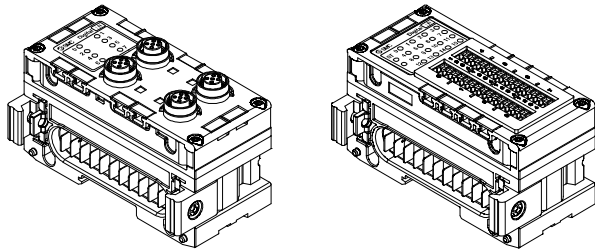




Instruction Manual
Fieldbus device - Temperature Measurement
EX600-ATB-X61 / EX600-ATF-X61



The intended use of the Temperature Measurement unit is to connect RTD temperature sensor input devices to an SI unit for the control of pneumatic valves and I/O.

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)^{*)}, and other safety regulations.

*)ISO 4414: Pneumatic fluid power — General rules and safety requirements for systems and their components.

ISO 4413: Hydraulic fluid power — General rules and safety requirements for systems and their components

IEC 60204-1: Safety of machinery - Electrical equipment of machines - Part 1: General requirements

ISO 10218-1: Robotics — Safety requirements — Part 1: Industrial robots

- 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.

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

2 Specifications

The EX600 range of units can be connected to a fieldbus to realize the reduction of input or output device wiring and a distributed control system. The system communicates with the fieldbus through the SI unit. One SI unit can be connected to manifold valves with up to 32 outputs, and to input, output and I/O units to a maximum of 10 units.

2.1 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
Weight	300 g

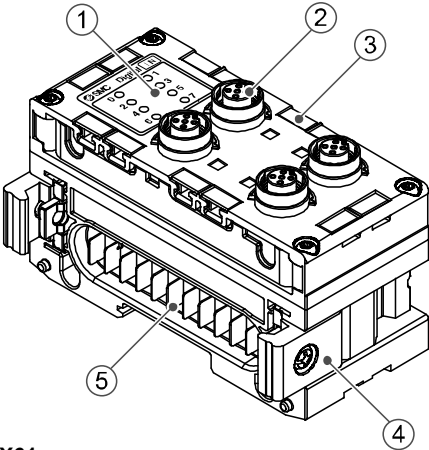
2 Specifications (continued)

2.2 Electrical specifications

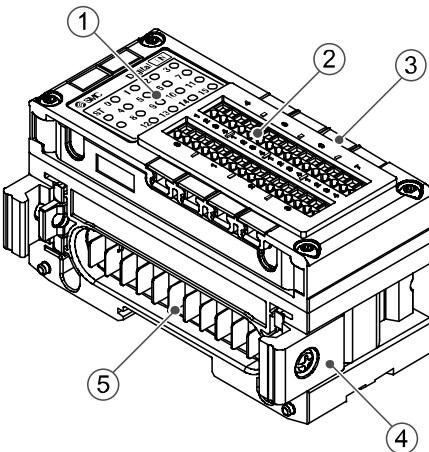
Model	EX600-ATB-X61	EX600-ATF-X61
Connector	M12 (5-pin) socket	Spring type terminal block (32 pins)
Input type	RTD sensor	
Number of inputs	4 channels	
Applicable sensor type	PT100 (Temperature coefficient: 0.00385 Ω / Ω / °C)	
Applicable wire type	2-wire / 3-wire / 4-wire (selectable by the parameter setting)	
Applicable wire diameter	-	0.08 to 1.5 mm ² (AWG 16 to 28)
Measurement range	-200 °C to +850 °C -328 °F to +1562 °F (selectable by parameter setting)	
Accuracy (at 25°C)	±0.1% Full Scale	
Resolution	15 bits plus sign	
Compatible SI Unit	EX600-SEN3-X80 EX600-SPN3/SPN4	
Enclosure rating	IP67 (manifold assembled)	IP40 (manifold assembled)

3 Name and function of Individual parts

EX600-ATB-X61



EX600-ATF-X61



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

4 Assembly

4.1 Assembling the unit

Warning

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.

