Wireless System

Usable even in welding environments

Noise resistance	High-speed connection	Communication response
Uses the 2.4 GHz ISM frequency band Frequency hopping: Every 5 ms	From power supply ON to start of communication: **Min. 250 ms** For wireless remote	Signal response time: **5 ms**

Communication cables not required	Number of I/O points	Compatible protocol
Reduced wiring work, space, and cost Minimized disconnection risk	Max. 1280 inputs/1280 outputs (Registration and communication of up to 127 remote units is possible.)	EtherNet/IP
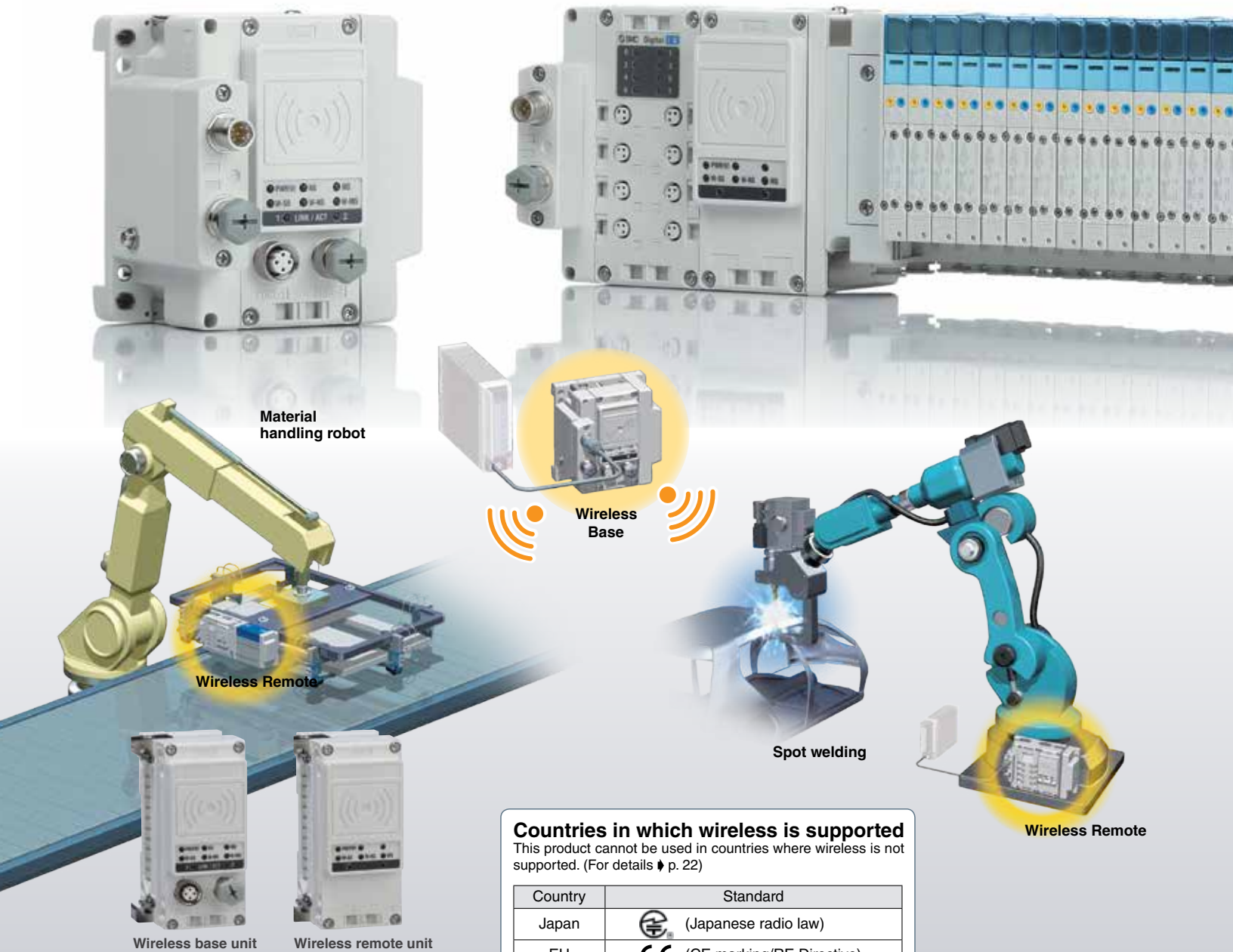
Material handling robot

Wireless Base

Wireless Remote

Spot welding

Wireless Remote

Wireless base unit   Wireless remote unit

Countries in which wireless is supported
This product cannot be used in countries where wireless is not supported. (For details ▶ p. 22)

Country	Standard
Japan	(Japanese radio law)
EU	(CE marking/RE Directive)
USA	(FCC)

EX600-W Series

SMC

NC02-28A

Provide safe and reliable communication

Uses the 2.4 GHz ISM frequency band

	kHz			MHz			GHz	
	10	100	1	10	100	1	10	

Wireless System

Wireless devices
- Wireless LAN
- RFID
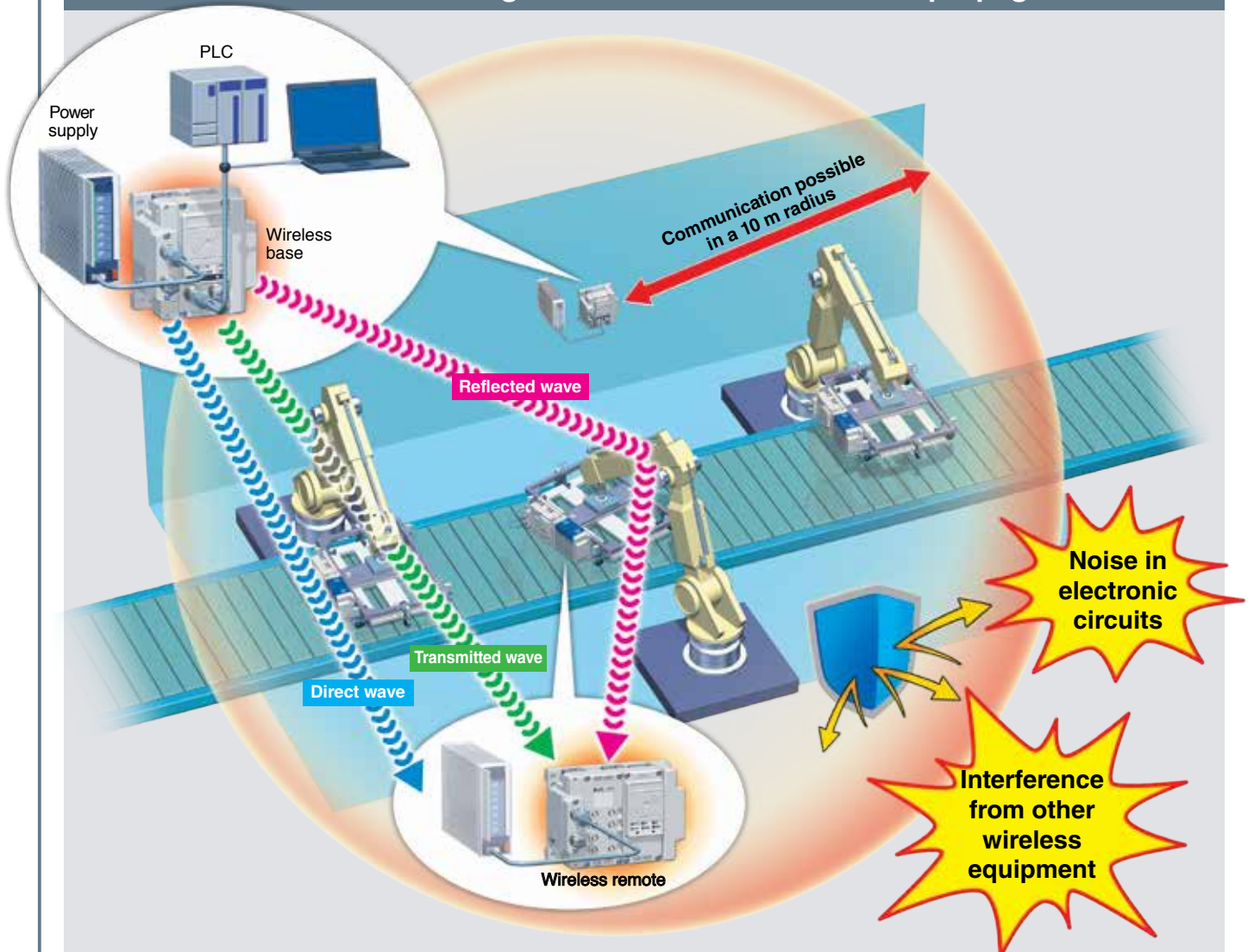- Bluetooth

Site noise
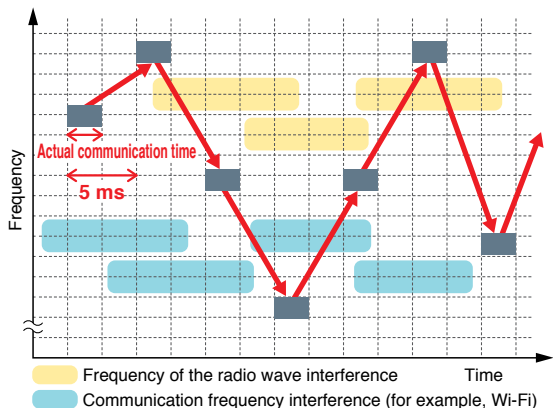- AC/DC welding machine
- Motor driver/Electromagnetic heater, etc.
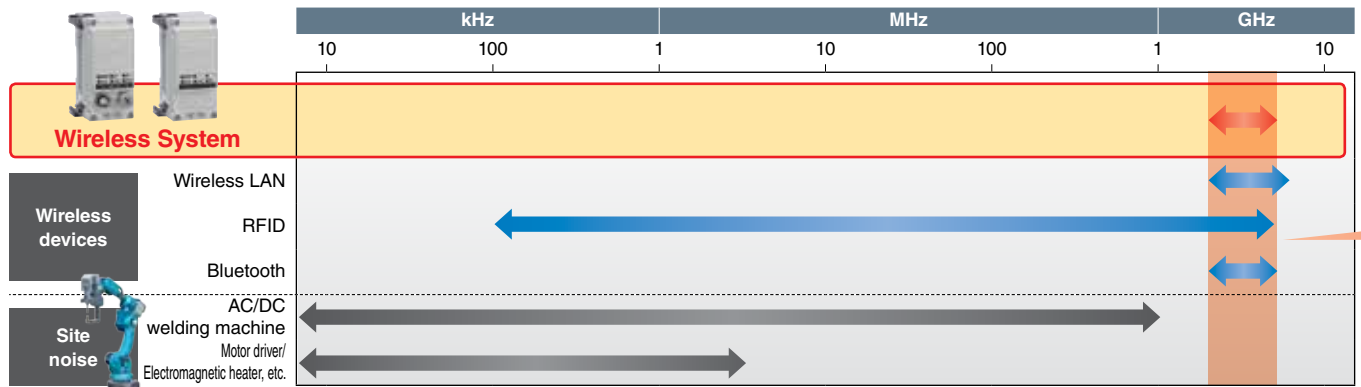
∗ ISM (Industrial, Scientific and Medical) radio bands: Radio bands reserved for the use of radio frequency energy for industrial, scientific and medical purposes.

