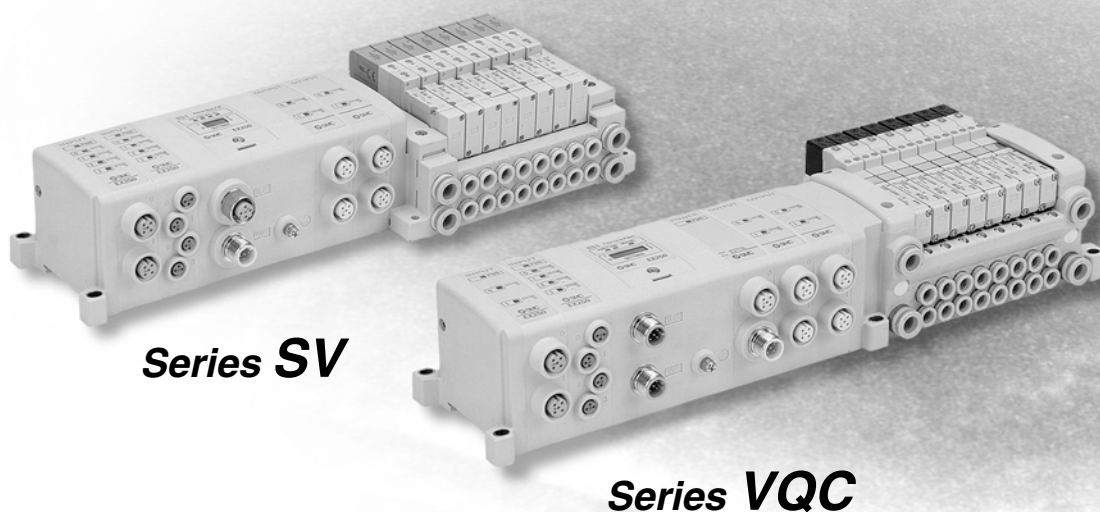


Serial Wiring with Input/Output Unit 5 Port Solenoid Valve for EX250 Series *SV/VQC*

Series	Applicable protocol	Applicable manifold
Serial wiring with input/output unit EX250	DeviceNet™	SV1000 2000 3000
	PROFIBUS-DP	
	CC-Link	
	AS-i	VQC1000 2000 4000
	CANopen	
	ControlNet™	
	EtherNet/IP™	

 **EtherNet/IP™ compatible products**
 are now available.

- Compatible with DHCP
- Communication speed: 10 M/100 Mbps
- Able to HOLD/CLEAR the output in case of an error occurrence.



EX250 Serial Wiring With Input/Output Unit Series SV



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How to Order

Tie-rod Base

SS5V 1 — **W 10S1** **QW** **□** **□** **□** **D** — **05** **U** **□** **□** **□**

Series	
1	SV1000
2	SV2000
3	SV3000

Enclosure
IP67 specification

Input block stations •
SI unit •

QW	DeviceNet
NW	PROFIBUS-DP
VW	CC-Link
TAW	AS-i 8in/8out 31Slave Mode, 2 power supply systems
TBW	AS-i 4in/4out 31Slave Mode, 2 power supply systems
TCW	AS-i 8in/8out 31Slave Mode, 1 power supply system
TDW	AS-i 4in/4out 31Slave Mode, 1 power supply system
YW	CANopen
ZCN	ControlNet (IP40)
ZEN	EtherNet/IP
0	Without SI unit, Without end plate

Nil	None
1	1 station
⋮	⋮
8	8 stations

Note) Without SI unit, the symbol is nil
When an AS-i compatible S kit is used, there is a limit on the maximum number of stations. For details, please refer to page 13.

Mounting

Nil	Direct mounting
D	DIN rail mounting (with DIN rail)
D0 (Note)	DIN rail mounting (without DIN rail)
D3	3 stations
⋮	⋮
D20	20 stations

Note) In the case of D0, only DIN rail brackets are attached.

- Input blocks cannot be mounted without SI unit.
 - When the DIN rail is included without an SI unit, the DIN rail length will accommodate an SI unit and one input block.
- Note 1) There is a limit on the current supplied from an SI unit of AS-i compatible power supply system specification to an input block or valve. For details, refer to page 13.
- Note 2) IP40 when the SI unit spec is only compatible with ControlNet.
(Manifold model no. is "SS5V□ 10S1ZCN□□□□D".)
- Note 3) For SI unit part no., refer to page 3.

Input block type •

Nil	Without input block
1	M12 2 inputs
2	M12 4 inputs
3	M8 4 inputs

Note) Without SI unit, the symbol is nil

Input block common specification •

Nil	+COM. or without input block
N	-COM.

Stations •

Symbol	No. of stations	Note
02	2 stations	Double wiring specification (Note 1)
⋮	⋮	
16	16 stations	Specified layout (Note 2) (Up to 32 solenoids possible.)
02	2 stations	
⋮	⋮	
20	20 stations	

Note) When an AS-i compatible SI unit is used, the maximum numbers of solenoids are as follows:
8in/8out specification: Maximum 8 solenoids
4in/4out specification: Maximum 4 solenoids

Note 1) Double wiring specification: Single, double, 3 position and 4 position solenoid valves can be used on all manifold stations.

Use of a single solenoid will result in an unused control signal. If this is not desired, order with a specified layout.

Note 2) Specified layout: Indicate wiring specification in the manifold specification sheet. (Note that double, 3 position and 4 position valves cannot be used where single solenoid wiring has been specified.)

P, E port position •

U	U side (2 to 10 stations)
D	D side (2 to 10 stations)
B	Both sides (2 to 20 stations)

SUP/EXH block assembly specification •

Nil	Internal pilot
S (Note)	Internal pilot, Built-in silencer
R	External pilot
RS (Note)	External pilot, Built-in silencer

Note) When the built-in silencer type is used, keep the exhaust port from coming in direct contact with water or other liquids.

A, B port size (Metric) •

Symbol	A, B port	P, E port	Applicable series
C3	With one-touch fitting for ø3.2	With one-touch fitting for ø8	SV1000
C4	With one-touch fitting for ø4		
C6	With one-touch fitting for ø6		
C4	With one-touch fitting for ø4	With one-touch fitting for ø10	SV2000
C6	With one-touch fitting for ø6		
C8	With one-touch fitting for ø8		
C6	With one-touch fitting for ø6	With one-touch fitting for ø12	SV3000
C8	With one-touch fitting for ø8		
C10	With one-touch fitting for ø10		
M	A, B ports mixed		

A, B port size (Inch) •

Symbol	A, B port	P, E port	Applicable series
N1	With one-touch fitting for ø1/8"	With one-touch fitting for ø5/16"	SV1000
N3	With one-touch fitting for ø5/32"		
N7	With one-touch fitting for ø1/4"		
N3	With one-touch fitting for ø5/32"	With one-touch fitting for ø3/8"	SV2000
N7	With one-touch fitting for ø1/4"		
N9	With one-touch fitting for ø5/16"		
N7	With one-touch fitting for ø1/4"	With one-touch fitting for ø3/8"	SV3000
N9	With one-touch fitting for ø5/16"		
N11	With one-touch fitting for ø3/8"		
M	A, B ports mixed		

* In the case of mixed specification (M), indicate separately in the manifold specification sheet.

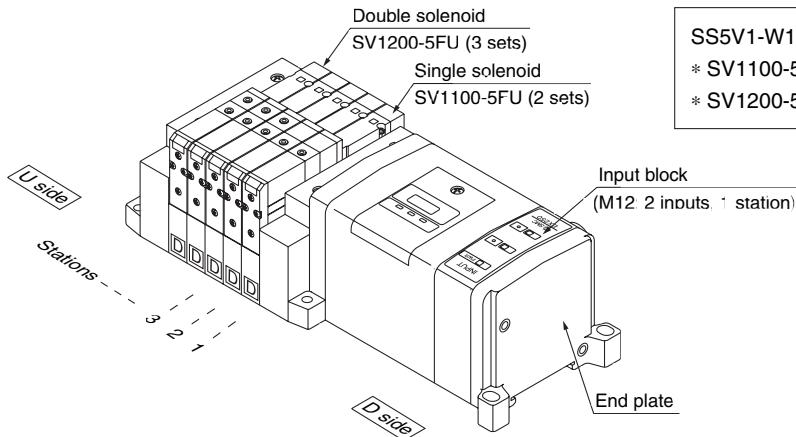
* Port sizes of X, PE port for external pilot specification (P, RS) are ø4 (metric), ø5/32" (inch) for the SV1000/2000 series and ø6 (metric) and ø1/4" (inch) for the SV3000 series.

How to Order Valve Manifold Assembly (Example)

Example (SV1000)

Manifold

SS5V1-W10S1QW11ND-05B-C6 (1 set)



SS5V1-W10S1QW11ND-05B-C6 1 set (Manifold base part no.)
 * SV1100-5FU 2 sets (Single solenoid part no.)
 * SV1200-5FU 2 sets (Double solenoid part no.)

How to Order Solenoid Valves

SV 1 1 0 0 - 5 F

Note



Note Available with manifold block for station additions. Refer to "Best Pneumatics 2004 Vol. 1" catalog

Series

1	SV1000
2	SV2000
3	SV3000

Type of actuation

1	2 position single solenoid
2	2 position double solenoid
3	3 position closed center
4	3 position exhaust center
5	3 position pressure center
A	4 position dual 3 port valve: N.C./N.C.
B	4 position dual 3 port valve: N.O./N.O.
C	4 position dual 3 port valve: N.C./N.O.

* 4 position dual 3 port valves are applicable to the SV1000 and SV2000 series only.

Pilot

Nil	Internal pilot
R	External pilot

* External pilot specification is not applicable for 4 position dual 3 port valves.

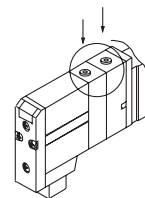
Back pressure check valve

Nil	None
K	Built-in

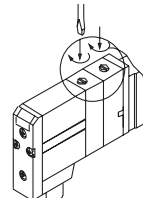
* Built-in back pressure check valve type is applicable to the SV1000 series only.

Manual override

Nil: Non-locking push type



D: Push-turn locking slotted type



Light/surge voltage suppressor

U	With light/surge voltage suppressor
R	With surge voltage suppressor

Rated voltage

5	24 VDC
---	--------

- For solenoid valve specifications and dimensions, refer to the SV series in the "Best Pneumatics 2004 Vol. 1" catalog.
- For SI unit dimensions, refer to page 12.
- For details on the SI unit, refer to the separate technical instruction manual.

SI Unit Part No.

SI Unit Part No.

