

The EVS-1-XX-DM 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 communication and provide a wide range of functionalities: remote control options, adjustable off level, min. and max. output voltage settings, and time-limited motor operation initiated by a logic or switch signal.



### Key features

- Invertible analogue input signal: 0–10 / 10–0 VDC or 0–20 / 20–0 mA
- Minimum and maximum output voltage setting via trimmers or 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)
- Analogue 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
- Green LED operating indication
- Illuminated power switch
- 1 low voltage supply output (+12 VDC / 1 mA) for external 10 kΩ potentiometer

### Area of use

- Fan speed control in ventilation systems
- Applications where Modbus communication or a timer function is needed
- For indoor use only

### Technical specifications

Power supply, $U_s$	230 VAC $\pm 10\%$ / 50–60 Hz	
Regulated output	30–100 % $U_s$ (69–230 VAC)	
Maximum load	Max. load depends on the version	
Analogue input	0–10 / 10–0 VDC or 0–20 / 20–0 mA	
Unregulated output	supply voltage ( $U_s$ ) / $I_{max}$ 2 A	
Logic input	Timer start (min. 2,5 VDC > 30 ms)	
Minimum output voltage setting, $U_{min}$	30–70% $U_s$ (69–161 VAC)	
Maximum output voltage setting, $U_{max}$	75–100 % $U_s$ (175–230 VAC)	
Supply output	+12 VDC / 1 mA	
Protections	Over voltage and over current	
Protection standard	IP54 (according to EN 60529)	
Ambient conditions	Operating temperature	-20–40 °C
	Relative humidity	0–80 % rH (non-condensing)



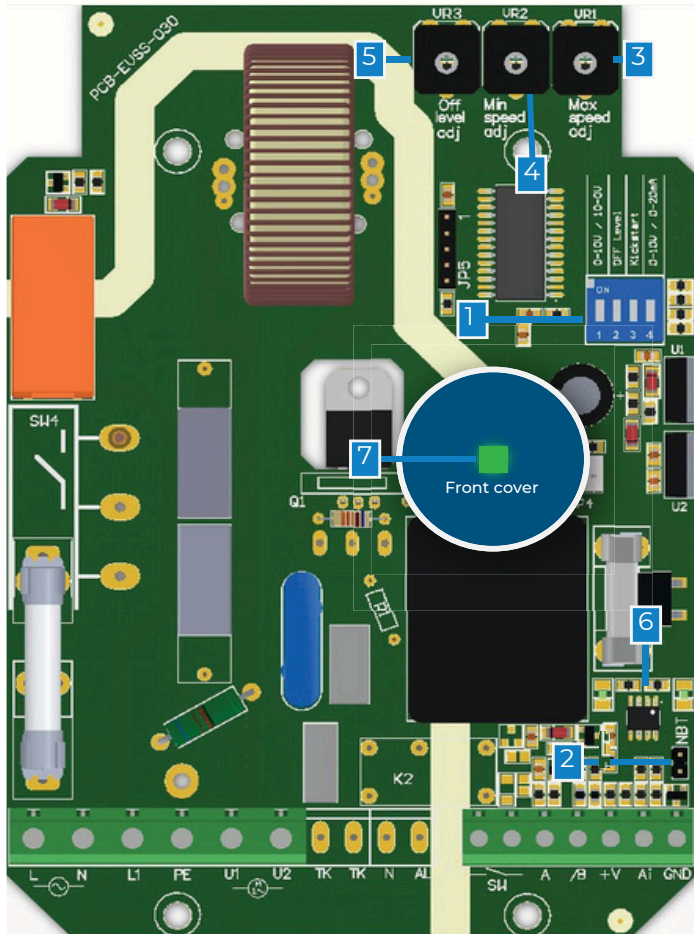
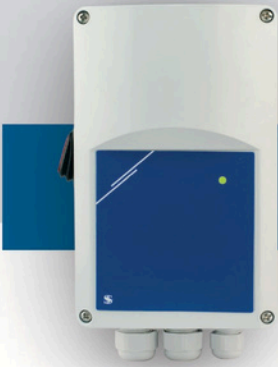
### Article codes

Article code	Max. rated current, [A]	Fuse rating (5*20 mm), [A]
EVS-1-15-DM	1,5	F 3,15 A H 250 VAC
EVS-1-30-DM	3,0	F 5,0 A H 250 VAC
EVS-1-60-DM	6,0	F 10,0 A H 250 VAC
EVS-1100-DM	10,0	(6,3*32 mm) F 16,0 A H 250 VAC

### Wiring and connections

L	Supply voltage 230 VAC $\pm 10\%$ / 50–60 Hz	
N	Neutral	
PE	Earth terminal	
LI	Unregulated output (230 VAC / max. 2 A)	
UI, U2	Regulated output to the motor	
SW	Remote control switch / timer start switch	
A	Modbus RTU (RS485) signal A	
/B	Modbus RTU (RS485) signal /B	
+V	Supply output +12 VDC / 1 mA	
Ai	Analogue 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 <sup>2</sup>
	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/EU
- EN 60335-1:2012 Household and similar electrical appliances - Safety - Part 1: General requirements. Amendment A11:2014 and AC:2014 to EN 60335-1:2012
- EN 61558-1:2005 Safety of power transformers, power supplies, reactors and similar products - Part 1: General requirements and tests. Amendment AC:2006 and A1:2009 to EN 61558-1: 2005

