EVSS

Electronic fan speed controller with TK

The EVSS1 electronic speed controllers automatically control the speed of single-phase voltage controllable electric motors (230 VAC / 50—60 Hz). These units are equipped with Modbus RTU (RS485) communication, an alarm relay output and thermal contacts to provide overheating protection of motors with cut-out contacts. The EVSS1 controllers feature a wide range of functionalities: remote control options, adjustable off level, min. and max. output voltage settings, time-limited motor operation initiated by a logic or switch signal.

Key features

- Invertible analog input signal: 0—10 / 10—0 VDC or 0—20 / 20—0 mA
- Minimum and maximum output voltage setting by trimmers or via Modbus
- Off level setting by trimmer or via Modbus
- Modbus RTU (RS485) communication
- Kick start or soft start
- Remote control input with selectable functionality (normal or timer)
- Analog input (normal or logic functionality - only for the timer start)
- 1 regulated output for the motor
- 1 unregulated output (230 VAC / max. 2 A) for 3-wire motor connection or voltage supply
- 1 low voltage supply output (+12 VDC / 1 mA) for external 10 kΩ potentiometer
- Overheating protection
- Alarm output 230 VAC / 1 A
- Green LED operating indication
- Red LED overheating indication
- Illuminated power switch

Area of use

- Fan speed control in ventilation systems
- For indoor use only

Technical specifications

Power supply	230 VAC ±10 % / 50—60 Hz	
Regulated output	30—100 % Us (69—230 VAC)	
Maximum load	depends on the version	
Analogue input	0-10 / 10-0 VDC or 0-20 / 20-0 mA	
Unregulated output	supply voltage (Us) / Imax 2 A	
Logic input	Timer start	
Off level	0—4 VDC / 0—8 mA for ascending mode; 10—6 VDC / 20—12 mA for descending mode	
Minimum output voltage setting, Umin	30—70 % Us (69—161 VAC)	
Maximum output voltage setting, Umax	75—100 % Us (175—230 VAC)	
Supply output	+12 VDC / 1 mA	
Alarm relay output	230 VAC (50—60 Hz) / 1 A	
Protections	Overheating, overvoltage and overcurrent	
Protection standard	IP54 (according to EN 60529)	
Ambient conditions	Operating temperature	-20—40 °C
	Relative humidity	0—80 % rH (non-condensing)

Modbus registers

The Sensistant Modbus configurator allows you to easily monitor and/or configure Modbus parameters.

The parameters of the unit can be monitored / configured through the 3SModbus software platform. You can download it from the following link:

https://www.sentera.eu/en/3SMCenter

For more information about the Modbus registers, please refer to the product Modbus Register Map.

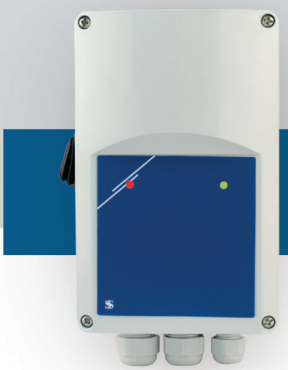
Article codes

Article code	Max. rated current, [A]	Fuse rating (5*20 mm), [A]
EVSS1-15-DM	1,5	F 3,15 A H 250 VAC
EVSS1-30-DM	3,0	F 5,0 A H 250 VAC
EVSS1-60-DM	6,0	F 10,0 A H 250 VAC
EVSS1100-DM	10,0	(6,3*32 mm) F 16,0 A H 250 VAC

Wiring and connections

L	Supply voltage 230 VAC ±10 % – 50 / 60 Hz	
N	Neutral	
PE	Earth terminal	
L1	Unregulated output (230 VAC / max. 2 A)	
U1, U2	Regulated output to the motor	
TK, TK	Thermal contacts	
N	Neutral	
AL	Alarm output (230 VAC / 1 A)	
SW	Remote control switch	
A	Modbus RTU (RS485) signal A	
/B	Modbus RTU (RS485) signal /B	
+V	Supply output +12 VDC / 1 mA	
Ai	Analog input 0—10 VDC / 0—20 mA (10—0 VDC / 20—0 mA) / Logic input for timer function	
GND	Ground	
Connections	Cable cross section	max. 2,5 mm2
	Cable gland clamping range	3—6 mm / 5—10 mm

Caution: *If an AC power supply is used with any of the units in a Modbus network, the GND terminal should NOT BE CONNECTED to other units on the network or via the CNVT-USB-RS485 converter. This may cause permanent damage to the communication semiconductors and / or the computer!*



