

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	Power supply	30–100 % Us (69–230 VAC)
Maximum load	Regulated output	depends on the version
Analogue input	Maximum load	0-10 / 10-0 VDC or 0-20 / 20-0 mA
Unregulated output	Analogue input	supply voltage (Us) / I _{max} 2 A
Logic input	Unregulated output	Timer start
Off level	Logic input	0–4 VDC / 0–8 mA for ascending mode; 10–6 VDC / 20–12 mA for descending mode
Minimum output voltage setting, U _{min}	Off level	30–70 % Us (69–161 VAC)
	Minimum output voltage setting, U _{off}	75–110 % Us (175–230 VAC)
Supply output	Maximum output voltage setting,	+12 VDC / 1 mA
Alarm relay output	U _{max}	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)



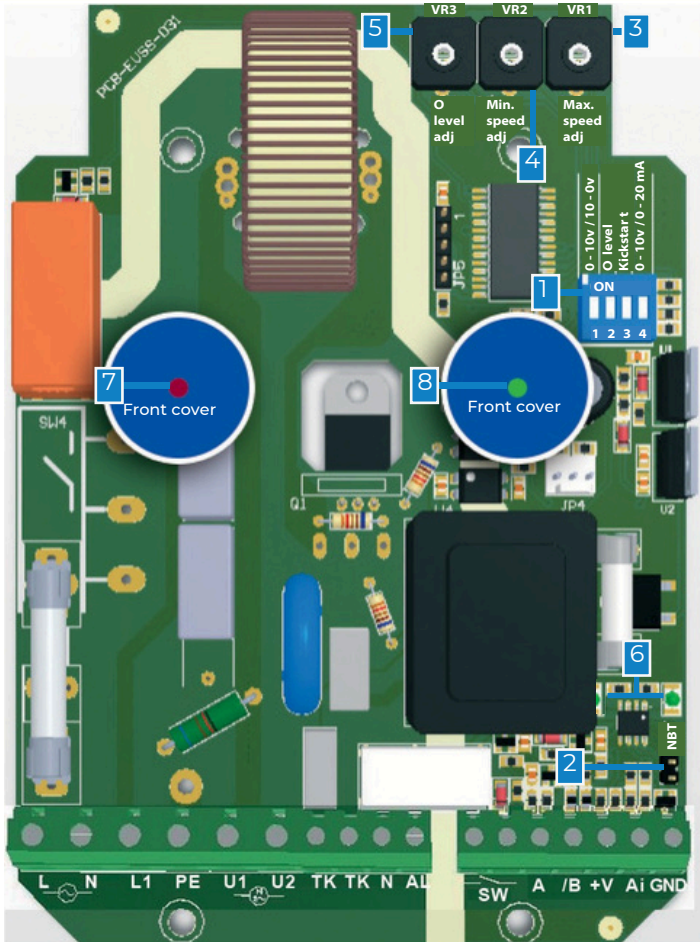
Article codes

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
LI	Unregulated output (230 VAC / max. 2 A)
UI, 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 mm ²
	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!



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
		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

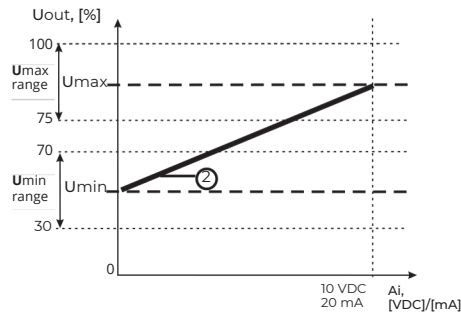
indicates open (OFF) position of the jumper.



