SPV-8-010-MF | 0–10 V POTENTIOMETER WITH MODBUS COMMUNICATION

Mounting and operating instructions

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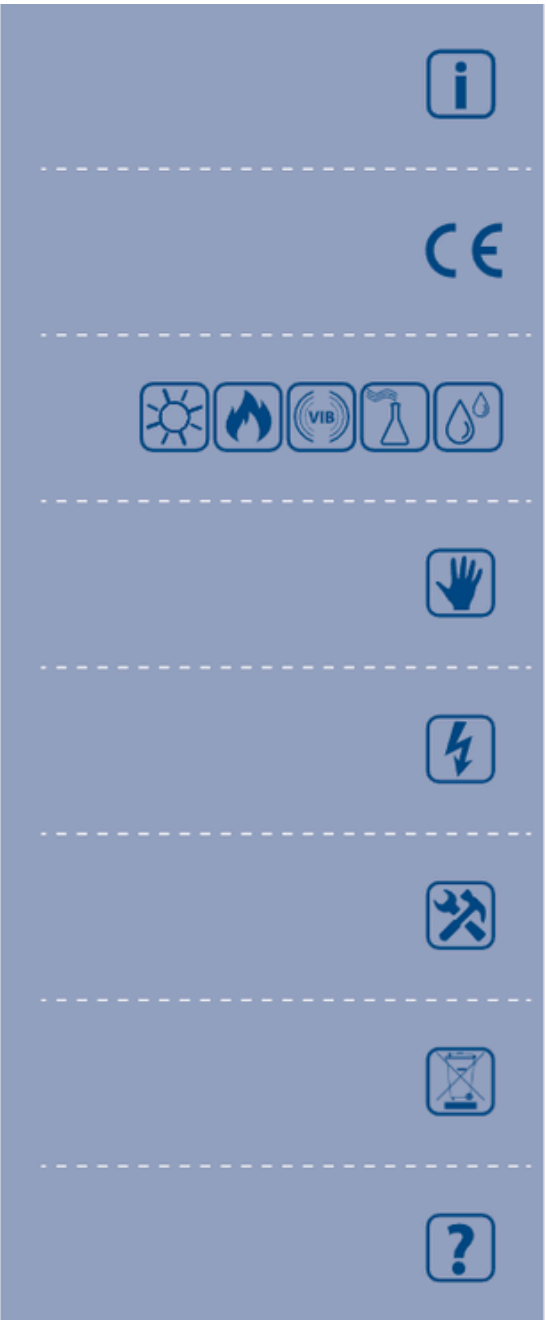
1. SAFETY AND PRECAUTIONS



Read all the information in this manual, in the datasheet and in the Modbus Register Map before working with the product. For personal and equipment safety and for optimum product performance, make sure you fully understand the content before installing, using or servicing this product.

For safety and licensing (CE) reasons, unauthorised conversions and / or modifications of the product are inadmissible.

The product should not be exposed to abnormal conditions, such as extreme temperatures, direct sunlight or vibrations. Long-term exposure to chemical vapours in high concentrations can affect the product performance. Make sure the work environment is as dry as possible and avoid condensation.

All installations must comply with local health and safety regulations and local electrical standards and approved codes. This product should only be installed by an engineer or a technician with expert knowledge of the product and safety precautions.

Avoid contact with energised electrical parts. Always disconnect the power supply before connecting, servicing or repairing the product.

Always check that you are connecting the correct power supply to the product and use wires with the correct characteristics and cross-section. Make sure all screws and nuts are properly tightened and fuses (if any) are in place.

Consideration should be given to recycling the equipment and packaging. These should be disposed of in accordance with local and national laws and regulations.

If there are questions that are not answered, contact your technical support or consult a professional.

2. PRODUCT DESCRIPTION

The SPV-8-010-MF potentiometer is intended for stepless control of multiple EC motors requiring a 0–10 VDC control signal. The minimum output values can be adjusted via Modbus RTU communication within the ranges: 0–4 VDC, and the maximum output values — within 6–10 VDC. The potentiometer SPV-8-010-MF has a dry contact for remote switching on and off of an external device.

3. ARTICLE CODES

Article code	Supply voltage
SPV-8-010-MF	85–264 VAC / 50–60 Hz

4. INTENDED AREA OF USE

- Controlled ventilation in buildings, warehouses, industrial environments, etc.

