit.

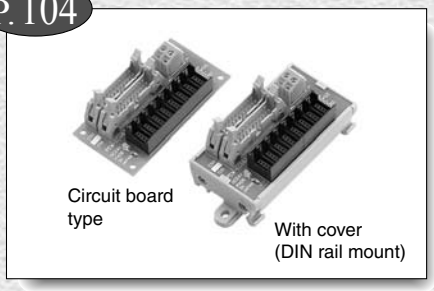
P. 103



16 point I/O unit

16 point unit with e-con allows common models used for both I/O units.

P. 104

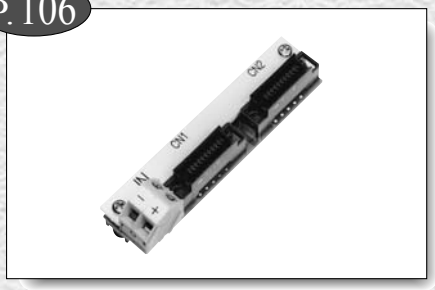


8 point I/O unit

8 point unit with e-con allows common models used for both I/O units.
Can use two 8 point I/O units in a cascade connection.

PC Wiring System / *Series PCW*

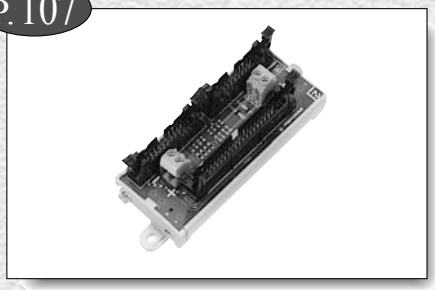
P. 106



Branch unit: PLC direct connected type

Directly mounted on PLC I/O card.

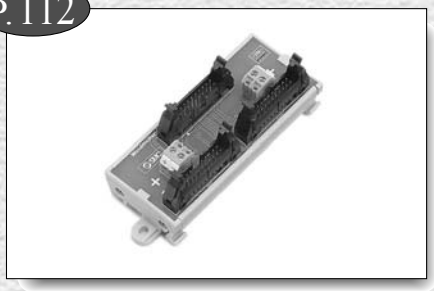
P. 107



Branch unit

Connected to PLC I/O card via connection cable.

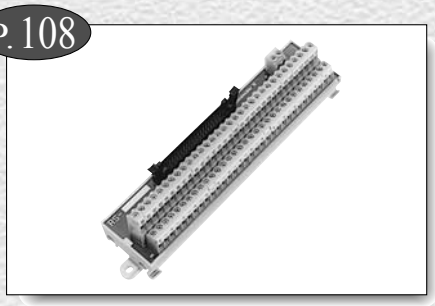
P. 112



8 point branch unit

Separates two of 8 point I/O transmissions once those are separated from two of 16 point I/O by the branch unit.

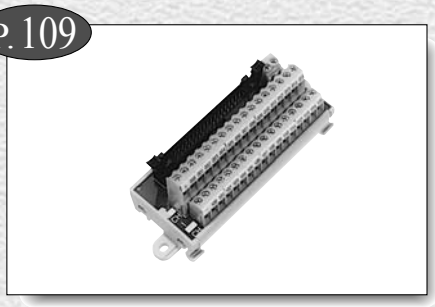
P. 108



32 point I/O unit

Wired to PLC I/O card via connection cable and wires connecting equipment to the terminal blocks.

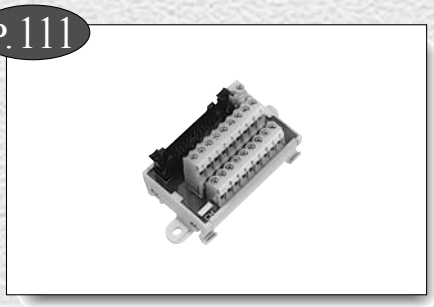
P. 109



32 point output reduced common unit

Wired to PLC I/O card via connection cable and wires connecting equipment to the terminal blocks. Products with cross-over common wires are available.

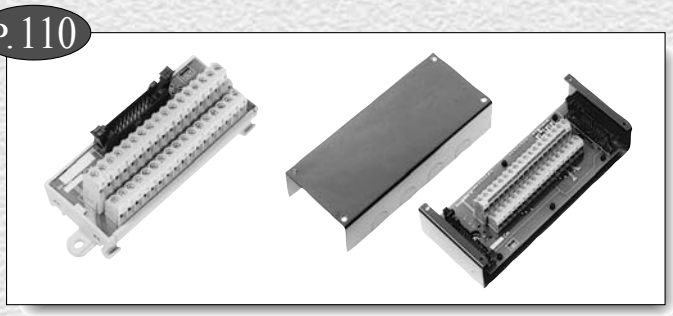
P. 111



16 point output reduced common unit

Wires two of 16 point I/O signals once separated by the branch unit to each connecting equipment via terminal block. Products with cross-over common wires are available.

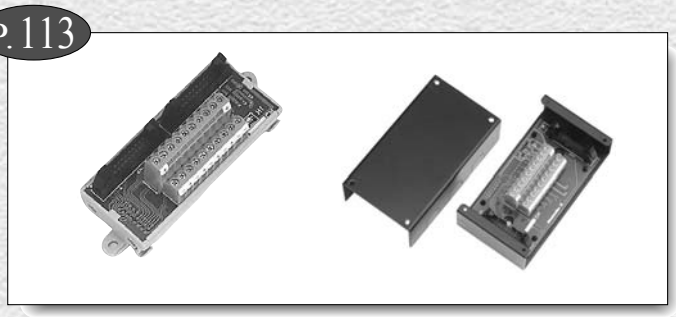
P. 110



16 point I/O unit

Wires two of 16 point I/O signals once separated by the branch unit to each connecting equipment via terminal block. DIN rail mount type and box mount types are available.

P. 113



8 point I/O unit

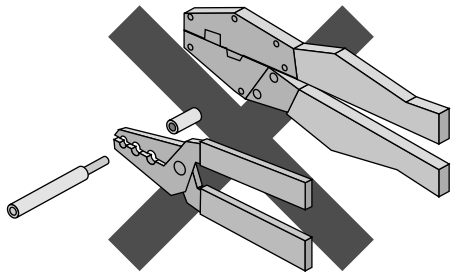
Wires two of 16 point I/O signals once separated by the branch unit to each connecting equipment via terminal block. DIN rail mount type and box mount types are available.

PC Wiring System
e-con Type
Series PCW-EC

Common Specifications

Rated voltage		24 VDC
Rated current	**Power supply line**	2 A
	Communication line	0.3 A
Insulation resistance		5 MΩ or more at 100 VDC
Withstand voltage		500 VAC
Impact resistance		500 m/s^2
Terminal block specifications	**Screw tightening torque (Phillips head screwdriver/flat head screwdriver)**	0.4 to 0.6 N·m/0.4 to 0.7 N·m
	Wire stripping length (recommended)	7 mm
	Connecting wire size	AWG26 to 14 (0.13 to 2.5 mm^2)
Input/output connector	**CS0, CS1**	Conforms to MIL-C-83503
	CN0 to CNF	e-con
Ambient temperature		–25 to 75°C

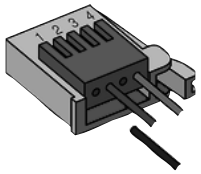
e-con connector
No need for special tools and wire stripping.



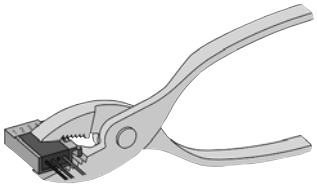
Weights

Model	Weight (g)
PCW-EC16ZBM00	47
PCW-EC16XBR00	
PCW-EC16YBR00	
PCW-EC16ZBM01	87
PCW-EC16XBR01	
PCW-EC16YBR01	
PCW-EC16Z00	38
PCW-EC16Z01	78
PCW-EC08Z00	31
PCW-EC08Z01	58

① Insert the electric cables into the cover.



② Press with pliers.
10 seconds for 4 cables.



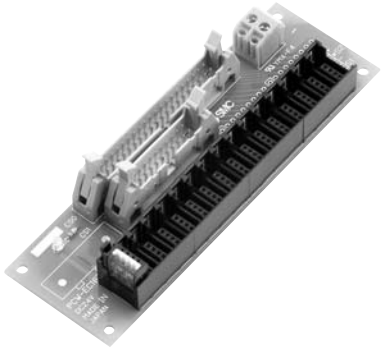
Option (e-con Connector)

Model		AWG No.	Cross section of conductor	Finished O.D.	Cover color
1 pc.	10 pcs./pack				
ZS-28-C	**ZS-28-C-P**	AWG26 to 24	0.14 to 0.2 mm^2	ø0.8 to ø1.0	Red
ZS-28-C-1	**ZS-28-C-1P**			ø1.0 to ø1.2	Yellow
ZS-28-C-2	**ZS-28-C-2P**			ø1.2 to ø1.6	Orange

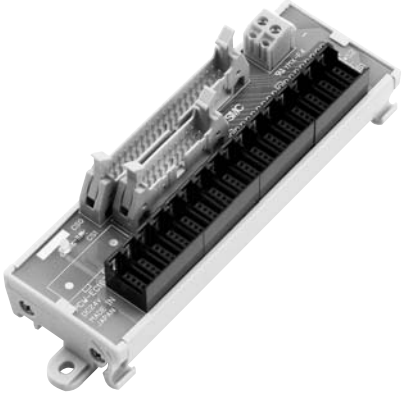
Note) Applicability varies dependant on conductive construction, conductive material, and/or insulating material even resulting in inapplicable. Consult with SMC and manufacture of connecting equipment.

Series PCW-EC
16 Point Input/Output Branch Unit

Circuit board type

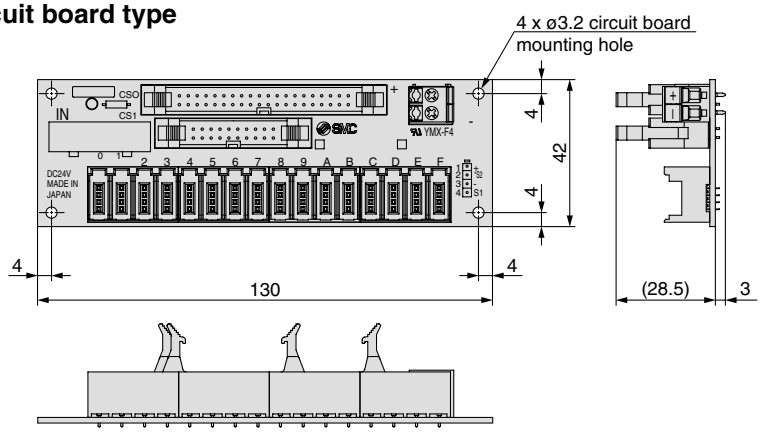


With cover
(DIN rail mount compatible)

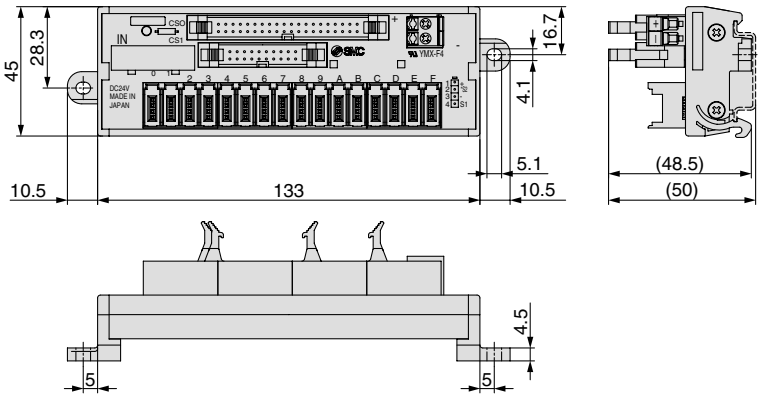


Dimentions

Circuit board type



With cover (DIN rail mount compatible)



Models

Input	Output	Note
PCW-EC16XBR00	**PCW-EC16YBR00**	Circuit board type
PCW-EC16XBR01	**PCW-EC16YBR01**	With cover (DIN rail mount compatible)
PCW-EC16ZBM00		Circuit board type
PCW-EC16ZBM01		With cover (DIN rail mount compatible)

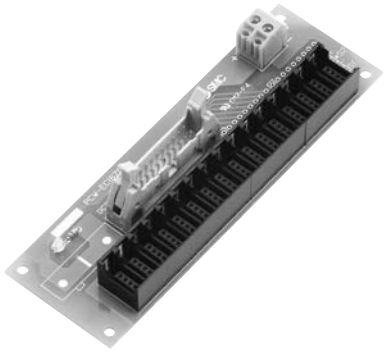
∗ For the circuit diagram, refer to pages 3 and 4 of CAT.E02-20.

EX

Series PCW-EC
16 Point Input/Output Unit

Models

Circuit board type



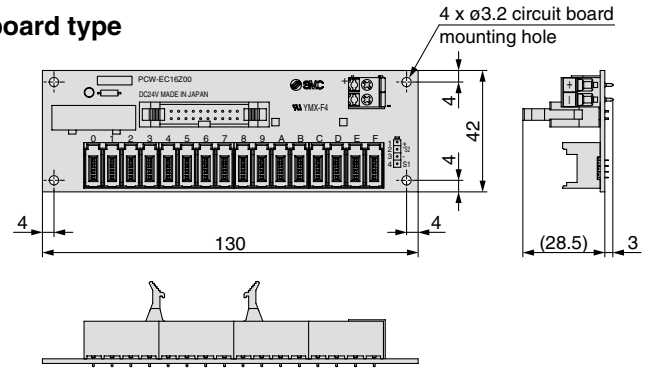
PCW-EC16Z00	Circuit board type
PCW-EC16Z01	With cover (DIN rail mount compatible)

∗ For the circuit diagram, refer to page 5 of CAT.E02-20.

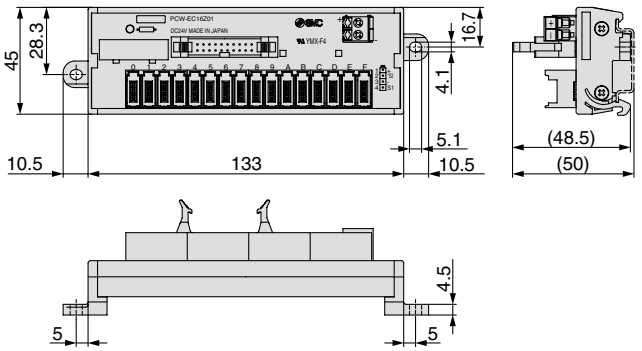
With cover (DIN rail mount compatible)

Dimentions

Circuit board type



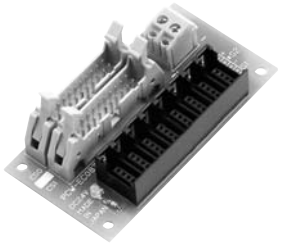
With cover (DIN rail mount compatible)



Series PCW-EC
8 Point Input/Output Unit

Models

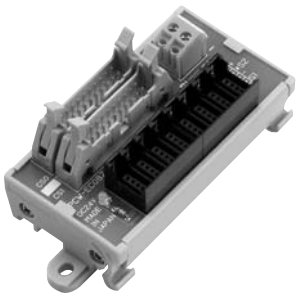
Circuit board type



PCW-EC08Z00	Circuit board type
PCW-EC08Z01	With cover (DIN rail mount compatible)

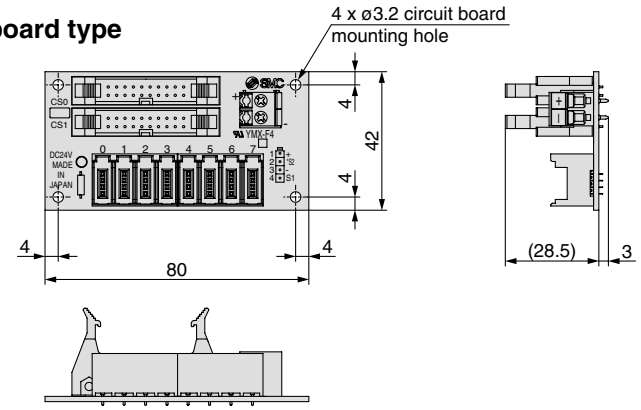
∗ For the circuit diagram, refer to page 6 of CAT.E02-20.

With cover (DIN rail mount compatible)

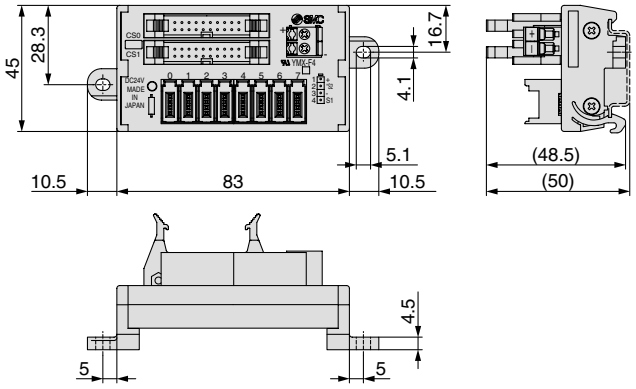


Dimentions

Circuit board type



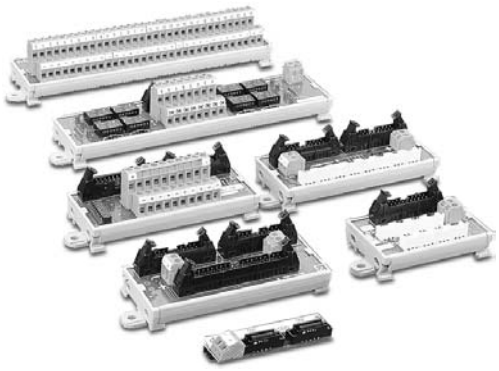
With cover (DIN rail mount compatible)



EX

PC Wiring System

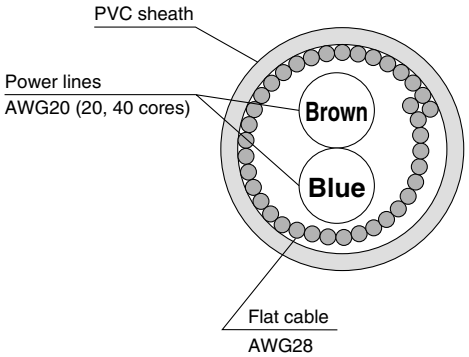
Series PCW



Common Specifications

Rated voltage			24 VDC
Rated current		**Power supply line**	2 A
		Communication line	0.3 A
Insulation resistance			5 MΩ or more at 100 VDC
Withstand voltage			0.5 kV
Impact resistance			500 m/s^2
Terminal block specifications	**Screw tightening torque**	**Power terminal (Phillips screw driver/Flat head screw driver)**	0.4 to 0.6 N·m/0.4 to 0.7 N·m
		I/O terminal (Phillips screw driver/ Flat head screw driver)	0.5 to 0.6 N·m/0.5 to 0.7 N·m
	Wire stripping length (recommended)	**Power terminal**	7 mm
		I/O terminal	
	Connecting wire size	**Power terminal**	AWG26 to 14 (0.13 to 2.5 mm^2)
		I/O terminal	AWG26 to 12 (0.13 to 4 mm^2)

Cable Specifications



	With power lines		Without power lines		
Model	**PCW-9930661H**	**PCW-9903491H**	—		
Flat cable	20 cores	40 cores	20 cores	34 cores	40 cores
	AWG28 (7 wires/0.127 mm)				
Length	100 m roll		—		
Power lines	AWG20 (21 wires/0.18 mm)		—		
Sheath O.D.	10.3 mm	12.0 mm	8.7 mm	11.8 mm	13.0 mm

Note) The flat ribbon cable without power lines are not available from SMC.
If required, please source locally from your preferred supplier.

