Fieldbus System (For Input/Output)

EX600 Series

Compatible Protocols

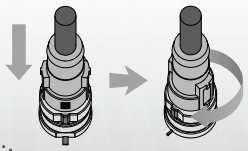
CC-Link V2 | DeviceNet | PROFIBUS | EtherNet/IP | EtherCAT | PROFINET

New Unit type added

Dual port SI Unit (EtherNet/IP™) product

- Can be used for linear type or DLR type topology.
- Supports QuickConnect™ function.
- Status checks and settings can be performed on a web browser.

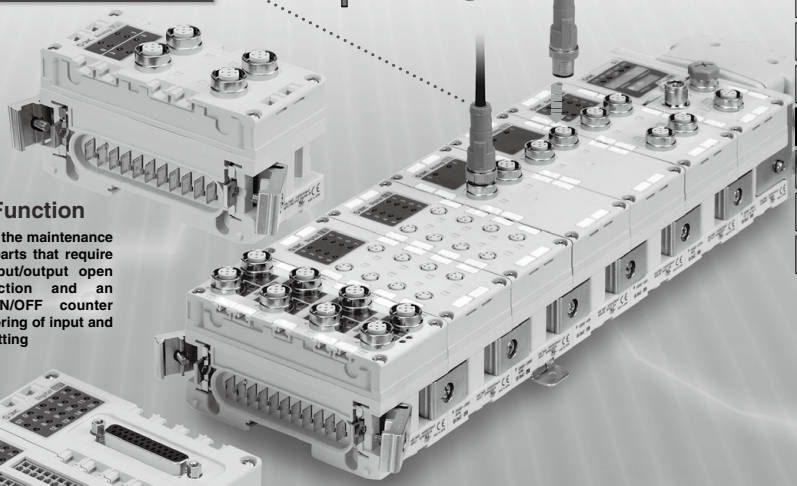
Reduction in wiring time with SPEEDCON (Phoenix Contact). Just insert and make 1/2 rotation!



IP67

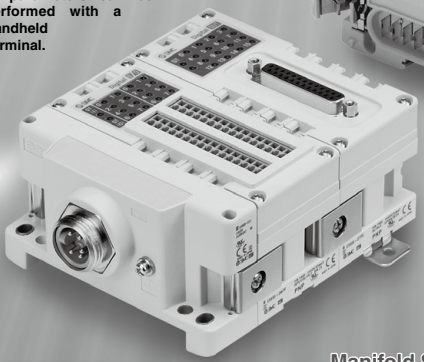
Note) Some products are IP40.

Handheld Terminal



Self Diagnosis Function

It is possible to ascertain the maintenance period and identify the parts that require maintenance, by an input/output open circuit detection function and an input/output signal ON/OFF counter function. Also, the monitoring of input and output signals and the setting of parameters can be performed with a Handheld Terminal.

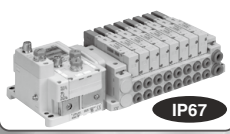
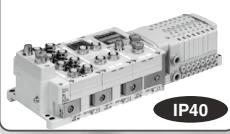
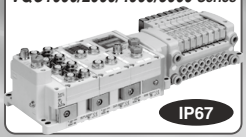


Max. 9 Units Note) Can be connected in any order.

The Input Unit to connect input device such as an auto switch, pressure switch and flow switch, and the Output Unit to connect output device such as a solenoid valve, relay and indicator light can be connected in any order.

Note) Except SI Unit

Manifold Solenoid Valves

SY3000/5000/7000 Series	*SV1000/2000/3000 Series*	*S0700 Series*	*VQC1000/2000/4000/5000 Series*
			
IP67	IP67	IP40	IP67

Note) The SY3000/5000/7000, S0700, and VQC1000/2000/4000/5000 are not UL-compatible.

EX600 Series Configurations

Analog Unit

M12 connector (5 pins)

Input Unit — 2CH

Output Unit — 2CH

Input/Output Unit — 2CH/2CH

IP67 IP67

Input device

Pressure sensor

Flow sensor

Output device

Electro-pneumatic regulator etc.

SI Unit

Dual port EtherNet/IP™ product added to compatible communication networks

▶P.824

IP67

Handheld Terminal

Parameter setting and I/O monitor tool ▶P.831

Units can be differentiated by color.

Power supply

Input Unit (IN) | Input Unit (IN) | Input Unit (IN) | Output Unit (OUT) | Input/Output Unit (I/O) | Input Unit (IN) | Input/Output Unit (I/O)

End Plate | Digital Unit | Analog Unit | SI Unit

For detailed specifications of connectable device, refer to the catalog of each device and select the right device for your application. If anything is unclear, please contact SMC.

Digital Unit

	M12 connector (5 pins)		M8 connector (3 pins)	D-sub connector	Spring type terminal block
Input Unit	8 inputs	16 inputs	8 inputs	16 inputs	16 inputs
Output Unit	8 outputs			16 outputs	16 outputs
Input/Output Unit				8 inputs/8 outputs	8 inputs/8 outputs
	IP67	IP67	IP67	IP40	IP40

Input device

Flow switch

Auto switch

Pressure switch

Others

Proximate sensor

Photoelectric switch

Limit switch

Output device

Solenoid valve

Others

Indicator light

Relay

Buzzer

SI Unit

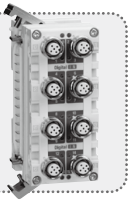
Unit to connect various Fieldbus with the EX600 system

- How to Order ▶P. 824
- Specifications ▶P. 826, 827
- Parts Description ▶P. 832
- Dimensions ▶P. 834

Digital Unit

Unit to input or output digital (switch) signals

- How to Order ▶P. 824
- Specifications ▶P. 828, 829
- Parts Description ▶P. 833
- Dimensions ▶P. 835



Analog Unit

Unit to input or output analog (voltage/current) signals

- How to Order ▶P. 825
- Specifications ▶P. 830, 831
- Parts Description ▶P. 833
- Dimensions ▶P. 835

End Plate

Unit to supply power to the EX600 system

- How to Order ▶P. 825
- Specifications ▶P. 831
- Parts Description ▶P. 833
- Dimensions ▶P. 834

Handheld Terminal

Parameter setting and I/O monitor tool

- How to Order ▶P. 825
- Specifications ▶P. 831
- Parts Description ▶P. 832
- Dimensions ▶P. 834

Accessories

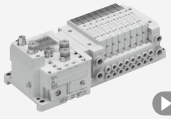
Options including a power supply cable etc. for the EX600 series

▶P. 836

Table of Mountable Units ····· ▶P. 840
Specific Product Precautions ···· ▶P. 841

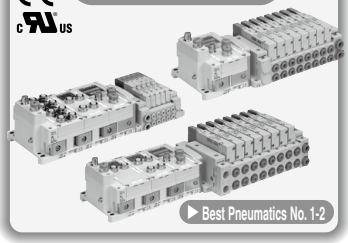
Manifold solenoid valves

SY Series (IP67)



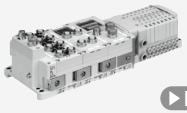
▶P.123

SV Series (IP67)



▶ Best Pneumatics No. 1-2

S0700 Series (IP40)



▶P.645

VQC Series (IP67)

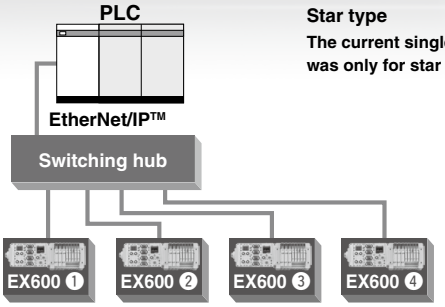
▶ Best Pneumatics No. 1-2

Latest EtherNet/IP™ Technology

The following functions are available for the dual port EtherNet/IP™ product (EX600-SEN3/4).

Added Compatible Topologies (connection configuration).

EX600-SEN1/2

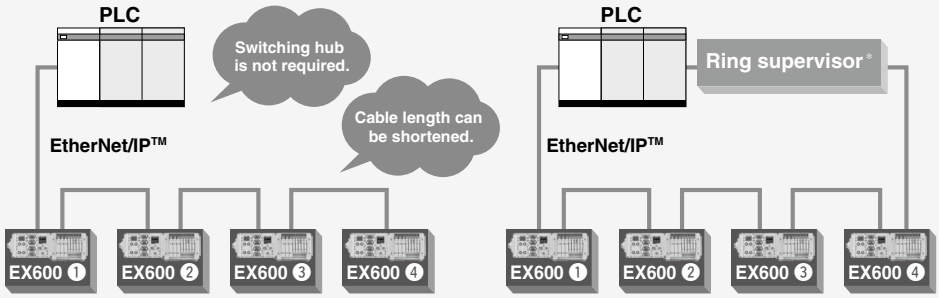


Star type

The current single port product (EX600-SEN1/2) was only for star topology.