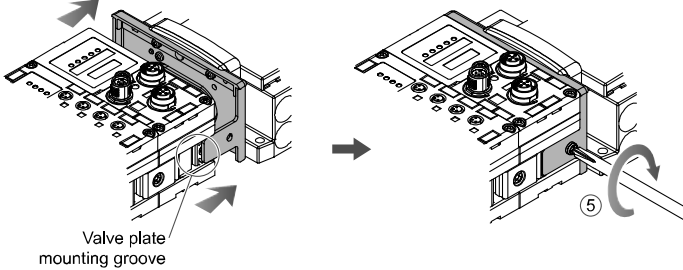
- (2) Add more I/O units. Up to 9 I/O units can be connected to one manifold.

- (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).

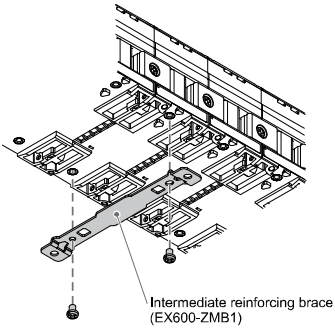


5 Installation

- Do not expose to direct sunlight. Use a suitable protective cover.
- 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.

• **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-M4x5 screws (Tightening torque: 0.7 to 0.8 N•m).



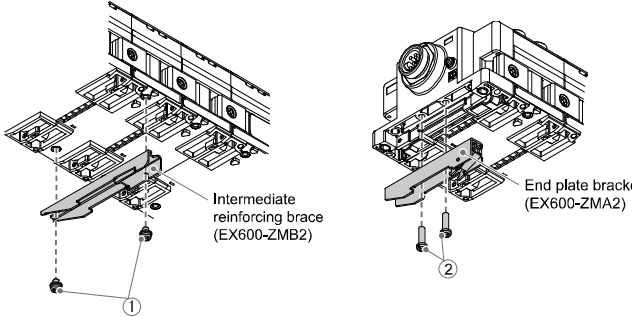
- (2) Mount and tighten the end plate at one end of the unit and mount the intermediate reinforcing brace if required using M4 screws (Tightening torque: 0.7 to 0.8 N•m). Fix the end plate at the valve side while referring to the operation manual for the applicable valve series.

5 Installation (continued)

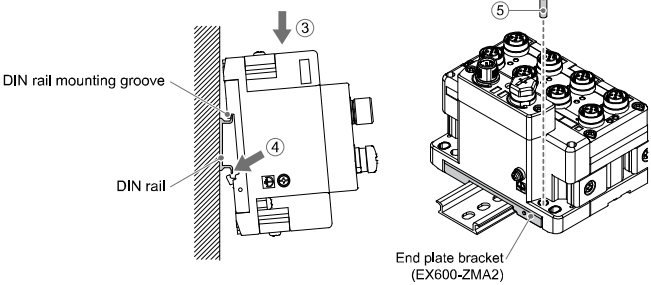
• **DIN rail mounting**

- (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).



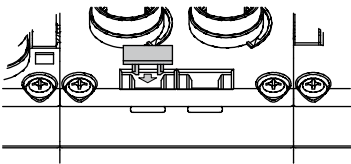
- (3) Hook the DIN rail mounting groove on to the DIN rail.
- (4) Press the manifold using its side hooked to the DIN rail as a fulcrum until the manifold is locked onto the DIN rail.
- (5) Fix the manifold by tightening the DIN rail fixing screws (M4 x 20) on the end plate bracket (Tightening torque: 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.

5.1 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.



5.2 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 Wiring

• EX600-ATB-X61

Select appropriate cables to mate with the M12 connectors on the unit.

