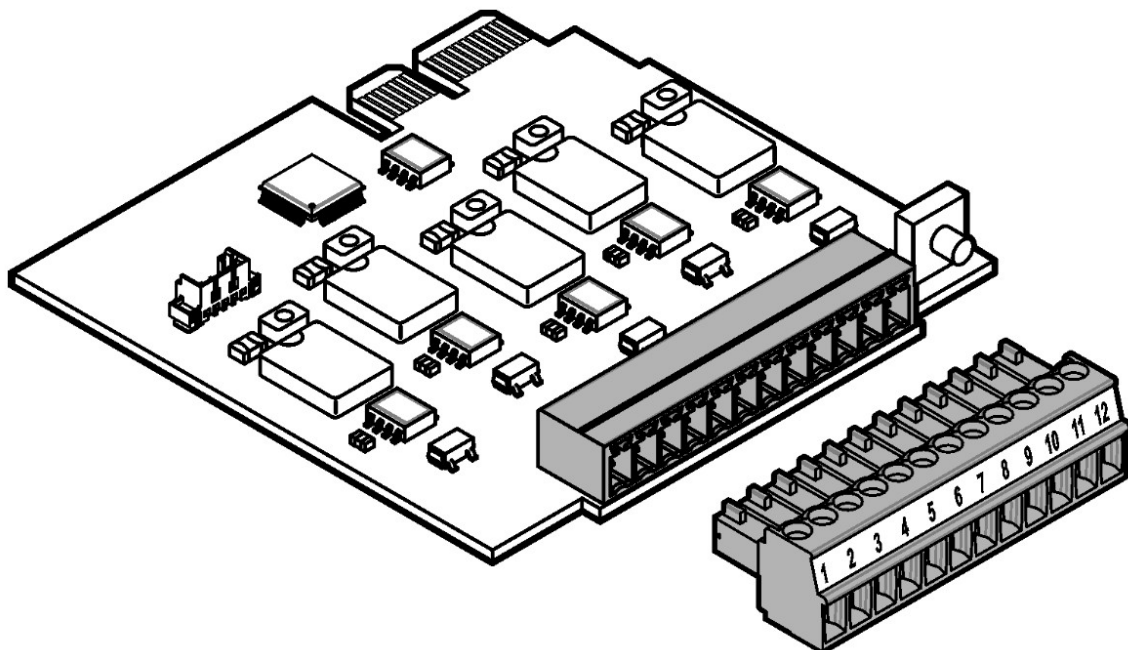


HACH DOC273.98.90587 4-20 mA Output Module User Manual

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DOC273.98.90587
4–20 mA Output Module
03/2022, Edition 8



User Instructions

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Section 1 Specifications

Specifications are subject to change without notice.

Specification	Details
Current	23 mA maximum
Loop resistance	12–18 VDC power supply: 0–250 Ω ; 18–24 VDC power supply: 250–500 Ω
Wiring	Wire gauge: 0.08 to 1.5 mm ² (28 to 16 AWG) with an insulation rating of 300 VAC or higher ¹
Operating temperature	–20 to 60 °C (–4 to 140 °F); 95% relative humidity, non-condensing
Storage temperature	–20 to 70 °C (–4 to 158 °F); 95% relative humidity, non-condensing
Certification	Listed for use with the SC4200c/SC4500 controller in Class 1, Division 2, Group A, B, C and D, Zone 2, Group IIC hazardous locations to FM and CSA safety standards by ETL

Section 2 General information

In no event will the manufacturer be liable for direct, indirect, special, incidental or consequential damages resulting from any defect or omission in this manual. The manufacturer reserves the right to make changes in this manual and the products it describes at any time, without notice or obligation. Revised editions are found on the manufacturer's website.

2.1 Safety information

The manufacturer is not responsible for any damages due to misapplication or misuse of this product including, without limitation, direct, incidental and consequential damages, and disclaims such damages to the full extent permitted under applicable law. The user is solely responsible to identify critical application risks and install appropriate mechanisms to protect processes during a possible equipment malfunction.

Please read this entire manual before unpacking, setting up or operating this equipment. Pay attention to all danger and caution statements. Failure to do so could result in serious injury to the operator or damage to the equipment.

Make sure that the protection provided by this equipment is not impaired. Do not use or install this equipment in any manner other than that specified in this manual.

2.1.1 Use of hazard information



DANGER

Indicates a potentially or imminently hazardous situation which, if not avoided, will result in death or serious injury.



WARNING

Indicates a potentially or imminently hazardous situation which, if not avoided, could result in death or serious

injury.

1 Do not use wire gauge other than 0.08 to 1.5 mm² (28 to 16 AWG), unless wires can be isolated from mains power and relay circuits.



Indicates a potentially hazardous situation that may result in minor or moderate injury.

NOTICE

Indicates a situation which, if not avoided, may cause damage to the instrument. Information that requires special emphasis.

2.1.2 Precautionary labels

Read all labels and tags attached to the instrument. Personal injury or damage to the instrument could occur if not observed. A symbol on the instrument is referenced in the manual with a precautionary statement.



	This symbol, if noted on the instrument, references the instruction manual for operation and/or safety information.
	This symbol indicates that a risk of electrical shock and/or electrocution exists.
	This symbol indicates the presence of devices sensitive to Electro-static Discharge (ESD) and indicates that care must be taken to prevent damage with the equipment.
	Electrical equipment marked with this symbol may not be disposed of in European domestic or public disposal systems. Return old or end-of-life equipment to the manufacturer for disposal at no charge to the user.



2.1.3 Class 1 Division 2 label



	This label indicates that the module is approved for use in a Class I Div 2 A-D, T4/Class I Zone 2 IIC, T4 environment when used with a Class I Div 2 approved SC4200c and SC4500 controllers and sensors: LDO and TSS-Ex 1.
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2.1.4 Precautions for hazardous location installation

	Explosion hazard. Only qualified personnel should conduct the installation tasks described in this section of the manual. This equipment is suitable for use in Class 1, Division 2, Groups A, B, C & D Hazardous Locations with specified sensors and options appropriately certified and rated for Class I, Division 2, Group A, B, C & D, Zone 2, Group IIC Hazardous Locations.

