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## Instruction manual motorized premium test stand with stepper motor

### SAUTER TVS

Version 2.1  
11/2021  
GB



PROFESSIONAL MEASURING

TVS-BA-e-2121



# SAUTER TVS

V. 2.1 11/2021

## Instruction manual motorized premium test stand with stepper motor

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Congratulations on the purchase of the SAUTER TVS Premium test stand with stepper motor. We hope you enjoy your quality measurement system with its wide range of functions and high reproducibility. If operated correctly, this high-quality product will give you many years of use.

For questions, wishes or suggestions we are always at your disposal.

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## 1 Introduction

In contrast to the TVM-N, the TVS test bench has a stepper motor.

This allows the movement to be controlled very precisely and the stepper motor allows very low speeds even with very high loads.

The use of a stepper motor allows very precise positioning and the speed is always the same regardless of the load.

Furthermore, the use of a stepper motor ensures precise starting and stopping without overshoot, even at high speeds and loads. The speed can be adjusted very precisely on the control panel.

All SAUTER force measuring devices can be mounted on the TVS Premium test stand. It also has longer guide columns as standard, which allow a larger horizontal working area for measurements. The extended working area means that all the fastening options can be used on the test stand without causing any significant impairment of the working area. SAUTER offers optional software and accessories to give you the greatest possible flexibility in configuring your measuring system. Please contact SAUTER for further information.

## 2 Scope of delivery

- SAUTER TVS
- Power cord
- Operating instructions
- Accessories (depending on model)

## 3 Weight and dimensions

Test bench	TVS 5000N240	TVS 10KN100	TVS 20KN100	TVS 30KN80	TVS 50KN80
Dimension (LxWxH)	400x250x 1550 mm	400x250x 1550 mm	480x295x 1680 mm	400x250x 1550 mm	490x295x 1680 mm
Weight	72kg		91kg		131kg
Packaging	stable wooden box				

## 4 Check before use

After receipt of the test bench, it should be checked in advance whether no transport damage has occurred, whether the outer packaging, the metal housing, other parts or even the test bench itself have been damaged. If any damage is evident, please notify SAUTER GmbH immediately.

## 5 Possible applications

The TVS test stand has been designed to accommodate most SAUTER force measuring devices without any great difficulty. It has a wide range of applications and can be operated manually. It can also perform individual functions independently. These include, for example, infinitely variable speed adjustment, automatic up and down movement with preset repetitions (up to 1000 cycles). It can be used for material testing in the metal, plastics and textile industries. It can also be operated with SAUTER software (AFH) and can be conveniently controlled from there using a PC. This software is also able to document force, time and distance. It can only be operated with an FH force gauge, because here its setting options can be used, for example to protect the test stand from overload with the STOP value.