Operational diagrams

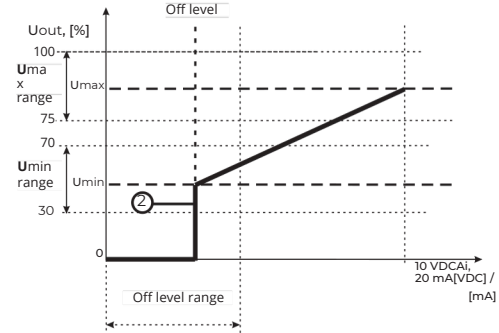
Operating modes

Off level disabled



Descending mode calculation formula	$U_{out} = U_{max} - \frac{A_i}{A_{i_{max}}} (U_{max} - U_{min})$
Ascending mode calculation formula	$U_{out} = U_{min} + \frac{A_i}{A_{i_{max}}} (U_{max} - U_{min})$

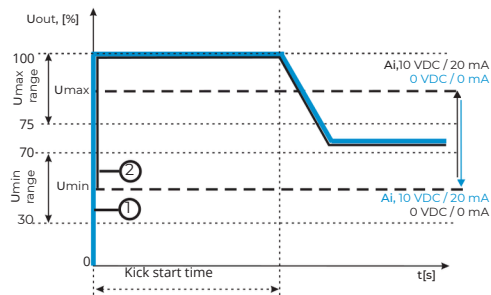
Off level enabled



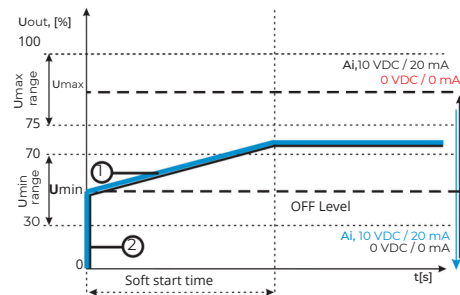
Descending mode calculation formula	$U_{out} = U_{max} - \frac{A_i - \text{Offlevel}}{A_{i_{max}} - \text{Offlevel}} (U_{max} - U_{min})$
Ascending mode calculation formula	$U_{out} = U_{min} + \frac{A_i - \text{Offlevel}}{A_{i_{max}} - \text{Offlevel}} (U_{max} - U_{min})$