Symbol	Protocol type	SI unit part no.
QW	DeviceNet	EX250-SDN1
NW	PROFIBUS-DP	EX250-SPR1
VW	CC-Link	EX250-SMJ2
YW	CANopen	EX250-SCA1
ZCN	ControlNet	EX250-SCN1

Symbol	Protocol type	SI unit part no.
TAW	AS-i 8in/8out 31Slave Mode, 2 power supply systems	EX250-SAS3
TBW	AS-i 4in/4out 31Slave Mode, 2 power supply systems	EX250-SAS5
TCW	AS-i 8in/8out 31Slave Mode, 1 power supply system	EX250-SAS7
TDW	AS-i 4in/4out 31Slave Mode, 1 power supply system	EX250-SAS9
ZEN	EtherNet/IP	EX250-SEN1

Series VQC1000

Base Mounted

Plug-in Manifold €



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How to Order Manifold

VV5QC 1 1 — 08 C6 SDQ [] [] [] [] — B S Kit

Series

1 VQC1000

Manifold

1 Plug-in manifold

Stations

01 1 station
: :
: :

The maximum number of stations differs depending on the kits.

Cylinder port size

C3	With one-touch fitting for ø3.2
C4	With one-touch fitting for ø4
C6	With one-touch fitting for ø6
M5	M5 thread
CM	Mixed size/with port plug
L3	Elbow top ported with one-touch fitting for ø3.2
L4	Elbow top ported with one-touch fitting for ø4
L6	Elbow top ported with one-touch fitting for ø6
L5	M5 thread
B3	Elbow bottom ported with one-touch fitting for ø3.2
B4	Elbow bottom ported with one-touch fitting for ø4
B6	Elbow bottom ported with one-touch fitting for ø6
B5	M5 thread
LM	Mixed size for elbow piping



Note 1) Indicate the size in the specification sheet in the case of "CM" and "LM".

Note 2) Symbols for inch sizes are as follows:

- N1 ø1/8"
- N3 ø5/32"
- N7 ø1/4"
- NM: Mixed

The top ported elbow is L□ and the bottom ported elbow is R□.

Kit name

(For details on kits, refer to the next page.)

Option

Nil	None
B	With back pressure check valve (all stations) ^{Note 2)}
D	With DIN rail (Rail length: Standard)
D□	With DIN rail (Rail length: Special) ^{Note 3)}
K	Special wiring specification (Except double wiring) ^{Note 4)}
N	With name plate
R	External pilot ^{Note 5)}
S	Built-in silencer, Direct exhaust ^{Note 6)}



Note 1) When two or more options are specified, indicate them alphabetically.

Example) -BRS

Note 2) When installing a back pressure check valve on the required station, enter the part number and specify the station position in the manifold specification sheet.

Note 3) For special DIN rail length, indicate "D□". (Enter the number of stations inside □.)

Example) -D08

In this case, stations will be mounted on a DIN rail for 8 stations regardless of the actual number of manifold stations.

The specified number of stations must be larger than the number of stations on the manifold.

Indicate "D□" for the option without DIN rail.

Note 4) Be sure to indicate the wiring specification in the specification sheet.

Note 5) For external pilot option, "P", indicate the external pilot specification "R" for the applicable valves as well.

Note 6) The built-in silencer type does not satisfy the IP67 standard.

Input block COM.

Nil	PNP or without input block
N	NPN

Input block type

Nil	Without input block
1	M12 2 inputs
2	M12 4 inputs
3	M8 4 inputs

Number of input blocks

Nil	Without SI unit
0	Without input block
1	With 1-input block
:	:
8	With 8-input block

Note) When an AS-i compatible S kit is used, there is a limit on the maximum number of stations.

For details, please refer to page 13.

SI unit COM.

SI unit COM.		EX250						
		DeviceNet	PROFIBUS-DP	CC-Link	AS-i	CANopen	ControlNet	EtherNet/IP
Nil	+COM.	—	—	○	—	—	—	—
N	-COM.	○	○	—	○	○	○	○



Note) Without SI unit, the symbol is nil.

How to Order Valves

VQC 1 1 0 0 — **5**

Series
1 VQC1000

Type of actuation

1	2 position single 	A Note)	4 position dual 3 port valve (A)
2	2 position double (Metal) 	B Note)	4 position dual 3 port valve (B)
	2 position double (Rubber) 	C Note)	4 position dual 3 port valve (C)
3	3 position closed center 	Note) Rubber seal type only.	
4	3 position exhaust center 		
5	3 position pressure center 		

With/Without light/surge voltage suppressor
Nil Yes

Rated voltage
5 24 VDC

Function

Nil	Standard (1 W)
K Note 1)	High-pressure type (1.0 MPa)
N	Negative COM.
R Note 3)	External pilot
Y Note 4)	Low-wattage type (0.5 W)

Note 1) Meta sea type only
Note 2) When two or more symbols are specified, indicate them alphabetically.
Note 3) It is not applicable to dual 3 port valves.
Note 4) Use a low wattage type for continuous energization (when the totaled energized time per day is longer than the non-energized time.)

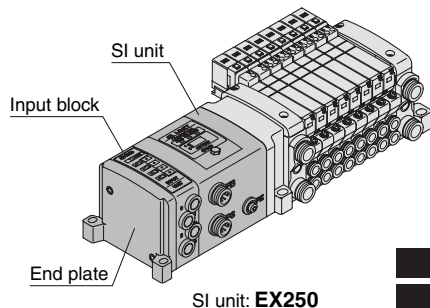
Seal

0	Metal seal
1	Rubber seal

Manual override
Nil: Non-locking push type (Tool required)
B: Locking type (Tool required)
C: Locking type (Manual)
D: Slide locking type (Manual)

Kit name

S Kit (Serial transmission kit for I/O)



IP40

IP67

Symbol	Protocol type	No. of stations	SI unit part no.
SD0	Without SI unit, Without end plate		—
SDQ	DeviceNet	1 to 12 stations (24 stations)	EX250-SDN1
SDN	PROFIBUS-DP		EX250-SPR1
SDV	CC-Link		EX250-SMJ2
SDTA	AS-i 8in/8out 31Slave Mode, 2 power supply systems	1 to 4 stations (8 stations)	EX250-SAS3
SDTB	AS-i 4in/4out 31Slave Mode, 2 power supply systems	1 to 2 stations (4 stations)	EX250-SAS5
SDTC Note)	AS-i 8in/8out 31Slave Mode, 1 power supply system	1 to 4 stations (8 stations)	EX250-SAS7
SDTD Note)	AS-i 4in/4out 31Slave Mode, 1 power supply system	1 to 2 stations (4 stations)	EX250-SAS9
SDY	CANopen	1 to 12 stations (24 stations)	EX250-SCA1
SDZCN	ControlNet (IP40)		EX250-SCN1
SDZEN	EtherNet/IP		EX250-SEN1

Note) There is a limit on the current supplied from an SI unit of the SDTC or SDTD specification to an input block or valve. For details, refer to page 13
• IP40 for the S kit only, which is compatible with ControlNet. (The other S kits are compatible with IP67 ratings.)

- For solenoid valve specifications and dimensions, refer to the VQC series in the "Best Pneumatics 2004 Vol. 2" catalog.
- For SI unit dimensions, refer to page 12.
- For details on the SI unit, refer to the separate technical instruction manual.

Series VQC2000

Base Mounted

Plug-in Manifold C €



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How to Order Manifold

VV5QC 2 1 — 08 C6 SDQ [] [] [] [] — B S Kit

Series

2	VQC2000
---	---------

Manifold

1	Plug-in manifold
---	------------------

Stations

01	1 station
⋮	⋮

The maximum number of stations differs depending on the kits.

Cylinder port size

C4	With one-touch fitting for ø4
C6	With one-touch fitting for ø6
C8	With one-touch fitting for ø8
CM	Mixed size/with port plug
L4	Elbow top ported with one-touch fitting for ø4
L6	Elbow top ported with one-touch fitting for ø6
L8	Elbow top ported with one-touch fitting for ø8
B4	Elbow bottom ported with one-touch fitting for ø4
B6	Elbow bottom ported with one-touch fitting for ø6
B8	Elbow bottom ported with one-touch fitting for ø8
LM	Mixed size for elbow piping



Note 1) Indicate the size in the specification sheet in the case of "CM" and "LM".
 Note 2) Symbols for inch sizes are as follows:
 • N3: ø5/32"
 • N7: ø1/4"
 • N9: ø5/16"
 • NM: Mixed
 The top ported elbow is LN□ and the bottom ported elbow is BN□.

Kit name

(For details on kits, refer to the next page.)

Option

Nil	None
B	With back pressure check valve (all stations) ^{Note 2)}
D	With DIN rail (Rail length: Standard)
D□	With DIN rail (Rail length: Special) ^{Note 3)}
K	Special wiring specification (Except double wiring) ^{Note 4)}
N	With name plate
R	External pilot ^{Note 5)}
S	Built-in silencer, Direct exhaust ^{Note 6)}
T	P, R port on U side, branched type ^{Note 7)}



Note 1) When two or more options are specified, indicate them alphabetically.

Example) -BRS

Note 2) When installing a back pressure check valve on the required station, enter the part number and specify the station position in the manifold specification sheet.

Note 3) For special DIN rail length, indicate "D□". (Enter the number of stations inside □.)

Example) D08

In this case, stations will be mounted on a DIN rail for 8 stations regardless of the actual number of manifold stations.

The specified number of stations must be larger than the number of stations on the manifold.

Indicate "D0" for the option without DIN rail.

Note 4) Be sure to indicate the wiring specification in the specification sheet.

Note 5) For external pilot option, "-R" indicate the external pilot specification "R" for the applicable valves as well.

Note 6) The built-in silencer type does not satisfy the IP67 standard.

Note 7) The SUP and EXH ports on U side are branched (toward the cylinder port and coil) with ø12 one-touch fittings for connection.

Input block COM.

Nil	PNP or without input block
N	NPN

Input block type

Nil	Without input block
1	M12 2 inputs
2	M12 4 inputs
3	M8 4 inputs

Number of input blocks

Nil	Without SI unit
0	Without input block
1	With 1-input block
⋮	⋮
8	With 8-input block

Note) When an AS-i compatible S kit is used, there is a limit on the maximum number of stations. For details, please refer to page 13.

SI unit COM.

SI unit COM.		EX250						
		DeviceNet	PROFIBUS-DP	CC-Link	AS-i	CANopen	ControlNet	EtherNet/IP
Nil	+COM.	—	—	○	—	—	—	—
N	-COM.	○	○	—	○	○	○	○



Note) Without SI unit, the symbol is nil

How to Order Valves

VQC 2 1 0 0 **5**

Series
2 VQC2000

Type of actuation

1	2 position single	A (Note)	4 position dual 3 port valve (A)
	2 position double (Metal)		4 position dual 3 port valve (B)
2	2 position double (Rubber)	B (Note)	4 position dual 3 port valve (C)
	3 position closed center		3 position exhaust center
3	3 position pressure center	C (Note)	
4			
5			

Note) Rubber seal type only.

