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## Instruction manual motorized test bench

### SAUTER TVM-N

Version 2.1  
11/2021  
GB



PROFESSIONAL MEASURING

TVM-N-BA-e-2121



# SAUTER TVM-N

V. 2.1 11/2021

## Instruction manual motorized test bench

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Congratulations on the purchase of the SAUTER TVM-N test bench. 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

The TVM-N test stand can measure tensile and compressive forces very accurately and is easy to operate. Various force measuring devices can be mounted on the test stand for the measurements.

SAUTER offers optional software and accessories to make the measuring system more versatile in use. Please contact SAUTER or the SAUTER supplier or visit our website [www.sauter.eu](http://www.sauter.eu).

## 2 Scope of delivery

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

## 3 Weight and dimensions

Test bench	TVM 5000N230N	TVM 5000N230NL	TVM 10KN120N	TVM 20KN120N	TVM 30KN70N
Dimension (LxWxH)	400x256x 1035mm	400x260x 1535mm	400x260x 1535mm	480x295x 1615mm	400x250x 1535mm
Weight	58kg		60kg	65kg	65kg
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 TVM-N 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 force-displacement. It is also possible to operate it only with an FH force gauge, because here the setting options of the FH force gauge can be used, for example to protect the test stand from overload with the STOP value.

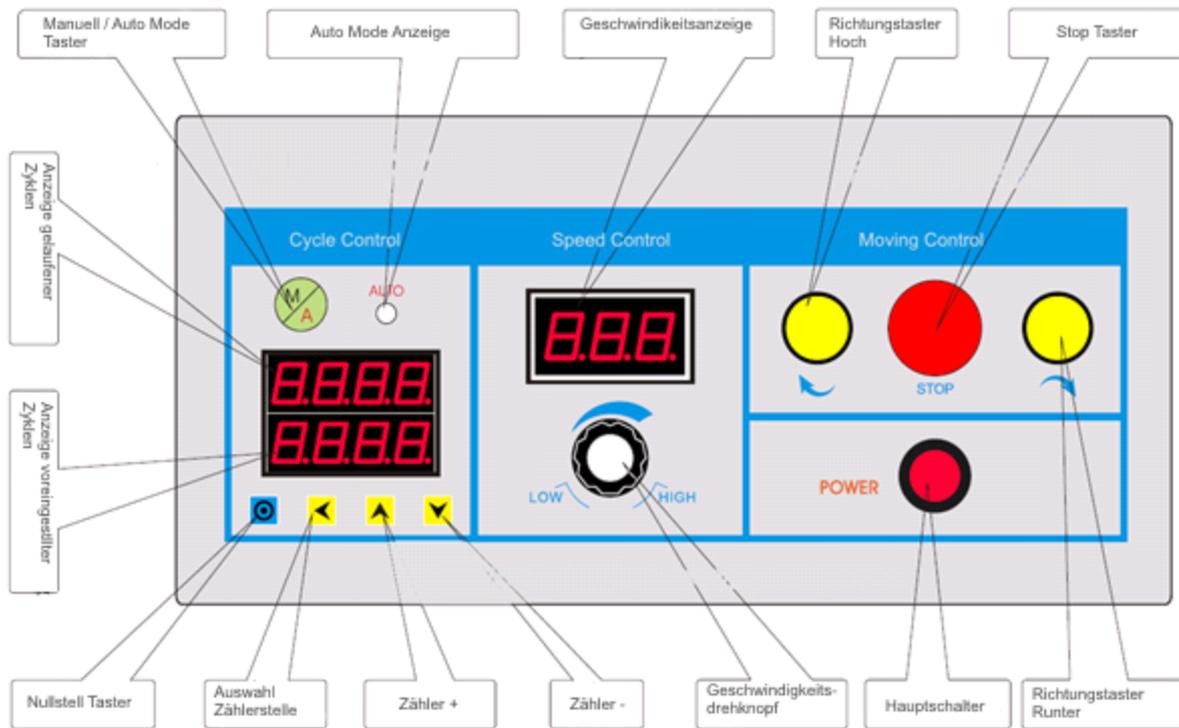
- Choose the right test stand with regard to the maximum force you require. Adjust the force gauge used to the maximum force or take special care when setting the travel distance. (Possible destruction of the force gauge)
- Under no circumstances should you attempt to open, repair or modify the unit. 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	TVM 5000N230N	TVM 5000N230NL	TVM 10KN120N	TVM 20KN120N	TVM 30KN70N
Maximum force	5.000 N	5.000 N	10.000 N	20.000 N	30.000N
Speed range	10-230 mm/min	10-230 mm/min	30-120 mm/min	30-120 mm/min	5-70 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	20 $\pm$ 10°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 prevent overload.

