SENTERA
C O N T R O L S

MVSS
Electronic fan speed controller with TK for DIN rail

The MVSS series control the speed of single-phase voltage controllable electric motors (230 VAC / 50—60 Hz) according to a standard input control signal. They are equipped with Modbus RTU communication, an alarm relay output and thermal contacts to provide overheating protection of motors with cut-out contacts. They 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 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 value 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
- DIN rail mounted
- Green LED operating indication
- Overheating protection
- Alarm output 230 VAC / 1 A
- Red LED overheating indication

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
Unregulated output	230 VAC / max. 2 A
Alarm relay output	230 VAC (50 / 60 Hz) / 1 A
Analog input	0—10 / 10—0 VDC or 0—20 / 20—0 mA
Logic input	Timer start (min. 2,5 VDC > 30 ms)
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 (172,5—230 VAC)
Supply output	+12 VDC / 1 mA
Enclosure	PA- UL94 V0, green RAL 6017
Protections	Overvoltage and overcurrent
Protection standard	IP20 (according to EN 60529)
Ambient conditions	Operating temperature	-20—40 °C
	Relative humidity	0—80 % rH (non-condensing)
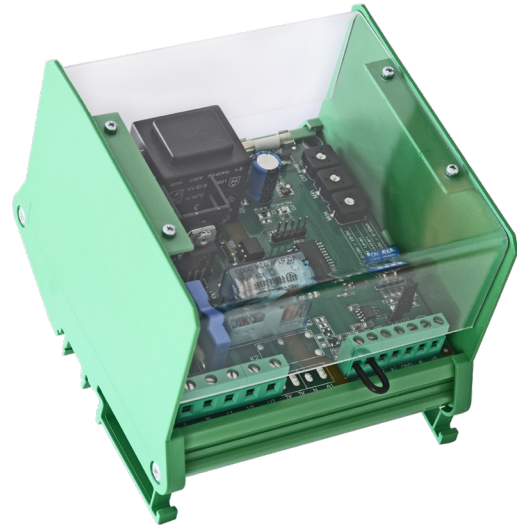
Article codes

Article code	Max. rated current, [A]	Fuse rating	
		Fuse 1	Fuse 2
MVSS1-15CDM	1,5	F 0,315 A H 250 V (5*20 mm)	F 3,15 A H 250 V (5*20 mm)
MVSS1-30CDM	3,0		F 5,0 A H 250 V (5*20 mm)
MVSS1-60CDM	6,0		F 10,0 A H 250 V (5*20 mm)
MVSS1100CDM	10,0		F 16,0 A H 250 V (6,3*32 mm)

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

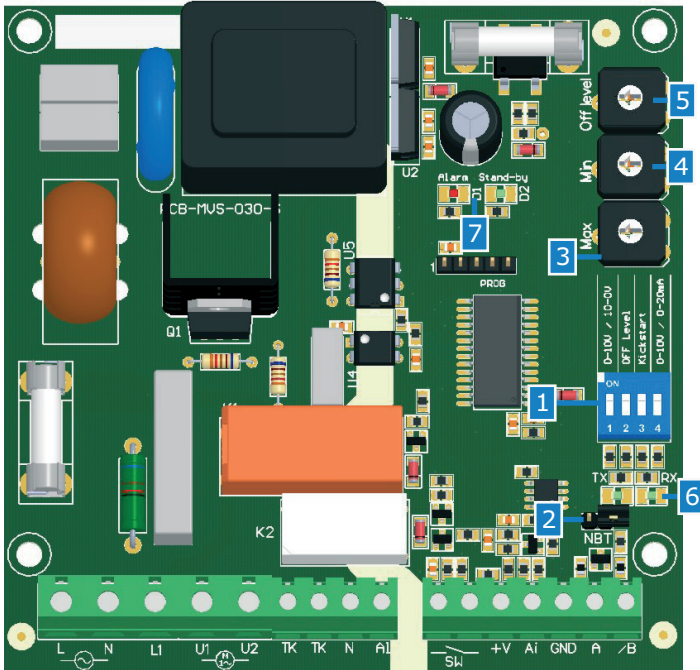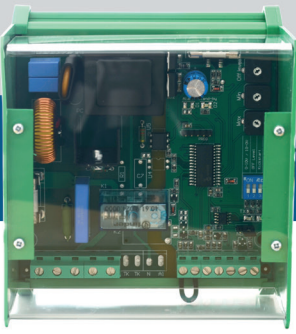For more information about the Modbus registers, please refer to the product Modbus Register Map.

