

STVS1

230 VAC TRANSFORMER
CONTROLLER WITH
ANALOGUE INPUT

Mounting and operating instructions



Table of contents

SAFETY AND PRECAUTIONS	3
PRODUCT DESCRIPTION	4
ARTICLE CODES	4
INTENDED AREA OF USE	4
TECHNICAL DATA	4
STANDARDS	4
OPERATIONAL DIAGRAM	5
WIRING AND CONNECTIONS	5
MOUNTING INSTRUCTIONS IN STEPS	6
VERIFICATION OF INSTALLATION	8
TRANSPORT AND STORAGE	9
WARRANTY AND RESTRICTIONS	9
MAINTENANCE	9

SAFETY AND PRECAUTIONS



Read all the information, the datasheet, Modbus map, 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.



In case there are any questions that are not answered, please contact your technical support or consult a professional.

PRODUCT DESCRIPTION

The STVS1 series of transformer fan speed controllers regulate the speed of single-phase voltage controllable motors in five steps by varying the output voltage according to an 0–10 VDC analogue input signal. They are equipped with autotransformer(s) and feature TK monitoring for thermal motor protection. The controllers up to 7,5 A are available in plastic enclosure, while the models above 7,5 A are available in a metal enclosure.

ARTICLE CODES

Article code	Rated max. current [A]	Fuse [A]
STVS1-15L22	1,5	(5*20 mm) T-2,5 A-H
STVS1-25L22	2,5	(5*20 mm) T-4,0 A-H
STVS1-35L22	3,5	(5*20 mm) T-5,0 A-H
STVS1-50L22	5,0	(5*20 mm) T-8,0 A-H
STVS1-75L22	7,5	(6*32 mm) T-12,5 A-H
STVS1100L22	10,0	(6*32 mm) T-16,0 A-H
STVS1130L22	13,0	(6*32 mm) T-20,0 A-H

INTENDED AREA OF USE

- Fan speed control of voltage controllable motors (pumps and fans) in ventilation systems
- For indoor use only

TECHNICAL DATA

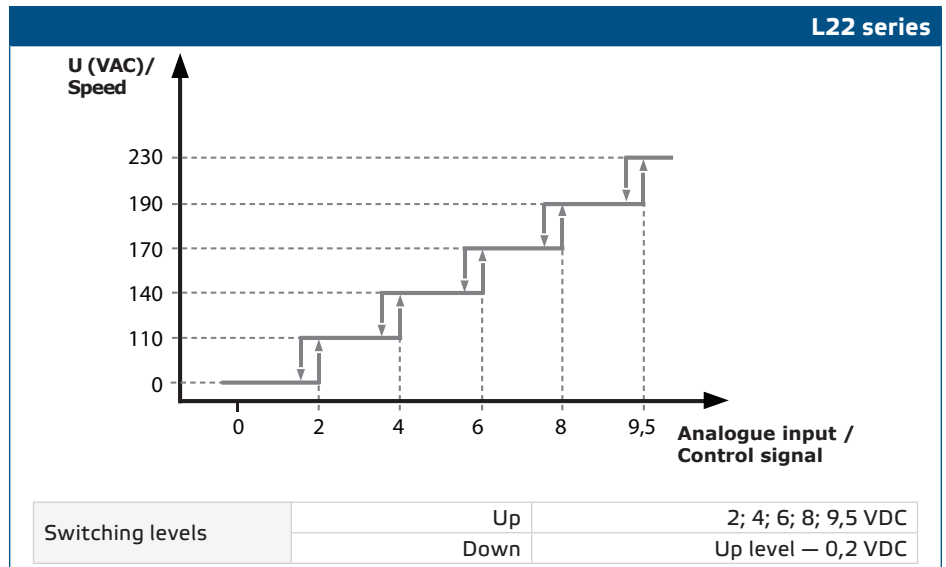
- Supply voltage: 230 VAC / 50–60 Hz
- Maximum motor current (I_{max}): 13 A
- Unregulated output: 230 VAC (I_{max}. 2 A)
- TK monitoring for thermal motor protection
- 12 VDC to supply an external device (e.g. potentiometer)
- 5 switching levels according to the input signal
- LED status indication
- Enclosure: plastic (R-ABS, UL94-V0, grey RAL 7035) or sheet steel (RAL 7035, polyester powder coating), depending on the product version
- Protection standard: IP54 (according to EN 60529)
- Operating ambient conditions:
 - ▶ Temperature: -20–35 °C
 - ▶ Rel. humidity: 5–95 % rH (non-condensing)