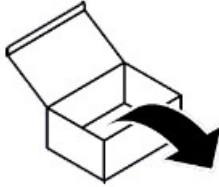



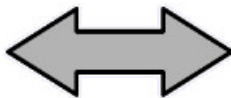
 DANGER	
	Explosion hazard. Do not remove or replace modules while power is supplied to the controller unless there are no ignitable gases in the area.

 DANGER	
	Explosion hazard. Do not connect or disconnect electrical components or circuits to the equipment unless power has been removed or the area is known to be non-hazardous.

 DANGER	
	Explosion hazard. Connect only peripheral components that are clearly marked as certified for Class 1, Division 2 Hazardous Locations.

Never connect any sensor or digital or analog module to an SC Controller that is not clearly marked as certified for Class 1, Division 2 Hazardous Locations.

2.2 Icons used in illustrations

				
Manufacturer supplied parts	User supplied parts	Look	Listen	Do one of these options

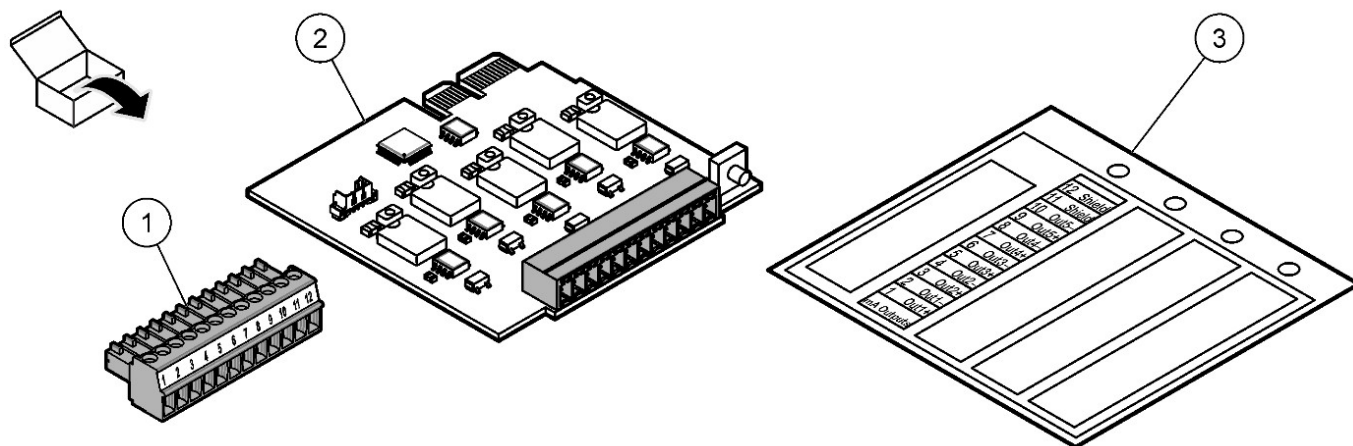
2.3 Product overview

The 4–20 mA output module is an expansion card that supplies five 4–20 mA analog output connections to the SC4200c and SC4500 controllers. The module connects to the expansion modules slots inside the controller. The analog outputs are commonly used for analog signaling or to control other external devices.

2.4 Product components

Make sure that all components have been received. Refer to **Figure 1**. If any items are missing or damaged, contact the manufacturer or a sales representative immediately.

Figure 1 Product components



1 Module connector	3 Label with wiring information
2 4-20 mA output module	

Section 3 Installation



Multiple hazards. Only qualified personnel must conduct the tasks described in this section of the document.



Electrocution hazard. Remove power from the instrument before this procedure is started.



Electrocution hazard. High voltage wiring for the controller is conducted behind the high voltage barrier in the controller enclosure. The barrier must remain in place unless a qualified installation technician is installing wiring for power, alarms, or relays.



WARNING



Electrical shock hazard. Externally connected equipment must have an applicable country safety standard assessment.

NOTICE

Make sure that the equipment is connected to the instrument in accordance with local, regional and national requirements.

NOTICE



Potential Instrument Damage. Delicate internal electronic components can be damaged by static electricity, resulting in degraded performance or eventual failure.

Refer to the steps in this procedure to prevent ESD damage to the instrument:

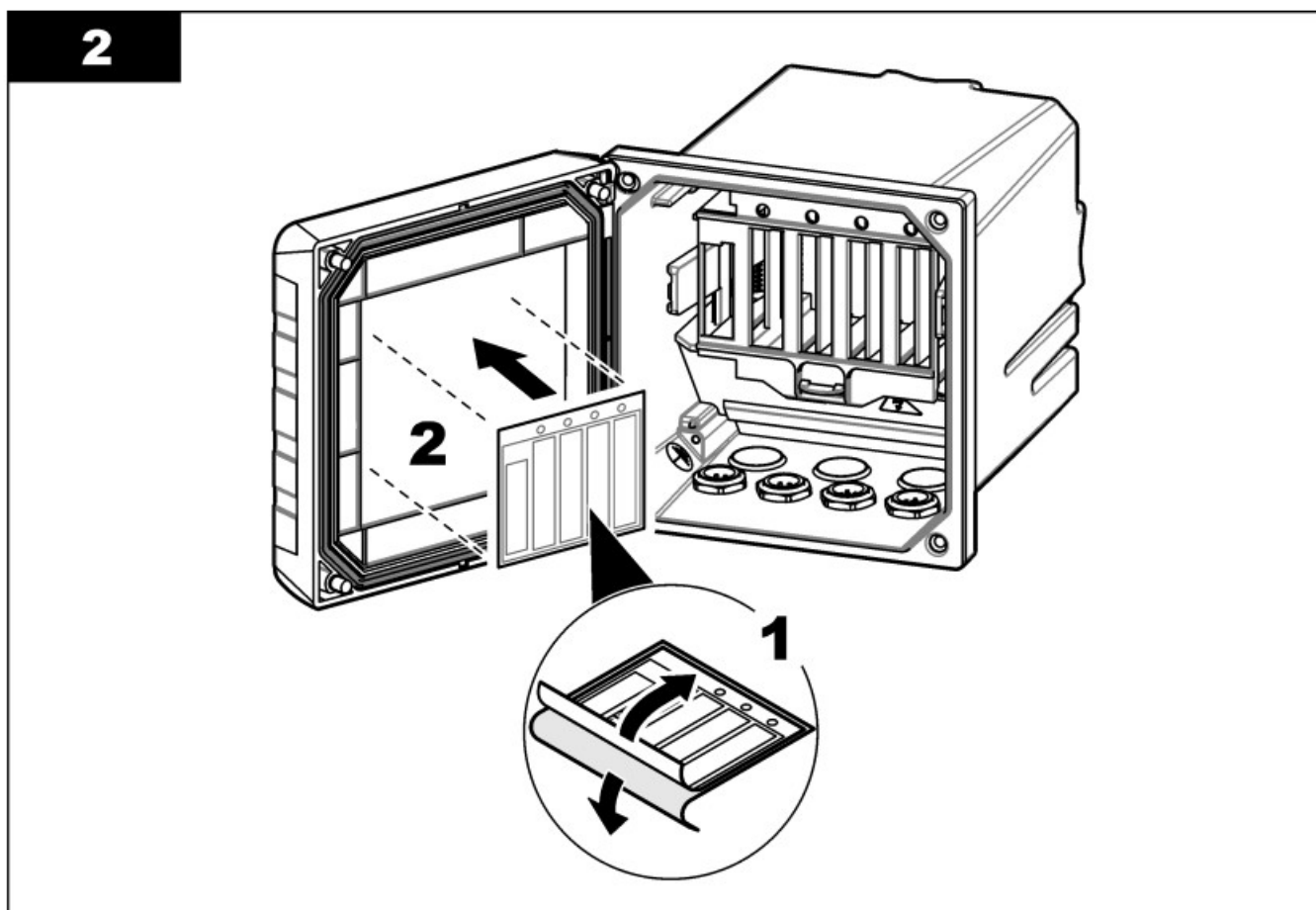
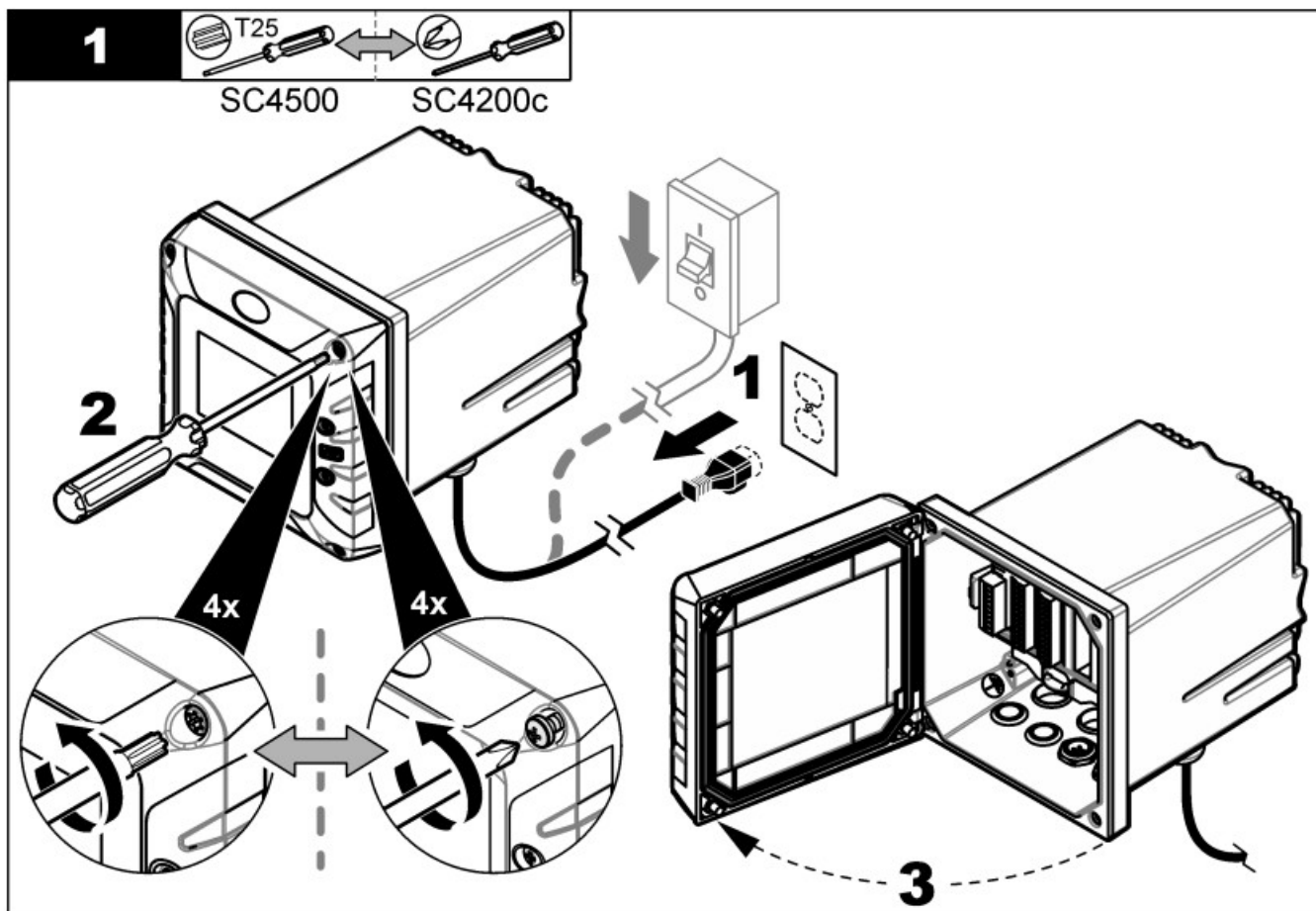
- Touch an earth-grounded metal surface such as the chassis of an instrument, a metal conduit or pipe to discharge static electricity from the body.
- Avoid excessive movement. Transport static-sensitive components in anti-static containers or packages.
- Wear a wrist strap connected by a wire to earth ground.
- Work in a static-safe area with anti-static floor pads and work bench pads.

