

# SDX-DM | ELECTRONIC FAN SPEED CONTROLLER

Mounting and operating instructions



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## 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 concentration 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 of 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.

## PRODUCT DESCRIPTION

The SDX-DM series consists of electronic fan speed controllers, which allow you to manually adjust the rotational speed of single phase AC motors by varying the motor voltage through phase angle control. The output can be regulated from minimum to maximum or from maximum to minimum. The operating mode can be selected via Modbus RTU communication. The output voltage can be set locally via the built-in potentiometer or remotely via Modbus RTU communication. The controller is suitable for both inset (IP44) and surface mounting (IP54). All parameters and settings can be adjusted via Modbus RTU communication.

## ARTICLE CODES

Output regulation (from low to high or from high to low)	
Code	Rated current range [A]
SDX-1-15-DM	0,1–1,5
SDX-1-25-DM	0,2–2,5


## INTENDED AREA OF USE

- Manual control of the motor / fan speed in HVAC applications
- For indoor use only

## TECHNICAL DATA

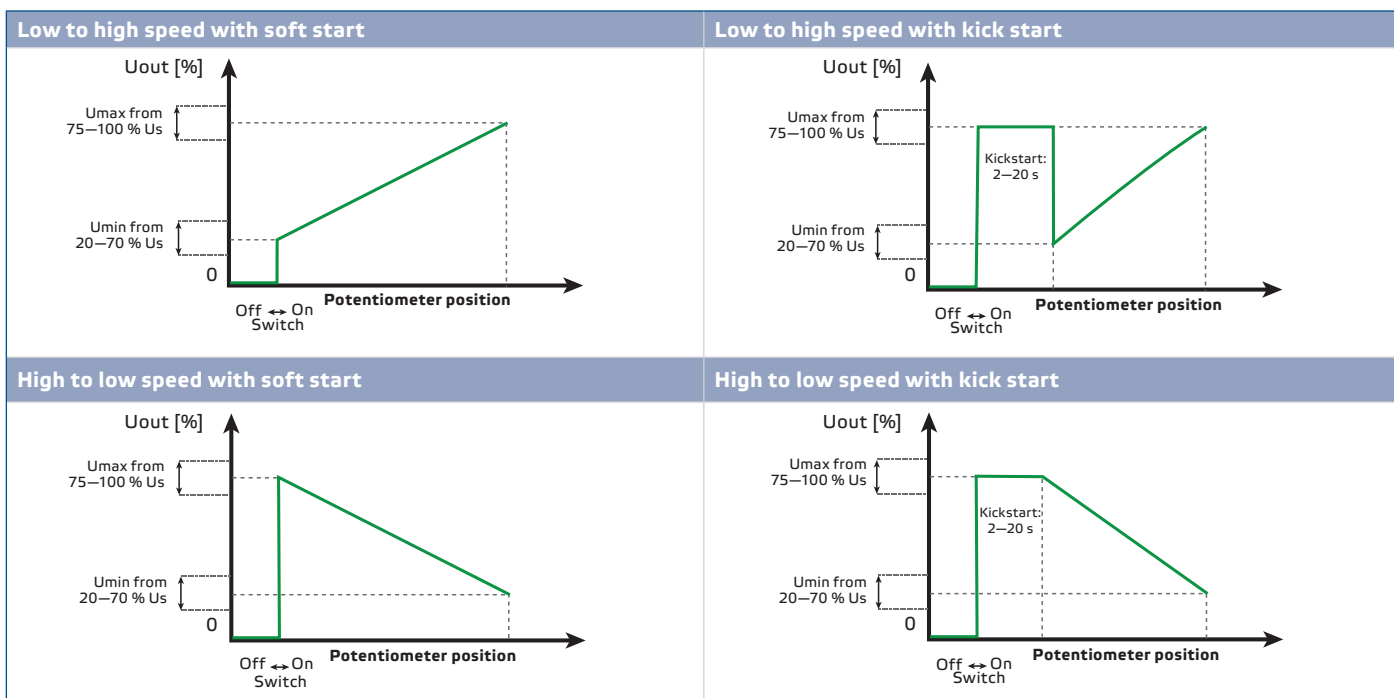
- Inset or surface mounting
- Supply voltage (Us): 230 VAC / 50–60 Hz
- Motor acceleration: kick start (from 2 to 20 seconds) or soft start
- Minimum and maximum output voltage are adjustable via Modbus RTU communication. Vmin: 20–70 % of Us and Vmax: 75–100 % of Us
- Overheating protection
- Operating mode selectable via Modbus RTU: from low to high speed or from high to low speed
- Enclosure:
  - ▶ External: ASA, white colour (28049P), IP54 protection (according to EN 60529);
  - ▶ Internal: ABS, black + white, IP44 protection (according to EN 60529).
- Operating ambient conditions:
  - ▶ temperature: 0–40 °C;
  - ▶ rel. humidity: 5–95 % rH (non-condensing).
- Storage temperature: -10–50 °C