Standards

- Low Voltage Directive 2014/35/EC
- EMC Directive 2014/30/EC
- DIN rail EN 50022
- RoHs Directive 2011/65/EU

CE

Wiring and connections

L	Supply voltage 230 VAC ±10 % / 50—60 Hz
N	Neutral
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 / timer start switch
+V	Supply output +12 VDC / 1 mA
Ai	Analog input 0—10 VDC / 0—20 mA
GND	Ground
A	Modbus RTU (RS485) signal A
/B	Modbus RTU (RS485) signal /B
Connections	Cable cross section: max. 2,5 mm²

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!

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)	*	MVSS is the first or last unit
3 - Max. speed trimmer	VR1	Adjusts the maximum output voltage from 175 VAC (left) to 230 VAC (right)
4 - Min. speed trimmer	VR2	Adjusts the minimum output voltage from 69 VAC (left) to 161 VAC (right)
5 - Off level trimmer	VR3	**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	Cont. green	Normal operation
	Blinking green	Stand-by mode
8 - Overheating indication, Alarm	Solid on	Motor overheating

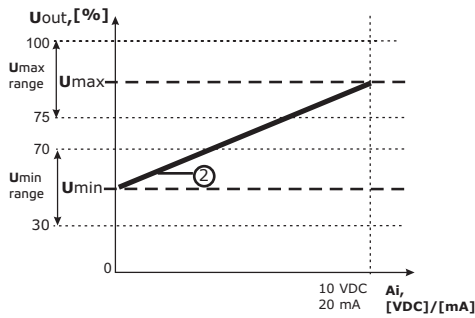* ▬▬ *indicates closed position of the jumper.*

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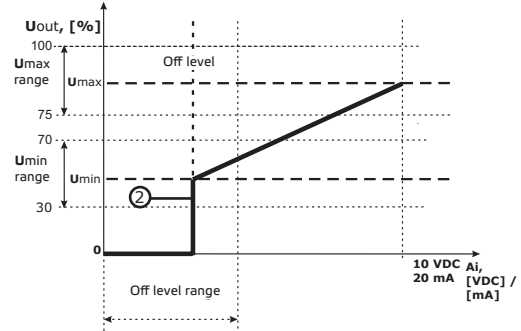
Descending mode calculation formula	$Uout = Umax - \frac{Ai - Offlevel}{Aimax - Offlevel}(Umax - Umin)$
Ascending mode calculation formula	$Uout = Umin + \frac{Ai - Offlevel}{Aimax - Offlevel}(Umax - Umin)$

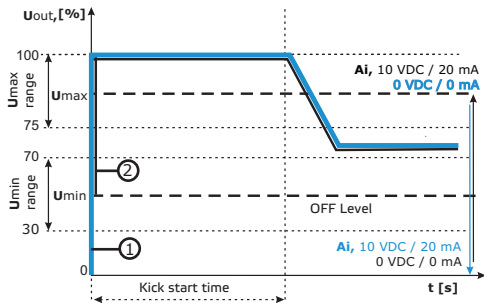**Note:** *The operational diagrams for Descending mode are mirror images of the diagrams above for Ascending mode.*
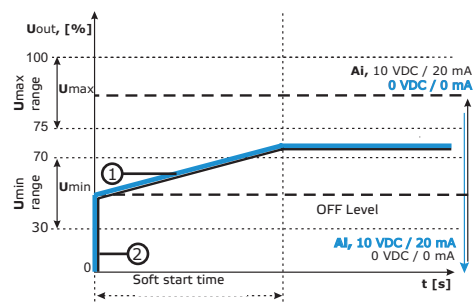
Kick start enabled
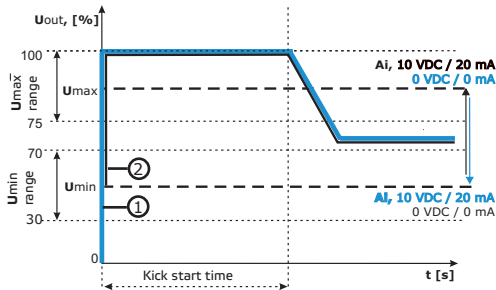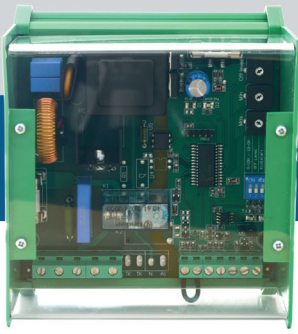

