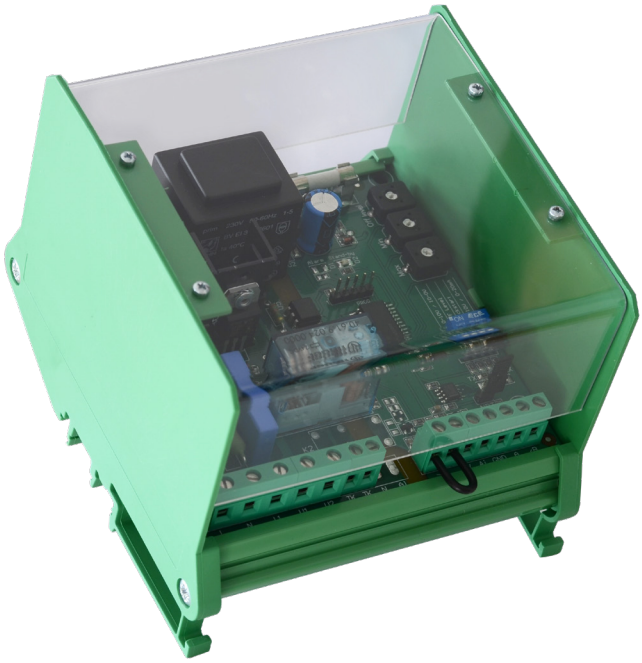
MVSS

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
- Mounting on a standard DIN rail
- Overheating protection
- Alarm output 230 VAC / 1 A
- Green LED operating indication
- Red LED overheating indication



Technical specifications

Power supply, Us		230 VAC ±10 % / 50—60 Hz
Regulated output		30—100 % Us (69—230 VAC)
Max. load		Max. load depends on the version
Unregulated output		230 VAC / max. 2 A
Analog input		0—10 / 10—0 VDC or 0—20 / 20—0 mA
Alarm relay output		230 VAC (50 / 60 Hz) / 1 A
Logic input		Timer start (min. 2,5 VDC > 30 ms)
Minimum output voltage setting, Umin		30—70 % Us (69—161 VAC)
Maximum output voltage setting, Umax		75—100 % Us (172,5—230 VAC)
Off level		0—4 VDC / 0—8 mA for ascending mode 10—6 VDC / 20—12 mA for descending mode
Supply output		+12 VDC / 1 mA
Protection		Overheating, overvoltage and overcurrent
Enclosure		PA- UL94 V0, green (RAL 6017)
Protection standard		IP20 (according to EN 60529)
Ambient conditions	Temperature	-20—40 °C
	Rel. humidity	0—80 % rH (non-condensing)

Article codes

Article	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)

Area of use

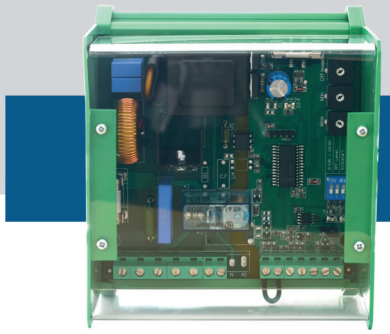
- Fan speed control in ventilation systems
- For indoor use only

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.



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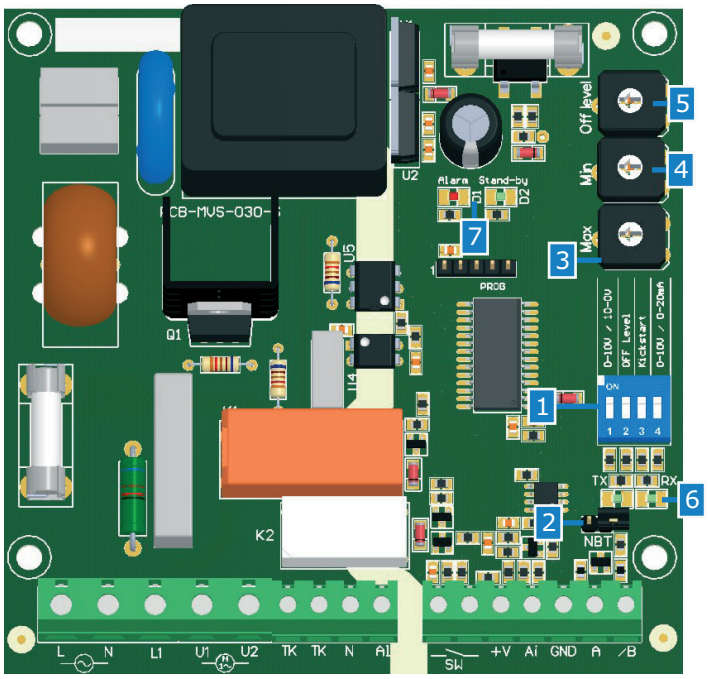


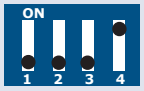
Wiring and connections

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!*

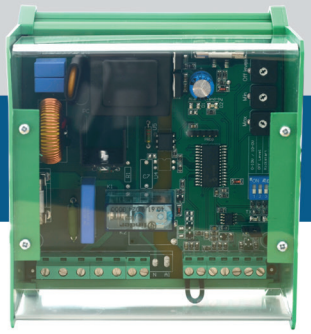
Settings

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		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	Transmitting / receiving
7 - Operating LED indication, Stand-by	Solid on	Normal operation
	Blinking	Stand-by mode
8 - Overheating indication, Alarm	Solid on	Motor overheating

*▬ indicates closed position of the jumper.