With/Without light/surge voltage suppressor
Nil Yes

Rated voltage
5 24 VDC

Function

Nil	Standard (1 W)
K (Note 1)	High-pressure type (1.0 MPa)
N	Negative COM.
R (Note 3)	External pilot
Y (Note 4)	Low-wattage type (0.5 W)

Note 1) Meta sea type only.
Note 2) When two or more symbols are specified, indicate them alphabetically.
Note 3) It is not applicable to dual 3 port valves.
Note 4) Use a low wattage type for continuous energization (when the totaled energized time per day is longer than the non-energized time.)

Seal

0	Metal seal
1	Rubber seal

Manual override

Nil: Non-locking push type (Tool required)

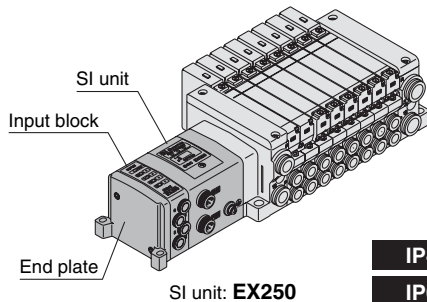
B: Locking type (Tool required)

C: Locking type (Manual)

D: Slide locking type (Manual)

Kit name

S Kit
(Serial transmission kit for I/O)



IP40

IP67

Symbol	Protocol type	No. of stations	SI unit part no.
SD0	Without SI unit, Without end plate		—
SDQ	DeviceNet	1 to 12 stations (24 stations)	EX250-SDN1
SDN	PROFIBUS-DP		EX250-SPR1
SDV	CC-Link		EX250-SMJ2
SDTA	AS-i 8in/8out 31Slave Mode, 2 power supply systems	1 to 4 stations (8 stations)	EX250-SAS3
SDTB	AS-i 4in/4out 31Slave Mode, 2 power supply systems	1 to 2 stations (4 stations)	EX250-SAS5
SDTC (Note)	AS-i 8in/8out 31Slave Mode, 1 power supply system	1 to 4 stations (8 stations)	EX250-SAS7
SDTD (Note)	AS-i 4in/4out 31Slave Mode, 1 power supply system	1 to 2 stations (4 stations)	EX250-SAS9
SDY	CANopen	1 to 12 stations (24 stations)	EX250-SCA1
SDZCN	ControlNet (IP40)		EX250-SCN1
SDZEN	EtherNet/IP		EX250-SEN1

Note) There is a limit on the current supplied from an SI unit of the SDTC or SDTD specification to an input block or valve. For details refer to page 13.
• IP40 for the S kit only, which is compatible with ControlNet. (The other S kits are compatible with IP67 ratings.)

- For solenoid valve specifications and dimensions, refer to the VQC series in the "Best Pneumatics 2004 Vol. 2" catalog.
- For SI unit dimensions, refer to page 12.
- For details on the SI unit, refer to the separate technical instruction manual.

Plug-in Manifold $\subset \mathbb{E}$



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How to Order Manifold

VV5QC 4 1—16 03 SDQ **S** Kit

Series

4	VQC4000
---	---------

Manifold

1	Plug-in manifold
---	------------------

Stations ●

01	1 station
⋮	⋮

The maximum number of stations differs depending on the kits.

Cylinder port size ●

C8	With one-touch fitting for ø8
C10	With one-touch fitting for ø10
C12	With one-touch fitting for ø12
02	Rc 1/4
03	Rc 3/8
B	Bottom ported Rc 1/4
CM	Mixed size



Note 1) Indicate the size in the specification sheet in the case of "CM"

Note 2) Symbols for inch sizes are as follows:

<For one touch fitting>

- N7: $\varnothing 1/4"$
- N9: $\varnothing 5/16"$
- N11: $\varnothing 3/8"$
- NM: Mixed

- SI unit COM.

SI unit COM.		EX250						
		DeviceNet	PROFIBUS-DP	CC-Link	AS-i	CANopen	ControlNet	EtherNet/IP
Nil	+COM.	—	—	○	—	—	—	—
N	—COM.	○	○	—	○	○	○	○

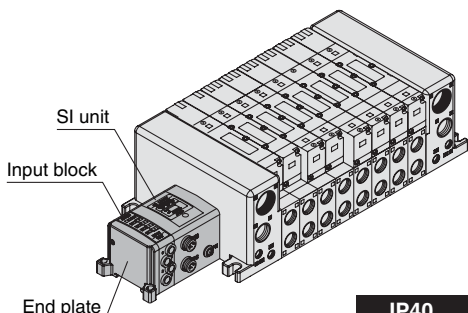


Note) Without SI unit, the symbol is nil

- **Kit name**

S

Kit
(Serial transmission kit for I/O)

SI unit: **EX250**

Symbol	Protocol type	No. of stations	SI unit part no.
SD0	Without SI unit, Without end plate	1 to 12 stations (24 stations)	—
SDQ	DeviceNet		EX250-SDN1
SDN	PROFIBUS-DP		EX250-SPR1
SDV	CC-Link		EX250-SMJ2
SDY	CANopen	1 to 4 stations (8 stations)	EX250-SCA1
SDTA	AS-i 8in/8out 31Slave Mode, 2 power supply systems	1 to 2 stations (4 stations)	EX250-SAS3
SDTB	AS-i 4in/4out 31Slave Mode, 2 power supply systems	1 to 4 stations (8 stations)	EX250-SAS5
SDTC ^(Note)	AS-i 8in/8out 31Slave Mode, 1 power supply system	1 to 2 stations (4 stations)	EX250-SAS7
SDTD ^(Note)	AS-i 4in/4out 31Slave Mode, 1 power supply system	1 to 12 stations (24 stations)	EX250-SAS9
SDZCN	ControlNet (IP40)		EX250-SCN1
SDZEN	EtherNet/IP		EX250-SEN1

Note) There is a limit on the current supplied from an SI unit of the SDTC or SDTD specification to an input block or valve. For details, refer to page 13.

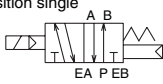
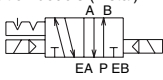
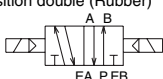
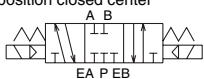
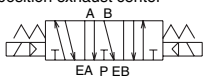
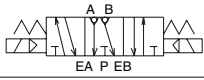
- IP40 for the S kit only, which is compatible with ControlNet. (The other S kits are compatible with IP67 ratings.)

How to Order Valves

VQC 4 1 0 0 — **5**

Series
4 VQC4000

Type of actuation

1	2 position single  EA P EB
2	2 position double (Metal)  EA P EB
	2 position double (Rubber)  EA P EB
3	3 position closed center  EA P EB
4	3 position exhaust center  EA P EB
5	3 position pressure center  EA P EB
6	3 position double check  EA P EB

With/Without light/surge voltage suppressor

Nil	Yes
E	Without light, with surge voltage suppressor

Rated voltage
5 24 VDC

Function

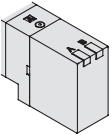
Nil	Standard (1 W)
R	External pilot
Y Note 2)	Low-wattage type (0.5 W)

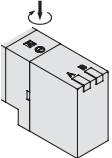
Note 1) When two or more symbols are specified, indicate them alphabetically.
Note 2) Use a low wattage type for continuous energization (when the totaled energized time per day is longer than the non-energized time.)

Seal

0	Metal seal
1	Rubber seal

Manual override

Nil: Non-locking push type (Tool required)


B: Locking type (Tool required)


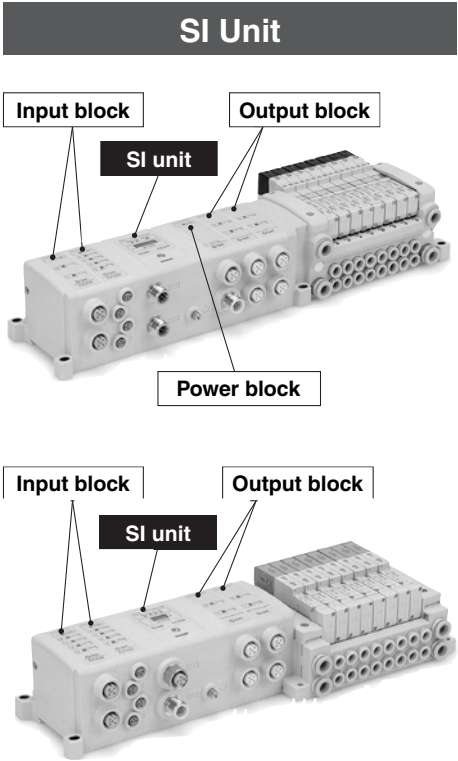
• For solenoid valve specifications and dimensions, refer to the VQC series in the "Best Pneumatics 2004 Vol. 2" catalog.
• For SI unit dimensions, refer to page 12.
• For details on the SI unit, refer to the separate technical instruction manual.

Serial Wiring with Input/Output Unit

Series *EX250*

Integrated serial wiring	• Ease of mounting, and space-savings are achievable, integrating wiring by connector.
Input/Output number	• Compatible with 32-digital outputs/inputs
Enclosure	• IP67 compatible (IP40: compliant with ControlNet)

How to Order SI Unit



EX250 S DN1

• **Communication protocol**

DN1	DeviceNet
PR1	PROFIBUS-DP
MJ2	CC-Link
AS3	AS-i (8in/8out 31Slave Mode, 2 power supply 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)
CA1	CANopen
CN1 Note)	ControlNet
EN1	EtherNet/IP

Note: The enclosure rating is IP40 for the S unit compatible with ControlNet.

For options, refer to page 16.