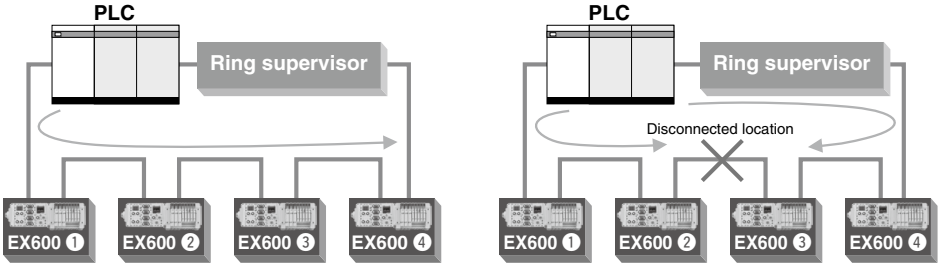
EX600-SEN3/4

The new dual port product (EX600-SEN3/4) is available for both the linear and device level ring topologies, in addition to the star type.



* One or more **ring supervisors** are required.

In the device level ring type, even though the communication cable is disconnected in one location, EtherNet/IP™ communication can be continued, and the disconnected portion can be specified by the ring supervisor.

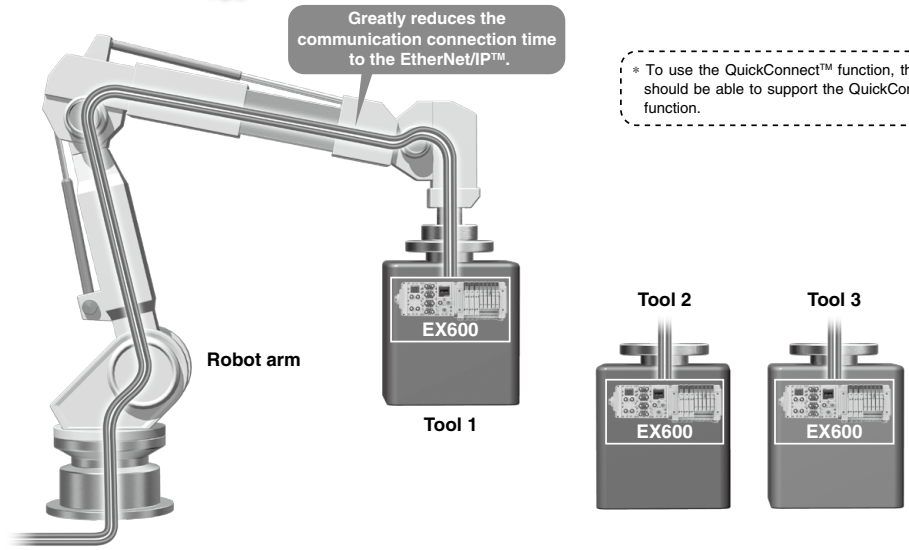


QuickConnect™ Function Available

From Power ON to communication connection

10 sec. → **Approx. 0.5 sec.**

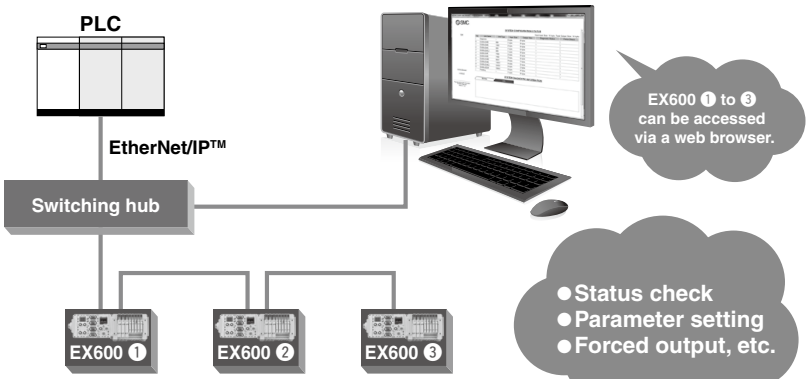
In the case of a tool changer, it takes about 10 seconds for the communication to be connected in common EtherNet/IP™ products, after the power of the device installed on the tool is turned ON.
Since the QuickConnect™ function* is available in the EX600-SEN3/4, the communication can be connected in about 0.5 seconds.



* To use the QuickConnect™ function, the PLC should be able to support the QuickConnect™ function.

Built-in Web Server Function

The EX600-SEN3/4 has a built-in web server function, which enables status checks, parameter settings and forced output of the EX600 using general-purpose web browsers, such as Internet Explorer. Start-up of the system and maintenance can be performed efficiently.



Connection example

D-sub Connector

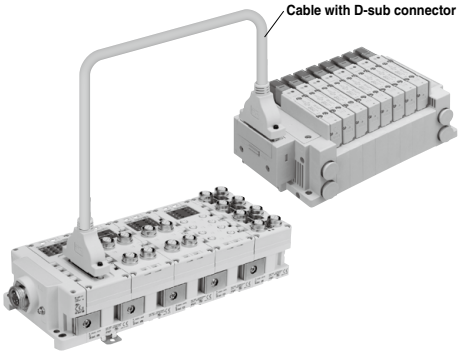
IP40

These Units are capable of connection using a D-sub connector. There are three types of Units, for Digital Input, Output, and Input/Output. The Digital Output Unit can be connected with an SMC manifold solenoid valve F kit (D-sub connector).

Manifold solenoid valve can be connected using cable with D-sub connector.

- **SY** series
- **S0700** series
- **SJ** series
- **SQ** series
- **SV** series
- **VQC** series
- **VQ** series

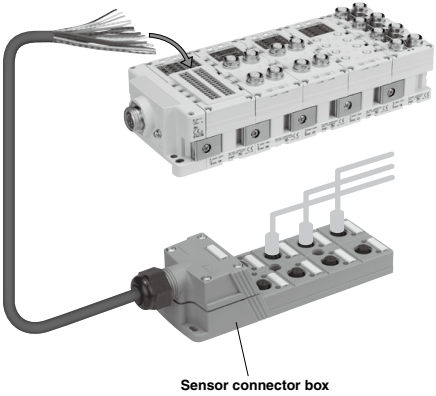
∗ Please limit the number of valve connections to 16 stations for single and 8 stations for double. Refer to the catalog for each product for pin assignment details.



Spring Type Terminal Block

IP40

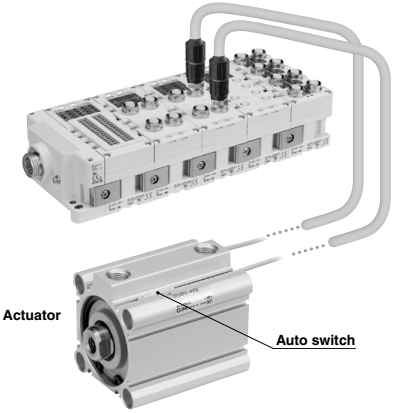
These Terminal Block Units are compatible with individual wiring configurations. There are three types of Units, for Digital Input, Output, and Input/Output. Wiring connection to a sensor connector box, etc., can be carried out easily using only a flat head screwdriver.



Digital Input Unit

IP67

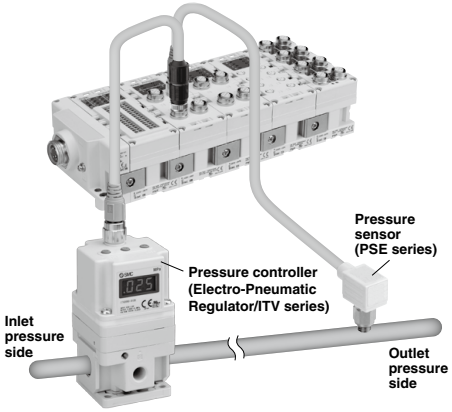
This Unit is for inputting a digital signal (ON/OFF signal). The signal of a 2-wire/3-wire auto switch attached to the actuator can be acquired to feedback a signal to the PLC. The control signal of an entire system can be managed by Fieldbus System.



Analog Input/Output Unit

IP67

These Units are for inputting or outputting an analog signal (voltage/ current). A single Unit performs both input and output, allowing feedback control where analog signals are received from a pressure sensor and sent to a pressure controller. Installation space is minimized as well.



Self Diagnosis Function

In combination with the Handheld Terminal, the following two functions are available.

