



ORIGINAL INSTRUCTIONS

Instruction Manual

Fieldbus device – Digital Input / Output unit

56-EX600-DX##-X10, 56-EX600-DY##-X10

56-EX600-DX#B-X10

56-EX600-DX#C#-X10

II 3G Ex ec IIC T4 Gc -10°C ≤ Ta ≤ 50°C
II 3D Ex tc IIIC T82°C Dc IP67

56-EX600-DX#D-X10

II 3G Ex ec IIC T4 Gc -10°C ≤ Ta ≤ 50°C
II 3D Ex tc IIIC T86°C Dc IP67

56-EX600-DY#B-X10

II 3G Ex ec IIC T4 Gc -10°C ≤ Ta ≤ 50°C
II 3D Ex tc IIIC T68°C Dc IP67

The intended use of the digital input and output unit is to connect I/O devices to the SI unit for the control of pneumatic valves.

1 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) ⁽¹⁾, and other safety regulations.

⁽¹⁾ ISO 4414: Pneumatic fluid power - General rules relating to systems.
ISO 4413: Hydraulic fluid power - General rules relating to systems.
IEC 60204-1: Safety of machinery - Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots - Safety. etc.

- Refer to product catalogue, Operation Manual and Handling Precautions for SMC Products for additional information.
- Keep this manual in a safe place for future reference.

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.

Warning

- Always ensure compliance with relevant safety laws and standards.
- All work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.

Ex Marking Description

II 3G Ex ec IIC T4 Gc -10°C ≤ Ta ≤ 50°C
II 3D Ex tc IIIC T82°C Dc IP67

Equipment Group II	tc - protected by enclosure
Category 3	IIIC - for all types of dust
Gas (G) and Dust (D) environment	T82°C - Max. surface temperature
Ex - European standards apply	Gc/Dc - Equipment Protection Level
ec - Increased safety	Ta - ambient temperature
IIC - for all types of gas	IP67 - Protection structure
T4 - Temperature classification	

Based on the conformity assessment carried out by SMC Corporation.

Certificate Number: SMC 20.0009 X

1 Safety Instructions (continued)

If the Certificate number includes an X, special conditions for safe use apply as follows:-

- Protect the product from sources of heat which can generate surface temperatures greater than the temperature classification.
- Protect the product and cable connections against all impact or mechanical damage using a suitable Ex compliant enclosure.
- Protect the product from direct sunlight or UV light using a suitable protective cover.
- Do not disconnect the M12 connectors before first switching OFF the power supply.
- Use only Ex approved connectors and use shielded cable to provide grounding.
- Use only a damp cloth to clean the product to avoid an electrostatic charge.

2 Specifications

- General specifications

Item	Specifications
Ambient temperature	-10 to +50 °C
Ambient humidity	35 to 85%RH (No condensate)
Ambient storage temperature	-20 to +60 °C
Withstand voltage	500 VAC applied for 1 minute
Insulation resistance	500 VDC, 10 MΩ or more

- Input unit electrical specifications

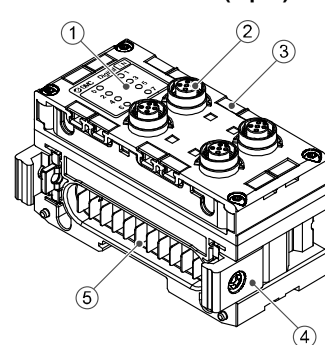
Model	56-EX600-DX#B	56-EX600-DX#C	56-EX600-DX#D
Power supply for control and input	24 VDC 2.0 A max.		
Input type	56-EX600-DXP#: PNP / source (-ve common) 56-EX600-DXN#: NPN / sink (+ve common)		
Input connector	M12 5-pin	M8 3-pin	M12 5-pin
No. of inputs	8 (2/connector)	8 (1/connector)	16 (2/connector)
Max. sensor supply current	0.5 A / connector 2 A / unit	0.25 A / connector 2 A / unit	0.5 A / connector 2 A / unit
Protective function	Short circuit protection		
Input resistance	2.7 kΩ		
Rated input current	9 mA max.		
Current consumption	50 mA max.	55 mA max.	70 mA max.

- Output unit electrical specifications

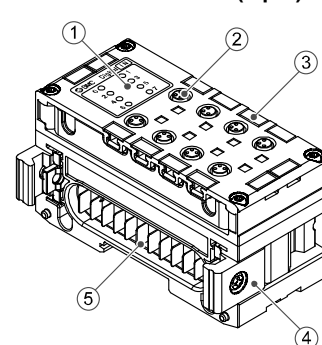
Model	56-EX600-DY#B
Power supply for control and input	24 VDC 2.0 A max.
Power supply for Outputs	24 VDC 2.0 A max.
Output connector	M12 5-pin socket
No. of outputs	8 (2 / connector)
Max. Load current	0.5 A / output 2 A / unit
Protective function	Short circuit protection
Current consumption	50 mA max.

