



### Compatible Protocols

CC-Link DeviceNet

PROFI  
BUS

Made to Order, refer to [www.smcworld.com](http://www.smcworld.com)

EtherNet/IP PROFIBUS  
NET-D

## Gateway System

# Serial Transmission System

## Series EX510

**MAX 128** points (Input **64** points/Output **64** points)



- An output unit is added.
- Applicable valve manifold series are expanded.  
(The SY (plug-in) / SJ / SZ / SQ / VQ series are added.)

# Gateway System

## Compatible Protocols

CC-Link DeviceNet

PROFI BUS

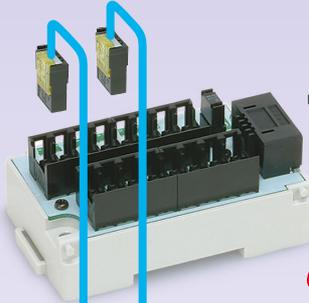
Made to Order, refer to [www.smcworld.com](http://www.smcworld.com)

EtherNet/IP PROFIBUS NET



\* Input units with covers

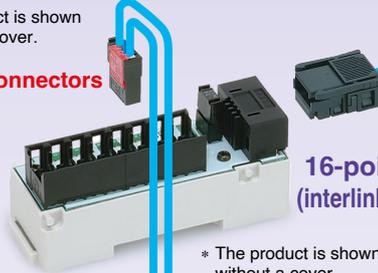
## e-CON connectors



16-point input unit  
(interlinks 16 connectors)

\* The product is shown without a cover.

## e-CON connectors

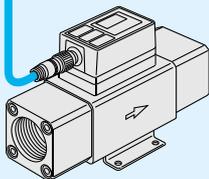


16-point input unit  
(interlinks 8 connectors)

\* The product is shown without a cover.

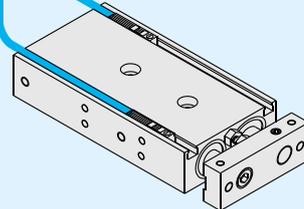


Pressure switch



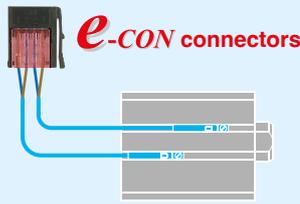
Flow switch

Input device



Auto switch

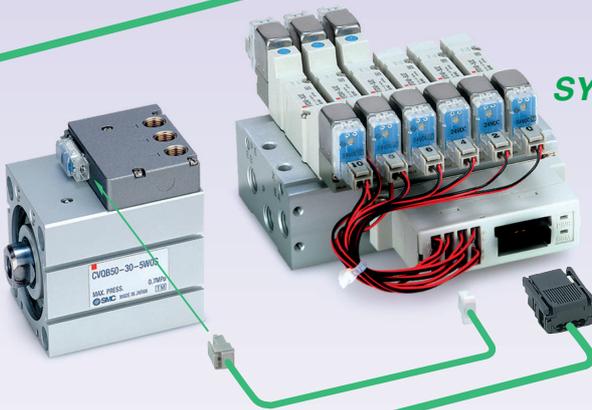
Two 2-wire auto switches can be connected to a single connector.



## e-CON connectors

# transmission System *Series EX510*

Manifold valve  
with SI unit



Output unit



## Output equipment

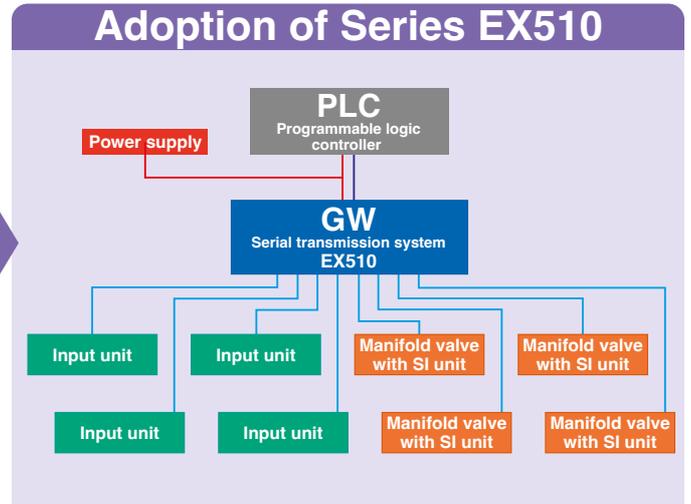
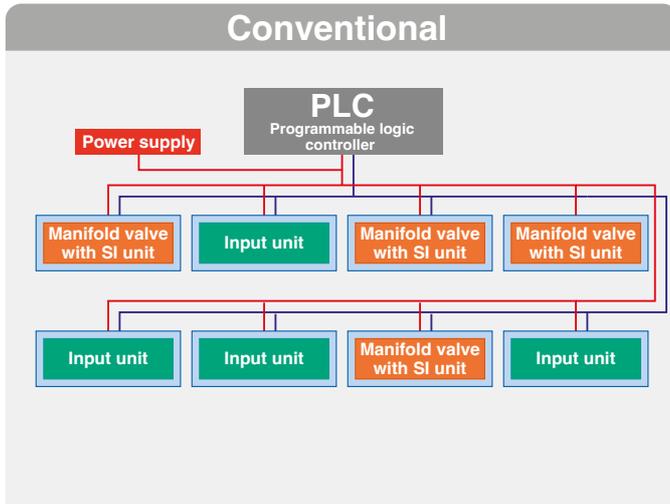
Valve, indicator light, relay, buzzer, etc.  
can be connected.



2 port  
solenoid valve



# Features of Series EX510



## Feature 1 More valves & sensors can be connected.

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

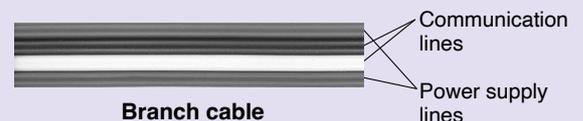
- The introduction of the EX510 series makes it possible to connect more valves and sensors.

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

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

- A power supply cable for each I/O unit was required in the past.

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



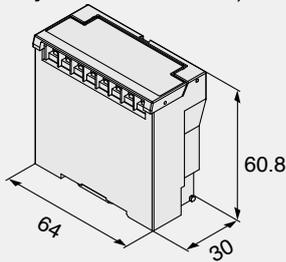
## Feature 3 There is no need to set the address for the SI and input units.

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

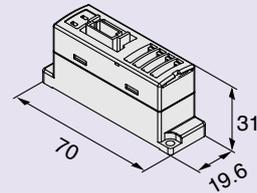
- With the introduction of the EX510 series only the address of the GW unit needs to be set.

## Feature 4 Compact SI unit

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



Conventional model (Series EX120)



Series EX510

## Feature 5 Can easily change to a different protocol.

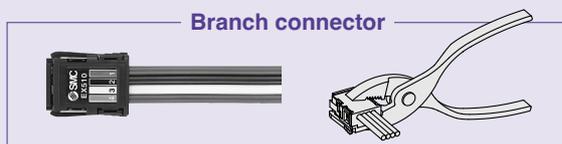
- In the past, all the part numbers of I/O units were needed to be changed by returning it to the manufacturer and reordering (re-estimate, delivery time) it.



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

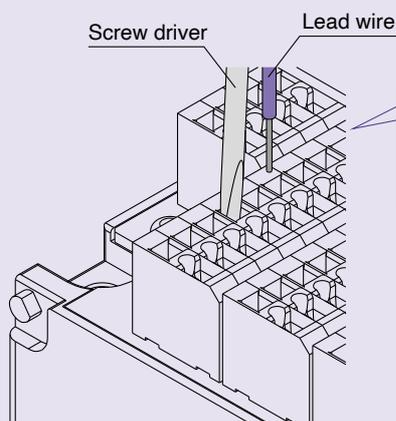
## Feature 6 Adoption of connectors which do not require any special tools for installation

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



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

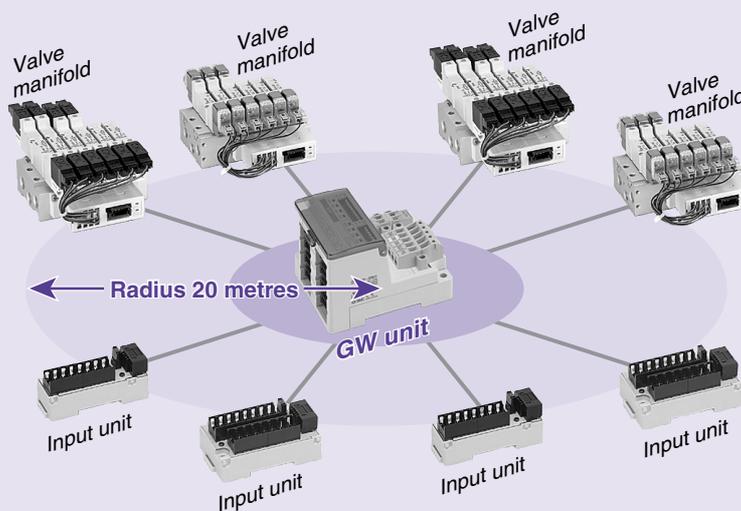
The output unit adopts a spring type terminal box, eliminating the need to tighten any retaining screws.



Torque control and crimping work is unnecessary.  
Screwless construction. No tightening of retaining screws required.

## Feature 7 Cable length of up to 20 metres is available.

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



## Feature 8 Delay in transmission of 1 ms or less

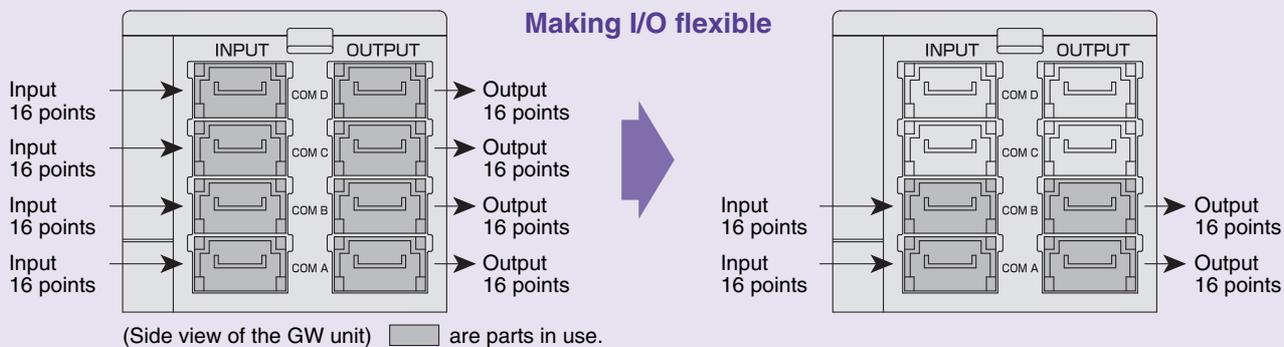
The delay in transmission between the GW unit and SI unit/Output unit/Input unit is 1 ms or less.

## Feature 9 Making I/O flexible

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

Input 64 points/Output 64 points (Initial setting)

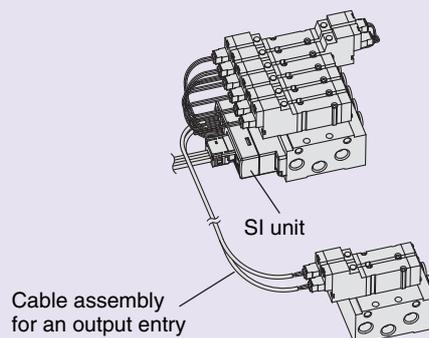
Example) Input 32 points/Output 32 points



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

## Feature 10 Effectively use the unused points of the SI unit

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

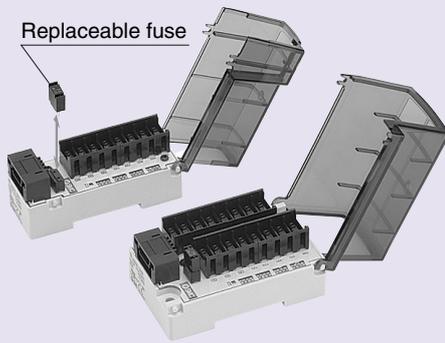


Feature **11** Protection

Each unit is protected against short circuiting from the power supply load.

The fuses for the Input / Output units are replaceable.

Short circuit protection is integrated for the SI unit.