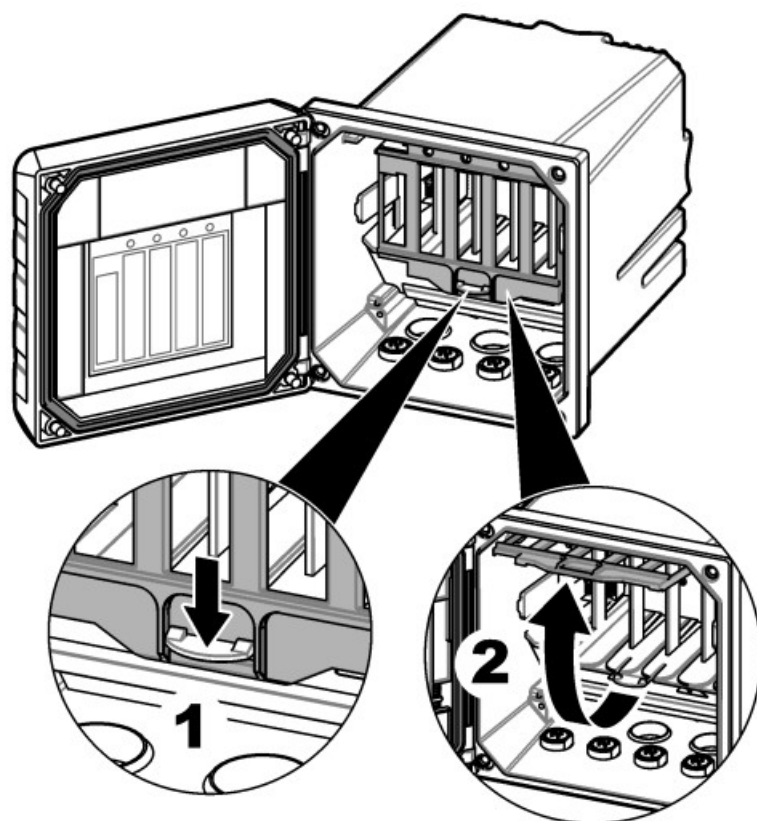
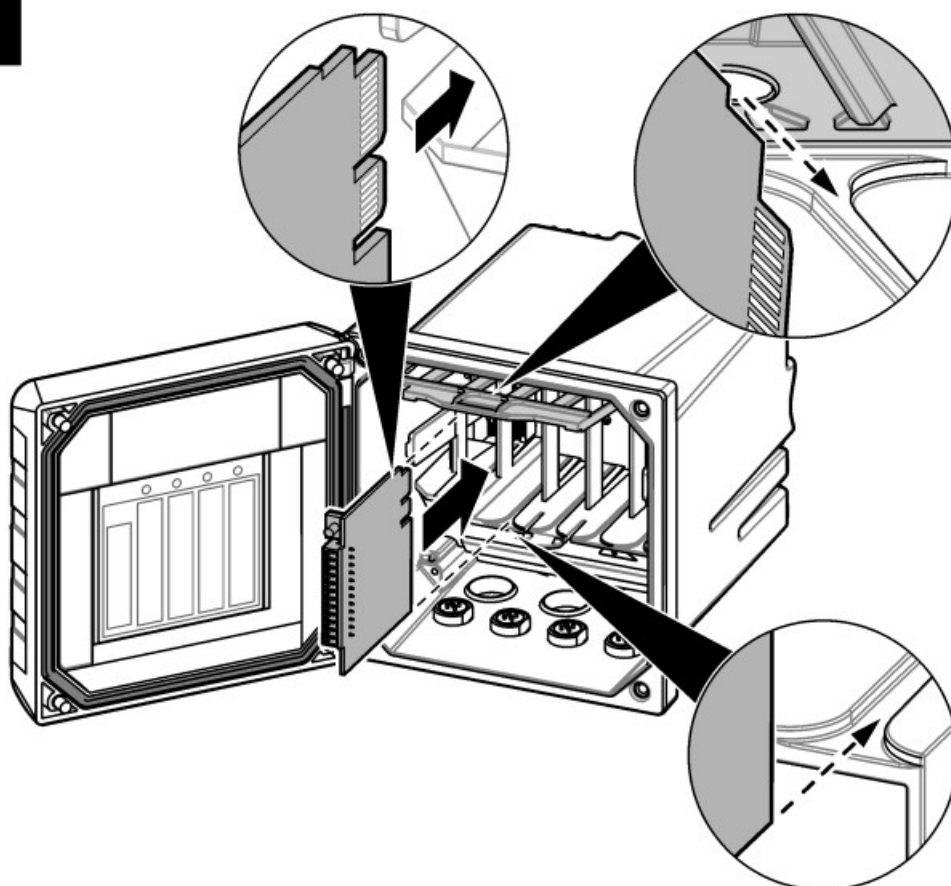
3.2 Install the module

Install the module in the controller. Refer to the illustrated steps that follow.

