

Tailor-made  
Cable - Test unit



Jahre  
mattke  
bewegt!

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# Cable - Test unit: Tailor-made

**Electronics and mechanics out of one hand – according to this motto Mattke AG supplies for more than 40 years the market for servo technology with any type of tailor-made servo drives.**

A new addition is the client-specific device construction, the complete realization of systems for simple handling tasks.

As for example equipment for testing of cables.

In this equipment, the test sample is clamped in position and then flexed in a defined angle and at a defined speed. This is carried out tens of thousands of times in order to test the stability of the material. At the same time the test voltage is connected to the cable wires who are monitored for cable breaks by a special circuit. If the cable breaks, the system will shut down and the number of completed cycles is displayed on an integrated counter.

The system was realized using a digital servo drive and brushless motor, a Mini-PLC and a special current measuring circuit.

The unit dimensions are (W x H x D) 510 x 430 x 400 mm.



Cable bend-test machine

## Technical Data

Number of test stations	1
Cycle duration	approx. 1 sec
Bending cycles	180 ° (there and back)
Supply voltage	230 V~ 50 Hz
Power	40 W

# Cable bend-test machine



Single-axis Cable bend-test machine

## Technical data (Single-axis Cable bend-Test machine)

Number of test stations	1
Bending cycle	180 ° (there and back)
Cycle duration	approx. 1 sec.
Measuring range of the counter	655,360,000 cycles
Supply voltage	230 V~ 50 Hz

# Cable bend-test machine



3-axis Cable bend-test machine

## Technical data (3-axis Cable bend-Test machine)

Number of test stations	3
Bending cycle	180 ° (there and back)
Cycle duration	approx. 1 sec.
Measuring range of the counter	655,360,000 cycles
Supply voltage	230 V~ 50 Hz

# Cable bend-test machine



## Technical data (3-axis Cable bend-Test machine)

Number of test stations	3
Bending cycle	180 ° (there and back)
Cycle duration	approx. 1 sec.
Measuring range of the counter	655,360,000 cycles
Supply voltage	230 V~ 50 Hz