- EMC Directive 2014/30/EU
- EN 61000-6-2:2005 Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments. Amendment AC: 2005 to EN 61000-6-2:2005
- EN 61000-6-3:2007 Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments. Amendment A1:2011 and AC:2012 EN 61000-6-3:2007
- EN 60730-1:2011 Automatic controls for household and similar use - Part 1: General requirements

- 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)		EVS 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
6 - Modbus communication indication		Off value from 20 mA (left) to 12 mA (right) in descending and current mode
		Transmitting / receiving
7 - Operating LED indication (on the front cover)		Normal operation
		Stand-by mode

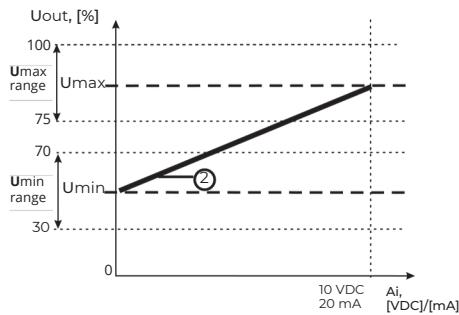
\* indicates closed position of the jumper.



### Operational diagrams

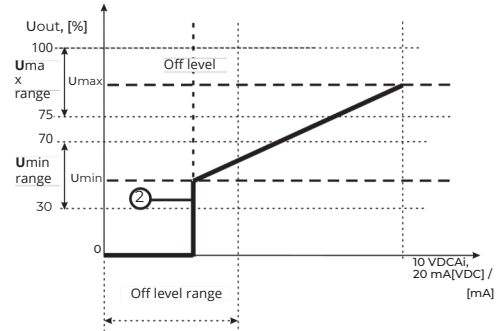
#### Operating modes

##### 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	$U_{out} = U_{min} + \frac{A_i}{A_{i_{max}}} (U_{max} - U_{min})$

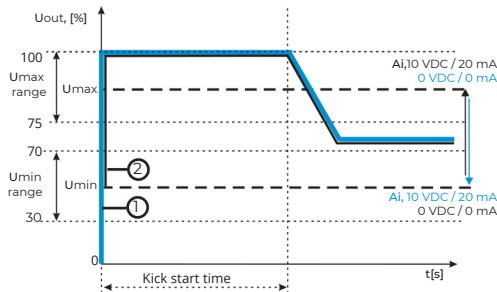
##### Off level enabled



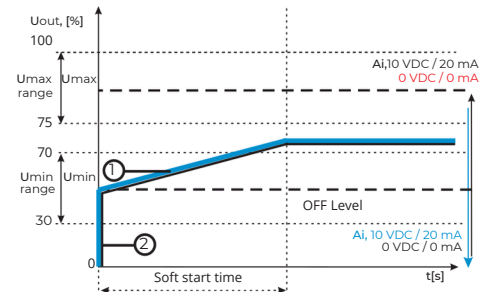
Descending mode calculation formula	$U_{out} = U_{max} - \frac{A_i - \text{Off level}}{A_{i_{max}} - \text{Off level}} (U_{max} - U_{min})$
Ascending mode calculation formula	$U_{out} = U_{min} + \frac{A_i - \text{Off level}}{A_{i_{max}} - \text{Off level}} (U_{max} - U_{min})$