Series PCW
Branch Unit: PLC Direct Connected Type

PLC connection

➡ **PLC**

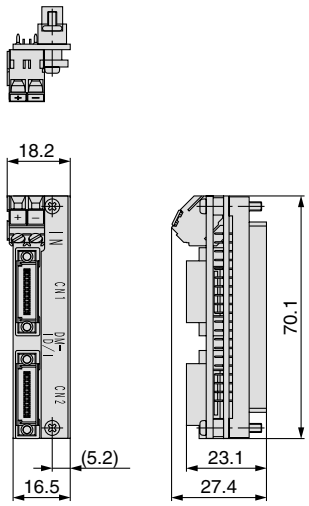
Can be directly mounted on PLC.

Specifications

Weight	25 g
Ambient temperature	–25 to 55°C

Note) Since some series PCW specifications are included in the common specifications, also refer to the common specifications on page 7 of CAT.E02-20.

Dimentions



Models

Input	Output	Circuit diagram
PCW-993104	**PCW-993105**	CAT.E02-20 page 9
PCW-993106 Note 1)	**PCW-993107** Note 2)	CAT.E02-20 page 10
PCW-993155 Note 3)	**PCW-993156** Note 4)	CAT.E02-20 page 11

Two pieces are required for 64 points of input/output.

Note 1) Combine one piece each of PCW-993106 and PCW-993108 (the PLC connection side connectors are reversed).

Note 2) Combine one piece each of PCW-993107 and PCW-993109 (the PLC connection side connectors are reversed).

Note 3) Combine one piece each of PCW-993155 and PCW-993174 (the PLC connection side connectors are reversed).

Note 4) Combine one piece each of PCW-993156 and PCW-993175 (the PLC connection side connectors are reversed).

⚠Caution

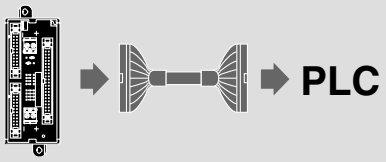
When removing a cable with connector, a PCW-04T puller is required.

EX

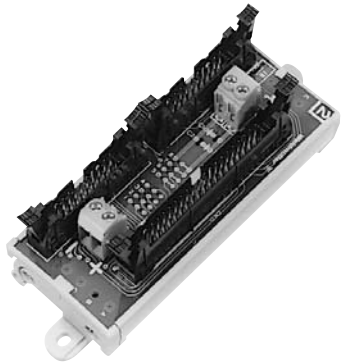
Series PCW

Branch Unit: DIN Rail Mount Type

PLC connection



Connected to PLC via connection cable.



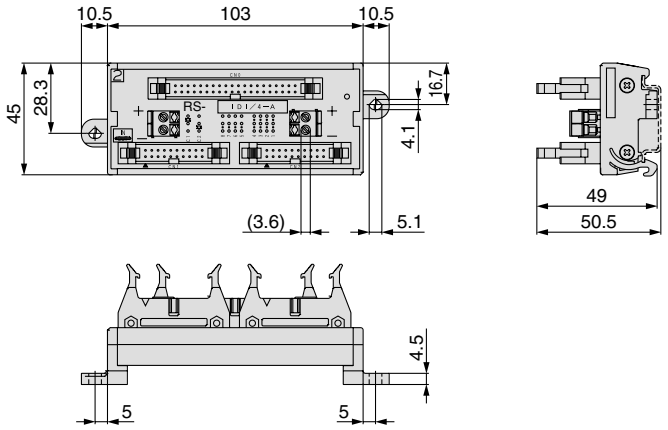
∗ **Refer to page 50 of CAT.E02-20 for the junction cable part number.**

Specifications

Weight	80 g
Ambient temperature	–25 to 80°C

Note) Since some series PCW specifications are included in the common specifications, also refer to the common specifications on page 7 of CAT.E02-20.

Dimentions



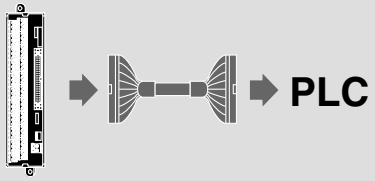
Models

Input	Output	Circuit diagram
PCW-993023A	**PCW-993033A**	CAT.E02-20 page 13
PCW-993015A	**PCW-993017A**	CAT.E02-20 page 14
PCW-993019A	**PCW-993021A**	CAT.E02-20 page 15
PCW-993029A	**PCW-993039A**	CAT.E02-20 page 16
PCW-993025A	**PCW-993035A**	CAT.E02-20 page 17
PCW-993049A	**PCW-993043A**	CAT.E02-20 page 18
PCW-993045A	**PCW-993047A**	CAT.E02-20 page 19
PCW-993027A	**PCW-993037A**	CAT.E02-20 page 20
PCW-993168A	**PCW-993169A**	CAT.E02-20 page 21
PCW-993200A	**PCW-993201A**	CAT.E02-20 page 22
PCW-993139A	**PCW-993140A**	CAT.E02-20 page 23

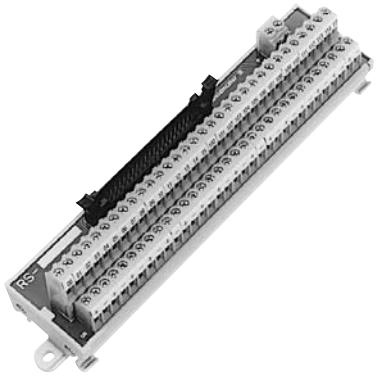
Two pieces are required for 64 points of input/output.

Series PCW
32 Point Input/Output Unit

PLC connection



Connected to PLC via connection cable.



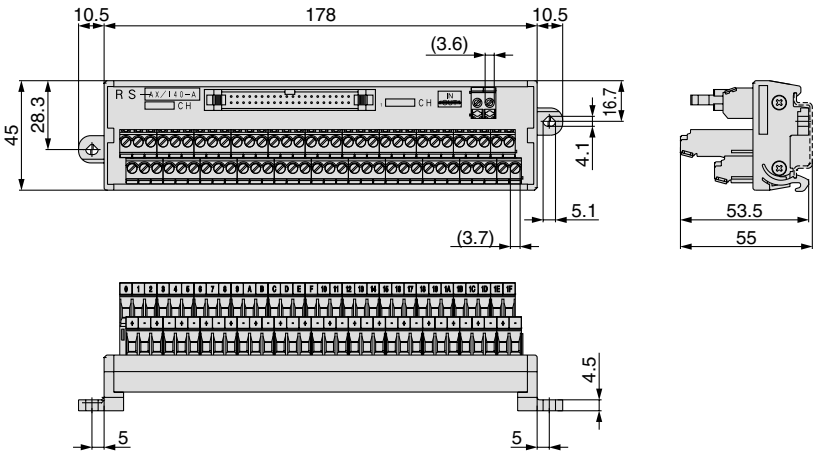
∗ **Refer to page 50 of CAT.E02-20 for the junction cable part number.**

Specifications

Weight	210 g
Ambient temperature	–25 to 55°C

Note) Since some series PCW specifications are included in the common specifications, also refer to the common specifications on page 7 of CAT.E02-20.

Dimentions



EX

Models

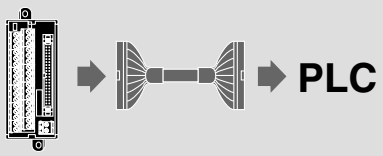
Input	Output	Circuit diagram
PCW-990344A	**PCW-990345A**	CAT.E02-20 page 25
PCW-993157A	**PCW-993158A**	CAT.E02-20 page 26
PCW-993159A	**PCW-993160A**	CAT.E02-20 page 27
PCW-990355A	**PCW-990356A**	CAT.E02-20 page 28
PCW-990386A	**PCW-990387A**	CAT.E02-20 page 29
PCW-993011A	**PCW-993012A**	CAT.E02-20 page 30
PCW-993163A	**PCW-993164A**	CAT.E02-20 page 31
PCW-993013A	**PCW-993014A**	CAT.E02-20 page 32
PCW-993166A	**PCW-993167A**	CAT.E02-20 page 33
PCW-993202A	**PCW-993203A**	CAT.E02-20 page 34
PCW-993161A	**PCW-993162A**	CAT.E02-20 page 35

Two pieces are required for 64 points of input/output.

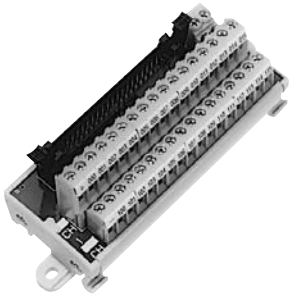
Series PCW

32 Point Output Reduced Common Unit

PLC connection



Connected to PLC via connection cable.



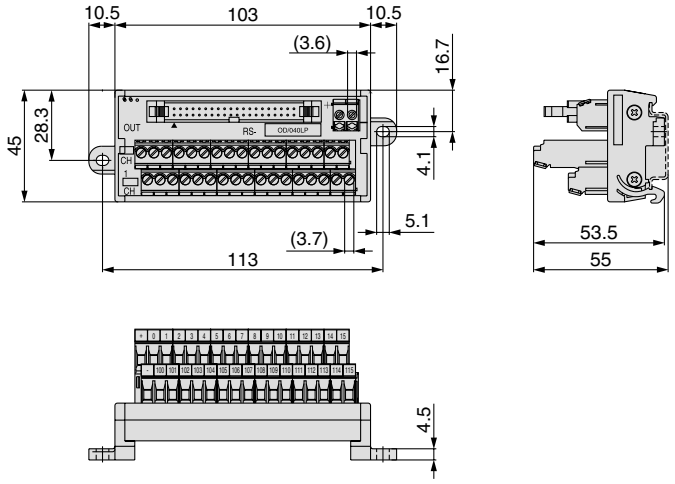
∗ **Refer to page 50 of CAT.E02-20 for the junction cable part number.**

Specifications

Weight	130 g
Ambient temperature	–25 to 55°C

Note) Since some series PCW specifications are included in the common specifications, also refer to the common specifications on page 7 of CAT.E02-20.

Dimentions



Models

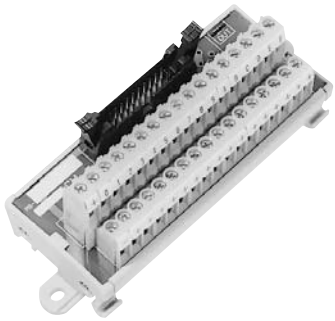
Output	Circuit diagram
PCW-993193	CAT.E02-20 page 37
PCW-993194	CAT.E02-20 page 37
PCW-993224	CAT.E02-20 page 38
PCW-993222	CAT.E02-20 page 38
PCW-993223	CAT.E02-20 page 39
PCW-993225	CAT.E02-20 page 39

Two pieces are required for 64 points of input/output.

Series PCW

16 Point Input/Output Unit

Terminal Block: DIN Rail Mount Type



Models

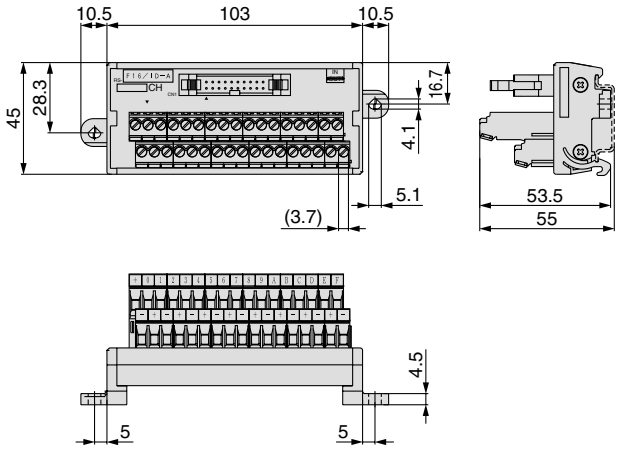
Input	**PCW-993051A**	Circuit diagram CAT.E02-20 page 41
Output	**PCW-993052A**	

Specifications

Weight	125 g
Ambient temperature	–25 to 80°C

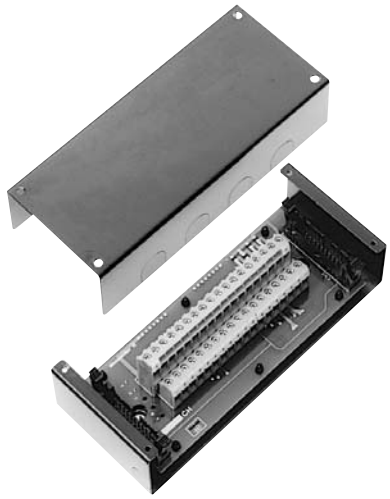
Note) Since some series PCW specifications are included in the common specifications, also refer to the common specifications on page 7 of CAT.E02-20.

Dimensions



EX

Terminal Block: Box Mount Type



Models

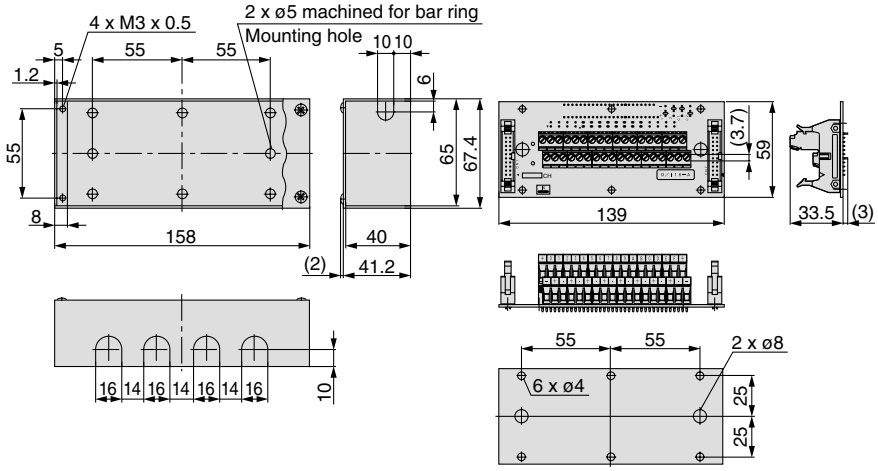
Input	**PCW-993055A**	Circuit diagram CAT.E02-20 page 42
Output	**PCW-993056A**	

Specifications

Weight	480 g
Ambient temperature	–25 to 80°C

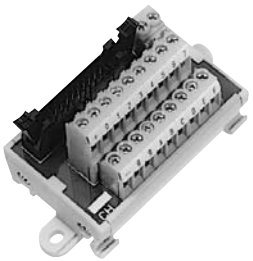
Note) Since some series PCW specifications are included in the common specifications, also refer to the common specifications on page 7 of CAT.E02-20.

Dimensions



Series PCW

16 Point Output Reduced Common Unit



Model

Output	PCW-993195

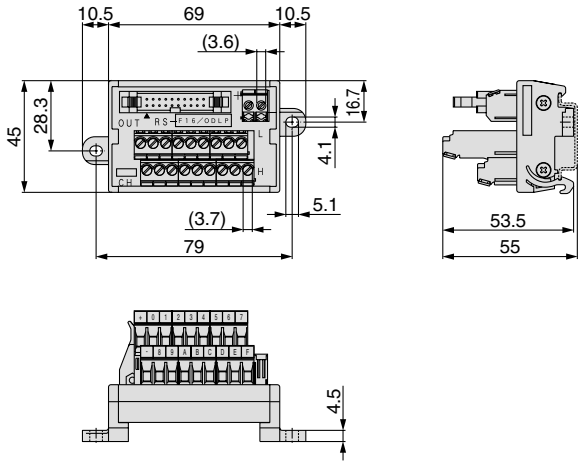
∗ For the circuit diagram, refer to page 43 of CAT.E02-20.

Specifications

Weight	80 g
Ambient temperature	–25 to 80°C

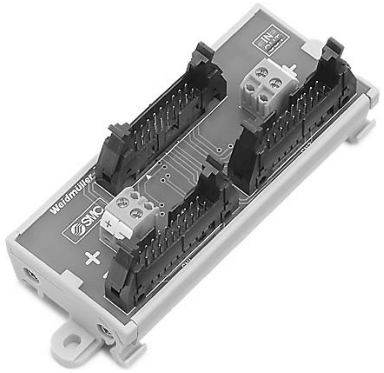
Note) Since some series PCW specifications are included in the common specifications, also refer to the common specifications on page 7 of CAT.E02-20.