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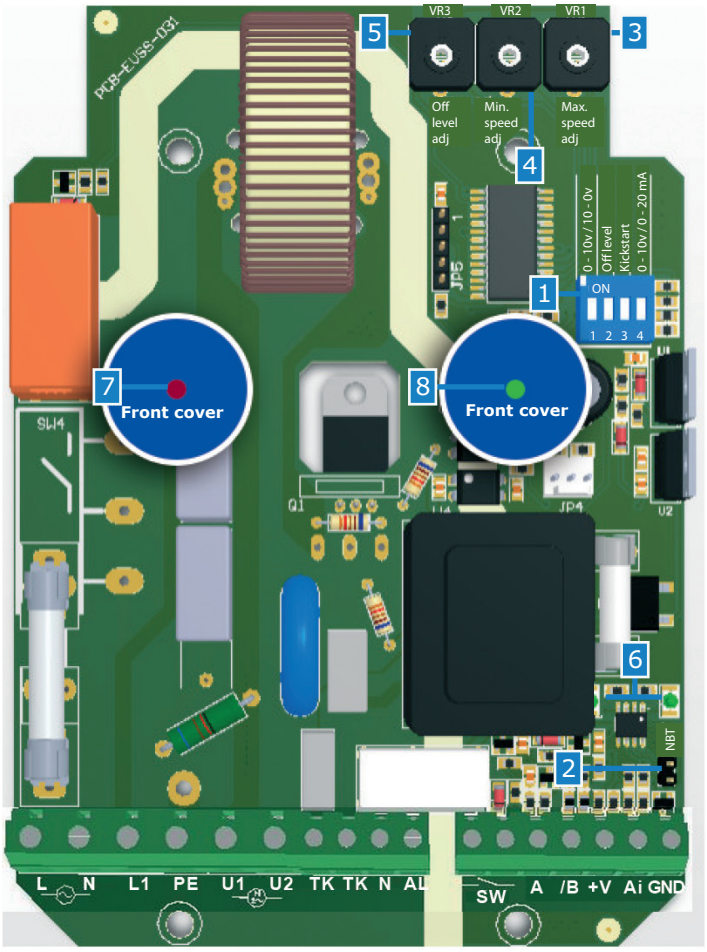

Standards

- Low Voltage Directive 2014/35/EC
- EMC Directive 2014/30/EC
- RoHs Directive 2011/65/EU

Settings

1 - DIP switch settings

Ascending / descending input mode selection (DIP switch, position 1)		ON – Descending mode: 10—0 VDC / 20—0 mA OFF – Ascending mode: 0—10 VDC / 0—20 mA
OFF level selection (DIP switch, position 2)		ON - enabled OFF - disabled
Kick start selection (DIP switch, position 3)		ON – Kick start enabled OFF – Soft start enabled
Input mode selection (DIP switch, position 4)		ON – Current mode (0—20 mA / 20—0 mA) OFF – Voltage mode (0—10 VDC / 10—0 VDC)

2 - Network bus resistor jumper (NBT)	*	EVSS is the first or last unit
3 - Max. speed trimmer		Adjusts the maximum output voltage from 175 VAC (left) to 230 VAC (right)
4 - Min. speed trimmer		Adjusts the minimum output voltage from 69 VAC (left) to 161 VAC (right)
5 - Off level trimmer		**Ascending mode** Off value from 0 VDC (left) to 4 VDC (right) in voltage mode Off value from 0 mA (left) to 8 mA (right) in current mode **Descending mode** Off value from 10 VDC (left) to 6 VDC (right) in descending and voltage mode Off value from 20 mA (left) to 12 mA (right) in descending and current mode
6 - Modbus communication indication	Blinking green	Transmitting / receiving
7 - Operating LED indication (on the front cover)	Cont. green	Normal operation
	Blinking green	Stand-by mode
8 - Overheating indication, Alarm	Solid on	Motor overheating

* ☐☐ indicates open (OFF) position of the jumper.

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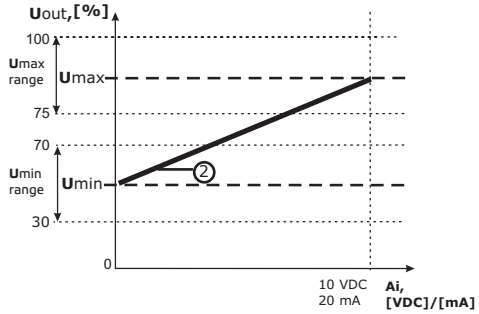
Operational diagrams

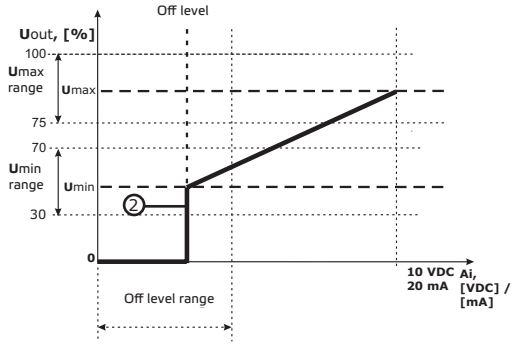
Operating modes

Off level disabled



Descending mode calculation formula	$Uout = Umax - \frac{Ai}{Aimax}(Umax - Umin)$
Ascending mode calculation formula	$Uout = Umin + \frac{Ai}{Aimax}(Umax - Umin)$