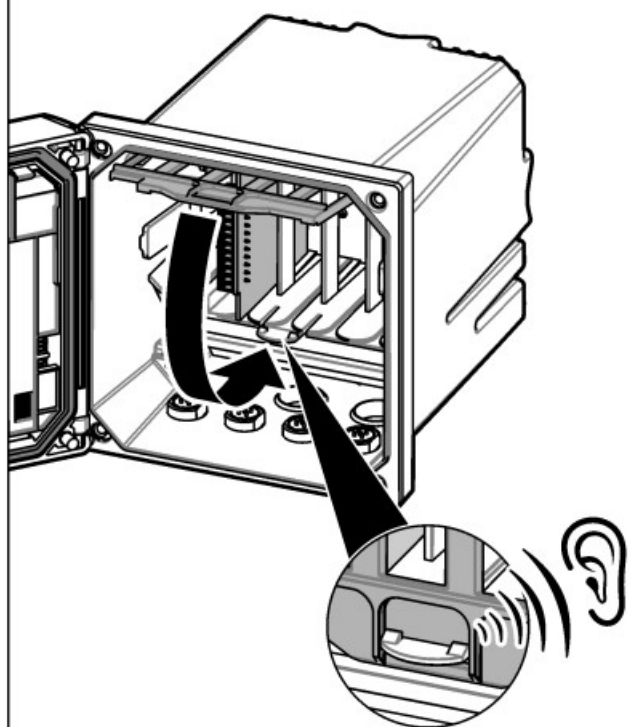
Notes:

- To keep the enclosure rating, make sure that all unused electrical access holes are sealed with an access hole cover.
- To maintain the enclosure rating of the instrument, unused cable glands must be plugged.
- Maximum loop resistance is 500 Ω .
- The analog outputs are isolated from the other electronics, but are not isolated from each other.
- The analog outputs are self-powered. Do not connect to a load with voltage that is independently applied.
- The analog outputs cannot be used to supply power to a 2-wire (loop-powered) transmitter.