SI Unit Specifications

Model		EX250-SDN1	EX250-SPR1	EX250-SMJ2	EX250-SCA1	EX250-SCN1	EX250-SEN1	EX250-SAS3/5	EX250-SAS7/9	
Applicable system	Protocol	DeviceNet	PROFIBUS-DP	CC-Link	CANopen	ControlNet	EtherNet/IP	AS-Interface (AS-i)		
	Version ^{Note 1)}	Release 2.0	V0	Ver.1.10	CiA DS-301 V4.02 and CiA DS-401	Version 2.0 Errata 3 adapter class	Release1.0	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 kbps 1.5 M/3 M/ 6 M/12 Mbps	156 k/ 625 kbps 2.5 M/5 M/ 10 Mbps	10 k/20 k/ 50 k/125 k/ 250 k/500 k/ 800 kbps/ 1 Mbps	5 Mbps	10 M/ 100 Mbps	167 kbps		
Power supply for input and internal control	Power supply voltage	21.6 to 26.4 VDC							26.5 to 31.6 VDC ^{Note 2)}	
	Internal current consumption	—	100 mA or less							—
Power supply for output	Power supply voltage	22.8 to 26.4 VDC							^{Note 2)} 26.5 to 31.6 VDC	
Power supply for communication	Power supply voltage	11 to 25 VDC	—					26.5 to 31.6 Vb ^{Note 2)}		
	Internal current consumption	100 mA or less	—					SAS3: 100 mA or less SAS5: 65 mA or less	SAS7: 100 mA or less SAS9: 65 mA or less	
Input	Number of inputs	32 points (Based on input block connection) ^{Note 5)}						SAS3: 8 points SAS5: 4 points	SAS7: 8 points SAS9: 4 points	
	Supply voltage	24 VDC								
	Supply current	Max. 1.0 A						SAS3: max. 240 mA SAS5: max. 2120 mA	^{Note 3)}	
Output	Output type	PNP output (–COM.)		NPN output (+COM.)	PNP output (–COM.)					
	Number of outputs	32 points						SAS3: 8 points SAS5: 4 points	SAS7: 8 points SAS9: 4 points	
	Connection block	Solenoid valve (single, double), Output block, Power block ^{Note 6)}								
	Supply voltage	24 VDC								
	Supply current	Max. 2.0 A						SAS3: max. 500 mA SAS5: max. 250 mA	^{Note 3)}	
Environmental resistance	Enclosure	IP67				IP40	IP67			
	Operating temperature range	Operating: 5 to 45C Stored: –20 to 60C (with no freezing and condensation)								
	Operating humidity range	Operating, Stored: 35 to 85%RH (with no condensation)								
	Withstand voltage	500 VAC for 1 min. between whole charging part and case								
	Insulation resistance	10 M or more (500 VDC Mega) between whole charging part and case								
	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 (CSA)								
Weight		250 g								
Accessory	Tie-rod ^{Note 4)}	2 pcs.								

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

Note 2) The EX250-SAS7/9 is powered by the single system spec., in which the communication power source is separated into input power supply for internal control, and/or for output.

Note 3) The EX250-SAS7/9 is powered by the single system spec., that is separated for use depending on the aggregated values of input/output supply power as shown below (For details, refer to page 13.)

EX250-SAS7 ... Max.250 mA, EX250-SAS9 ... Max.120 mA

Note 4) When the SI unit is integrated into manifold, its tie-rod is also incorporated at the time of snipping.

Note 5) For connected input equipment, refer to page 14.

Note 6) For connected output equipment, refer to page 21.

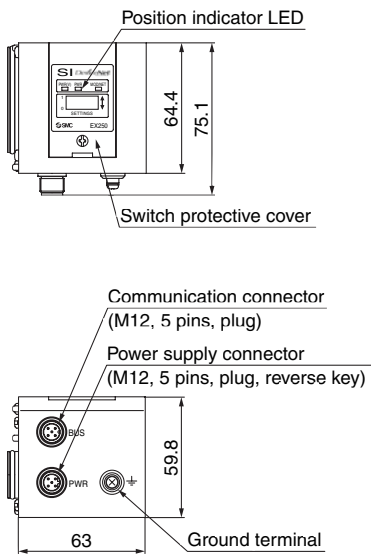
Maximum Transmission Distance

Model	Maximum transmission distance
EX250-SDN1	500 m (125 kbps), 250 m (250 kbps), 100 m (500 kbps)
EX250-SPR1	23 km (Repeater required)
EX250-SMJ2	1200 m (156 kbps), 900 m (625 kbps), 400 m (2.5 Mbps), 160 m (5 Mbps), 100 m (10 Mbps)
EX250-SCA1	5000 m (10 kbps), 2000 m (20 kbps), 1000 m (50 kbps), 500 m (125 kbps), 250 m (250 kbps), 100 m (500 kbps), 50 m (800 kbps), 25 m (1 Mbps)
EX250-SCN1	1000 m (Tap number: 2)
EX250-SEN1	100 m (10/100 Mbps)
EX250-SAS3/5	300 m (when using a repeater)
EX250-SAS7/9	

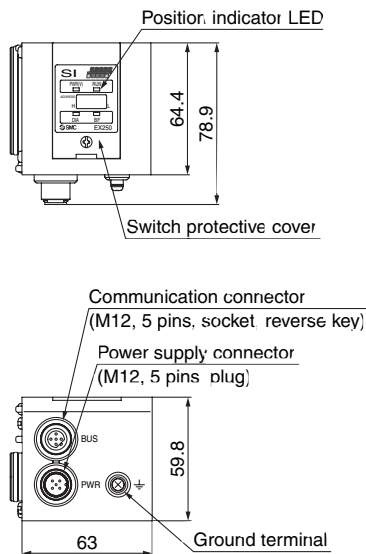
Series EX250

SI Unit Dimensions / Parts Description

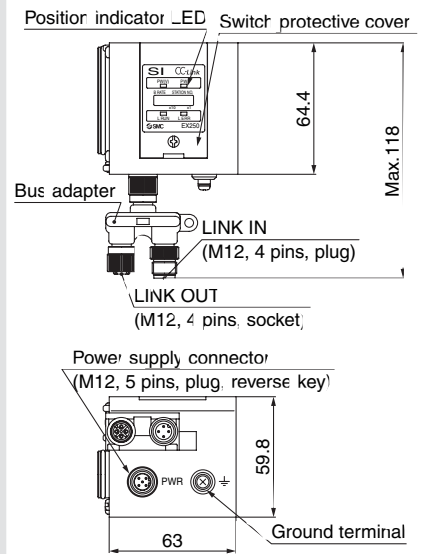
EX250-SDN1 (DeviceNet)



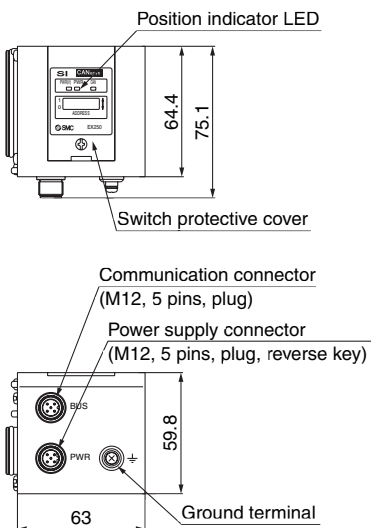
EX250-SPR1 (PROFIBUS-DP)



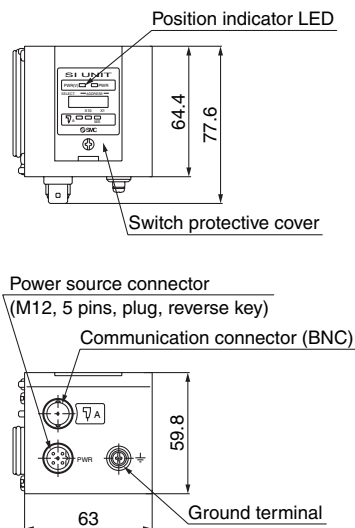
EX250-SMJ2 (CC-Link)



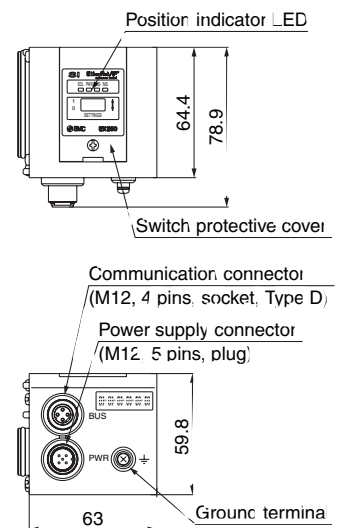
EX250-SCA1 (CANopen)



EX250-SCN1 (ControlNet)

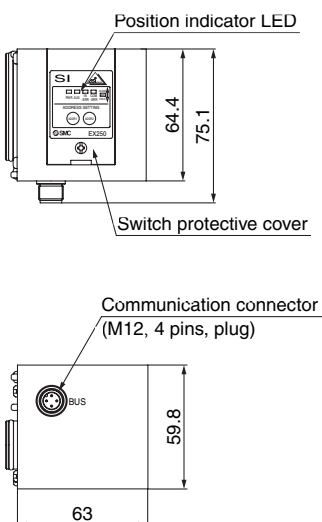


EX250-SEN1 (EtherNet/IP)

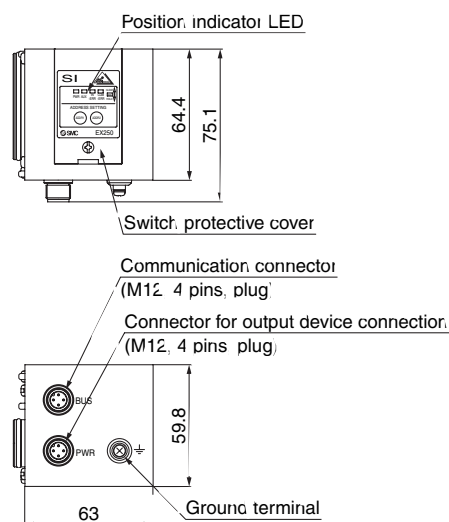


AS-i

EX250-SAS7/9 (1 power supply system)



EX250-SAS3/5 (2 power supply systems)



⚠ Specific Product Precautions

Be sure to read this before handling. Please consult with SMC for applications outside the specifications.

When one AS-i power supply system is used

⚠ Caution

		EX250-SAS7	EX250-SAS9
Power supply voltage		Supplied from AS-i 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-i. For details, please refer to instruction manuals provided by the respective manufacturers.

Note 2) The AS-i 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]

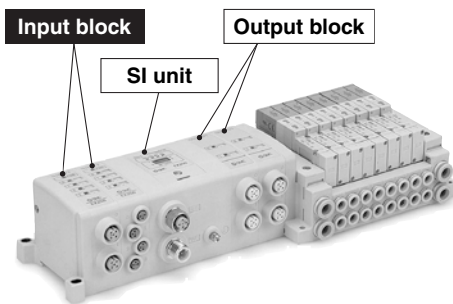
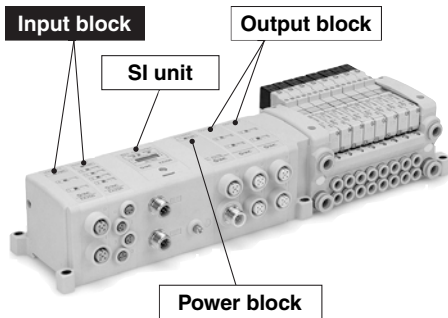
Use of low-wattage type valves by minimizing the maximum number of simultaneous outputs, and low current consumption sensors (2-wire sensor, etc.) is recommended.

