



## Installation & Maintenance Manual

### Fieldbus System - SI unit

Type EX600-SPR1 / EX600-SPR2



#### 1. Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage.

These instructions indicate the level of potential hazard by label of "DANGER", "WARNING" or "CAUTION", followed by important safety information which must be carefully followed.

To ensure safety of personnel and equipment the safety instructions in this manual and the product catalogue must be observed, along with other relevant safety practices.

<b>⚠ DANGER</b>	In extreme conditions, there is a possible result of serious injury or loss of life.
<b>⚠ WARNING</b>	If instructions are not followed there is a possibility of serious injury or loss of life.
<b>⚠ CAUTION</b>	If instructions are not followed there is a possibility of injury or equipment damage.

#### **⚠ WARNING**

Do not disassemble, modify (including change of printed circuit board) or repair this product.

Injury or failure can result.

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

Do not operate the product beyond the specification range.  
Do not use the product for flammable or harmful gases or liquids.  
Fire, malfunction, or damage to the product can result.  
Please confirm the specifications before use.

Do not operate the product in an environment where flammable or explosive gases may be present.

Fire or an explosion can result.  
The product is not designed to be explosion proof.

The following instructions must be followed when using the product in an interlocking circuit:

- Provide a multiple interlocking system, such as a mechanical protection system.
  - Check the product regularly to ensure proper operation.
- Otherwise malfunction can result, causing an accident.

The following instructions must be followed during maintenance:

- Turn off the power supply.
- Stop the air supply, exhaust the residual pressure and verify that the air is released to atmosphere before performing maintenance. Otherwise injury can result.

#### **⚠ CAUTION**

Perform a proper functional check after completing maintenance.  
Stop operation if the equipment does not function properly.  
Safety cannot be assured due to unexpected malfunction.

Provide grounding to assure the safety and noise immunity of the fieldbus system.

Individual grounding should be provided close to the product with an earth cable as short as possible.

When handling, assembling and replacing the unit:

- Do not touch any sharp metal parts of the connector or plug.
  - Do not apply excessive force to the unit.
- The connecting portions of the unit are firmly joined with seals.  
When joining units, take care not to get fingers caught between units.  
Injury can result.

#### 2. How to Order

Refer to the catalogue or operation manual for this product.

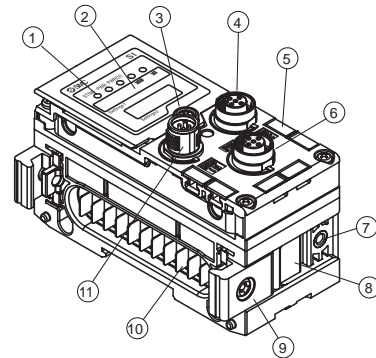
#### 3. Specifications

Refer to the catalogue or operation manual for this product.

#### 4. Outline dimensions(mm)

Refer to the catalogue or operation manual for this product.

#### 5. Names / Functions of individual Parts



No.	Part	Usage
1	Status indication LED	Indicates the unit status. (Refer to the "Trouble Shooting" section for further details.)
2	Indication cover	Open to gain access to the setting switches.
3	Indication cover set screw	Loosen to open the indication cover.
4	Connector (BUS OUT) (socket)	Connector for FieldBus output. BUS IN and BUS OUT are connected inside the unit.
5	Marker groove	Groove to mount an indication marker.
6	Connector (for handheld terminal) (socket)	Connector to connect a handheld terminal.
7	Valve plate mounting holes	Holes for fixing the valve plate.
8	Valve plate mounting groove	Groove for mounting the valve plate.
9	Joint bracket	Joint bracket to join the adjacent unit, fixed with attached screws.
10	Connector for unit (plug)	Conveys the signals and power supplies to the adjacent unit.
11	Connector (BUS IN) (plug)	Connector for FieldBus input. BUS IN and BUS OUT are connected inside the unit.

