

DVSS8 | ELECTRONIC FAN SPEED CONTROLLER FOR DIN RAIL

Mounting and operating instructions

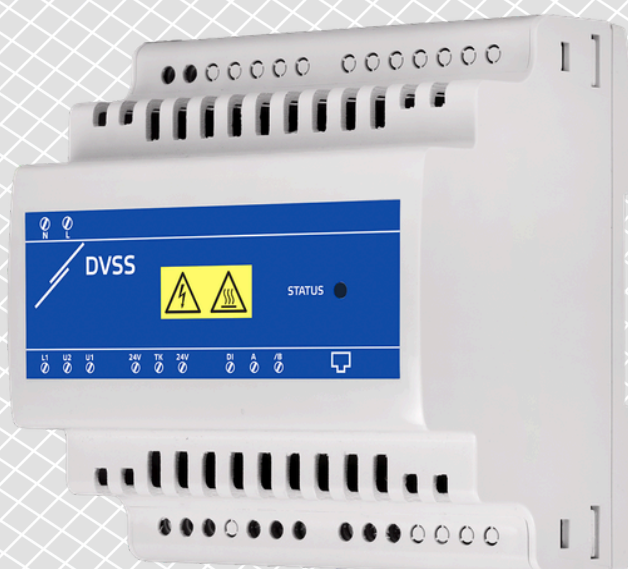


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1. SAFETY AND PRECAUTIONS



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

DVSS8 are electronic fan speed controllers intended for DIN-rail mounting. The fan speed controllers reduce the motor voltage by phase angle control. They are compatible with a wide range of supply voltages — 110–230 VAC $\pm 10\%$ / 50–60 Hz.

Fan speed can be regulated remotely via Modbus RTU communication by changing the value of Holding Register 13. This can be achieved via our online HVAC portal — SenteraWeb, a Building Management System, or any other Modbus master device.

These fan speed controllers feature a digital input for remote switching on and off of the device, which guarantees full control of motor operation.

3. ARTICLE CODES

Article code	Rated output current (A)	Fuse (A)
DVSS8-30-DM	0,2–3 A	F: 5 A-H (5x20 mm)
DVSS8-60-DM	0,2–6 A	F: 10 A-H (5x20 mm)

4. INTENDED AREA OF USE

- Controlled ventilation in buildings, warehouses, industrial environments, etc.
- Fan speed control in HVAC applications.

5. TECHNICAL DATA

- Supply voltage: 110–230 VAC $\pm 10\%$ / 50–60 Hz
- Regulated output voltage: 20–100 % of the supply voltage
- Unregulated output voltage / current: Supply voltage / $I_{max} 2 A$
- Automatic supply voltage frequency detection: 50–60 Hz
- Phase angle control with zero-cross detection
- Motor acceleration (2–20 s):
 - Kickstart
 - Softstart
- Thermal protection input (TK): Normally closed input
- Remote On / Off input (DI): Normally closed input
- Device status indication: Via Modbus RTU and via the RGB LED
- Storage temperature: -10–50 °C
- Operating conditions
 - Temperature: -10–40 °C
 - Relative humidity: 5–90 % rH, non-condensing
- Enclosure
 - Ingress protection: IP20
 - Colour: Grey (RAL 7035)

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. WARNINGS AND ATTENTION POINTS

- The controller is to be used only with voltage-controllable fans / motors. Several motors can be connected to the controller as long as the current limit is not exceeded.
- If the motor has a built-in thermal contact (TK), it can be connected to the fan speed controller to monitor its temperature. In case of overheating, the controller will automatically stop the motor.
- The minimum voltage must be set so that the motor does not stop due to overload or mains voltage variations. The controller restarts after a power failure.

8. MOUNTING INSTRUCTIONS IN STEPS

Before you start mounting the unit, read carefully "Safety and Precautions".

Follow these steps:

1. Switch off the power supply.
2. Slide the unit along the guides of a standard 107 mm DIN rail and fix it to the rail by means of the black locking clip on the enclosure. Mind the correct position and mounting dimensions shown in **Fig. 1** and **Fig. 2**.