Provide stable communication

Communications using various forms of radio wave propagation

PLC

Power supply

Wireless base

Communication possible in a 10 m radius

Reflected wave

Transmitted wave

Direct wave

Noise in electronic circuits

Interference from other wireless equipment

Wireless remote

SMC

Frequency hopping: Every 5 ms

A stable wireless environment is established using an original protocol which is not affected by interference. Interference from other wireless equipment is prevented.

Frequency

Actual communication time

5 ms

Frequency of the radio wave interference
Communication frequency interference (for example, Wi-Fi)

Time

Frequency Hopping

The communication technology rapidly changes frequency (hopping), to prevent interference from other wireless equipment. When the frequency of Wi-Fi and other wireless communications compete, or radio wave interference is present, then other frequencies are used for communication. For details, refer to technical data on page 22.

High security using encryption

Unauthorized access from outside is prevented by using data encryption.

Wireless **base**

Wireless **remote**

Unauthorized access/ data falsification

Unauthorized wiretapping

Removing device

Point-to-Multipoint communication

Registration and communication of up to 127 wireless remote units is possible.

Wireless **base**

127 units

Wireless **remote** 1

Wireless **remote** 2

Wireless **remote** 3

Wireless **remote** 4

∗ 1 to 15 units are recommended for simultaneous operation
∗ It is possible to install multiple wireless **base**s in the same area

Wireless communication status can be monitored.
<Monitoring the remote communication status>

The wireless system connection can be monitored during operation according to the diagnostic data.
The installation location can be ascertained according to the intensity level of the radio wave received by the unit display.

[Diagnostic data]
∗ When communication from the **remote** cannot be received.
∗ When communication retry has exceeded the upper limit (32 times).**[Unit display]**

For wireless **base**	W-SS (Radio wave receiving intensity (For communication from wireless remote to wireless base))	
	Green LED is ON.	Received power level of all **remote**s is 3.
○ PWR(V) ○ NS ○ MS ○ W-SS ○ W-NS ○ W-MS 1 ● LINK / ACT ● 2	Green LED flashes. (1 Hz)	There are connected **remote**s with received power level 2.
	Green LED flashes. (2 Hz)	There are connected **remote**s with received power level 1.
	Red LED flashes.	No wireless **remote**s connected.
	OFF	Wireless **remote** unit is not registered.

For wireless **remote**	W-SS (Radio wave receiving intensity (Communication from wireless base to wireless remote))	
	Green LED is ON.	Received power level is 3.
○ PWR(V) ○ ○ W-SS ○ W-NS ○ MS ● ●	Green LED flashes. (1 Hz)	Received power level is 2.
	Green LED flashes. (2 Hz)	Received power level is 1.
	Red LED flashes.	Wireless communication is not connected.
	OFF	Wireless **base** unit is not registered.

∗ A received radio wave intensity level of 1 means the intensity is weak. Add a wireless **base** so that the wave intensity becomes level 3 or 2 . Alternatively remove the obstacle between the **base** and **remote**, or reduce the distance between the **base** and **remote**.

<Communication status can be downloaded by a PC>

By connecting the wireless **base** to a PC, it is possible to view log files which show the number of retries or the received radio wave intensity. Log files are accessed by using a web browser to connect to the built-in WEB server. The wireless environment and installation location can be optimized by checking the number of retries and received radio wave intensity.
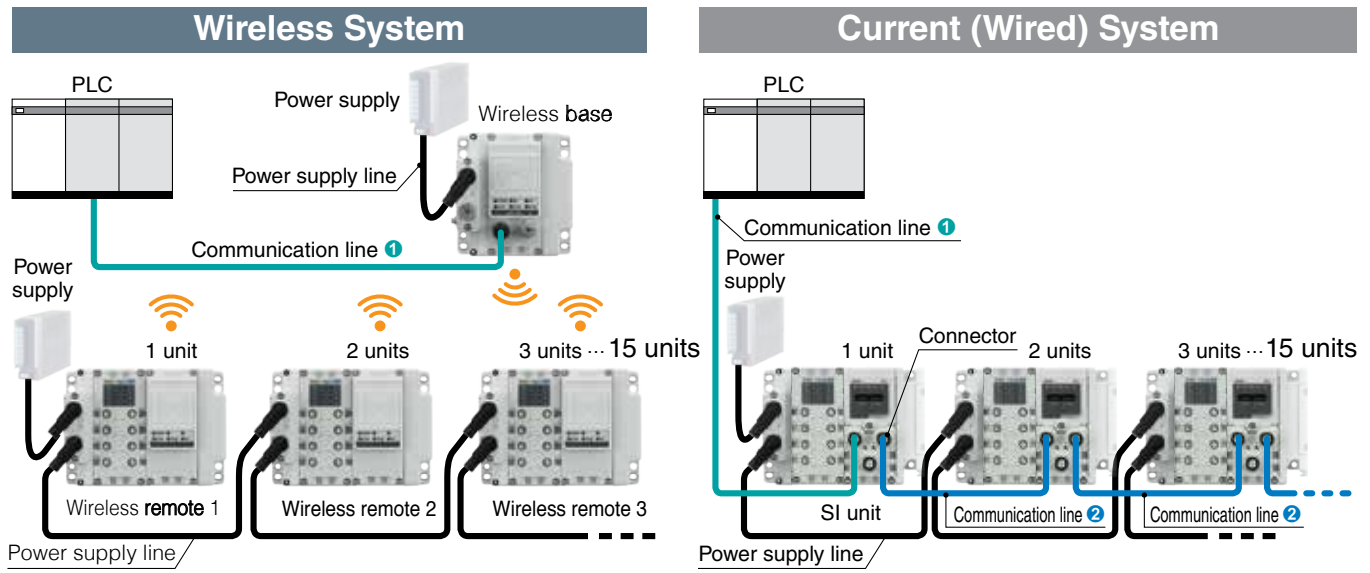
The log files showing the number of retries or the received radio wave intensity, can be downloaded in the form of a CSV file.

Web screen example

PC

Wiring material cost and installation man-hours can be reduced.

Wireless System	Current (Wired) System

PLC
Power supply
Wireless base
Power supply line
Communication line ❶
Power supply
1 unit
2 units
3 units ···15 units
Wireless remote 1
Wireless remote 2
Wireless remote 3
Power supply line

PLC
Communication line ❶
Power supply
1 unit
Connector
2 units
3 units ···15 units
SI unit
Communication line ❷
Communication line ❷
Power supply line

SI unit: Comparison when 15 units are connected	Number of communication devices	Communication line		Communication connectors
		❶	❷	
Wireless system	Wireless base: 1 unit Wireless remote: 15 units	1 line (Connector at one end)	—	1 place
Current (Wired)	SI unit: 15 units	1 line (Connector at one end)	14 lines (Connector at both ends)	29 places

Interchangeability maintained

* Maximum I/O of wireless base/remote unit is limited to 128 points.

Connection interchangeability between EX600 series SI units is maintained.
Replacement of wireless and wired systems is possible.

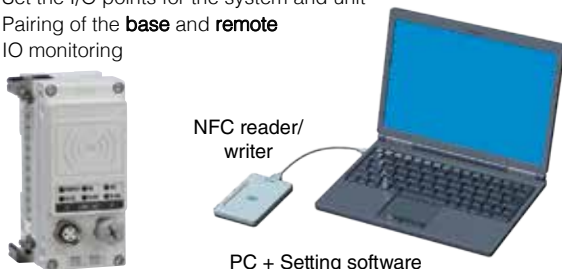Wireless system   Wireless unit

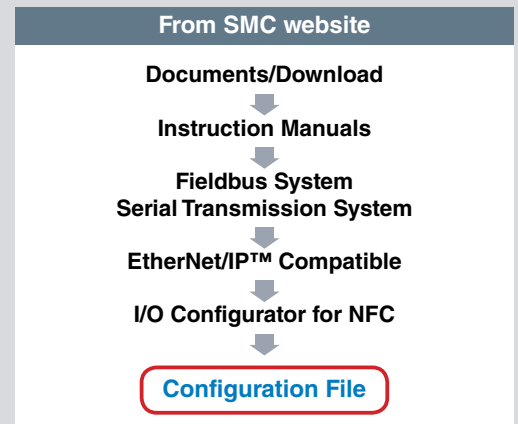Wired system   SI unit

NFC contactless communication

(NFC: Near Field Communication)

Settings are possible using an NFC reader/ writer and setting software.
(Some items can be set when there is no power supplied)
• Write IP address to the base
• Set the I/O points for the system and unit
• Pairing of the **base** and **remote**
• IO monitoring

NFC reader/ writer

PC + Setting software

Configuration File

From SMC website

Documents/Download
⬇
Instruction Manuals
⬇
Fieldbus System
Serial Transmission System
⬇
EtherNet/IP™ Compatible
⬇
I/O Configurator for NFC
⬇
Configuration File
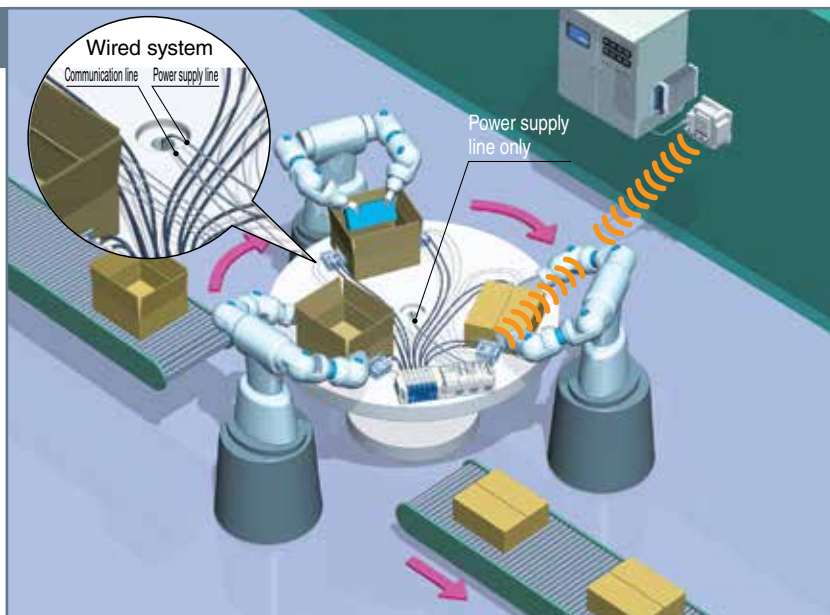
SMC