Maximum number of AS-i compatible input blocks

SI unit specifications		Input block type		Input block maximum stations
EX250-SAS3	AS-i 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-i 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-i 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-i 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

How to Order Input Block

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 page 16.

Input Block Specifications

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

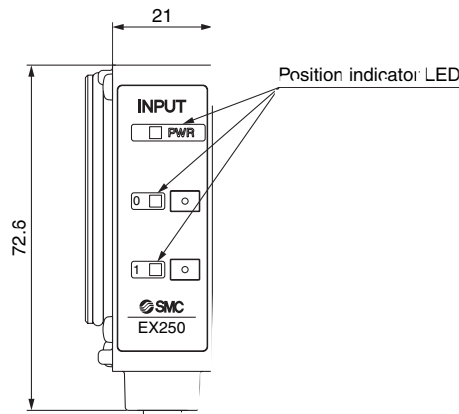
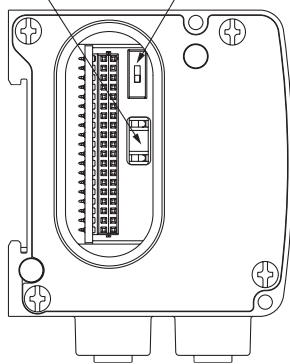
Note 1) When the maximum inputs to the SI unit is reached by adding an input block, pay attention not to exceed the supply current for the SI unit input.

Note 2) When the SI unit is integrated into manifold, its tie-rod is also incorporated at the time of shipping.

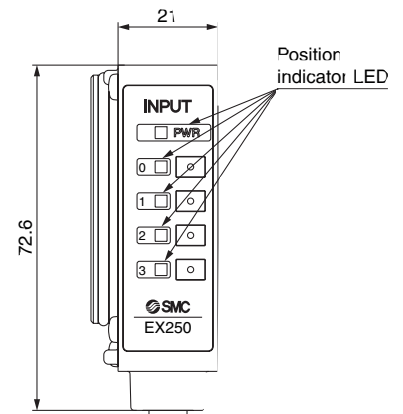
Input Block Dimensions / Parts Description

EX250-IE1 EX250-IE2

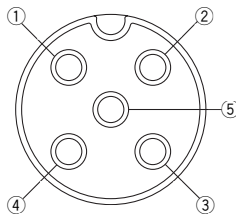
Fuse (Note) NPN/PNP conversion switch



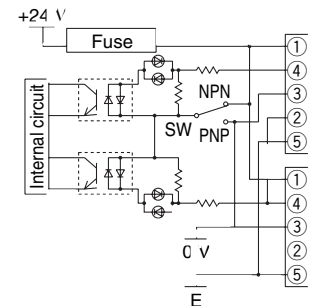
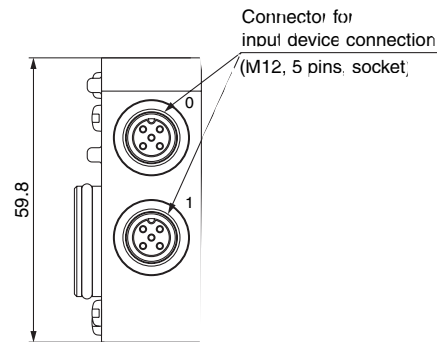
EX250-IE1



EX250-IE2



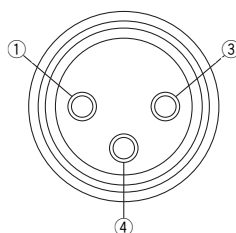
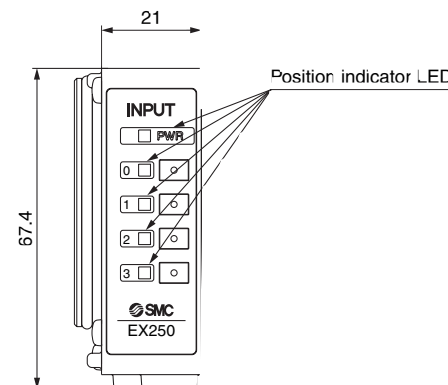
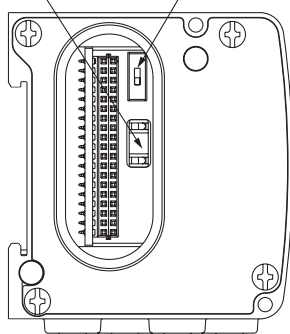
Connector's pin assignment for the input device connection (M12, 5 pins, socket)



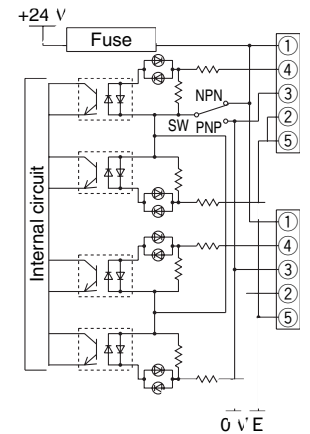
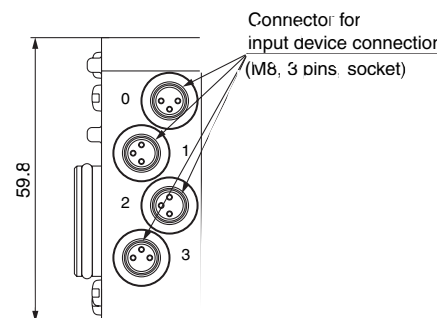
Circuit diagram EX250-IE1

EX250-IE3

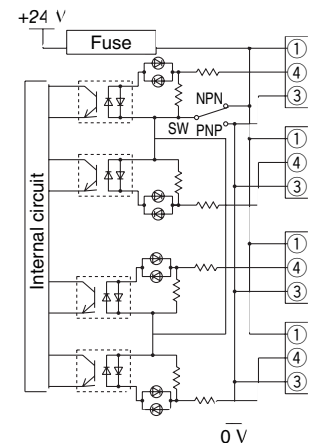
Fuse (Note) NPN/PNP conversion switch



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



Circuit diagram: EX250-IE2



Circuit diagram: EX250-IE3

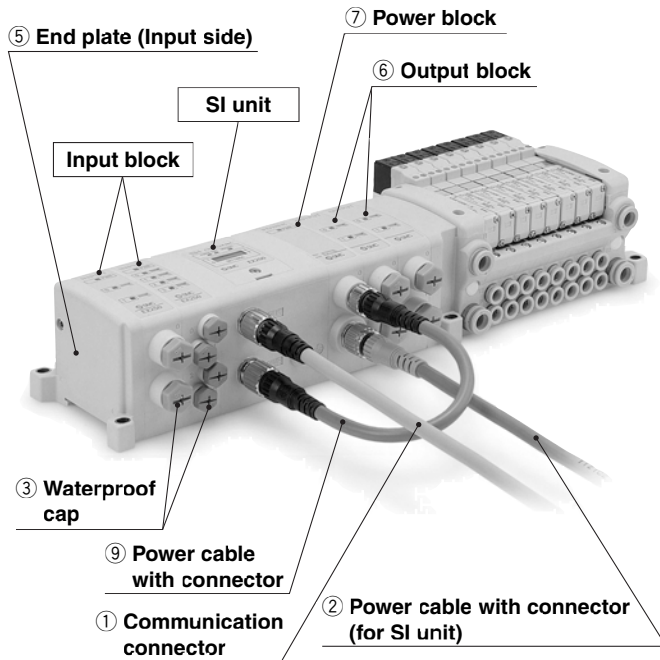
Note) Fuse for overcurrent protection

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 19.

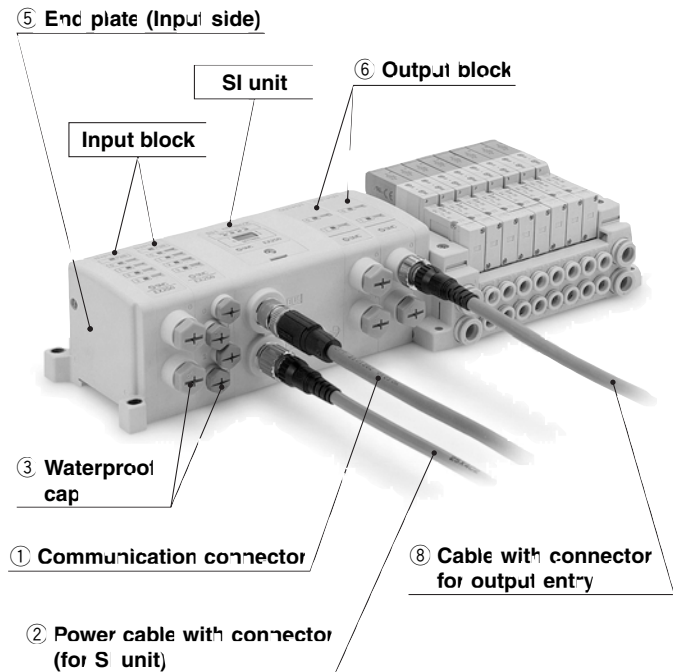
Options

Example of connections

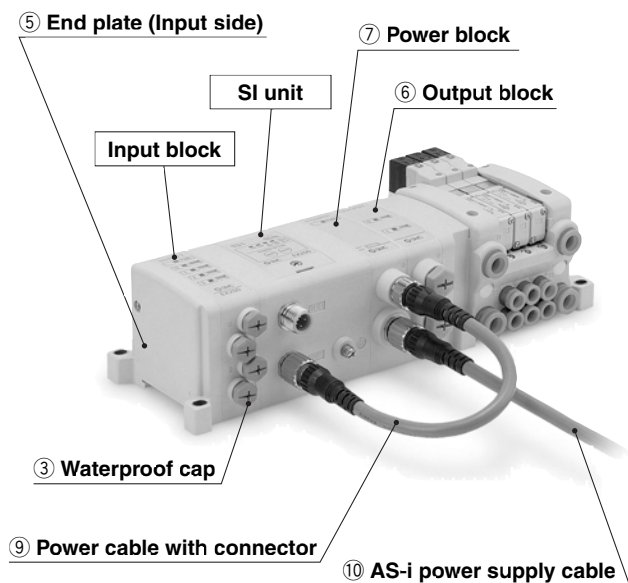
Connection example of the SI unit compliant with DeviceNet