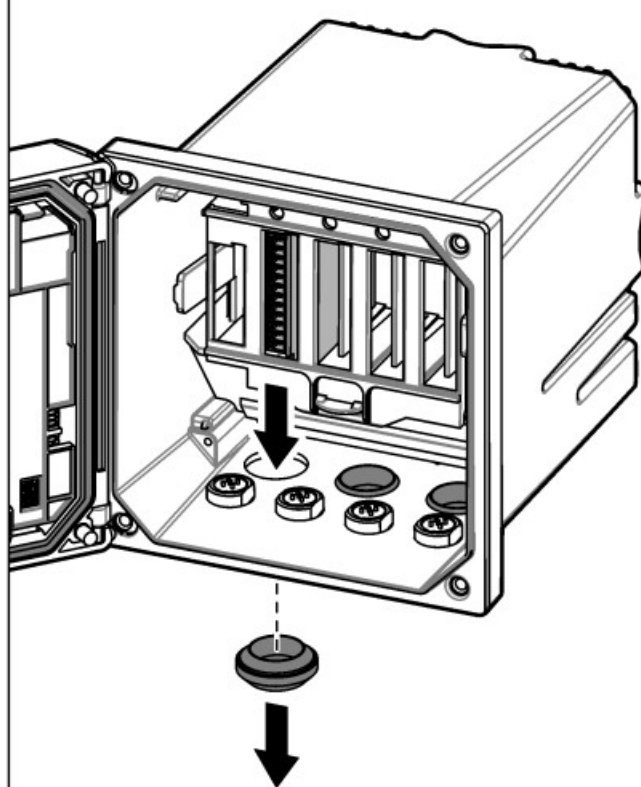


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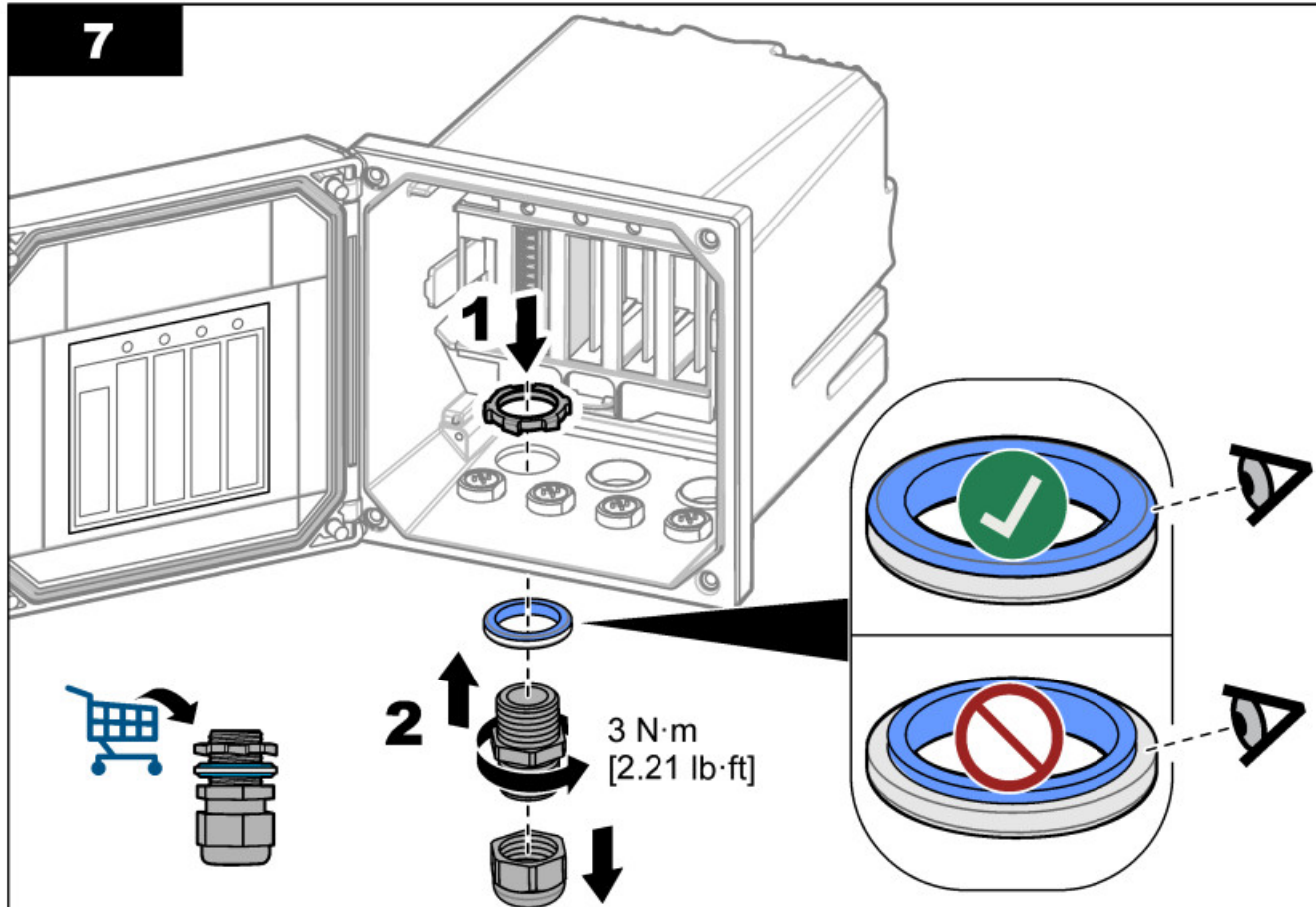
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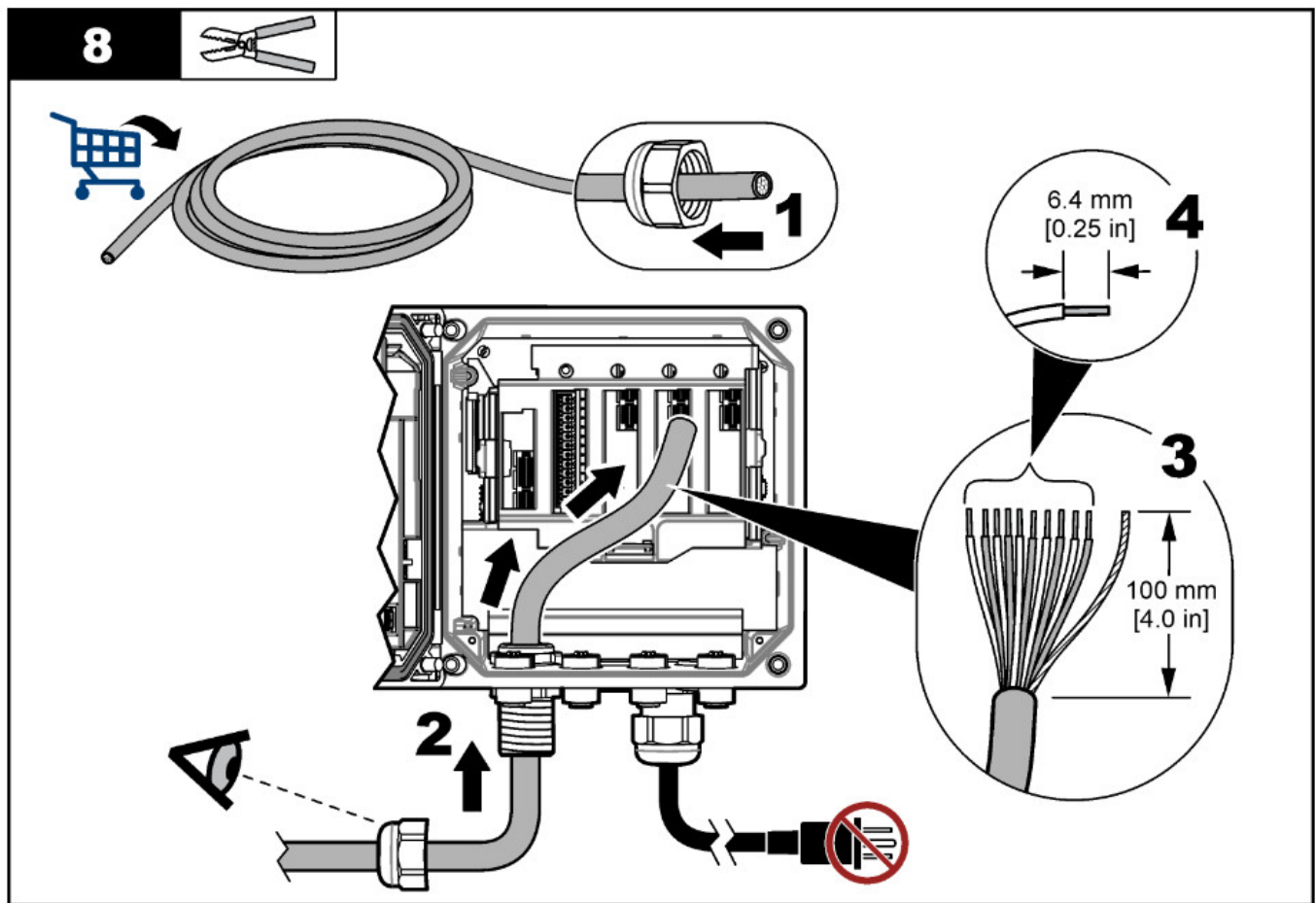
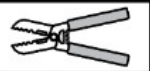


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NOTICE

Use cabling with a wire gauge of 0.08 to 1.5 mm² (28 to 16 AWG)² and an insulation rating of 300 VAC or higher. Use twisted-pair shielded wire³.

² Do not use wire gauge other than 0.08 to 1.5 mm² (28 to 16 AWG), unless wires can be isolated from mains power and relay circuits.

³ Use of non-shielded cable may result in radio frequency emission or susceptibility levels higher than allowed.