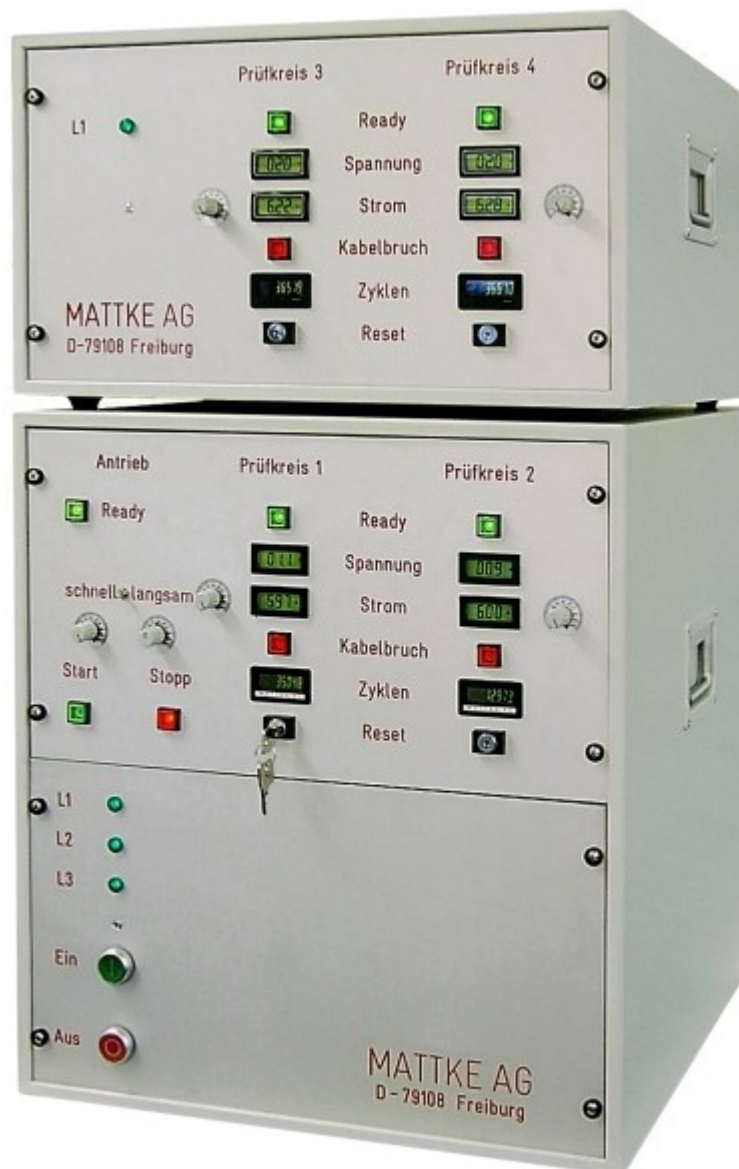
# Cable test unit

An additional application with the dimensions 3.500 x 1.200 x 1.600 mm, for the testing of complete cable runs with 1 million test cycles at a time has also been created for a customer.



Cable test unit (before the retrofit)

# Cable test unit



Controller after the retrofit

## Technical data (after the retrofit)

Number of test stations	4
Maximum speed	4 m/sec.
Maximum acceleration	8 m/sec. <sup>2</sup>
Maximum traveling time	1.2 m
Cycle duration	1 sec.
Supply voltage	3 x 400 V~ 50 Hz



# Cable test machine for 1 and 5 cables respectively

The machine determines continuously the mechanical capacity of electric cables (test samples).

Up to 5 cables can be tested simultaneously.

The control system is inside a 12 HE table housing.

The test samples are put under stress by bending. Each cable end is fitted to a dragchain which moves them there and back on a traveling distance of 0,51 m.

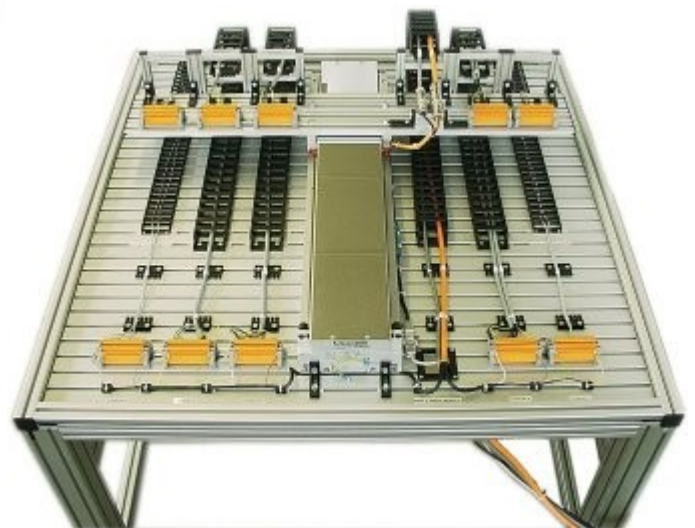
During the test, the realized cycles are counted.