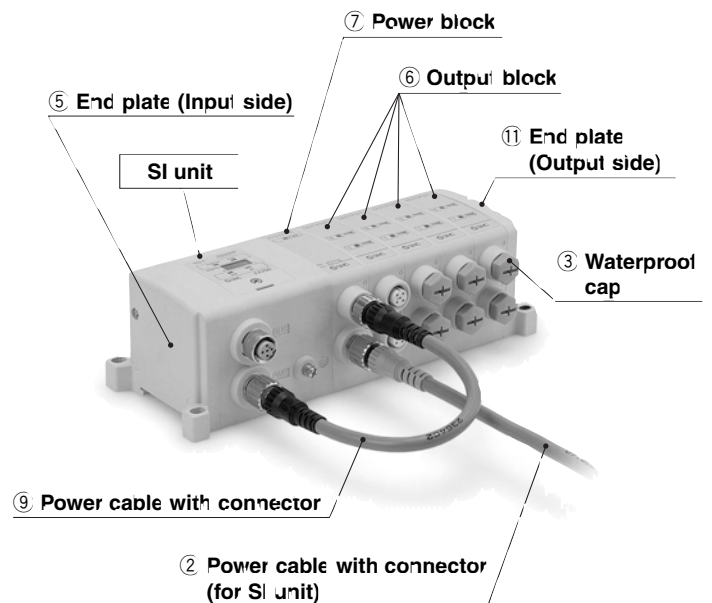
Connection example of the SI unit compliant with EtherNet/IP



Connection example of the SI unit compliant with AS-i



Connection example of the SI unit compliant with PROFIBUS-DP



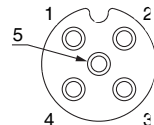
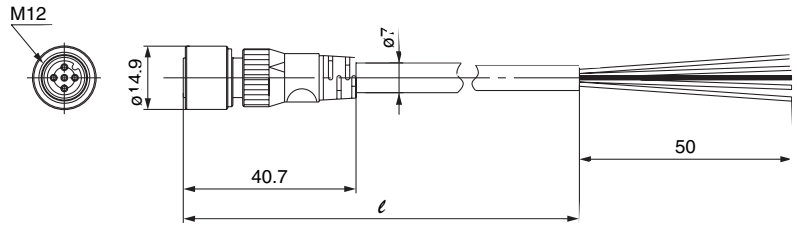
① Communication connector

For DeviceNet type SI unit

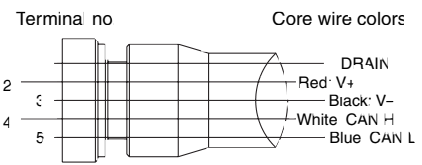
EX500—AC 050—DN

Cable length (ℓ)

010	1000 [mm]
050	5000 [mm]



Socket connector
pin arrangement



Connections

For EtherNet/IP type SI unit

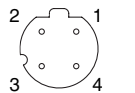
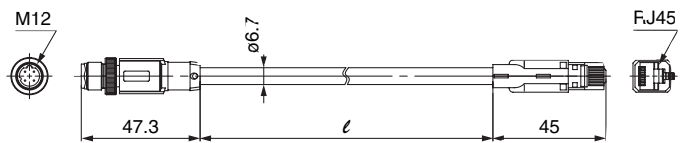
EX9—AC 020 EN—PSRJ

Cable length (ℓ)

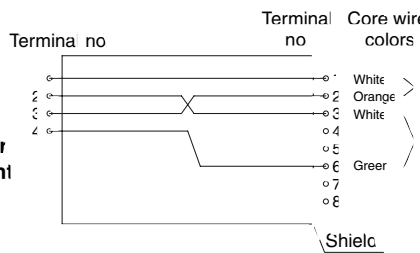
020	2000 [mm]
-----	-----------

Connector specification

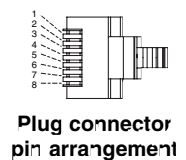
PSRJ M12 plug (straight) ↔ RJ-45 connector



Plug connector
pin arrangement



Connections (Straight cable)



Plug connector
pin arrangement

Series EX250

Options

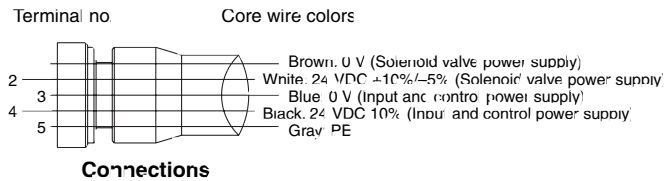
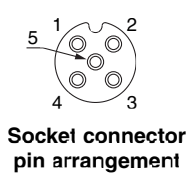
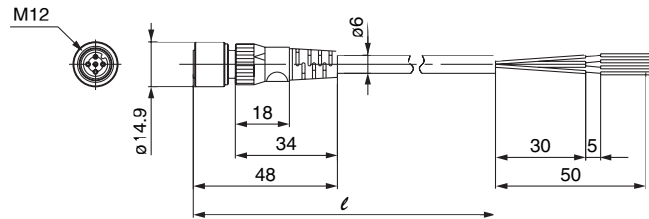
② Power cable with connector (for SI unit)

For PROFIBUS-DP, EtherNet/IP type SI unit

EX500 AP 050-S

Cable length (ℓ)

010	1000 [mm]
050	5000 [mm]

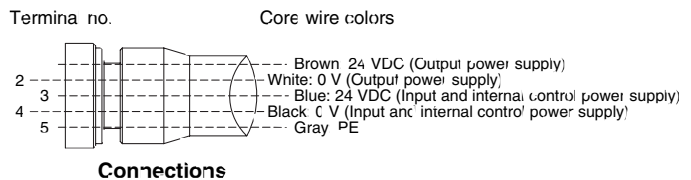
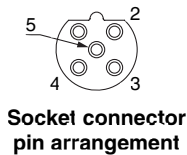
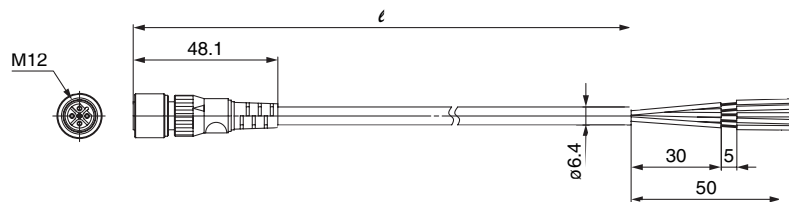


For the SI unit (except for PROFIBUS-DP, AS-i, EtherNet/IP) and power block

EX9 AC 050-1

Cable length (ℓ)

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



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

Use this on ports that are not being used for M8 and M12 connectors (socket).

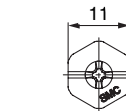
Use of this waterproof cap maintains the integrity of the IP65 enclosure.

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

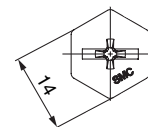
EX500 AW

Connector type

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



M8 connector (for socket)



M12 connector (for socket)

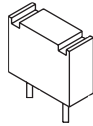
④ Replacement fuse

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

EX9 FU05

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

Fuse



⑤ End plate (Input side)

EX250 EA 1

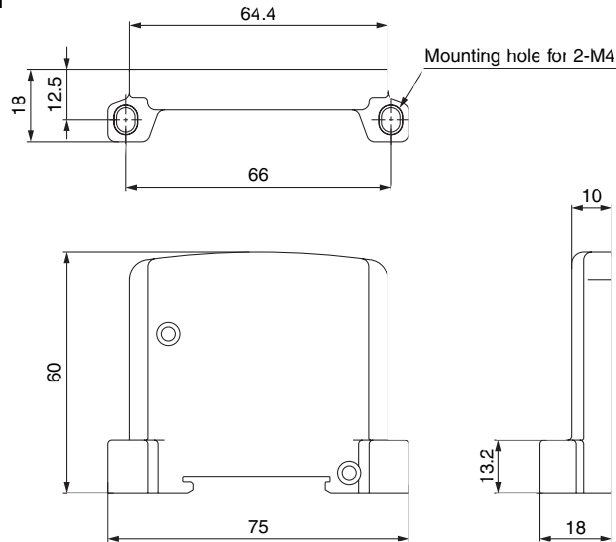
● Mounting specification

1	Direct mounting
2	DIN rail mounting

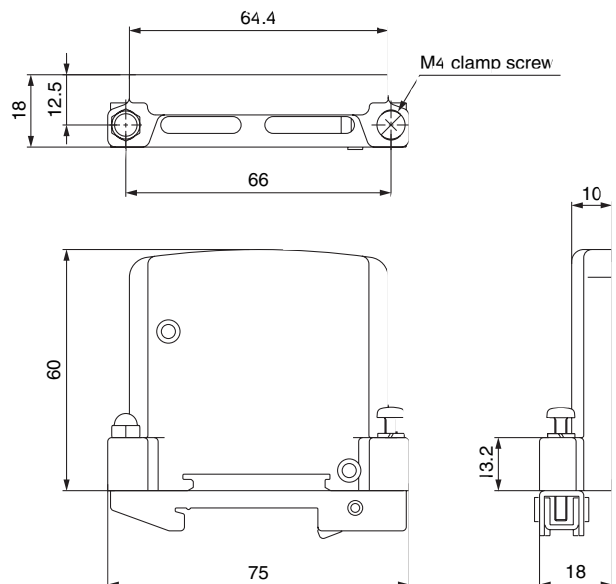
Accessory

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

EX250-EA1



EX250-EA2



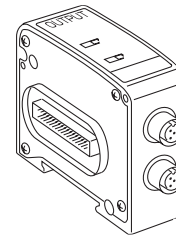
Series EX250

Options

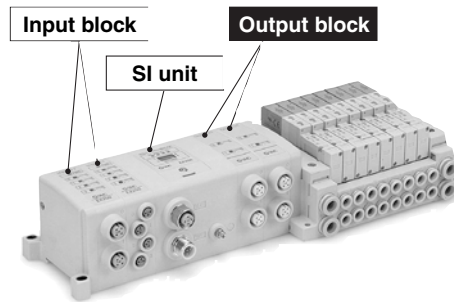
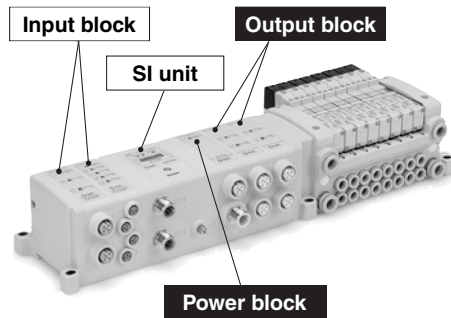
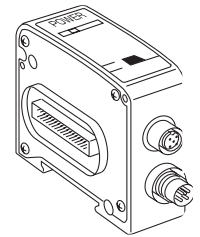
⑥ Output block / ⑦ Power block

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

Output block



Power block



How to Order Output Block

EX9 OE T 1

• Output specification

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

• Power supply type

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

Note) Required to connect with a power block

How to Order Power Block

EX9 PE1

Option/Part No.