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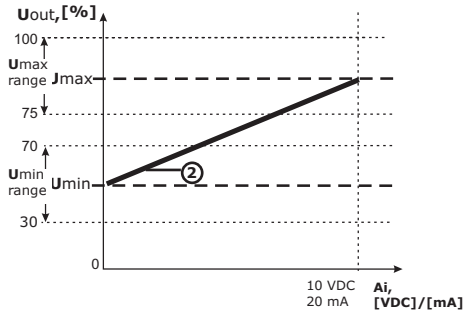
Operational diagrams

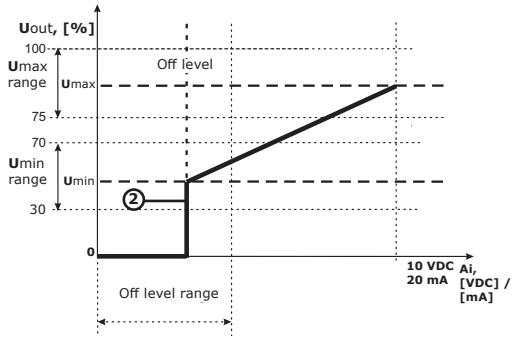
Operating modes

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

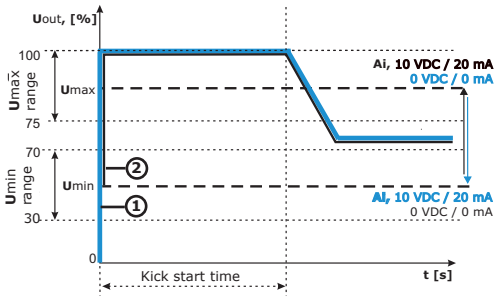


Descending calculation formula	$Uout = Umax - \frac{Ai - Offlevel}{Aimax - Offlevel}(Umax - Umin)$
Ascending calculation formula	$Uout = Umin + \frac{Ai - Offlevel}{Aimax - Offlevel}(Umax - Umin)$

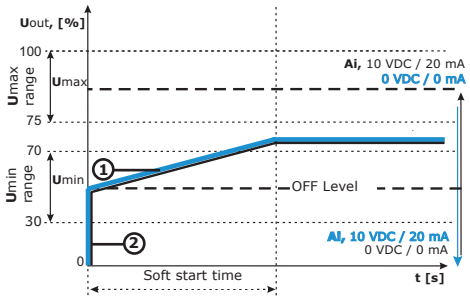
Note: *The operational diagrams for Descending mode are mirror images of the diagrams above for Ascending mode.*

Ascending / Descending input mode

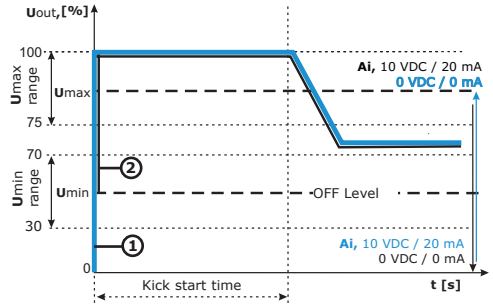
Kick start enabled



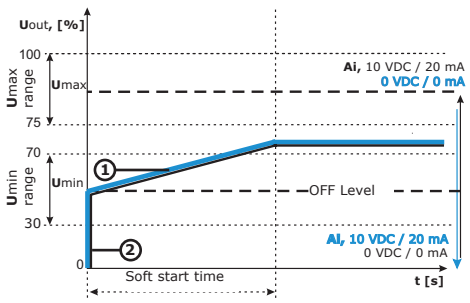
Soft start enabled



Kick start & off level



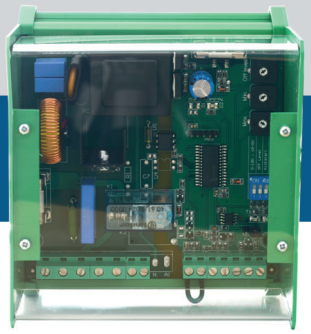
Soft start & off level



① - Descending mode

② - Ascending mode

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



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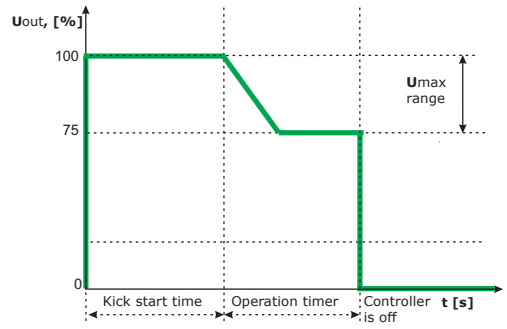
Operational diagrams