Fig. 1 Mounting dimensions

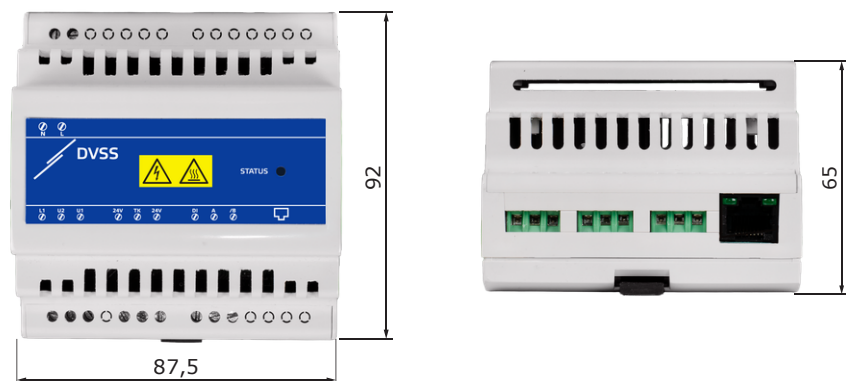
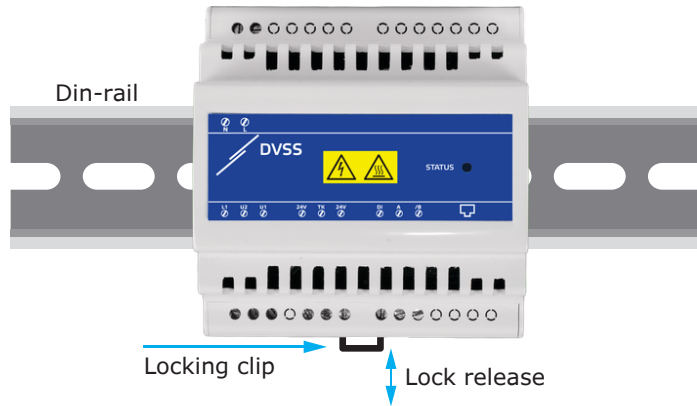


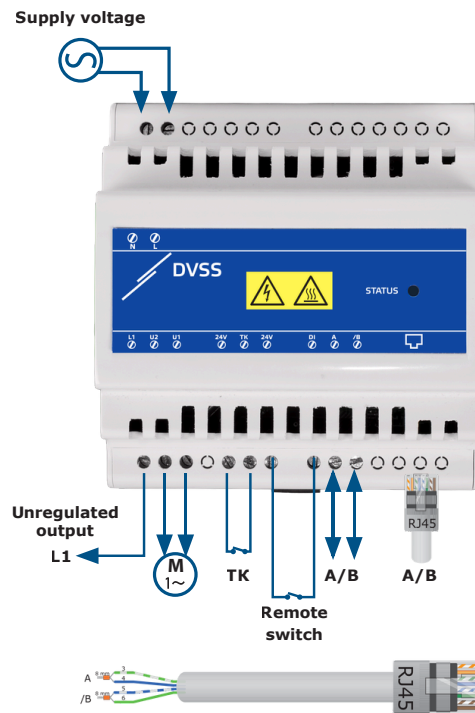
Fig. 2 Mounting position



3. Do the wiring according to the wiring diagram — see **Fig. 3** while adhering to the information from section “Wiring and connections”.
4. Switch on the power supply.

9. WIRING AND CONNECTIONS

Fig. 3 Wiring diagram



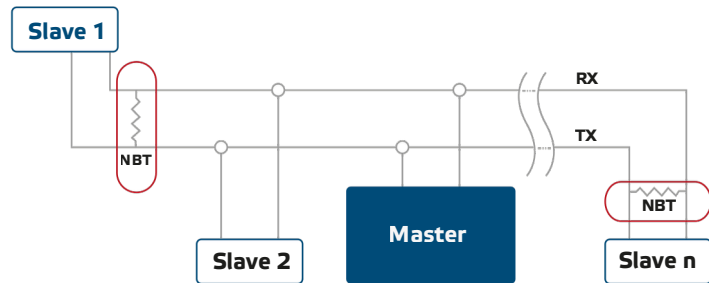
Screw terminal block	
Supply voltage	
L, N	110–230 VAC ±10 % / 50–60 Hz
Unregulated output	
L1	110–230 VAC ± 10 % / I _{max} 2 A
Regulated output	
U2 (N), U1	20–100 % of the supply voltage Adjustable via HR13