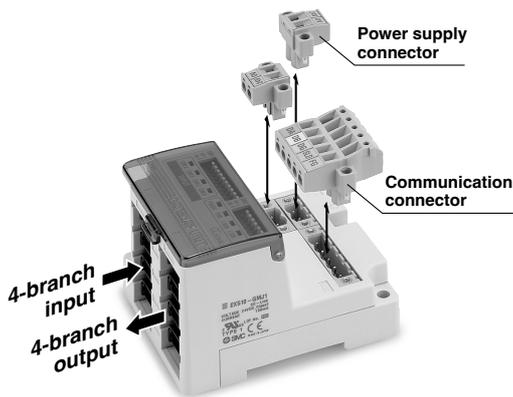


# Gateway System

## Serial Transmission System

# Series EX510

### GW Unit



### How to Order

EX510-G **MJ1**

Communication protocol

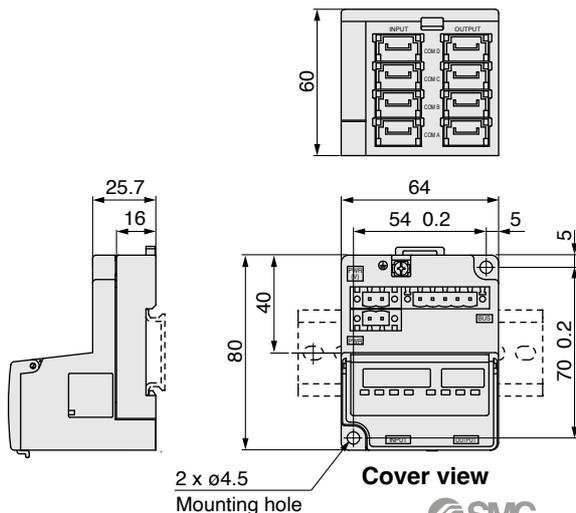
<b>MJ1</b>	CC-Link
<b>DN1</b>	DeviceNet
<b>PR1</b>	PROFIBUS-DP

### Specifications

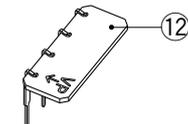
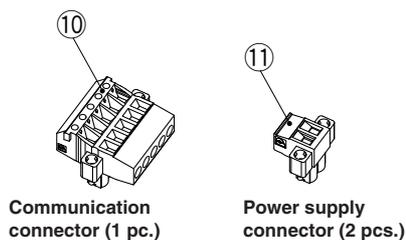
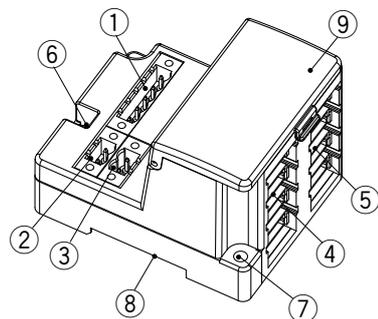
Model	EX510-GMJ1	EX510-GDN1	EX510-GPR1
<b>Communication protocol</b>	CC-Link (Ver.1.10)	DeviceNet (Release2.0)	PROFIBUS-DP (EN50170)
<b>GW type</b>	Remote device station	Group 2 Only Server	DPV0 Class 2
<b>Communication speed</b>	156/625 kbps 2.5/5/10 Mbps	125/250/500 kbps	9.6/19.2/45.45/93.75/ 187.5/500 kbps 1.5/3/6/12 Mbps
<b>Device data file</b> <small>Note 1)</small>	—	EDS file	GSD file
<b>Rated voltage</b>	24 VDC		
<b>Power supply voltage range</b>	Power supply for input and control unit for GW: 24 VDC 10% Power supply for output: 24 VDC +10%/-5% (with power drop warning at approx. 20 V)		
<b>Current consumption</b>	100 mA or less (single GW unit)		
<b>Number of inputs/outputs</b>	[Usable I/O points] • Setting to occupy 2 stations Input 32 points/Output 32 points • Setting to occupy 3 stations Input 64 points/Output 64 points * Number of occupied stations can be changed by setting a switch.	Number of inputs: Max. 64 points / Number of outputs: Max. 64 points Number of inputs/outputs can be changed respectively by setting a switch. • Number of inputs settings 0, 16, 32, 64 points • Number of outputs settings 0, 16, 32, 64 points	
<b>Number of input/output branches</b>	Input 4 branches/Output 4 branches		
<b>Branch cable</b>	4 core flat cable		
<b>Branch cable length</b>	Within 20 m		
<b>Ambient operating temperature/humidity</b>	-10 to 50C/35 to 85% RH (no condensation)		
<b>Ambient stored temperature</b>	-20 to 60C		
<b>Enclosure</b>	IP20		
<b>Applicable standards</b>	UL, CSA, CE/UKCA <small>Note 2)</small>		
<b>Weight (g)</b>	160 g (accessory included)		

Note 1) The file for using when setting the device automatically. Contact our sales representative for each file.  
Note 2) EMC directive 89/336/EEC; EN61000-6-2: 2001, EN55011: 1998+A1+A2

### Dimensions



## Parts Description



**Terminating resistor (1 pc.)**  
\* Attached to EX510-GPR1 only.

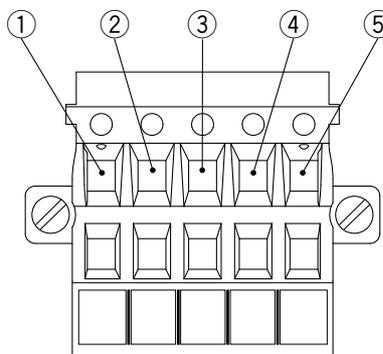
**Included accessories**

### GW Unit

No.	Description	Applications
1	<b>Communication socket (BUS)</b>	For connecting with a network, using the communication connector (⑩).
2	<b>Power supply socket (PWR(V))</b>	Supplies power for output devices, such a solenoid valve, using the power supply connector (⑪).
3	<b>Power supply socket (PWR)</b>	Supplies power for input devices, as well as the Gateway control unit, using the power supply connector (⑪).
4	<b>Branch connector (for inputs) on GW unit side</b>	Connects input units, etc., using a branch cable (EX510-FC□□).
5	<b>Branch connector (for outputs) on GW unit side</b>	Connects SI units (manifold valves) and output units, etc., using a branch cable (EX510-FC□□).
6	<b>PE terminal</b>	Used for grounding.
7	<b>Mounting hole</b>	Used for mounting the unit with two M4 screws.
8	<b>Mounting groove for DIN rail</b>	Used for mounting the unit to a DIN rail.
9	<b>Display, Switch setting part</b>	Displays the LEDs corresponding to the units condition and the switches for setting the address and the communication speed.
10	<b>Communication connector</b>	Used for connecting the network cable.
11	<b>Power supply connector</b>	Used for connecting the power supply cable.
12	<b>Terminating resistor</b>	Connects a terminating resistor to both end units of a transmission route.

### Communication Connector Pin Assignment

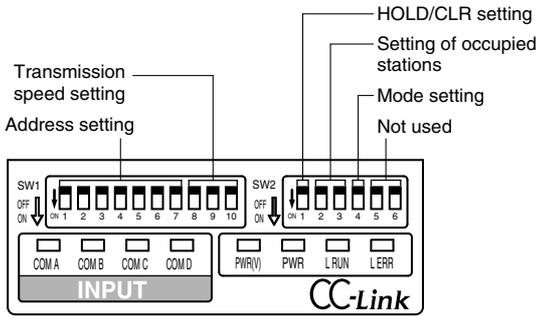
Part no.	Communication protocol	Pin assignment and the corresponding wire colour				
		①	②	③	④	⑤
<b>EX510-GMJ1</b>	CC-Link (Ver.1.10)	DA (Blue)	DB (White)	DG (Yellow)	SLD	FG
<b>EX510-GDN1</b>	DeviceNet (Release2.0)	V-(Black)	CAN_L (Blue)	Drain	CAN_H (White)	V+ (Red)
<b>EX510-GPR1</b>	PROFIBUS-DP (EN50170)	VP	RxD/TxD-N (Green)	DGND	RxD/TxD-P (Red)	SHIELD



# Series EX510

## EX510-GMJ1 (CC-Link compatible)

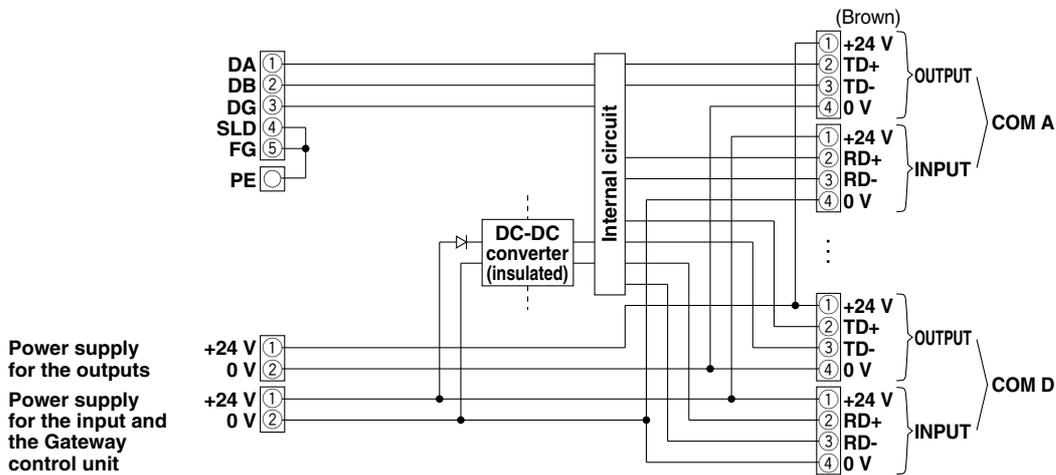
### Display Setting



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

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

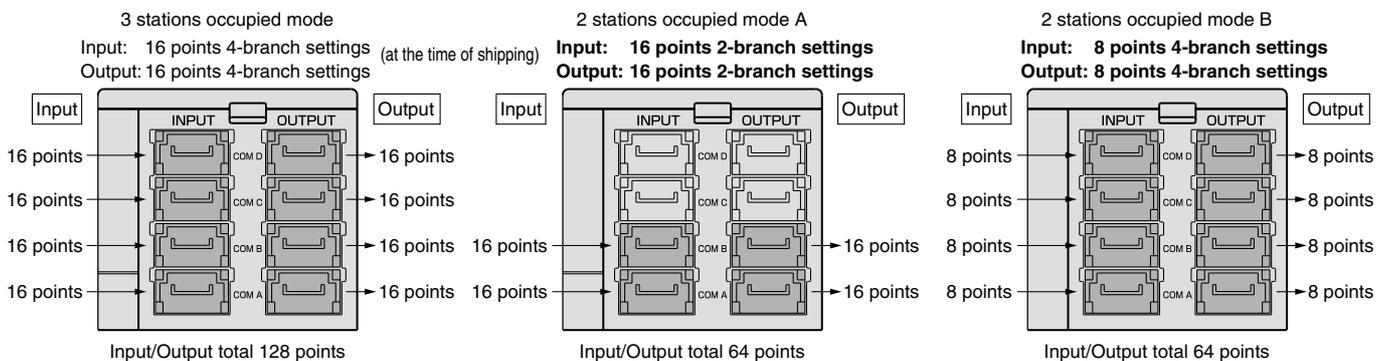
### Internal Circuit



### Examples of Flexible I/O Settings

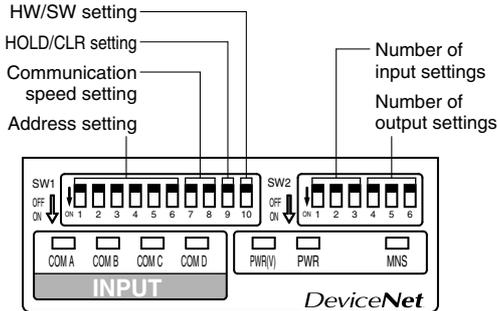
The occupying number of the Gateway units can be changed easily by setting a switch. Consult the instruction manual for details.