Short/Open Circuit Detection Function

It is possible to detect short or open circuit of input device such as an electronic 2-wire switch and 3-wire switch and output device such as a solenoid valve. The location of the error can be identified by the indicator light and the network.

Green ON Normal

Red ON Short circuit

Red flashing Open circuit

Counter Function

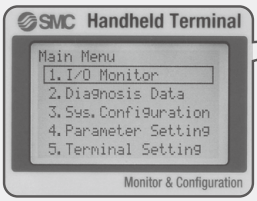
It is possible to ascertain the maintenance period and identify the parts that require maintenance by an input and output signal ON/OFF counter function. When the counter function is enabled and a certain number of contact operations is reached, the display of counter will flash in red.

Note) The counter function is not provided with the Analog Unit.

Handheld Terminal

Forced Input and Output Function

The input and output signals are controlled forcedly without a PLC. The startup time after facility introduction can be shortened.



Password Setting Function

Simple Operation

Cursor button: **Mode and setting change etc.**

Function key: **Value and command entry etc.**

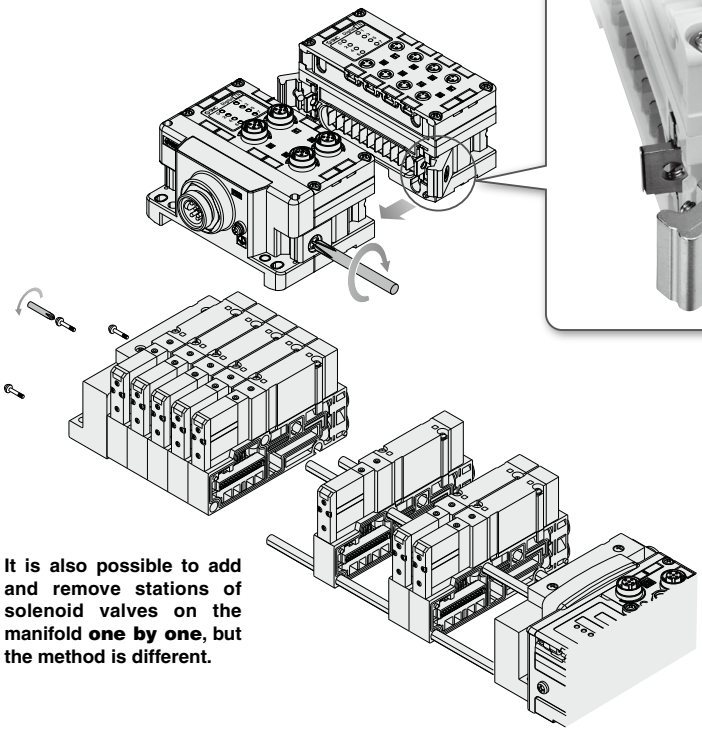
Can be used for the adjustment of internal parameters and the monitoring of input and output signal status.

Parameters: **Analog data format**
Analog measurement range
Input filter selection
Counter function
Open circuit detection function, etc.

A parameter is a set value to change the function and operation of the product through a PLC or Handheld Terminal. The desired operation for the customer's application is realized by the set values. There are some parameters that can only be set using the Handheld Terminal of this series.

Individual Units can be connected and removed one by one.

A unique clamping method is adopted to prevent screws from falling out.
It is easy to separate the Unit just by loosening joint bracket.



It is also possible to add and remove stations of solenoid valves on the manifold one by one, but the method is different.

5 Port Solenoid Valves SY3000/5000/7000

Different sizes (SY3000/5000 or SY5000/7000) can be mixed!

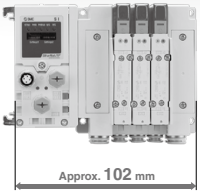
The installation area can be reduced, and the number of SI Units and the wiring can also be reduced.

Overall length of manifold
Approx. 22% reduction

Example of SY3000 and SY5000

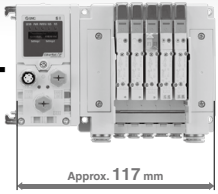
Installation space

Single manifold
SY5000 3 stations

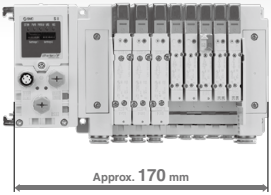


+

Single manifold
SY3000 5 stations



Mixed manifold
SY5000 3 stations SY3000 5 stations



Number of SI Units, Unit cost

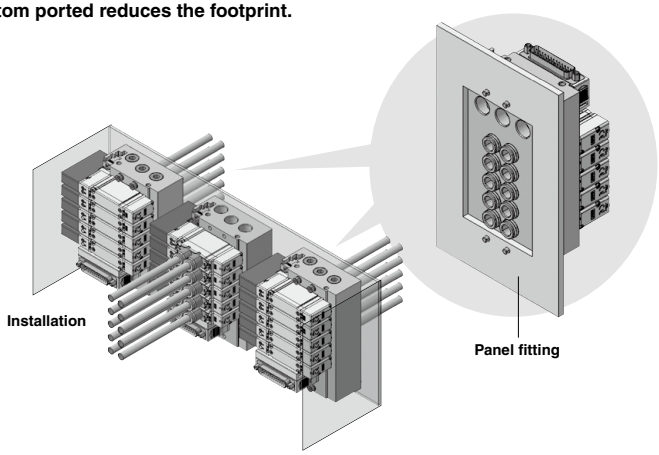
+

Manifold 2 pcs.
Serial Units 2 sets

Manifold 1 pc.
Serial Unit 1 set

Bottom ported type is available!

Top or bottom ported reduces the footprint.



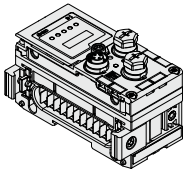
Fieldbus System

EX600 Series

How to Order

SI Unit

EX600-S EN 3 ☐



Protocol

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

Version

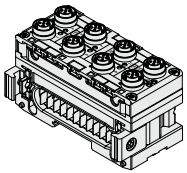
Symbol	Condition
Nil	Select in the case of MJ, EN, EC or PN.
A	Select in the case of PR or DN.

Output type

Symbol	Description	Condition
1	PNP (Negative common)	Can be selected by all protocols.
2	NPN (Positive common)	Can be selected by all protocols.
3	PNP (Negative common) EtherNet/IP (2 ports)	Can be selected in the case of EN.
4	NPN (Positive common) EtherNet/IP (2 ports)	Can be selected in the case of EN.

Digital Input Unit

EX600-DX P D



Input type

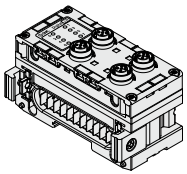
Symbol	Description
P	PNP
N	NPN

Number of Inputs, Open circuit detection, and Connector

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

Digital Output Unit

EX600-DY P B



Output type

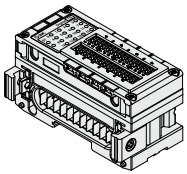
Symbol	Description
P	PNP
N	NPN

Number of Outputs and Connector

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

Digital Input/Output Unit

EX600-DM P F



Input/Output type

Symbol	Description
P	PNP
N	NPN

Number of Inputs/Outputs and Connector

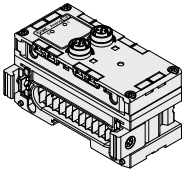
Symbol	Number of inputs	Number of outputs	Connector
E	8 inputs	8 outputs	D-sub connector (25 pins) Note1) 2)
F	8 inputs	8 outputs	Spring type terminal block (32 pins) Note1) 2)

Note 1) Cannot be communicated with the EX600-HT1-☐. Refer to page 840 for "Table of Mountable Units."
Note 2) Cannot be connected with the EX600-SPR1, EX600-SPR2, EX600-SDN1, or EX600-SDN2. Refer to page 840 for "Table of Mountable Units."

How to Order

Analog Input Unit

EX600 – AX A



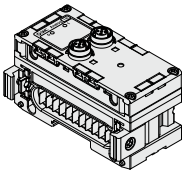
Analog input

Number of Input channels and Connector

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

Analog Output Unit

EX600 – AY A



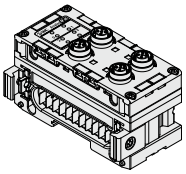
Analog output

Number of Output channels and Connector

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

Analog Input/Output Unit

EX600 – AM B



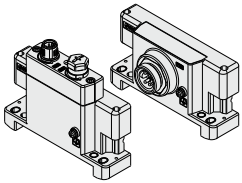
Analog input/output

Number of Input/Output channels and Connector

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

End Plate

EX600 – ED 2 – ☐



Power connector

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

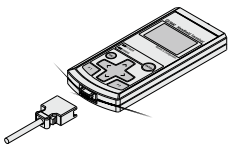
Mounting method

Symbol	Description
Nil	Without DIN rail mounting bracket
2	With DIN rail mounting bracket
3	With DIN rail mounting bracket (Specialized for SY series)

Handheld Terminal

EX600 – HT1A – 3

Handheld Terminals are not yet UL-compatible.