Application Examples

Tool change

• **Communication cable is not necessary for moving parts.**
• **Minimized disconnection risk**
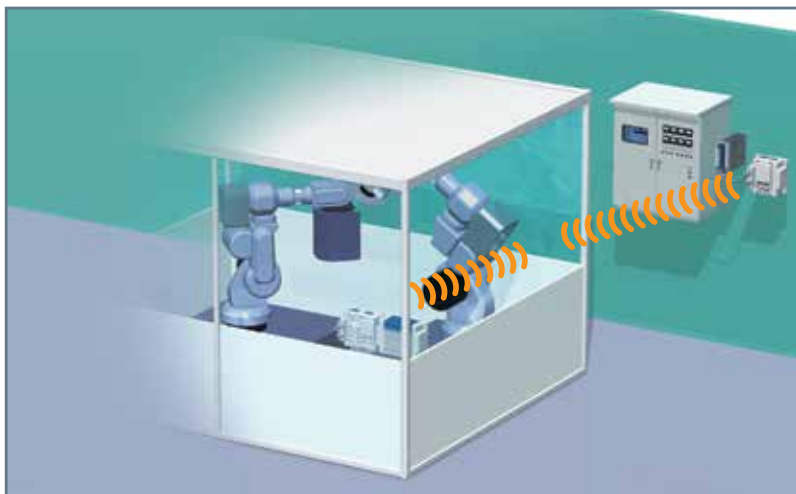• **Shorter time for establishing communication (startup time)**
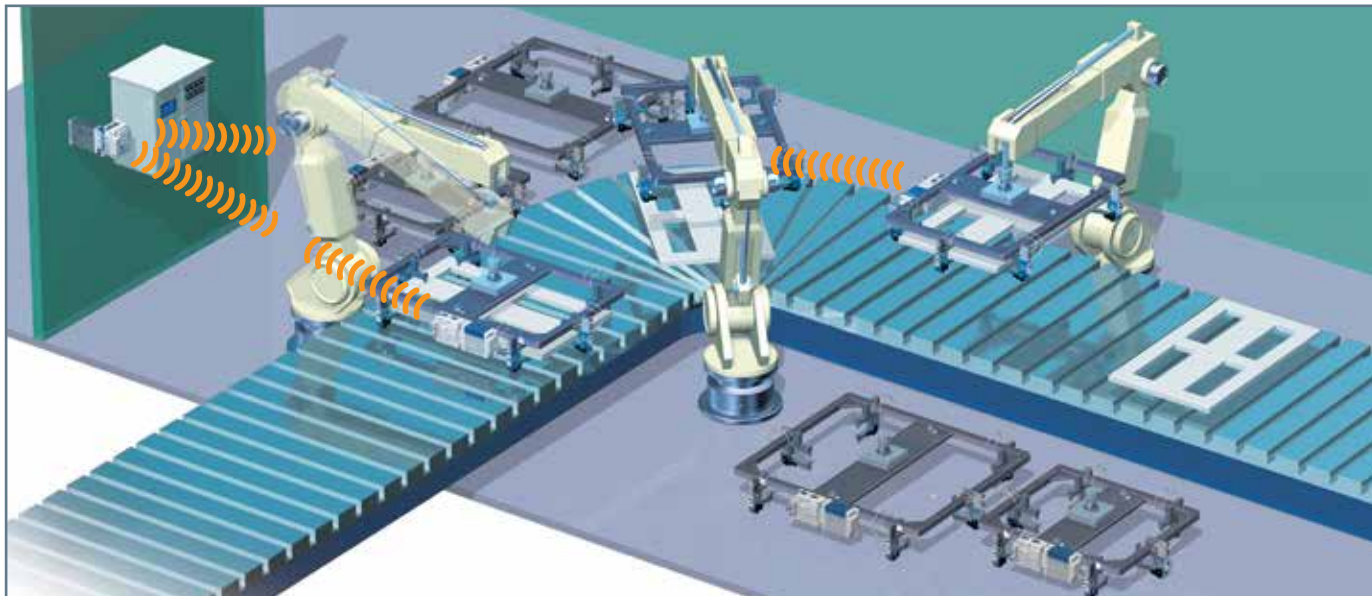
Rotary table

• **Minimized disconnection risk**
• **Smaller diameter communication cable/tubing**

Wired system
Communication line   Power supply line
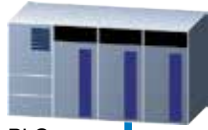
Power supply line only

Blocking of radio waves

∗ The radio waves must not be blocked by nearby conductive objects such as metal enclosures or covers.

System Examples

PLC

Fieldbus **EtherNet/IP**™

Setting/Monitor tool

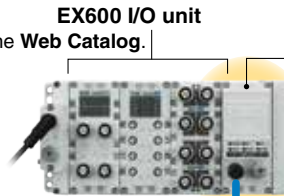Initial setting/monitoring/
pairing are possible.

PC

Wireless Network

EX600 I/O unit
Refer to the **Web Catalog**.
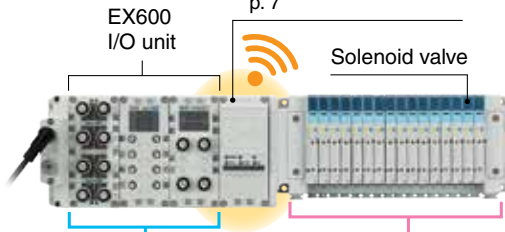
Wireless base unit
p. 7

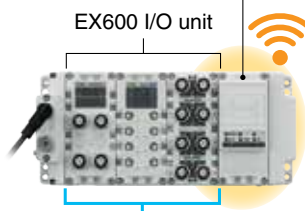Number of I/O points:
Max. 1280 inputs
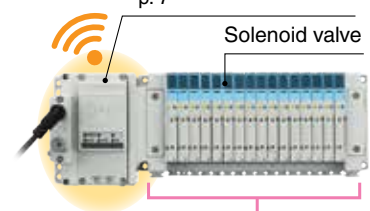1280 outputs

Combination Example ➊

EX600
I/O unit

Wireless remote unit No. 1
p. 7

Solenoid valve

Combination Example ➋

Wireless remote unit No. 2
p. 7

EX600 I/O unit

Combination Example ➌

Wireless remote unit No. 3
p. 7

Solenoid valve

Other products
Pressure switch, flow switch, auto switch, and other switches
(proximate sensor, photoelectric switch, limit switch, etc.)

Various actuators

Applicable Manifold Solenoid Valves

SY Series (IP67)

CE

SV Series (IP67)

CE cRUus

S0700 Series (IP40)

CE

VQC Series (IP67)

CE

SMC

Wireless System
EX600-W *Series*

Wireless base unit   Wireless remote unit

⊜SMC

6

Wireless System
EX600-W Series

CE
RoHS

How to Order

SI Unit

EX600‐W EN 1

Wireless compatible

SI unit

Symbol	Specifications	Note
EN	Wireless base unit	For EtherNet/IP™
SV	Wireless remote unit	—

Output type

Symbol	Specifications
1	PNP
2	NPN

Wireless base unit   **Wireless remote unit**

Digital Input Unit

EX600‐DX P D

Input type

Symbol	Description
P	PNP
N	NPN

Number of inputs and Connector

Symbol	Number of inputs	Connector
B	8 inputs	M12 connector (5 pins) 4 pcs.
C	8 inputs	M8 connector (3 pins) 8 pcs.
D	16 inputs	M12 connector (5 pins) 8 pcs.
E	16 inputs	D-sub connector (25 pins)
F	16 inputs	Spring type terminal block (32 pins)
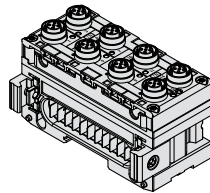
∗ For specifications, refer to the Fieldbus system EX600 series in the **Web Catalog**.

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)
F	16 outputs	Spring type terminal block (32 pins)

∗ For specifications, refer to the Fieldbus system EX600 series in the **Web Catalog**.

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)
F	8 inputs	8 outputs	Spring type terminal block (32 pins)

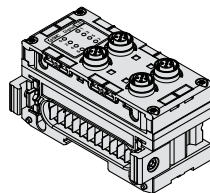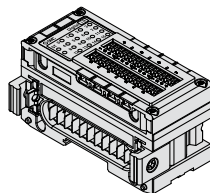∗ For specifications, refer to the Fieldbus system EX600 series in the **Web Catalog**.
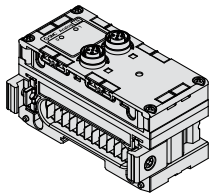
SMC

How to Order

Analog Input Unit
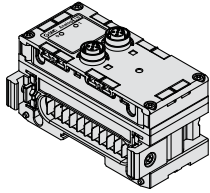
EX600–AX A

Analog input •

• **Number of input channels and Connector**

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

∗ For specifications, refer to the Fieldbus system EX600 series in the **Web Catalog**.

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.

∗ For specifications, refer to the Fieldbus system EX600 series in the **Web Catalog**.
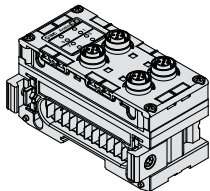
Analog Input/Output Unit

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.

∗ For specifications, refer to the Fieldbus system EX600 series in the **Web Catalog**.

End Plate (D side)

EX600–E D 2 – 2

End plate •

End plate mounting position: D side •

Power supply connector •

Symbol	Power supply connector	Specifications
2	M12 (5 pins) B-coded	IN
3	7/8 inch (5 pins)	IN
4	M12 (4/5 pins) A-coded*1	IN/OUT
5	M12 (4/5 pins) A-coded*1	IN/OUT

∗1 The pin layout for "4" and "5" pin connector is different. Refer to the dimensions on page 14.

For M12   **For 7/8 inch**

• **Mounting method**

Symbol	Description	Note
Nil	Without DIN rail mounting bracket	—
2	With DIN rail mounting bracket	For SV, S0700, VQC series
3	With DIN rail mounting bracket	For SY series
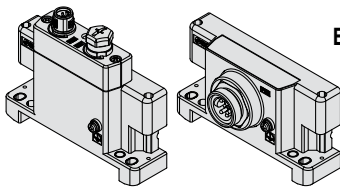
∗ When the end plate (U side) is used, the symbol for the mounting method must be the same as the D side.

End Plate (U side)

EX600–E U 1 – 2

End plate •

End plate mounting position: U side •

Specifications •

Symbol	Specifications
1	Waterproof cover

• **Mounting method**

Symbol	Description
Nil	Without DIN rail mounting bracket
2	With DIN rail mounting bracket

∗ When the end plate (D side) is used, the symbol for the mounting method must be the same as the U side.

⊗SMC
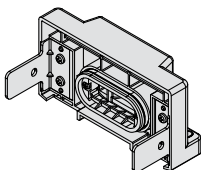
EX600-W Series

Ordering Example of the Base Unit

Base unit: Without valve manifold and input/output unit

Wireless unit (Wireless base unit)
EX600-WEN1

End plate (D side)
EX600-ED4

End plate (U side)
EX600-EU1

D side

U side

EX600-ED4 ··························	**1 set**
EX600-WEN1 ························	**1 set**
EX600-EU1 ··························	**1 set**

· Products should be ordered separately and
  assembled by the customer.