STANDARDS

- Low Voltage Directive 2014/35/EC
- EMC Directive 2014/30/EC: EN 61326
- WEEE Directive 2012/19/EC
- RoHs Directive 2011/65/EC



OPERATIONAL DIAGRAM



WIRING AND CONNECTIONS

Wiring and connections	
L	Power supply, phase (230 VAC / 50–60 Hz)
N	Power supply, neutral
Pe	Earth terminal
Pe	Earth terminal
L1	Unregulated output, line
N1	Unregulated output, neutral
N1	Regulated output to motor, neutral
U	Regulated output to motor, line
TK	Input - TK monitoring for thermal motor protection
TK	
0V	Ground
+12V	Output 12 VDC / I _{max} 50 mA
+V*	Digital output 12 VDC / I _{max} 50 mA (0 VDC = TK fault; 12 VDC = normal operation)
V/C	Input U: 0–10 VDC

ATTENTION

The total output current for both outputs (+12V and +V) must not exceed 100 mA!

MOUNTING INSTRUCTIONS IN STEPS

Before you start mounting the STVS1, read carefully “**Safety and Precautions**” and follow these steps. Choose a smooth solid surface for installation (a wall, panel, etc.).

Follow these steps:

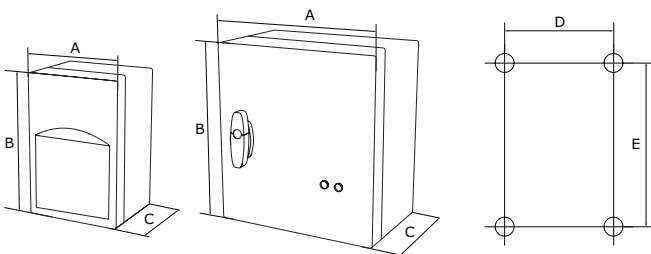
1. Unscrew the front cover and open the enclosure. Mind the wires that connect the front cover with the printed circuit board.
2. Fix the unit onto the wall or panel using the provided screws and dowels. Mind the correct mounting position and unit mounting dimensions. (See **Fig. 1 Mounting dimensions** and **Fig. 2 Mounting position**.)
3. Pay attention to the following instructions in order to minimize the operating temperature:
 - 3.1 Respect the distances both between the wall / ceiling and the device and between two devices as shown in **Fig. 2**. In order to ensure sufficient ventilation of the controller, clearance on every side has to be maintained.
 - 3.2 When installing the device, please keep in mind that the higher you install it, the warmer the device will get. For example, in a technical room the correct installation height can be of great importance.
 - 3.3 If maximum ambient temperature cannot be adhered to, please provide extra forced ventilation / cooling.

Not respecting the abovelisted rules can reduce service life and relieves the manufacturer of any responsibilities.

For metal enclosures (above 7.5 A)