Dimensions



Series PCW

8 Point Branch Unit



Models

Input	**PCW-2K0072501**
Output	**PCW-2K0072502**

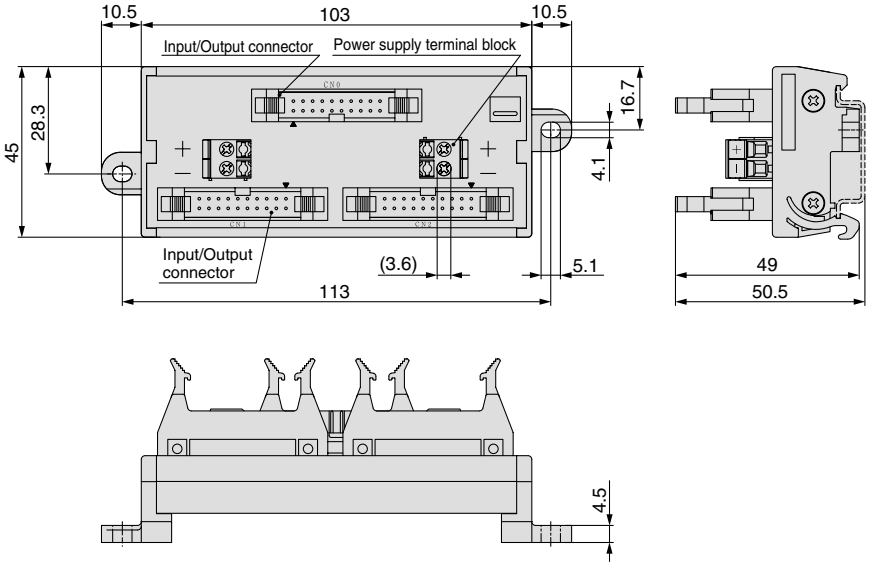
∗ For the circuit diagram, refer to page 44 of CAT.E02-20.

Specifications

Weight	80 g
Ambient temperature	–25 to 80°C

Note) Since some series PCW specifications are included in the common specifications, also refer to the common specifications on page 7 of CAT.E02-20.

Dimensions



EX

Series PCW
8 Point Input/Output Unit: HI/LO Setting Type

Terminal Block: DIN Rail Mount Type

Models

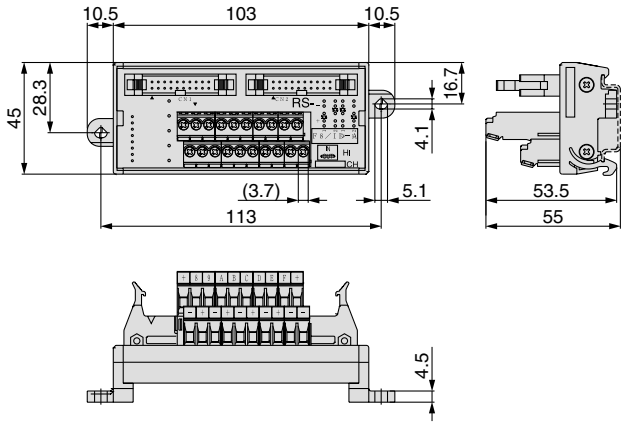
Input	HI	PCW-993210	Circuit diagram CAT.E02-20 page 46
	LO	PCW-993211	
Out-put	HI	PCW-993212	Circuit diagram CAT.E02-20 page 47
	LO	PCW-993213	

Specifications

Weight	105 g
Ambient temperature	–25 to 80°C

Note) Since some series PCW specifications are included in the common specifications, also refer to the common specifications on page 7 of CAT.E02-20.

Dimensions



Terminal Block: Box Mount Type

Models

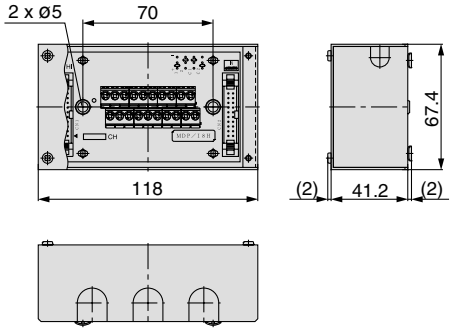
Input	HI	PCW-993214	Circuit diagram CAT.E02-20 page 48
	LO	PCW-993215	
Out-put	HI	PCW-993216	Circuit diagram CAT.E02-20 page 49
	LO	PCW-993217	

Specifications

Weight	365 g
Ambient temperature	–25 to 80°C

Note) Since some series PCW specifications are included in the common specifications, also refer to the common specifications on page 7 of CAT.E02-20.

Dimensions



■ **HI/LO setting**

This type is unnecessary to set jumpers (short-circuit sockets) with fixed higher/lower (HI/LO) orders of input/output units

LO type: address assignment is fixed from "LO" 0 to 7.

HI type: address assignment is fixed from "HI" 8 to F.

Connector Cable

For Connection of PLC Input/Output Card to PCW Unit

- **PLC input/output card to PCW branch unit**
- **PLC input/output card to PCW 32 point unit**

PCW − 02 □ − 005

Lead wire length

Symbol	Lead wire length
005	0.5 m
010	1 m
015	1.5 m
020	2 m
030	3 m
050	5 m

Contact your SMC sales representative regarding connector cables with lead wire lengths other than those in the table above.

Power supply line

Symbol	Power supply line
Nil	Yes
N	No

Specifications

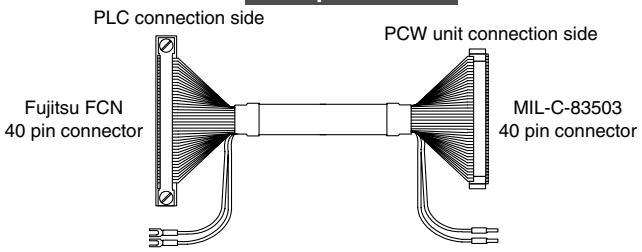
Symbol	Specifications
02	Standard specifications
05	For connection of PCW unit for Keyence Corp. PLC I/O card (KZ-C32X, KZ-C32T)
06	For connection of PCW unit for Hitachi Ltd. PLC I/O card (XDC24D2H, YTR24DH)

Note) When using a PCW unit equipped with Fujitsu FCN connector, contact your SMC sales representative as the connector cable is different.

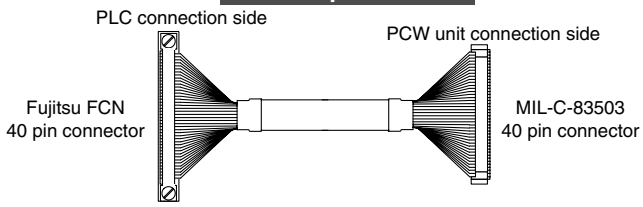
Dimensions

Series PCW-02

With power lines

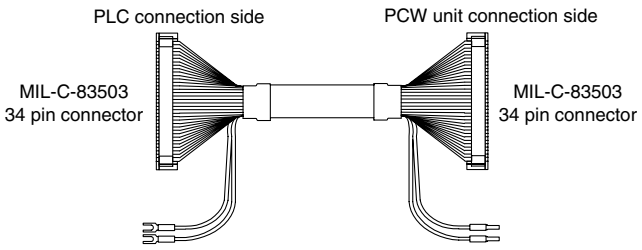


Without power lines

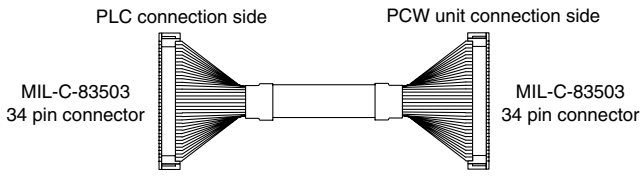


Series PCW-05

With power lines

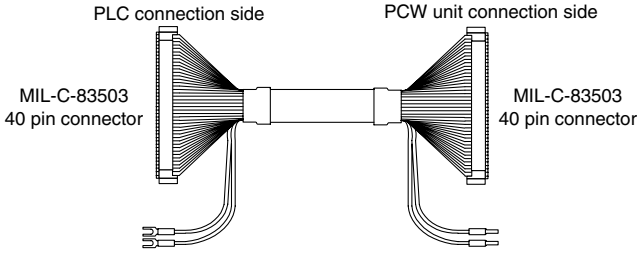


Without power lines

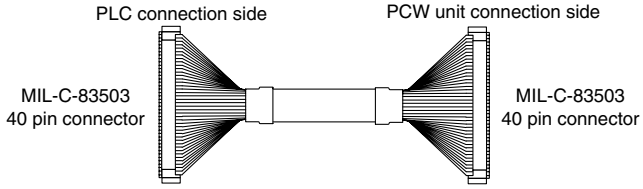


Series PCW-06

With power lines



Without power lines



EX

Connector Cable

Branch Unit: Connection of PLC Direct Connecting Type to PCW Unit

- **Branch unit: Connection of PLC direct connecting type to PCW 16 point unit**
- **Branch unit: Connection of PLC direct connecting type to PCW 8 point unit**

PCW − 04 □ − 005

Lead wire length

Symbol	Lead wire length
005	0.5 m
010	1 m
015	1.5 m
020	2 m
030	3 m
050	5 m

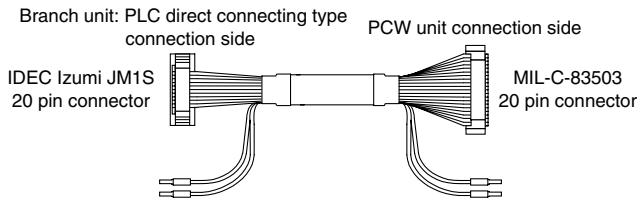
Contact your SMC sales representative regarding connector cables with lead wire lengths other than those in the table above.

Power supply lines

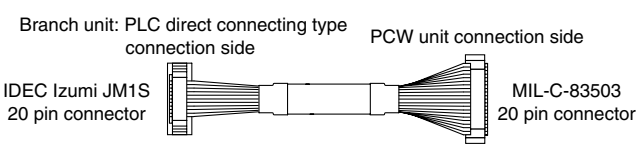
Symbol	Power supply lines
Nil	Yes
N	No

Dimensions

With power lines



Without power lines



Branch Unit: Connection of PLC Direct Connecting Type to Manifold Solenoid Valves

- **Branch unit: Connection of PLC direct connecting type to manifold solenoid valves**

PCW − 04 V − 005

Lead wire length

Symbol	Lead wire length
005	0.5 m
010	1 m
015	1.5 m
020	2 m
030	3 m
050	5 m

Contact your SMC sales representative regarding connector cables with lead wire lengths other than those in the table above.

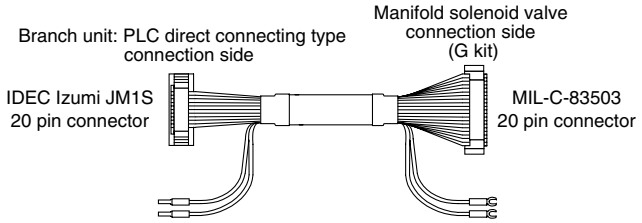
Power supply lines

Symbol	Power supply lines	Applicable manifold solenoid valve kit
V	Yes	G kit
N	No	J kit

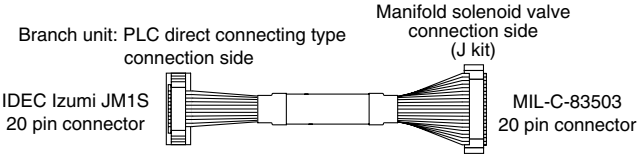
Refer to "Best Pneumatics No. 1" for details regarding applicable manifold solenoid valves.

Dimensions

With power lines



Without power lines



Connector Cable

Connection of PCW Unit to PCW Unit

- **Connection of PCW branch unit to PCW 16 point unit**
- **Connection of PCW branch unit to PCW 8 point unit**
- **Connection of PCW 8 point unit to PCW 8 point unit**

PCW-01 □ -005

Lead wire length

Symbol	Lead wire length
005	0.5 m
010	1 m
015	1.5 m
020	2 m
030	3 m
050	5 m

Contact your SMC sales representative regarding connector cables with lead wire lengths other than those in the table above.

Power supply lines

Symbol	Power supply lines
Nil	Yes
N	No

Connection of PCW Unit to Manifold Solenoid Valves

- **Connection of PCW branch unit to manifold solenoid valves**
- **Connection of PCW 8 point unit to manifold solenoid valves**

PCW-01V-005

Lead wire length

Symbol	Lead wire length
005	0.5 m
010	1 m
015	1.5 m
020	2 m
030	3 m
050	5 m

Contact your SMC sales representative regarding connector cables with lead wire lengths other than those in the table above.

Power supply lines

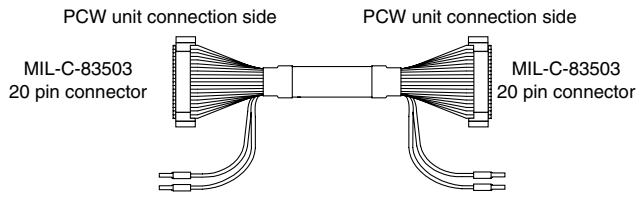
Symbol	Power supply lines	Applicable manifold solenoid valve kit
V	Yes	G kit
N	No	J kit

Refer to "Best Pneumatics No. 1" for details regarding applicable manifold solenoid valves.

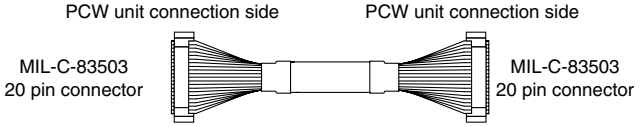
EX

Dimensions

With power lines

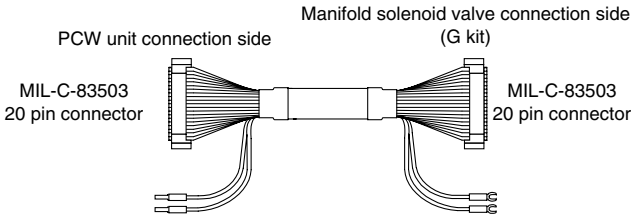


Without power lines

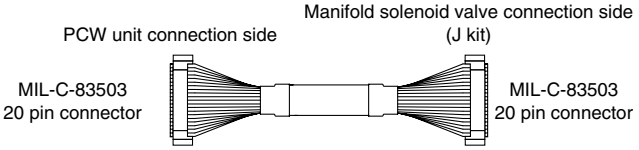


Dimensions

With power lines



Without power lines



Series PCW
Check Unit

- **Effective for software/hardware debugging and maintenance of PC wiring systems and other compatible systems.**
- **Signal monitoring possible with LED.**
- **Switches allow forced release and forced ON operation of connections between connectors in one bit increments.**
- **Allows voltage measurement and wave form observation of signals between the check terminal and common terminal.**

How to Order

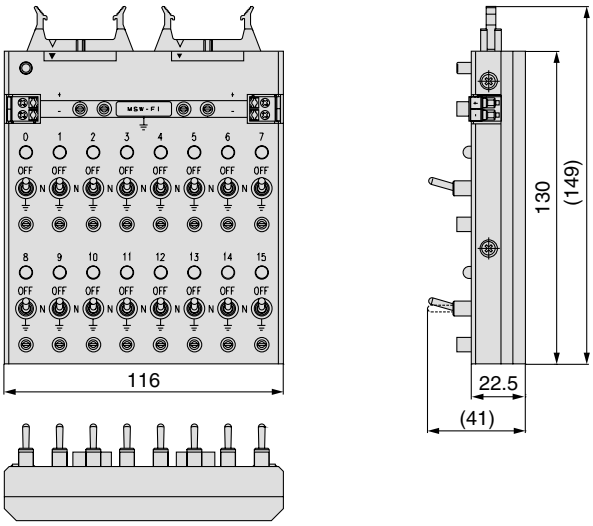
PCW – 993065

• Check unit

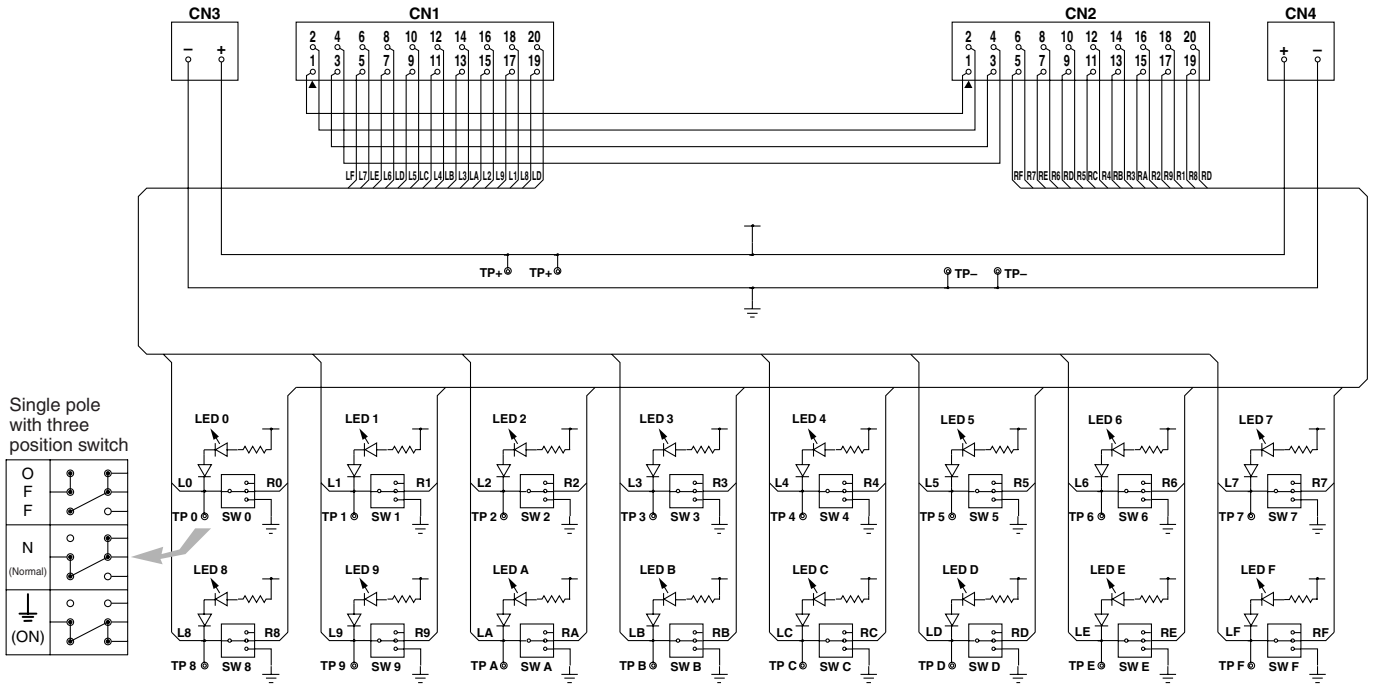
Specifications

Rated voltage		24 VDC
Rated current		0.3 A
Withstand voltage		0.5 kV
Terminal block	**Thread tightening torque (Phillips screw driver/Flat head screw driver)**	0.4 to 0.6 N·m/0.4 to 0.7 N·m
	Wire stripping length	7 mm
	Connecting wire size	AWG26 to 14 (0.13 to 2.5 mm^2)
Ambient temperature		–25 to 80°C

Dimensions



Internal Circuit Diagram



Series PCW
PC Wiring System Precautions 1

Be sure to read before handling.