M12 5-pin (socket) connector

Connector	Pin No.	Signal Name
	1	V in 1
	2	I sense 1
	3	I sense 2
	4	V in 2
	5	FE

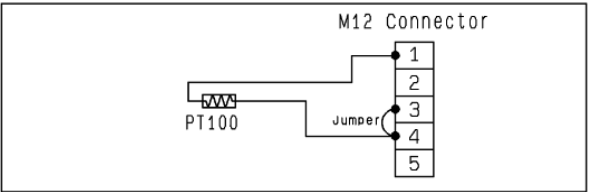
* An M12 4-pin connector can also be used.

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.

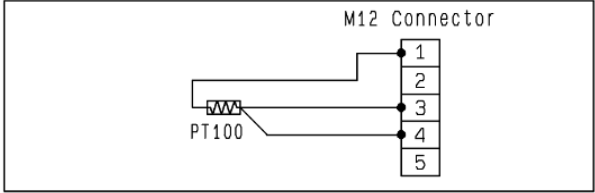
Warning

- 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.

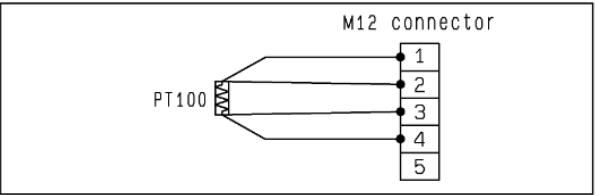
Example of wiring a 2-wire RTD sensor



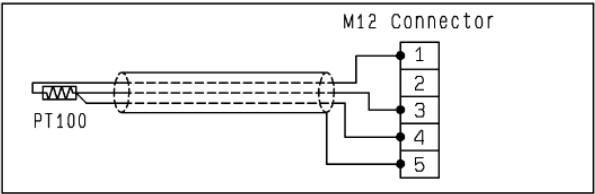
Example of wiring a 3-wire RTD sensor



Example of wiring a 4-wire RTD sensor



Example of wiring a 3-wire RTD sensor with shielded cable



Warning

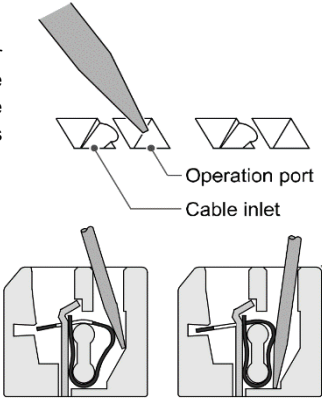
- When using a sensor with a long cable (>3 m) noise may be introduced. It is recommended that screened cable is used to reduce the noise problem. Always minimize cable length to ensure best accuracy.

6 Wiring (continued)

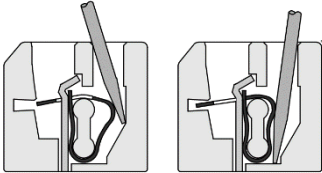
• EX600-ATF-X61

The EX600-ATF-X61 unit used spring type terminals. The connection method using these terminals is shown below.

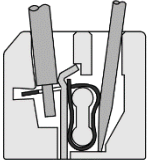
- Insert a flat blade screwdriver inclined to the left into the operation port on the right side hole of the 2 holes available as shown.



- Incline the screwdriver to the right and push the screwdriver downwards until it stops. The cable inlet will open.



- Insert the cable into the left side hole.



- The spring terminal will capture the cable when the screwdriver is pulled out. This completes the connection.