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



**EX510-GDN1 (DeviceNet compatible)**

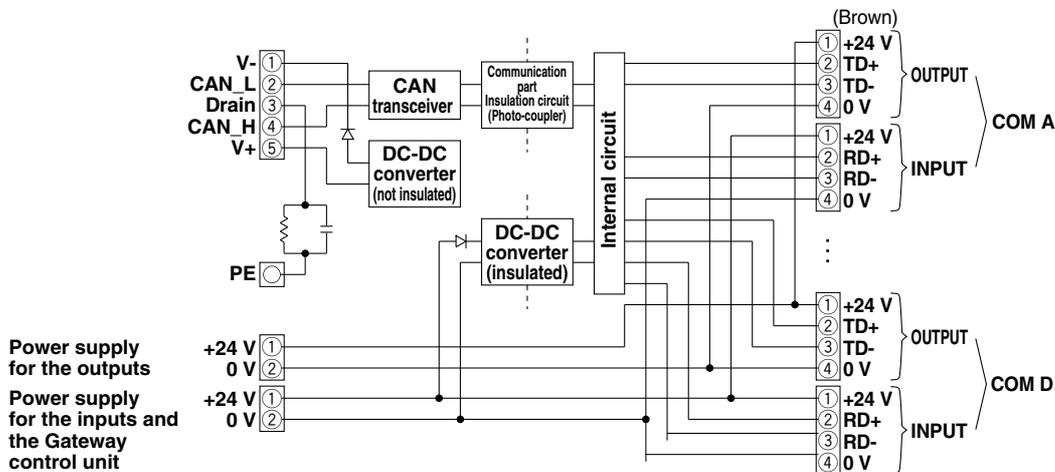
**Display Setting**



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

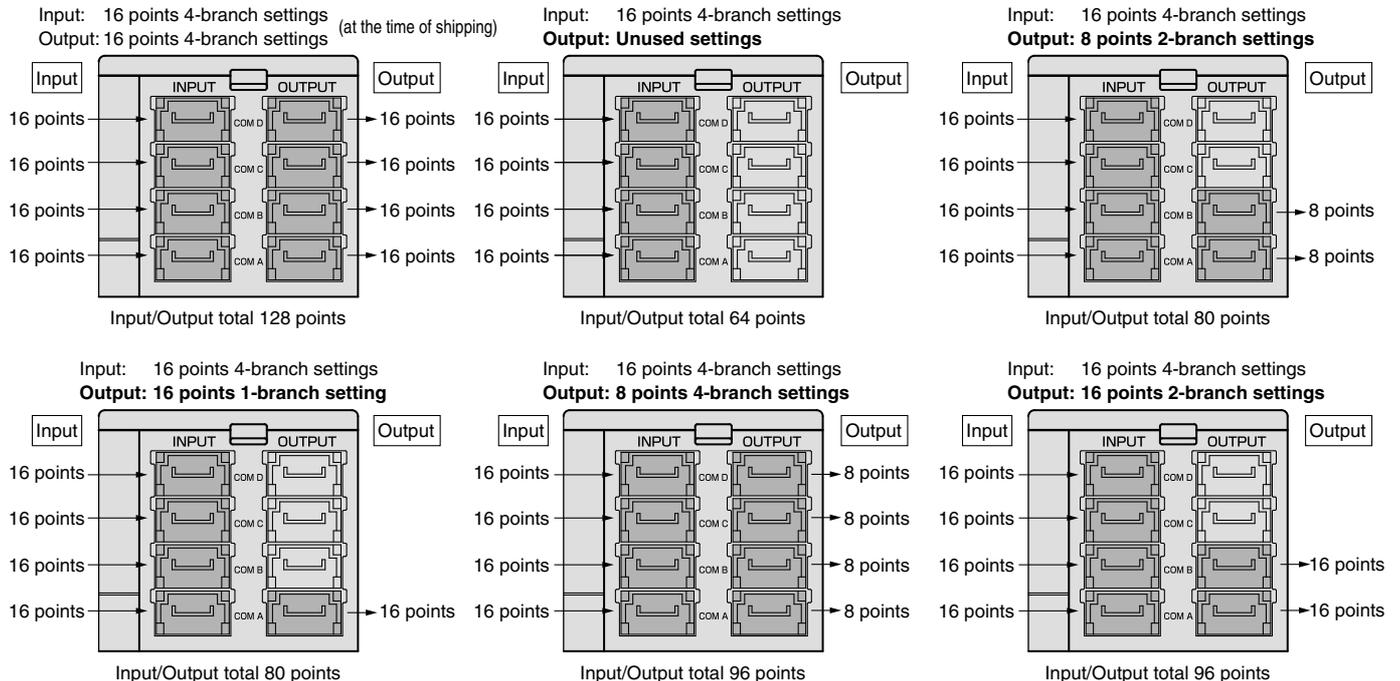
\* Input unit (Input device) is connected and will illuminate when communication is working properly.

**Internal Circuit**



**Examples of Flexible I/O Settings**

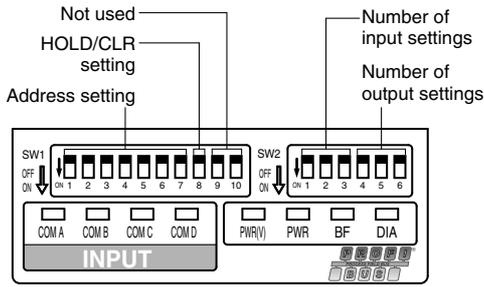
The occupying number of the Gateway units can be changed easily by setting a switch. (Side view of the Gateway unit) are parts in use. The number of occupied inputs and outputs can be set respectively. (Figures below are examples of the flexibility of setting the output occupied numbers.) Consult the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



# Series EX510

## EX510-GPR1 (PROFIBUS-DP compatible)

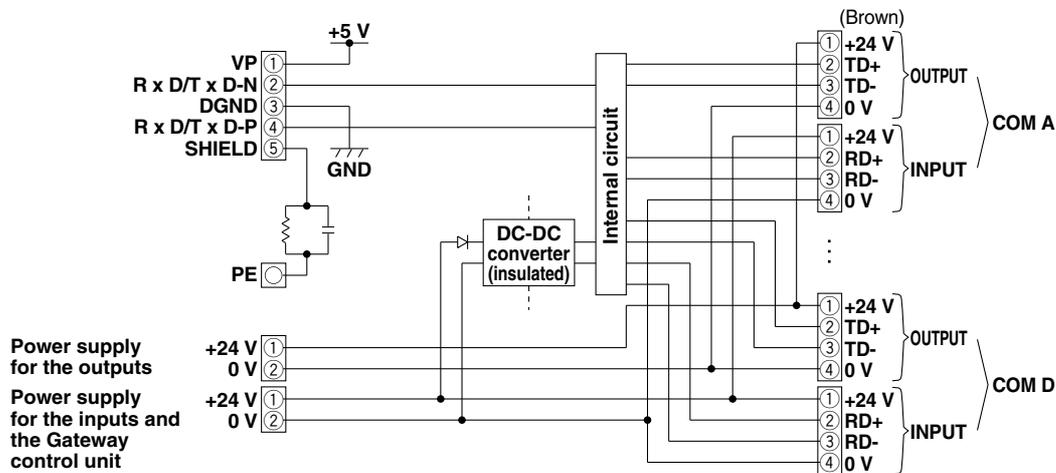
### Display Setting



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

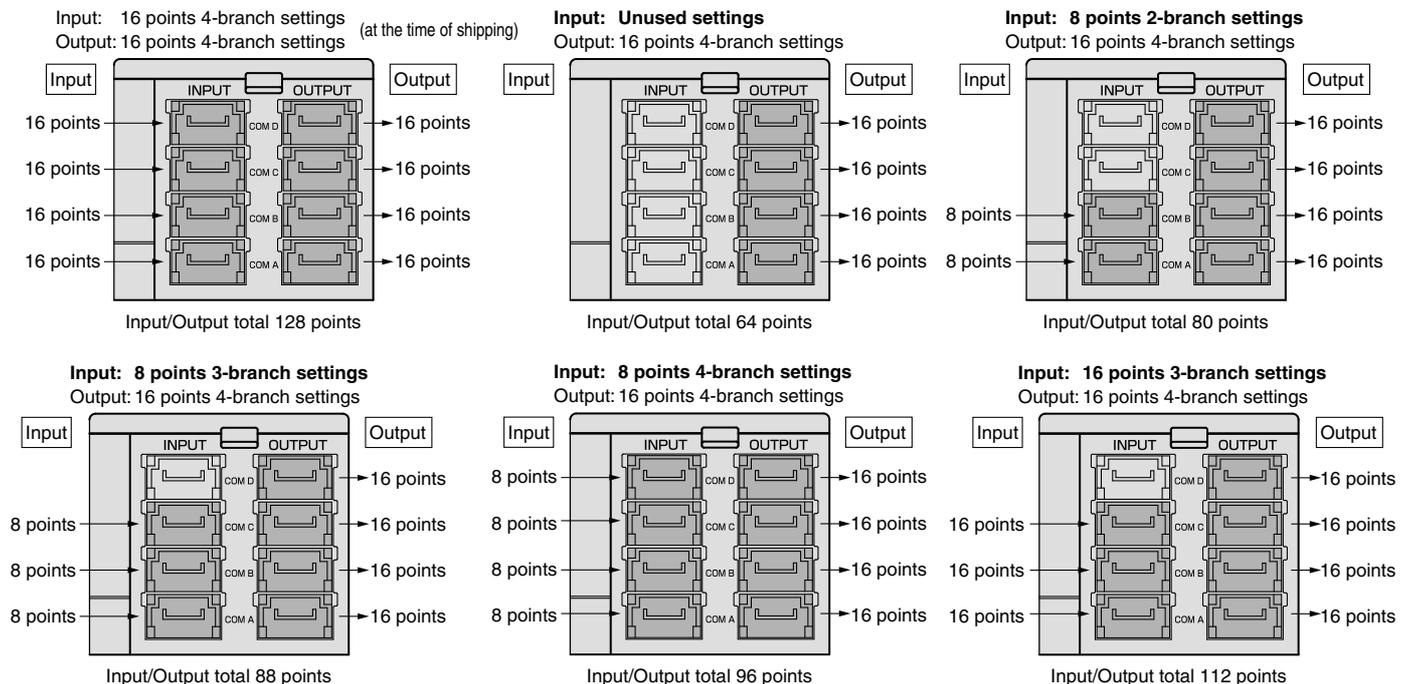
\* Input unit (Input device) is connected will illuminate when communication is working properly.

### Internal Circuit



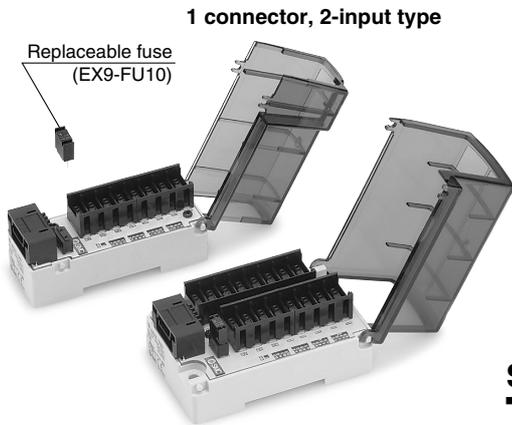
### Examples of Flexible I/O Settings

The occupying number of the Gateway units can be changed easily by setting a switch. (Side view of the Gateway unit) (Grey are parts in use.)  
 The number of occupied inputs and outputs can be set respectively. (Figures below are examples of the flexibility of setting the input occupied numbers.)  
 Consult the instruction manual for details.



## How to Order

### Input Unit



1 connector, 1-input type

EX510-DX **N** **1**

#### Unit type

<b>1</b>	1 connector, 2-input type
<b>2</b>	1 connector, 1-input type

#### Compliant sensor

<b>N</b>	NPN output
<b>P</b>	PNP output
<b>B</b>	2-wire type

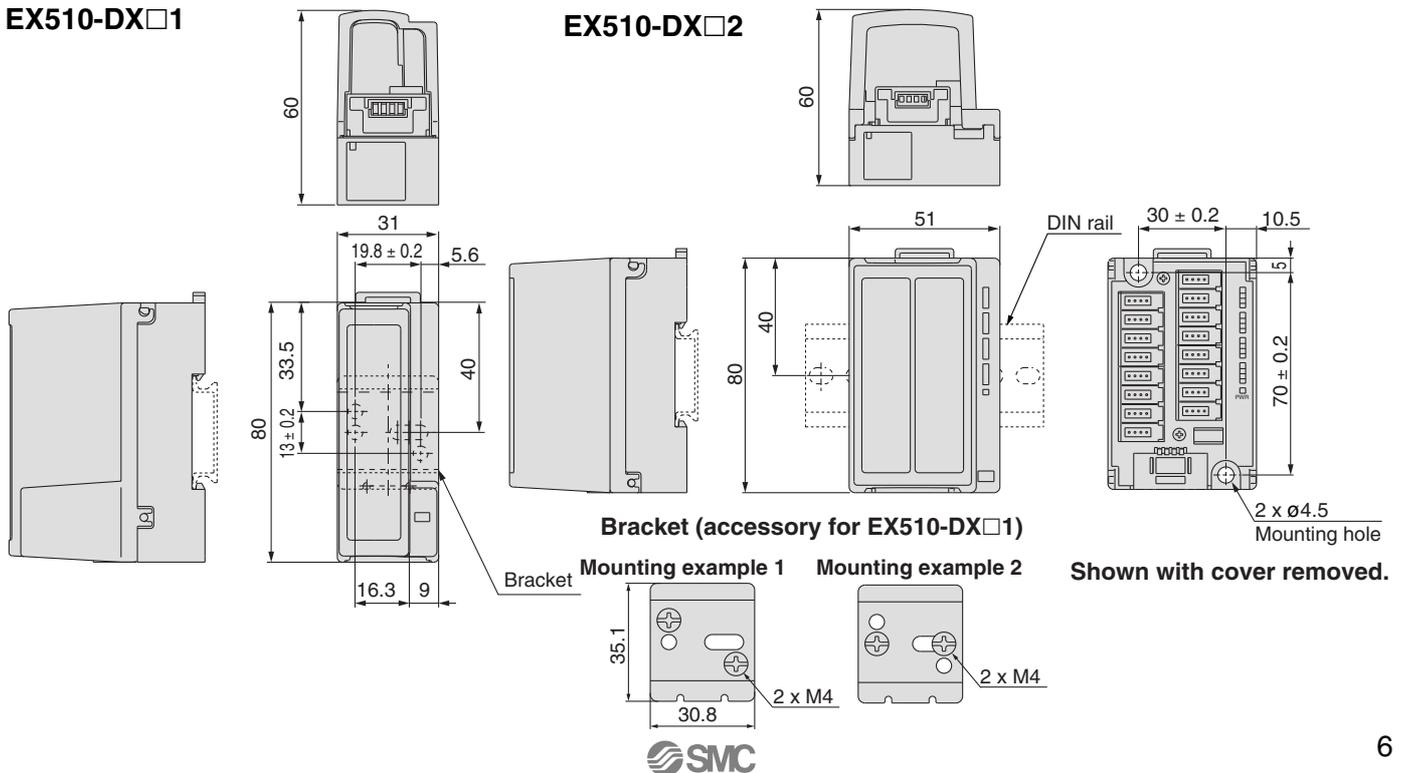
Note 1) B (2-wire type) is available with 1 connector, 2-input type only.