#### 6. Assembly

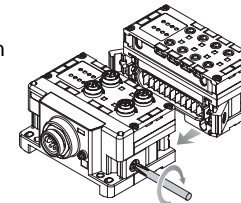
##### Composing the unit as a manifold.

※ : If the unit was purchased as a manifold, the work described in this section is not necessary.

##### Note

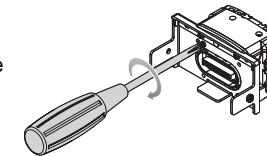
Be sure to turn off the power when carrying out the work to compose the unit as a manifold.

- ① Connect a unit to the end plate. Digital input units, digital output units and analog units can be connected in any order.  
(Tightening torque: 1.5 to 1.6 Nm)

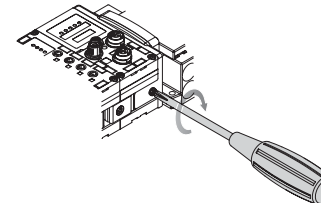


- ② Connection of SI unit  
Connect the SI unit after connecting all of the required I/O units together.  
The connection procedure is the same as the previous step ①.

- ③ Mounting the valve plate  
Mount the valve plate to the manifold valve with valve fixing screws.  
(Tightening torque: 0.6 to 0.7 Nm)



- ④ Connect the SI unit to the manifold valves.  
Insert the valve plate into the valve plate mounting groove at the side of the SI unit.  
Fix using the valve plate fixing screws.  
(Tightening torque: 0.7 to 0.8 Nm)

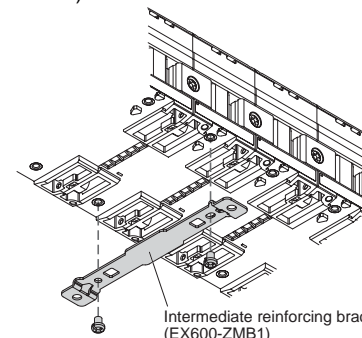


#### 7. Installation

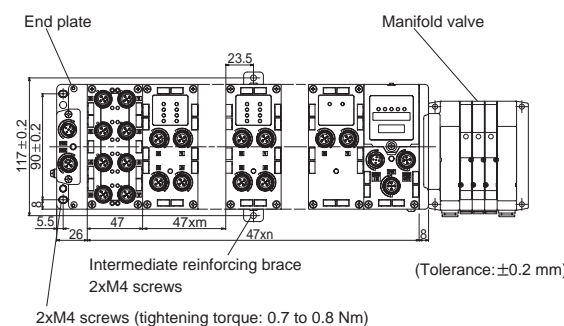
##### <Installation method>

##### Direct mounting

- ① When joining six or more units, fix the middle part of the complete EX600 unit with an intermediate reinforcing brace (EX600-ZMB1) before mounting (Refer to the figure below.) using 2xM4 screws (Tightening torque: 0.7 to 0.8 Nm)



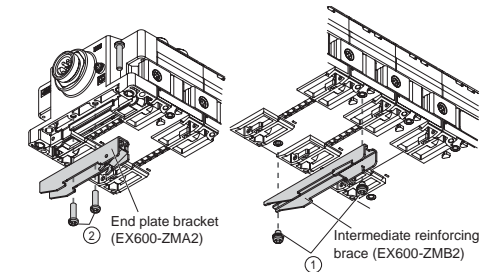
Fix and tighten the end plates at one end of the unit as shown in the figure below. (Tightening torque: 0.7 to 0.8 Nm)  
Fix the end plate at the valve side while referring to the operation manual of the corresponding manifold valve.