Version

Cable length

Symbol	Description
Nil	No cable
1	1 m
3	3 m

Note 1) Cannot be communicated with the EX600-HT1-☐. Refer to page 840 for "Table of Mountable Units."

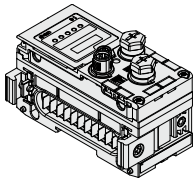
Note 2) Cannot be connected with the EX600-SPR1, EX600-SPR2, EX600-SDN1, or EX600-SDN2. Refer to page 840 for "Table of Mountable Units."

SI Unit Specifications

All Units Common Specifications

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

Note) Except Handheld Terminals

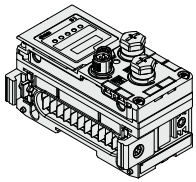


EX600-SPR□A

SI Unit (EX600-SPR□A)

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

Note) The setting file can be downloaded from the SMC website, http://www.smcworld.com

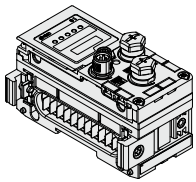


EX600-SDN□A

SI Unit (EX600-SDN□A)

Model		EX600-SDN1A	EX600-SDN2A
Communication	**Protocol**	DeviceNet™: Volume 1 (Edition 2.1), Volume 3 (Edition 1.1)	
	Device type	Group 2 Only Server	
	Communication speed	125/250/500 kbps	
	Configuration file	EDS file Note)	
	Occupation area (Number of inputs/outputs)	Max. (512 inputs/512 outputs)	
	Applicable messages	Duplicate MAC ID Check Message Group 2 Only Unconnected Explicit Message Explicit Message (Group 2) Poll I/O Message (Predefined M/S Connection set)	
DeviceNet™ power supply		11 to 25 VDC (Current consumption 50 mA or less)	
Internal current consumption (Power supply for Control/Input)		55 mA or less	
Output	**Output type**	Source/PNP (Negative common)	Sink/NPN (Positive common)
	Number of outputs	32 outputs (8/16/24/32 outputs selectable)	
	Load	Solenoid valve with surge voltage suppressor 24 VDC, 1.5 W or less (SMC)	
	Power supply	24 VDC, 2 A	
	Fail safe	HOLD/CLEAR/Forced power ON	
	Protection	Short-circuit protection	
Enclosure		IP67 (Manifold assembly)	
Standards		CE Marking, UL (CSA), RoHS compliant	
Weight		300 g	

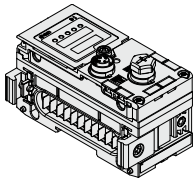
Note) The setting file can be downloaded from the SMC website, http://www.smcworld.com



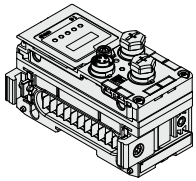
EX600-SMJ□

SI Unit (EX600-SMJ□)

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



EX600-SEN1/2

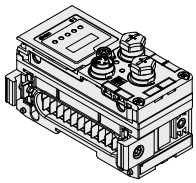


EX600-SEN3/4

SI Unit (EX600-SEN□)

Model		EX600-SEN1	EX600-SEN2	EX600-SEN3	EX600-SEN4
Communication	Number of communication ports	1 port		2 ports	
	Protocol	EtherNet/IP™ (Conformance version: Composite 6)		EtherNet/IP™ (Conformance version: Composite 11)	
	Communication speed	10/100 Mbps			
	Communication method	Full duplex/Half duplex			
	Configuration file	EDS file Note)			
	Occupation area (Number of inputs/outputs)	Max. (512 inputs/512 outputs)			
	IP address setting range	SI Unit switch settings: 192.168.0 or 1.1 to 254 Through DHCP server: Optional address			
	Device information	Vendor ID: 7 (SMC Corporation) Device type: 12 (Communication Adapter) Product code: 126		Vendor ID: 7 (SMC Corporation) Device type: 12 (Communication Adapter) Product code: 203	
	QuickConnect™	—		Compliant	
	DLR	—		Compliant	
	WEB server	—		Compliant	
Internal current consumption		120 mA or less			
Output	Output type	Source/PNP (Negative common)	Sink/NPN (Positive common)	Source/PNP (Negative common)	Sink/NPN (Positive common)
	Number of outputs	32 outputs (8/16/24/32 outputs selectable)		32 outputs	
	Load	Solenoid valve with surge voltage suppressor 24 VDC, 1.5 W or less (SMC)		Solenoid valve with surge voltage suppressor 24 VDC, 1.0 W or less (SMC)	
	Power supply	24 VDC, 2 A			
	Fail safe	HOLD/CLEAR/Forced power ON			
	Protection	Short-circuit protection			
Enclosure		IP67 (Manifold assembly)			
Standards		CE Marking, UL (CSA), RoHS compliant			
Weight		300 g			

Note) The setting file can be downloaded from the SMC website, http://www.smcworld.com

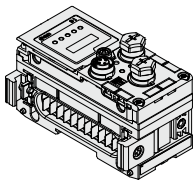


EX600-SEC□

SI Unit (EX600-SEC□)

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

Note) The setting file can be downloaded from the SMC website, http://www.smcworld.com



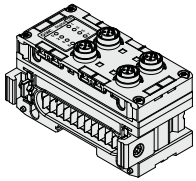
EX600-SPN□

SI Unit (EX600-SPN□)

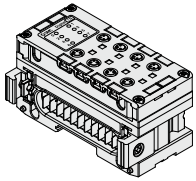
Model		EX600-SPN1	EX600-SPN2
Communication	Protocol	PROFINET IO (PROFINET RT)	
	Communication speed	100 Mbps	
	Configuration file	GSDML file Note)	
	Occupation area (Number of inputs/outputs)	Max. (512 inputs/512 outputs)	
Internal current consumption (Power supply for Control/Input)		120 mA or less	
Output	Output type	Source/PNP (Negative common)	Sink/NPN (Positive common)
	Number of outputs	32 outputs	
	Load	Solenoid valve with surge voltage suppressor 24 VDC, 1.0 W or less (SMC)	
	Power supply	24 VDC, 2 A	
	Fail safe	HOLD/CLEAR/Forced power ON	
	Protection	Short-circuit protection	
Enclosure		IP67 (Manifold assembly)	
Standards		CE Marking, UL (CSA), RoHS compliant	
Weight		300 g	

Note) The setting file can be downloaded from the SMC website, http://www.smcworld.com

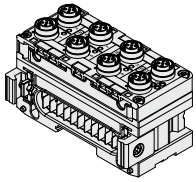
Digital Unit Specifications



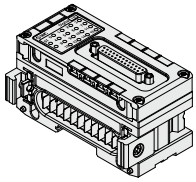
EX600-DX□B



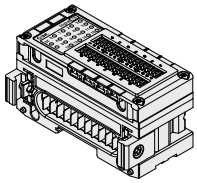
EX600-DX□C□



EX600-DX□D



EX600-DX□E



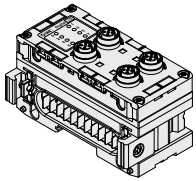
EX600-DX□F

Digital Input Unit

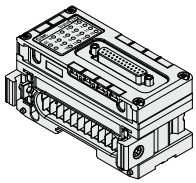
Model			EX600-DXPB	EX600-DXNB	EX600-DXPC□	EX600-DXNC□	EX600-DXPD	EX600-DXND
Input	Input type		PNP	NPN	PNP	NPN	PNP	NPN
	Input connector		M12 (5-pin) socket Note 1)		M8 (3-pin) socket Note 3)		M12 (5-pin) socket Note 1)	
	Number of inputs		8 inputs (2 inputs/Connector)		8 inputs (1 input/Connector)		16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

Note 1) M12 (4-pin) connector can be connected.
Note 2) Function only applies to the EX600-DX□C1.
Note 3) When connecting the M8 plug connector, the tightening torque must be 0.2 N·m ±10%. If tightened with an excessive tightening torque, this may cause the connector thread of the Unit to break.