Operation

⚠Warning

1. This product is intended for use in general FA equipment. Avoid using this product in machinery or equipment which directly affects human lives or where malfunction or failure can cause extended damage.

2. Do not disassemble this product for repair or rebuilding.

Mounting, Adjustment & Wiring

⚠Caution

1. Do not drop or bump.

Do not drop, bump or apply excessive impacts (500 m/s^2 or more) during handling. The PC wiring system unit can be damaged and connected equipment may malfunction.

2. Be careful of incorrect wiring.

Incorrect wiring may result in damage to connected equipment. The power supply will be short circuited if inputs and outputs are connected incorrectly for the 8 point/16 point input/output units following a branch unit.

3. Do not wire with power lines or high voltage lines.

To prevent the intrusion of noise and surge from power and high voltage lines into signal lines, perform wiring for the PC wiring system separately (separate conduits) from power lines and high voltage lines.

4. Confirm proper insulation of wiring.

Faulty insulation (crossed wiring, insulation defects between terminals, etc.) may result in damage to connected equipment, due to the application of excessive voltage or current flowing to the equipment.

5. Tighten screws with the proper tightening torque.

If tightened beyond the tightening torque range, the terminal block and screws may be damaged.

6. Avoid subjecting cables to repeated bending or pulling forces.

Wiring installations which result in repeated bending stress and pulling force on cables can cause broken wires.

7. Note that the disposition of I/O addresses differs for each PLC manufacturer.

General purpose label sets (applicable to all manufacturers) are included, which can be cut as needed and inserted into the terminal label holders.

8. Operate within the rated current.

The maximum current capacity for the power supply line on circuit boards of all units is 2.0 A. If the current passing through units such as the branch unit and input/output unit exceeds 2.0 A, connect the power supply line to the same power supply terminal and do not allow current to pass through the circuit board.

Design & Selection

⚠Caution

1. Confirm the specifications.

Use properly after confirming the specifications. Operation outside the range of specifications (voltage, ambient temperature, impact, etc.) can cause damage, malfunction or fire.

2. Ensure sufficient clearance for maintenance activities.

When designing an application, be sure to allow sufficient clearance for maintenance and inspections.

Operating Environment

⚠Caution

1. Absolutely do not use in an atmosphere with explosive gas.

The PC wiring system is not an explosion-proof construction. Never use in an atmosphere with an explosive gas since this may cause a serious explosion.

2. Do not use in an environment with temperature cycles.

Temperature cycles other than found with normal temperature changes may adversely affect the PC wiring system unit.

3. Do not use in an area where surges are generated.

If there are devices or equipment that generate large surges (magnetic lifter, high-frequency induction furnace, motor, etc.) near the connected equipment or PC wiring system unit, the connected equipment may deteriorate or be damaged. Consider appropriate measures for any source of power surges and take care with crossed lines.

4. Keep wire scraps and other extraneous material from getting inside this product.

This can cause fire, failure or malfunction, etc. Keep wire scraps and other extraneous material from getting inside this product.

5. Use with consideration for an operating environment with a protective structure.

Avoid using the PC wiring system unit where water or oil is splashed.

Maintenance & Inspection

⚠Caution

1. To prevent unintended malfunctioning, perform maintenance regularly.

Unintended malfunctioning and misoperation may result in an inability to ensure safety.

2. Do not touch the terminals or internal boards when current is being suplied.

Touching terminals or internal boards when current is being suplied may result in malfunctioning or damage with the PC wiring system unit or connected equipment, or electric shock.

Series PCW
PC Wiring System Precautions 2

Be sure to this before handling.

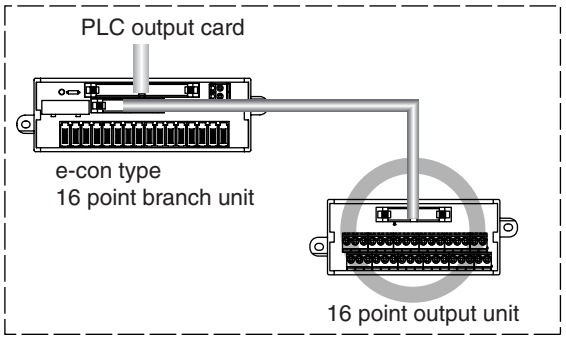
Design & Selection

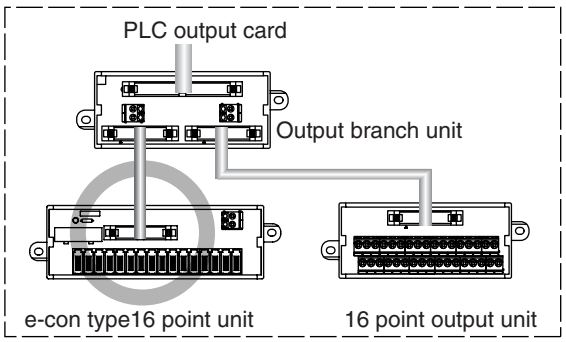
⚠Warning

1. Only the output specification unit can be selected when combining each unit of Series PCW and Series PCW-EC.

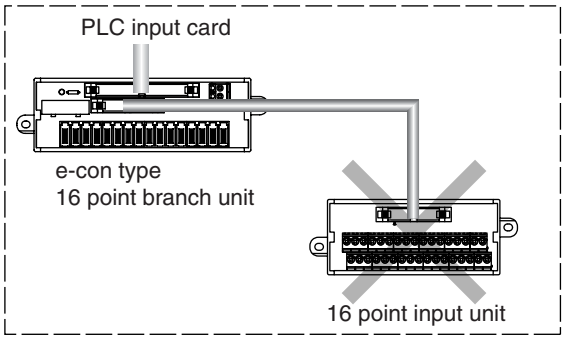
Please note: If an input specification unit is used, this may cause damage and/or possible burnout of any connected equipment.

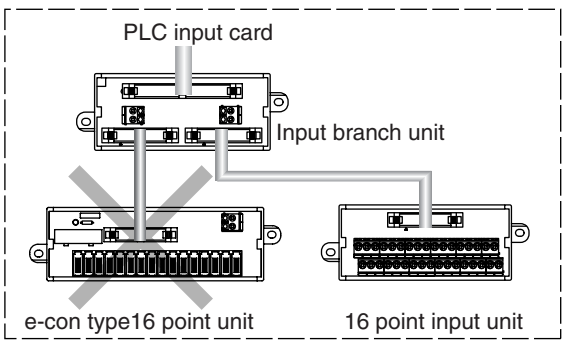
When used for PLC output card





When used for PLC input card





M8/M12 Connector

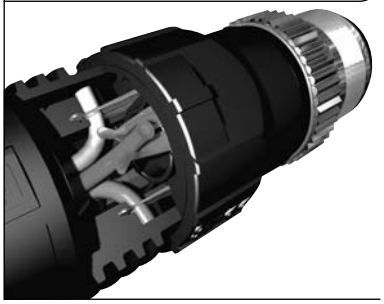
PCA/EX9/EX500

Fieldwireable Connectors

Reduction in wiring time

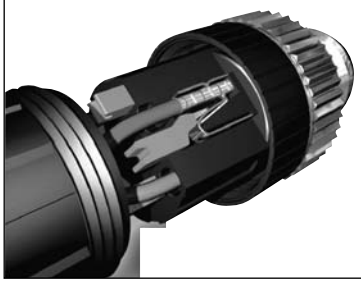
The man-hours can be decreased because no exclusive tools (such as solder, crimped terminal) are required. Also, the wire length can be adjusted at the site.

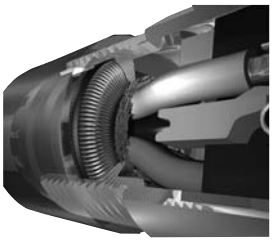
QUICKON-ONE ▶ P. 139



Piercecon® ▶ P. 140

Spring-cage Connection ▶ P. 138



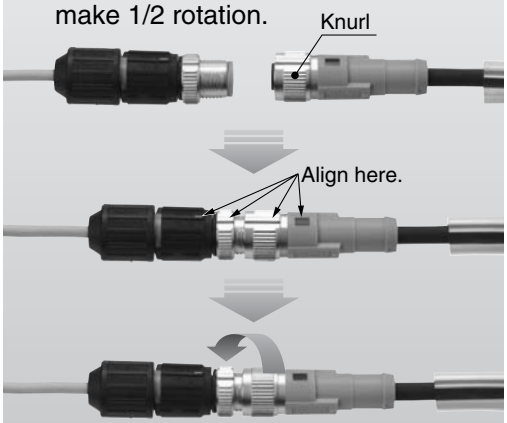


Conforming to IEC61076-2-101

SPEEDCON

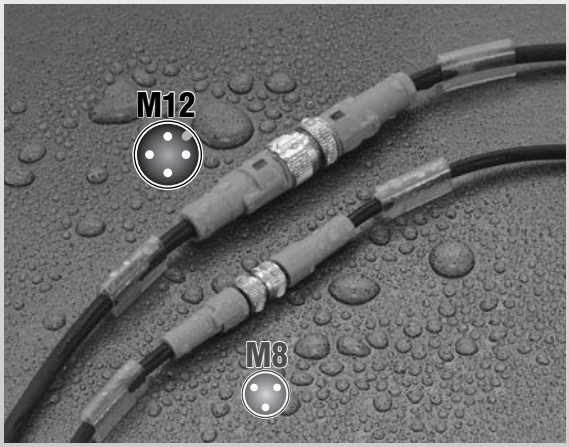
Reduction in wiring time

Just insert the connector and make 1/2 rotation.



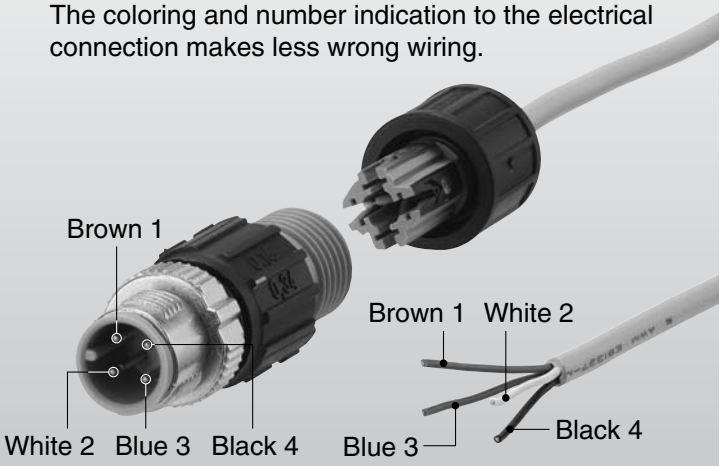
EX

IP67 (IEC60529)



Conforming to IEC60947-5-2

The coloring and number indication to the electrical connection makes less wrong wiring.

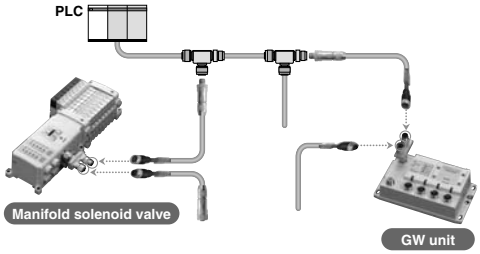


It provides the Fieldbus communication unit and input device applicable to

Communication Cable/Connector ▶P. 125 to P. 128

● It has a product lineup applicable to any communication standards.

The SMC Fieldbus (SI) Unit can be connected to the PLC (controller) and communication units of other manufacturers with cables with connectors and fieldwireable connectors (with shield) applicable to the standards of CC-Link, DeviceNet™, and PROFIBUS DP.



CC-Link ▶P. 125

DeviceNet™ ▶P. 126

PROFIBUS ▶P. 127

Communication cable

SPEEDCON

Socket (Female)
- ❶ For CC-Link
- ❺ For DeviceNet™
- ❿ For PROFIBUS DP

Plug (Male)
- ❸ For CC-Link
- ❼ For DeviceNet™
- ⓬ For PROFIBUS DP

SPEEDCON

Plug (Male)
- ❷ For CC-Link
- ❻ For DeviceNet™
- ⓫ For PROFIBUS DP

Socket (Female)
- ❹ For CC-Link
- ❽ For DeviceNet™
- ⓭ For PROFIBUS DP

Fieldwireable communication connector

Terminal plug (Terminal resistor)

It is connected to the communication port of the communication unit connected at the end.

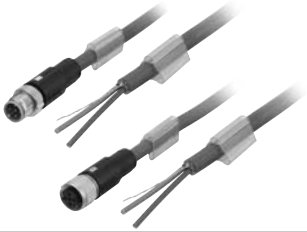
❾

For DeviceNet™ (Plug)

⓮

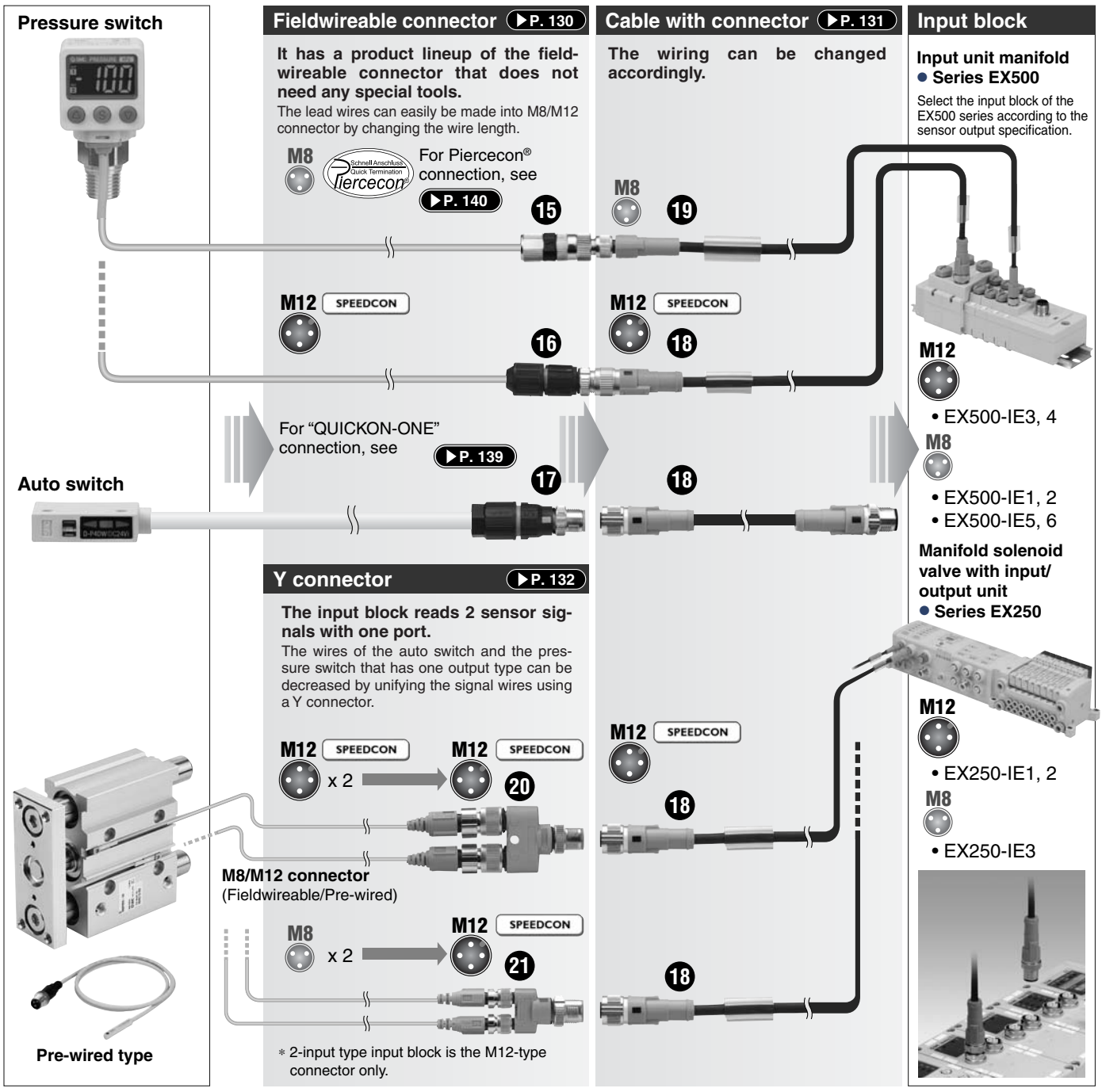
For PROFIBUS DP (Plug/B-coded)

● Product Table

Description	Application	No.	SMC part no.	Name
Cable with connector	For Fieldbus communication 	❶	PCA-1567720	Communication cable for CC-Link (Socket)
		❷	PCA-1567717	Communication cable for CC-Link (Plug)
		❺	PCA-1557633	Communication cable for DeviceNet™ (Socket)
		❻	PCA-1557646	Communication cable for DeviceNet™ (Plug)
		❿	PCA-1557688	Communication cable for PROFIBUS DP (Socket/B-coded)
		⓫	PCA-1557691	Communication cable for PROFIBUS DP (Plug/B-coded)
Fieldwire-able connector	For Fieldbus communication 	❸	PCA-1557617	Fieldwireable connector for CC-Link (Plug/Spring-caged)
		❹	PCA-1557620	Fieldwireable connector for CC-Link (Socket/Spring-caged)
		❼	PCA-1557659	Fieldwireable connector for DeviceNet™ (Plug/Spring-caged)
		❽	PCA-1557662	Fieldwireable connector for DeviceNet™ (Socket/Spring-caged)
		⓬	PCA-1557701	Fieldwireable connector for PROFIBUS DP (Plug/B-coded/Spring-caged)
		⓭	PCA-1557714	Fieldwireable connector for PROFIBUS DP (Socket/B-coded/Spring-caged)
Terminal plug	For Fieldbus communication 	❾	PCA-1557675	Terminal resistor for DeviceNet™ (M12)
		⓮	PCA-1557727	Terminal resistor for PROFIBUS DP (M12/B-coded)