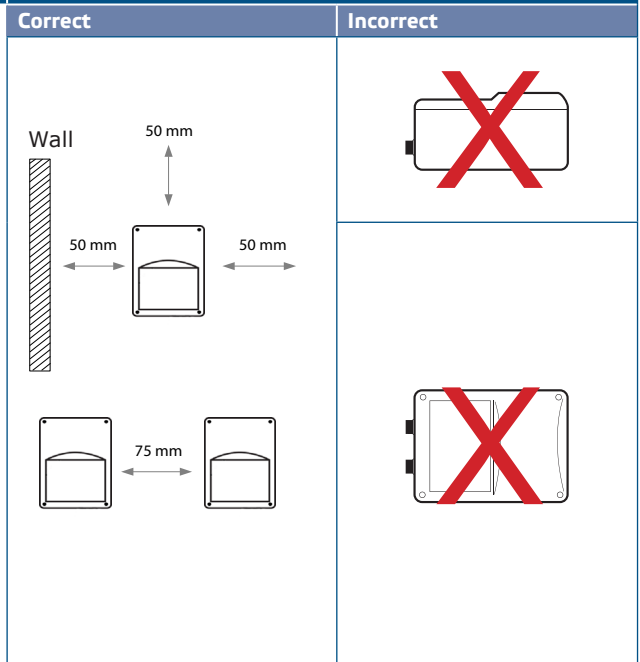
4. Once secured in position, the mounting screws or bolts should be sealed to maintain the IP rating of the enclosure.
5. Because the controller enclosure is made of metal, it must be earthed and bonded

Fig. 1 Mounting dimensions



Article code	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
STVS1-15L22	200	305	140	183	236
STVS1-25L22	200	305	140	183	236
STVS1-35L22	200	305	140	183	236
STVS1-50L22	200	305	140	183	236
STVS1-75L22	200	305	140	183	236
STVS1100L22	300	325	170	255	255
STVS1130L22	300	325	170	255	255

Fig. 2 Mounting position



6. Insert the cables through the cable glands and do the wiring according to the wiring diagram (see **Fig. 3**) while adhering to the information from section “**Wiring and connections**” above.
 - 6.1 Connect the power supply line (terminals L, N and Pe);
 - 6.2 Connect the motor(s) (terminals U, N and Pe);
 - 6.3 Connect the 0-10 Volt control signal input (terminals 0V and V/C).

- 6.4 If applicable, connect the unregulated output (L1 and N). It can be used to supply a 230 VAC valve, lamp, etc. when the knob is not at '0' position (see **Table 1** below).
- 6.5 Connect the TK contacts for monitoring of the thermal motor protection to the motor TK terminals. As standard, there is a bridge between the TK terminals.
- 6.6 If applicable, connect the 12 VDC digital output (+V terminal) for fault indication (0V = TK fault; 12 V = normal operation)

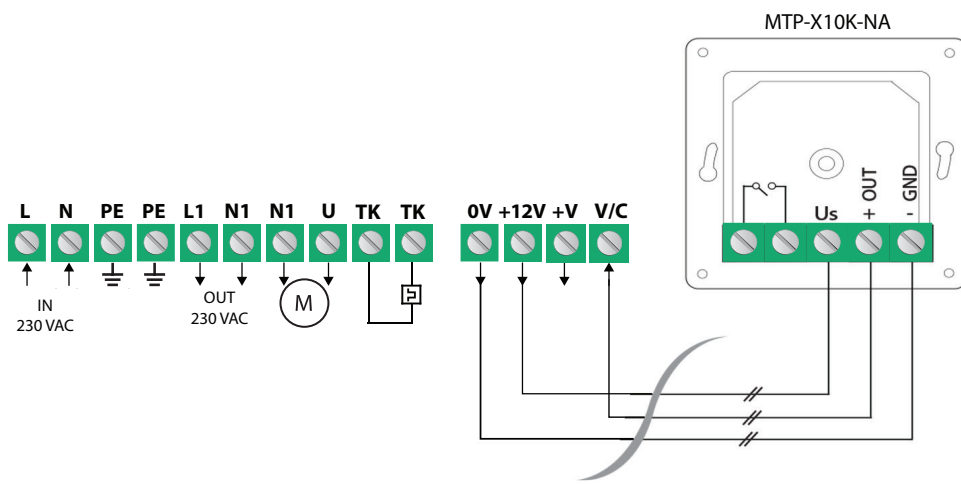
ATTENTION

A safety isolator / disconnect switch should be installed on the mains electricity side of all motor drives.