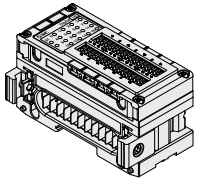
Model		EX600-DXPE	EX600-DXNE	EX600-DXPF	EX600-DXNF
Input	Input type	PNP	NPN	PNP	NPN
	Input connector	D-sub socket (25 pins) Lock screw: No.4-40 UNC		Spring type terminal block (32 pins)	
	Number of inputs	16 inputs		16 inputs (2 inputs x 8 blocks)	
	Supplied voltage	24 VDC			
	Max. supplied current	2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



EX600-DY□B



EX600-DY□E
EX600-DM□E



EX600-DY□F
EX600-DM□F

Digital Output Unit

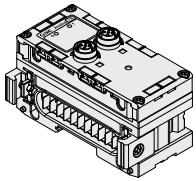
Model		EX600-DYPB	EX600-DYNB	EX600-DYPE	EX600-DYNE	EX600-DYPF	EX600-DYNF
Output	Output type	PNP	NPN	PNP	NPN	PNP	NPN
	Output connector	M12 (5-pin) socket Note)		D-sub socket (25 pins) Lock screw: No.4-40 UNC		Spring type terminal block (32 pins)	
	Number of outputs	8 outputs (2 outputs/Connector)		16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

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

Digital Input/Output Unit

Model		EX600-DMPE	EX600-DMNE	EX600-DMPF	EX600-DMNF
Input/Output type		PNP	NPN	PNP	NPN
Connector		D-sub socket (25 pins) Lock screw: No.4-40 UNC		Spring type terminal block (32 pins)	
Input	Number of inputs	8 inputs		8 inputs (2 inputs x 4 blocks)	
	Supplied voltage	24 VDC			
	Max. supplied current	2 A/Unit		0.5 A/Block 2 A/Unit	
	Protection	Short-circuit protection			
	Input current (at 24 VDC)	5 mA or less			
	ON voltage	17 V or more (At NPN input, between the pin for input terminal and supplied voltage of +24 V) (At PNP input, between the pin for input terminal and supplied voltage of 0 V)			
	OFF voltage	5 V or less (At NPN input, between the pin for input terminal and supplied voltage of +24 V) (At PNP input, between the pin for input terminal and supplied voltage of 0 V)			
Output	Number of outputs	8 outputs		8 outputs (2 outputs x 4 blocks)	
	Supplied voltage	24 VDC			
	Max. load current	0.5 A/Output 2 A/Unit			
	Protection	Short-circuit protection			
Applicable wire		—		0.08 to 1.5 mm² (AWG16 to 28)	
Current consumption		50 mA or less		60 mA or less	
Enclosure		IP40 (Manifold assembly)			
Standards		CE Marking, UL (CSA), RoHS compliant			
Weight		300 g			

Analog Unit Specifications

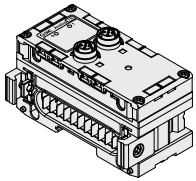


EX600-AXA

Analog Input Unit

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

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

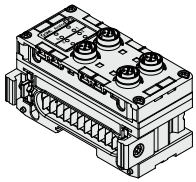


EX600-AYA

Analog Output Unit

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

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

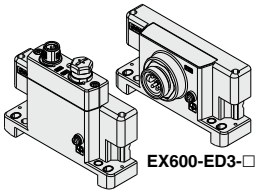


EX600-AMB

Analog Input/Output Unit

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

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

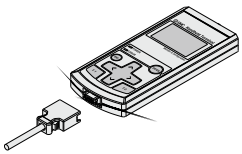


EX600-ED3-□

EX600-ED2-□

End Plate

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



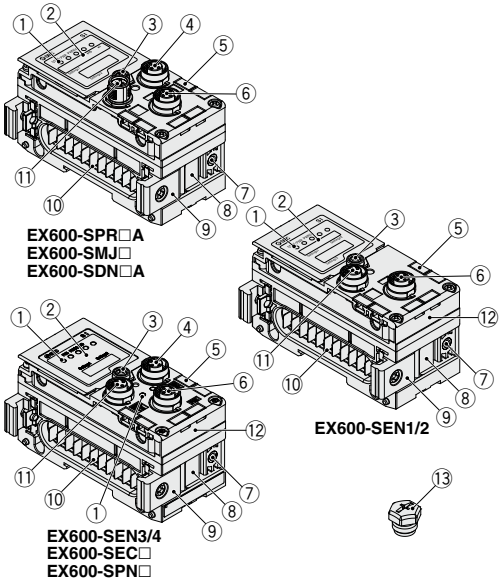
EX600-HT1A-□

Handheld Terminal

Model	EX600-HT1A-□
Power supply	Power supplied from SI Unit connector (24 VDC)
Current consumption	50 mA or less
Display	LCD with backlight
Connection cable	Handheld Terminal cable (1 m ··· EX600-AC010-1, 3 m ··· EX600-AC030-1)
Enclosure	IP20
Standards	CE Marking, RoHS compliant
Weight	160 g

Parts Description

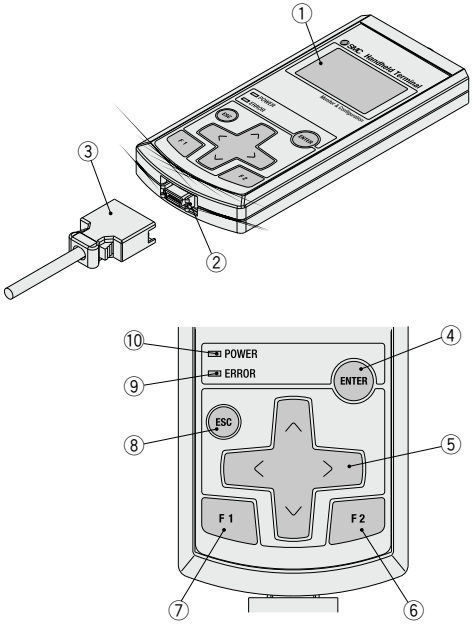
SI Unit



No.	Name	Use
1	**Status indication LED**	Displays Unit status.
2	**Indication cover**	Open for setting the switch.
3	**Indication cover set screw**	Loosen for opening the indication cover.
4	**Connector (BUS OUT)**	Connects to the fieldbus output cable.
5	**Marker groove**	Can be used to mount a marker.
6	**Connector (PCI)**	Connects to the Handheld Terminal cable.
7	**Valve plate mounting holes**	Fixes a valve plate in place.
8	**Valve plate mounting groove**	Inserts a valve plate.
9	**Joint bracket**	Links Units to one another.
10	**Connector for Unit (Plug)**	Transmits signals to the neighboring Unit and supplies power.
11	**Connector (BUS IN)**	Connects to the cable for fieldbus input.
12	**MAC address name plate** Note)	Displays a unique 12-digit MAC address for each SI Unit.
13	**Seal cap**	Mounted on the connectors (BUS OUT and PCI) at the time of shipment.

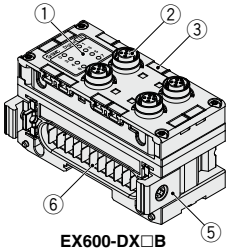
Note) MAC address name plate is not provided on the EX600-SEC□.

Handheld Terminal

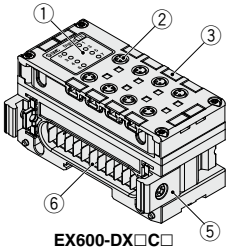


No.	Name	Use
1	**LCD**	Displays operation and Unit information.
2	**Connector**	Connects to the Handheld Terminal cable.
3	**Handheld Terminal cable**	Connects the SI Unit to the Handheld Terminal.
4	**Enter button (ENTER)**	From the selection screen, goes to the screen for the item selected. On the settings screen, registers the settings that have been made so far.
5	**Cursor button**	Moves the cursor on the LCD up, down, left or right. Moves the cursor on the selection screen up, down, left or right to make selections. On the settings screen, increases or decreases the value of settings or turns settings on and off.
6	**F2 button (F2)**	Functions in accordance with on-screen display or instructions.
7	**F1 button (F1)**	Functions in accordance with on-screen display or instructions.
8	**Escape button (ESC)**	On the selection screen, goes back to the previous screen. On the settings screen, cancels the settings that have been made so far and goes back to the previous screen.
9	**ERROR LED**	Lights up red when the EX600 diagnosis errors occur.
10	**POWER LED**	Connects to the EX600 SI Unit, and lights up green when control/input power supply is on.

