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## Instruction manual motorized test bench

### SAUTER TVM-N

Version 2.0  
01/2020  
GB



PROFESSIONAL MEASURING

TVM-N-BA-e-2020



# SAUTER TVM-N

V. 2.0 01/2020

## 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.

### Table of contents:

<b>1</b>	<b>Introduction</b> .....	<b>3</b>
<b>2</b>	<b>Scope of delivery</b> .....	<b>3</b>
<b>3</b>	<b>Weight and dimensions</b> .....	<b>3</b>
<b>4</b>	<b>Check before use</b> .....	<b>3</b>
<b>5</b>	<b>Possible applications</b> .....	<b>4</b>
<b>6</b>	<b>Technical data</b> .....	<b>5</b>
<b>7</b>	<b>Control panel</b> .....	<b>6</b>
<b>8</b>	<b>Application</b> .....	<b>7</b>
8.1	Check before starting the measurement / test .....	7
8.2	Speed setting .....	7
8.3	Presetable cycles .....	7
8.4	RS 232 connection .....	7
8.5	Limit switch.....	7
<b>9</b>	<b>Warnings</b> .....	<b>8</b>
<b>10</b>	<b>Assembly instructions for the test system</b> .....	<b>9</b>
10.1	with internal load cell (TVM 5000N230N/NL and TVM 10KN120N).....	9
10.2	with external load cell (TVM 5000N230N/NL and TVM 10KN120N).....	9
10.3	with external load cell (TVM 20KN100 and TVM 30KN) .....	10
10.4	Wiring of the test bench (model independent).....	10
10.5	Cabling TVM with a force measuring and length measuring device .....	11

## 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.

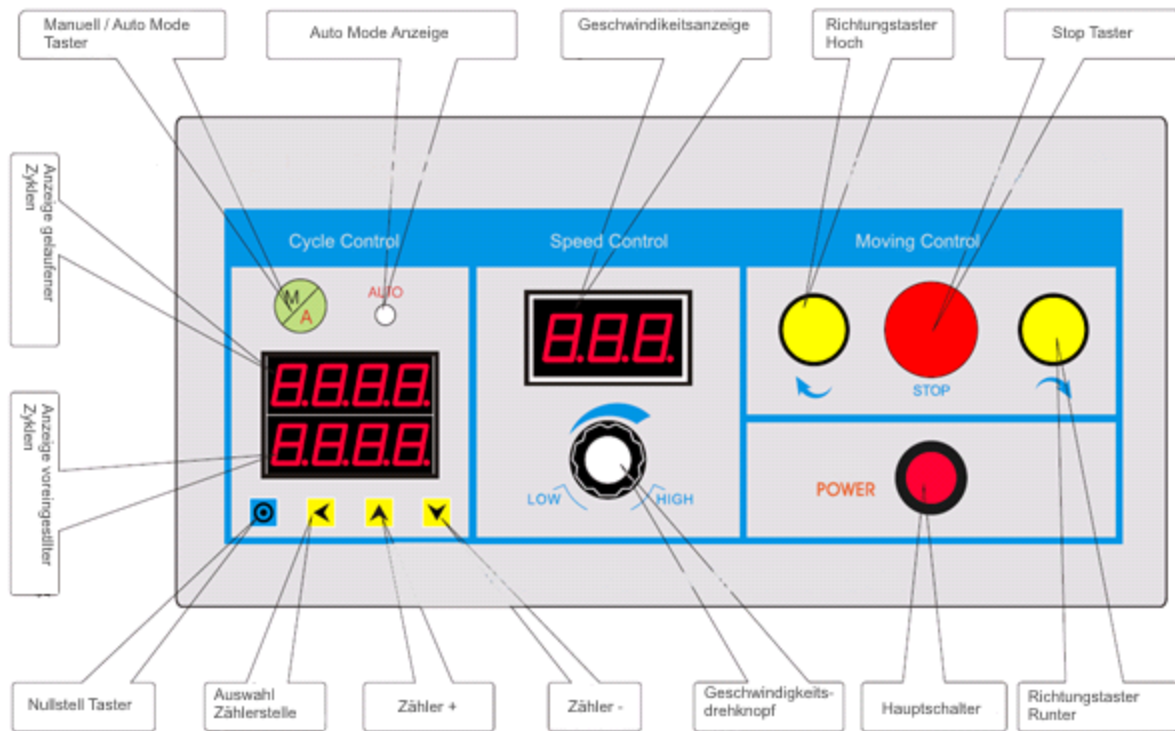
- Choose the right test stand with regard to the maximum force you require. Adjust the force gauge used to the maximum force or take special care when setting the travel distance. (Possible destruction of the force gauge)
- Under no circumstances should you attempt to open, repair or modify the unit. 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 Warnings