3 Name and function of Individual parts

56-EX600-DX#B-X10 (input)

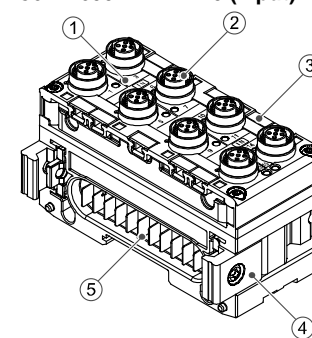


56-EX600-DX#C#-X10 (input)

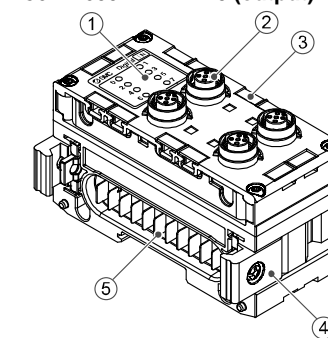


3 Name and function of Individual parts (continued)

56-EX600-DX#D-X10 (input)



56-EX600-DY#B-X10 (output)



No	Part	Description
1	LED display	Displays the status of the unit.
2	Connector	Connector for Inputs / Outputs (M12 or M8 connector)
3	Marker groove	Groove for identification marker.
4	Joint bracket	Bracket for joining to adjacent units.
5	Unit connector	Connector for signal/power to next unit.

4 Assembly

4.1 Assembling the unit



Do not install the product unless the safety instructions have been read and understood.

(1) Connect an I/O unit to the end plate. Digital and analogue units can be connected in any order. Joint bracket screw tightening torque: 1.5 to 1.6 N•m.

(2) Add more I/O units. Up to 9 I/O units can be connected to one manifold.

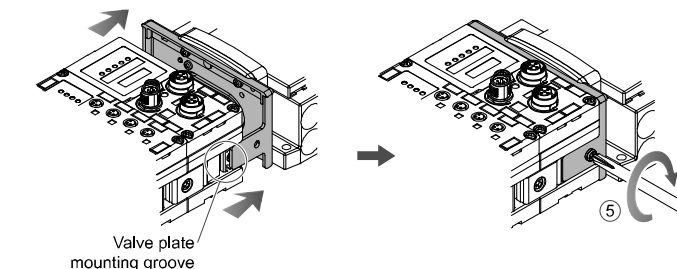
(3) Connect the SI unit. After connecting the required I/O units, connect the SI unit. The connection method is as above.

(4) Mount the valve plate (EX600-ZMV#) to the valve manifold using the valve screws (M3 x 8) supplied. (Tightening torque: 0.6 to 0.7 N•m).

(5) Connect the SI unit assembly to the valve manifold.

Insert the valve plate into the valve plate mounting groove.

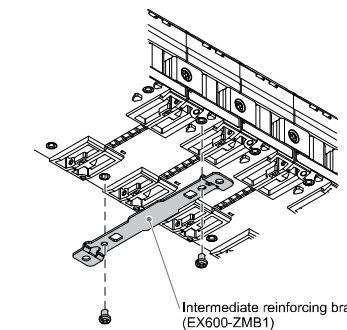
Then fix using the valve plate mounting screws (M4 x 6) supplied (Tightening torque: 0.7 to 0.8 N•m).



5 Installation

- Direct mounting

(1) When assembling six or more units, the middle part of the assembly must be fitted with an intermediate reinforcing brace (EX600-ZMB1) before mounting using 2-M4 x 5 screws (Tightening torque: 0.7 to 0.8 N•m).

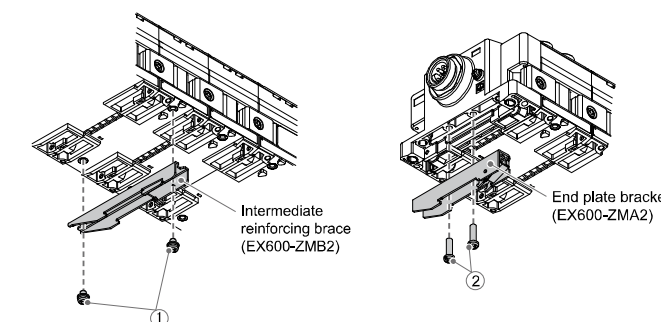


(2) Mount and tighten the end plate at one end of the unit and mount the intermediate reinforcing brace if required using M4 screws (Tightening torque: 0.7 to 0.8 N•m). Fix the end plate at the valve side while referring to the operation manual for the applicable valve series.