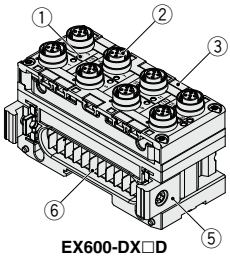
Digital Unit



EX600-DX□B
EX600-DY□B

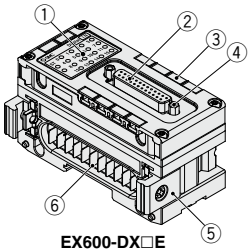


EX600-DX□C□

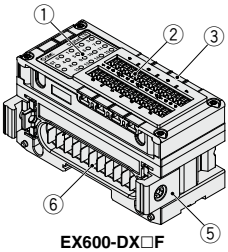


EX600-DX□D

No.	Name	Use
1	**Status indication LED**	Displays Unit status.
2	**Connector**	Connects with input or output devices.
3	**Marker groove**	Can be used to mount a marker.
4	**Lock screw**	Fixes the D-sub connector in place. (No.4-40 UNC)
5	**Joint bracket**	Links Units to one another.
6	**Connector for Unit (Plug)**	Transmits signals to the neighboring Unit and supplies power.

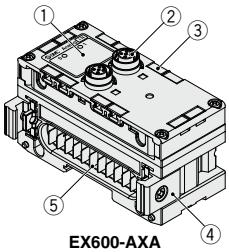


EX600-DX□E
EX600-DY□E
EX600-DM□E

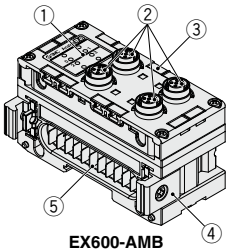


EX600-DX□F
EX600-DY□F
EX600-DM□F

Analog Unit



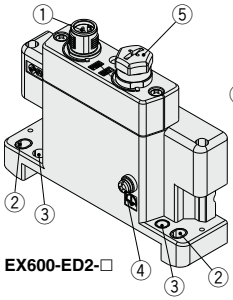
EX600-AXA
EX600-AYA



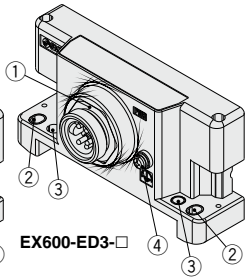
EX600-AMB

No.	Name	Use
1	**Status indication LED**	Displays Unit status.
2	**Connector**	Connects with input or output devices.
3	**Marker groove**	Can be used to mount a marker.
4	**Joint bracket**	Links Units to one another.
5	**Connector for Unit (Plug)**	Transmits signals to the neighboring Unit and supplies power.

End Plate



EX600-ED2-□



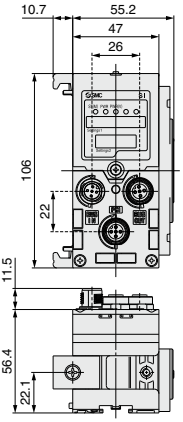
EX600-ED3-□

No.	Name	Use
1	**Power connector**	Supplies power to the Unit and/or input/output devices.
2	**Fixing hole for direct mounting**	Connects directly to equipment.
3	**Fixing hole for DIN rail**	Converts to manifold or for DIN rail mounting.
4	**FE terminal**	Used for grounding. Ground this terminal securely to improve the noise immunity.
5	**Connector (Unused)**	This connector has not yet been used. Do not remove the seal cap.

