Sontay®
Four Elms Road · Edenbridge
Kent · TN8 6AB · UK

FC-EVS
Fan Speed Controller via Remote Signal

Issue Number: 7.1
Date of Issue: 26/08/2021

Features & Benefits

- Volume or velocity reduction
- Suitable for supply & extract systems
- Minimum and maximum speed adjustment
- 2 or 3-wire fan speed connections
- Quite operation
- Flow rate reduction on centrifugal pumps

Technical Overview

The FC-EVS series of electronic speed controllers provide an economic means of regulation for voltage controllable single-phase AC motors. Centrifugal fans, axial fans, propeller fans, and centrifugal pumps are prime candidates for electronic speed control.

Fan speed is controlled via a remote invertible 0-10Vdc / 10-0Vdc or 0-20mA / 20-0mA signal, suitable for direct connection to BEMS or transmitters.

It is equipped with Modbus RTU communication and provides 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.

Product Codes

FC-EVS-1.5	Electronic speed controller 1.5A
FC-EVS-3	Electronic speed controller 3A
FC-EVS-6	Electronic speed controller 6A
FC-EVS-10	Electronic speed controller 10A

Specification

Nominal Supply	230Vac ±10% 50/60Hz	
Control type	0-10Vdc/10-0Vdc or 0-20mA/20-0mA Modbus RTU	
On/Off switch	Mounted on side	
Input signal:		
	0-20mA @ 250Ω 0-10Vdc @ 90KΩ	
Starting sequence:		
Kick start	Max. speed for 10 sec, then motor speed is as input signal	
No kick start	Motor speed is as input signal	
Speed adjustment:		
Minimum	69-161V	
Maximum	175-230V	
Off level	0-4V / 10-6V or 0-8mA / 20-12mA (adjustable by potentiometer)	
Ratings	Current (nominal)	Fuse
FC-EVS-1.5	1.5A	F 3.15 A-H
FC-EVS-3	3.0A	F 5.0 A-H
FC-EVS-6	6.0A	F 10.0 A-H
FC-EVS-10	10.0A	F 16.0 A-H
Mounting style	Wall mount	
Dimensions	205 x 124 x 92mm	
Protection category	IP54	
Ambient:		
Temperature	-20 to 40°C	
RH	95% non-condensing	
Country of origin	Bulgaria	
Conformity	EMC, LVD, CE & UKCA Marked	

WEEE Directive:
At the end of the products useful life please dispose as per the local regulations.
Do not dispose of with normal household waste.
Do not burn.

CE UKCA

Tel: +44 (0)1732 861200 - E-mail: sales@sontay.com - Web: www.sontay.com

Notes

Read all the information, the datasheet, mounting and operating instructions and study the wiring and connection diagram before working with the product. For personal and equipment safety, and for optimum product performance, make sure you entirely understand the contents before installing, using, or maintaining this product.

For safety and licensing (CE) reasons, unauthorised conversion and / or modifications of the product are inadmissible.

The product should not be exposed to abnormal conditions, such as: extreme temperatures, direct sunlight or vibrations. Long-term exposure to chemical vapours in high concentration can affect the product performance. Make sure the work environment is as dry as possible; avoid condensation.

All installations shall comply with local health and safety regulations and local electrical standards and approved codes. This product can only be installed by an engineer or a technician who has expert knowledge of the product and safety precautions.

Avoid contacts with energised electrical parts. Always disconnect the power supply before connecting, servicing or repairing the product.

Always verify that you apply appropriate power supply to the product and use appropriate wire size and characteristics. Make sure that all the screws and nuts are well tightened and fuses (if any) are fitted well.

Recycling of equipment and packaging should be taken into consideration and these should be disposed of in accordance with local and national legislation / regulations.

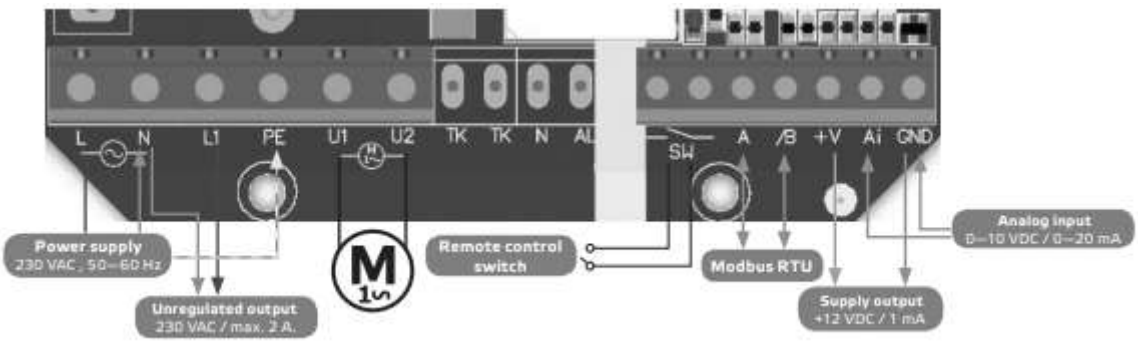
Wiring & Connections

L	Mains supply 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
SW	Remote / timer switch
A	Modbus RTU (RS485) signal A
/B	Modbus RTU (RS485) signal /B
+V	Supply output + 12 VDC / 1 mA