Manifold with base unit: With input/output unit

Digital input unit
EX600-DXPD

Digital output unit
EX600-DYPB

Wireless unit
(Wireless base unit)
EX600-WEN1

2-position single
SY3100-5U1 (3 sets)

2-position double
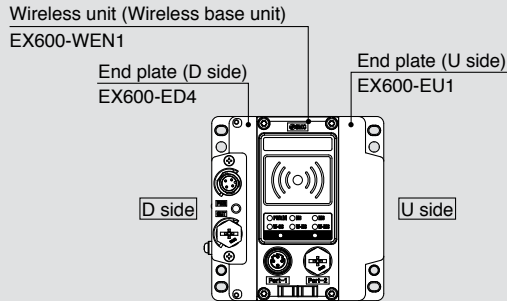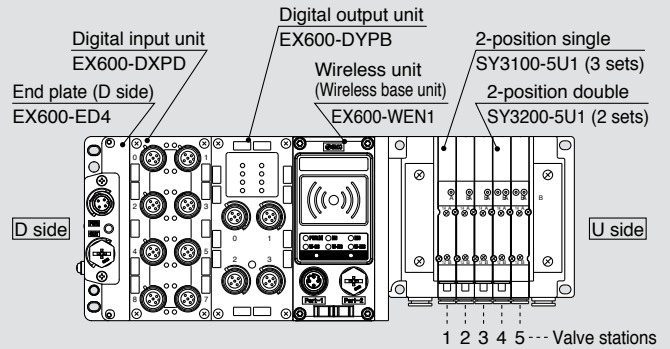SY3200-5U1 (2 sets)

End plate (D side)
EX600-ED4

D side

U side

1 2 3 4 5 --- Valve stations

SS5Y3-10S6WE72-05B-C6
(Type 10 5-station manifold base, Wireless EtherNet/IP™)
Negative common, M12 connector IN/OUT pin arrangement 1, I/O unit: 2 stations

✳**SY3100-5U1**·················	**3 sets (2-position single part no.)**
✳**SY3200-5U1**·················	**2 sets (2-position double part no.)**
✳**EX600-DXPD**···············	**1 set I/O unit part no. (Stations 1)**
✳**EX600-DYPB**···············	**1 set I/O unit part no. (Stations 2)**

└─►**The asterisk denotes the symbol for the assembly.**
     Prefix it to the part numbers of the valve, etc.

· For details, refer to the catalog of each valve series.

Ordering Example of the Remote Unit

Remote unit: Without valve manifold and with input/output unit

Digital output unit
EX600-DYPB

Digital input unit
EX600-DXPD

Wireless unit
(Wireless remote unit)
EX600-WSV1

End plate (D side)
EX600-ED4

End plate (U side)
EX600-EU1

D side

U side

EX600-ED4 ···························	**1 set**
EX600-DXPD ·························	**1 set**
EX600-DYPB ·························	**1 set**
EX600-WSV1 ·························	**1 set**
EX600-EU1 ···························	**1 set**

· Products should be ordered separately and
  assembled by the customer.

Manifold with remote unit: With input/output unit

Digital input unit
EX600-DXPD

Digital output unit
EX600-DYPB

Wireless unit
(Wireless remote unit)
EX600-WSV1

2-position single
SY3100-5U1 (3 sets)

2-position double
SY3200-5U1 (2 sets)

End plate (D side)
EX600-ED4

D side

U side

1 2 3 4 5 --- Valve stations

SS5Y3-10S6WS72-05B-C6
(Type 10 5-station manifold base, Wireless remote)
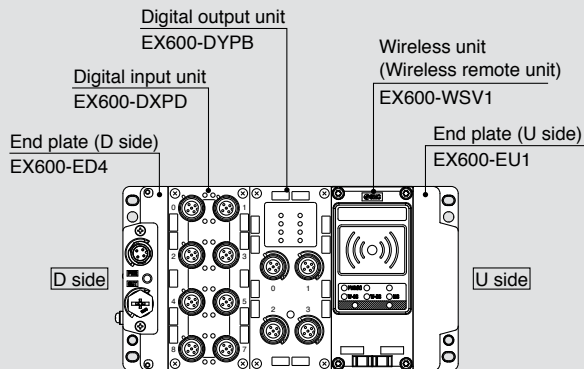**Negative common, M12 connector IN/OUT pin arrangement 1, I/O unit: 2 stations**

✳**SY3100-5U1**·················	**3 sets (2-position single part no.)**
✳**SY3200-5U1**·················	**2 sets (2-position double part no.)**
✳**EX600-DXPD**···············	**1 set I/O unit part no. (Stations 1)**
✳**EX600-DYPB**···············	**1 set I/O unit part no. (Stations 2)**

└─►**The asterisk denotes the symbol for the assembly.**
     Prefix it to the part numbers of the valve, etc.

· For details, refer to the catalog of each valve series.

SMC

Specifications

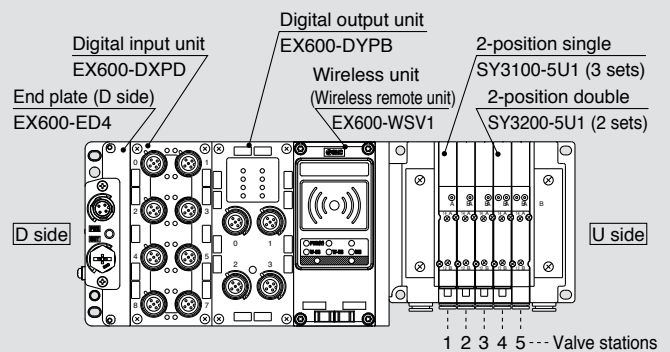## Wireless Base Unit: EX600-WEN□

	Item	Specifications
EtherNet/IP™ communication	**Communication protocol**	EtherNet/IP™ (Conformance test version: Composit 12)
	Transmission medium (cable)	Standard Ethernet cable (CAT5 or higher, 100BASE-TX)
	Communication speed	10 Mbps/100 Mbps
	Communication method	Full duplex/Half duplex
	Configuration file	EDS file*1
	IP address setting	Manual/BOOTP, DHCP
	Device information	Vendor ID: 7 (SMC Corp.) Device type: 12 (Communication Adaptor) Product code: 186
	Topology	Star, Bus, Ring (DLR), Line, Tree
	QuickConnect™ function	Applicable
	DLR function	Applicable
	Web server function	Applicable
Wireless communication	**Protocol**	SMC original protocol (SMC encryption)
	Radio wave type (spread)	Frequency Hopping Spread Spectrum (FHSS)
	Frequency	2.4 GHz (2403 to 2481 MHz)
	Number of frequency channels	79 ch (Bandwidth: 1.0 MHz)
	Communication speed	250 kbps
	Communication distance	32.8 ft (10 m) (Depending on the operating environment)
	Radio Law certificate	Japanese radio law (Japan), RE (EU*2), FCC (USA)
Electrical	**For control/input (US1)** — **Power supply voltage**	24 VDC ±10%
	Current consumption	150 mA or less
	For output (US2) — **Power supply voltage**	24 VDC ±10%
	Max. supply current	4 A
Input/Output	**Number of inputs** — **System input size**	Max. 1280 points together with the registered remote units
	Input size	Max. 128 points (increase or decrease by 16 points)
	Number of outputs — **System output size**	Max. 1280 points together with the registered remote units
	Output size	Max. 128 points (increase or decrease by 16 points)
	Analog input/output — **AD refresh time**	10 ms or less (the input connected to the base unit)
	DA refresh time	10 ms or less (the output connected to the base unit)
	Valve output — **Output type**	EX600-WEN1: Source/PNP (–COM) EX600-WEN2: Sink/NPN (+COM)
	Number of outputs	Max. 32 points (0/8/16/24/32 points)
	Connected load	Solenoid valve with surge voltage suppressor of 24 VDC and 1.5 W or less (manufactured by SMC)
	Number of remote units connected	Max. 127 units (0/15/31/63/127 units)
	Number of connected EX600 I/O units	Max. 9 EX600 series I/O units (I/O = 128. I/O above 128 cannot be recognized.)
General	**Enclosure**	IP67 equivalent (with manifold assembled)
	Ambient temperature (Operating temperature)	14 to 122 ºF (–10 to +50ºC)
	Ambient temperature (Storage temperature)	-4 to 140 ºF (–20 to +60ºC)
	Ambient humidity	35 to 85% RH (No condensation)
	Withstand voltage	500 VAC for 1 minute between external terminals and metallic parts
	Insulation resistance	10 MΩ or more (500 VDC between external terminals and metallic parts)
	Standards	CE marking, RoHS compliant
	Weight	10.58 oz (300 g)
NFC communication*3	**Communication standard**	ISO/IEC14443B (Type-B)
	Frequency	13.56 MHz
	Communication speed	20 to 100 kHz (I2C)
	Communication distance	Up to 0.4 in (1 cm)

*1 The configuration file can be downloaded from the SMC website: http://www.smcworld.com
*2 Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, U.K., Turkey
*3 The NFC communication RFID tag of the 13.56 MHz passive type

■**Trademark**
EtherNet/IP™ is a trademark of ODVA.

EX600-W Series

Specifications

Wireless Remote Unit: EX600-WSV□

	Item		Specifications
Electrical	For control/input (US1)	Power supply voltage	24 VDC ±10%
		Current consumption	70 mA or less
	For output (US2)	Power supply voltage	24 VDC ±10%
		Max. supply current	4 A
Input/Output	Number of inputs	Input size	Max. 128 points (increase or decrease by 16 points)
	Number of outputs	Output size	Max. 128 points (increase or decrease by 16 points)
	Valve output	Output type	EX600-WSV1: Source/PNP (–COM) EX600-WSV2: Sink/NPN (+COM)
		Number of valve manifold connections	Max. 32 points (0/8/16/24/32 points)
		Connected load	Solenoid valve with surge voltage suppressor of 24 VDC and 1.5 W or less (manufactured by SMC)
	AD/DA refresh time		0.1/0.2/0.5/1/2/5/10/30/60 s[2]
	Number of connected EX600 I/O units		Max. 9 EX600 I/O units (I/O = 128. I/O above 128 cannot be recognized.)
Wireless communication	Protocol		SMC original protocol (SMC encryption)
	Radio wave type (spread)		Frequency Hopping Spread Spectrum (FHSS)
	Frequency		2.4 GHz (2403 to 2481 MHz)
	Number of frequency channels		79 ch (Bandwidth: 1.0 MHz)
	Communication speed		250 kbps
	Communication distance		32.8 ft (10 m) (Depending on the operating environment)
	Radio Law certificate		Japanese radio law (Japan), RE (EU[1]), FCC (USA)
General	Enclosure		IP67 equivalent (with manifold assembled)
	Ambient temperature (Operating temperature)		14 to 122 °F (–10 to +50ºC)
	Ambient temperature (Storage temperature)		-4 to 140 °F (–20 to +60ºC)
	Ambient humidity		35 to 85% RH (No condensation)
	Withstand voltage		500 VAC for 1 minute between external terminals and metallic parts
	Insulation resistance		10 MΩ or more (500 VDC between external terminals and metallic parts)
	Standards		CE marking, RoHS compliant
	Weight		9.87 oz (280 g)
NFC communication[3]	Communication standard		ISO/IEC14443B (Type-B)
	Frequency		13.56 MHz
	Communication speed		20 to 100 kHz (I2C)
	Communication distance		Up to 0.4 in (1 cm)