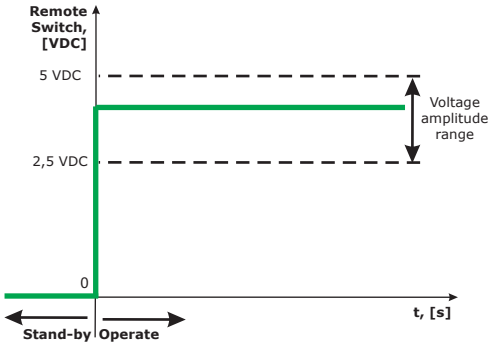
Timer mode

Kick start enabled



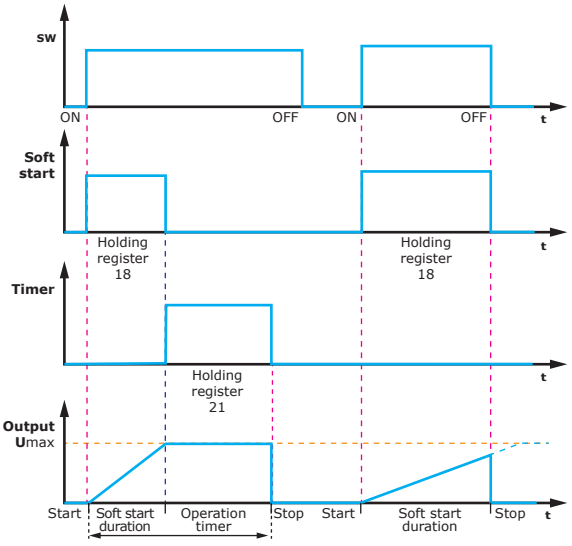
Logic mode

Switch control signal

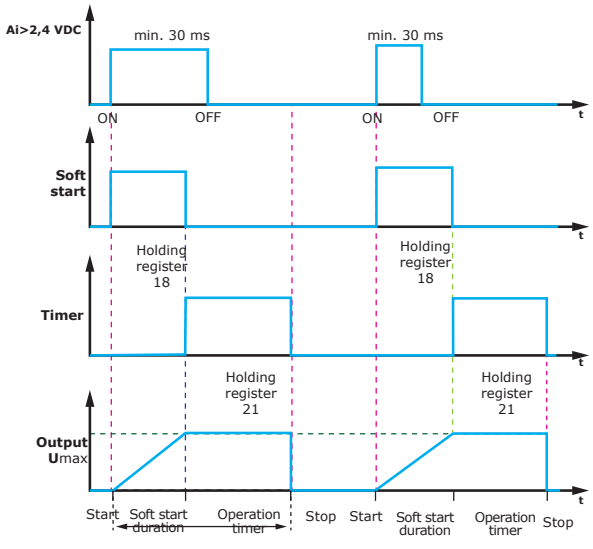


Soft start enabled

Switch control signal

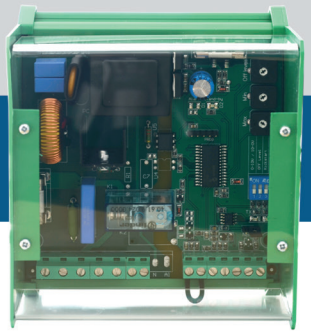


Ai control signal



Standards

- Low Voltage Directive 2014/35/EC
- EMC Directive 2014/30/EC
- WEEE Directive 2012/19/EC
- DIN rail EN 50022
- RoHs Directive 2011/65/EC



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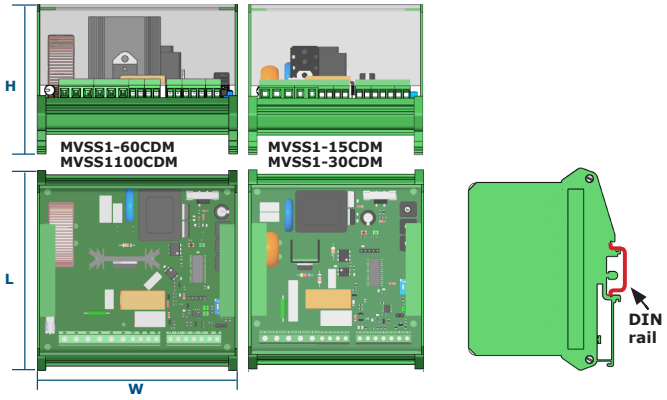
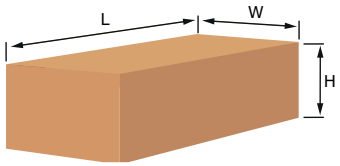
Fixing and dimensions



MVSS1-15CDM MVS1-30CDM		
Height [mm]	Length [mm]	Width [mm]
96	127	112
MVSS1-60CDM, MVS1100CDM		
96	127	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