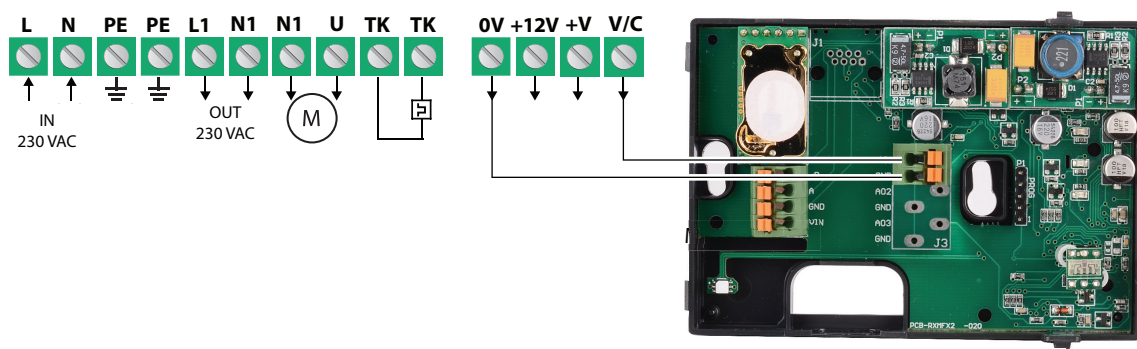
Fig. 3 Wiring and connections

STVS1xxxL22

Application example 1: STVS1 + potentiometer MTP-X10K-NA



Application example 2: STVS1 + sensor (e.g. RCMFF-2R)



ATTENTION

Make sure the connections are correct before you power the unit.







- 7. Close the cover and secure it with the screws.
- 8. Turn the knob at '0'.
- 9. Tighten the cable glands.
- 10. Switch on the mains supply.
- 11. The controller needs to be switched via the external device providing analogue input signal
- 12. Make sure the transformer controller can operate normally (consider an isolating

switch).

13. Operate the controller via the external device output voltages.

Optional settings

The standard configuration of the output voltages is as indicated in **Table 1** below. However, because more than 5 output voltages are available, it is possible to adjust the 5 steps by changing the internal wiring.

	Voltage						
0–10 VDC or external potentiometer positions (MTV or MTP)*	0 VDC	-	2 VDC	4 VDC	6 VDC	8 VDC	9.5 VDC
Wires		-					
Regulated output [VAC]							
Voltages***	0	80**	110	140	170	190	230
Unregulated output [VAC]							
L1	0	230	230	230	230	230	230
* See also the operational diagram on page 5 for the corresponding voltages.							
** Available but not connected.							
If more than 5 output voltages are available, it is possible to adjust the 5 steps by changing the internal wiring.							

VERIFICATION OF INSTALLATION

ATTENTION

Use only tools and equipment with non-conducting handles when working on electrical devices.

After connecting the unit to the mains supply, the green LED on its cover should light up to indicate that the controller is supplied.

Safe operation depends on proper installation. Before start up, ensure the following:

- The mains supply is connected correctly.
- Protection is provided against electrical shock.
- The cables are the appropriate size and fuse-protected.
- There is sufficient air flow around the unit.

The controller is equipped with TK terminals to connect to the thermal contact integrated in the motor. When actuated (in case of an overheated motor), the thermal contact cuts the voltage supply to the motor and switches on the red LED to indicate that it does not work.

ATTENTION

The unit is supplied with electrical energy at voltages high enough to inflict personal injury or threat to health. Take the relevant safety measures.

ATTENTION

Disconnect and confirm that there is no live current flowing to the unit before servicing.

ATTENTION

Avoid exposing the controller to direct sunlight!

TRANSPORT AND STORAGE

Avoid shocks and extreme conditions; stock in original packing.

WARRANTY AND RESTRICTIONS

Two years from the delivery date against defects in manufacturing. Any modifications or alterations to the product after the date of publication relieve the manufacturer of any responsibilities. The manufacturer bears no responsibility for any misprints or mistakes in this data.

MAINTENANCE

In normal conditions this product is maintenance-free. If soiled, clean with a dry or damp cloth. In case of heavy pollution, clean with a non-aggressive product. In these circumstances the unit should be disconnected from the supply. Pay attention that no fluids enter the unit. Only reconnect it to the supply when it is completely dry.