*1 Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, U.K., Turkey
*2 Varies depending on the wireless communication status and the surrounding environment.
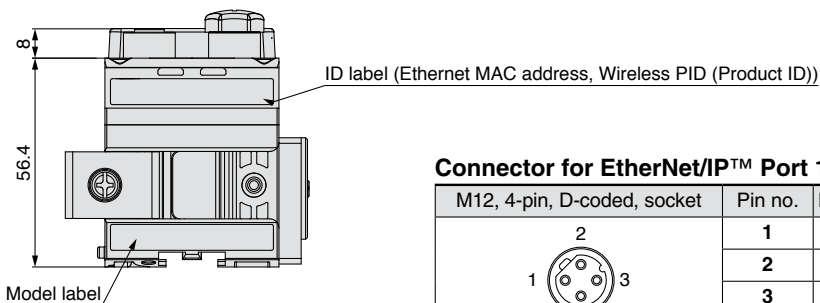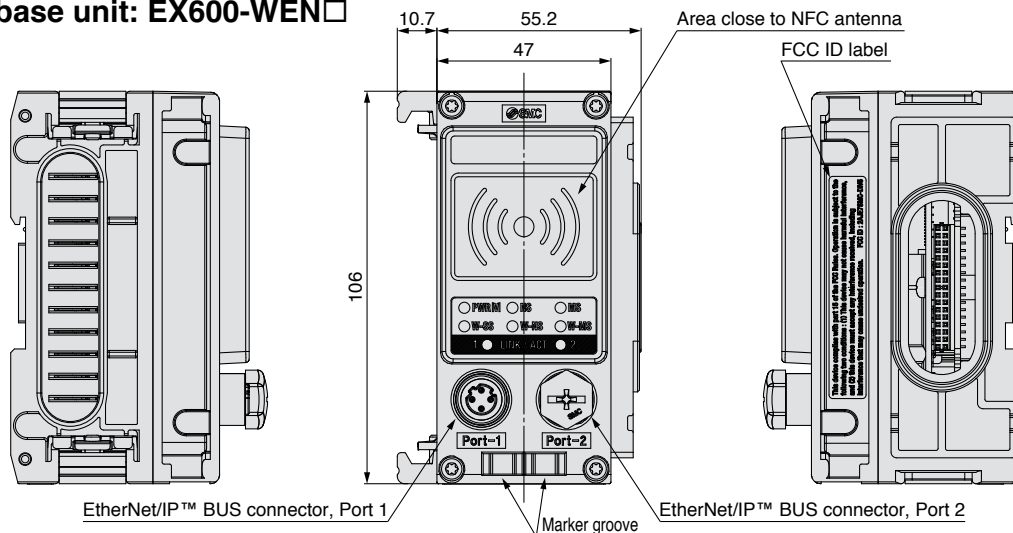*3 The NFC communication RFID tag of the 13.56 MHz passive type

End Plate (D side): EX600-ED4/5-□

	Item		Specifications
Electrical	Connector type	PWR IN	M12 plug, 4-pin
		PWR OUT	M12 socket, 5-pin
	Rated voltage	Power supply for output	24 VDC +10%/–5%
		Power supply for control/input	24 VDC ±10% (the power supply for the unit is shut off at 17 V or less)
	Rated current	Power supply for output	Max. 4 A
		Power supply for control/input	Max. 4 A
General	Enclosure		IP67 (with manifold assembled)
	Withstand voltage		500 VAC for 1 minute (between FE and external terminals)
	Insulation resistance		10 MΩ or more (500 VDC between FE and external terminals)
	Ambient temperature	Operating	14 to 122 °F (–10 to +50ºC)
		Stored/Transported	-4 to 140 °F (–20 to +60ºC)
	Ambient humidity		35% to 85% RH (No condensation)
	Standards		CE marking, RoHS compliant

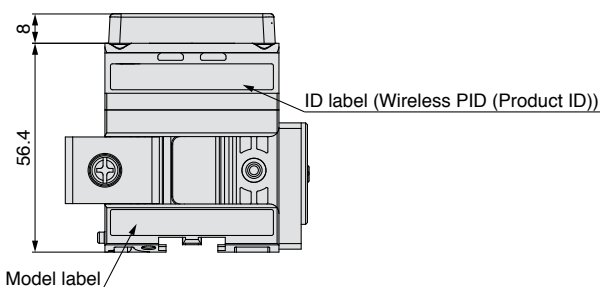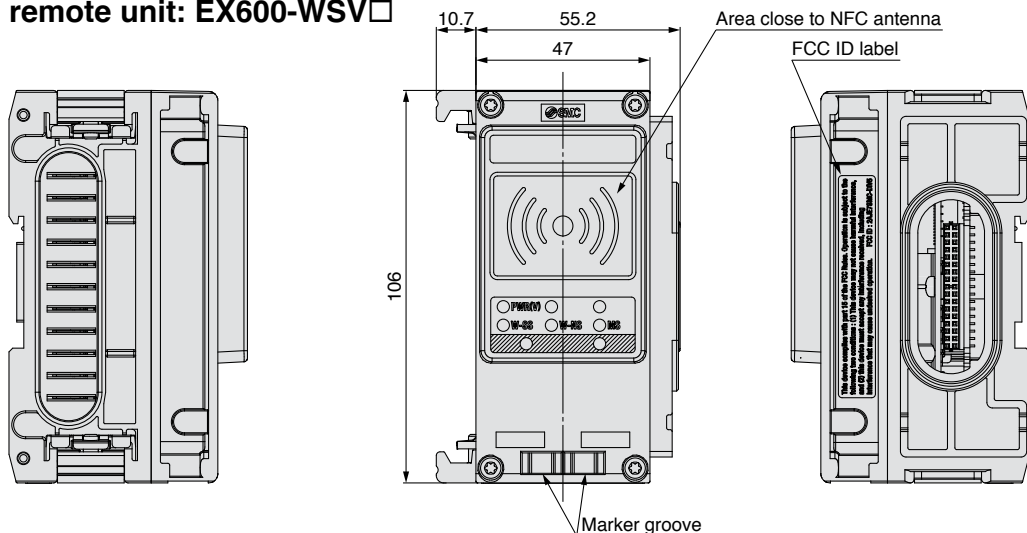* For the EX600-ED2/3-□, refer to the Fieldbus system EX600 series in the **Web Catalog**.

SMC

Dimensions

Wireless base unit: EX600-WEN□

10.7 55.2 47

106

Area close to NFC antenna

FCC ID label

PWR M   MS   NS
W-SS   W-NS   W-MS
1   LINK ACT   2

Port-1   Port-2

EtherNet/IP™ BUS connector, Port 1

Marker groove

EtherNet/IP™ BUS connector, Port 2

8

56.4

ID label (Ethernet MAC address, Wireless PID (Product ID))

Model label

Connector for EtherNet/IP™ Port 1/Port 2

M12, 4-pin, D-coded, socket	Pin no.	Description
2	**1**	Tx+
1 3	**2**	Rx+
	3	Tx–
4	**4**	Rx–

Wireless remote unit: EX600-WSV□

10.7 55.2 47

106

Area close to NFC antenna

FCC ID label

PWR(V)
W-SS   W-NS   MS

Marker groove

8

56.4

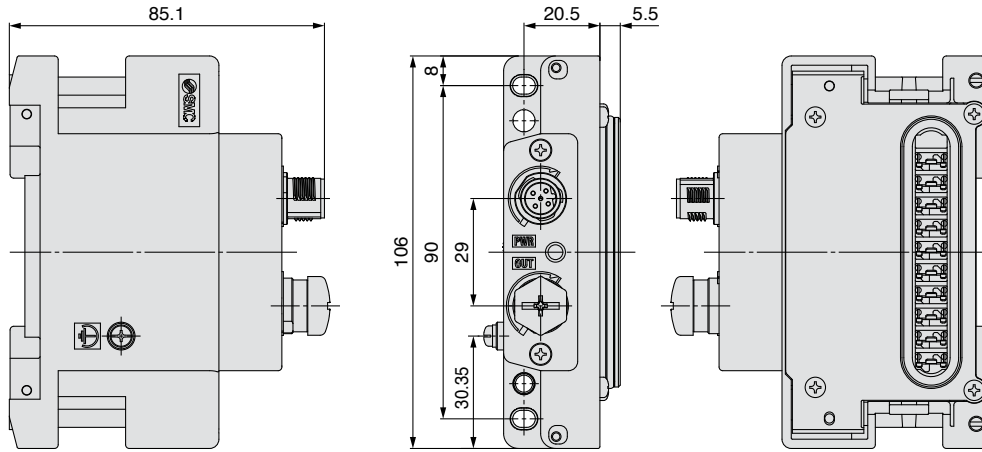ID label (Wireless PID (Product ID))

Model label

EX600-W *Series*

Dimensions

End plate (D side)
EX600-ED2
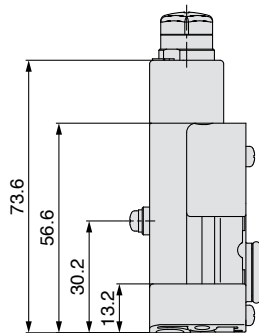
Power supply connector PWR: M12 5-pin plug, B-coded

Configuration	Pin no.	Description
	1	24 V (for output)
	2	0 V (for output)
	3	24 V (for control/input)
	4	0 V (for control/input)
	5	FE

EX600-ED3
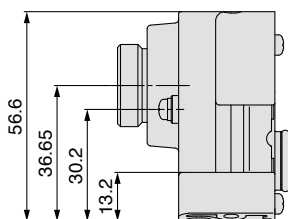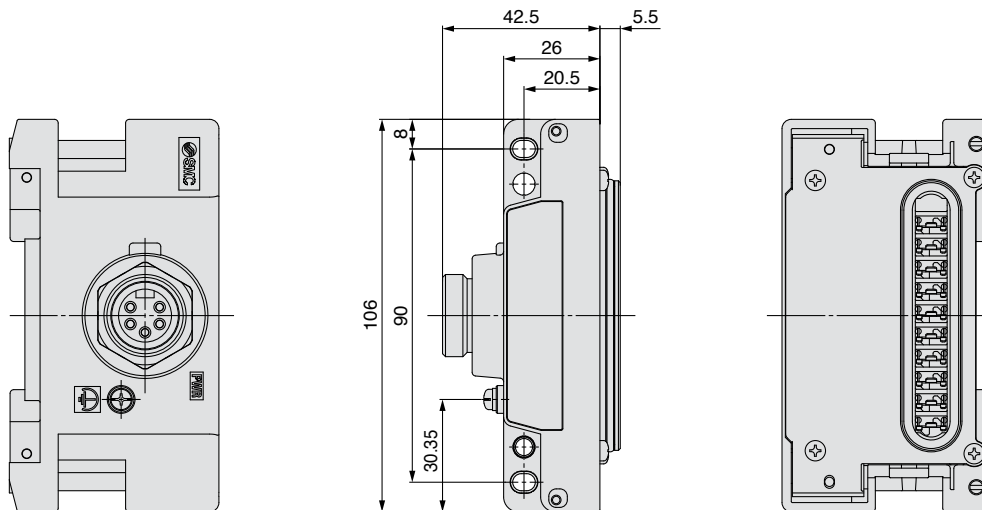
Power supply connector PWR: 7/8 inch 5-pin plug