Incorrectly performed force measurements can lead to serious injury to persons and damage to objects. Force measurements should therefore only be carried out by trained and experienced personnel.

In particular, it should be avoided that forces are applied to the measuring instrument by the test bench which exceed the maximum load (Max) of the test bench or measuring instrument or which do not act axially on the instrument via the test bench

Note:

To view the CE declaration, please click on the following link:

<https://www.kern-sohn.com/shop/de/DOWNLOADS/>



## 10 Assembly instructions for the test system

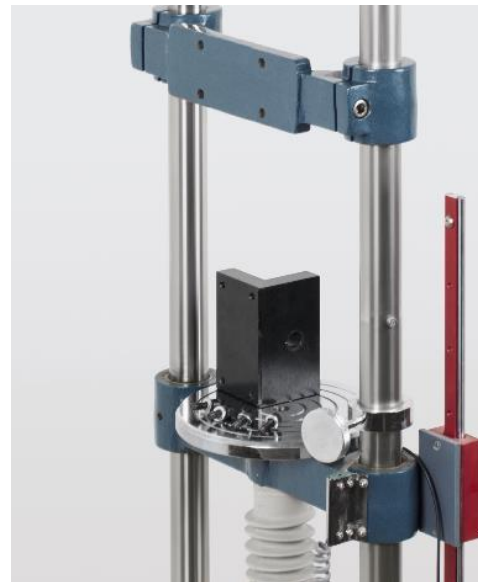
### 10.1 with internal load cell (TVM 5000N230N/NL and TVM 10KN120N)



- 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)

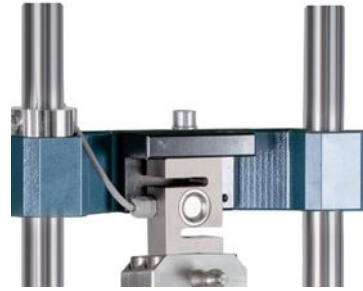
- Mounting bracket AFM 41 with 4x M6x35 (black) with washer and spring washer on crossbar Screws



- 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)

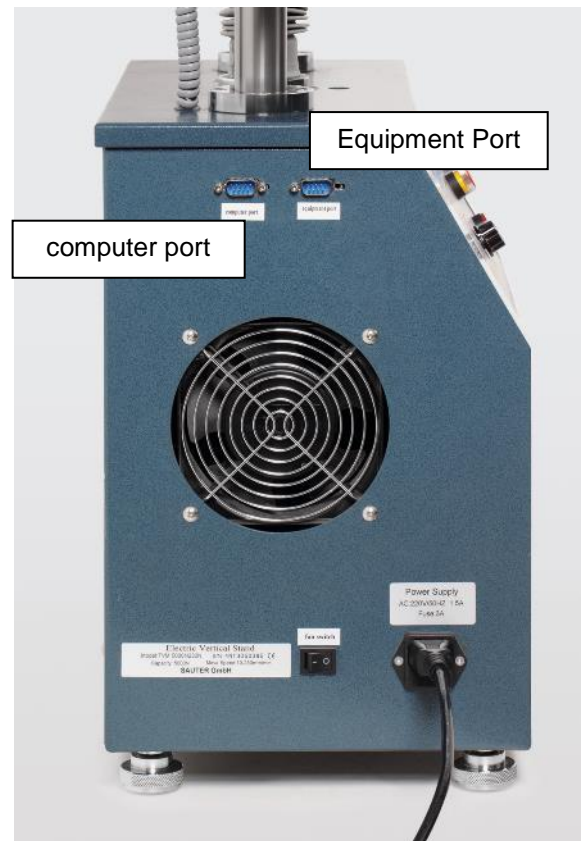


### 10.4 Wiring of the test bench (model independent)



- 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