



Installation & Maintenance Manual  
Fieldbus system - SI unit  
Type 56-EX600-SDN1A-X10  
56-EX600-SDN2A-X10



II 3G Ex nA IIC T4 Gc X -10 °C≤Ta≤50 °C  
II 3D Ex tc IIIC T77 °C Dc X IP67

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 for long periods.**  
Fire or an explosion can result.  
This product is suitable for ATEX category 3 only.
- 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.

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.

Safety Instructions (Continued)

Caution (Continued)

- 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 noise resistance of the Fieldbus system.**  
Individual grounding should be provided close to the product with a short cable.

ATEX Marking Description

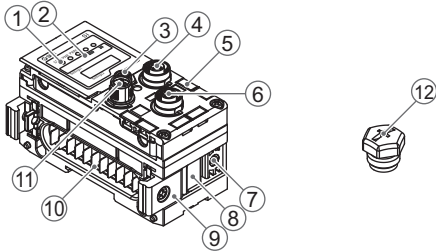
II 3G Ex nA IIC T4 Gc X -10 °C≤Ta≤50 °C  
II 3D Ex tc IIIC T77 °C Dc X IP67

Equipment Group II	tc - protected by enclosure
Category 3	IIIC - for all types of dust
Gas (G) and Dust (D) environment	T77 °C - max. surface temperature
Ex - European standards apply	Gc/Dc - Equipment Protection Level
nA - Non-sparking apparatus	X - special conditions apply, see instructions
IIC - for all types of gas	Ta - ambient temperature
T4 - Temperature classification	IP67 - protection structure

Special Conditions Notes

- The SI unit should be used within the range of specifications given below and in the product catalogue.  
If labelled with X special conditions apply:
1. Protect the SI unit from sources of heat which can generate surface temperatures higher than the temperature classification.
  2. Protect the SI unit and cables against all impact or mechanical damage using a suitable ATEX compliant enclosure.
  3. Protect the SI unit from direct sunlight or UV light using a suitable protective cover.
  4. Do not disconnect the M12 connectors before first switching off the power supply.
  5. Use only ATEX approved M12 connectors and use only shielded cable to provide grounding.
  6. Use only a damp cloth to clean the SI unit body, to avoid an electrostatic charge.

Summary of Product parts

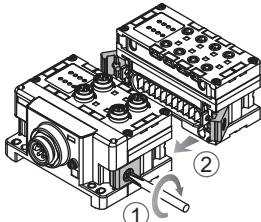


No.	Description	Function
1	Status display LED	Displays the status of the unit.
2	Display cover	Open to access the setting switches.
3	Display cover screw	Screw to open the display cover.
4	Connector (BUS OUT)	Connector for Fieldbus outputs.
5	Marker groove	Groove for an identification marker.
6	Connector (PCI)	Connector for handheld terminal.
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 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)

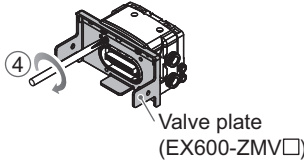
Assembly

Assembling the unit as a manifold

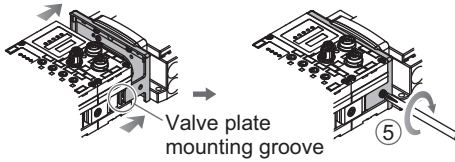
- (1) Connect a unit to the end plate.  
Digital and Analogue I/O units can be connected in any order.  
Tighten the joint brackets to a torque of 1.5 to 1.6 Nm.
- (2) Add more I/O units.  
Up to 10 units (including the SI unit) can be connected to one manifold.
- (3) Connecting the SI unit.  
After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



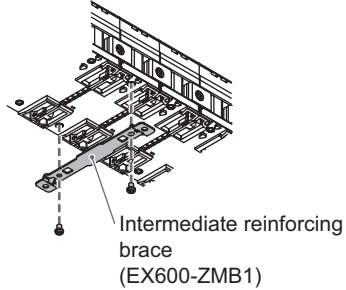
- (5) Connect the SI unit to the valve manifold.  
Insert the valve plate into the valve plate mounting groove on the side of the SI unit.  
Fix using the valve plate screws (M4x6) supplied, to a torque of 0.7 to 0.8 Nm.



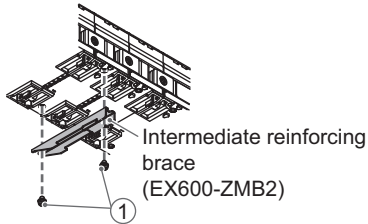
Mounting and Installation

Installation

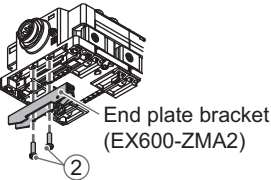
- Direct mounting
  - (1) When joining six or more units, fix the middle part of the complete EX600 unit with an intermediate reinforcing brace (EX600-ZMB1) before mounting, using 2-M4x5 screws.  
Tightening torque: 0.7 to 0.8 Nm.
  - (2) Mount and tighten the end plate at one end of the unit. (M4)  
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.

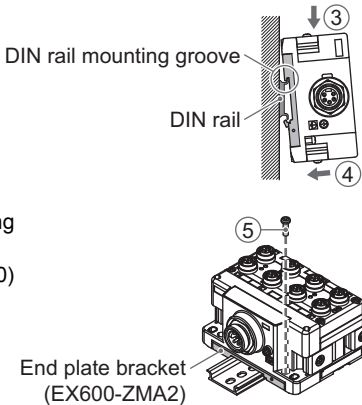


- (2) Mount the end plate bracket (EX600-ZMA2) to the end plate at the opposite end to the valves, using 2-M4x14 screws.  
Tightening torque: 0.7 to 0.8 Nm.