• Spring Terminal Connector Pin assignment

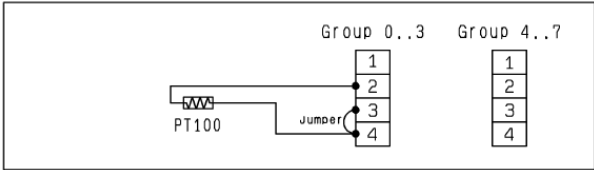
Configuration	Group	Pin number	Signal name
	0	1	CH0_Isense1
		2	CH0_Vin1
		3	CH0_Isense2
		4	CH0_Vin2
	1	1	CH1_Isense1
		2	CH1_Vin1
		3	CH1_Isense2
		4	CH1_Vin2
	2	1	CH2_Isense1
		2	CH2_Vin1
		3	CH2_Isense2
		4	CH2_Vin2
	3	1	CH3_Isense1
		2	CH3_Vin1
		3	CH3_Isense2
		4	CH3_Vin2
	4	1	FE
		2	FE
		3	FE
		4	FE
	5	1	FE
		2	FE
		3	FE
		4	FE
	6	1	FE
		2	FE
		3	FE
		4	FE
	7	1	FE
		2	FE
		3	FE
		4	FE

Warning

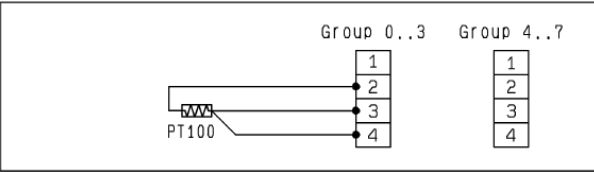
- When using a sensor with a long cable (>3 m) noise may be introduced. It is recommended that screened cable is used to reduce the noise problem. Always minimize cable length to ensure best accuracy.

6 Wiring (continued)

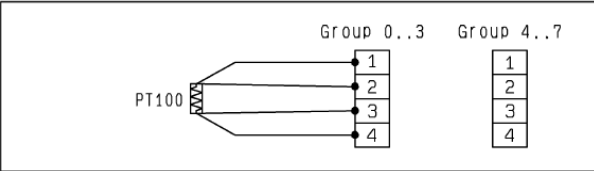
Example of wiring a 2-wire RTD sensor



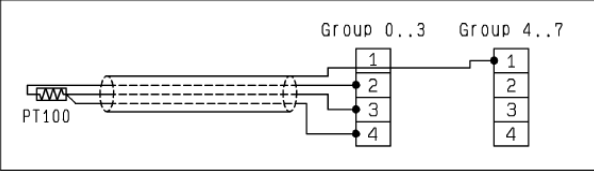
Example of wiring a 3-wire RTD sensor



Example of wiring a 4-wire RTD sensor



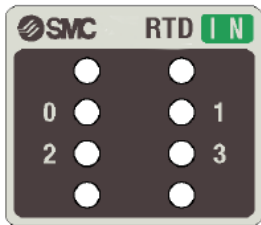
Example of wiring a 3-wire RTD sensor with shielded cable



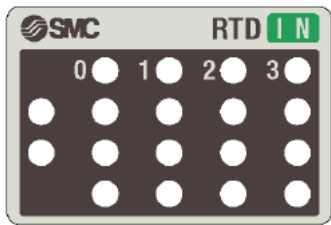
7 LED Display

The LED module display indicates the module status.

EX600-ATB-X61



EX600-ATF-X61



LED 0 to 3	Content
○ OFF	The power supply for control and input is OFF.
● Green LED is ON	The power supply for control and input is ON

8 Parameter setting

The temperature measurement unit parameters can be configured for the unit and channel. The parameter setting method differs depending on the type of SI unit.

- EX600-SPN3 / SPN4 -> GSDML configuration file
- EX600-SEN3-X80 -> Web server function

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

9 How to Order

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

10 Outline Dimensions (mm)

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

11 Maintenance

11.1 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.

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

Supply power to the product.

The output status just before the power failure is not maintained when power supply is recovered.

Start operation after confirming safety of the entire equipment.

12 Limitations of Use

12.1 Limited warranty and Disclaimer/Compliance Requirements

Refer to Handling Precautions for SMC Products.

13 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.

14 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, 1-5-5, Kyobashi, Chuo-ku, Tokyo 104-0031, JAPAN
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