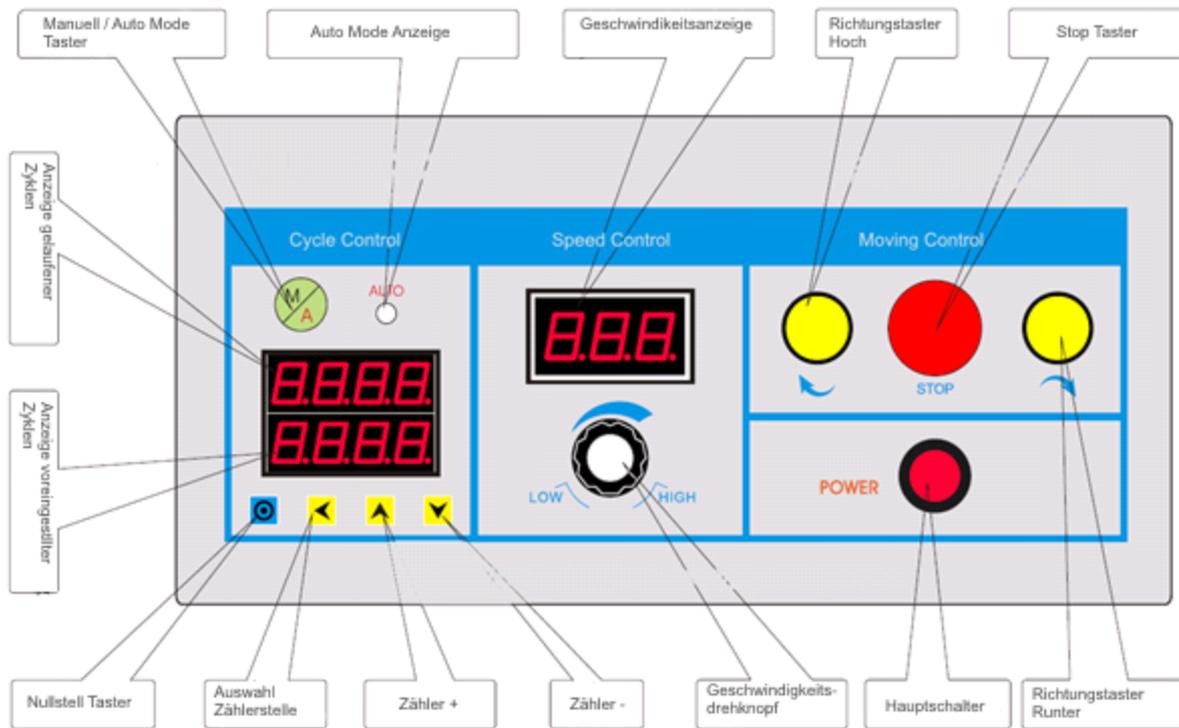
- Choose the right test stand with regard to the maximum force you require. Adjust the force gauge used to the maximum force or take special care when setting the travel distance. (Possible destruction of the force gauge)
- Under no circumstances should you attempt to open, repair or modify the unit. Contact SAUTER GmbH.
- The test bench is not suitable for operation in a humid environment. Avoid penetration of moisture into the housing under all circumstances.
- Do not use sharp objects to operate the buttons.
- Use the limiting rings on the test bench to check the travel. Precise adjustment of the travel using the limiting rings prevents damage to the test stand and the force gauge used.
- From time to time, moisten the rods with a lubricating oil.

Turn off the unit and unplug the power cord if you are not going to use it for a long time.

## 6 Technical data

Test bench	TVS5000 N240	TVS 10KN100	TVS 20KN100	TVS 30KN80	TVS 50KN80
Maximum force	5.000 N	10.000 N	20.000 N	30.000 N	50.000N
Speed range	1-240 mm/min	1-200 mm/min	1-70 mm/min	1-70 mm/min	1-70 mm/min
Speed accuracy	1-100 mm/min $\pm 2$ mm/min; > 100 mm/min $\pm 10\%$				
Maximum travel distance	210mm				
Maximum number of cycles	1000				
Nominal voltage	220V 50/60Hz				
Rated current	1,5A				
Backup	3A				
Operating temperature	10-30°C				
Storage and transport temp.	-5°C~40°C				
Relative air humidity	15%~80%				

## 7 Control panel



Function	Declaration
<b>Main switch:</b>	Switching the test bench on / off
<b>Direction switch OPEN:</b>	Lower slide moves upwards (as long as is pressed)
<b>Direction button AB:</b>	Lower slide moves downwards (as long as is pressed)
<b>Stop button:</b>	In Auto Mode the movement is stopped
<b>Speed control knob:</b>	Regulation of the lifting speed
<b>Manual / Auto Mode:</b>	Choice between manual or automatic movement
<b>Display of preset cycles:</b>	With the help of the counters ▲, counters ▼ and selection of counter position ◀ a number can be preset, how many cycles are to be run
<b>Display of driven cycles:</b>	The number of cycles completed is displayed here
<b>Reset button:</b>	Zeroing of the driven cycles Ⓚ

The movement of the test bench is defined by the lower and upper limiting ring. These limiting rings must be adjusted for each test.

## 8 Application

### 8.1 Check before starting the measurement / test

- Wiring, switching on Display flashes 5 times
- Test the movement without the test piece, manually actuating the limit switches to test their function.
- Test of the automatic movement. Press the Manual/Auto Mode button, Auto Mode indicator lights up. Set cycles (avoid setting "1"), start test run with Up or Down button. At the end of the cycles, the test bench stops and emits an alarm tone 3 times, test finished.