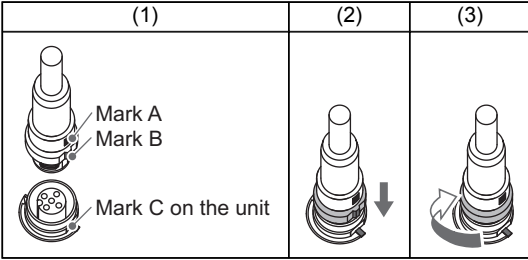
Mounting and Installation (Continued)

- (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

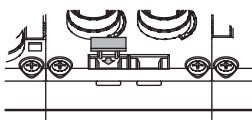
- Connect the M12 connector cable.  
The M12 SPEEDCON connector connection method is explained below.
  - (1) Align mark B on the metal bracket of the cable connector (plug/socket) with mark A.
  - (2) Align with mark C on the unit and insert the connector vertically.  
If they are not aligned, the connector 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.



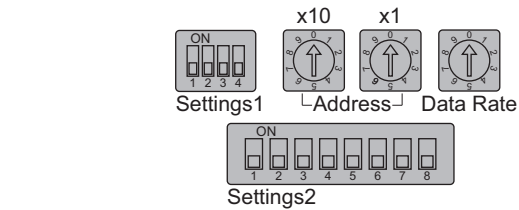
Connector pin assignment

Configuration		Pin number	Signal name
BUS IN	BUS OUT		
		1	DRAIN
		2	V+
		3	V-
		4	CAN_H
		5	CAN_L

- 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.



Setting and Adjustment



•Address setting switch

Address X10	Address X1	Node Address
0	0	0 (Default setting)
0	1	1
:	:	:
6	3	63
6	4	PGM *
:	:	
9	9	

\*: PGM allows setting via the network.

•Data Rate setting switch

Data Rate	Communication speed
0	125 kbps (Default setting)
1	250 kbps
2	500 kbps
3	PGM *
:	
9	

\*: PGM allows setting via the network.

•V\_SEL switch: The number of outputs (size) occupied by the SI unit is selected.

Settings1		Content	SI unit output data size
1	2		
OFF	OFF	Number of valves = 32 outputs	4 byte (Default setting)
OFF	ON	Number of valves = 24 outputs	3 byte
ON	OFF	Number of valves = 16 outputs	2 byte
ON	ON	Number of valves = 8 outputs	1 byte

•Diagnostic switch: Allocates the diagnostic data to the input data

Settings2		Mode	Content	Diagnostic size set for the input
1	2			
OFF	OFF	0	Input data only (Default setting)	0 byte
OFF	ON	1	Input data + System diagnosis	4 byte
ON	OFF	2	Input data + System diagnosis + Unit diagnosis (Up to 10 units)	6 byte

•HOLD/CLEAR switch: Sets the output status when the fieldbus has a communication error or is in idling state.

Settings2	Content
3	
OFF	Output is OFF. (Default setting)
ON	Holds the output.

•HW/SW switch: Select the selection method of the Fieldbus address and Data rate.

Settings2	Content
4	
OFF	Address and Data Rate are set by the SI unit switch. (Hardware) (Default setting)
ON	Address and Data Rate are set via the PLC. (Software) *

\*: In order to set software via the network, set the address or data Rate switch to PGM.

Refer to the SMC website (URL <http://www.smcworld.com>) to obtain more detailed information about setting and adjustment.

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.
MS	Displays the module status.
NS	Displays the network status.

•SI unit common status

LED display	Content
OFF.	The power supply for control and input is OFF.
Green LEDs are ON.	The unit is in normal operation.
Red ST(M) LED is ON.	A component failure inside the SI unit.
Red PWR LED is ON.	The power supply voltage for control and input is abnormal.
Red PWR(V) LED is ON.	The power supply voltage for output is abnormal.

Green ST(M) LED is flashing.	A unit other than the SI unit has been detected.
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.
Red/Green ST(M) LED is flashing alternately.	Either of the following conditions: •Connection error between units has occurred. •Configuration memory error has occurred.

LED Display (Continued)

•DeviceNet™ status

LED display	Content
OFF.	The power supply for control and inputs is OFF.
Green MS LED is ON.	Either of the following conditions: •Checking the node address. •Communication error.
Green MS and NS LEDs are both ON.	Communication is normal.
Green MS LED is ON and Green NS LED is flashing.	Connecton is not established.
Red MS LED is ON.	A component failure inside the SI unit.
Green MS LED is ON and Red NS LED is ON.	Fatal communication error.

Green MS LED is ON and Red NS LED is flashing.	Minor communication error.
Red/Green MS LED is flashing alternately. Then, Red/Green NS LED is flashing alternately.	Flashes when performing self diagnostics test when the power supply starts.

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.

Specification

Power supply	Control and input	24 VDC, 2 A
	Output	24 VDC, 2 A
Connected load		24 VDC 1.5 W (SMC) Solenoid valve with LED and circuit protection
Operating temperature range		-10 to 50 °C (Max. surrounding air temperature rating: 50 °C)
Storage temperature range		-20 to 60 °C
ATEX Classification		II 3G Ex nA IIC T4 Gc X -10 °C≤Ta≤50 °C II 3D Ex tc IIIC T77 °C Dc X IP67
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 product catalogue or SMC website (URL <http://www.smcworld.com>) to obtain more detailed information about product specifications.

Commissioning

- Parameter Setting
- Hardware Configuration (EDS file)
- I/O Map
- DeviceNet™ object

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

Diagnostic

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

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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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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