5. TECHNICAL DATA

- Modbus RTU communication
- Regulation of multiple EC motors simultaneously
- Fan speed regulation from minimum to maximum or vice versa
- Analogue output signal: 0–10 VDC
- Minimum input impedance: 1kΩ
- Minimum load resistance: 1 kΩ (RL ≥ 1 kΩ)
- Selectable minimum and maximum output ranges via Modbus RTU
  - Vmin: 0–40 %
  - Vmax: 60–100 %
- Dry contact (remote ON/OFF)
  - Switching current: max. 4 A
- Automatic slave ID for Modbus RTU communication
- Unique ID for product recognition
- Storage temperature: -10–70 °C
- Operating conditions
  - Temperature: 0–65 °C
  - Relative humidity: 5–95 % rH, non-condensing
- Enclosure:
  - Material: ASA (Acrylonitrile Styrene Acrylate)
  - Colour: White (28049P)
  - Ingress protection
    - Inset mounting: IP44
    - Surface mounting: IP54

6. STANDARDS

- Low Voltage Directive 2014/35/EU CE
- Electromagnetic Compatibility (EMC) Directive 2014/30/EU
- Commission Delegated Directive (EU) 2015/863 (RoHs 3) of 31 March 2015 amending Annex II to Directive 2011/65/EU of the European Parliament and of the Council as regards the list of restricted substances
- WEEE Directive 2012/19/EU

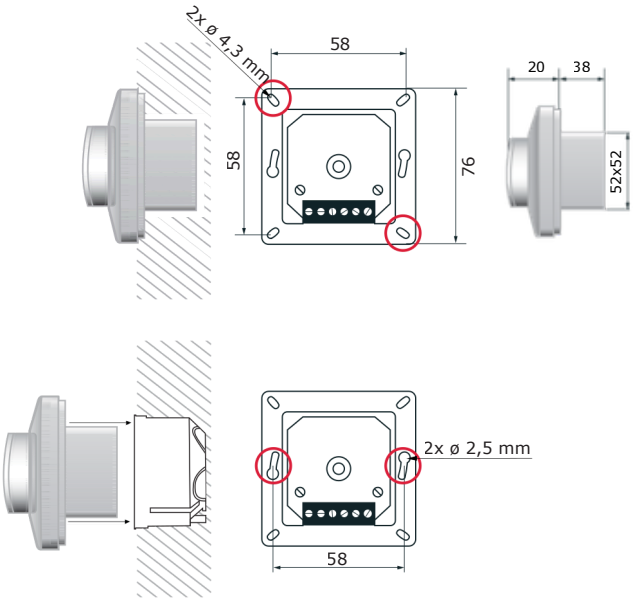
7. MOUNTING INSTRUCTIONS IN STEPS

Before you start mounting the unit, read carefully "Safety and Precautions" and follow these steps:

Inset mounting

1. Switch off the power supply.
2. Remove the knob by pulling it out.
3. Unscrew the nut and remove the washer to open the cover of the external enclosure. Separate the internal enclosure from the external one.
4. Do the wiring according to the wiring diagram — see **Fig. 3**.
5. Mount the internal enclosure into the wall according to the mounting dimensions shown in **Fig. 1**.

Fig. 1 Mounting dimensions — Inset mounting



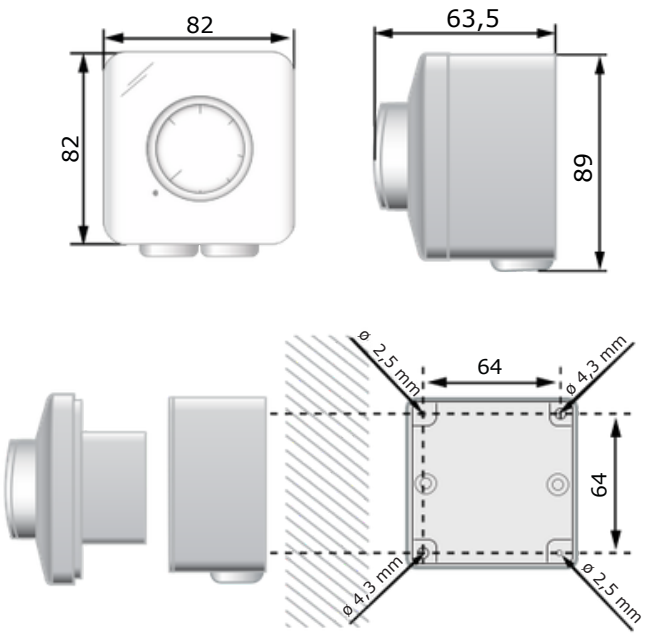
Correct	Incorrect

6. Mount the cover back and secure it with the washer.
7. Put back the knob.
8. Turn on the power supply.

Surface mounting

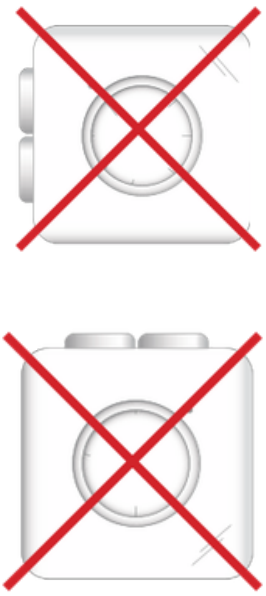
1. Disconnect the mains supply.
2. Remove the knob by pulling it out.
3. Unscrew the washer to remove the cover of the external enclosure.
4. Mount the external enclosure onto the surface by means of the screws and dowels adhering to the mounting dimensions shown in **Fig. 2**.

