Installation & Maintenance Manual
Fieldbus system - Analogue unit
Type EX600-AX / EX600-AY / EX600-AM

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), Japan Industrial Standards (JIS) and other safety regulations.

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

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 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.

Safety Instructions (Continued)

⚠ Caution

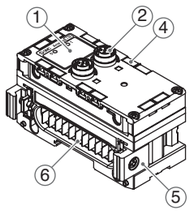
- **When handling, assembling or replacing the unit:**
  - Avoid touching any sharp metal parts of the connectors for connecting units.
  - When assembling units, take care not to get any fingers caught between units. Injury can result.
  - When disassembling units, take care to avoid excessive force. 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

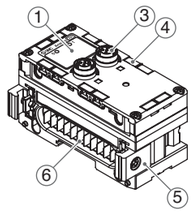
- The direct current power supply to combine should be UL1310 Class2 power supply when conformity to UL is necessary.

Summary of Product parts

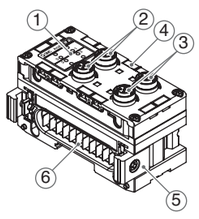
- Analogue input unit
  - EX600-AXA



- Analogue output unit
  - EX600-AYA



- Analogue I/O unit
  - EX600-AMB

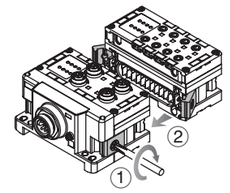


No.	Description	Function
1	Status display LED	Displays the status of the unit.
2	Connector (Analogue input)	Connector for Analogue inputs.
3	Connector (Analogue output)	Connector for Analogue outputs.
4	Marker groove	Groove for an identification marker.
5	Joint bracket	Bracket for joining adjacent units.
6	Unit connector (Plug)	Connector for signals and power supplies to adjacent units.

Assembly

○Assembling the unit as a manifold

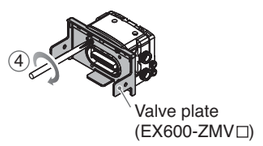
(1) Connect a unit to the end plate.
Digital and Analogue I/O units can be connected in any order.
Tighten the joint brackets to a torque of 1.5 to 1.6 Nm.



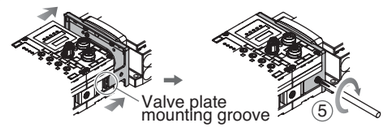
(2) Add more I/O units.
Up to 10 units (including the SI unit) can be connected to one manifold.

(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. (M3x8)
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 (M4x6) supplied, to a torque of 0.7 to 0.8 Nm.

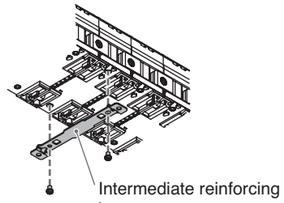


Mounting and Installation

■Installation

- Direct mounting

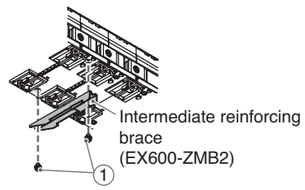
(1) When joining six or more units, fix the middle part of the complete EX600 unit with an intermediate reinforcing brace (EX600-ZMB1) before mounting, using 2-M4x5 screws.
Tightening torque:
0.7 to 0.8 Nm.



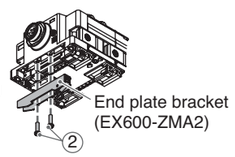
(2) Mount and tighten the end plate at one end of the unit. (M4)
Tightening torque: 0.7 to 0.8 Nm.
Fix the end plate at the valve side while referring to the operation manual of the corresponding valve manifold.

- 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-M4x6 screws.
Tightening torque: 0.7 to 0.8 Nm.



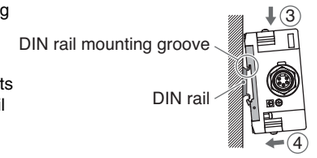
(2) Mount the end plate bracket (EX600-ZMA2) to the end plate at the opposite end to the valves, using 2-M4x14 screws.
Tightening torque: 0.7 to 0.8 Nm.



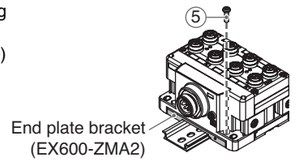
Mounting and Installation (Continued)

(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. (M4x20)
Tightening torque:
0.7 to 0.8 Nm.
The tightening torque at the valve side depends on the valve type.
Refer to the operation manual of the corresponding valve manifold.



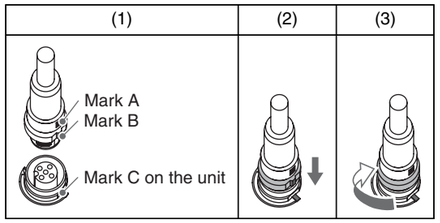
■Wiring

- Connect the M12 connector cable.
  The M12 SPEEDCON connector connection method is explained below.

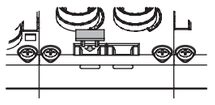
(1) Align mark B on the metal bracket of the cable connector (plug/socket) with mark A.

(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 difficult to remove the connector.



- Identification marker
  The signal name of the input or output devices and unit address can be written on the marker, and can be installed on each unit.
  Mount the marker (EX600-ZT1) into the marker groove as required.