Description	Part no.	Note
Waterproof cap	EX500-AWTS	Refer to page 18. Order separately: 10 pcs. included
Power cable with connector	EX9-AC□-1	Refer to page 18, Order separately.
Cable with connector for between SI unit and power block	EX9-AC002-2 EX9-AC002-3 EX9-AC002-4	Refer to page 23, Order separately.
AS-i power supply cable	EX9-AC□-5	Refer to page 24, Order separately.

SI Unit Part No.

SI unit part no.	Output	Applicable model
EX250-SDN1 EX250-SPR1 EX250-SAS□ EX250-SCA1 EX250-SCN1 EX250-SEN1	-COM.	EX9-OET1 EX9-OEP1
EX250-SMJ2	+COM.	EX9-OET2 EX9-OEP2

Option/Part No.

Description	Part no.	Applicable model		Note
		OET□	OEP□	
Waterproof cap	EX500-AWTS	○	○	Refer to page 18. Order separately: 10 pcs. included
Cable with connector for output entry	EX9-AC□-7	○	○	Refer to page 23. Order separately.
Power block	EX9-PE1		○	Refer to page 20. 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	Operating: 5 to 45 ^o TM°C Stored: –20 to 60°C (with no freezing and condensation)			
	Operating humidity range	Operating, Stored: 35 to 85%RH (with no condensation)			
	Withstand voltage	1500 VAC for 1 min. between whole charging part and case			
	Insulation resistance	10 M or more (500 VDC Mega) between whole charging part and case			
	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	100 m/s ² in each X, Y, Z direction, 3 times (De-energized)			
Standard		CE marking, UL (CSA)			
Weight		120 g			
Accessory	Tie-rod	2 pcs.			

Power Block Specifications

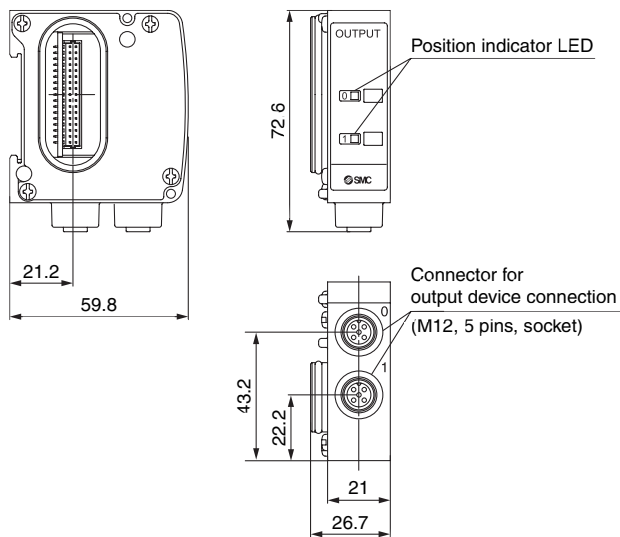
Model		EX9-PE1
Connection block		Output block (EX9-OEP□)
Connection block stations		Output block: Max. 9 stations (excluding input blocks) ^{Note)}
Power supply for output and internal control	Power supply voltage	22.8 to 26.4 VDC
	Internal power consumption	20 mA or less
Supply current		Max. 3.1 A (When 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	Operating: 5 to 45°C Stored: –20 to 60°C (with no freezing and condensation)
	Operating humidity range	Operating, Stored: 35 to 85%RH (with no condensation)
	Withstand voltage	1500 VAC for 1 min. between whole charging part and case
	Insulation resistance	10 M or more (500 VDC Mega) between whole charging part and case
	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	100 m/s ² in each X, Y, Z direction, 3 times (De-energized)
Standard		CE marking, UL (CSA)
Weight		120 g
Accessory	Tie-rod	2 pcs.
	Waterproof cap (for M12 connector socket)	1 pc. (EX500-AWTS)

Note) The total number of connectable input/output/power block to the EX250 series SI unit (except for AS-compliant) is 10 stations at the maximum

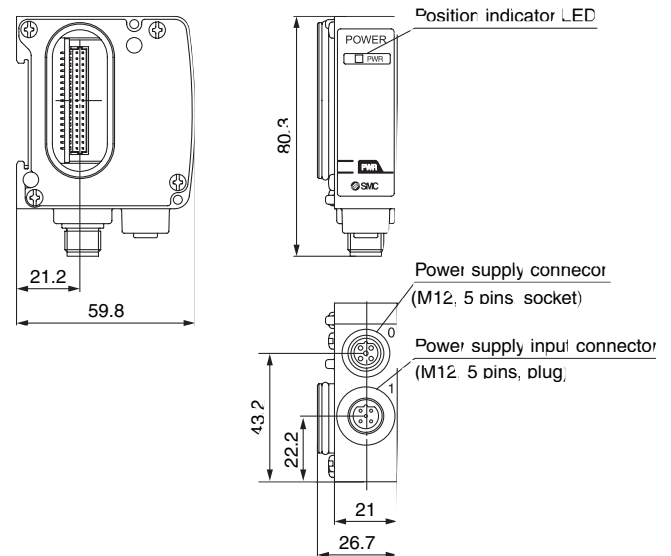
Series EX250

Options

Output Block Dimension

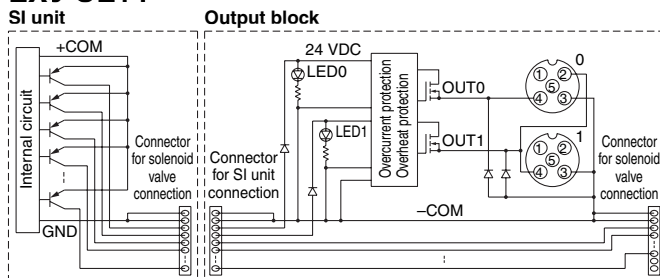


Power Block Dimension

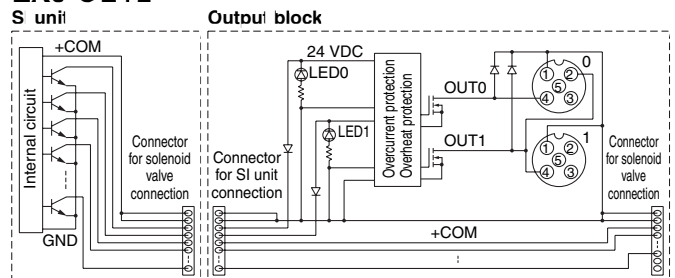


Circuit Diagram

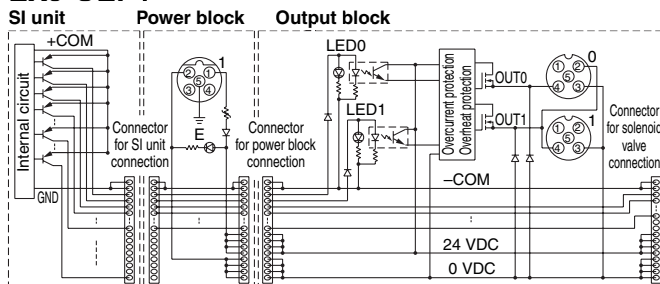
EX9-OET1



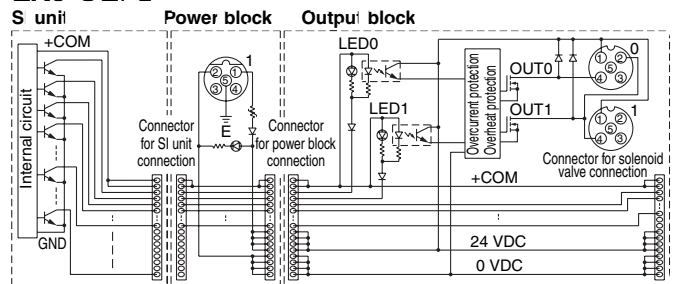
EX9-OET2



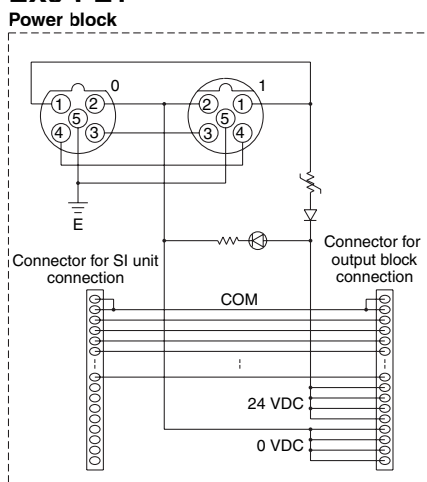
EX9-OEP1



EX9-OEP2



EX9-PE1



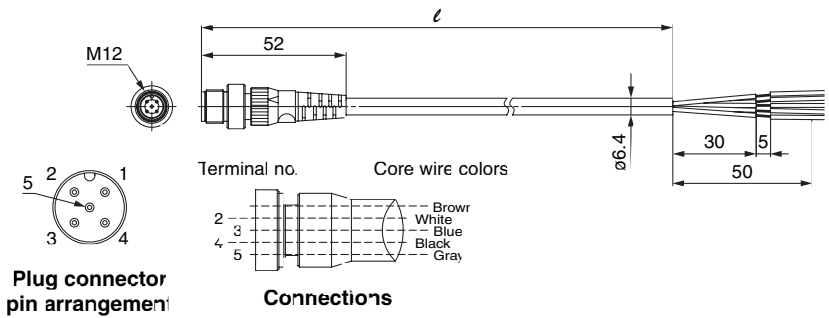
We sell this product individually. Please place an order separately. You are requested to connect it to an SI unit and a valve manifold. When using the output block only (valve manifold is unused.), place an order for an end plate (⑪ EX9-EA□) separately for connection. Refer to the separate technical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

⑧ Cable with connector for output entry

EX9 AC 030-7

Cable length (ℓ)

010	1000 [mm]
030	3000 [mm]



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

⑨ Power cable with connector

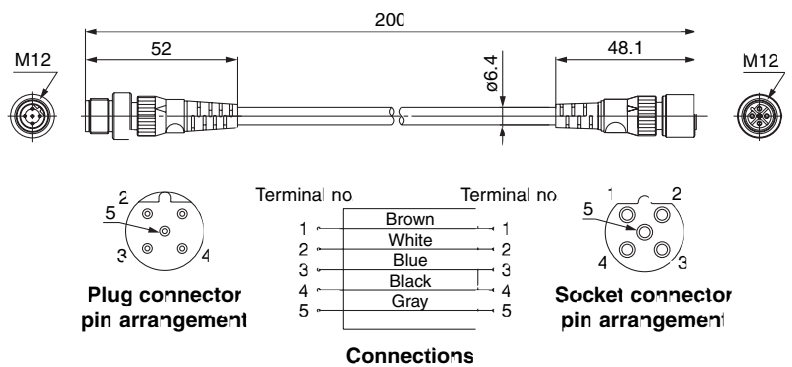
Connects between the power supply connector for the power block and the SI unit power supply connector, bridging the external power supply which is supplied with the power block, to the SI unit.