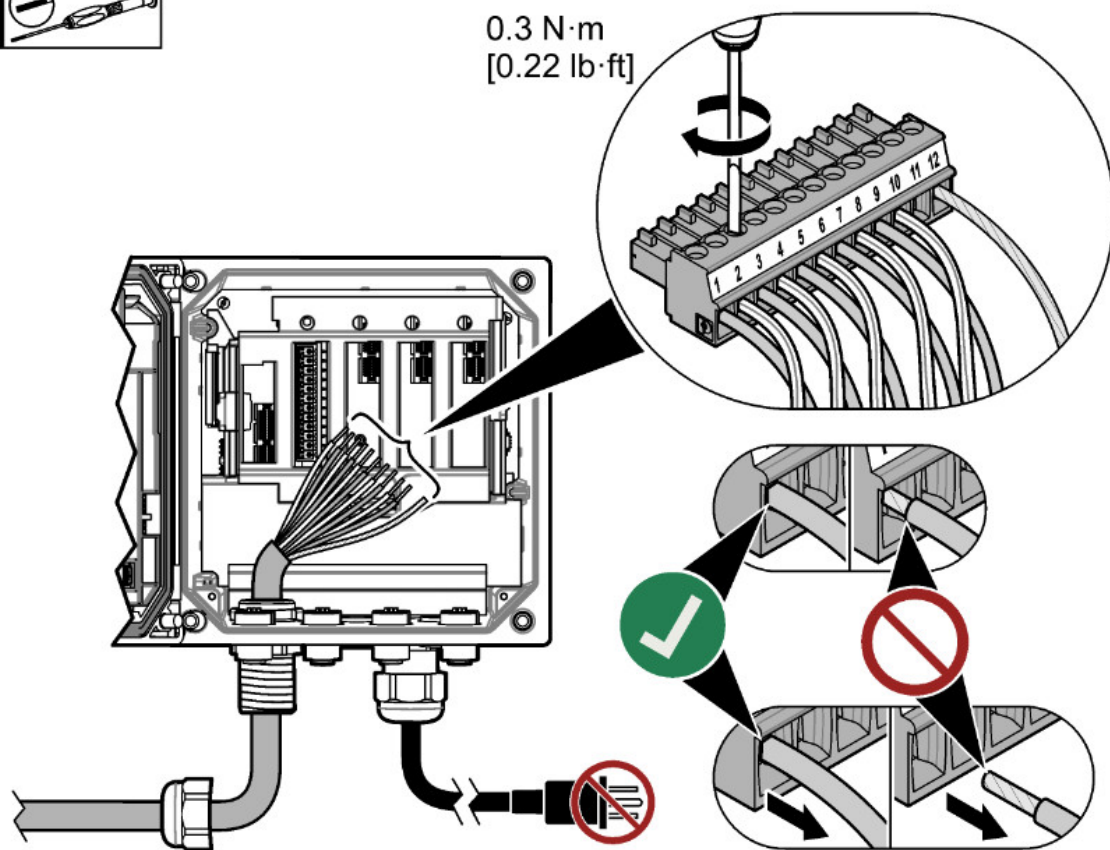
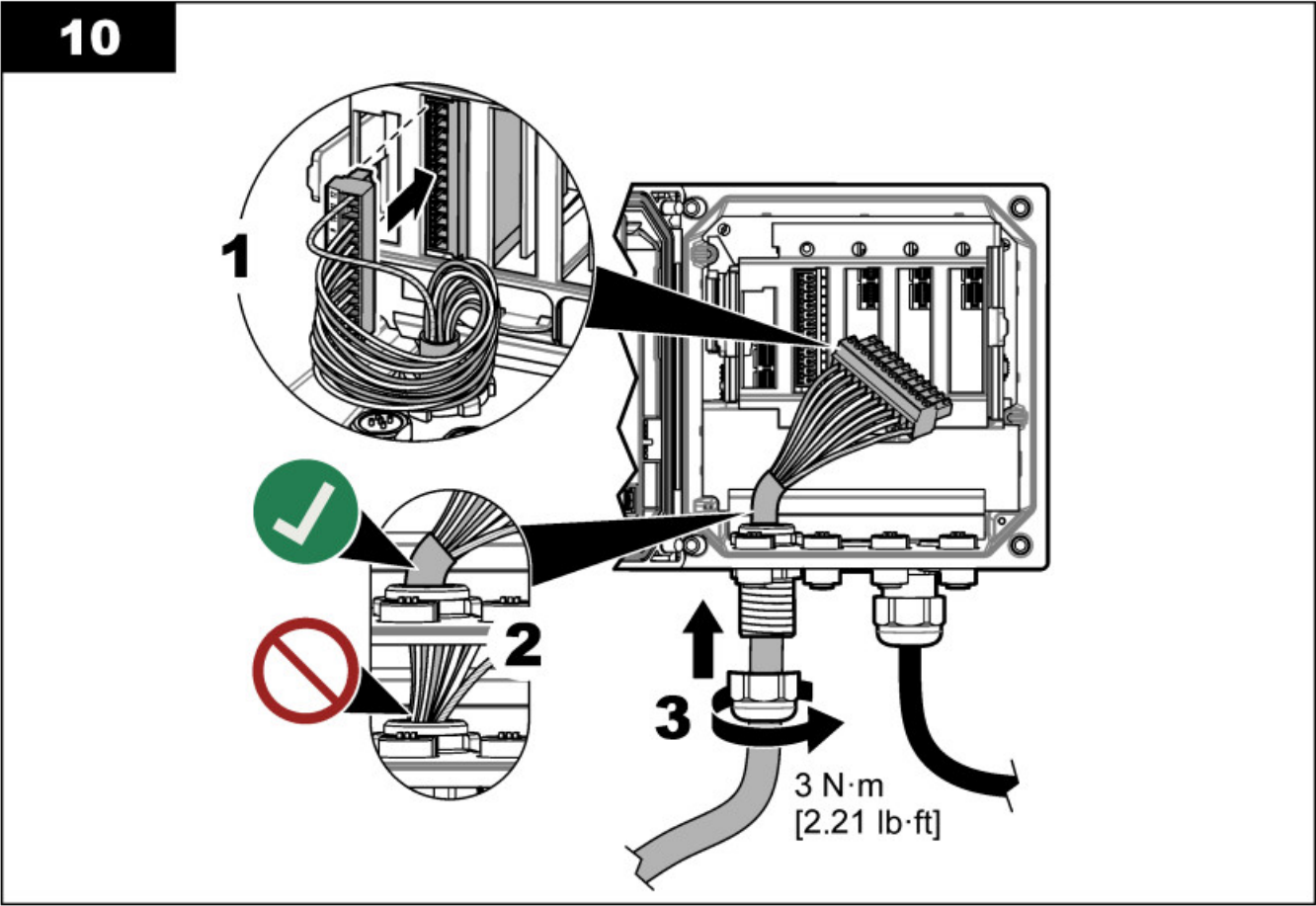