Between Sensor/Switch and Input Device ▶P. 129 to P. 132

● Connection between connectors and products



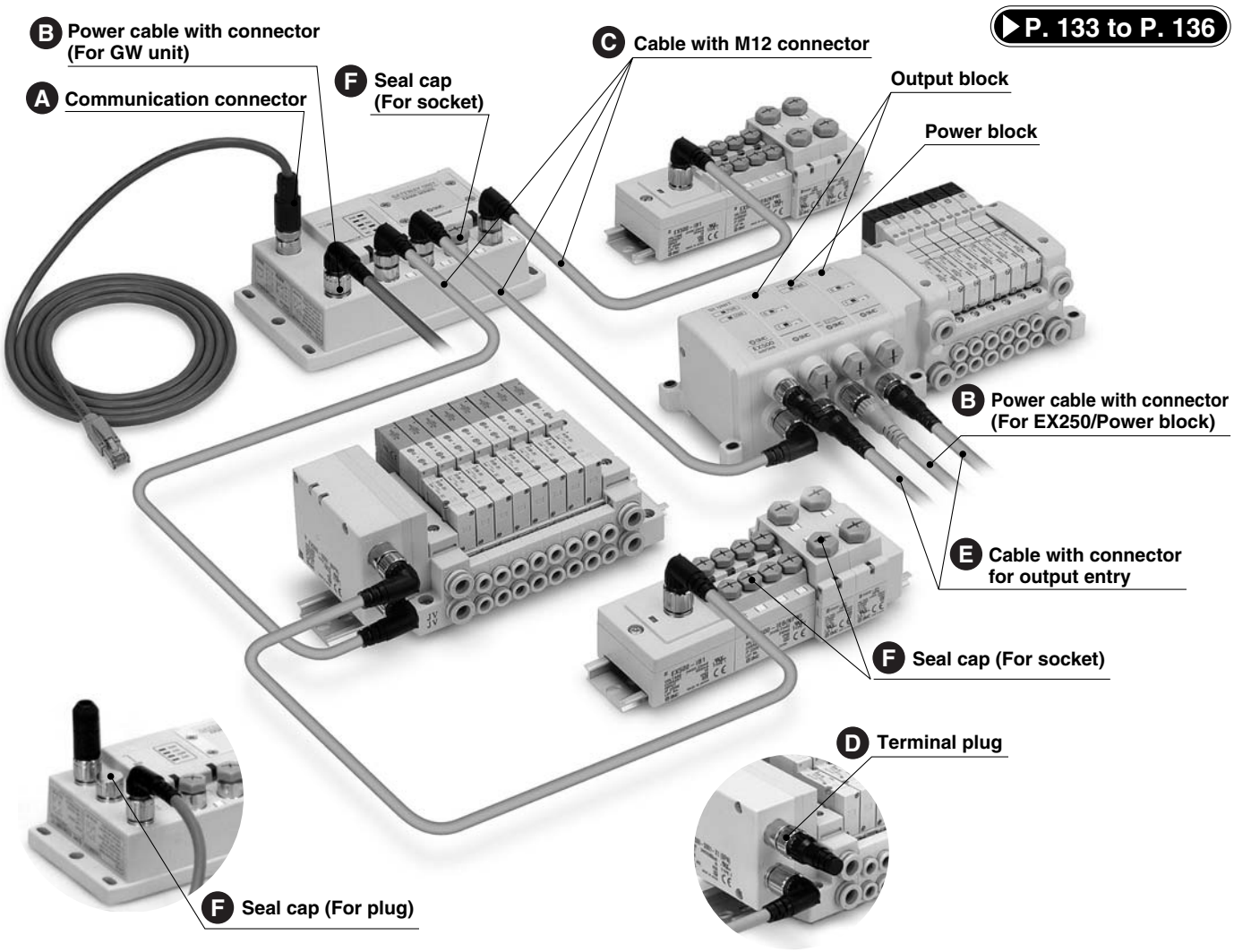
● Product Table

Description	Application	No.	SMC part no.	Name
Cable with connector	For sensor	18	PCA-1557769	Cable with M12 connector (4 pins/3 m)
		19	PCA-1557772	Cable with M8 connector (3 pins/3 m)
Fieldwireable connector	For sensor	15	PCA-1557730	Fieldwireable connector (M8/3 pins/Plug/Piercecon® connection)
		16	PCA-1557743	Fieldwireable connector (M12/4 pins/Plug/QUICKON-ONE connection/SPEEDCON)
		17	PCA-1557756	
Y connector	For sensor	20	PCA-1557785	Y connector (2 x M12 (3 pins)-M12 (5 pins)/SPEEDCON)
		21	PCA-1557798	Y connector (2 x M8 (3 pins)-M12 (4 pins)/SPEEDCON)

EX

Other M8/M12 Connector Accessories (EX500/EX250/EX9)

▶ P. 133 to P. 136



A Communication connector
- For AB RIO
- For DeviceNet™ (With cable)
- For EtherNet/IP™ (RJ45-M12, with cable)

B Power cable with connector
- For GW unit (A-coded)
- For EX250/Power block (B-coded)

C Cable with M12 connector (For EX500)

D Terminal plug (For EX500)

E Cable with connector for output entry

F Seal cap
- For plug
- For socket

● Other M8/M12 Connector Accessories (EX500/EX250/EX9)

Description	Application	No.	SMC part no.	Name
Cable with connector	For Fieldbus communication	A	EX500-AC□□□-DN	Communication cable for DeviceNet™ (Socket)
			EX9-AC020EN-PSRJ	Communication cable for EtherNet/IP™ (M12 plug/D-coded-RJ45)
	For power supply	B	EX500-AP□□□-S	Power cable with connector (Socket/A-coded)
			EX500-AP□□□-A	
			EX9-AC□□□-1	Power cable with connector (Socket/B-coded)
	For EX500	C	EX500-AC□□□-SSPS	Cable with M12 connector (8 pins/Both straight)
			EX500-AC□□□-SAPA	Cable with M12 connector (8 pins/Both angle)
	For output entry	E	EX9-AC□□□-7	Cable with M12 connector (Plug/A-coded)
Fieldwireable connector	For Fieldbus communication	A	EX500-AC000-AB	Communication connector for Remote I/O (Socket)
Terminal plug	For EX500	D	EX500-AC000-S	Terminal plug (M12/8 pins)
Seal cap	For plug	F	EX500-AWTP	Seal cap (M12/For plug)
			EX9-AWES	Seal cap (M8/For socket)
			EX9-AWTS	Seal cap (M12/For socket)

INDEX

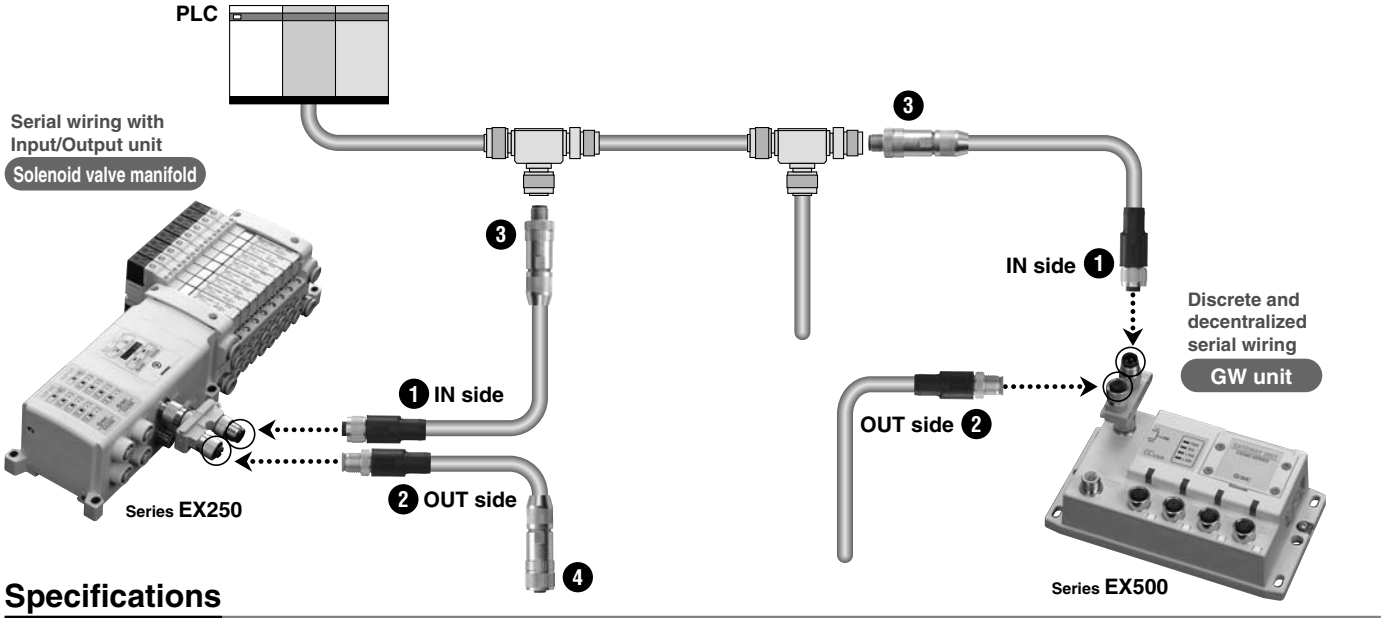
EX

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		5m		—	
	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.

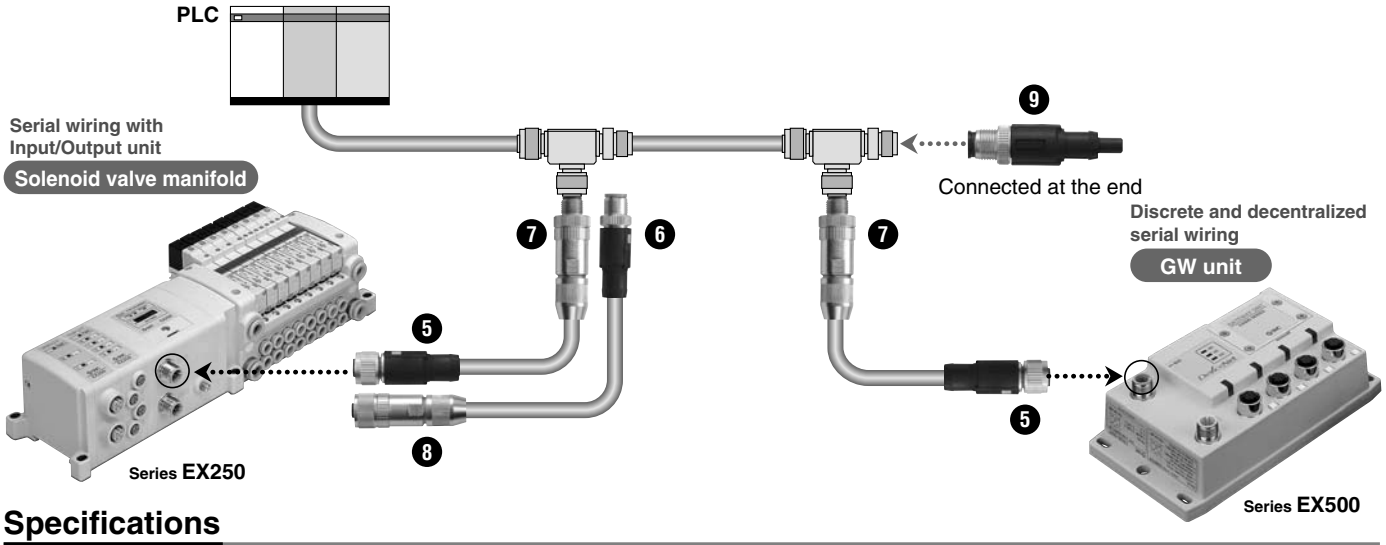
SMC

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 (Viewed from the plug/socket side)	Socket, A-coded (Viewed from the plug/socket side)	DeviceNet™ / CANopen 1: DRAIN 2: V+ (Red) 3: V– (Black) 4: CAN H (White) 5: CAN L (Blue)	1: — 2: — 3: CAN GND 4: CAN H 5: CAN L	1: DRAIN: NC 2: V+: NC 3: V–: NC 4: CAN H 5: CAN L 121 Ω
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				
		Data pair	0.2 mm²/AWG24			0.14 to 0.5 mm²/AWG26 to 20	—
	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.

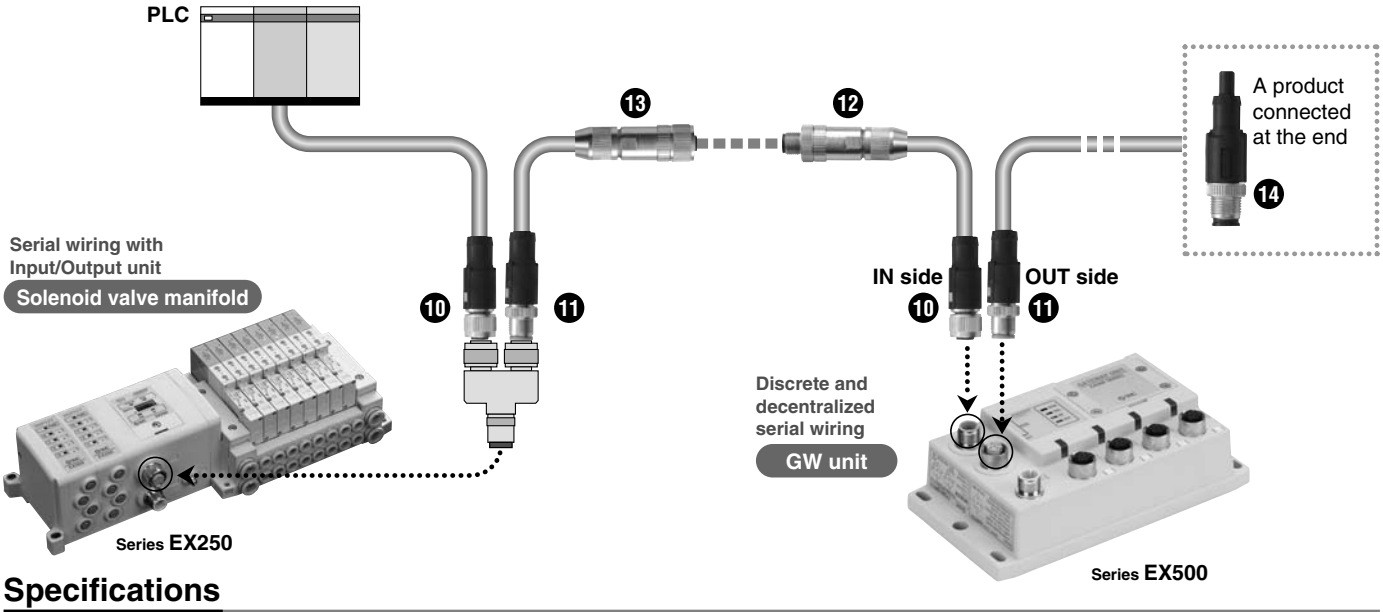
EX

Communication Cable/Connector

M12

PROFI PROCESS FIELD BUS 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			10 SPEEDCON Socket	11 SPEEDCON Plug	12 Plug	13 Socket	14 For PROFIBUS DP (Plug, B-coded)
Number of functional poles			M12: 2 poles		M12: 3 poles		M12: 4 poles
Key type			B-coded (Reverse key)				
Pin assignment			Plug, B-coded (Viewed from the plug/socket side)		Plug, B-coded (Viewed from the plug/socket side)		1: VP, 4: B Line, 2: A Line, 3: DGND
Wiring specifications (Note)	Fixed cable length		5m		—		
	Cable O.D.		7.80 ±0.2 mm		Applicable cable	4.0 to 8.0mm	—
	Wire gauge (Stranded wire cross section)		0.34 mm²/AWG22			0.14 to 0.5mm²/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		60V		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/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		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

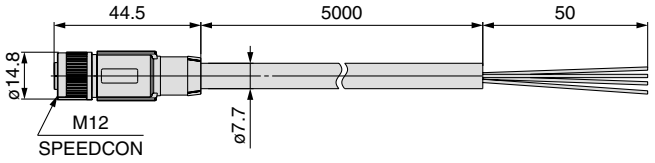
Dimensions

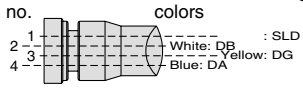
Communication cable (With one side connector)

CC-Link

1 PCA-1567720
For CC-Link
(Socket)

Socket connector pin assignment
A-coded (Normal key)

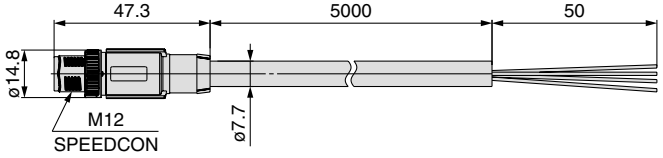




Wiring

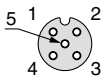
2 PCA-1567717
For CC-Link
(Plug)

Socket connector pin assignment
A-coded (Normal key)

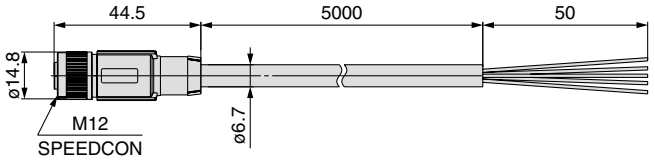


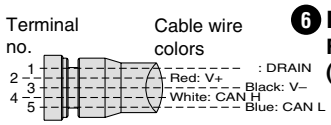
DeviceNet™

5 PCA-1557633
For DeviceNet™
(Socket)



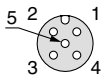
Socket connector pin assignment
A-coded (Normal key)



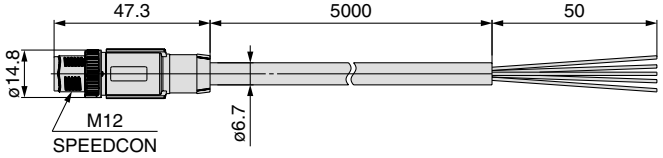


Wiring

6 PCA-1557646
For DeviceNet™
(Plug)

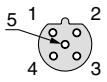


Socket connector pin assignment
A-coded (Normal key)

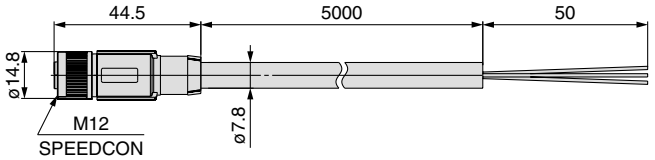


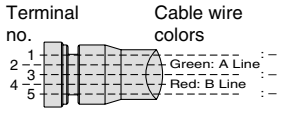
PROFIBUS

10 PCA-1557688
For PROFIBUS DP
(Socket)



Socket connector pin assignment
B-coded (Reverse key)

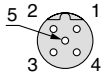




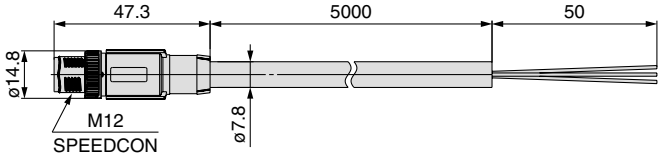
Shield line is connected to the knurl.

