

STVS4

400 VAC 3-PHASE TRANSFORMER
CONTROLLER WITH TK AND
ANALOGUE CONTROL

Mounting and operating instructions



Table of contents

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

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 STVS4 series of transformer fan speed controllers regulate the rotational speed of three-phase voltage controllable motors in five steps by varying the output voltage according to a 0–10 VDC analogue input signal. They are equipped with auto-transformers and feature TK monitoring for thermal motor protection.

ARTICLE CODE

Article code	Rated max. current [A]
STVS4-15L40	1,5
STVS4-25L40	2,5
STVS4-40L40	4
STVS4-60L40	6
STVS4-80L40	8
STVS4110L40	11

INTENDED AREA OF USE

- Speed control of voltage controllable 400 V three-phase motors (pumps and fans)
- For indoor use only

TECHNICAL DATA

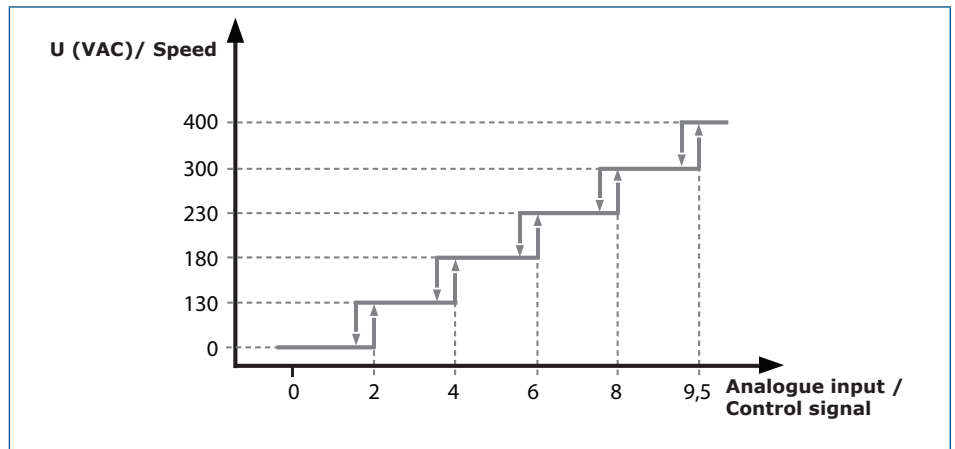
- Supply voltage: 3x 400 VAC / 50–60 Hz
- Analogue input signal (0–10 VDC) galvanically isolated
- 5 switching levels according to the input signal
- Unregulated output: 230 VAC / 2 A
- +12 VDC output (e.g. as supply for MTP-X10K-NA potentiometer from Sentera)
- TK monitoring for thermal motor protection
- LED status indication
- Enclosure: sheet steel (RAL 7035, polyester powder coating)
- 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 DIAGRAMS



WIRING AND CONNECTIONS

Pe	Earth terminals
R	Power supply 3*400 VAC / 50–60 Hz
S	
T	
N	
U	Regulated output to motor
V	
W	
L1	Unregulated output, line
N1	Unregulated output, neutral
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



NOTE

Make sure you use cables with an appropriate diameter.



ATTENTION

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

MOUNTING INSTRUCTIONS IN STEPS

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

Follow these steps:

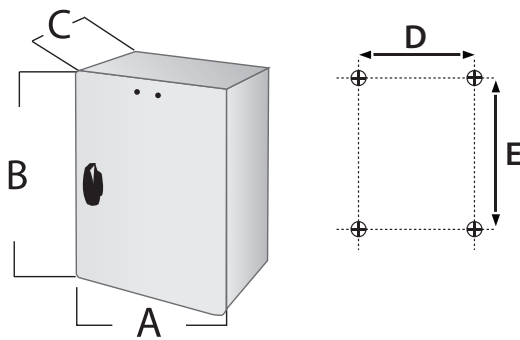
1. Open the door of the controller.

2. Mount the enclosure using corrosion resistant screws or bolts. Mind the correct mounting position and unit mounting dimensions (see **Fig. 1 Mounting dimensions** and **Fig. 2 Mounting position**). The mounting holes are on the inside back panel of the enclosure and are covered with blanking plugs.
3. Pay attention to 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.