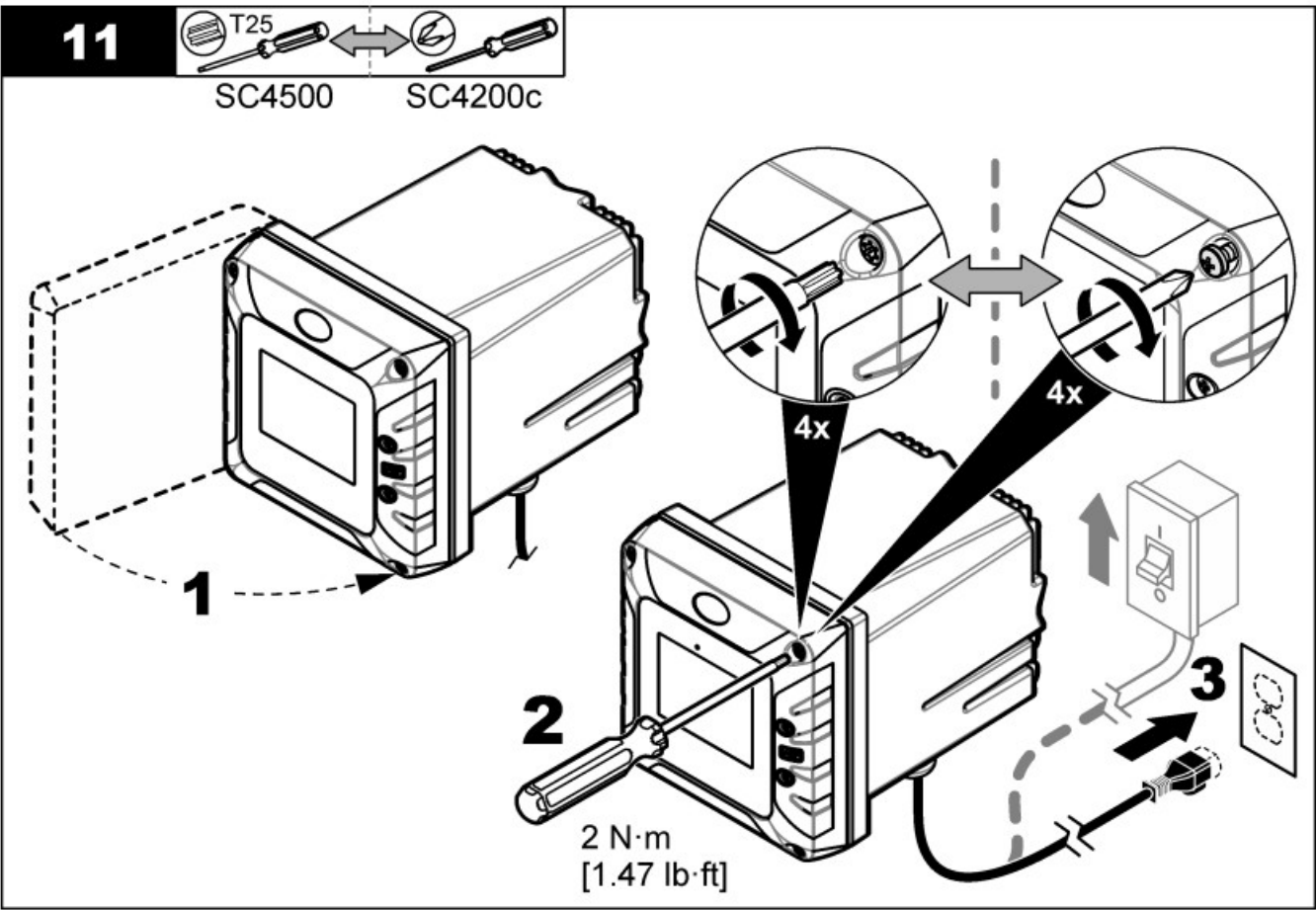
Table 1 Wiring information

Terminal	Signal	Terminal	Signal
1	Output 1+	7	Output 4+
2	Output 1–	8	Output 4–
3	Output 2+	9	Output 5+
4	Output 2–	10	Output 5–
5	Output 3+	11	Shield
6	Output 3–	12	Shield

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Section 4 Configuration

Refer to the controller documentation for instructions. Refer to the expanded user manual on the manufacturer's website for more information.



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Documents / Resources

 <p>4-20 mA Output Module DOC273.98.90587</p>	<p>HACH DOC273.98.90587 4-20 mA Output Module [pdf] User Manual DOC273.98.90587 4 20 mA Output Module, DOC273.98.90587, 4 20 mA Output Module, Output Module, Module</p>
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References

- [Geräte und Reagenzien für die Wasserqualitätsanalyse | Hach](#)
- [Hach | Hach](#)