Fig. 2 Mounting dimensions — Surface mounting



Correct

Incorrect



5. Insert the cables through the grommets.
6. Do the wiring according to the wiring diagram — see **Fig. 3**.
7. Insert the internal enclosure into the external one and fix it using the screws. Mount back the cover and secure it with the washer.
8. Put back the knob.
9. Turn on the power supply.

8. WIRING AND CONNECTIONS

Fig. 3 Wiring diagram

Supply voltage	
L, N	85–264 VAC/ 50–60 Hz
Cable characteristics	Cable cross section: 2,5 mm^2, pitch: 5 mm, push-in cage clamp terminal block
Dry Contact	
_/ _	Dry contact (remote ON / OFF)
Modbus RTU communication	
A, /B	Modbus RTU (RS485)
Analogue output	
A01, GND	Analogue output
Cable characteristics	Cable cross section: 1,5 mm^2, pitch: 3,5 mm, push-in cage clamp terminal block

9. OPERATIONAL DIAGRAMS

Fig. 4 Operational diagram — Normal logic (from min. to max.)

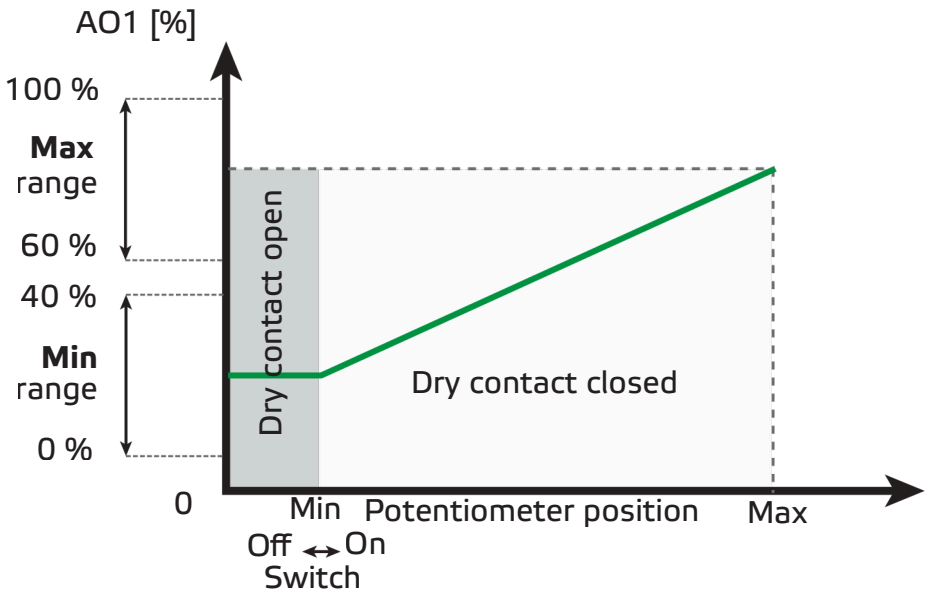
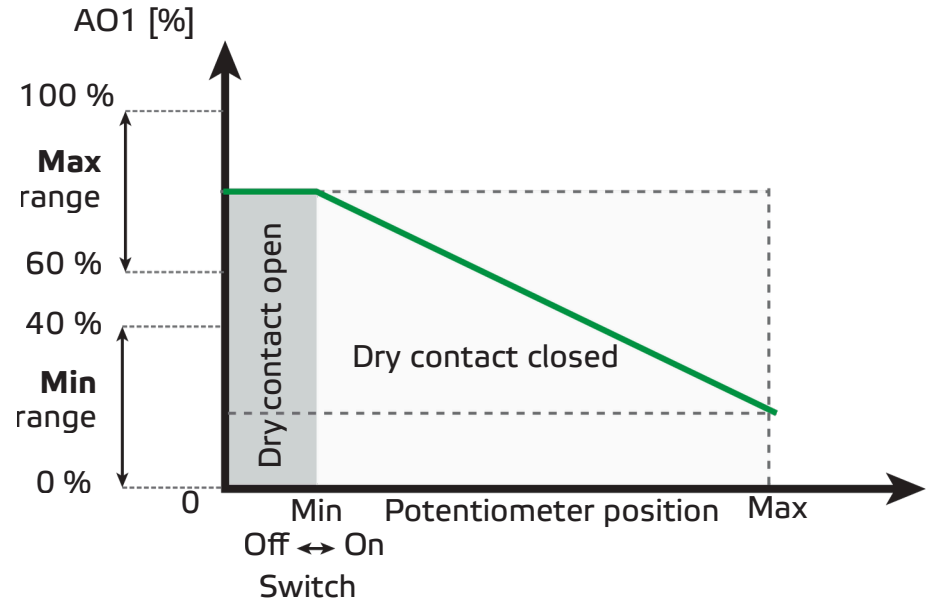


Fig. 5 Operational diagram — Inverted logic (from max. to min.)

