

EX600-TFR01



## Installation & Maintenance Manual

### Fieldbus system (SI unit)

#### Type EX600-SPN1 / EX600-SPN2



## 1 Safety Instructions

This manual contains essential information for the protection of users and others from possible injury and/or equipment damage.

- Read this manual before using the product, to ensure correct handling, and read the manuals of related apparatus before use.
- Keep this manual in a safe place for future reference.
- These instructions indicate the level of potential hazard by label of "Caution", "Warning" or "Danger", 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>Caution</b>	CAUTION indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
	<b>Warning</b>	WARNING indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
	<b>Danger</b>	DANGER indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

This product is class A equipment that is intended for use in an industrial environment.

There may be potential difficulties in ensuring electromagnetic compatibility in other environments due to conducted as well as radiated disturbances.

## Warning

- Do not disassemble, modify (including changing the printed circuit board) or repair.**  
An injury or failure can result.
- Do not operate or set with wet hands.**  
This may lead to an electric shock.
- Do not operate the product outside of the specifications.**  
Do not use for flammable or harmful fluids.  
Fire, malfunction, or damage to the product can result.  
Verify the specifications before use.
- Do not operate in an atmosphere containing flammable or explosive gases.**  
Fire or an explosion can result.  
This product is not designed to be explosion proof.
- If using the product in an interlocking circuit:**
  - Provide a double interlocking system, for example a mechanical system
  - Check the product regularly for 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 before performing maintenance  
Otherwise an injury can result.

## 1 Safety Instructions (continued)

### Caution

- When handling, assembling or replacing the units:**
  - Avoid touching any sharp metal parts of the connectors for connecting units.
  - When assembling units, take care not to get any fingers caught between units. Injury can result.
  - When disassembling units, take care to avoid excessive force.  
The connection parts of the unit are firmly joined with seals and injury can result.
- After maintenance is complete, perform appropriate functional inspections.**  
Stop operation if the equipment does not function properly.  
Safety cannot be assured in the case of unexpected malfunction.
- Provide grounding to assure the safety and noise resistance of the Fieldbus system.**  
Individual grounding should be provided close to the product with a short cable.

### NOTE

- The direct current power supply to combine should be UL1310 Class2 power supply when conformity to UL is necessary.
- The output rating is UL tested as a DC output for General use.

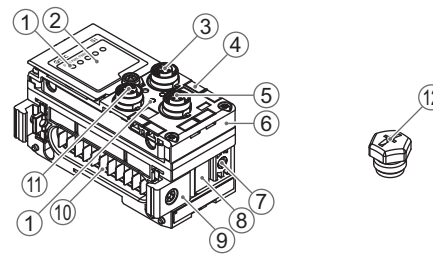
Refer to the operation manual on the SMC website  
(URL <http://www.smcworld.com>).

## 2 Specifications

Power supply	Control and input	24 VDC Class2, 2 A
	Output	24 VDC Class2, 2 A
Output rating		24 VDC, 1.0 W or less, DC General per output
Operating temperature range		-10 to 50 °C (Max. surrounding air temperature rating: 50 °C)
Storage temperature range		-20 to 60 °C
Pollution degree		For use in Pollution Degree 3 Environment (UL508)
Vibration resistance		10 to 57 Hz: constant amplitude 0.75 mm p-p 57 to 150 Hz: constant acceleration 49 m/s <sup>2</sup> for 2 hours each in direction X, Y and Z respectively (De-energized)
Impact resistance		147 m/s <sup>2</sup> 3 times each in directions of X, Y and Z respectively (De-energized)

Refer to the operation manual on the SMC website  
(URL <http://www.smcworld.com>).