Thermal protection	
24V, TK	Thermal protection input (normally closed)
Remote switch	
24V, DI	Remote on / off input (normally closed)
Modbus RTU	
A, /B	Modbus RTU (RS485)
Terminal block specifications	Cable cross section: 1,5 mm ² , pitch: 5 mm, wire strip length max: 5 mm
RJ45: Modbus RTU	
A	Signal A RJ45, pins 3 and 4
/B	Signal /B, RJ45, pins 5 and 6

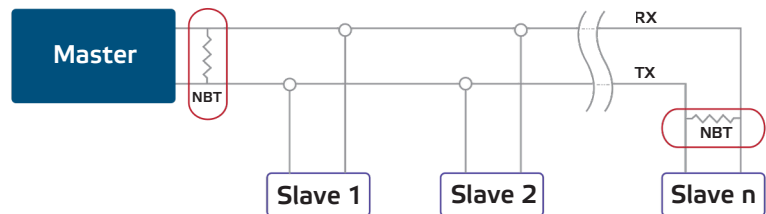
Optional settings

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.

10. OPERATIONAL DIAGRAMS

Fig. 4 Operational diagram - Softstart

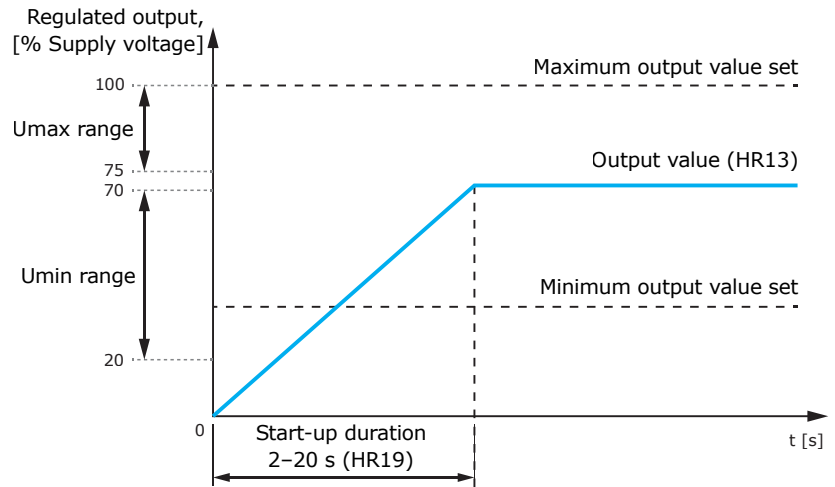
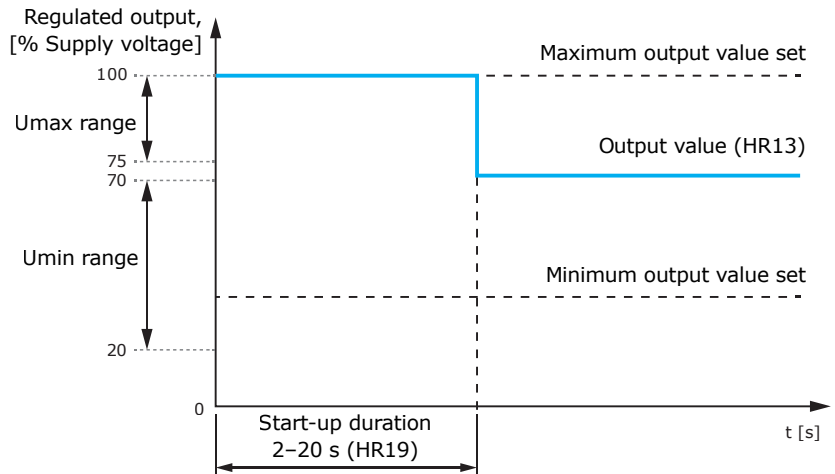


Fig. 5 Operational diagram - Kickstart



11. OPERATING INSTRUCTIONS

When turned on, DVSS8 is directly in Run mode (depending on the operating mode set in HR20, default = Run mode):

- Operating mode Run – The regulated output is turned on.
- Operating mode Stop – The regulated output is turned off.

In Run mode, there are two parameters to be set for controlling the output:

- Output Overwrite Value (HR13) – The regulated output is controlled by the value written in Output Overwrite Value between Umin (Minimum Output Value Limit) and Umax (Maximum Output Value Limit).
- Output Start-up Mode (HR18) – The start-up mode could be softstart or kickstart.