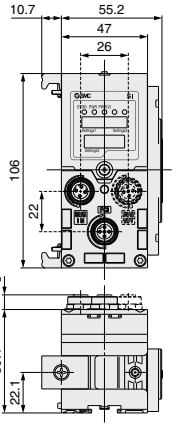
Dimensions

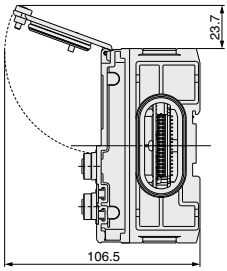
SI Unit

EX600-SPR□A
EX600-SDN□A
EX600-SMJ□



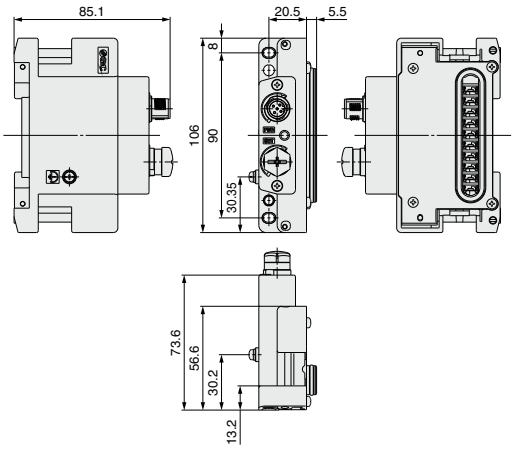
EX600-SEN□
EX600-SEC□
EX600-SPN□



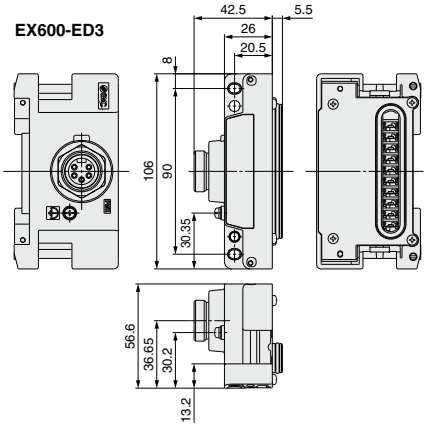


End Plate

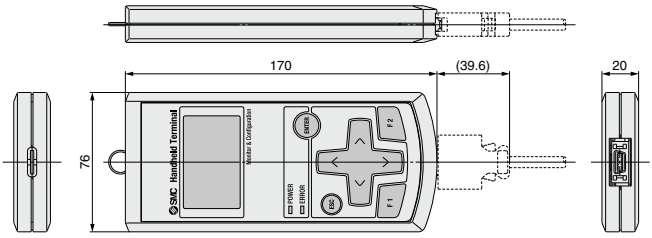
EX600-ED2



EX600-ED3



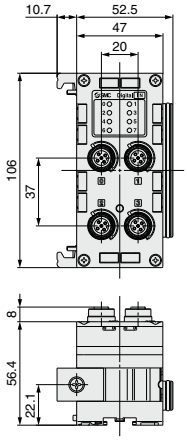
Handheld Terminal



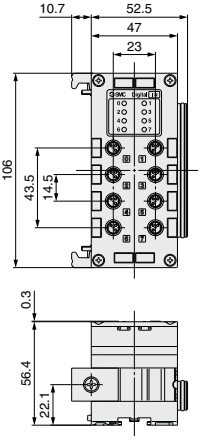
SMC

Digital Unit

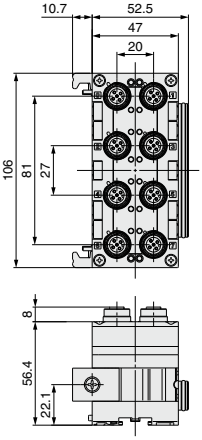
EX600-DX□B
EX600-DY□B



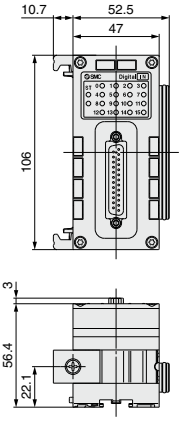
EX600-DX□C□



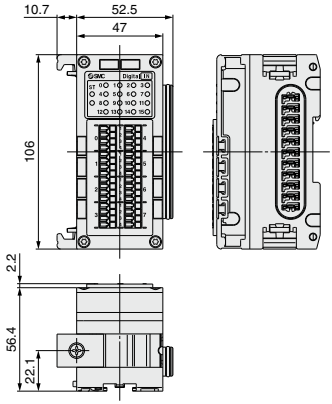
EX600-DX□D



EX600-DX□E
EX600-DY□E
EX600-DM□E

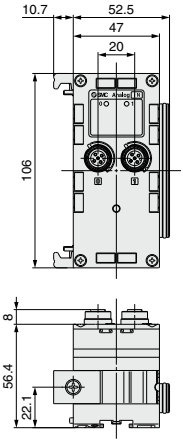


EX600-DX□F
EX600-DY□F
EX600-DM□F

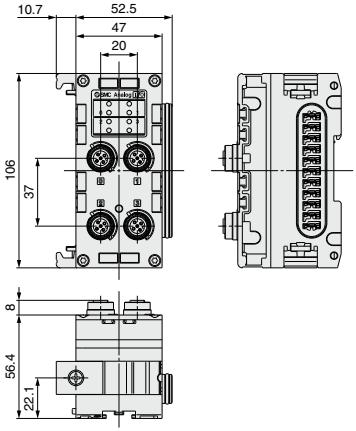


Analog Unit

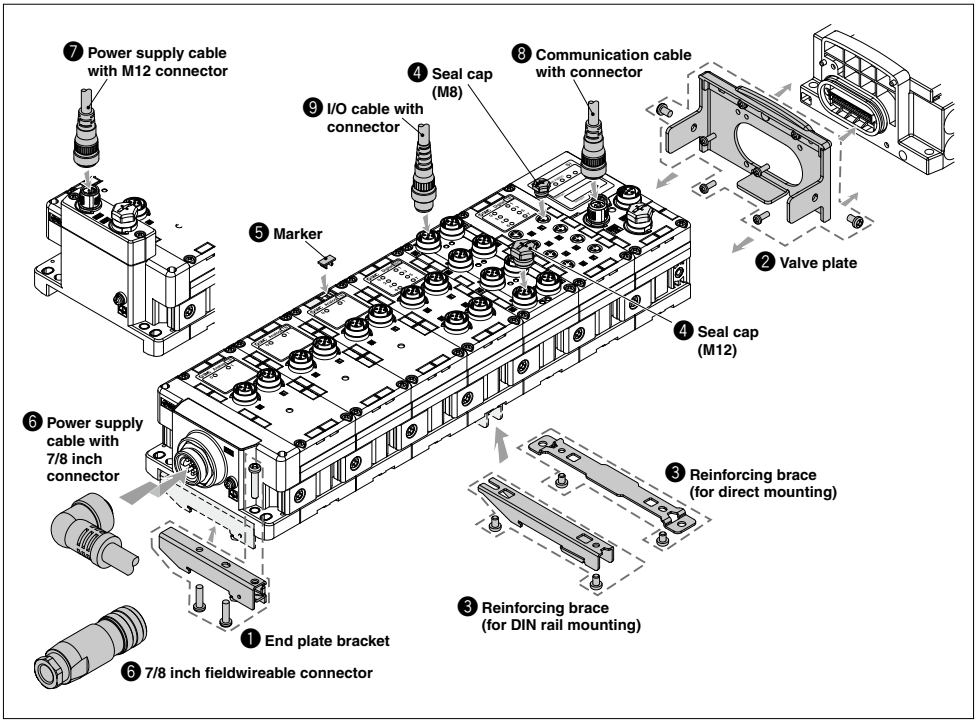
EX600-AXA
EX600-AYA



EX600-AMB



EX600 Series
Accessories



❶ End Plate Bracket

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

EX600-ZMA2

Enclosed parts

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

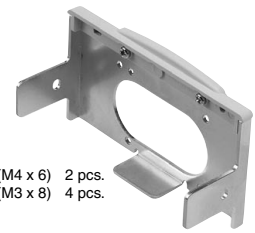
EX600-ZMA3
(Specialized for SY series)

Enclosed parts

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

❷ Valve Plate

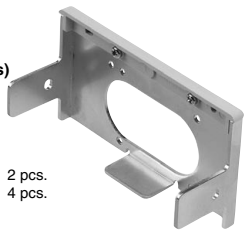
EX600-ZMV1



Enclosed parts

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

EX600-ZMV2
(Specialized for SY series)



Enclosed parts

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

❸ Reinforcing Brace

This bracket is used on the bottom of the Unit at the intermediate position for connecting 6 Units or more.
Note) Be sure to attach this bracket to prevent connection failure between the Units caused by deflection.

For direct mounting
EX600-ZMB1

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

For DIN rail mounting
EX600-ZMB2

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

❹ Seal Cap (10 pcs.)

Be sure to mount a seal cap on any unused I/O connectors. Otherwise, the specified enclosure cannot be maintained.

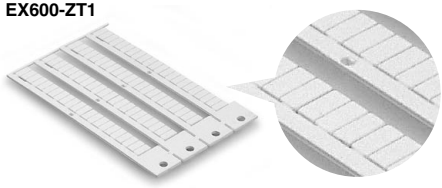
EX9-AWES
For M8

EX9-AWTS
For M12

❺ Marker (1 sheet, 88 pcs.)

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

EX600-ZT1



❻ 7/8 Inch Connector and Its Related Parts

• Power supply cable with 7/8 inch connector

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

• Fieldwireable 7/8 inch connector [compatible to AWG22-16]

PCA-1578078	Plug
PCA-1578081	Socket

❼ Power Supply Cable with M12 Connector (5-pin B-coded)

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

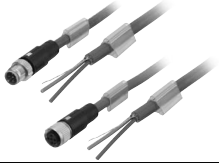
SPEEDCON

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

⑧ Communication Cable with Connector/Communication Connector

For SI Unit compatible with CC-Link, DeviceNet™ and PROFIBUS DP

For details, refer to page 907 and later.

Name	Use	Part no.	Description
Cable with connector SPEEDCON	For Fieldbus communication 	**PCA-1567720**	Communication cable for CC-Link (Socket)
		PCA-1567717	Communication cable for CC-Link (Plug)
		PCA-1557633	Communication cable for DeviceNet™ (Socket)
		PCA-1557646	Communication cable for DeviceNet™ (Plug)
		PCA-1557688	Communication cable for PROFIBUS DP (Socket/B-coded)
		PCA-1557691	Communication cable for PROFIBUS DP (Plug/B-coded)
Fieldwireable connector	For Fieldbus communication 	**PCA-1557617**	Fieldwireable connector for CC-Link (Plug/Spring-caged)
		PCA-1557620	Fieldwireable connector for CC-Link (Socket/Spring-caged)
		PCA-1557659	Fieldwireable connector for DeviceNet™ (Plug/Spring-caged)
		PCA-1557662	Fieldwireable connector for DeviceNet™ (Socket/Spring-caged)
		PCA-1557701	Fieldwireable connector for PROFIBUS DP (Plug/B-coded/Spring-caged)
		PCA-1557714	Fieldwireable connector for PROFIBUS DP (Socket/B-coded/Spring-caged)

For SI Unit compatible with EtherNet/IP™, EtherCAT® and PROFINET

Cable with connector

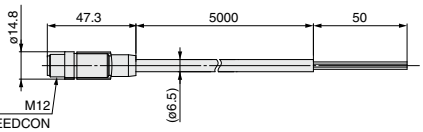
PCA−1446566 SPEEDCON

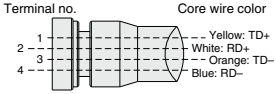
Cable length

1446566	5000 [mm]

Plug connector pin arrangement

D-coded





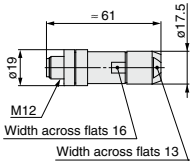
Connections

Fieldwireable connector

PCA−1446553

Plug connector pin arrangement

D-coded



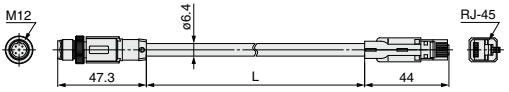
EX9−AC 020 EN − PSRJ

Cable length

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

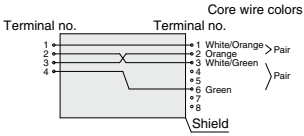
Connector specification

PSRJ	M12 plug (straight) ⇔ RJ-45 connector



Plug connector pin arrangement

D-coded



Connections (Straight cable)

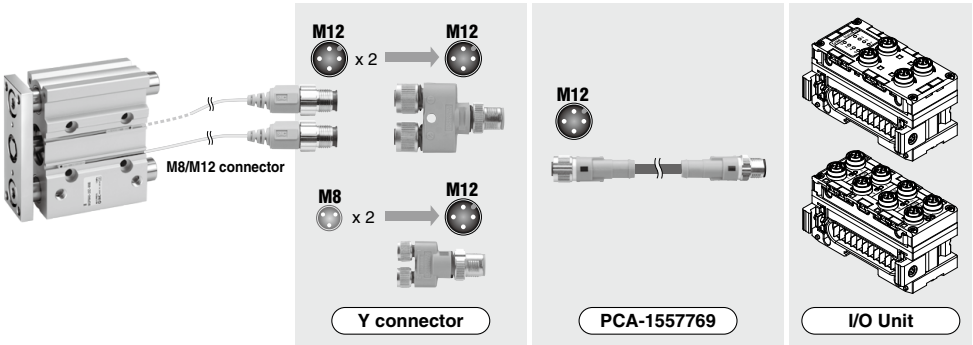
Plug connector pin arrangement

⑨ I/O Cable with Connector/I/O Connector

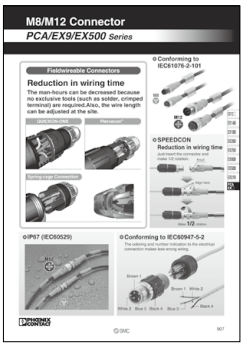
For details, refer to page 907 and later.