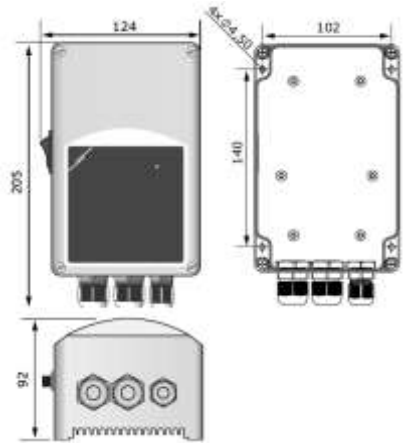
Analog input:

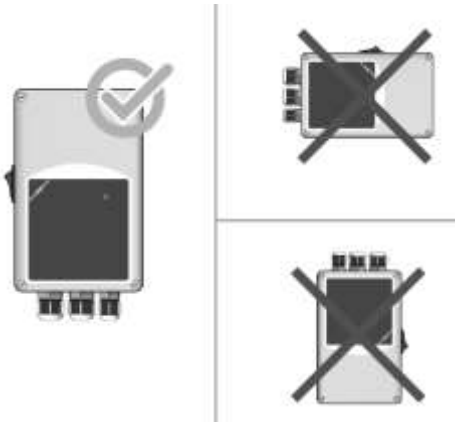
	(0-10Vdc / 0-20mA) or (10-0Vdc / 20-0mA)
Ai	Logic input (Timer functionality):
	(min. 2,5Vdc & > 30ms)
GND	Ground

Connections
Cable cross section: max. 2,5mm²
Cable gland clamping range: 3-6mm / 5-10mm

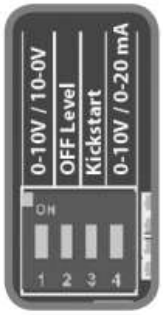


Mounting Dimensions & Position





DIP-Switches



Ascending / descending 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 / soft start selection (DIP switch, position 3)		ON - Kick start OFF - Soft start
Input mode selection (DIP switch, position 4)		ON - Current mode (0—20 mA) OFF - Voltage mode (0—10 VDC)

Potentiometers (Trimmers)

Maximum speed	Default setting is Us (230Vac)
Minimum speed	Default setting is 30% Us (69Vac)
OFF level	Default setting is 0Vac

Installation

1. The FC-EVS should only be installed by a competent, suitably trained technician, experienced in installation with hazardous voltages. (>50Vac & <1000Vac or >75Vdc & 1500Vdc)
2. Ensure that all power is disconnected before carrying out any work on the FC-EVS.
3. Open the enclosure cover and fix the unit to the wall or panel using the provided dowels and screws. Mind the correct mounting position and unit dimensions.
4. Connect the motor / fan. Connect L1 output for a 3-wire connection, controlled valve, etc. (if necessary).
5. Select the required analogue input type and mode, start mode and OFF level mode by the DIP switch on the board.
6. Connect the power supply cable.
7. Adjust the max. speed by trimmer (if necessary). The default setting is Us (230Vac). — Max. speed trimmer
8. Adjust the min. speed by trimmer (if necessary). The default setting is 30% Us (69Vac). — Min. speed trimmer
9. Adjust the OFF level value by trimmer (if necessary). The default setting is 0Vac. — Off level trimmer
10. Close the enclosure and fix the cover and switch on the power supply.

Verification of Installation Instructions

Follow the instructions below:

1. Switch on the mains supply.

2. Set the NBT jumper, DIP switch, Max. trimmer, Min. trimmer and OFF level trimmer to desired positions / values. The factory settings are as follows:

   ► NBT jumper is open (Network bus termination resistor is disconnected);
   ► Ascending mode: 0-10Vdc / 0-20mA
   ► Off level - OFF;
   ► Kick start disabled;
   ► Input voltage mode (0-10Vdc);
   ► Min. setting of the Min. speed trimmer
   ► Max. setting of the Max. speed trimmer;
   ► Min. setting of the Off level trimmer.

3. Set the analogue input signal to the maximum value of 10Vdc or 20mA.

4. The connected motor will run at maximum speed or minimum speed depending on the analogue input mode (ascending / descending).

5. If OFF level is enabled and descending analogue input mode is selected, the motor will stop running.

6. Set the analogue input signal to the maximum value of 0Vdc or 0mA.

7. The connected fan will run at minimum speed or maximum speed depending on the analogue input mode (ascending / descending).