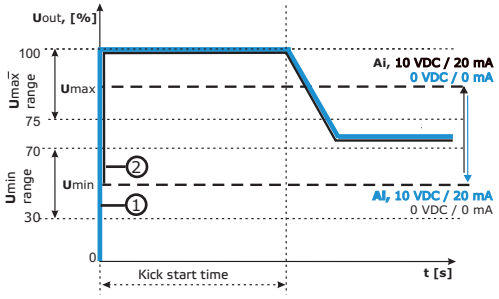
Off level enabled



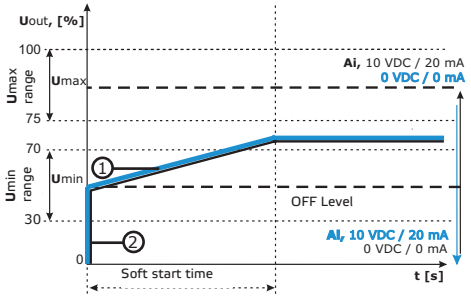
Descending mode calculation formula	$Uout = Umax - \frac{Ai - Offlevel}{Aimax - Offlevel}(Umax - Umin)$
Ascending mode calculation formula	$Uout = Umin + \frac{Ai - Offlevel}{Aimax - Offlevel}(Umax - Umin)$

Note: *The operational diagrams for Descending mode are mirror images of the diagrams above for Ascending mode.*

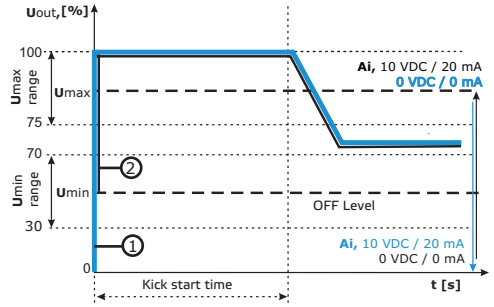
Kick start enabled



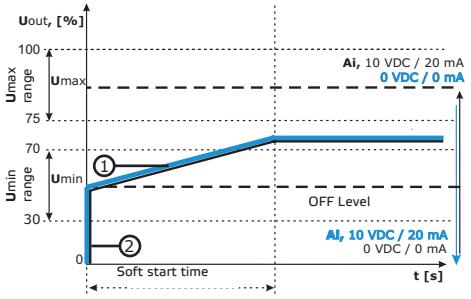
Soft start enabled



Kick start & off level



Soft start & off level



① - **Descending mode**

② - **Ascending mode**

Ascending / Descending input mode

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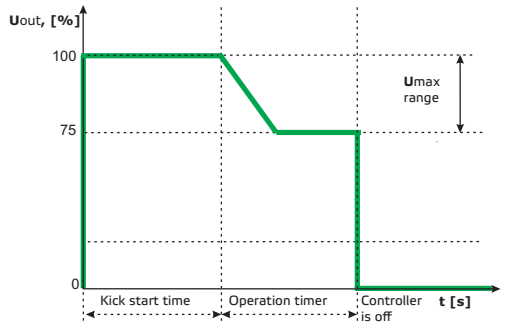
Operational diagrams