Soft start enabled
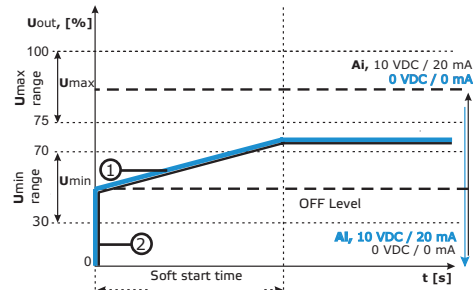
Kick start & off level

Soft start & off level

Ascending / Descending input mode

① - **Descending mode**

② - **Ascending mode**

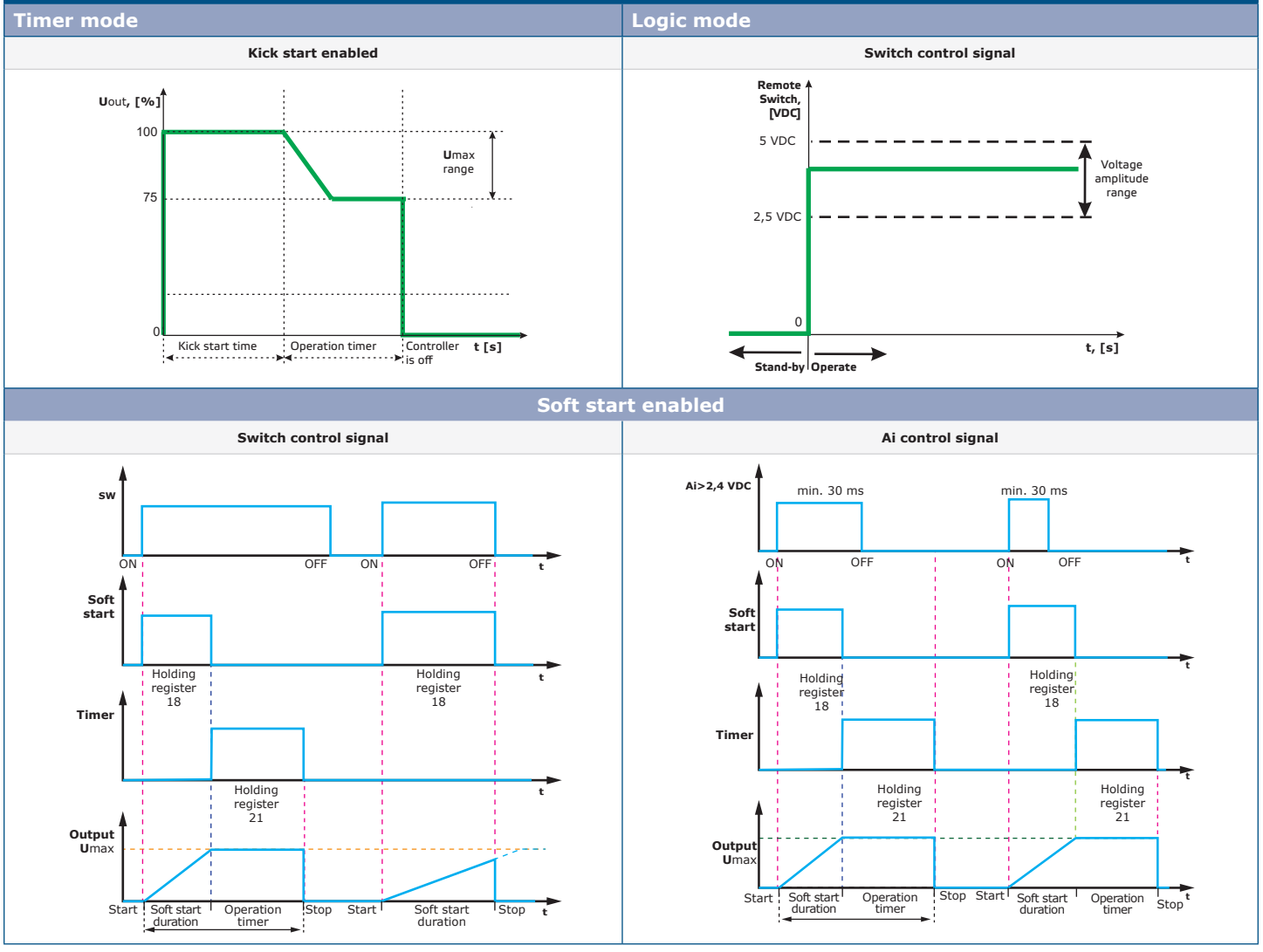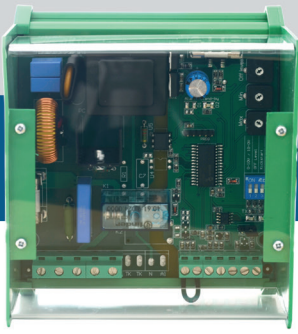**Note:** *More details about EVSS control functionalities you can find in our mounting instruction published on our site. Please follow the link:* http://www.sentera.eu