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

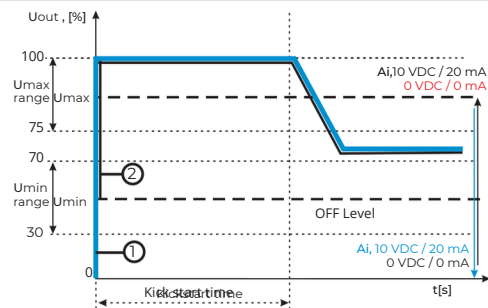
##### Kick start enabled



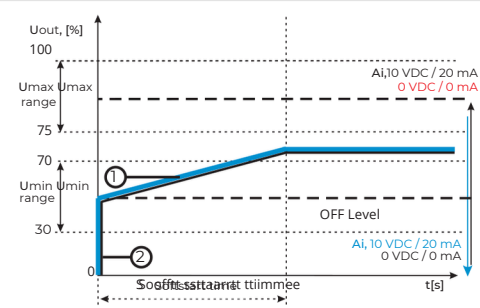
##### Soft start enabled



##### Kick start & off level



##### Soft start & off level

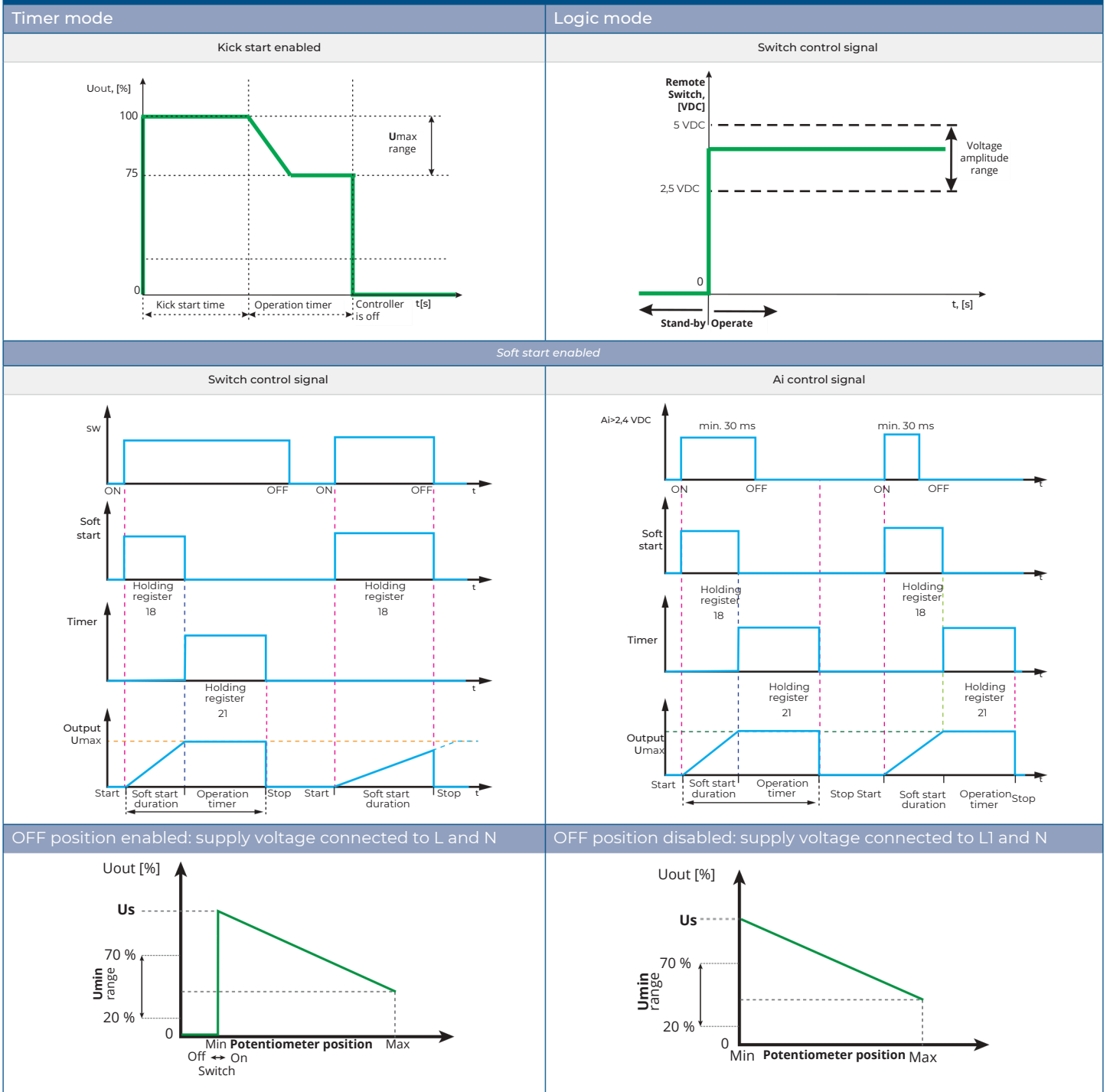


- ① Descending mode
- ② Ascending mode

Ascending / Descending input mode



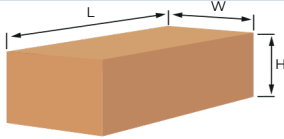
### Fixing and dimensions



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



### Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
EVS-1-15-DM	Unit (1 pc.)	208	128	108	0,72 kg	0,82 kg
	Box (15 pcs.)	545	405	245	10,80 kg	13,27 kg
EVS-1-30-DM	Unit (1 pc.)	245	155	115	0,67 kg	0,84 kg
	Box (15 pcs.)	590	380	280	10,15 kg	10,15 kg
EVS-1-60-DM	Unit (1 pc.)	208	128	108	0,83 kg	1,00 kg
	Box (15 pcs.)	545	405	245	12,53 kg	12,53 kg
EVS-1100-DM	Unit (1 pc.)	245	155	115	0,80 kg	0,90 kg
	Box (15 pcs.)	590	380	280	12,00 kg	14,47 kg

### Global trade item numbers (GTIN)

Packaging	Unit	Box
EVS-1-15-DM	05401003004067	05401003501030
EVS-1-30-DM	05401003004074	05401003501047
EVS-1-60-DM	05401003004081	05401003501054
EVS-1100-DM	05401003004098	05401003501061