8. If OFF level is enabled and ascending analogue input mode is selected, the motor will stop running.

9. If OFF level is enabled and the input signal is equal to the value of the OFF level, the speed of the motor will be the minimum speed in ascending mode or the maximum speed in descending mode.

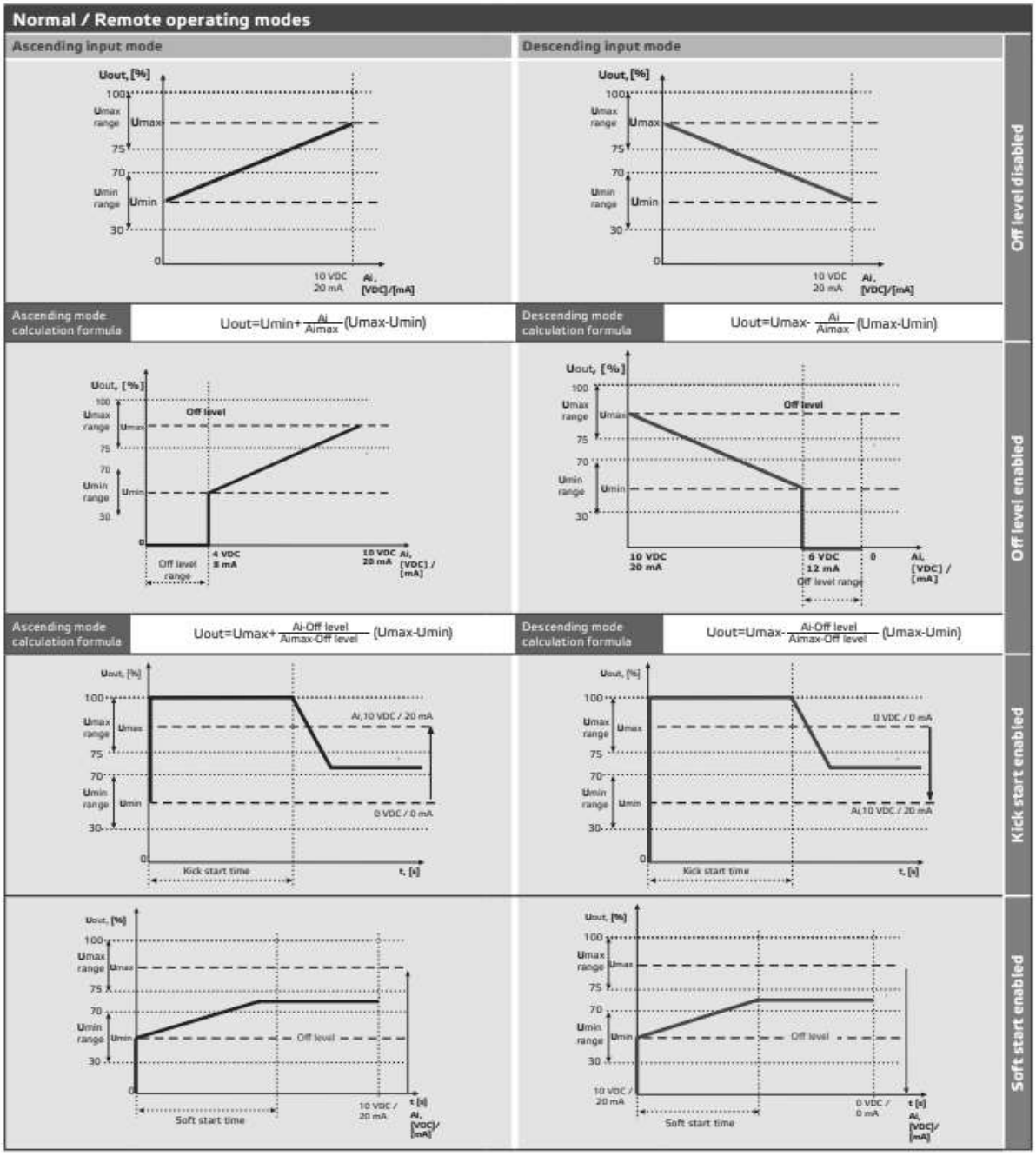
10. If the controller does not work according to the instructions above, the wiring connections and settings need to be checked.

Front panel LED indication

When the green LED on the front cover gives out a continuous light, the controller operates in normal mode. When it blinks:

- The controller operates in remote control mode, or
- OFF level is enabled and the analogue input signal is below the OFF level value.