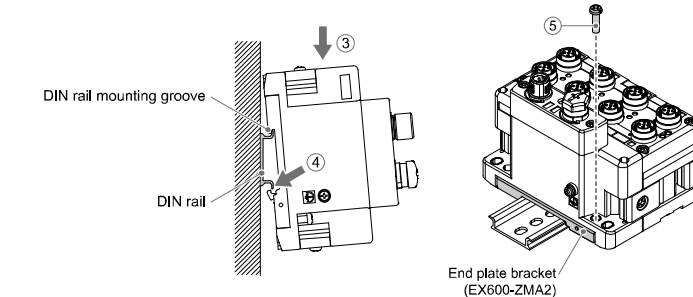
- DIN rail mounting

(1) When assembling six or more units, the middle part of the complete assembly must be fitted with an intermediate reinforcing brace for DIN rail mounting (EX600-ZMB2), using 2-M4 x 6 screws. (Tightening torque: 0.7 to 0.8 N•m).

(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 N•m). For the SY series, use end plate bracket (EX600-ZMA3).



(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 onto the DIN rail.
(5) Fix the manifold by tightening the DIN rail fixing screws (M4 x 20) on the end plate bracket (Tightening torque: 0.7 to 0.8 N•m).



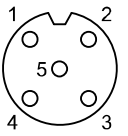
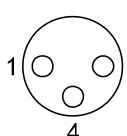
Refer to the Operation Manual for the applicable valve series on the SMC website (URL: <https://www.smcworld.com>) for the mounting method of the valve manifold.

5 Installation (continued)

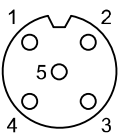
5.1 Wiring connections

Select the appropriate cables to mate with the connectors on the unit.

• Digital Input unit

Connector		Pin No.	Signal name
56-EX600-DX#B 56-EX600-DX#D	56-EX600-DX#C		
 M12 5-pin	 M8 3-pin	1	24 V (control and input)
		2	Input 2
		3	24 V (control and input)
		4	Input 1
		5	FE

• Digital Output unit

Connector	Pin No.	Signal name	
		56-EX600-DYPB	56-EX600-DYNB
 M12 5-pin	1	N.C.	24 V (output)
	2	Output 2	Output 2
	3	0 V (output)	N.C.
	4	Output 1	Output 1
	5	FE	FE

The M12 connector cable for fieldbus and power supply connections has two types, Standard M12 and SPEEDCON compatible. If both plug and socket have SPEEDCON connectors, the cable can be inserted and connected by turning it a 1/2 rotation. A standard connector can be connected to a SPEEDCON connector.

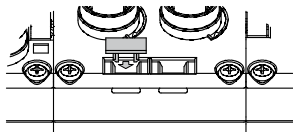
Warning

- Be sure to fit a seal cap (EX9-AWTS) on any unused connectors. Proper use of the seal cap enables the enclosure to maintain IP67 specification.

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



5.3 Environment

Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not install in a location subject to vibration or impact in excess of the product's specifications.
- Do not mount in a location exposed to radiant heat that would result in temperatures in excess of the product's specifications.

6 How to Order

Refer to the operation manual on the SMC website (URL: <https://www.smcworld.com>) for How to order information.

7 Outline Dimensions (mm)

Refer to the operation manual on the SMC website (URL: <https://www.smcworld.com>) for outline dimensions.

8 LED Display

• Digital Input unit

LED	Description
OFF	Power supply for control and input or the input device is OFF.
Green LED ON	The input device is ON.
Red LED ON	<ul style="list-style-type: none"> The power supply of the input device or LED has a short circuit. The input device power supply has a short circuit (only for EX600-DX#C1).
Red LED flashing	<ul style="list-style-type: none"> The input device ON/OFF counter has exceeded the set value. The input device is open circuit (only for EX600-DX#C1).

• Digital Output unit

LED	Description
OFF	Power supply for control and input or the output device is OFF.
Green LED ON	The output device is ON.
Red LED ON	The output device has a short circuit.
Red LED flashing	<ul style="list-style-type: none"> The output device ON/OFF counter has exceeded the set value. The output device is open circuit

9 Maintenance

9.1 General Maintenance

Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous.
- Maintenance of pneumatic systems should be performed only by qualified personnel.
- Before performing maintenance, turn off the power supply and be sure to cut off the supply pressure. Confirm that the air is released to atmosphere.
- After installation and maintenance, apply operating pressure and power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- If any electrical connections are disturbed during maintenance, ensure they are reconnected correctly and safety checks are carried out as required to ensure continued compliance with applicable national regulations.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions
- Stop operation if the product does not function correctly.

10 Limitations of Use

10.1 Limited warranty and Disclaimer/Compliance Requirements

Refer to Handling Precautions for SMC Products.

11 Product disposal

This product should not be disposed of as municipal waste. Check your local regulations and guidelines to dispose of this product correctly, in order to reduce the impact on human health and the environment.

12 Contacts

Refer to www.smcworld.com or www.smc.eu for your local distributor / importer.

SMC Corporation

URL: <https://www.smcworld.com> (Global) <https://www.smc.eu> (Europe)
 SMC Corporation, 4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, Japan
 Specifications are subject to change without prior notice from the manufacturer.
 © 2021-2022 SMC Corporation All Rights Reserved.
 Template DKP50047-F-085M