## Specifications

Model	EX510-DX□	EX510-DXP□, DXB1
Input type	NPN input	PNP input
Number of inputs	16 points	
Sensor supply voltage	24 VDC	
Max. sensor supply current	0.2 A/1 point, 0.9 A/1 unit	
Consumption current	100 mA (Input unit internal parts)	
Input resistance	5.6 kΩ	
Rated input current	Approx. 4 mA	
ON voltage/ON current	17 V or greater/2.5 mA or greater (Between input terminal and for sensor + 24 VDC)	17 V or greater/2.5 mA or greater (Between input terminal and for sensor 0 VDC)
OFF voltage/OFF current	7 V or less/1 mA or less (Between input terminal and for sensor + 24 VDC)	7 V or less/1 mA or less (Between input terminal and for sensor 0 VDC)
Display	Green LED (illuminated when ON)	
Weight	EX510-DX□1: 90 g EX510-DX□2: 110 g (accessories included)	

## Dimensions

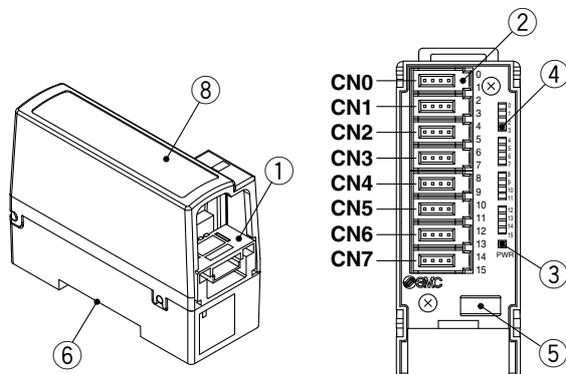
### EX510-DX□1



# Series EX510

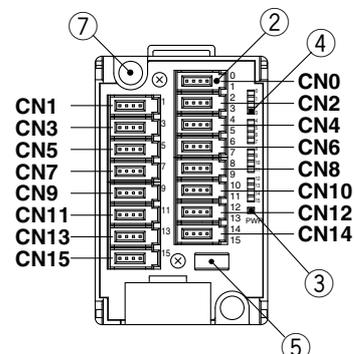
## Parts Description

### EX510-DX□1



Shown with cover removed.

### EX510-DX□2

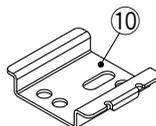


Shown with cover removed.

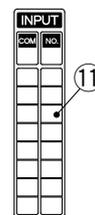
### Included accessories



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



Bracket  
\* Attached to  
EX510-DX□1 only



Marker label

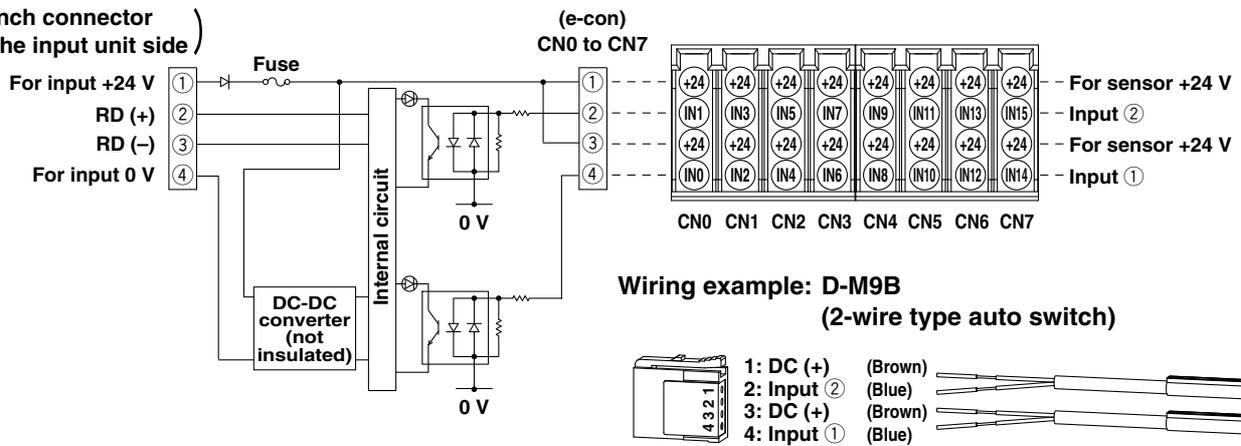
### Input Unit

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

## Internal Circuits and Wiring Examples

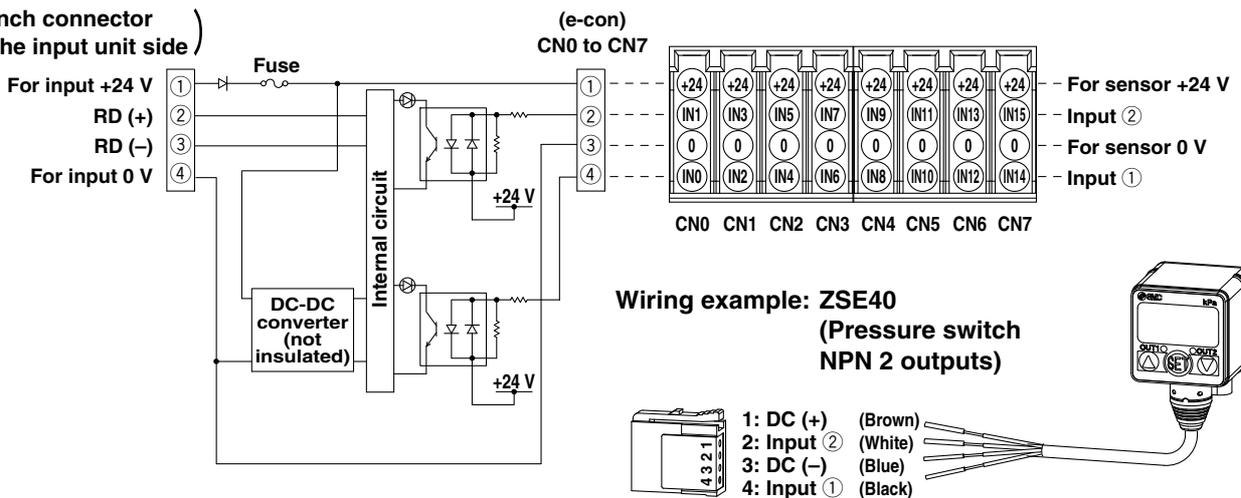
### • EX510-DXB1 ... 2-wire type input unit (1 connector, 2-input type)

(Branch connector on the input unit side)



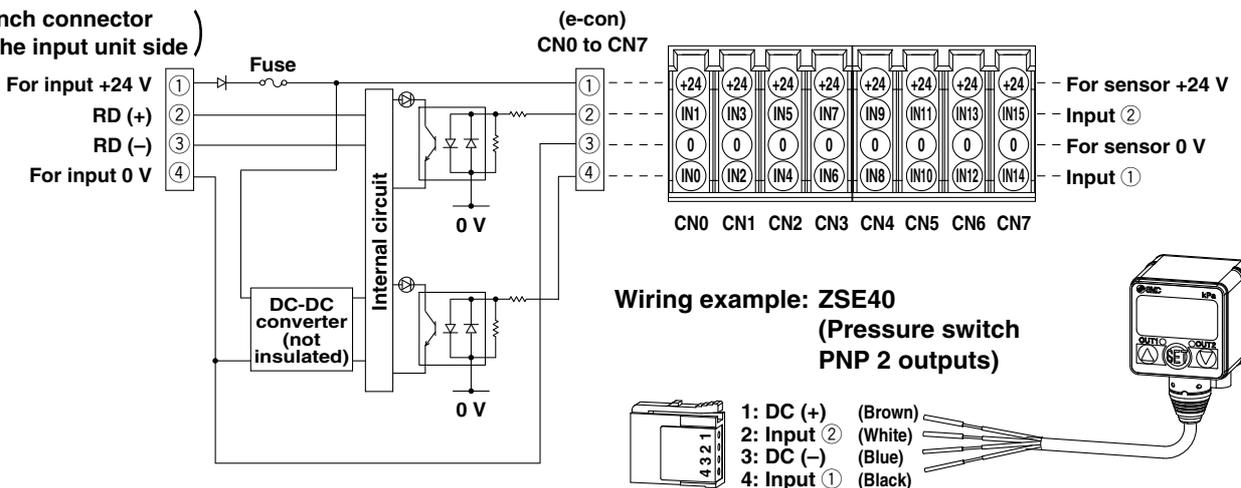
### • EX510-DXN1 ... Input unit for NPN (1 connector, 2-input type)

(Branch connector on the input unit side)



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

(Branch connector on the input unit side)

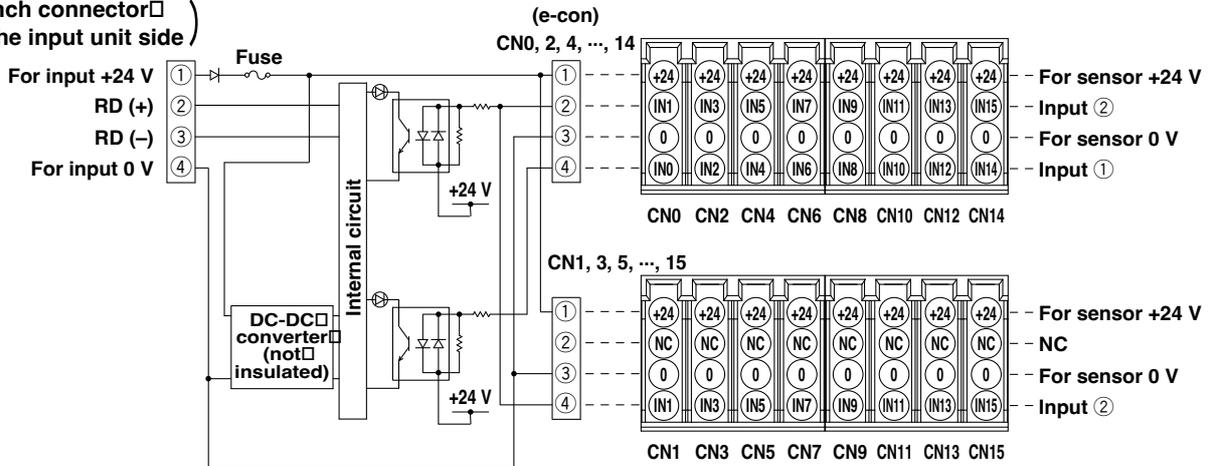


# Series EX510

## Internal Circuits and Wiring Examples

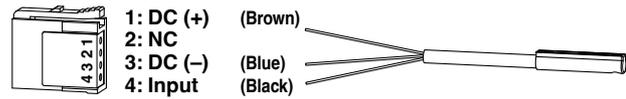
### • EX510-DXN2 ... Input unit for NPN (1 connector, 1 input type)

(Branch connector □  
on the input unit side)