Configuration	Pin no.	Description
	1	0 V (for output)
	2	0 V (for control/input)
	3	FE
	4	24 V (for control/input)
	5	24 V (for output)

SMC

Dimensions

End plate (D side)
EX600-ED4/5

(4.4) 26 5.5
20.5

Power supply connector
PWR IN

8

106
90

PWR OUT

Power supply connector
PWR OUT

FE terminal

(86.6)
73.6
56.6
30.2
13.2
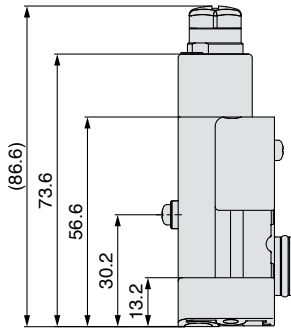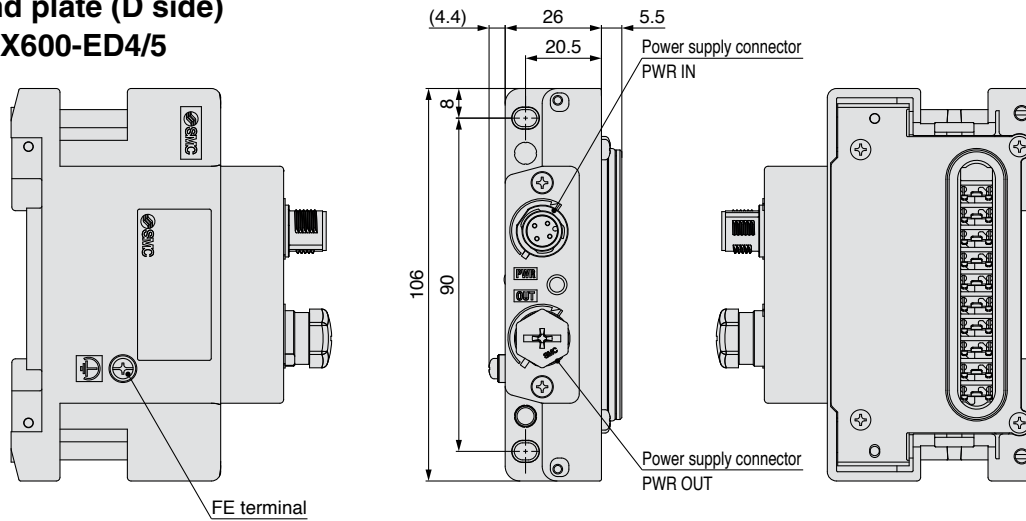
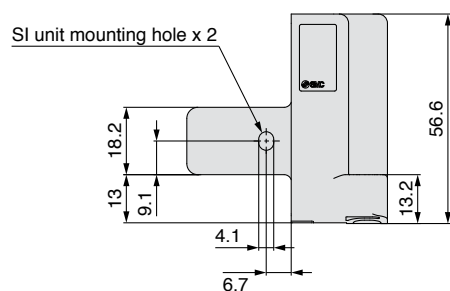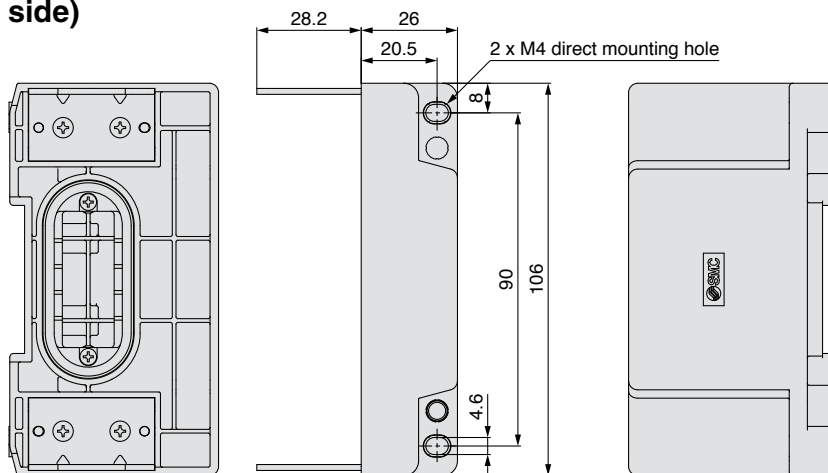**Power supply connector PWR IN: M12 4-pin plug, A-coded**

Configuration	EX600-ED4 (Pin arrangement 1)		EX600-ED5 (Pin arrangement 2)	
	Pin no.	Description	Pin no.	Description
3 2	**1**	24 V (for control/input)	**1**	24 V (for output)
	2	24 V (for output)	**2**	0 V (for output)
4 1	**3**	0 V (for control/input)	**3**	24 V (for control/input)
	4	0 V (for output)	**4**	0 V (for control/input)

Power supply connector PWR OUT: M12 5-pin socket, A-coded

Configuration	EX600-ED4 (Pin arrangement 1)		EX600-ED5 (Pin arrangement 2)	
	Pin no.	Description	Pin no.	Description
1 2	**1**	24 V (for control/input)	**1**	24 V (for output)
	2	24 V (for output)	**2**	0 V (for output)
	3	0 V (for control/input)	**3**	24 V (for control/input)
4 5 3	**4**	0 V (for output)	**4**	0 V (for control/input)
	5	Unused	**5**	Unused

End plate (U side)
EX600-EU1

28.2 26
20.5

2 x M4 direct mounting hole

8

90
106

4.6

SI unit mounting hole x 2

18.2
13
9.1
4.1
6.7

56.6
13.2

EX600-W *Series*

LED Display

**Wireless base unit
EtherNet/IP™ communication
specifications**

No.	LED name	Function	Color of LED	Operation
1	PWR (V)	Power supply voltage for output (US2)	Green LED is ON.	Power supply voltage for output (US2) is normal.
			Red LED flashes.	Power supply voltage for output (US2) is abnormal. (Indication only. The product can be operated.)
			OFF	Power supply for control and input (US1) is not supplied.
2	NS	EtherNet/IP™ connection status	Green LED is ON.	EtherNet/IP™ communication is established.
			Green LED flashes.	EtherNet/IP™ communication is not established.
			Red LED flashes.	EtherNet/IP™ communication time out
			Red LED is ON.	Duplicated IP addresses are detected.
			OFF	IP address not set
3	MS	Wireless base module system status	Green LED is ON.	Wireless base module is normal.
			Green LED flashes.	EtherNet/IP™ communication is not connected.
			Red LED flashes.	Restorable error is detected. (LED flashes when one diagnostic information item or more is detected.) · Abnormal power supply voltage level for control and input · Excessive I/O setting inputs/outputs · Analog I/O upper set limit exceeded · Analog I/O upper and lower limit exceeded · Abnormal number of remote connections · Error in communication between units · EX600 I/O unit detects diagnostic information · Valve diagnostic information detected
			Red LED is ON.	Non-restorable error is detected. (e.g. Hardware failure)
			OFF	Power supply for control and input (US1) is not supplied.
4	W-SS	Radio wave receiving intensity (For communication from wireless remote to wireless base)	Green LED is ON.	Received power level of all remotes is 3.
			Green LED flashes. (1 Hz)	There are connected remotes with received power level 2.
			Green LED flashes. (2 Hz)	There are connected remotes with received power level 1.
			Red LED flashes.	No wireless remotes connected.
			OFF	Wireless remote unit is not registered.
5	W-NS	Wireless communication connection status	Green LED is ON.	All wireless remote units are connected correctly.
			Green LED flashes.	There are unconnected wireless remote units.
			Red LED flashes.	All wireless remote units are unconnected.
			Red LED is ON.	All wireless remote units are unconnected. (Non-restorable error in wireless communication)
			Red/Green	Wireless communication connection is under construction. (Pairing)
			Orange LED is ON.	Forced output mode
			OFF	Wireless remote unit is not registered.
6	W-MS	Wireless remote module connection system status	Green LED is ON.	Wireless remote module is normal.
			Red LED flashes.	Restorable error is detected. (LED flashes when one diagnostic information item or more is detected.) · Abnormal power supply voltage level for control and input (US1) · Abnormal power supply voltage level for output (US2) · Excessive I/O setting inputs/outputs · Analog I/O upper set limit exceeded · Analog I/O upper and lower limit exceeded · Error in communication between units · EX600 I/O unit detects diagnostic information · Valve diagnostic information detected
			Red LED is ON.	Non-restorable error is detected. (e.g. Hardware failure)
			OFF	No wireless remote unit connected.
7	LINK/ACT1 LINK/ACT2	Communication status of EtherNet/IP™ ports 1 and 2 100 Mbps: Green 10 Mbps: Orange	Green LED is ON.	Link, No Activity (100 Mbps)
			Green LED flashes.	Link, Activity (100 Mbps)
			Orange LED is ON.	Link, No Activity (10 Mbps)
			Orange LED flashes.	Link, Activity (10 Mbps)
			Red LED is ON.	IP address has been duplicated.
			OFF	EtherNet/IP™ is not connected.

SMC

LED Display

Wireless remote unit

No.	LED name	Function	Color of LED	Operation
1	PWR (V)	Power supply voltage for output (US2)	Green LED is ON.	Power supply voltage for output (US2) is normal.
			Red LED flashes.	Power supply voltage for output (US2) is abnormal. (Indication only. The product can be operated.)
			OFF	Power supply for control and input (US1) is not supplied.
2	MS	Wireless remote module system status	Green LED is ON.	Wireless remote module is normal.
			Red LED flashes.	Restorable error is detected. (LED flashes when one diagnostic information item or more is detected.) · Abnormal power supply voltage level for control and input · Excessive I/O setting inputs/outputs · Analog I/O upper set limit exceeded · Analog I/O upper and lower limit exceeded · Error in communication between units · EX600 I/O unit detects diagnostic information · Valve diagnostic information detected
			Red LED is ON.	Non-restorable error is detected. (e.g. Hardware failure)
			OFF	Power supply for control and input (US1) is not supplied.
3	W-SS	Radio wave receiving intensity (Communication from wireless base to wireless remote)	Green LED is ON.	Received power level is 3.
			Green LED flashes. (1 Hz)	Received power level is 2.
			Green LED flashes. (2 Hz)	Received power level is 1.
			Red LED flashes.	Wireless communication is not connected.
			OFF	Wireless base unit is not registered.
4	W-NS	Wireless communication connection status	Green LED is ON	Wireless remote is connected correctly.
			Red LED flashes.	No wireless remotes connected.
			Red LED is ON.	No wireless remotes connected (Non-restorable error in wireless communication)
			Red/Green	Wireless communication connection is under construction. (Pairing)
			Orange LED is ON.	Forced output mode
			OFF	Wireless base unit is not registered.