Wiring

11 PCA-1557691
For PROFIBUS DP
(Plug)



Socket connector pin assignment
B-coded (Reverse key)



Fieldwireable connector Refer to page 138 for details on assembly.

Plug

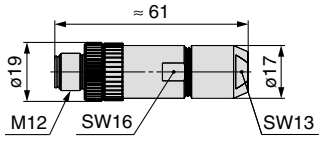
3 PCA-1557617
For CC-Link

A-coded
(Normal key)

7 PCA-1557659
For DeviceNet™

B-coded
(Reverse key)

12 PCA-1557701
For PROFIBUS DP



Socket

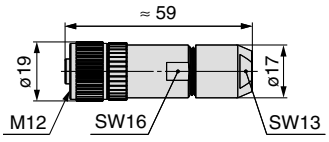
4 PCA-1557620
For CC-Link

A-coded
(Normal key)

8 PCA-1557662
For DeviceNet™

B-coded
(Reverse key)

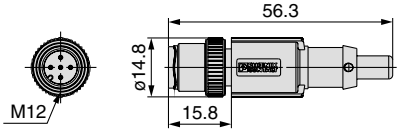
13 PCA-1557714
For PROFIBUS DP



Terminal plug

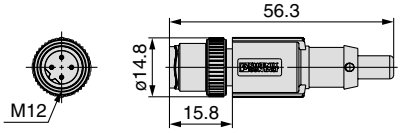
DeviceNet™

9 PCA-1557675
Terminal resistor
for DeviceNet™



PROFIBUS

14 PCA-1557727
Terminal resistor
for PROFIBUS DP



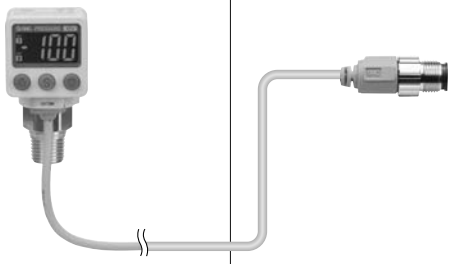
EX

Between Sensor/Switch and Input Device

Example of Connection

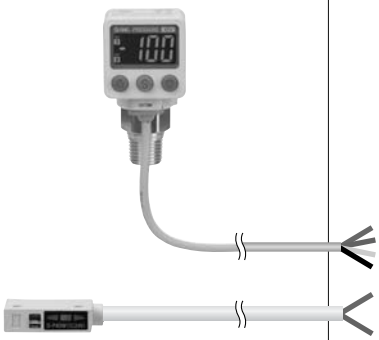
Cable with connector | **Input block**

1 Sensor with pre-wired connector
Direct connection between connectors



Cable with connector: ▶P. 131

2 Sensor with lead wire entry
Lead wire → M8/M12 connector conversion



Fieldwireable connector ▶P. 130

M12 SPEEDCON

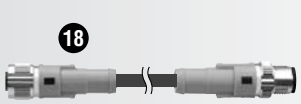
For connection, see ▶P. 139

"QUICKON-ONE" connection

M8 Schnell Anschluss Quick Termination Tiercecon® connection

For connection, see ▶P. 140

M12 SPEEDCON



M8

Input unit manifold
● **Series EX500**

M12

• EX500-IE3, 4

M8

• EX500-IE1, 2
• EX500-IE5, 6

Manifold solenoid valve with input unit
● **Series EX250**

M12

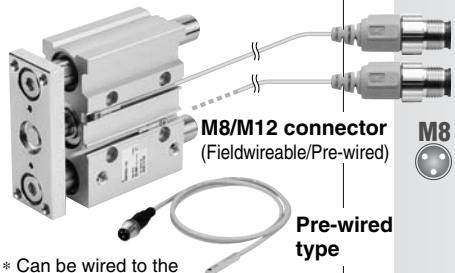
• EX250-IE1, 2

M8

• EX250-IE3

Y connector ▶P. 132

3 Auto switch with pre-wired connector



M8/M12 connector
(Fieldwireable/Pre-wired)

Pre-wired type

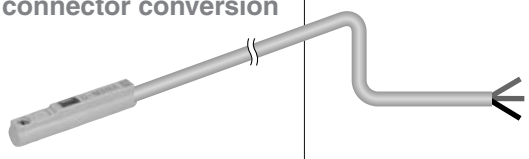
∗ Can be wired to the input block after converting 1-output signal to 2-output signal. (M12 only)

M12 SPEEDCON x 2 → M12 SPEEDCON

M8 x 2 → M12 SPEEDCON

M12 SPEEDCON

4 Auto switch with lead wire entry
Lead wire → M8/M12 connector conversion



∗ Cut the cable into the necessary length, and wire with fieldwireable connectors.

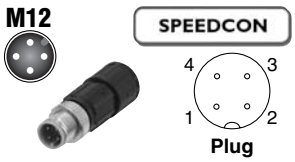
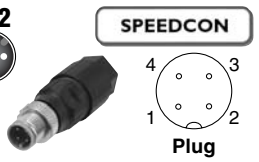
Fieldwireable connector ▶P. 130

M12 SPEEDCON

"QUICKON-ONE" connection

M8 Schnell Anschluss Quick Termination Tiercecon® connection

Specifications

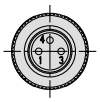
Part no.			PCA-1557730	PCA-1557743	PCA-1557756
Product image/Pin assignment			⓯ M8  Plug	⓰ M12 SPEEDCON  Plug	⓱ M12 SPEEDCON  Plug
Number of functional poles			M8: 3 poles	M12: 4 poles	
Key type			—	A-coded (Normal key)	
Wiring specifications Note)	Applicable cable	Cable O.D.	3.0 to 5.0 mm	3.5 to 6.0 mm	4.0 to 8.0mm
		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

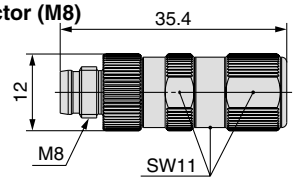
Note) The shaded parts show the specifications for the applicable cable. Adaptation for the connector may vary on account of the conductor construction of the electric wire.

EX

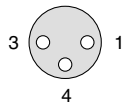
Dimensions

⓯ PCA-1557730
Fieldwireable connector (M8)

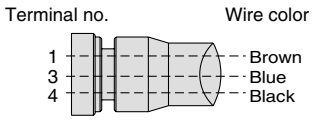




Refer to page 140 for details on assembly.

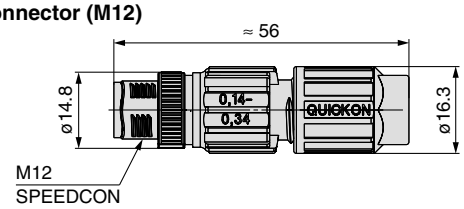


Plug connector pin assignment

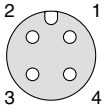


Wiring

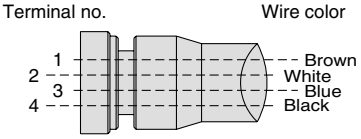
⓰ PCA-1557743
Fieldwireable connector (M12)



Refer to page 139 for details on assembly.

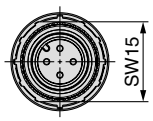


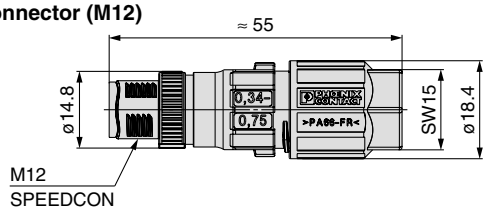
Plug connector pin assignment A-coded (Normal key)



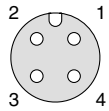
Wiring

⓱ PCA-1557756
Fieldwireable connector (M12)

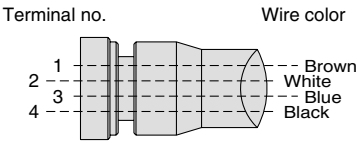




Refer to page 139 for details on assembly.



Plug connector pin assignment A-coded (Normal key)



Wiring

Between Sensor/Switch and Input Device

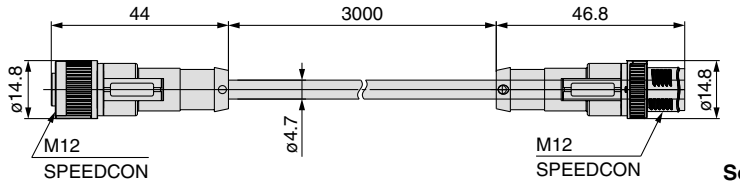
Cable with Connector

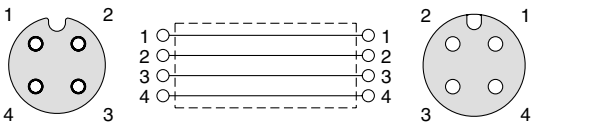
Specifications

Part no.				PCA-1557769	PCA-1557772
Product image				⑱ M12 	⑲ M8 
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

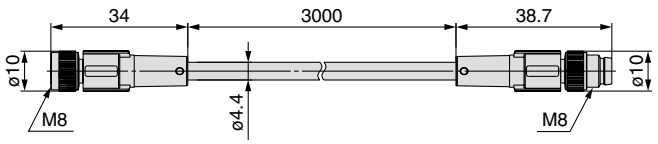
⑱ PCA-1557769
Cable with M12 connector (4 poles)

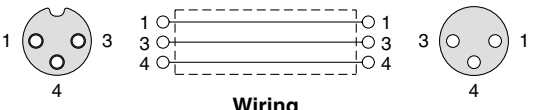




Socket connector pin assignment A-coded (Normal key) | **Wiring** | **Plug connector pin assignment A-coded (Normal key)**

⑲ PCA-1557772
Cable with M8 connector (3 poles)





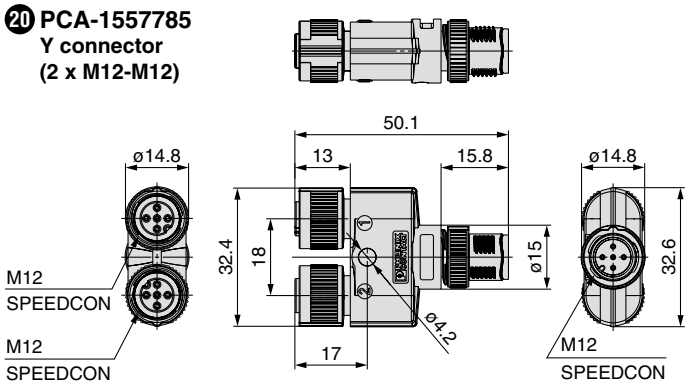
Socket connector pin assignment | **Wiring** | **Plug connector pin assignment**

Specifications

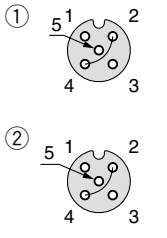
Part no.		PCA-1557785	PCA-1557798
Product image		⑳ M12 / M12 → M12, SPEEDCON	㉑ M8 / M8 → M12, SPEEDCON
Number of functional poles		2 x M12: 4 poles + PE – M12: 4 poles + PE	2 x M8: 3 poles – M12: 4 poles
Key type		A-coded (Normal key)	
Rating/Performance	Rated current	4 A	
	Rated voltage	60 V	
	Contact 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	Approx. 13 g

Dimensions

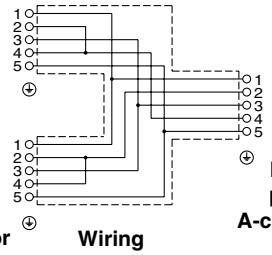
⑳ PCA-1557785
Y connector
(2 x M12-M12)



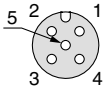
Socket connector pin assignment A-coded (Normal key)



Socket connector pin assignment A-coded (Normal key)

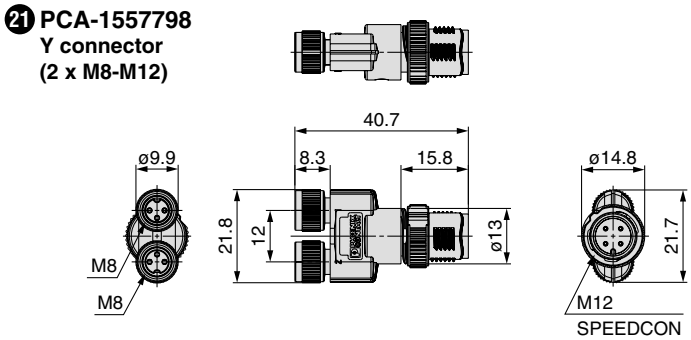


Wiring

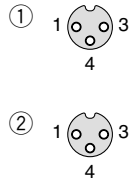


Plug connector pin assignment A-coded (Normal key)

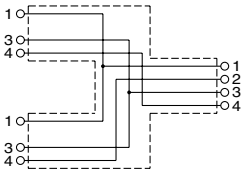
㉑ PCA-1557798
Y connector
(2 x M8-M12)



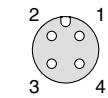
Socket connector pin assignment



Socket connector pin assignment



Wiring

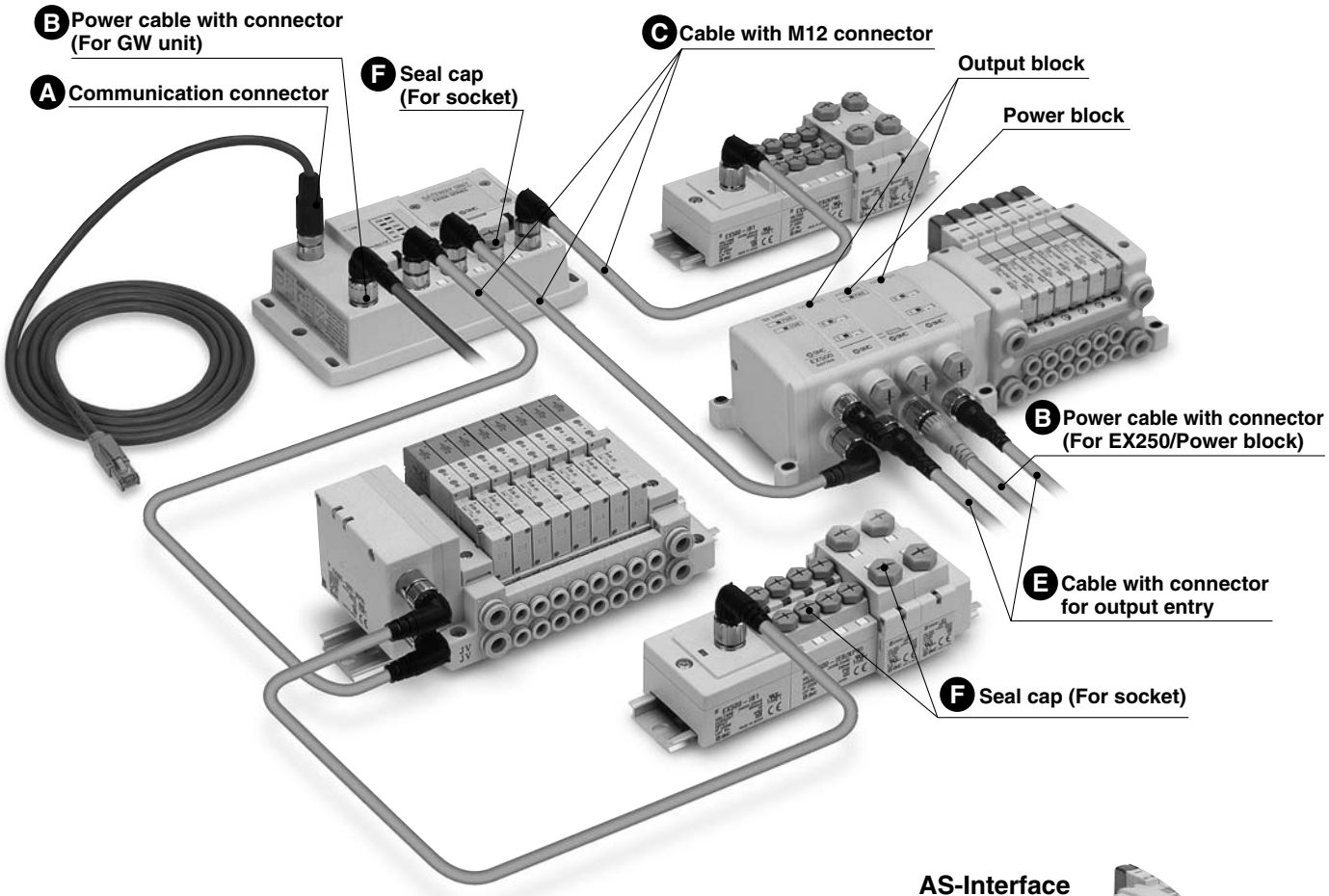


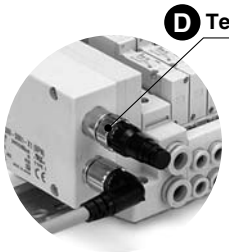
Plug connector pin assignment A-coded (Normal key)

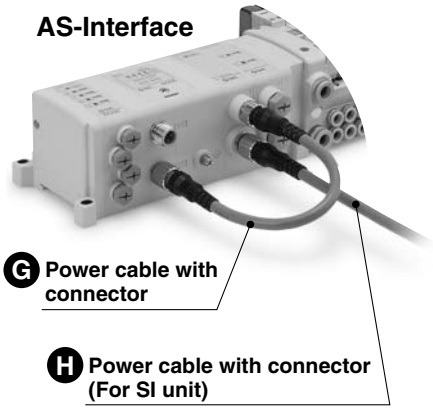
Connection image

Other Accessories

M8/M12 Connector Accessories (EX500/EX250/EX9)







A Communication connector
- For AB RIO
- For DeviceNet™ (with cable)
- For EtherNet/IP™ (RJ45-M12, with cable)

B Power cable with connector
- For GW unit (A-coded)
- For EX250/Power block (B-coded)

C Cable with M12 connector (For EX500)

D Terminal plug (For EX500)