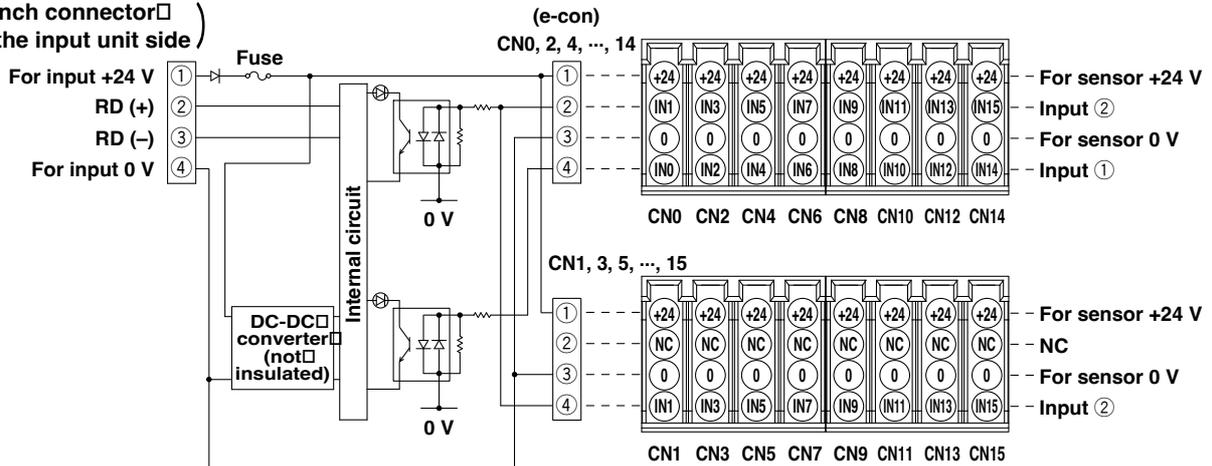
#### Wiring example: □D-M9N□

□ (3-wire type auto switch, NPN output)



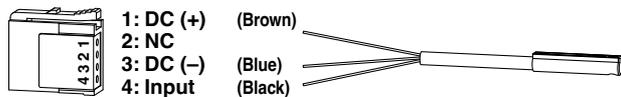
### • EX510-DXP2 ... Input unit for PNP (1 connector, 1 input type)

(Branch connector □  
on the input unit side)

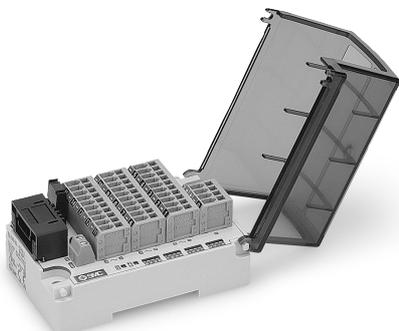


#### Wiring example: □D-M9P□

□ (3-wire type auto switch, PNP output)



**Output Unit**



**How to Order**

**EX510-DY** **P** **3**

• **Connector type**

<b>3</b>	Terminal box type (Internal power supply)
<b>4</b>	Terminal box type (External power supply)

• **Output specification**

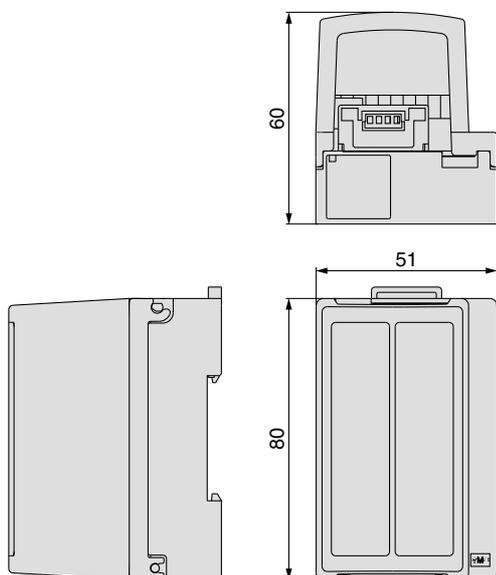
<b>N</b>	NPN output
<b>P</b>	PNP output

**Specifications**

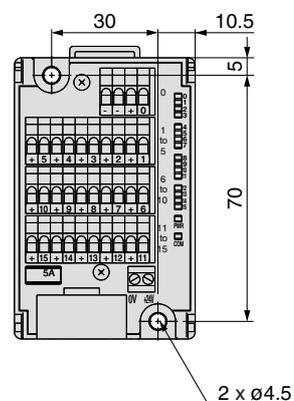
Model	EX510-DYN3	EX510-DYP3	EX510-DYN4	EX510-DYP4
<b>Output type</b>	NPN output (sink type)	PNP output (source type)	NPN output (sink type)	PNP output (source type)
<b>Rated load voltage</b>	24 VDC			
<b>Power supply type</b>	Internal power supply (supplied by GW unit)		External power supply (supplied by power supply connector)	
<b>Applicable cable for power supply connector</b>	—		0.14 to 1.5 mm <sup>2</sup> (AWG16 to 26)	
<b>Number of outputs</b>	16 points			
<b>Output connector type</b>	Spring type			
<b>Applicable cable</b>	0.08 to 1.5 mm <sup>2</sup> (AWG16 to 28)			
<b>Max. load current</b>	Meet the following 3 conditions: 1. 0.5 A or less per point 2. 1 A or less per unit 3. The total current for OUT0 to 7 must be 1 A or less. The total current for OUT8 to 15 must be 1 A or less.		Meet the following 3 conditions: 1. 0.5 A or less per point 2. 3 A or less per unit 3. The total current for OUT0 to 7 must be 1.5 A or less. The total current for OUT8 to 15 must be 1.5 A or less.	
<b>Protection</b>	Built-in short circuit protection			
<b>Current consumption</b>	50 mA or less (inside a unit)			
<b>Weight</b>	130 g (including accessories)			

**Dimensions**

EX510-DY□□



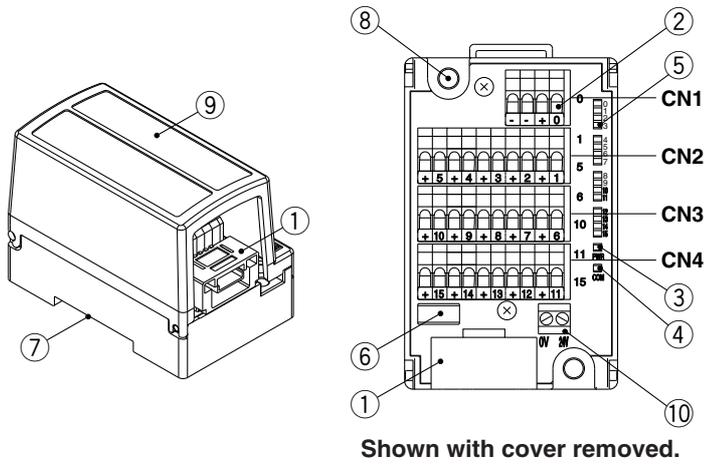
**Fixed with screws**



Shown with cover removed.

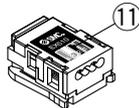
# Series EX510

## Parts Description

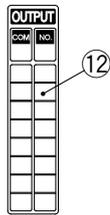


Shown with cover removed.

### Included accessories



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



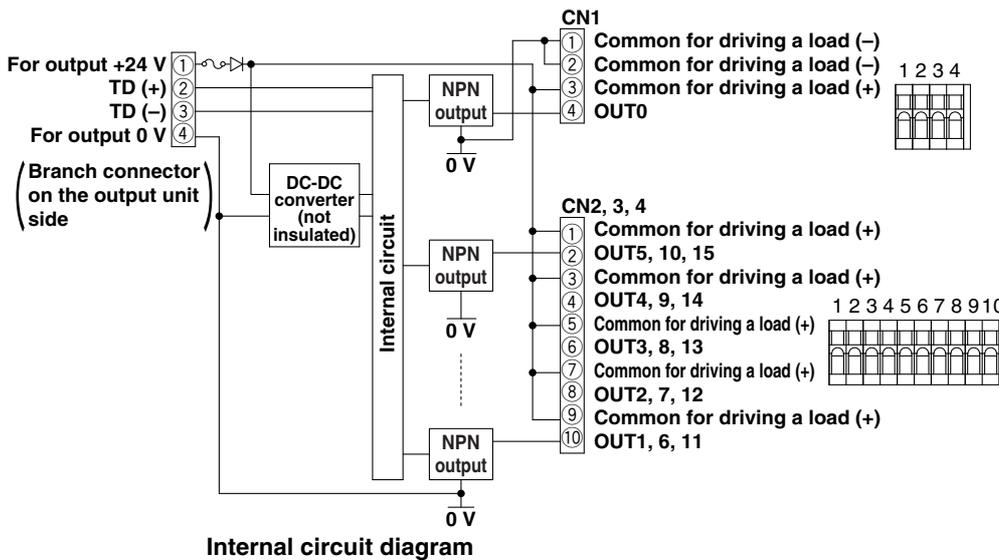
Marker label

### Output Unit

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

## Internal Circuits and Wiring Examples

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



Internal circuit diagram

### Terminal Block Connector (CN1)

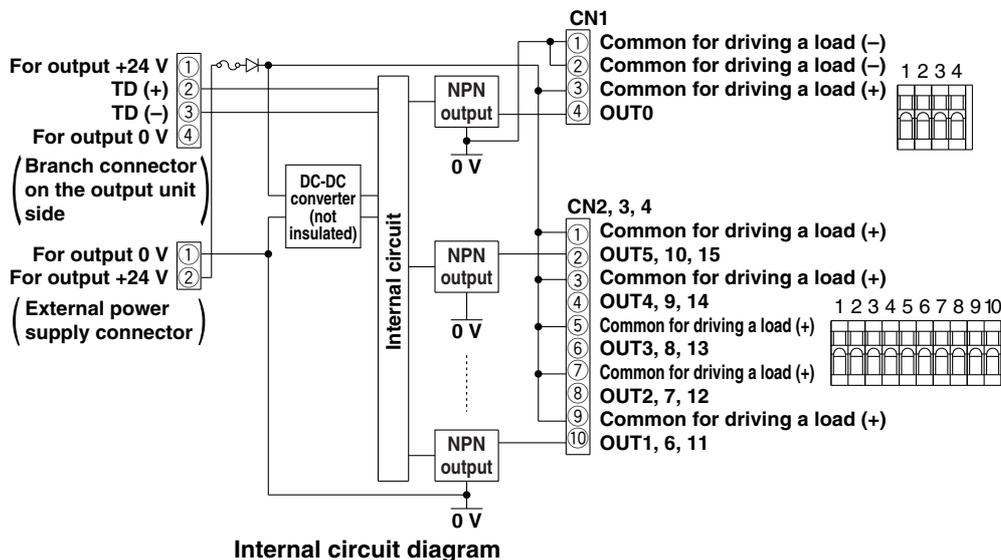
No.	Description	Functions	
		CN1	
1	COM	Common for driving a load (-)	
2	COM	Common for driving a load (-)	
3	COM	Common for driving a load (+)	
4	Output	OUT0	

### Terminal Block Connector (CN2, CN3, CN4)

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

## Internal Circuits and Wiring Examples

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



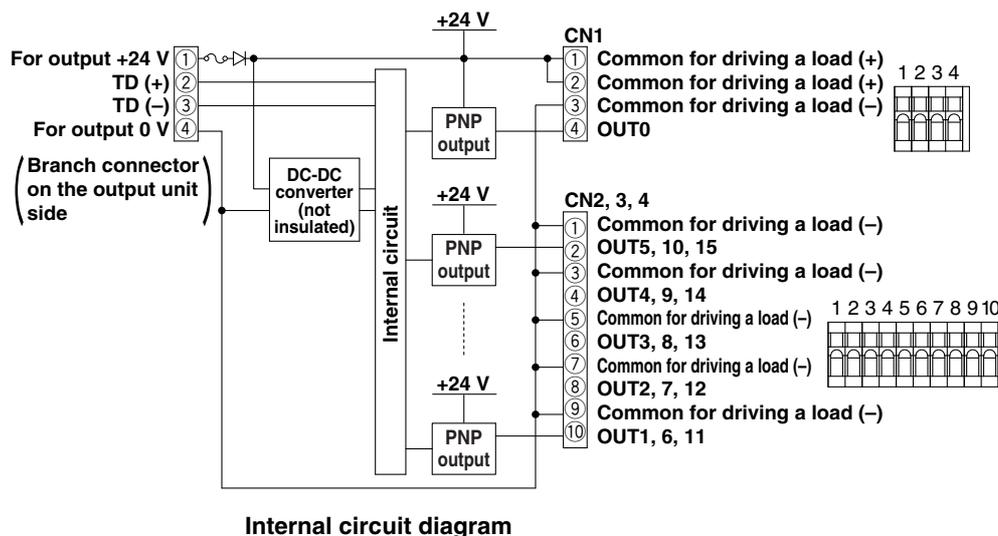
#### Terminal Block Connector (CN1)

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

#### Terminal Block Connector (CN2, CN3, CN4)

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

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



#### Terminal Block Connector (CN1)

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

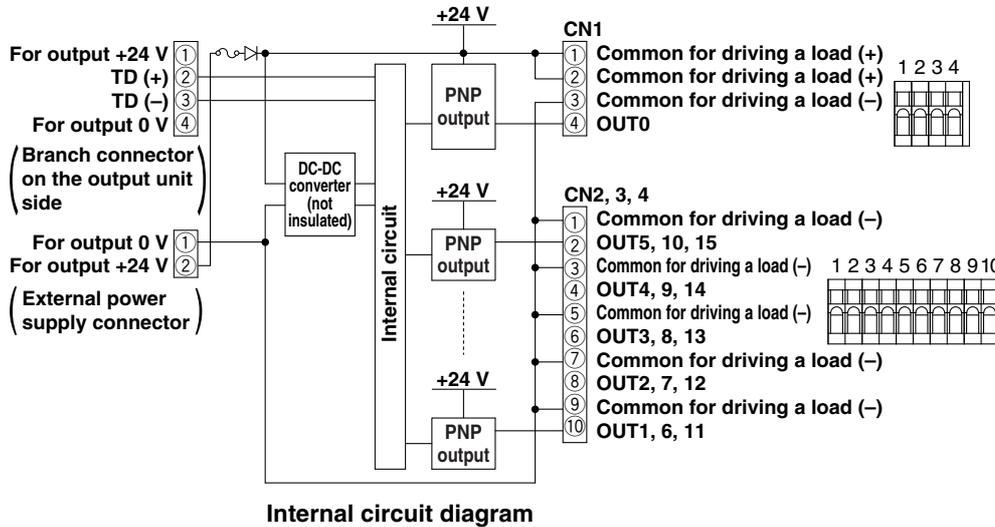
#### Terminal Block Connector (CN2, CN3, CN4)

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

# Series EX510

## Internal Circuits and Wiring Examples

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



### Terminal Block Connector (CN1)

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

### Terminal Block Connector (CN2, CN3, CN4)

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

## Connection to Output Equipment

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

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

Operating current per point for one valve  
 $10.5 \text{ W} \div 24 \text{ V} = 0.44 \text{ A}$  ..... Meets the output unit load current requirement 1.