Operational diagrams

Timer mode

Kick start enabled

Logic mode

Switch control signal

Soft start enabled

Switch control signal

Ai control signal

Fixing and dimensions

MVSS1-60CDM
MVSS1100CDM

MVSS1-15CDM
MVSS1-30CDM

DIN rail
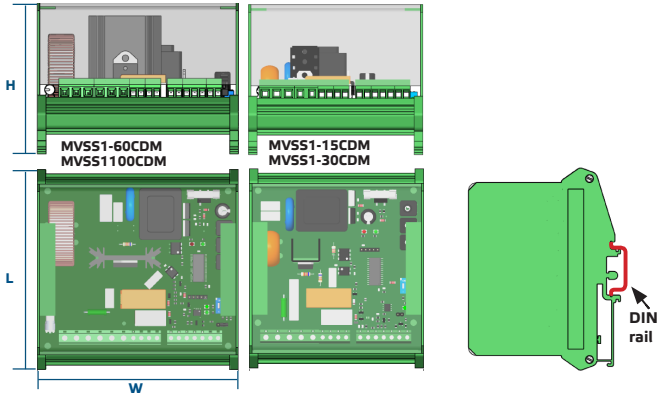
Articles	Height [mm]	Length [mm]	Width [mm]
MVSS1-15CDM, MVSS1-30CDM	96	127	112
MVSS1-60CDM, MVSS1100CDM			128

Packaging
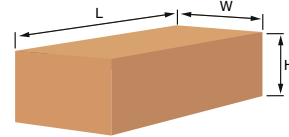
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
MVSS1-15CDM	Unit (1 pc.)	220	130	110	0,36 kg	0,46 kg
	Box (15 pcs.)	590	380	280	5,40 kg	7,70 kg
MVSS1-30CDM	Unit (1 pc.)	220	130	110	0,36 kg	0,46 kg
	Box (15 pcs.)	590	380	280	5,40 kg	7,70 kg
MVSS1-60CDM	Unit (1 pc.)	220	130	110	0,49 kg	0,59 kg
	Box (15 pcs.)	590	380	280	7,35 kg	9,65 kg
MVSS1100CDM	Unit (1 pc.)	220	130	110	0,50 kg	0,60 kg
	Box (15 pcs.)	590	380	280	7,50 kg	9,80 kg

Global trade item numbers (GTIN)

Article	Unit	Box
MVSS1-15CDM	05401003010594	05401003502273
MVSS1-30CDM	05401003010600	05401003502280
MVSS1-60CDM	05401003010617	05401003502297
MVSS1100CDM	05401003010624	05401003502303