Name	Use	Part no.	Description
Cable with connector	For sensor 	**PCA-1557769**	Cable with M12 connector (4 pins/3 m)
		PCA-1557772	Cable with M8 connector (3 pins/3 m)
Fieldwireable connector	For sensor 	**PCA-1557730**	Fieldwireable connector (M8/3 pins/Plug/Piercecon® connection)
		PCA-1557743	Fieldwireable connector (M12/4 pins/Plug/QUICKON-ONE connection/SPEEDCON)
		PCA-1557756	
Y connector	For sensor 	**PCA-1557785**	Y connector (2 x M12 (5 pins)-M12 (5 pins)/SPEEDCON)
		PCA-1557798	Y connector (2 x M8 (3 pins)-M12 (4 pins)/SPEEDCON)

Note) When using the Y connector, connect it to the connector on the I/O Unit through the sensor cable (PCA-1557769) with the M12 connector.



M8/M12 connector



For details about the cables and connectors that can be purchased from SMC, refer to page 907.

EX600 Series
Table of Mountable Units

The Units that can be connected differ depending on the product number.
Before mounting, please check the types of Units that can be connected.

○: Acceptable
×: Not acceptable

Table of Compatible Units Mountable with Each SI Unit

			Product number: SI Unit			
			EX600-SPR□ (PROFIBUS DP) EX600-SDN□ (DeviceNet™)	EX600-SPR□A (PROFIBUS DP) EX600-SDN□A (DeviceNet™)	EX600-SMJ□ (CC-Link)	EX600-SEN□ (EtherNet/IP™) EX600-SEC□ (EtherCAT®) EX600-SPN□ (PROFINET)
			Version Nil	Version A	Version Nil	Version Nil
Product number	Digital Input Unit	EX600-DX□B	○	○	○	○
		EX600-DX□C□	○	○	○	○
		EX600-DX□D	○	○	○	○
		EX600-DX□E	×	○	○	○
		EX600-DX□F	×	○	○	○
	Digital Output Unit	EX600-DY□B	○	○	○	○
		EX600-DY□E	×	○	○	○
		EX600-DY□F	×	○	○	○
	Digital Input/Output Unit	EX600-DM□E	×	○	○	○
		EX600-DM□F	×	○	○	○
	Analog Input Unit	EX600-AXA	○	○	○	○
	Analog Output Unit	EX600-AYA	×	○	○	○
	Analog Input/Output Unit	EX600-AMB	×	○	○	○
	Handheld Terminal	EX600-HT1-□	○	○	○	×
		EX600-HT1A-□	○	○	○	○

Table of Compatible Units Capable of Communication with Handheld Terminals

			Product number: Handheld Terminal	
			EX600-HT1-□	EX600-HT1A-□
			Version Nil	Version A
Product number	SI Unit	EX600-SPR□ (PROFIBUS DP)	○	○
		EX600-SPR□A (PROFIBUS DP)	○	○
		EX600-SDN□ (DeviceNet™)	○	○
		EX600-SDN□A (DeviceNet™)	○	○
		EX600-SMJ□ (CC-Link)	○	○
		EX600-SEN□ (EtherNet/IP™)	×	○
		EX600-SEC□ (EtherCAT®)	×	○
		EX600-SPN□ (PROFINET)	×	○
	Digital Input Unit	EX600-DX□B	○	○
		EX600-DX□C□	○	○
		EX600-DX□D	○	○
		EX600-DX□E	×	○
		EX600-DX□F	×	○
	Digital Output Unit	EX600-DY□B	○	○
		EX600-DY□E	×	○
		EX600-DY□F	×	○
	Digital Input/Output Unit	EX600-DM□E	×	○
		EX600-DM□F	×	○
	Analog Input Unit	EX600-AXA	○	○
	Analog Output Unit	EX600-AYA	×	○
	Analog Input/Output Unit	EX600-AMB	×	○

EX600 Series
Specific Product Precautions 1

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 3 to 9 for 3/4/5 Port Solenoid Valve Precautions.

Design/ Selection

⚠Warning

1. Do not use beyond the specification range.
Using beyond the specification range can cause a fire, malfunction, or damage to the system.
Check the specifications before operation.

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

Otherwise, this may cause possible injuries due to malfunction.

⚠Caution

1. When applicable to UL, use a Class 2 power supply unit conforming to UL1310 for direct current power supply.

2. Use within the specified voltage range.
Using beyond the specified voltage range is likely to cause the product to be damaged or to malfunction.

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

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

5. Do not remove the name plate.
Improper maintenance or incorrect use of Operation Manual can cause equipment failure or malfunction. Also, there is a risk of losing conformity with safety standards.

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

Mounting

⚠Caution

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

2. Do not drop, bump, or apply excessive impact.
Otherwise, this can cause damage, equipment failure or malfunction.

Mounting

⚠Caution

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

4. When lifting a large size Manifold Solenoid Valve Unit, take care to avoid causing stress to the valve connection joint.
The connection joint with the Unit may be damaged.
Because the product may be heavy, carrying and installation should be performed by more than one operator to avoid strain or injury.

5. When placing a manifold, mount it on a flat surface. Additionally, when connecting six stations or more, be sure to use the intermediate reinforcing brace (EX600-ZMB1 or EX600-ZMB2).
Torsion in the whole manifold can lead to trouble such as air leakage or contact failure.

Wiring

⚠Caution

1. To improve the noise resistance of the reduced wiring system, be sure to perform the grounding.
Perform the dedicated grounding separate from the inverter of the drive system and minimize the grounding distance from the unit.

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

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

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

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

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

EX600 Series
Specific Product Precautions 2

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 3 to 9 for 3/4/5 Port Solenoid Valve Precautions.

Wiring

⚠Caution

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

Noise in signal lines may cause a malfunction.

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

Otherwise, this can cause damage, equipment failure or malfunction.

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

This may cause equipment failure or malfunction due to contact failure.

Operating Environment

⚠Warning

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

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

⚠Caution

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

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

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

2) Suitable mounting of each Unit and manifold valve.

3) Be sure to mount a seal cap on any unused connectors.

If using in an environment that is exposed to water splashes, please take measures such as using a cover.
When the enclosure is IP40, do not use in an operating environment or atmosphere where it may come in contact with corrosive gas, chemical agents, seawater, water, or water vapor. When connected to the EX600-D□□E or EX600-D□□F, manifold enclosure is IP40.
Also, the Handheld Terminal conforms to IP20, so prevent foreign matter from entering inside, and water, solvent or oil from coming in direct contact with it.

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

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

1) Where noise is generated by static electricity etc.

2) Where there is a strong electric field

3) Where there is a danger of exposure to radiation

4) When in close proximity to power supply lines

Operating Environment

⚠Caution

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

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

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

This may damage the Unit and cause it to malfunction.

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

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

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

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

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

8. Keep dust, wire scraps and other foreign matter from entering inside the product.

This may cause equipment failure or malfunction.

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

This may cause equipment failure or malfunction.

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

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

11. Do not use in direct sunlight.

This may cause equipment failure or malfunction.

12. Observe the ambient temperature range.

This may cause a malfunction.

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

Such places are likely to cause a malfunction.

EX600 Series
Specific Product Precautions 3

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 3 to 9 for 3/4/5 Port Solenoid Valve Precautions.

Adjustment/ Operation

⚠Warning

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

<Handheld Terminal>

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

3. The forced input/output function is used to change the signal status forcibly. When operating this function, be sure to check the safety of the surroundings and installation.
This may cause, injuries or equipment damage.

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

⚠Caution

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

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

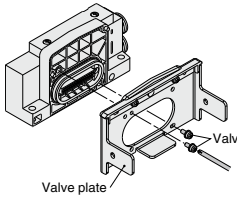
3. For details on programming and address setting, refer to the manual from the PLC manufacturer.
The content of programming related to protocol is designed by the manufacturer of the PLC used.

<Handheld Terminal>

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

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

When the order does not include the SI Unit, a valve plate which connects the manifold and SI Unit, is not mounted. Use attached valve holding screws and mount the valve plate.
(Tightening torque: 0.6 to 0.7 N·m)



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

Maintenance

⚠Warning

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

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

Unexpected malfunction of system components and injury can result.

⚠Caution

1. When handling and replacing Units:
- **Do not touch the sharp metal parts of the connector or plug.**
- **Do not apply excessive force to the Unit when disassembling.**

The connecting portions of the Unit are firmly joined with seals.
- **When joining Units, take care not to get fingers caught between Units.**

Injury can result.

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

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

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

Other

⚠Caution

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

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