⑦ **Power supply cable with connector**

⑥ **Communication cable with connector**

④ **Seal cap (M8)**

⑤ **Marker**

② **Valve plate**

⑧ **Power supply cable (7/8 inch connector)**

④ **Seal cap (M12)**

③ **Reinforcing brace (for direct mounting)**

③ **Reinforcing brace (for DIN rail mounting)**

① **End plate bracket**

⑧ **Power supply field wireable connector (7/8 inch)**

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 the 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 the 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.
∗ Be sure to attach this bracket to prevent connection failure between the units caused by deflection.

For direct mounting
EX600-ZMB1

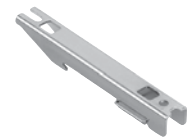**Enclosed parts**
Round head screw (M4 x 5)   2 pcs.

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.

For M8
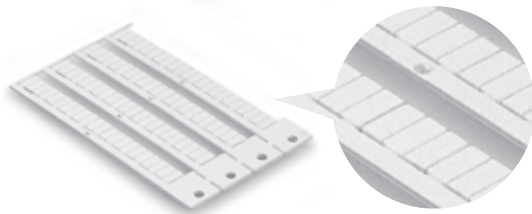### EX9-AWES

For M12
EX9-AWTS

SMC

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

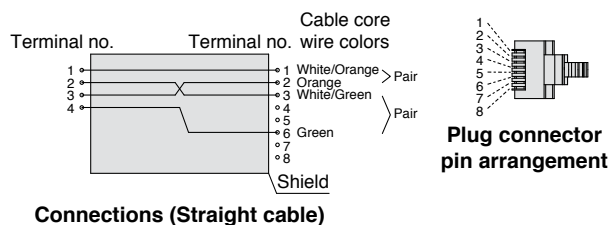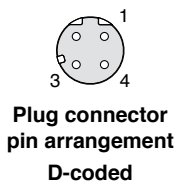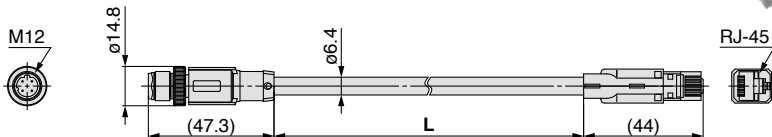## ❻ Communication Cable with Connector/Communication Connector

Cable with M12 ↔ RJ-45 connector

EX9-AC 020 EN-PSRJ (Plug/RJ-45 connector)

● **Cable length (L)**

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

M12

ø14.8 ø6.4 RJ-45

(47.3) **L** (44)

Plug connector pin arrangement D-coded

Terminal no. Terminal no. Cable core wire colors

1 White/Orange ⟩ Pair
2 Orange
3 White/Green ⟩ Pair
4
5
6 Green
7
8
Shield

Plug connector pin arrangement

Connections (Straight cable)

Item	Specifications
Cable O.D.	ø6.4 mm
Nominal cross section	0.14 mm²/AWG26
Wire diameter	0.98 mm
Min. bending radius	26 mm (Fixed)

Cable with connector

PCA-1446566 (Plug)

ø14.8 47.3 5000 50

M12 SPEEDCON (ø6.5)

Plug connector pin arrangement D-coded

Terminal no. Wire guide colors

1 —— Yellow: TD+
2 —— White: RD+
3 —— Orange: TD–
4 —— Blue: RD–
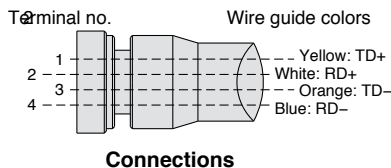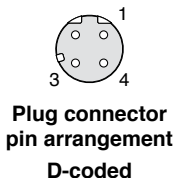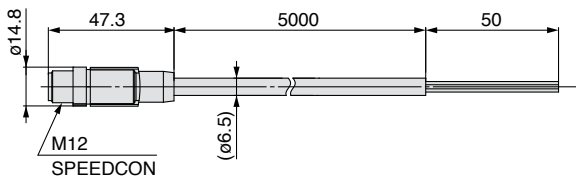
Connections

Item	Specifications
Cable O.D.	ø6.5 mm
Nominal cross section	AWG22
Wire diameter (Including insulator)	1.5 mm
Min. bending radius	45.5 mm

Field wireable connector

PCA-1446553

≈ 61 ø17.5

ø19 M12 Width across flats 16 Width across flats 13

Plug pin arrangement D-coded
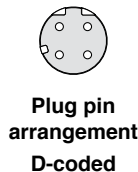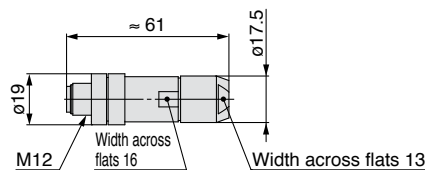
Terminal no.	Wire guide colors
1	Orange/White
2	Green/White
3	Orange
4	Green

Applicable Cable

Cable O.D.	4.0 to 8.0 mm
Wire gauge (Stranded wire cross section)	0.14 to 0.34 mm²/AWG26 to 22

∗ The table above shows the specifications for the applicable cable. Adaptation for the connector may vary on account of the conductor construction of the electric wire.

EX600-W Series

❼ Power Supply Cable with M12 Connector (A-coded)

EX500-AP 050 - S

Cable length (L)

010	1000 mm
050	5000 mm

Connector specification

S	Straight
A	Angle

Straight connector type

5 1 2
4 3
M12
ø14.9
ø6
27
40.7
30
5
50
L

**Socket connector
pin arrangement
A-coded
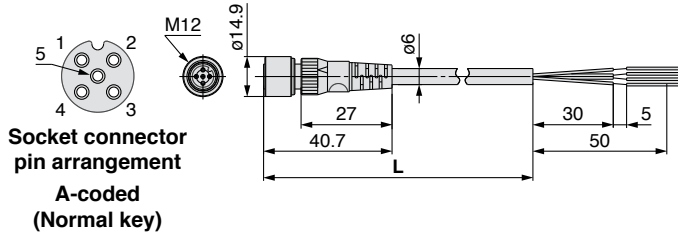(Normal key)**

Item	Specifications
Cable O.D.	ø6 mm
Nominal cross section	0.3 mm²/AWG22
Wire diameter (Including insulator)	1.5 mm
Min. bending radius	40 mm (Fixed)

Angle connector type
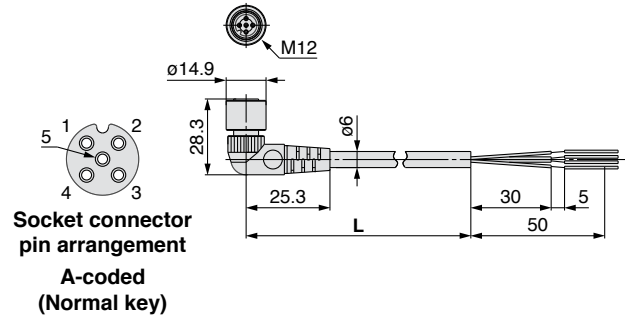
5 1 2
4 3
M12
ø14.9
28.3
ø6
25.3
L
30
5
50

**Socket connector
pin arrangement
A-coded
(Normal key)**

Item	Specifications
Cable O.D.	ø6 mm
Nominal cross section	0.3 mm²/AWG22
Wire diameter (Including insulator)	1.5 mm
Min. bending radius	40 mm (Fixed)

Terminal no.   Cable core wire colors
1 — Brown
2 — White
3 — Blue
4 — Black
5 — Gray

Connections
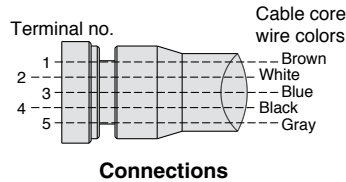
SPEEDCON

PCA- 1401804

Cable length (L)

1401804	1500 mm
1401805	3000 mm
1401806	5000 mm

5 1 2
4 3
ø14.8
44.5
L
50
M12
SPEEDCON
ø5

**Socket connector
pin arrangement
A-coded
(Normal key)**
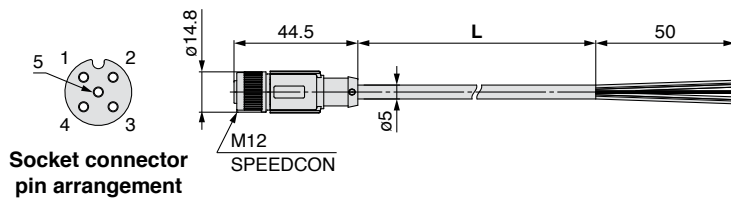
Item	Specifications
Cable O.D.	ø5 mm
Nominal cross section	0.3 mm²/AWG22
Wire diameter (Including insulator)	1.27 mm
Min. bending radius	21.7 mm (Fixed)

Terminal no.   Cable core wire colors
1 — Brown
2 — White
3 — Blue
4 — Black
5 — Green/Yellow
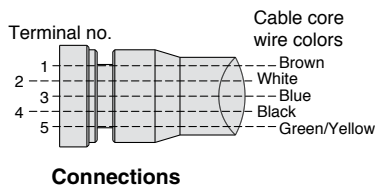
Connections

PCA- 1557769

Cable length (L)

1557769	3000 mm

ø14.8
44
L
46.8
ø14.8
M12
SPEEDCON
ø4.7
M12
SPEEDCON

1 2
4 3

1 — 1
2 — 2
3 — 3
4 — 4

2 1
3 4

**Socket connector
pin arrangement
A-coded
(Normal key)**

Connections

**Plug connector
pin arrangement
A-coded
(Normal key)**

SMC
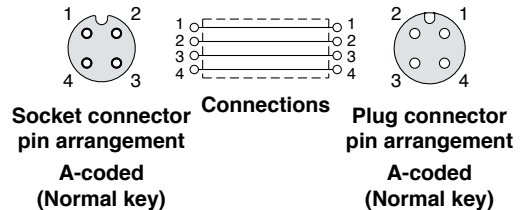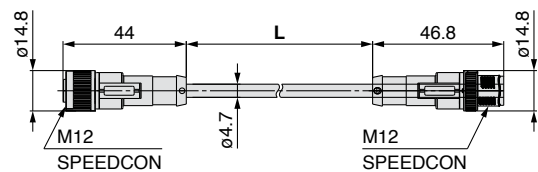
❼ **Power Supply Cable with M12 Connector (B-coded)**

SPEEDCON

PCA- 1564927

● **Socket specification, Cable length (L)**

1564927	Straight 2 m
1564930	Straight 6 m
1564943	Angle 2 m
1564969	Angle 6 m

Straight connector type

ø14.8 | 44.5 | L | 50

ø5.9

M12
SPEEDCON

**Socket connector
pin arrangement
B-coded
(Reverse key)**

Terminal no. — Cable core wire colors

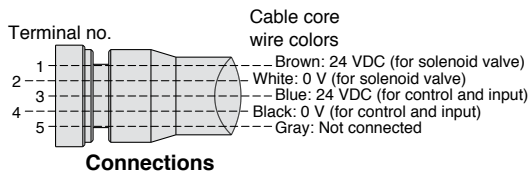1 — Brown: 24 VDC (for solenoid valve)
2 — White: 0 V (for solenoid valve)
3 — Blue: 24 VDC (for control and input)
4 — Black: 0 V (for control and input)
5 — Gray: Not connected