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

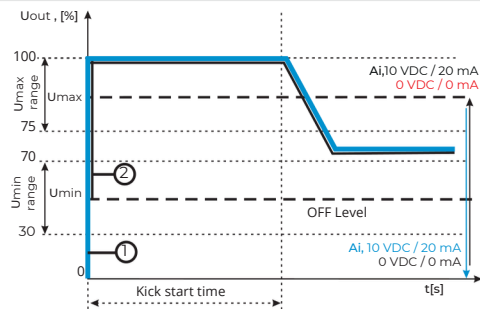
Kick start enabled



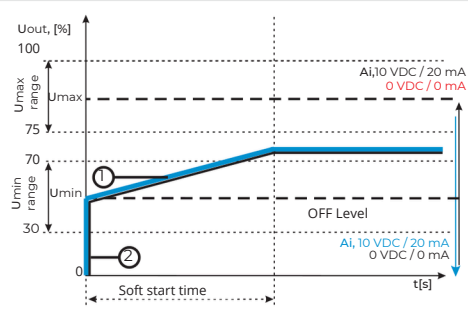
Soft start enabled



Kick start & off level



Soft start & off level



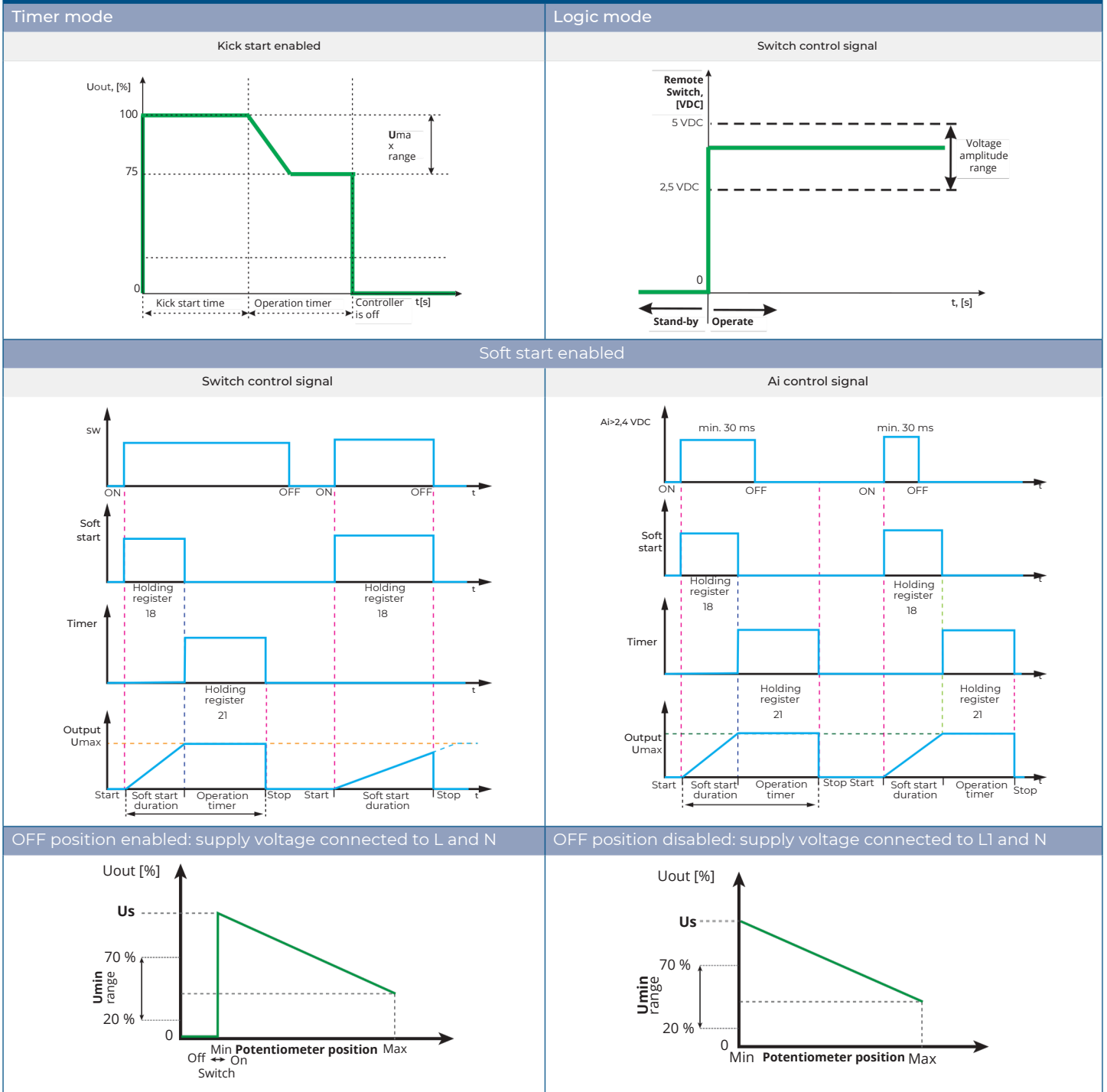
① Descending mode

② Ascending mode

Ascending / Descending input mode



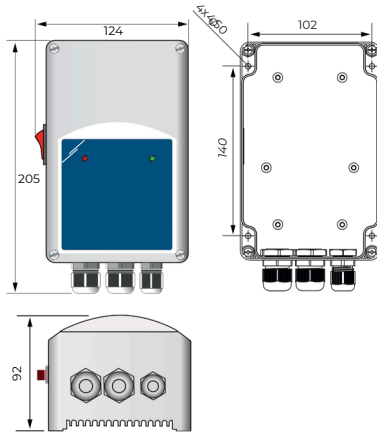
Operational diagrams



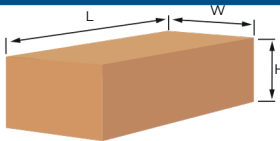
Note: To disable the OFF position (1,5 A and 3,0 A versions ONLY!), connect the 230 VAC supply voltage to the unregulated output (L1). In this case, do not connect the power supply to L.



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