## 3 Summary of Product parts

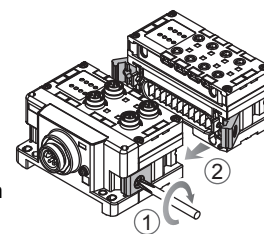


No.	Description	Function
1	Status display LED	Displays the status of the unit.
2	Display cover	The display cover should not be opened.
3	Connector (BUS OUT)	Connector for fieldbus outputs.
4	Marker groove	Groove for an identification marker.
5	Connector (PCI)	Connector for Handheld Terminal.
6	MAC address label	Displays the 12 digit MAC address which is different for each SI unit.
7	Valve plate mounting hole	Holes for fixing the valve plate.
8	Valve plate mounting groove	Groove for mounting the valve plate.
9	Joint bracket	Bracket for joining to adjacent units.
10	Unit connector (Plug)	Connector for signals and power supplies to adjacent units.
11	Connector (BUS IN)	Connector for fieldbus inputs.
12	Seal cap (2 pcs.)	Fitted to unused connectors. (BUS OUT and PCI)

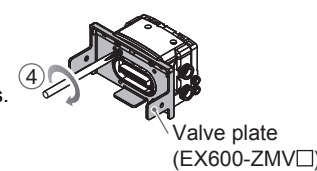
## 4 Installation

### Assembly

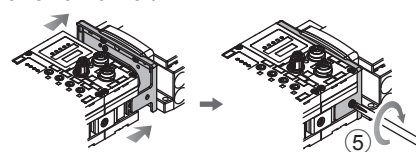
- (1)Connect a unit to the end plate.  
Digital and Analogue I/O units can be connected in any order.  
Tighten the joint brackets to a torque of 1.5 to 1.6 Nm.
- (2)Add more I/O units.  
Up to 10 units (including the SI unit) can be connected to one manifold.
- (3)Connecting the SI unit.  
After connecting the required I/O units, connect the SI unit.  
The method is as above in (1), (2).



- (4)Mounting the valve plate.  
Mount the valve plate (EX600-ZMV□) to the valve manifold using the valve set screws. (M3 x 8)  
Apply 0.6 to 0.7 Nm tightening torque to the screws.



- (5)Connect the SI unit to the valve manifold.  
Insert the valve plate into the valve plate mounting groove on the side of the SI unit.  
Fix using the valve plate screws (M4 x 6) supplied, to a torque of 0.7 to 0.8 Nm.

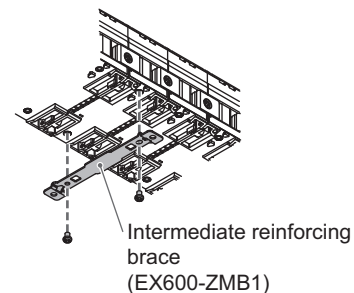


## 4 Installation (continued)

### Installation

- 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, using 2-M4 x 5 screws.  
Tightening torque: 0.7 to 0.8 Nm.

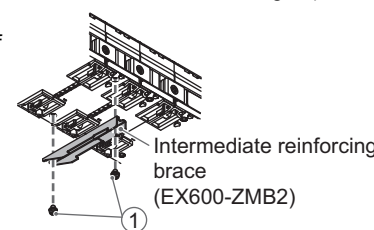


- (2)Mount and tighten the end plate and the solenoid valve at one end of the unit. (M4)  
Tightening torque: 0.7 to 0.8 Nm.  
The tightening torque at the manifold solenoid valve side depends on the valve type. Refer to the operation manual of the corresponding valve manifold.

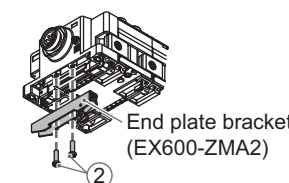
- DIN rail mounting

(Not available for SY series valves. Refer to the SY catalogue.)

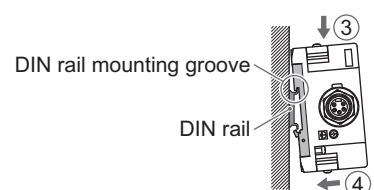
- (1)When joining six or more units, fix the middle part of the complete EX600 unit with an intermediate reinforcing brace (EX600-ZMB2) before mounting, using 2-M4 x 6 screws.  
Tightening torque 0.7 to 0.8 Nm.