E Cable with connector for output entry

F Seal cap
- For plug
- For socket

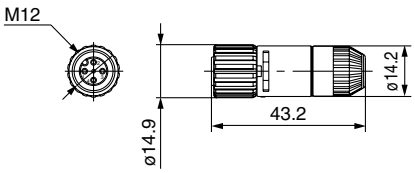
G Power cable with connector

H Power cable (For SI unit)

A Communication connector

For Remote I/O (AB RIO)

EX500−AC000−AB



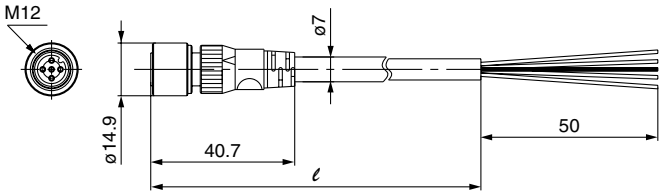
Applicable cable size
ø6 (ø5 to ø6)

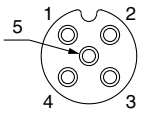
For DeviceNet™

EX500−AC 050 −DN

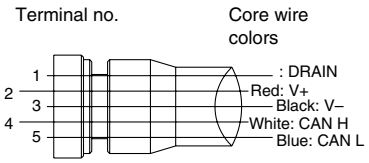
Cable length (ℓ)

010	1000 [mm]
050	5000 [mm]





Socket connector pin arrangement



Wiring

For EtherNet/IP™

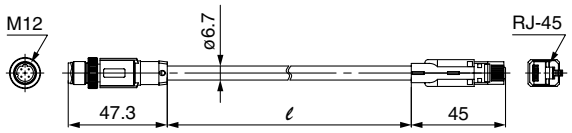
EX9−AC 020 EN− PSRJ

Cable length (ℓ)

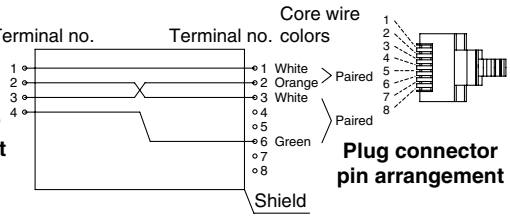
020	2000 [mm]

Connector specification

PSRJ	M12 plug (Straight) ⇔ RJ-45 connector



Plug connector pin arrangement



Plug connector pin arrangement

Wiring (Straight cable)

EX

B Power cable with connector (For GW unit/SI unit (A-coded))

EX500−AP 050 − S

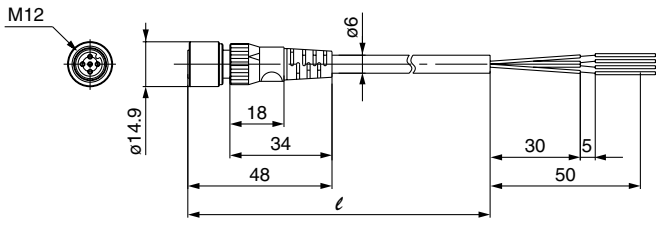
Cable length (ℓ)

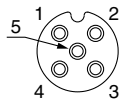
010	1000 [mm]
050	5000 [mm]

Connector specification

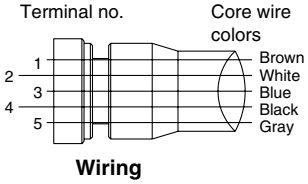
S	Straight
A	Angle

Straight connector type



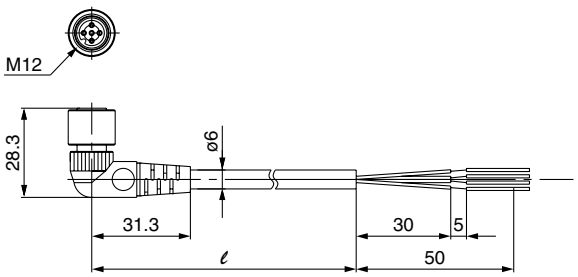


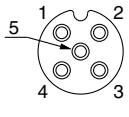
Socket connector pin arrangement



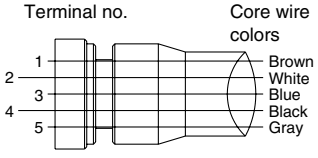
Wiring

Angle connector type





Socket connector pin arrangement



Wiring

Other Accessories

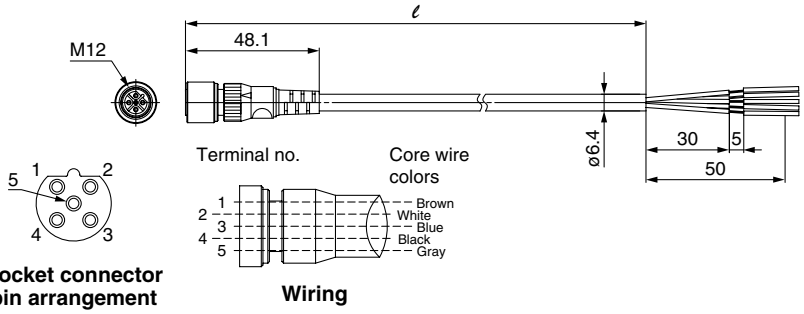
M8/M12 Connector Accessories (EX500/EX250/EX9)

B Power cable with connector (For EX250/Power block (B-coded))

EX9 − AC 050 − 1

Cable length (ℓ)

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



C Cable with M12 connector

EX500 − AC 030 − SSPS

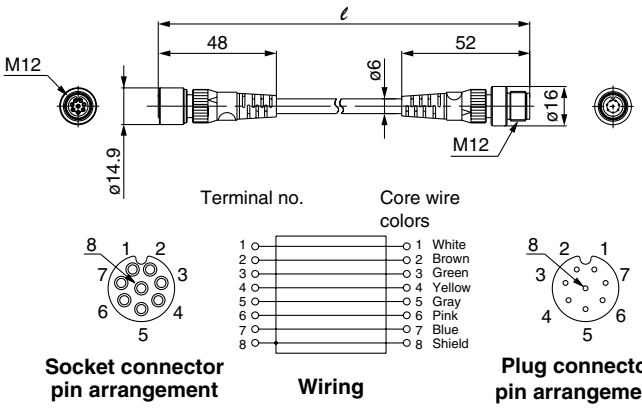
Cable length (ℓ)

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

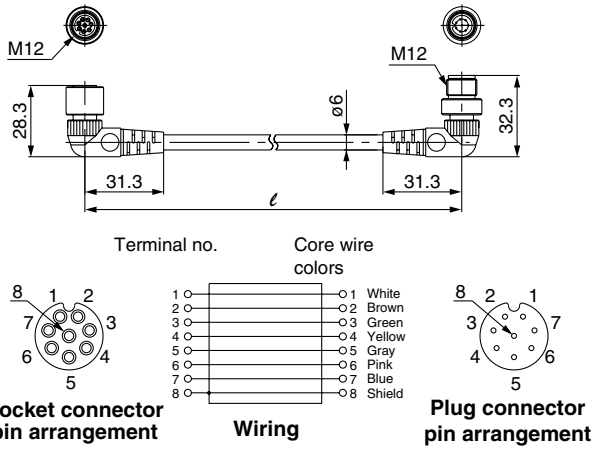
Connector specification

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

Straight connector type



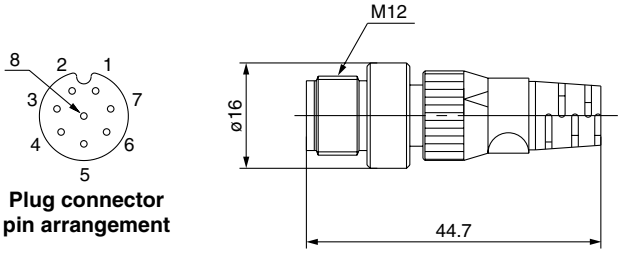
Angle connector type



D Terminal plug

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

EX500 − AC000 − S

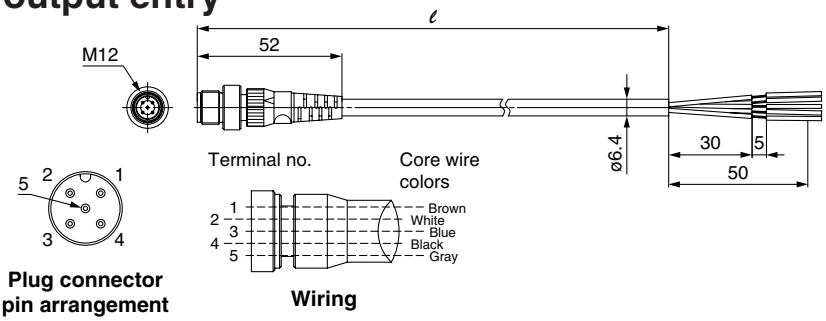


E Cable with connector for output entry

EX9 − AC 030 − 7

Cable length (ℓ)

010	1000 [mm]
030	3000 [mm]



Plug connector pin arrangement

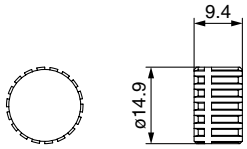
Wiring

F Seal cap: M12 connector (For plug)

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

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

EX500 − AWTP



F Seal cap: M8, M12 connector (For socket)/Accessories

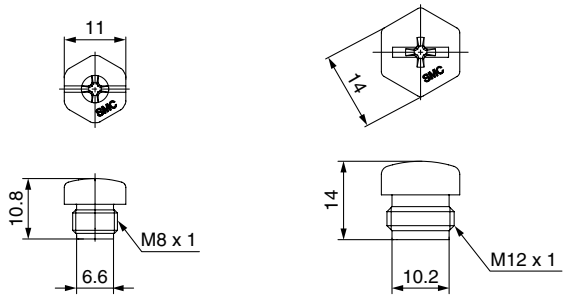
Use this on ports that are not being used for a M8, M12 connector (socket).
Use of this waterproof cap maintains the integrity of the enclosure. (Waterproof cap is packed together with each unit.)

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

EX9 − 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)

EX

M8/M12 Connector Accessories (EX500/EX250/EX9)

G Power cable with connector

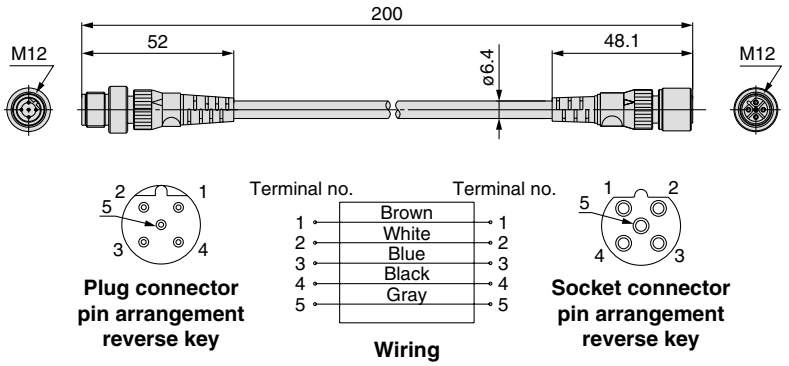
The cable connects the power supply connector of the power block and the power connector of the SI unit. It works as a bridge between a power source supplied to the power block and the SI unit.

EX9−AC002−2

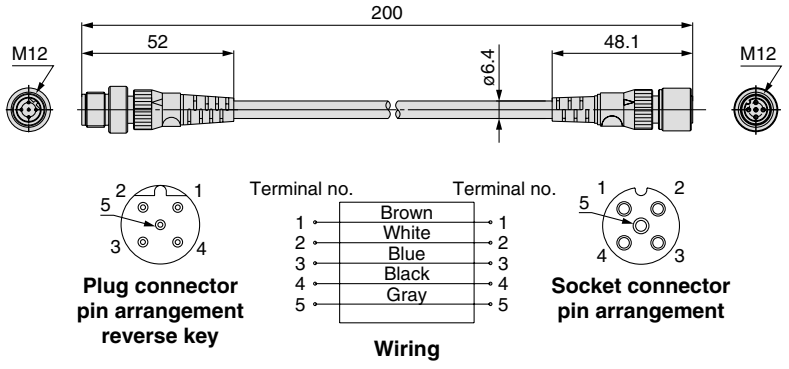
SI unit type

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

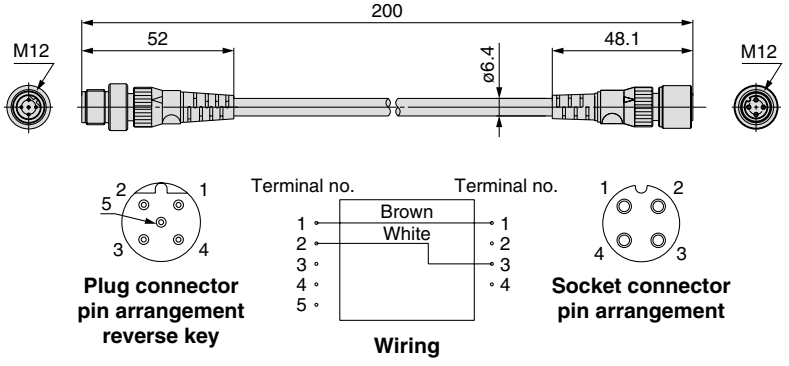
EX9-AC002-2



EX9-AC002-3



EX9-AC002-4



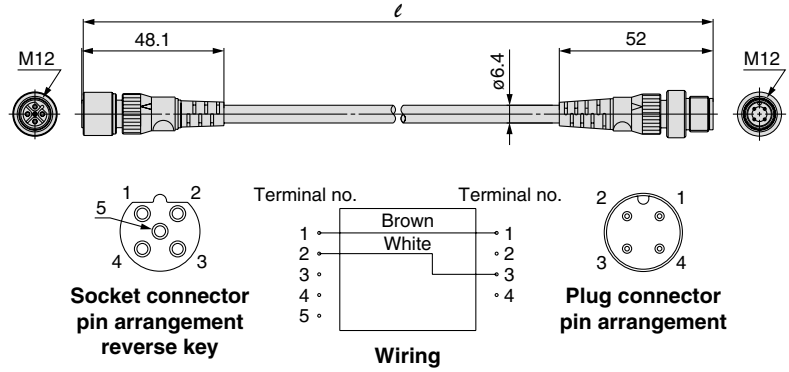
H AS-Interface power cable

It is the cable for connecting the branch connector (M12) of the AS-Interface power line (for external devices) and the power input connector of the power block.

EX9−AC010−5

Cable length (ℓ)

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



Assembly Procedure

Spring-cage Connection

Corresponding Model

● **Plug**

- For CC-Link
  ❸ **PCA-1557617**
- For DeviceNet™
  ❼ **PCA-1557659**
- For PROFIBUS DP
  ⓬ **PCA-1557701**

● **Socket**

- For CC-Link
  ❹ **PCA-1557620**
- For DeviceNet™
  ❽ **PCA-1557662**
- For PROFIBUS DP
  ⓭ **PCA-1557714**

Features

- M12 connector corresponding to shield connecting
- Save wiring time approx. 40% compared to screw and solder connection.
- Color-coded wire connection part allows easy wiring and prevents miswiring.
- Easy shield treatment

Structure image of wiring

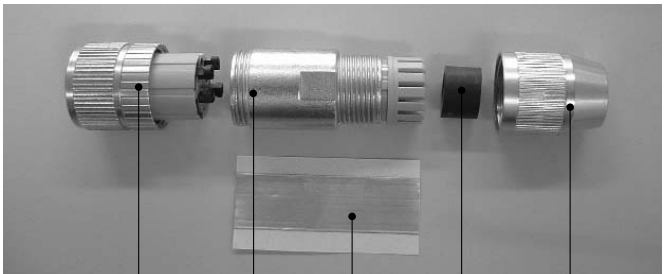
Structure image of shield wiring

Things to Prepare

- Stripper for cable sheath
  (Recommendation: Phoenix Contact KAMES MULTI (1209075))
- Stripper for wire sheath
  (Recommendation: Phoenix Contact QUICK WIREFOX2.5 (1206667))
- (Small) Nippers for cutting shield

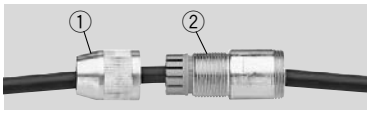
Product Construction

Check the contents when opening the package.

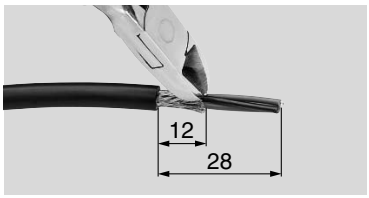


Assembly Procedure

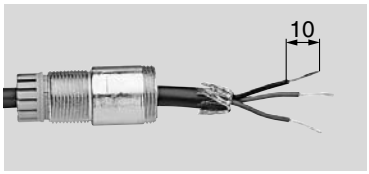
1 Slide Cap ① and Body Ⅱ ② over the cable.



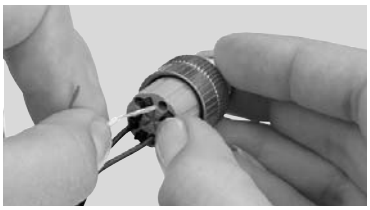
2 Strip the cable sheath over a length of **approx. 28 mm** for straight connector. Trim the braided shield to a length of **approx. 12 mm**.



3 Fold back the braided shield over the cable sheath.
Strip **approx.10 mm** off the single wires.
If necessary, crimp suitable ferrules to the end of each wire.

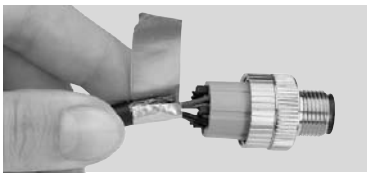


4 Connect the wire into Body Ⅰ.
In case of stranded wire, press the black button and open the connection part and insert the wire.
In case of wire with ferrule, insert directly without pressing the black button.

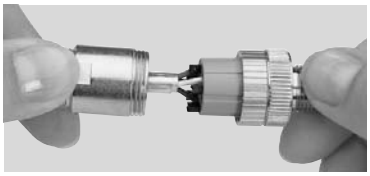


The color coding is previously printed on the connection part according to the wire color.

5 Fold the braided shield back again. Apply the attached adhesive shield foil around the braided shield.



6 Pull Body Ⅱ up to Body Ⅰ. Screw Body Ⅱ into Body Ⅰ.



7 Attach Cap on Body Ⅱ.
Tightening torque:
2.7 to 3.3 N·m

Check if the connector has no loosing by pulling the cable lightly.