Therefore, the total current of the output unit is:  
 $10.5 \text{ (W)} \div 24 \text{ (V)} \times 5 \text{ (pcs.)} = 2.2 \text{ (A)}$  ..... Therefore only the external power supply type can meet condition 2. The internal power supply type cannot be used.

Based on condition 3, The total current for OUT0 to 7 and OUT8 to 15 are 1.5 A respectively.

Therefore, 3 VX valves can be wired to either of the 3 points for OUT0 to 7. (1.32 A for OUT0 to 7) and 2 VX valves can be wired to either of the 2 points OUT8 to 15. (0.88 A for OUT8 to 15)

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

### Load Current Requirement

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

## Direct Operated 2 Port Solenoid Valve

### VX



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

### VCW



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

### VDW



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

**SI Unit**

**How to Order**

EX510-S 0 0 1  

**Output specification**

<b>0</b>	NPN output (common (+))
<b>1</b>	PNP output (common (-))

**Applicable valve manifold**

<b>1</b>	Non-plug-in manifold
<b>2</b>	Plug-in manifold

**Mounting specification**

<b>-</b>	Screw mounting
<b>A</b>	Mounting on DIN rail vertically
<b>B</b>	Mounting on DIN rail horizontally
<b>C</b>	Mounting on DIN rail horizontally (Dedicated for the SJ manifold) <small>Note)</small>

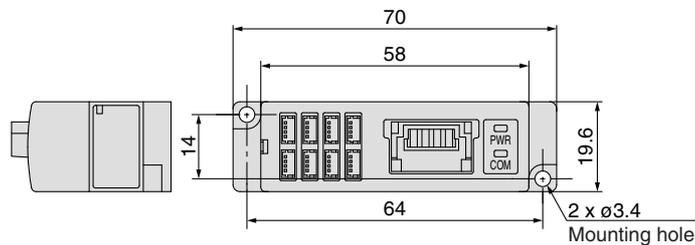
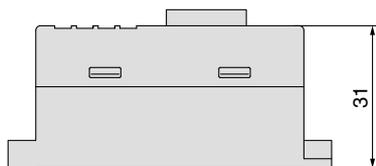
Note) Applicable for EX510-S  only.

**Specifications**

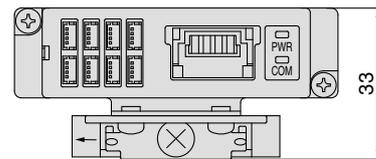
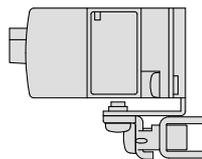
Model	EX510-S001 <span style="border: 1px solid black; padding: 2px;"> </span> , S002 <span style="border: 1px solid black; padding: 2px;"> </span>	EX510-S101 <span style="border: 1px solid black; padding: 2px;"> </span> , S102 <span style="border: 1px solid black; padding: 2px;"> </span>
<b>Output type</b>	NPN output (sink type)	PNP output (source type)
<b>Number of outputs</b>	16 points	
<b>Rated load voltage</b>	24 VDC	
<b>Max. load current</b>	Meet the following 3 conditions: 1. 0.25 A or less per point 2. 1.4 A or less per unit 3. Total current for OUT 0 to 7 must be 1 A or less. Total current for OUT 8 to 15 must be 1 A or less.	
<b>Protection</b>	Built-in short circuit protection	
<b>Current consumption</b>	50 mA or less (SI unit internal parts)	
<b>Weight</b>	EX510-S <span style="border: 1px solid black; padding: 2px;"> </span> 01: 40 g    EX510-S <span style="border: 1px solid black; padding: 2px;"> </span> 01A, B: 80 g EX510-S <span style="border: 1px solid black; padding: 2px;"> </span> 02: 50 g    EX510-S <span style="border: 1px solid black; padding: 2px;"> </span> 02A, B, C: 90 g (including accessories)	

**Dimensions**

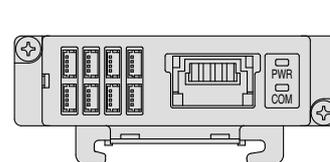
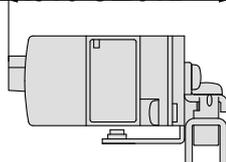
EX510-S 01



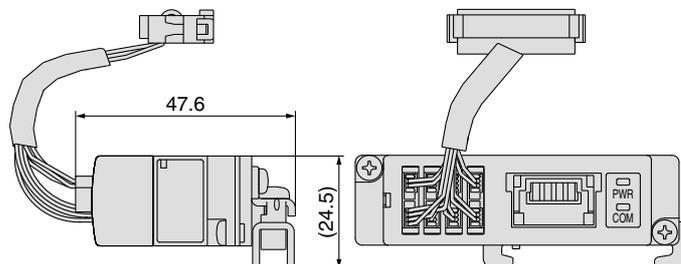
EX510-S 01A



EX510-S 01B



EX510-S 02C



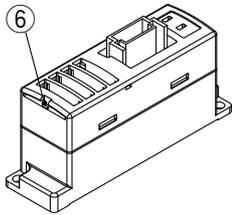
# Series EX510

## Parts Description

It is possible to order a valve manifold with SI unit from the valve series listed in the brackets below. For further information, please refer to the individual valve/manifold catalogues. Also, you can change the system of your device by retrofitting the SI unit to an already purchased manifold.

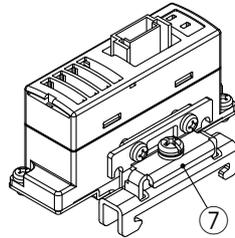
### EX510-S□01

(Series SY, SYJ, S0700, VQZ)

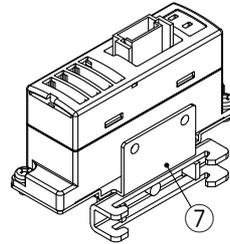


### EX510-S□01A

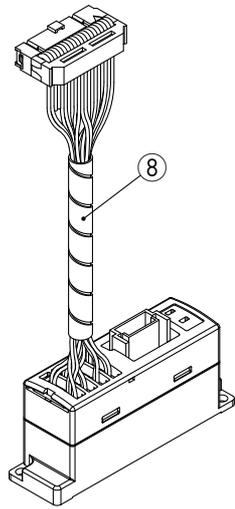
(Series SY (Type 45))



### EX510-S□01B

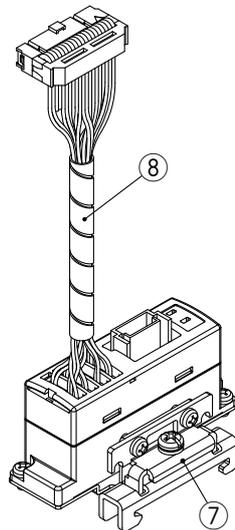


### EX510-S□02



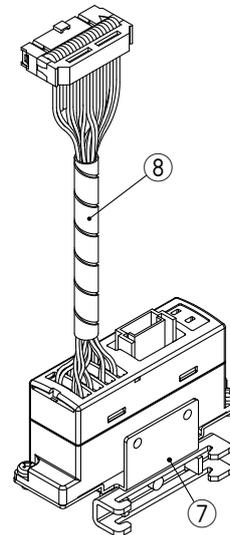
### EX510-S□02A

(Series SY, VQ)



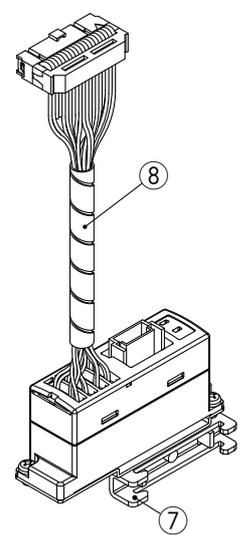
### EX510-S□02B

(Series SZ, SQ)



### EX510-S□02C

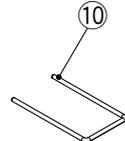
(Series SJ)



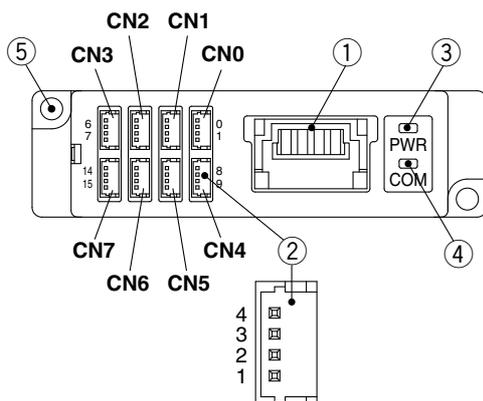
### Included accessories



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



Connector lock pin  
(1 pc.)

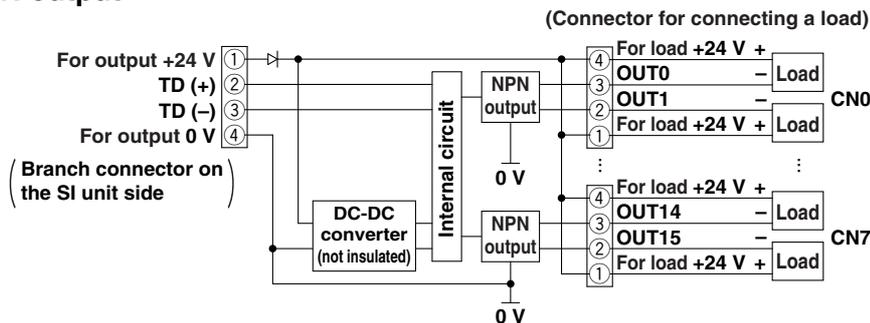


### SI Unit

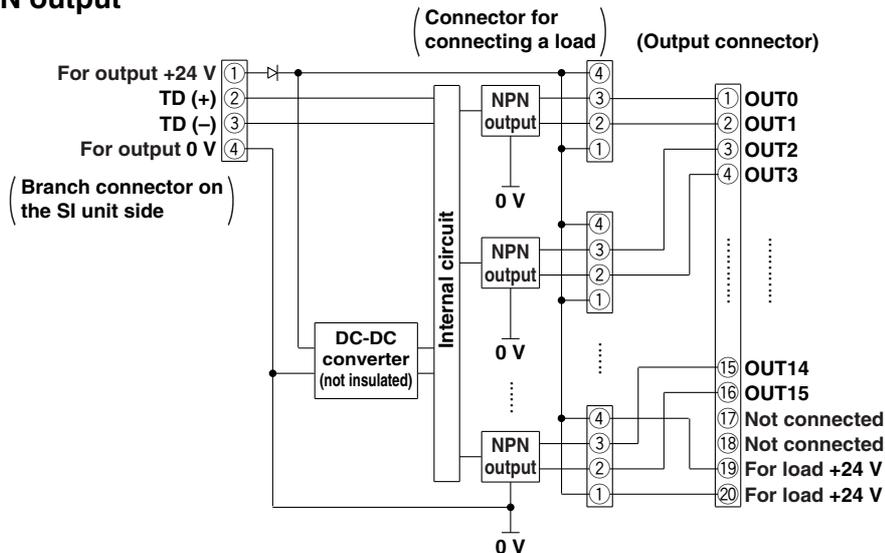
No.	Description	Applications
1	<b>Branch connector on the SI unit side</b>	For connecting with the GW unit, by press-fitting the branch connector (9) to the branch cable (EX510-FC□□).
2	<b>Connector for connecting a load</b>	Connects an output device such as a solenoid valve, etc.
3	<b>LED for power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