Connections

Angle connector type

36.3 | L | 50

28

ø5.9

M12
SPEEDCON

ø14.8

**Socket connector
pin arrangement
B-coded
(Reverse key)**

Terminal no. — Cable core wire colors

1 — Brown: 24 VDC (for solenoid valve)
2 — White: 0 V (for solenoid valve)
3 — Blue: 24 VDC (for control and input)
4 — Black: 0 V (for control and input)
5 — Gray: Not connected

Connections

EX600-W Series

❽ Power Supply Cable with 7/8 Inch Connector/Power Supply Connector

PCA- 1558810

● **Specifications**

Symbol	Cable length (L)	Connector specification
1558810	2000	Straight
1558823	6000	Straight
1558836	2000	Right angle
1558849	6000	Right angle

Straight connector type

49.9
36
L
ø26
ø7/8"
ø12.58
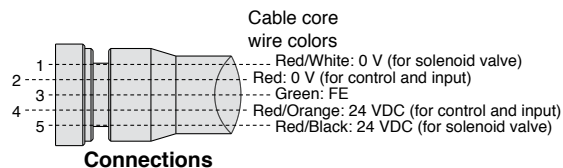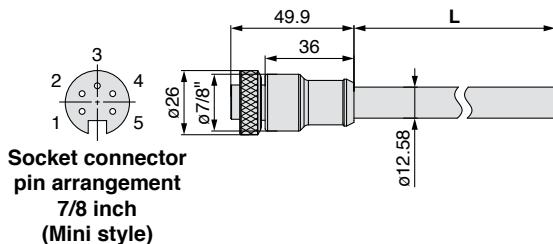
Socket connector pin arrangement 7/8 inch (Mini style)

Cable core wire colors

1 — Red/White: 0 V (for solenoid valve)
2 — Red: 0 V (for control and input)
3 — Green: FE
4 — Red/Orange: 24 VDC (for control and input)
5 — Red/Black: 24 VDC (for solenoid valve)

Connections

Angle connector type

53
L
26.5
40.4
ø7/8"
ø26
ø12.58

Socket connector pin arrangement 7/8 inch (Mini style)

Cable core wire colors

1 — Red/White: 0 V (for solenoid valve)
2 — Red: 0 V (for control and input)
3 — Green: FE
4 — Red/Orange: 24 VDC (for control and input)
5 — Red/Black: 24 VDC (for solenoid valve)

Connections

Field wireable connector

PCA- 1578078

● **Specifications**

Symbol	Connector specification
1578078	Plug
1578081	Socket

≈ 86
ø27
ø27

≈ 86
ø27
ø27

Width across flats 24

Plug connector pin arrangement 7/8 inch (Mini style)

Socket connector pin arrangement 7/8 inch (Mini style)
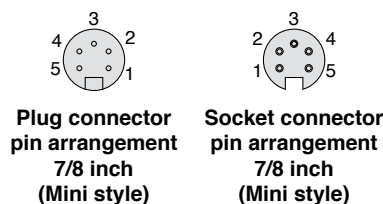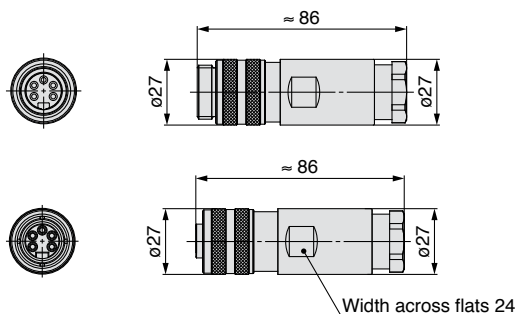
Terminal no.	Wire guide colors
1	Red/White
2	Red
3	Green
4	Red/Orange
5	Red/Black

Applicable Cable

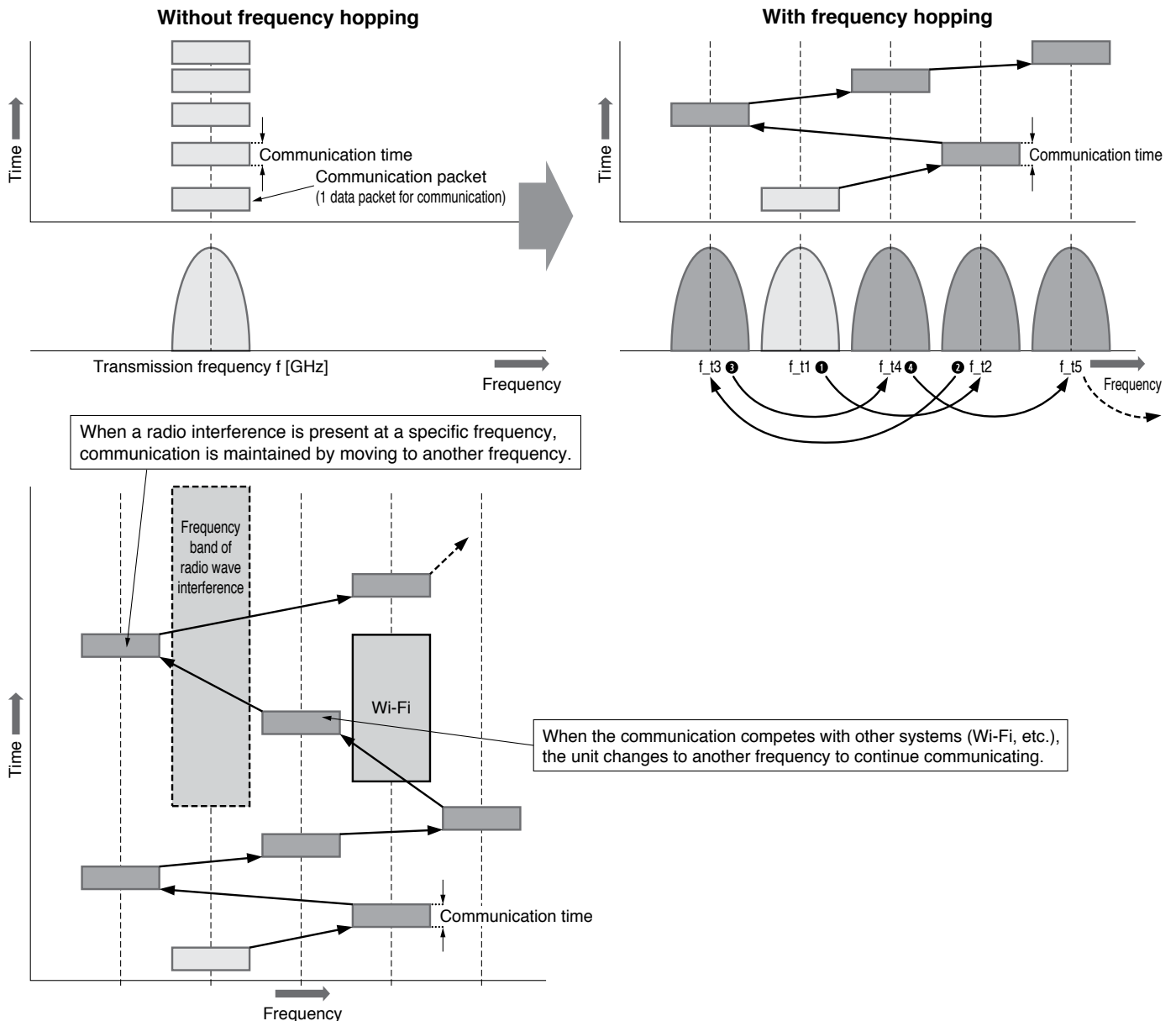|	
Cable O.D.	12.0 to 14.0 mm
Wire gauge (Stranded wire cross section)	0.34 to 1.5 mm^2/AWG22 to 16

∗ The table above shows the specifications for the applicable cable. Adaptation for the connector may vary on account of the conductor construction of the electric wire.

∗ For further information on cables and connectors, refer to the M8/M12 connector PCA series in the **Web Catalog**.

SMC

EX600-W Series
Technical Data

Frequency Hopping (FHSS: Frequency Hopping Spread Spectrum)

A communication technology that uses spread spectrum transmission with frequency hopping to rapidly switch the frequency. Because the frequency rapidly changes all the time, this communication method is resistant to radio wave interference due to reflections or noise from other wireless equipment, while ensuring a high level of data security. Multiple systems can be installed in the same area, and it is a suitable technology for point-to-multipoint communication.

Without frequency hopping

Time

Communication time

Communication packet
(1 data packet for communication)

Transmission frequency f [GHz]

Frequency

With frequency hopping

Time

Communication time

f_t3 ❸   f_t1 ❶   f_t4 ❹   ❷ f_t2   f_t5

Frequency

When a radio interference is present at a specific frequency, communication is maintained by moving to another frequency.

Frequency band of radio wave interference

Wi-Fi

When the communication competes with other systems (Wi-Fi, etc.), the unit changes to another frequency to continue communicating.

Time

Communication time

Frequency

<Important>
- The product is certified as a wireless equipment in accordance with the Radio Act and the certificate of Technical Standard Conformity has been obtained. Customers do not need to apply for a license to use this equipment.
  Be sure to comply with the following precautions.
  · Do not disassemble or modify the product. Disassembly and modification are prohibited by law.
  · This product is for use in Japan, European countries (Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, U.K., Turkey), and the U.S. For use in other countries, please contact SMC.
- This product communicates by radio waves, and the communication may stop instantaneously due to ambient environments and operating methods. SMC will not be responsible for any secondary failure which may cause an accident or damage to other devices or equipment.
- When several units are installed closely to each other, slight interference may occur due to the characteristics of the wireless product.
- Do not use this product close to any equipment which may cause malfunction due to radio waves from this product.
- The communication performance is affected by the ambient environment, so please perform the communication testing before use.

SMC

<table>
<tr><td colspan="2">

⚠ **Safety Instructions**

</td><td>

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

</td></tr>
</table>

⚠ **Caution:**	**Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
⚠ **Warning:**	**Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
⚠ **Danger :**	**Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

∗1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
　　 ISO 4413: Hydraulic fluid power – General rules relating to systems.
　　 IEC 60204-1: Safety of machinery – Electrical equipment of machines.
　　　　　　　　　 (Part 1: General requirements)
　　 ISO 10218-1: Manipulating industrial robots – Safety.
　　 etc.

⚠Warning

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

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

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

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

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

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

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

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

⚠Caution

1. The product is provided for use in manufacturing industries.

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

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".
Read and accept them before using the product.

Limited warranty and Disclaimer

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

　∗2) **Vacuum pads are excluded from this 1 year warranty.**
　　　 A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
　　　 Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

⚠Caution

SMC products are not intended for use as instruments for legal metrology.
Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

⚠ **Safety Instructions** | Be sure to read the "Handling Precautions for SMC Products" (M-E03-3) and "Operation Manual" before use.

XT-RRD-5M

⧉SMC