### 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

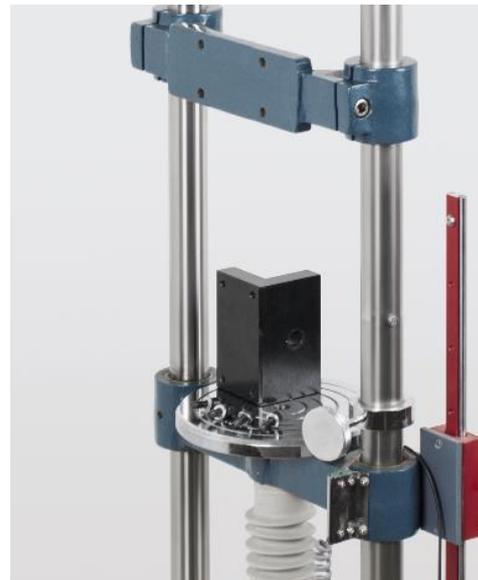
### 10.1 with internal load cell (TVM 5000N230N/NL and TVM 10KN120N)



- 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 (TVM 5000N230N/NL and TVM 10KN120N)

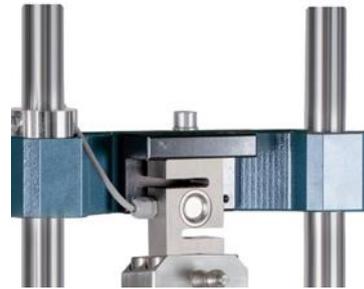
- Mounting bracket AFM 41 with 4x M6x35 (black) with washer and spring washer on crossbar Screws



- 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 (TVM 20KN100 and TVM 30KN)

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

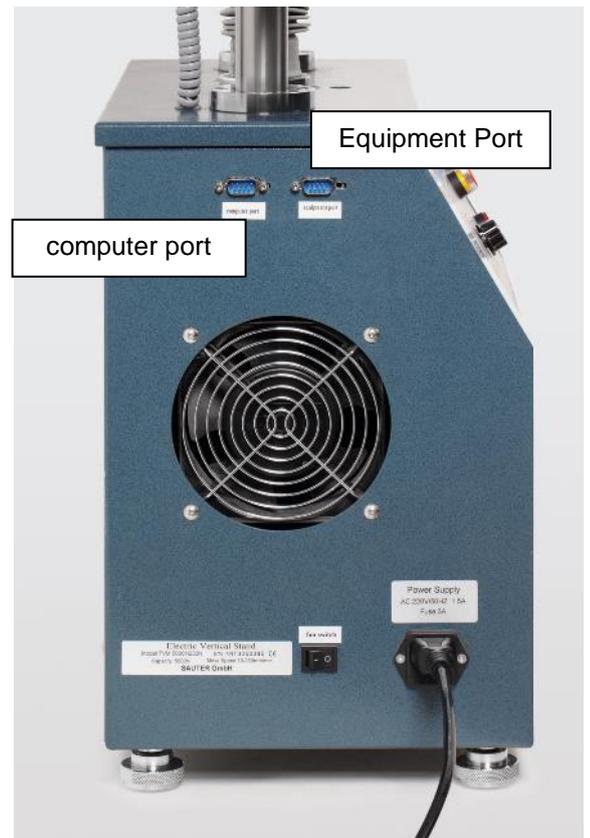


### 10.4 Wiring of the test bench (model independent)



- 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 adapter
- From the adapter with a USB extension cable to PC



### 10.5 Cabling TVM 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 a USB-RS232 converter