## STANDARDS

- Low Voltage Directive 2014/35/EU 
  - ▶ EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
  - ▶ EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
- EMC directive 2014/30/EU
  - ▶ EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
  - ▶ EN 61000-6-1:2007 Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light industrial environments
  - ▶ EN 61000-6-3:2007 Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments Amendments A1:2011 and AC:2012 to EN 61000-6-3

- EN 61000-3-2:2014 Electromagnetic compatibility (EMC) – Part 3-2: Limits - Limits for harmonic current emissions (equipment input current  $\leq 16$  A per phase)
- RoHs Directive 2011/65/EU
- WEEE Directive 2012/19/EU

## OPERATIONAL DIAGRAMS



### NOTE

By default, the desired fan speed or output value is set via the built-in potentiometer. It is possible to overrule the built-in potentiometer via Modbus RTU communication. Output overwrite can be enabled via Modbus Holding register 12. When output overwrite is enabled, the desired output value can be written in Modbus Holding register 13. In that case it is advisable also to activate Modbus safety timeout by writing a value different from 0 in Holding register 8. After the timeout period elapses, the output is forced to the minimum output value. If timeout is set to zero, this function is disabled.

### ATTENTION

Overheating protection is activated when an excessive load is connected to the output or in case the ambient temperature exceeds the maximum allowed operating temperature. When overheating protection is activated, the output is disabled and overheat condition is indicated in Modbus input register 10. When the overheating condition is removed, the device automatically resumes operation.

## WIRING AND CONNECTIONS

<b>A</b>	Modbus RTU communication, signals A and /B
<b>/B</b>	Modbus RTU communication, signals A and /B
<b>L</b>	Power supply, line (230 VAC $\pm 10$ % / 50–60 Hz)
<b>N</b>	Power supply, neutral
<b>U2</b>	Regulated output to motor, neutral
<b>U1</b>	Regulated output to motor, line
<b>Connections</b>	Screw terminal block, pitch 5 mm; maximum cable diameter 2,5 mm <sup>2</sup>