Operational Diagrams

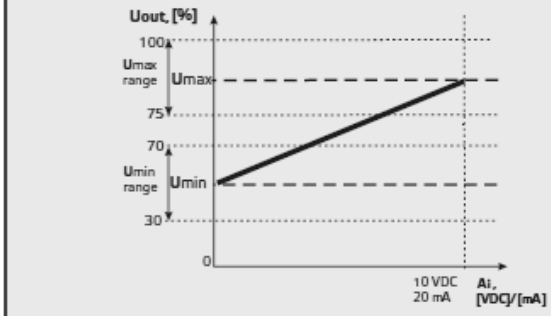


Operational Diagrams

Normal / Remote operating modes

Off level disabled

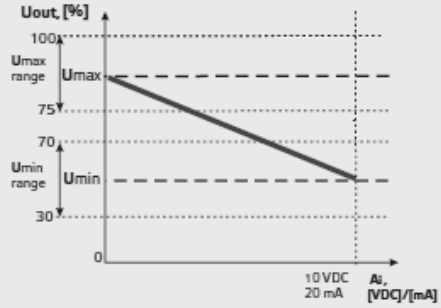
Ascending input mode



Ascending mode calculation formula

$$Uout = Umin + \frac{Ai}{Aimax}(Umax - Umin)$$

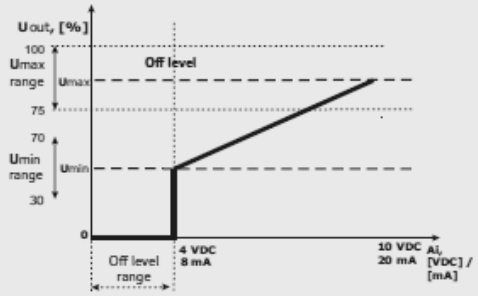
Descending input mode

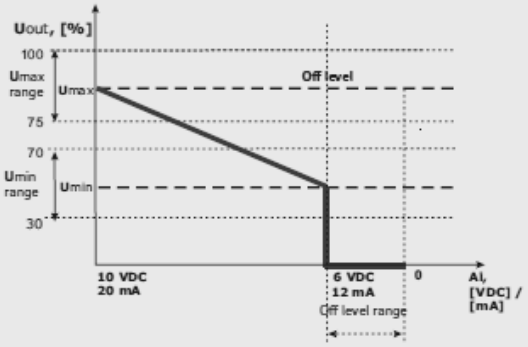


Descending mode calculation formula

$$Uout = Umax - \frac{Ai}{Aimax}(Umax - Umin)$$

Off level enabled





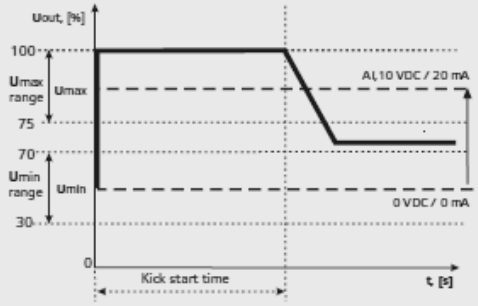
Ascending mode calculation formula

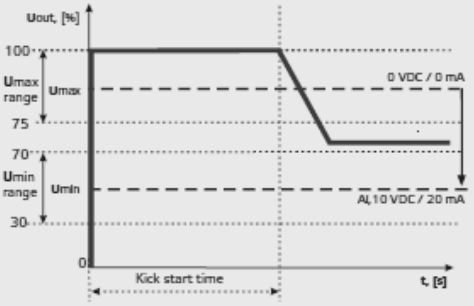
$$Uout = Umax + \frac{Ai - Off\ level}{Aimax - Off\ level}(Umax - Umin)$$

Descending mode calculation formula

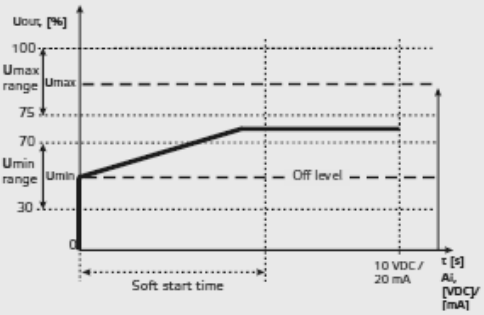
$$Uout = Umax - \frac{Ai - Off\ level}{Aimax - Off\ level}(Umax - Umin)$$

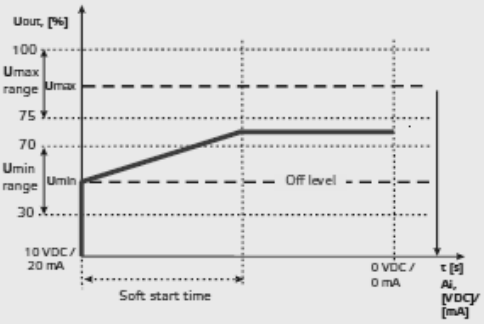
Kick start enabled





Soft start enabled





Operational Diagrams