### 8.2 Speed setting

The speed can be adjusted continuously up to the maximum. The set speed can be read off the display.

### 8.3 Presetable cycles

A number of cycles can be preset on the test bench. The preset value is displayed in the lower area. It can be set  with the keys Counter , Counter  and Select counter position. The "run" number is displayed in the upper area. The counter can be  reset with the Zero key.

### 8.4 RS 232 connection

The test stand has two 9-pin connectors to connect a force gauge and one connector for communication with the PC. The test stand can be operated with SAUTER AFH software. This allows the motion control and number of cycles to be set directly on the PC. The software can be used to evaluate the data in terms of force-time or force-displacement. The test stand can be controlled at the connection for the force measuring device using an FH series force measuring device to ensure that no overload can occur.

### 8.5 Limit switch

In manual mode, movement stops when the limit switches are reached. In Automatic mode, movement stops at the Perimeter Switch for about 5 seconds and then continues in the opposite direction. In order to ensure that the test/examinations run smoothly, you should ensure that you align the boundary rings very precisely so that the test object or test equipment is not destroyed if the path is too long/short.

## 9 General safety instructions

### WARNING

#### Risk of injury due to overridden functions of the protective devices!

Overloaded functions of the protective devices can lead to severe injuries lead.

- Never override the functions of the protective devices, either yourself or by third parties.
- Never test with protective devices disabled.
- Never tamper with protective devices.
- Comply with all safety instructions.

### WARNING

#### Risk of injury from falling parts!

Falling parts can cause serious injuries.

- Only use suitable and technically flawless lifting gear.
- Use lifting equipment with sufficient lifting capacity.
- Carefully fasten individual parts and larger assemblies with lifting gear.
- Secure individual parts and larger assemblies with lifting gear.
- Make sure that there is no danger from the hoist.
- Lift individual parts and larger assemblies slowly.

### WARNING

#### Risk of injury from rotating components!

The drive can start automatically. Rotating components such as spindles on the drive of the crosshead or the extensometer can catch long hair, loose clothing as well as sleeves or jewelry. This can lead to serious injuries.

- Work only in clothing with tight-fitting sleeves.
- Wearing jewelry while working on the test system is prohibited.
- Use hairnet if necessary.
- Wear suitable protective equipment

### WARNING



#### Risk of injury when handling in the test room!

When handling in the test room during the operation of the test system, there are Risk of injury. Your hands and arms can be pinched and crushed.

- Never handle in the test room while the test system is running.
- Never handle anything in the test room during a test.

## WARNING



### **Danger of tipping due to use of heavy specimens!**

In the case of heavy specimens that are inserted off-center, as well as due to improper Behavior can tip the test system.

- Ensure that the test system is securely positioned.
- Never use the test system as a climbing aid.

## WARNING



### **Risk of injury from electric shock!**

There is a risk of injury when cleaning the electrical system with wet cloths. by electric shock.

- Turn off the power supply with the main switch.
- Unplug the power cord.
- Do not use wet cleaning cloths.
- Always use only dry or moistened cloths.

## CAUTION

### **Risk of injury!**

There is a risk of injury when working on/with the test system.

- Comply with the applicable and binding national regulations on the accident prevention.

Comply with the recognized technical rules for safety and professional work.

Comply with the regulations on health and safety at work.

Provision of work equipment and its use.

- Observe company regulations such as supervision and reporting requirements.
- Read the operating instructions completely.
- Read the operating instructions and data sheets of external components all the way through.
- Observe all safety instructions in the operating instructions.
- Observe all safety signs attached to the test system.
- Always wear appropriate safety equipment.

## NOTE

Work on the test system may only be carried out by specialists qualified for this work. be carried out.

## NOTE

Only one operator may work on the test system at a time.