Remote ON / OFF functionality			
Remote mode (HR11)	Remote ON/OFF input	Regulated output	Function description
Disabled	-	Running	Remote ON / OFF input is ignored
Enabled	Closed	Running	Closed contact allows motor to run
	Open	Stopped	Open contact stops the motor / LED blinking green

Thermal protection input functionality			
TK detection control (HR17)	Thermal protection input (TK)	Regulated output	Function description
Disabled	-	Running	TK input is ignored
Enabled	Closed	Running	Closed contact allows motor to run
	Open	Stopped	(*) Open contact stops the motor / LED blinking red

(*) Once the thermal protection is triggered, it can only be reset by disconnecting the power supply.

12. VERIFICATION OF INSTALLATION

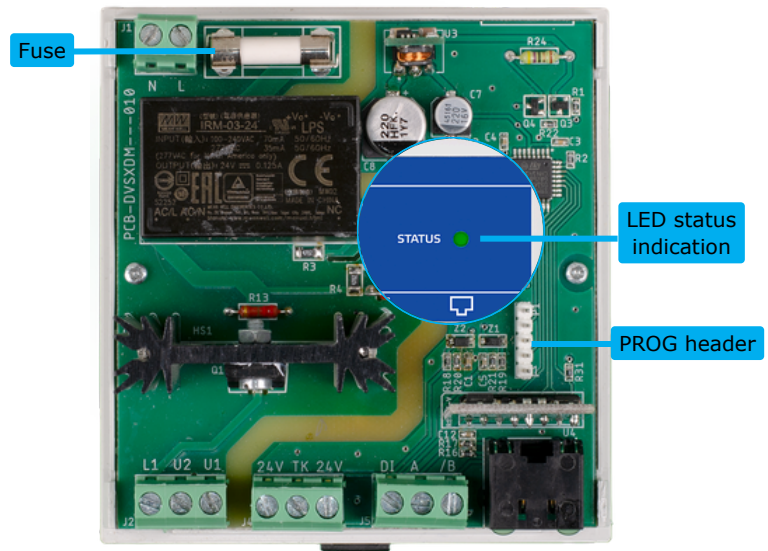
If your unit does not function as expected, please check the connections or refer to the **"Troubleshooting"** section.

13. TROUBLESHOOTING

In case of faulty operations, please check if

- The right voltage is applied.
- All connections are correct.
- The controller is not overheated (check Input Register 10 or the LED indication).
- The motor is working.
- Modbus communication is working, and all settings are accessible via Modbus RTU.

Fig. 6 Settings and indications



PROG header, P1		Put a jumper onto pins 1 and 2 and wait for at least 15 seconds to reset the Modbus communication parameters
Fuse		
LED indication		
RGB LED	Continuous red	Overheating
	Blinking red	Thermal protection activated (Once the thermal protection is triggered, it can only be reset by disconnecting the power supply.)
	Blinking yellow	Problem with the control electronics (zero cross detection failure)
	Continuous green	Device is working properly
	Blinking green	Device stopped by remote ON / OFF

14. FREQUENTLY ASKED QUESTIONS (FAQs)

How does the DVSS8 series work?

The fan speed controllers from this series can be operated via Modbus RTU communication through our online HVAC portal SenteraWeb, a Building Management System (BMS) or a Modbus master device. The value written in Holding register 13 corresponds to the percentage of the supply voltage that will regulate the fan speed. For instance, when the value '500' is written in HR13, the fan will be regulated with 50 % of the supply voltage. The start-up mode and start-up duration can be selected via Holding registers 18 and 19, respectively.

What is the purpose of the unregulated output?

The unregulated output is active when the motor is enabled. The output is called 'unregulated' since it can be either ON (230 Volt) or OFF (0 Volt). The maximum current of this output is 2 A. It is typically used to control an external run-indicator, to open or close a damper, to switch an external relay, etc. For example, when the fan stops, the damper is closed. When the fan is active, the damper is open.

What environment can the device enclosure withstand?

The enclosure of the DVSS8 fan speed controllers is specifically designed for DIN-rail mounting in electrical cabinets. The ingress protection of the series is IP20, which ensures protection against solid objects larger than or equal to 12,5 mm. Since the fan speed controllers from this series are intended for installation in electrical cabinets, the device enclosure is not protected against water ingress.

15. TRANSPORT AND STORAGE

Avoid shocks and extreme conditions; stock in original packaging.

16. 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.

17. 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.