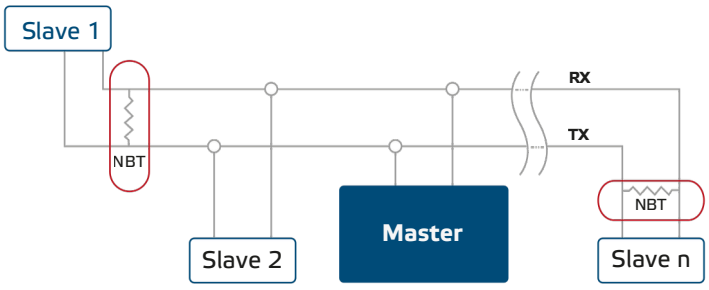


10. OPERATING INSTRUCTIONS

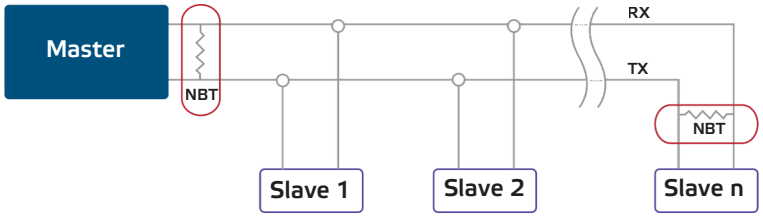
Optional settings

The Network Bus Termination (NBT) Resistor is controlled via Modbus RTU and is disconnected by default. For correct communication, the NBT needs to be activated only in the two furthest devices on the Modbus RTU network. If necessary, enable the NBT resistor through SenteraWeb via Holding register 9.

Example 1



Example 2



NOTE

On a Modbus RTU network, two bus terminators (NBTs) need to be activated.

11. VERIFICATION OF INSTALLATION

If your unit does not function as expected, please check the connections or refer to the **"Troubleshooting"** section.

12. TROUBLESHOOTING

In case of faulty operations, please check if

- All connections are correct.
- The potentiometer is supplied with the correct voltage.
- Modbus communication is working, and all settings are accessible via Modbus RTU.

13. FREQUENTLY ASKED QUESTIONS (FAQs)

How many EC motors can I control with SPV-8-010-MF?

This potentiometer requires a minimum load of 1 kOhm. This makes it possible to control multiple EC motors with 0–10 Volt signal. The exact number of EC motors that can be connected depends on the input impedance of the EC motors. Their combined imput impedance must be higher than 1 kOhm.

How can fan speed be controlled with SPV-8-010-MF?

SPV-8-010-MF can regulate EC motors via a 0–10 Volt control signal. Fan speed is controlled steplessly by turning of the device knob clockwise or by overwriting the output value via Modbus communication. If the output value is overwritten, turning of the knob will not adjust the fan speed. The control signal can be regulated from low to high (default) or from high to low, which can be selected via Holding register 17.

How are device components protected?

The enclosure of SPV-8-010-MF is specifically designed for both inset and surface mountning. It provides a different level of ingress protection depending on the mounting type.

- If the device is inset-mounted, the enclosure has IP44 rating, which protects the PCB components from solid objects larger than 1 mm and from splashing water from any direction.
- If SPV-8-010-MF is surface-mounted, the enclosue provides IP54 protection, which prevents dust and splashing water ingress.

Can AC fans be controlled with SPV-8-010-MF?

This potentiometer provides 0–10 Volt signal, which can directly regulate only the fan speed of EC motors. For AC fan speed control, SPV-8-010-MF can be connected to one of our variable fan speed controllers with an analogue input. Then the fan speed of an AC motor can be regulated by turning of the potentiometer knob clockwise or by overwriting the output value via Modbus communication.

14. TRANSPORT AND STORAGE

Avoid shocks and extreme conditions; stock in original packaging.

15. WARRANTY AND RESTRICTIONS

Two years from the delivery date against defects in manufacturing. Any modifications or alterations to the product after the production date relieve the manufacturer of any responsibilities. The manufacturer bears no responsibility for any misprints or mistakes in this data.

16. MAINTENANCE

In normal conditions, this product is maintenance-free. If soiled, clean with a dry or damp cloth. In case of heavy pollution, clean with a non-aggressive product. In these circumstances, the unit should be disconnected from the supply. Pay attention that no fluids enter the unit. Only reconnect it to the supply when it is completely dry.