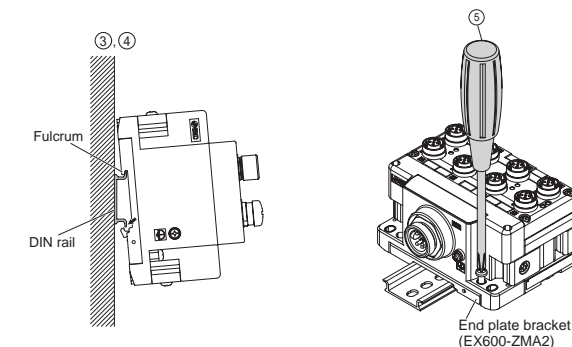
#### 7. Installation (continued)

##### <DIN rail mounting>

- ① When joining five or more units, fix the middle part of the complete EX600 unit with an intermediate reinforcing brace (EX600-ZMB2) before mounting, using 2xM4 screws. (Tightening torque: 0.7 to 0.8 Nm)
- ② Mount the end plate bracket (EX600-ZMA2) to the end plate, using 2xM4 screws. (Tightening torque: 0.7 to 0.8 Nm)



- ③ Hook the DIN rail mounting groove to the DIN rail. (See the figure below.)
- ④ Press the manifold using its side hooked to the DIN rail as a fulcrum until the manifold is locked.
- ⑤ Fix the manifold by tightening the DIN rail fixing screws of the EX600-ZMA2. (Tightening torque: 0.7 to 0.8 Nm)  
The tightening torque at the valve side depends on the valve type.

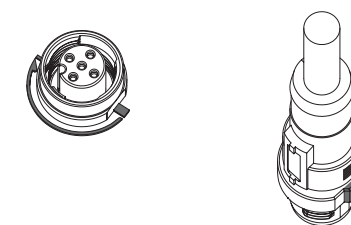


#### 8. Wiring

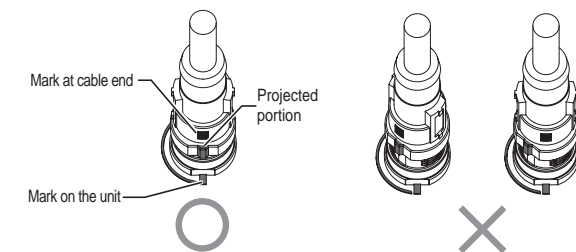
##### <SPEEDCON Wiring method>

The M12 connector can be mated with a SPEEDCON connector.

- ① Set the projected portion of the cable connector metal ring (plug / socket) to the mark at cable end.

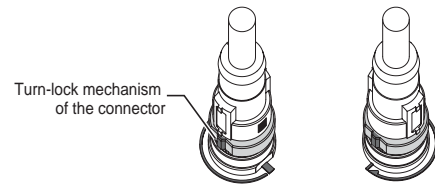


- ② Push the connector straight to insert it into the receptacle of the unit. If inserted without aligning the mark, the connector will not mate with the receptacle.



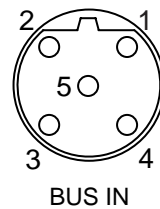
## 8. Wiring (continued)

- ③ Turn the connector clockwise. It stops when turned 1/4 turn. Turn it further. When the connector is turned 1/2 turn from the original position, the projected portion is set at the diagonal position to the mark and the turn is completed. Check that the connector is securely locked.  
If the connector is turned excessively, it will become difficult to remove.



### <Connection>

Signal name	Pin No.	Wire colour
NC	1	-
RXD/TXD-N	2	Green
NC	3	-
RXD/TXD-P	4	Red
SHIELD	5	Shield

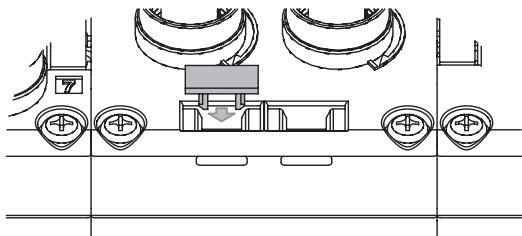


### Wiring connection with handheld terminal

Refer to "Handheld Terminal Operation Manual" for the connection with the handheld terminal.