## Internal Circuits and Wiring Examples

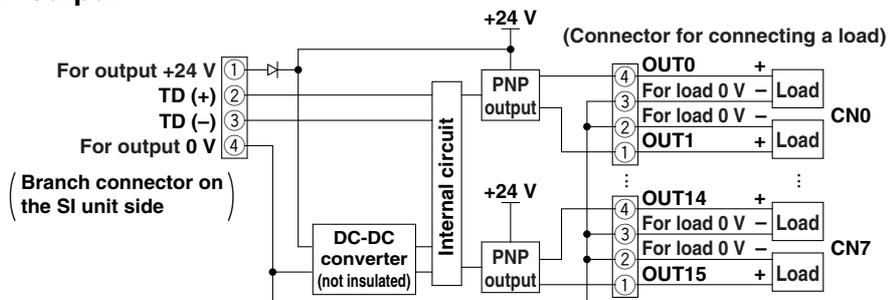
### EX510-S001/NPN output



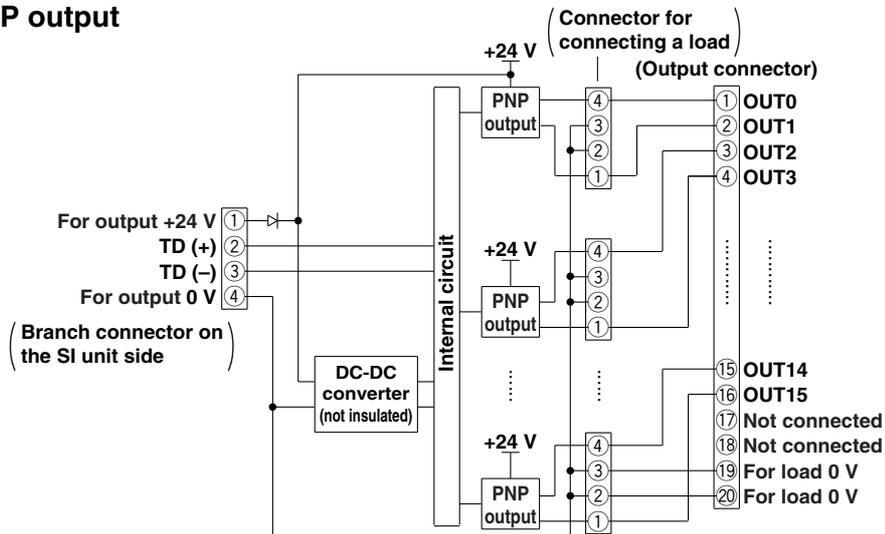
### EX510-S002/NPN output



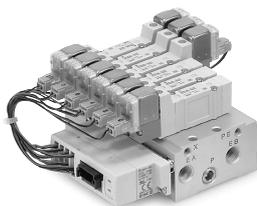
### EX510-S101/PNP output



### EX510-S102/PNP output



# EX510 Serial Wiring Compatible 5 Port Solenoid Valves



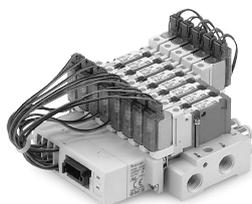
## SY

Series	Sonic conductance: C [dm <sup>3</sup> /(s·bar)] (representative value)	Applicable cylinder size (reference)	Port size for A, B ports												
			Piping with One-touch fittings								Thread piping				
			Metric size				Inch size								
			ø4	ø6	ø8	ø10	ø12	ø5/32"	ø1/4"	ø5/16"	ø3/8"	M5	1/8	1/4	3/8
SY3000	1.1	ø40	●	●				●	●			●	●		
SY5000	2.8	ø63	●	●	●			●	●	●			●	●	
SY7000	4.5	ø80			●	●				●	●			●	
SY9000	10.0	ø100			●	●	●			●	●			●	●



## SYJ

Series	Sonic conductance: C [dm <sup>3</sup> /(s·bar)] (representative value)	Applicable cylinder size (reference)	Port size for A, B ports								
			Piping with One-touch fittings				Thread piping				
			Metric size			Inch size					
			ø4	ø6	ø8	ø5/32"	ø1/4"	ø5/16"	M3	M5	1/8
SYJ3000	0.46	ø25	●			●			●	●	
SYJ5000	0.83	ø40	●	●		●	●			●	
SYJ7000	2.9	ø50		●	●		●	●			●



## S0700

Series	Sonic conductance: C [dm <sup>3</sup> /(s·bar)] (representative value)	Applicable cylinder size (reference)	Port size for A, B ports				
			Piping with One-touch fittings				Thread piping
			Metric size		Inch size		
			ø3.2	ø4	ø1/8"	ø5/32"	M5
S0700	0.36	ø20	●	●	●	●	●

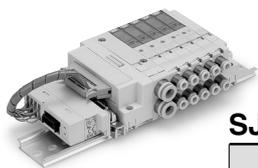


## VQZ

Series	Sonic conductance: C [dm <sup>3</sup> /(s·bar)] (representative value)	Applicable cylinder size (reference)	Port size for A, B ports												
			Piping with One-touch fittings								Thread piping				
			Metric size				Inch size								
			ø3.2	ø4	ø6	ø8	ø10	ø1/8"	ø5/32"	ø1/4"	ø5/16"	ø3/8"	M5	1/8	1/4
VQZ1000	1.2	ø40	●	●	●			●	●	●			●		
VQZ2000	2.0	ø63		●	●	●			●	●	●			●	
VQZ3000	3.9	ø80			●	●	●			●	●	●			●

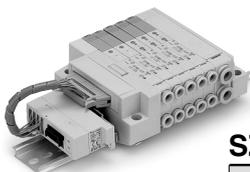
For details, refer to the catalogue of each product.

**Plug-in Type Manifold**



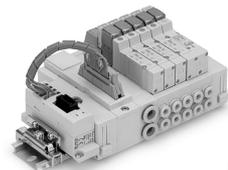
**SJ**

Series	Sonic conductance: C [dm <sup>3</sup> /(s·bar)] (representative value)	Applicable cylinder size (reference)	Port size for A, B ports				
			Piping with One-touch fittings			Thread piping	
			Metric size				
			ø2	ø4	ø6	M3	M5
<b>SJ2000</b>	0.36	ø25	●	●		●	
<b>SJ3000</b>	0.56	ø32	●	●	●		●



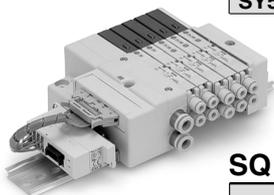
**SZ**

Series	Sonic conductance: C [dm <sup>3</sup> /(s·bar)] (representative value)	Applicable cylinder size (reference)	Port size for A, B ports				
			Piping with One-touch fittings				Thread piping
			Metric size		Inch size		
			ø4	ø6	ø5/32"	ø1/4"	M5
<b>SZ3000</b>	0.77	ø32	●	●	●	●	●



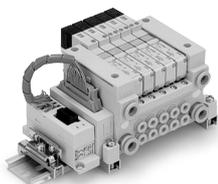
**SY**

Series	Sonic conductance: C [dm <sup>3</sup> /(s·bar)] (representative value)	Applicable cylinder size (reference)	Port size for A, B ports					
			Piping with One-touch fittings					
			Metric size			Inch size		
			ø4	ø6	ø8	ø5/32"	ø1/4"	ø5/16"
<b>SY3000</b>	1.1	ø40	●	●		●	●	
<b>SY5000</b>	2.8	ø63	●	●	●	●	●	●



**SQ**

Series	Sonic conductance: C [dm <sup>3</sup> /(s·bar)] (representative value)	Applicable cylinder size (reference)	Port size for A, B ports									
			Piping with One-touch fittings							Thread piping		
			Metric size				Inch size					
			ø3.2	ø4	ø6	ø8	ø1/8"	ø5/32"	ø1/4"	ø5/16"	M5	10-32UNF
<b>SQ1000</b>	0.83	ø32	●	●	●		●	●	●		●	●
<b>SQ2000</b>	2.9	ø63		●	●	●		●	●	●		



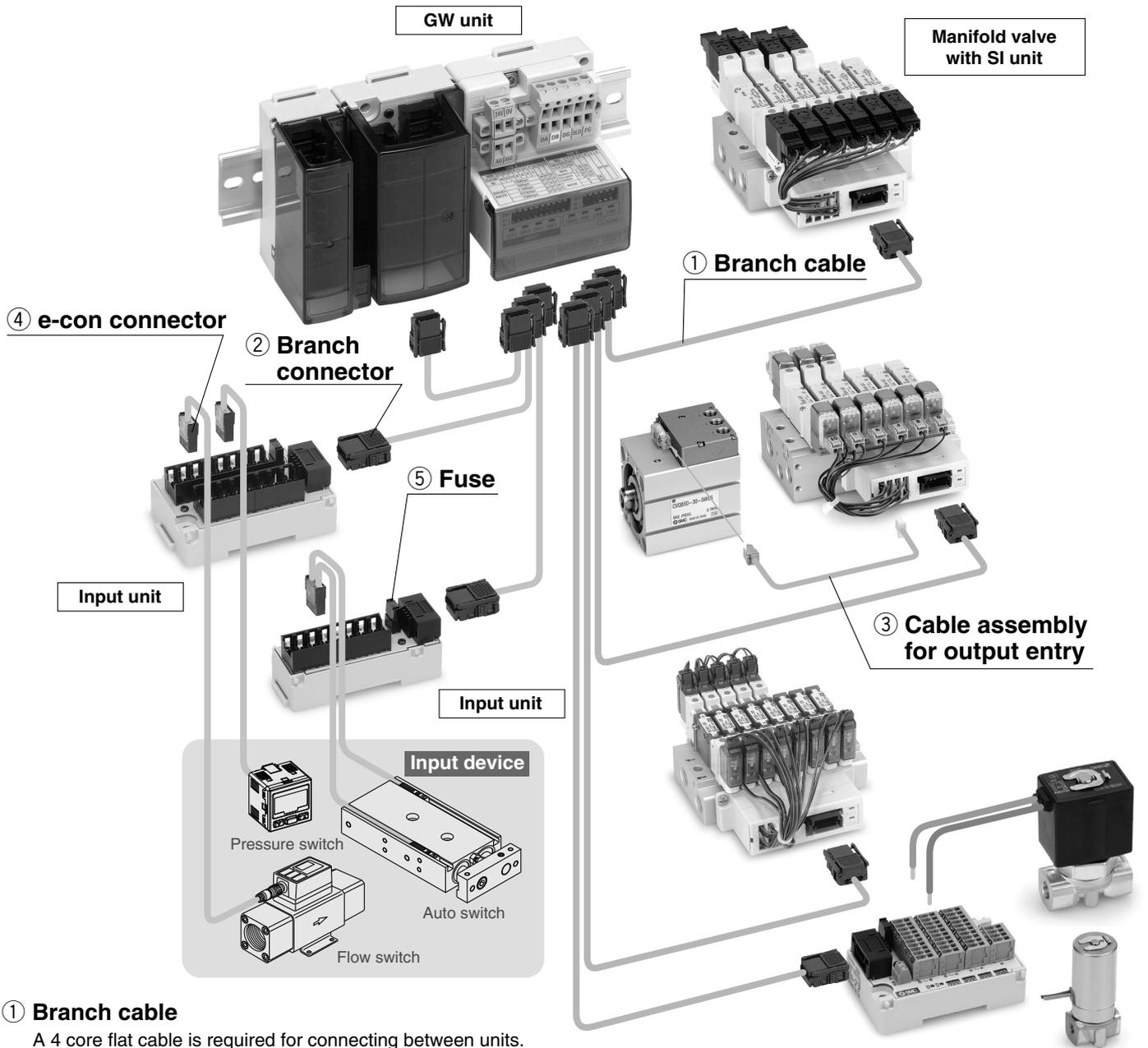
**VQ**

Series	Sonic conductance: C [dm <sup>3</sup> /(s·bar)] (representative value)	Applicable cylinder size (reference)	Port size for A, B ports									
			Piping with One-touch fittings							Thread piping		
			Metric size				Inch size					
			ø3.2	ø4	ø6	ø8	ø1/8"	ø5/32"	ø1/4"	ø5/16"	M5	10-32UNF
<b>VQ1000</b>	1.0	ø40	●	●	●		●	●	●		●	●
<b>VQ2000</b>	3.2	ø63		●	●	●		●	●	●		

For details, refer to the catalogue of each product.

# Series EX510

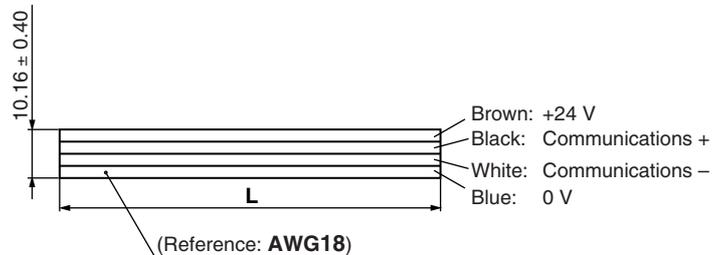
## System Composition / Options



- ① **Branch cable**  
A 4 core flat cable is required for connecting between units.