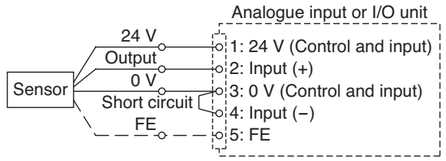
Mounting and Installation (Continued)

•Connector pin assignment

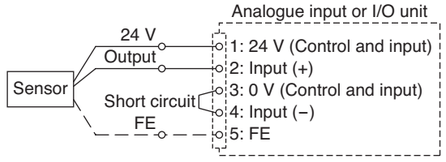
Configuration	Pin number	Signal name	
		Analogue input unit EX600-AXA	Analogue output unit EX600-AYA
	1	24 V (Control and input)	24 V (Output)
	2	input +	Output
	3	0 V (Control and input)	0 V (Output)
	4	input -	0 V (Output)
	5	FE	FE
	Pin number	Analogue I/O unit EX600-AMB	
		Input connector	Output connector
	1	24 V (Control and input)	24 V (Output)
	2	input +	Output
	3	0 V (Control and input)	0 V (Output)
	4	input -	0 V (Output)
	5	FE	FE

•Examples of wiring input devices

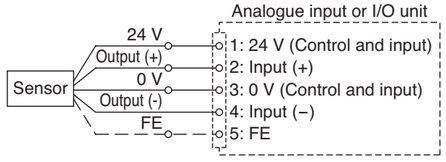
•When using a 3-wire analogue output type sensor.



•When using a 2-wire current output type sensor.



•When using a differential output type sensor.



●Note

When an analogue input sensor is connected to the EX600 Analogue input or I/O unit, pay attention to the following:

The Analogue input unit has a differential input specification, and is based on pin-2 (input +) and pin-4 (input -).

When using an analogue sensor which is not a differential type, pin-3 and pin-4 must be connected together externally.

If pin-4 is not connected, the input will not operate correctly.

LED Display

•Analogue input unit

Display	Content
OFF.	The power supply for control and input is OFF.
Green LED is ON.	The product is operating normally.
Red LED is ON.	The input device has a short circuit.
0 and 1 Red LEDs are ON.	Either of the following conditions: •The analogue input current has exceeded the upper or lower limit. •The range has been set for current input type, but a voltage input device is connected.
Red LED is flashing.	Either of the following conditions: •The upper or lower limit of the range is exceeded. •The upper or lower limit of the measuring value (with user's setting value) is exceeded.

•Analogue output unit

Display	Content
OFF.	The power supply for control and input is OFF.
Green LED is ON.	The product is operating normally.
Red LED is ON.	The output device has a short circuit.
Red LED is flashing.	The upper or lower limit of the output value (with user's setting value) is exceeded.

•Analogue I/O unit

Display		Content
OFF.		The power supply for control and input is OFF.
Green LED is ON.		The product is operating normally.
Red LED is ON.		The input or output device has a short circuit.
0 and 1 Red LEDs are ON.	Input	Either of the following conditions: •The analogue input current has exceeded the upper or lower limit. •The range has been set for current input type, but a voltage input device is connected.
Red LED is flashing.	Input	Either of the following conditions: •The upper or lower limit of the range is exceeded. •The upper or lower limit of the measuring value (with user's setting value) is exceeded.
	Output	The upper or lower limit of the output value (with user's setting value) is exceeded.

Refer to the SMC website (URL http://www.smcworld.com) to obtain more detailed information about the LED display .

Specification

Model		EX600-AXA	EX600-AYA	EX600-AMB
Power supply	Control and input	24 VDC Class2, 2 A		
	Output	-	24 VDC Class2, 2 A	
Input signal range		-10 V to 10 V -20 mA to 20 mA	-	0 V to 10 V 0 mA to 20 mA
Output signal range		-	0 V to 10 V 0 mA to 20 mA	0 V to 10 V 0 mA to 20 mA
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 2 Environment (UL508)		
Vibration resistance		10 to 57 Hz: constant amplitude 0.75 mm p-p 57 to 150 Hz: constant acceleration 49 m/s² for 2 hours each in direction X, Y and Z respectively (De-energized)		
Impact resistance		147 m/s² 3 times each in directions of X, Y and Z respectively (De-energized)		

∗1: Input terminals are not isolated from Power source.

∗2: Do not connect outside Power source to Input and Output terminals.

Refer to the product catalogue or SMC website (URL http://www.smcworld.com) to obtain more detailed information about product specifications.

Maintenance

•Maintenance should be performed according to the Safety Instructions.

•Perform regular maintenance and inspections.
There is a risk of unexpected malfunction.

•Do not use solvents such as benzene, thinner etc. to clean each unit.
They could damage the surface of the body and erase the markings on the body.
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.

Refer to the SMC website (URL http://www.smcworld.com) to obtain more detailed information about maintenance.

Troubleshooting

Refer to the LED Display. Refer to the SMC website (URL http://www.smcworld.com) to obtain more detailed information about troubleshooting.

Analogue characteristics

Refer to the SMC website (URL http://www.smcworld.com) to obtain more detailed information about analogue characteristics.

Outline with Dimensions

Refer to the product catalogue or SMC website (URL http://www.smcworld.com) to obtain more detailed information about outline dimensions.

Contacts

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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
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SMC Corporation

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

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