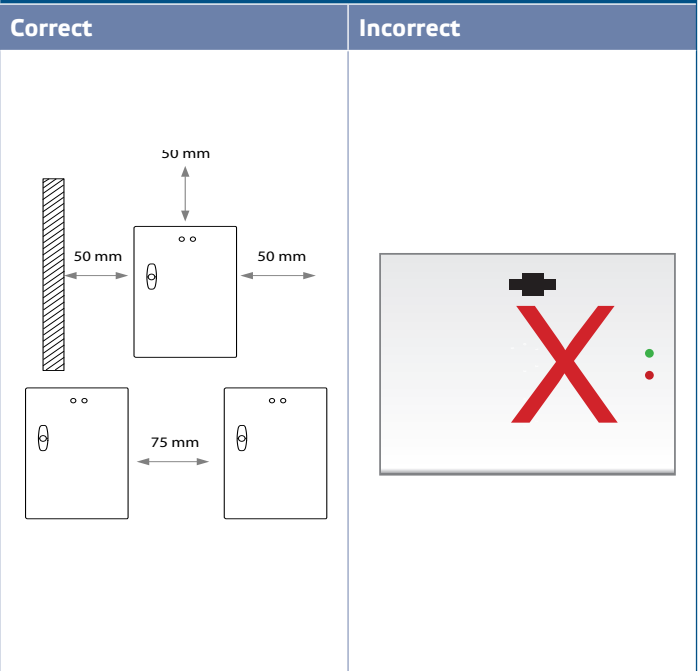
4. Once secured in position, the mounting screws or bolts should be sealed to maintain the IP rating of the enclosure.
5. Because the controller enclosure is made of metal, it must be earthed and bonded to other existing metal surfaces.

Fig. 1 Mounting dimensions



Article code	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
STVS4-15L40	300	425	170	255	355
STVS4-25L40	300	425	170	255	355
STVS4-40L40	400	425	200	355	355
STVS4-60L40	400	425	200	355	355
STVS4-80L40	400	425	200	355	355
STVS4100L40	400	425	200	355	355

Fig. 2 Mounting position



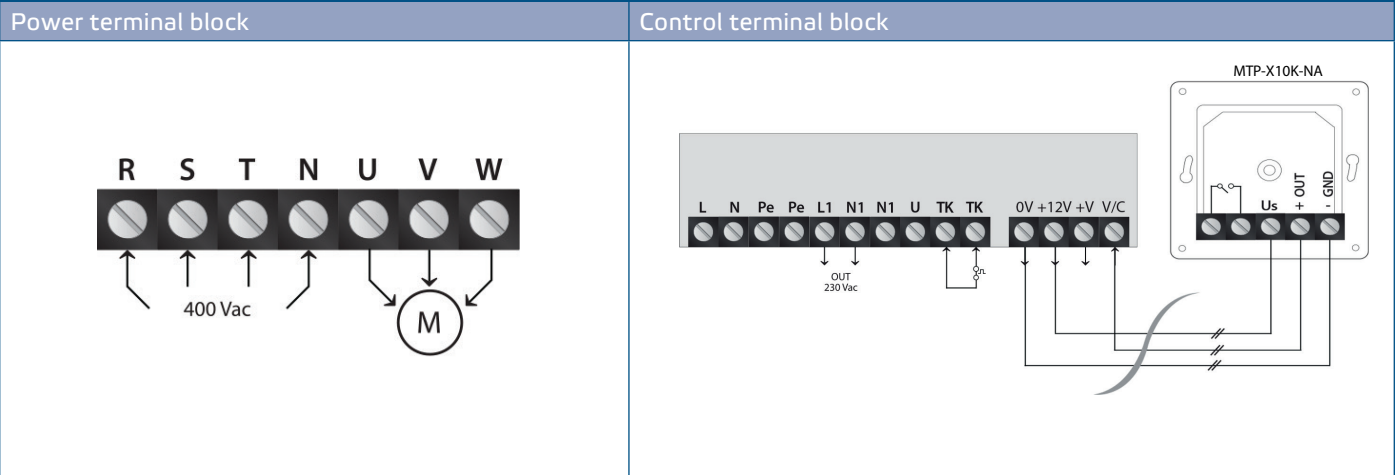
6. Insert the cables through the cable glands and do the wiring according to the wiring diagram (see **Fig. 3**) while adhering to the information from section **“Wiring and connections”** above.
 - 6.1 Connect the power supply lines (terminals R, S, T and PE).
 - 6.2 Connect the motor(s) (terminals U, V, W and PE).
 - 6.3 Connect the 0 V and +12 V to the to the external device (e.g. Sentera’s MTP-X10K-NA potentiometer).
 - 6.4 Connect V/C terminal to the 0–10 VDC output of the external device (e.g. Sentera’s MTP-X10K-NA potentiometer).
 - 6.5 If applicable, connect the unregulated output (L1 and N). It can be used to supply a 230 VAC valve, lamp, etc. (see **Table 1** below).
 - 6.6 If applicable, 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.

6.7 If applicable, connect the 12 VDC digital output (+V terminal) for fault indication (0 V = 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 diagram



ATTENTION

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

7. Close the door of the controller.
8. Set the external device to OFF.
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.

Output voltages
The standard configuration of the output voltages is as indicated in **Table 1** below.

Table 1 Voltage						
0–10 VDC or external potentiometer positions (MTV or MTP)*	0	1	2	3	4	5
Regulated output [VAC]						
Voltages	0	130	180	230	300	400
Unregulated output [VAC]						
L1	0	230	230	230	230	230

* See the operational diagram above for the corresponding voltages

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 indicating 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.