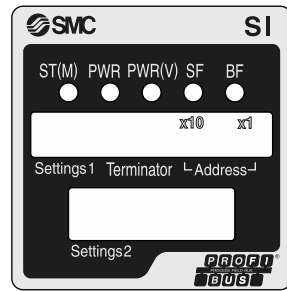
### Note

Be sure to place a seal cap on any unused connectors. Placing the seal cap appropriately enables the unit to achieve IP67 protection.



## 9. Trouble Shooting

Status indication LED (see figure below) displays the power supply status and communication status. These can be checked according to the following:



### <Display status>

Indicator symbol	Status	Indicator symbol	Status
○	OFF	● (flashing)	Flashing Red
● (flashing)	Red Light ON	● (flashing)	Flashing Red and Green alternately
● (flashing)	Green Light ON	● (flashing)	Flashing Green

### <SI Unit - PROFIBUS DP>

Indicator	Status
ST(M) PWR PWR(V) SF BF ○ ○ ○ ○ ○	Normal status with established communication with DP master, or power for control/input is OFF.
ST(M) PWR PWR(V) SF BF ○ ○ ● ○ ○	SI unit recognized the communication speed but DP master address setting is wrong. Check and correct the address setting.
ST(M) PWR PWR(V) SF BF ○ ○ ○ ● ○	Any one of the following: •No connection between DP master and SI unit. •SI unit cannot recognize the communication speed. •DP master failure or SI unit failure.
ST(M) PWR PWR(V) SF BF ○ ○ ● ● ○	Communication established between DP master and SI unit, but with diagnostic error.
ST(M) PWR PWR(V) SF BF ○ ○ ● ● ●	Discrepancy between DP master setting and device configuration data. Check and correct the setting.
ST(M) PWR PWR(V) SF BF ○ ○ ● ● ●	SI unit address set to "0" or above "126". Check and correct the address setting.

### <Common for SI Units>

Indicator	Status
ST(M) PWR PWR(V) ○ ○ ○ ○ ○	Power for control/input is OFF.
ST(M) PWR PWR(V) ● ● ● ● ○	Unit is operating normally.
ST(M) PWR PWR(V) ○ ● ○ ○ ○	Abnormal power voltage for control/input. Check the power supply and adjust or replace it.
ST(M) PWR PWR(V) ○ ○ ● ○ ○	Abnormal power voltage for output. Check the power supply and adjust or replace it.
ST(M) PWR PWR(V) ● ○ ○ ○ ○	Component failure inside SI unit. When ST(M) indicator is red, stop using the product and contact SMC.
ST(M) PWR PWR(V) ● ● ○ ○ ○	•Valve is in short circuit or open circuit. •Valve ON/OFF counter has exceeded the set value.
ST(M) PWR PWR(V) ● ● ● ○ ○	Communication error between units. Check the connection between the units.
ST(M) PWR PWR(V) ● ● ● ● ○	Error diagnostics detected the error of a unit other than the SI unit.

## 10. Contact

AUSTRIA	(43) 2262 62280	NETHERLANDS	(31) 20 531 8888
BELGIUM	(32) 3 355 1464	NORWAY	(47) 67 12 90 20
CZECH REP.	(420) 541 424 611	POLAND	(48) 22 211 9600
DENMARK	(45) 7025 2900	PORTUGAL	(351) 21 471 1880
FINLAND	(358) 207 513513	SLOVAKIA	(421) 2 444 56725
FRANCE	(33) 1 6476 1000	SLOVENIA	(386) 73 885 412
GERMANY	(49) 6103 4020	SPAIN	(34) 945 184 100
GREECE	(30) 210 271 7265	SWEDEN	(46) 8 603 1200
HUNGARY	(36) 23 511 390	SWITZERLAND	(41) 52 396 3131
IRELAND	(353) 1 403 9000	UNITED KINGDOM	(44) 1908 563888
ITALY	(39) 02 92711		

## SMC Corporation

URL <http://www.smcworld.com> (Global) <http://www.smceu.com> (Europe)

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