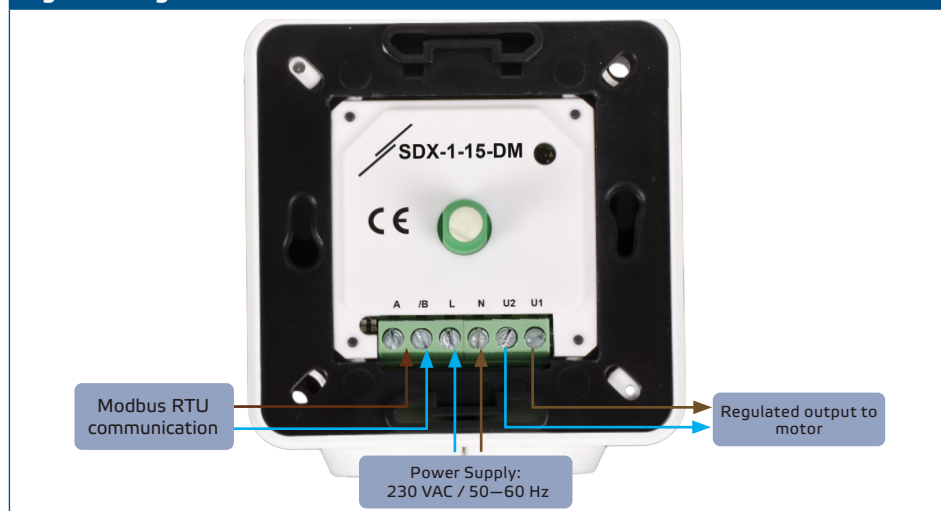
## MOUNTING INSTRUCTIONS IN STEPS

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

### Inset 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. Do the wiring according to the wiring diagram (see **Fig. 1 Wiring and connections**).
5. Mount the internal enclosure into the wall according to the mounting dimensions shown in **Fig. 2 Mounting dimensions - inset mounting**.

**Fig. 1 Wiring and connections**



**Fig. 2 Mounting dimensions - Inset mounting**

	Correct	Incorrect



### NOTE

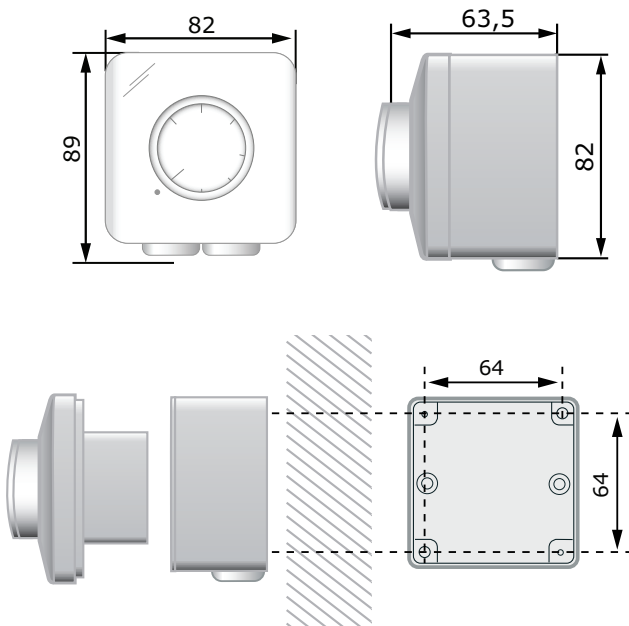









Mount the unit so that the terminal block and connections are at the lower side.

6. Mount back the cover and secure it with the washer.
7. Put back the knob and turn it to off position.
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, included in the box, adhering to the mounting dimensions shown in **Fig. 3 Mounting dimensions - surface mounting**.

**Fig. 3 Mounting dimensions - surface mounting**

	<table><tr><th>Correct</th><th>Incorrect</th></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>	Correct	Incorrect				
Correct	Incorrect						
							
							

5. Insert the cables through the grommets.
6. Do the wiring according to the wiring diagram (see **Fig. 1 Wiring and connections**).
7. Insert the internal enclosure into the external one and fix it using the screws.



#### NOTE

*Mount the unit so that the terminal block and connections are at the lower side.*

8. Mount back the cover and secure it with the washer.
9. Put back the knob and turn it to off position.
10. Turn on the power supply.

## OPERATING INSTRUCTIONS



#### ATTENTION

*Use only tools and equipment with non-conducting handles when working on electrical devices.*

The controller is to be used only with voltage controllable fans / motors. You can connect several motors to the controller as long as the current limit is not exceeded. The motor should be protected against overheating. The minimum output value should be adjusted so that the motor cannot stall at minimum speed. The controller restarts after power failure.

## TROUBLESHOOTING

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In case of faulty operation, please check if:

- the right voltage is applied;
- the controller is not overheated;
- the Modbus communication is available;
- all connections are correct;
- the machine to be regulated is functioning.

## TRANSPORT AND STORAGE

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Avoid shocks and extreme conditions; stock in original packing.

## WARRANTY AND RESTRICTIONS

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

## MAINTENANCE

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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.