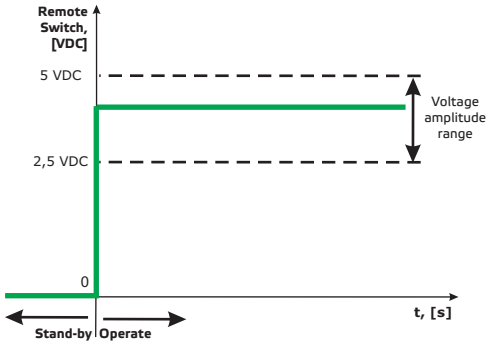
Timer mode

Kick start enabled



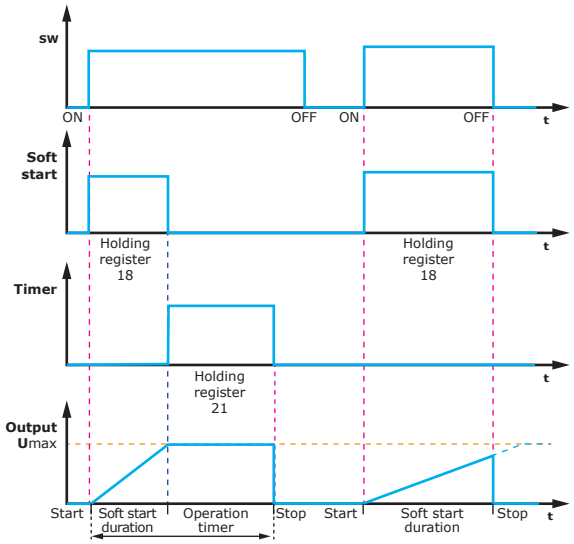
Logic mode

Switch control signal

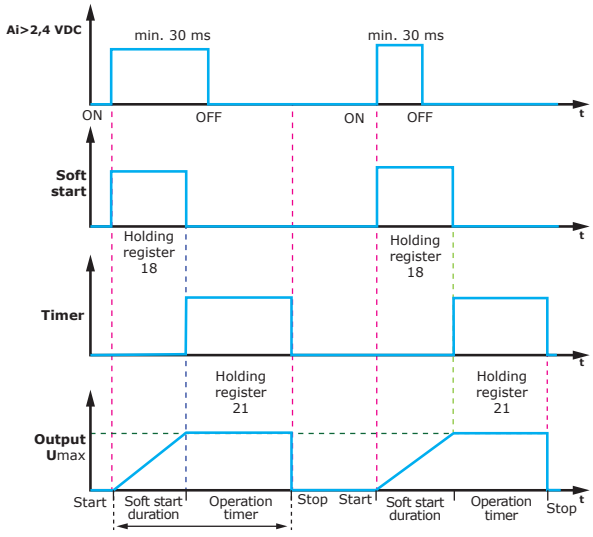


Soft start enabled

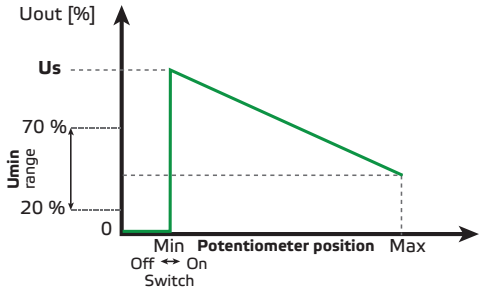
Switch control signal



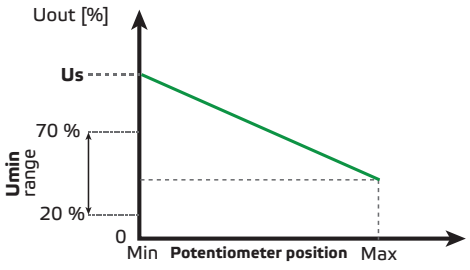
Ai control signal



OFF position enabled: supply voltage connected to L and N



OFF position disabled: supply voltage connected to L1 and N



Note: *To disable the OFF position (1,5 A and 3,0 A versions ONLY!), connect the 230 VAC supply voltage to the unregulated output (L1). In this case, do not connect the power supply to L.*

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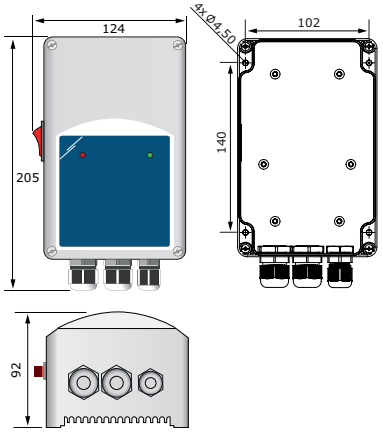
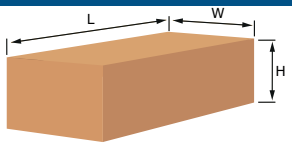
Fixing and dimensions



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
EVSS1-15-DM	Unit (1 pc.)	210	130	110	0,65 kg	0,81 kg
	Box (15 pcs.)	545	405	245	9,71 kg	13,05 kg
EVSS1-30-DM	Unit (1 pc.)	210	130	110	0,68 kg	0,92 kg
	Box (15 pcs.)	545	405	245	10,33 kg	13,89 kg
EVSS1-60-DM	Unit (1 pc.)	210	130	110	0,85 kg	1,02 kg
	Box (15 pcs.)	545	405	245	12,74 kg	15,39 kg
EVSS1100-DM	Unit (1 pc.)	210	130	110	0,87 kg	1,04 kg
	Box (15 pcs.)	545	405	245	13,10 kg	16,44 kg

Global trade item numbers (GTIN)

Packaging	Unit	Box
EVSS1-1-15-DM	05401003004104	05401003501078
EVSS1-1-30-DM	05401003004111	05401003501085
EVSS1-1-60-DM	05401003004128	05401003501092
EVSS1100-DM	05401003004135	05401003501108