- During operation, the operator's workplace is located in front of the

## 10 Assembly instructions for the test system

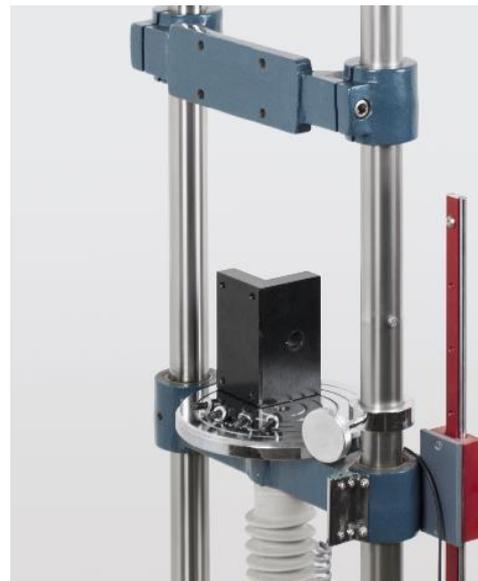
### 10.1 with internal load cell (TVS 5000N240 and TVS 10KN100)



- Force gauges with internal sensor by means of the adapter plates to the crosshead (4x M3x8 cylinder screws).
- (Here as an example with a FH 500)

### 10.2 with external load cell (TVS 5000N240 and TVS 10KN100)

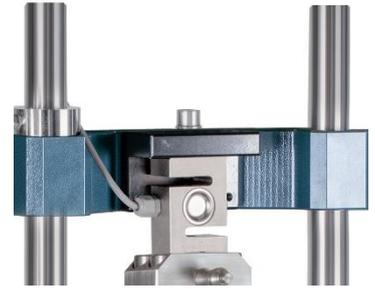
- Mounting bracket AFM 41 with 4x M6x35 (black) with washer and spring washer on crossbar Screws



- The external load cell is mounted to the AFM 41 bracket with an M12x40 screw, included in the scope of delivery
- Connecting the measuring cell to the display unit of the force gauge  
(Here as an example with a FH 1K)

### 10.3 with external load cell (TVS 20KN100, 30KN80 and 50KN80)

- The external load cell is mounted to the AFM 41 mounting bracket with an M12x80 screw (for TVS 20KN, TVS 30KN and TVS 50KN), included in the scope of delivery
- (Here as an example with a FH 20K)

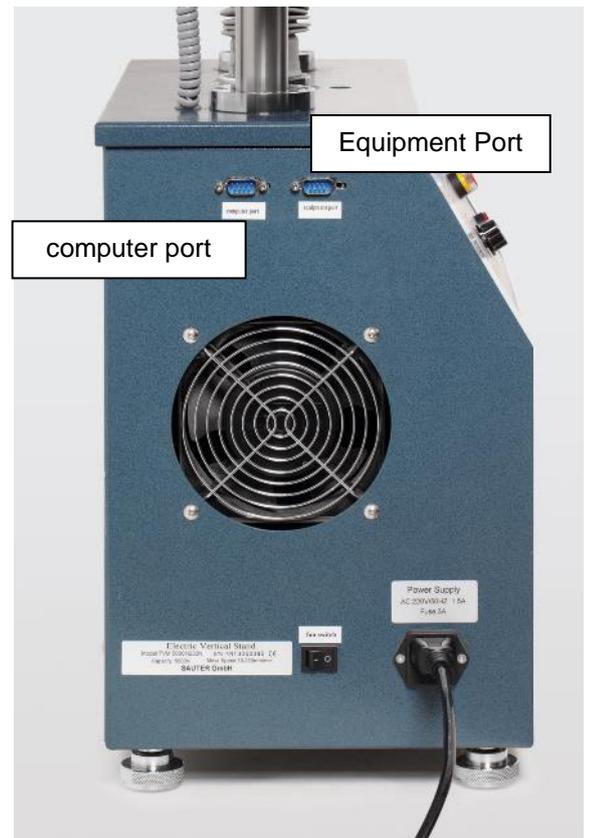


### 10.4 Wiring of the test bench (model independent)



- The force gauge screwed to the test stand is now connected to the test stand at the equipment port by means of the RS232 cable

- With a RS232 cable from the test bench (computer port) to a RS232-USB converter
- From the adapter with a USB extension cable to PC



### 10.5 Cabling TVS with a force measuring and length measuring device

- Wire the force gauge wiring as described in previous points of section 10
- Connect the linear encoder to the PC via the USB cable (only for LD linear encoders)