- (2)Mount the end plate bracket (EX600-ZMA2) to the end plate, using 2-M4 x 14 screws.  
Tightening torque: 0.7 to 0.8 Nm.



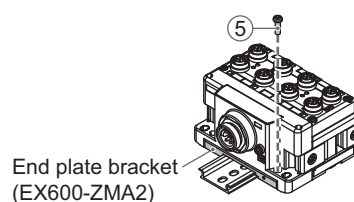
- (3)Hook the DIN rail mounting groove on to the DIN rail.



- (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. (M4 x 20)  
Tightening torque: 0.7 to 0.8 Nm.

The tightening torque at the manifold solenoid valve side depends on the valve type. Refer to the operation manual of the corresponding valve manifold.



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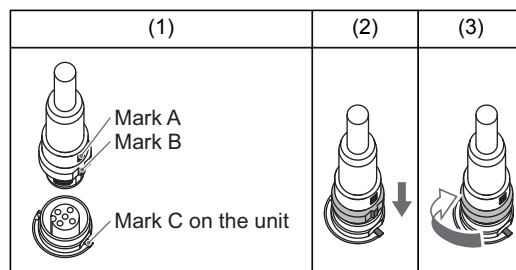
## 4 Installation (continued)

### ■Wiring

- Connect the M12 connector cable.

The M12 SPEEDCON connector connection method is explained below.

- (1)Align mark B on the metal bracket of the cable connector (plug/socket) with mark A.
- (2)Align with mark C on the unit and insert the connector vertically. If they are not aligned, the connector cannot be connected correctly.
- (3)When mark B has been turned 180 degrees (1/2 turn), wiring is complete. Confirm that the connection is not loose. If turned too far, it will become hard to remove the connector.



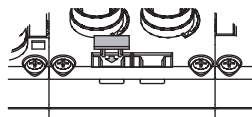
- Connector pin assignment

Configuration		Pin number	Signal name
BUS IN	BUS OUT		
1 2 4 3	1 2 4 3	1	TD+
		2	RD+
		3	TD-
		4	RD-

- Mounting the marker

The signal name of the input or output devices and unit address can be written to the marker, and can be installed to each unit.

Mount the marker (EX600-ZT1) into the marker groove as required.



## 5 Setting

This product has no switches for setting, therefore the display cover should not be opened.

## 6 How to order

Refer to the operation manual on the SMC website (URL <http://www.smcworld.com>).

## 7 Outline Dimensions (mm)

Refer to the operation manual on the SMC website (URL <http://www.smcworld.com>).

## 8 Maintenance

Turn OFF the power supply, stop the supplied air, exhaust the residual pressure and verify the release of air before performing maintenance.

### Cleaning method

Use a soft cloth to remove stains.

For heavy stains, use a cloth soaked with diluted neutral detergent and fully squeezed, then wipe up the stains again with a dry cloth.

Do not use solvents such as benzene, thinner etc. to clean each unit.

Inspection item	Content of inspection
Connector/wiring	If the connector is loose, tighten it correctly.
Seal cap	If the seal cap is loose, tighten it correctly.
Screws for mounting and installation	If the screws are loose, tighten according to the specified torque.
Connection cables	If the cable is damaged or has any visual abnormality, replace the cable.
Supply voltage	Check that the supply voltage is within specification (24 VDC $\pm$ 10%).

### How to reset the product for power cut or forcible de-energizing

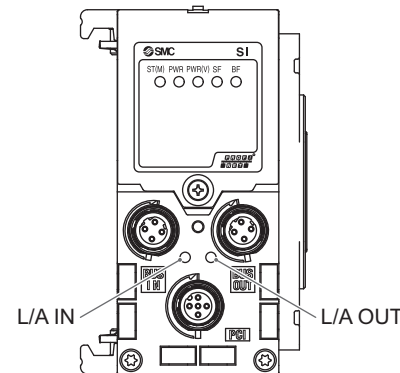
Supply power to the product.

The output status from just before the power was disconnected will not be maintained when the power supply is recovered.

Start operation of the product after confirming the safety of the entire system.

## 9 LED Display

The status display LED displays the power supply and communication status.