⚠Caution

- **Do not use it besides an original purpose.**
- **This connector may only be operated when under no load.**
- **The work by the wet hand causes the electric shock.**
- **Never perform the repair.**

EX

Assembly Procedure

QUICKON-ONE Connection

Corresponding Model

SPEEDCON

⑯ PCA-1557743

⑰ PCA-1557756

Features

- Quick connection M12 connector with IDC technique
- Save wiring time approx. 80% compared to screw and solder connection.
- The connection is possible by 1/2 turn with SPEEDCON technique.

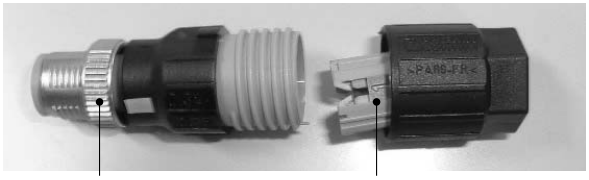
Structure image of wiring

Things to Prepare

- Stripper for cable sheath
  (Recommendation: Phoenix Contact CYCLOPS (1204481))
- (Small) Nippers for cutting wire

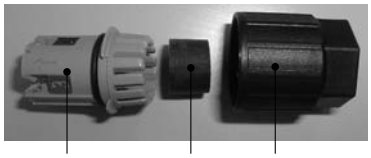
Product Construction

Check the contents when opening the package.



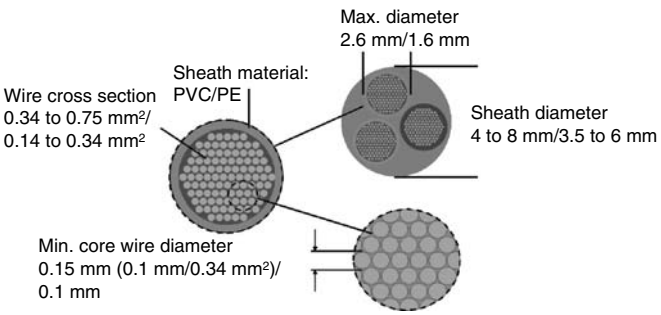
Body Union nut

Construction of Union nut



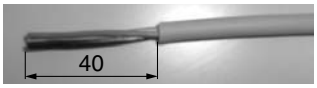
Splice ring Seal Cable gland

Construction of Cable



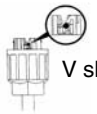
Assembly Procedure

1 Strip the cable sheath. (**approx. 40 mm**)

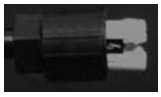


2 Slide the cable onto Union nut.
Insert the cable sheath to the stopper inside the Splice ring.

3 Insert the wires into the marked core entry of Splice ring.
Splice ring is colored with respective wire color of sensor.

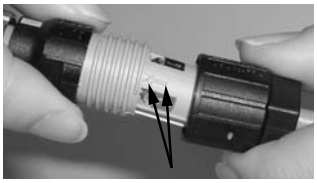


4 Cut off the projecting wire ends flush by nippers, etc.



Recommended cutting plane

5 Meet the mark ▲ on Body and mark "←" on Union nut.
Then, combine each others.



6 Screw up each others.
Tightening torque:
0.14 to 0.34 mm² ⋯ 0.72 to 0.88 N·m
0.34 to 0.75 mm² ⋯ 1.08 to 1.32 N·m

7 Finish

Check if the connector has no loosing by pulling the cable lightly.

⚠Caution

- **Connection between cables (with the same material and the same cross section) is 10 times at max.**
- **PVC or PE is suitable for sheath material, however fluoro resin is not suitable for sheath material.**
- **Only for flexible cable, not for solid cable.**
- **When you remove the cable, pull the cable. However, if you remove the Cable gland, cable and the Splice ring remain to the body.**
- **When you connect the cable again, screw the Splice ring approx. two turns into the Cable gland before using.**
- **When you connect the cable again, cut and strip the cable.**
- **Do not use it besides an original purpose.**
- **QUICKON-ONE may only be operated when under no load.**
- **The work by the wet hand causes the electric shock.**
- **Never perform the repair.**

Piercecon® Connection

Corresponding Model

⓯ **PCA-1557730**

Features

- Quick connection M8 connector with Piercecon® technique
- Save wiring time approx. 70% compared to screw and solder connection.
- Very small construction of a fieldwireable M8 connector

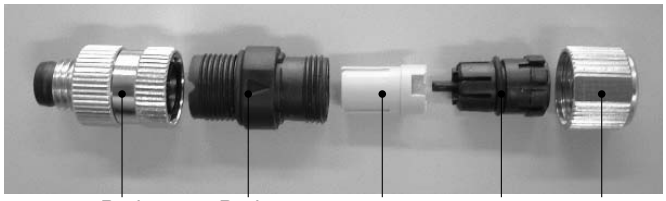
Structure image of wiring

Things to Prepare

- Stripper for cable sheath
  (Recommendation: Phoenix Contact CYCLOPS (1204481))
- (Small) Nippers for cutting wire

Product Construction

Check the contents when opening the package.



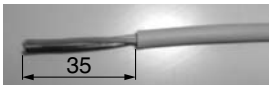
Body Ⅰ　Body Ⅱ　Cable guide　Pressure hull　Cap

Included 2 Cable guides.
White ··· 0.25 to 0.34 mm² (AWG24 to 22)
Min. wire outer dia. 1.3 mm
Black ··· 0.14 to 0.25 mm² (AWG26 to 24)
Min. wire outer dia. 1.0 mm

Use either one of Cable guides according to the wire.

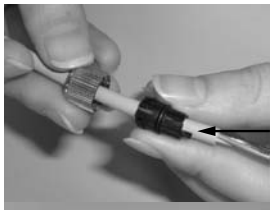
Assembly Procedure

1 Strip the cable sheath.
(**approx. 35 mm**)



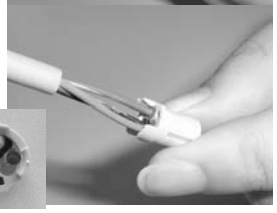
2 Slide Cap and Pressure hull over the cable.

Keep the direction of Pressure hull 凸 (arrow) to the wire side.

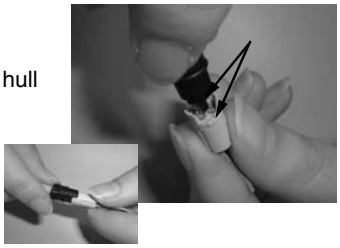


3 Slide the wire into Cable guide.

Cable guide is colored with respective wire color of sensor.

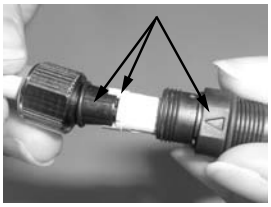


4 Push Pressure hull into Cable guide.
Meet the position of Pressure hull 凸 (arrow) and Cable guide 凹 (arrow).



5 Combine **4** and Body Ⅱ.

Meet the position of mark ▲ on Body Ⅱ, Cable guide and Pressure hull 凸 (arrow).



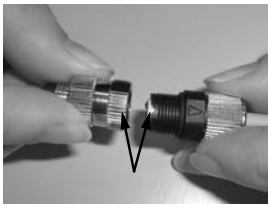
6 Screw Cap into Body Ⅱ.
Screw up each others.
Tightening torque: 1.08 to 1.32 N·m

7 Cut off the projecting wires by nippers.

Shape the cross sections.

8 Screw Body Ⅰ into Body Ⅱ.

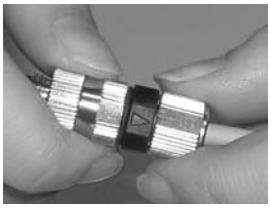
Meet the position of mark ▲ on Body Ⅱ and Body Ⅰ.



9 Tighten without gap between Body Ⅰ and Body Ⅱ.

Tightening torque: 1.08 to 1.32 N·m

Check if the connector has no loosing by pulling the cable lightly.



10 Finish

⚠Caution

- **Connection between cables (with the same material and the same cross section) is 10 times at max.**
- **Only for flexible cable, not for solid cable.**
- **When you connect the cable again, cut and strip the cable.**
- **Do not use it besides an original purpose.**
- **Piercecon® may only be operated when under no load.**
- **The work by the wet hand causes the electric shock.**
- **Never perform the repair.**
- **Piercecon® is a registered trademark of by CONINVERS GmbH.**

EX

Compatibility between Sensors and Fieldwireable Connectors

●: Applicable
▲: Applicable, but number of electric wire cores is limited. (Number of sensor lead wire cores is larger than the number of connector pins.)
△: Connectable, but may not correspond to IP65/67 depending on installation method. ×: Non-conformance

Auto Switch

Model	Cable part no.	Number of cores	Applicable connector			Cable specifications								Note
			M8	M12		Sheath		Insulator		Conductor				
			15	16	17	O.D.	Material	O.D.	Material	Nominal cross section	Stranding	O.D.	Material	
D-P4DW□	Integrated type	2	×	×	●	ø6	Oil resistant vinyl	ø1.9	Flame-retardant semi-rigid PVC	0.5 mm²	100 pcs./0.08 mm	ø0.9	Tin plating annealed copper bunch stranded wire	
D-M9BA□ **D-M9BAV□**	Integrated type	2	●	△	×	2.7 x 3.2	Oil resistant vinyl	ø0.9	Cross-linked semi-rigid PVC	0.15 mm²	77 pcs./0.05 mm	ø0.5	Tin plating copper and silver alloy wire	
D-M9NA□ **D-M9PA□** **D-M9NAV□** **D-M9PAV□**	Integrated type	3	●	△	×	2.7 x 3.2	Oil resistant vinyl	ø0.9	Cross-linked semi-rigid PVC	0.15 mm²	77 pcs./0.05 mm	ø0.5	Tin plating copper and silver alloy wire	
D-M9B□ **D-M9BV□** **D-M9BW□** **D-M9BWV□**	Integrated type	2	●	△	×	2.7 x 3.2	Oil resistant vinyl	ø0.9	Semi-rigid PVC	0.15 mm²	77 pcs./0.05 mm	ø0.5	Tin plating copper and silver alloy wire	
D-M9N□ **D-M9P□** **D-M9NV□** **D-M9PV□** **D-M9NW□** **D-M9PW□** **D-M9NWV□** **D-M9PWV□**	Integrated type	3	●	△	×	2.7 x 3.2	Oil resistant vinyl	ø0.9	Semi-rigid PVC	0.15 mm²	77 pcs./0.05 mm	ø0.5	Tin plating copper and silver alloy wire	

Pressure Switch

Model	Cable part no.	Number of cores	Applicable connector			Cable specifications								Note
			M8	M12		Sheath		Insulator		Conductor				
			15	16	17	O.D.	Material	O.D.	Material	Nominal cross section	Stranding	O.D.	Material	
Z/ISE30-□	ZS-27-A-□	3	●	●	×	ø3.4	Oil resistant vinyl	ø1.12	Cross-linked PVC	0.20 mm² (AWG25)	40 pcs./0.08 mm	ø0.58	Annealed copper wire	UL2130
ISE35-□	ZS-32-A-□	3	●	●	×	ø3.4	Oil resistant vinyl	ø1.12	Cross-linked PVC	0.20 mm² (AWG25)	40 pcs./0.08 mm	ø0.58	Annealed copper wire	UL2130
Z/ISE40□-□ **Z/ISE50□-□** **Z/ISE6□-□**	Integrated type	5	▲	▲	×	ø3.5	Oil resistant vinyl	ø0.97	Irradiated cross-linked PVC	0.15 mm² (AWG28)	30 pcs./0.08 mm	ø0.51	Tin plating annealed copper wire	
ISE70/75(H)-□	ZS-31-B	4	▲	●	×	ø4.0	Oil resistant vinyl	ø1.14	Irradiated cross-linked PVC	0.30 mm² (AWG23)	60 pcs./0.08 mm	ø0.72	Tin plating copper alloy wire	Straight
	ZS-31-C		▲	●	×									Angle
Z/ISE80□-□	Integrated type	5	▲	▲	×	ø3.5	Oil resistant vinyl	ø0.95 ±0.10	Heat-resistance PVC	0.15 mm² (AWG26)	30 pcs./0.08 mm	ø0.51	Annealed copper wire	UL20379
		4	▲	●	×									
		3	●	●	×									
ISA2-□	ISA-8-A	4	×	×	●	ø6.0	Oil resistant vinyl	ø1.72	Irradiated cross-linked PVC	0.53 mm² (AWG21)	21 pcs./0.18 mm	ø0.9	Tin plating copper alloy wire	Straight
	ISA-8-B		×	×	●									Angle

Flow Switch

Model	Cable part no.	Number of cores	Applicable connector			Cable specifications								Note
			M8	M12		Sheath		Insulator		Conductor				
			15	16	17	O.D.	Material	O.D.	Material	Nominal cross section	Stranding	O.D.	Material	
PF2A7□ **PF2W7□**	ZS-37-A	4	▲	●	×	ø4.0	Oil resistant vinyl	ø1.14	Irradiated cross-linked PVC	AWG23	60 pcs./0.08 mm	ø0.72	Tin plating copper alloy wire	Straight
	ZS-37-B		▲	●	×									Angle
PFM7□	ZS-33-D	4	▲	●	×	ø3.5	Oil resistant vinyl	ø1.00	Cross-linked PVC	AWG26	28 pcs./0.08 mm	ø0.50	Annealed copper wire	

Note) Information on cable specifications is based on specification sheets supplied by the manufacturer.

American Wire Gauge Conversion Table

This table shows to change American wire gauge (AWG) into a diameter.

The wire material is indicated as AWG (American wire gauge) in the documentations overseas.
Use the following table for conversion into diameter.

Wire size (AWG)	Diameter (mm)	Cross section (mm^2)
1	7.348	42.3846
2	6.543	33.6065
3	5.827	26.6538
4	5.189	21.1367
5	4.62	16.7554
6	4.115	13.2926
7	3.665	10.5443
8	3.264	8.3632
9	2.906	6.6292
10	2.588	5.2577
11	2.304	4.1671
12	2.052	3.3054
13	1.829	2.6260
14	1.628	2.0806
15	1.45	1.6505
16	1.29	1.3063

Wire size (AWG)	Diameter (mm)	Cross section (mm^2)
17	1.151	1.0400
18	1.024	0.8231
19	0.912	0.6529
20	0.813	0.5189
21	0.724	0.4115
22	0.643	0.3246
23	0.574	0.2586
24	0.511	0.2050
25	0.455	0.1625
26	0.404	0.1281
27	0.361	0.1023
28	0.32	0.0804
29	0.287	0.0647
30	0.254	0.0506
31	0.226	0.0401
32	0.203	0.0323

Wire size (AWG)	Diameter (mm)	Cross section (mm^2)
33	0.18	0.0254
34	0.16	0.0201
35	0.142	0.0158
36	0.127	0.0127
37	0.114	0.0102
38	0.102	0.0082
39	0.089	0.0062
40	0.079	0.0049
41	0.071	0.0040
42	0.064	0.0032
43	0.056	0.0025
44	0.051	0.0020
45	0.045	0.0016
46	0.04	0.0013

Cable/Connector Accessories Precautions

Be sure to read this before handling.

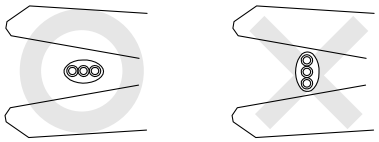
Wiring

⚠Caution

1. **Do not lay the wires while they are energized. It may give you an electric shock.**
2. **It should be cabled according to the connection diagram.**
3. **Check if it can be connected when using a sensor or switch.**
4. **When the cable sheath is stripped, confirm the stripping direction.**

   (For SMC switches with oblong cables)

   The insulator may be split or damaged depending on the direction.



Tightening of Screw

⚠Caution

1. **It cannot maintain the enclosure (IP6○) or the screws may be loosened if they are not tightened sufficiently.**
2. **Check that they are tightened enough at appropriate intervals during the operation.**

Connection and Disconnection of Connector

⚠Caution

1. **Be sure to turn the power off when connecting and disconnecting the connectors.**
2. **Do not touch surface of the engagement with wet hands.**
3. **Do not pull the cable out by holding the cable.**
4. **Note the key direction.**

   Especially for the SPEEDCON specifications, match the protrusion of the knurl (bracket) and the mark at the mold for insertion so that the SPEEDCON function can be maintained.
5. **When engaging the connectors, insert the connectors enough until all the engagement surfaces can be hidden and tighten the screws not to damage the thread ridges.**

Handling of Cable with Connector

⚠Caution

1. **Avoid repeatedly bending or stretching the cable and applying a heavy object or force to it.**
2. **Set up the cables to the place where they cannot be stepped on in order to prevent them being broken or damage to the connectors.**

   Install a protective cover in case it is used in the place stated above.
3. **Do not pull the connector or cable unnecessarily. It may damage the connectors or break the cables.**
4. **Do not bend the cable at the root of the connector when installed.**

Handling of Fieldwireable Connector

⚠Caution

Common Precautions

1. **Follow "Assembly Procedure" provided by SMC. If not, it may not maintain IP65/67.**
2. **Do not use it besides an original purpose.**
3. **This connector may only be operated when under no load.**
4. **The work by the wet hand causes the electric shock.**
5. **Never perform the repair.**

Spring-cage Connection

1. **Do not use it besides an original purpose.**
2. **This connector may only be operated when under no load.**
3. **The work by the wet hand causes the electric shock.**
4. **Never perform the repair.**

QUICKON-ONE Connection

1. **Connection between cables** (with the same material and the same cross section) **is 10 times at max.**
2. **PVC or PE is suitable for sheath material, however fluoro resin is not suitable for sheath material.**
3. **Only for flexible cable, not for solid cable.**
4. **When you remove the cable, pull the cable. However, if you remove the Cable gland, cable and the Splice ring remain to the body.**

   When you connect the cable again, screw the Splice ring approx. two turns into the Cable gland before using.
5. **When you connect the cable again, cut and strip the cable.**

Piercecon® Connection

1. **Connection between cables** (with the same material and the same cross section) **is 10 times at max.**
2. **Only for flexible cable, not for solid cable.**
3. **If you connect the cable again, cut and strip the cable.**

Operating Environment

⚠Caution

1. **Do not use in the atmosphere and environment over the rated specifications.**
2. **Do not use in the environment of corrosive gas or liquid splash.**
3. **Do not use in an environment where oil and chemicals are used.**

Maintenance

⚠Caution

1. **Perform periodic inspection.**