EX9 AC002-2

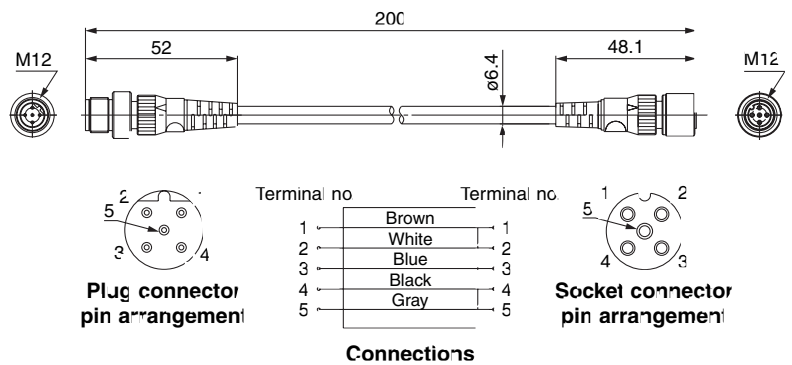
SI unit type

2	EX250-SDN1 EX250-SMJ2 EX250-SCA1 EX250-SCN1	Compliant
3	EX250-SPR1 EX250-SEN1	Compliant
4	EX250-SAS3/5	Compliant

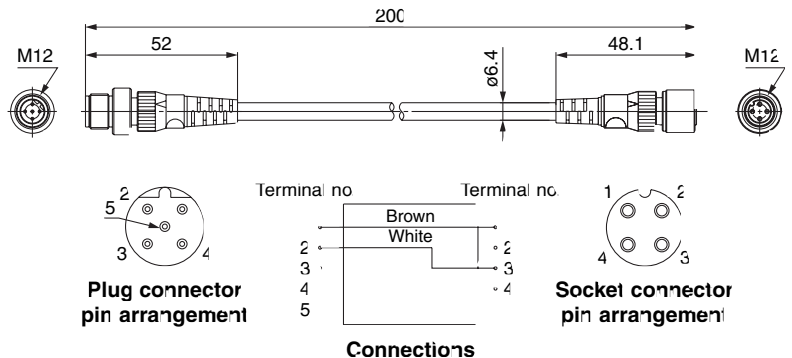
EX9-AC002-2



EX9-AC002-3



EX9-AC002-4



Options

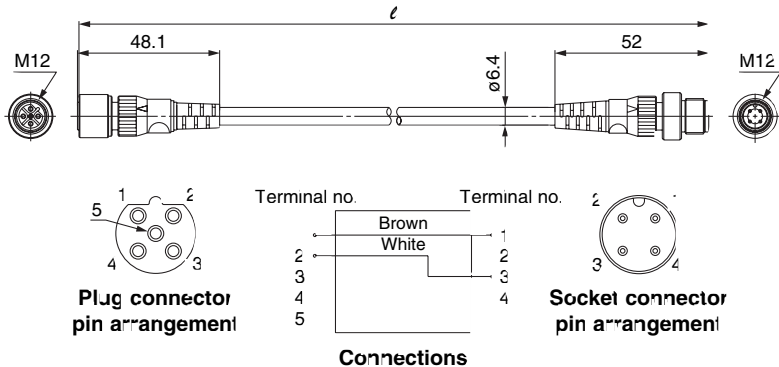
⑩ AS-i power cable

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

EX9 AC 010-5

Cable length (ℓ)

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



⑪ End plate (Output side)

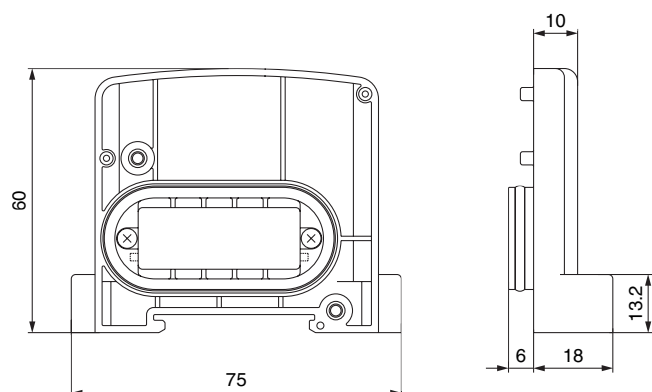
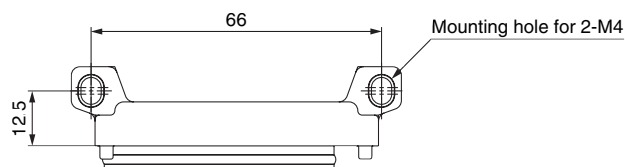
The plate connected on the output block side in order to connect or fix between the S unit and the input/output/power block when the valve manifold is not used.

EX9 EA 03

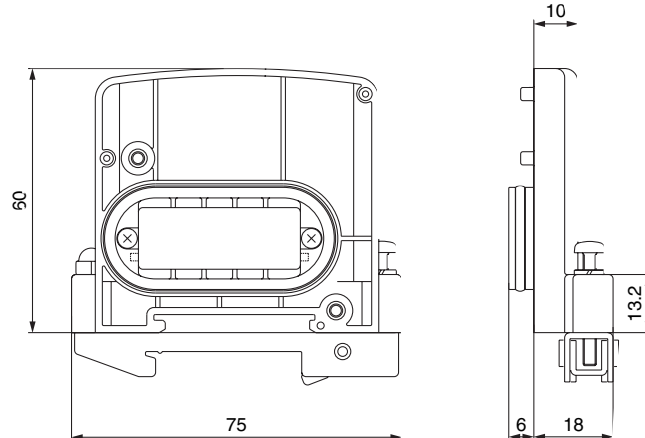
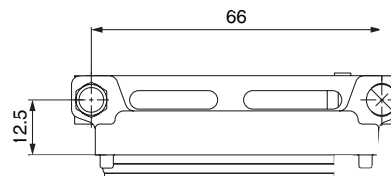
Mounting specification

03	Direct mounting
04	DIN rail mounting

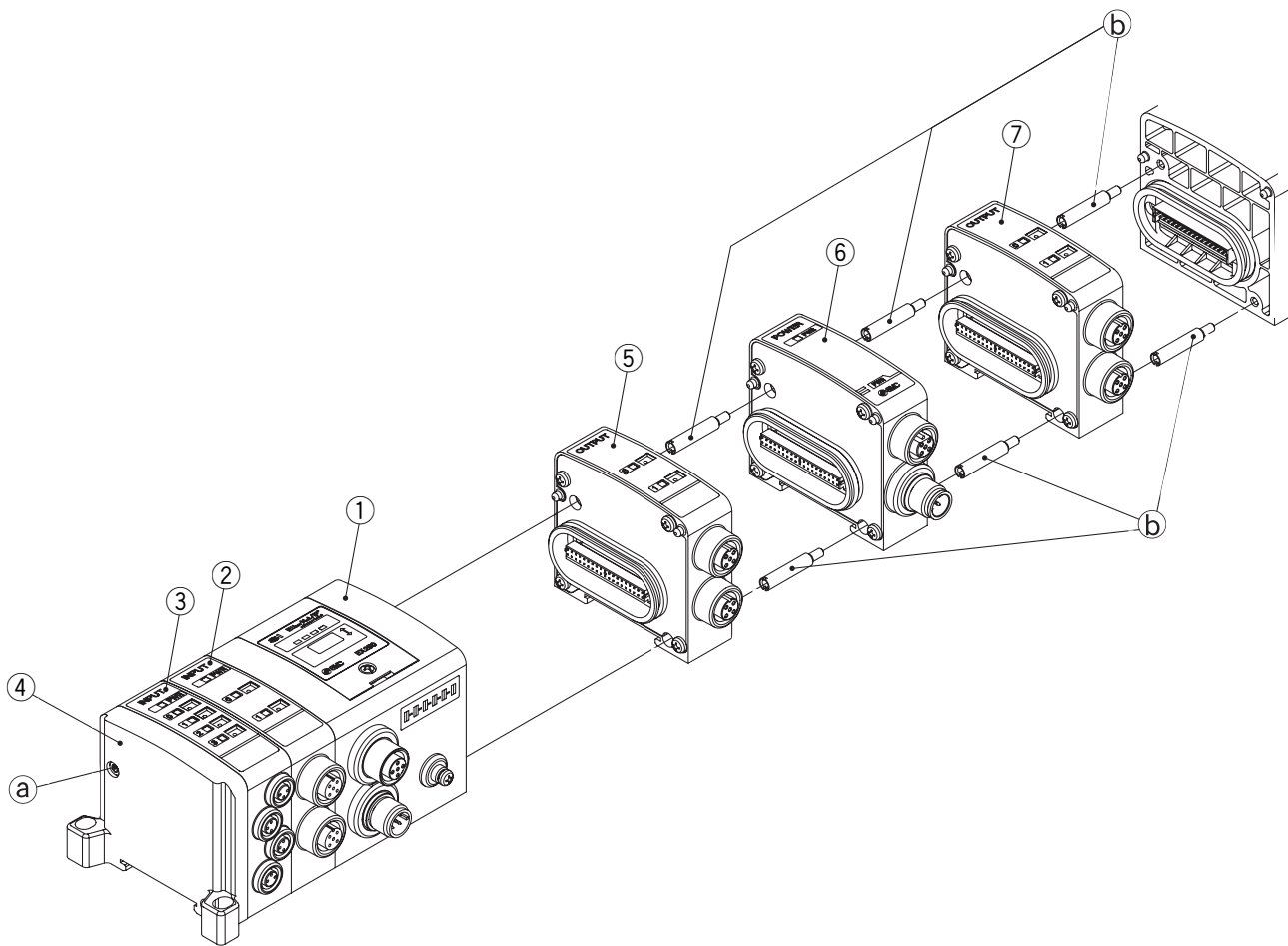
EX9-EA03



EX9-EA04



How to Increase Input/Output Blocks, Procedure Drawing



Parts List

No.	Description	Part no.	Note
1	SI unit	EX250-S□	For details, refer to page 10.
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
6	Power block	EX9-PE1	For EX9-OEP□
7	Output block (For high-wattage load)	EX9-OEP□	1: PNP output, 2: NPN output

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

- ① Loosen the hexagon socket head cap screws ① (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 (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 ①, paying attention to avoid the gap between each block

* 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.