How to Order  
**EX510-FC 10**

Cable length (L)	
01	1 m
02	2 m
05	5 m
10	10 m
20	20 m
60	60 m



\* The maximum length of a branch cable for the EX510 series should be 20 metres or less.

- ② **Branch connector (Unit 1 pc.)**  
Connector required for connecting a branch cable to each unit. Two branch connectors are attached to the SI unit, the input unit and the output unit respectively.

How to Order  
**EX510-LC1**



(When press-fitting)

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

③ **Cable assembly for output entry**

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

**How to Order**  
**EX510-V S 10 S**

**Output**

S	1 point
W	2 points

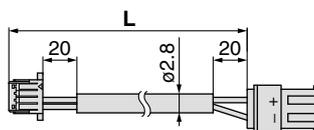
**Cable length (L)**

10	1 m
30	3 m

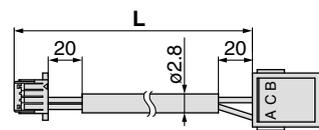
**Valve connector**

-	None
S	For SY, SYJ series
Q	For VQ, VQZ series

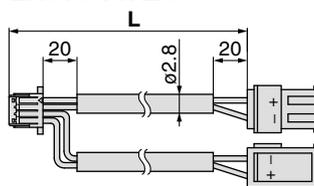
**EX510-VS□S**



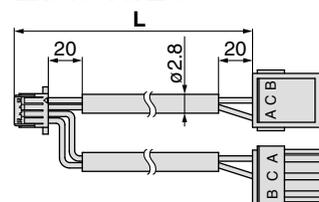
**EX510-VS□Q**



**EX510-VW□S**



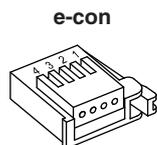
**EX510-VW□Q**



④ **e-con connector**

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

**How to Order**  
**ZS-28-C** □ □



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

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

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

**Applicable Wire**

SMC part no. (1 pc.)	Cover colour	Compliant wire diameter (φ)	Nominal cross sectional area (mm <sup>2</sup> )	Tyco Electronics AMP K.K. part no.
ZS-28-CA-1	Orange	0.6 to 0.9	0.1 to 0.5 (AWG26 to 20)	3-1473562-4
ZS-28-CA-2	Red	0.9 to 1.0		1-1473562-4
ZS-28-CA-3	Yellow	1.0 to 1.15		1473562-4
ZS-28-CA-4	Blue	1.15 to 1.35		2-1473562-4
ZS-28-CA-5	Green	1.35 to 1.60		4-1473562-4
SMC part no. (1 pc.)	Cover colour	Compliant wire diameter (φ)	Nominal cross sectional area (mm <sup>2</sup> )	Sumitomo 3M Ltd. part no.
ZS-28-C	Red	0.8 to 1.0	0.14 to 0.3 (AWG26 to 24)	37104-3101-000FL
ZS-28-C-1	Yellow	1.0 to 1.2		37104-3122-000FL
ZS-28-C-2	Orange	1.2 to 1.6		37104-3163-000FL
ZS-28-C-3	Green	1.0 to 1.2	0.3 to 0.5 (AWG22 to 20)	37104-2124-000FL
ZS-28-C-4	Blue	1.2 to 1.6		37104-2165-000FL
ZS-28-C-5	Gray	1.6 to 2.0		37104-2206-000FL
SMC part no. (1 pc.)	Cover colour	Compliant wire diameter (φ)	Nominal cross sectional area (mm <sup>2</sup> )	OMRON Corp. part no.
—	Clear	Up to 1.5	0.08 to 0.5 (AWG28 to 20)	XN2A-1430*

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

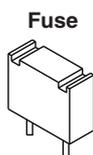
⑤ **Replacement fuse**

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

**How to Order**  
**EX9-FU10**

**Fuse rated current**

10	1 A
50	5 A

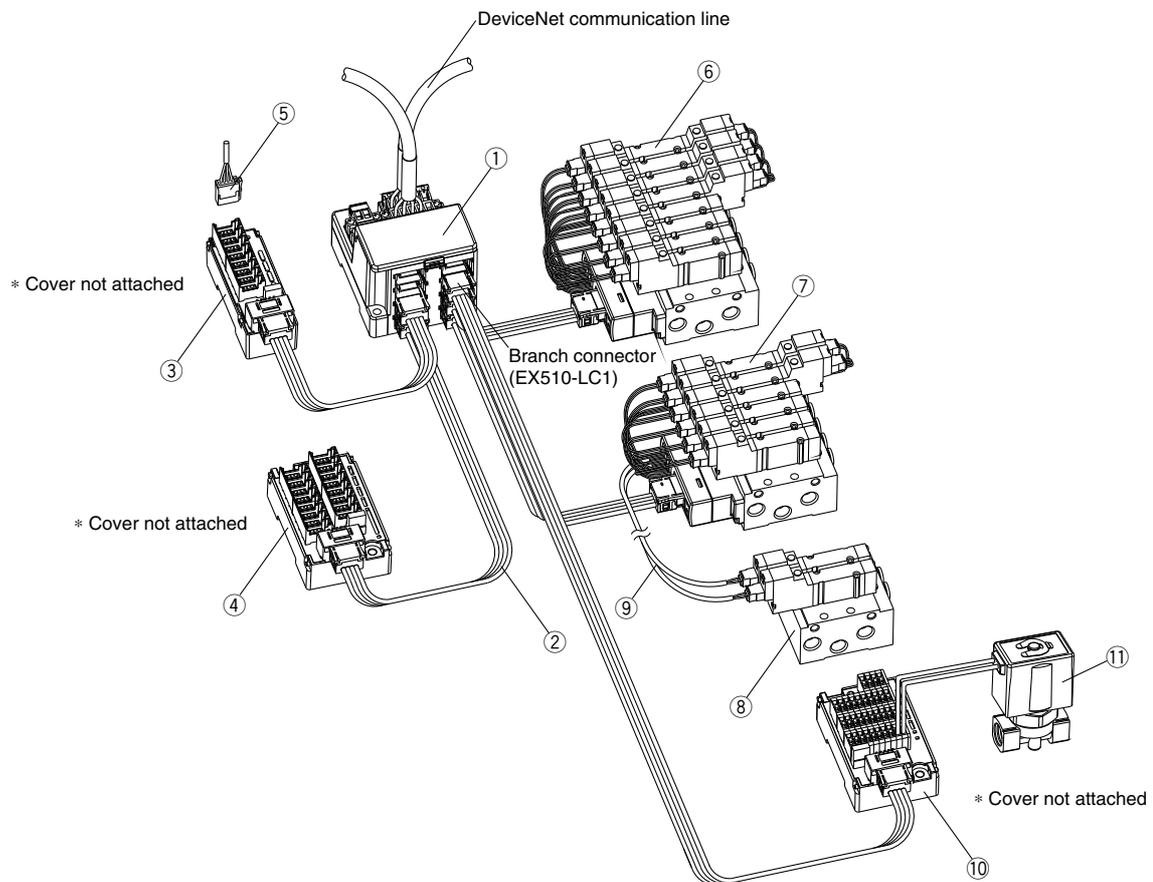


Electrical specifications		
Part no.	EX9-FU10	EX9-FU50
Applicable model	EX510-DX□□ EX510-DY□3	EX510-DY□4
Rated current	1 A	5 A
Rated insulation capacity	AC/DC 48 V 50 A	
Fuse resistance value	0.145 Ω	18 mΩ

# Series EX510

## Ordering Examples

Shown is an example for ordering the EX510 series.



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

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



# Series EX510

## Specific Product Precautions 1

Be sure to read this before handling.

### Caution on Design and Selection

#### Warning

- 1. Use within the allowable voltage range.**  
Using beyond the allowable voltage range is likely to cause the units and connecting devices to be damaged or to malfunction.
- 2. Do not use beyond the specification range.**  
Using beyond the specification range is likely to cause a fire, malfunction, or breakdown in the units and connecting devices. Check the specifications before handling.
- 3. Establish a backup system beforehand, which employs fail-safe concepts such as multiple equipment and devices to prevent breakage or malfunction of this product.**
- 4. Provide an external emergency stop circuit that will immediately stop an operation and cut off the power supply.**
- 5. When using in an interlock circuit:**
  - Provide a double interlock which is operated by another system (such mechanical protection function).
  - Perform an inspection to check that the interlock circuit is working properly because it can cause possible injuries.

#### Caution

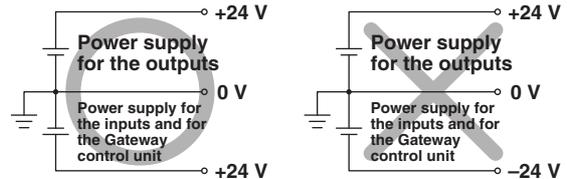
- 1. Keep the surrounding space free for maintenance.**  
When designing a system, take into consideration the amount of free space needed for performing maintenance.
- 2. Use the UL-certified products below for combined direct current power supply.**
  - (1) Circuit in which voltage and current are controlled in accordance with UL508  
A circuit to which power is supplied by the secondary coil of a transformer that meets the following conditions.
    - Maximum voltage (with no load):  
30 Vrms (42.4 V at peak) or less
    - Maximum current:
      1. 8 A or less (including when short-circuited)
      2. and in case of being controlled by circuit protection devices (fuse, etc) which meets the below rated volatges.

Voltage with no load (V peak)	Max. rated current (A)
0 to 20 (V)	5.0
Exceeding 20 (V) up to 30 (V)	100
	Voltage figure at peak
  - (2) A Class 2 circuit using a maximum of 30 Vrms or less (42.4 V at peak), which power is supplied by a Class-2 power supply unit in accordance with ULB10 or UL1585.
- 3. This product is one of the components that is installed into a final piece of equipment. The customer has to confirm that the whole equipment conforms to the EMC directive.**

### Caution on Design and Selection

#### Caution

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



### Mounting

#### Caution

- 1. Do not drop, bump, or apply excessive impact.**  
Otherwise, the unit can become damaged, malfunction, or fail to function.
- 2. Hold the body while handling this product.**  
Otherwise, the unit can become damaged, malfunction, or fail to function.
- 3. Observe the tightening torque range**  
Tightening outside of the allowable torque range will likely damage the product.
- 4. Do not install a unit in a place where it can be used as a scaffold.**  
Applying any excessive load such as stepping on the unit by mistake or placing a foot on it, will cause it to break.



## Series EX510

# Specific Product Precautions 2

Be sure to read this before handling.

### Wiring

#### ⚠ Warning

##### 1. Avoid miswiring.

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

##### 2. Do not wire while energising the product.

It is likely to damage the units or connecting devices.

##### 3. Avoid wiring power and high tension lines in the same wiring route as the unit.

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

##### 4. Confirm the wiring insulation.

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

#### ⚠ Caution

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

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

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

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

### Operating Environment

#### ⚠ Warning

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

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

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

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

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

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

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

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

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

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

### Operating Environment

#### ⚠ Warning

##### 6. Use it near sources that generate a surge which exceeds the benchmark test. Even though this product is CE/UKCA-marked, do not.

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

##### 7. Use a product type that has an integrated-surge absorption element when directly driving a load which generates a surge voltage such as relay or a solenoid valve.

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

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

### Adjustment, Operation

#### ⚠ Warning

##### 1. Do not short-circuit a load.

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

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

Performing such activity will likely cause an electrical shock.

#### ⚠ Caution

##### 1. DIP switches and rotary switches should be set with a small watchmakers' screwdriver.

### Maintenance

#### ⚠ Warning

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

Such actions are likely to cause injuries or breakage.

##### 2. Perform periodic inspection.

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

##### 3. When an inspection is performed.

- Turn off the power supply.
- Stop the supplied fluid and discharge the fluid in the piping and confirm the release to the atmosphere before performing an inspection. Otherwise injuries are likely to occur.

#### ⚠ Caution

## Safety Instructions

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

### Danger:

**Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

### Warning:

**Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

### Caution:

**Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

- 1) ISO 4414: Pneumatic fluid power – General rules and safety requirements for systems and their components.
- ISO 4413: Hydraulic fluid power – General rules and safety requirements for systems and their components.
- IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
- ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots.
- 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 catalogue 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. Our products cannot be used beyond their specifications.

**Our products are not developed, designed, and manufactured to be used under the following conditions or environments.**

**Use under such conditions or environments is not covered.**

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, fuel equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogues and operation manuals.
3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.

## Caution

**We develop, design, and manufacture our products to be used for automatic control equipment, and provide them for peaceful use in manufacturing industries.**

**Use in non-manufacturing industries is not covered.**

Products we manufacture and sell cannot be used for the purpose of transactions or certification specified in the Measurement Act.

The new Measurement Act prohibits use of any unit other than SI units in Japan.

## 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. <sup>2)</sup> 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 catalogue 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.

## Safety Instructions

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

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