Display	Content
ST(M)	Displays the diagnostic status of the unit.
PWR	Displays the status of the power supply voltage for control and input.
PWR(V)	Displays the status of the power supply voltage for outputs.
SF	Displays the system status.
BF	Displays the communication status.

Display	Content
L/A IN	Displays the communication status of the BUS IN side.
L/A OUT	Displays the communication status of the BUS OUT side.

## 9 LED Display (continued)

- SI unit common status

LED display	Content
ST(M) PWR PWR(V) OFF.	The power supply for control and input is OFF.
ST(M) PWR PWR(V) Green LEDs are ON.	The unit is in normal operation.
ST(M) PWR PWR(V) Red ST(M) LED is ON.	An internal memory error has occurred in the SI unit.
ST(M) PWR PWR(V) Red PWR LED is ON.	The power supply voltage for control and input is abnormal. (Control and input power supply voltage monitoring parameter is valid)
ST(M) PWR PWR(V) Red PWR(V) LED is ON.	The power supply voltage for outputs is abnormal. (Output power supply voltage monitoring parameter is valid)
ST(M) PWR PWR(V) Green ST(M) LED is flashing.	A unit other than the SI unit has been detected.
ST(M) PWR PWR(V) Red ST(M) LED is flashing.	Either of the following conditions: •The valve ON/OFF counter has exceeded the set value. •The valve is short circuited or disconnected.
ST(M) PWR PWR(V) Red/Green ST(M) LED is flashing alternately.	Connection error between units has occurred.

- PROFINET status

LED display	Content
SF BF OFF.	The communication with the PLC has been established normally, or the power supply for control and input is OFF.
SF BF Red SF LED is ON.	The communication with the PLC has been established, but a diagnostic error has occurred.
SF BF Red BF LED is flashing.	The configuration data of the PLC and EX600 are not consistent.
SF BF Red BF LED is ON.	Either of the following conditions: •Power supply for the PLC is OFF. •The cable between the PLC and SI unit is not connected. •The PLC or the SI unit is faulty. •The configuration data of the PLC and the Device Name of the SI unit are not consistent.
SF BF Green SF LED is flashing.	The SI unit received a Node flashing test command.
(L/A IN) (Green)	OFF : No Link, No Activity ON : Link, No Activity Flashing : Link, Activity
(L/A OUT) (Green)	OFF : No Link, No Activity ON : Link, No Activity Flashing : Link, Activity

Refer to the operation manual on the SMC website (URL <http://www.smcworld.com>).

## 10 Troubleshooting

Refer to the LED Display. Refer to the operation manual on the SMC website (URL <http://www.smcworld.com>).

## 11 Commissioning

- Parameter Setting
- Hardware Configuration
- I/O Map
- Diagnostic

Refer to the operation manual on the SMC website (URL <http://www.smcworld.com>).

## 12 Contacts

AUSTRIA	(43) 2262 62280-0	LATVIA	(371) 781 77 00
BELGIUM	(32) 3 355 1464	LITHUANIA	(370) 5 264 8126
BULGARIA	(359) 2 974 4492	NETHERLANDS	(31) 20 531 8888
CZECH REP.	(420) 541 424 611	NORWAY	(47) 67 12 90 20
DENMARK	(45) 7025 2900	POLAND	(48) 22 211 9600
ESTONIA	(372) 651 0370	PORTUGAL	(351) 21 471 1880
FINLAND	(358) 207 513513	ROMANIA	(40) 21 320 5111
FRANCE	(33) 1 6476 1000	SLOVAKIA	(421) 2 444 56725
GERMANY	(49) 6103 4020	SLOVENIA	(386) 73 885 412
GREECE	(30) 210 271 7265	SPAIN	(34) 945 184 100
HUNGARY	(36) 23 511 390	SWEDEN	(46) 8 603 1200
IRELAND	(353) 1 403 9000	SWITZERLAND	(41) 52 396 3131
ITALY	(39) 02 92711	UNITED KINGDOM	(44) 1908 563888

## SMC Corporation

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

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