Control system for 5 cables



Cable test machine for 5 cables



Cable test machine for 5 cables

## Cable test machine for 1 and 5 cables respectively

### Technical data

<b>Cable test machine for</b>	<b>1 cable</b>	<b>5 cables</b>
Supply voltage	3 x 400 V, 50/60 Hz	3 x 400 V, 50/60 Hz
Motor type - nominal current of the motor - nominal power of the motor	LMX1L-S23-1-0616-D1A0 3,5 A 85 W	LMX1L-S37-1-0536-D1A0 3,5 A 160W
Maximum traveling distance	approx. 0,52 m	approx. 0,51 m
Maximum speed	3,25 m/sec.	2,5 m/sec.
Acceleration	20,3 m/sec <sup>2</sup>	12,0 m/sec <sup>2</sup>
Touchscreen, IDEC	IDEC, HG2F-SB22VF	IDEC, HG2F-SB22VF
SPS-module, IDEC	IDEC, FC5A-C24R2	IDEC, FC5A-C24R2
Dimensions of the table housing (W x H x D)	510 x 420 x 400 mm	510 x 560 x 400 mm
Dimensions of the cable test machine (W x H x D)	1100 x 850 x 600 mm	1280 x 850 x 1280 mm
Number of test sample	1	5
Current through the test sample	0,5 A to approx. 3,0 A adjustable	0,5 A to approx. 3,0 A adjustable
Cycle duration	approx. 0,61 sec	approx. 0,83 sec
Number of cycles per minute	approx. 94	approx. 72
Measuring zone of the counter	up to 655.359.999 cycles	up to 655.359.999 cycles

# Cable test machine for 4 cables

The unit determines continuously the mechanical capacity of electric cables.

The wires are put under stress by bending. The four wires are fitted in chains and one end of each cable is moved there and back on a traveling distance of 1,65 m.

During the test the realized cycles are counted.

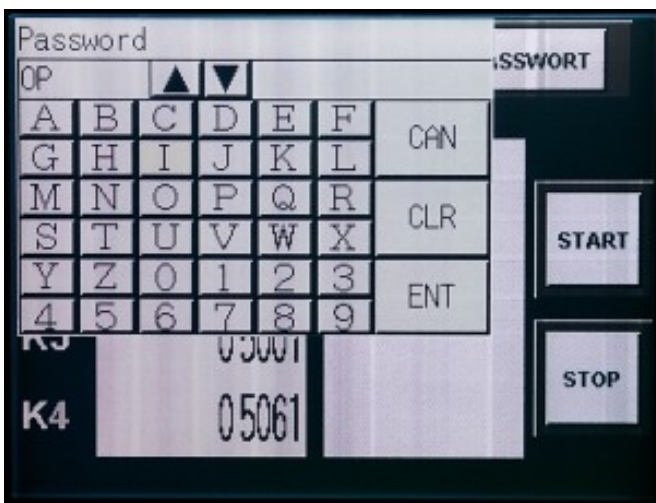
The test parameters (traveling distance, acceleration and maximum speed) are adjustable.

Simple adjustments are made by touch screen.



Test table with control panel.

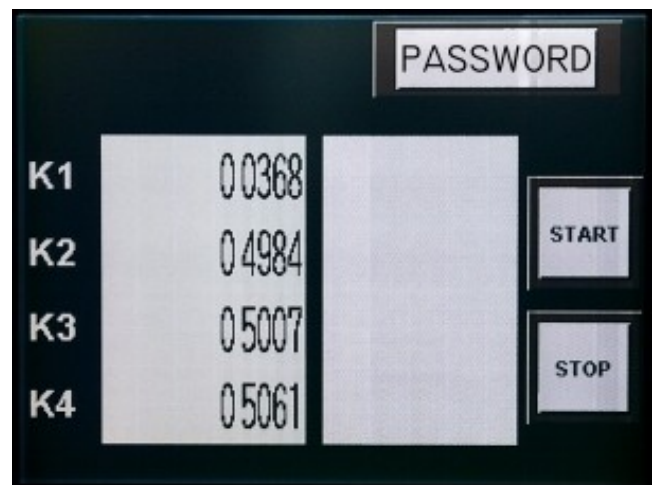
In case of a cable break, the corresponding counter stops and the machine continues to operate in order to allow the test of the other



Touch screen display with password-entry

test samples until their final break.

The machine only stops if cable breaks have occurred in all of the 4 cables (in between times the machine can be stopped in order to change a defective cable or to carry out other modifications) the cycles counted until then stay stored.



Touch screen display showing the counting results.

**This machine can test 4 wires simultaneously!**

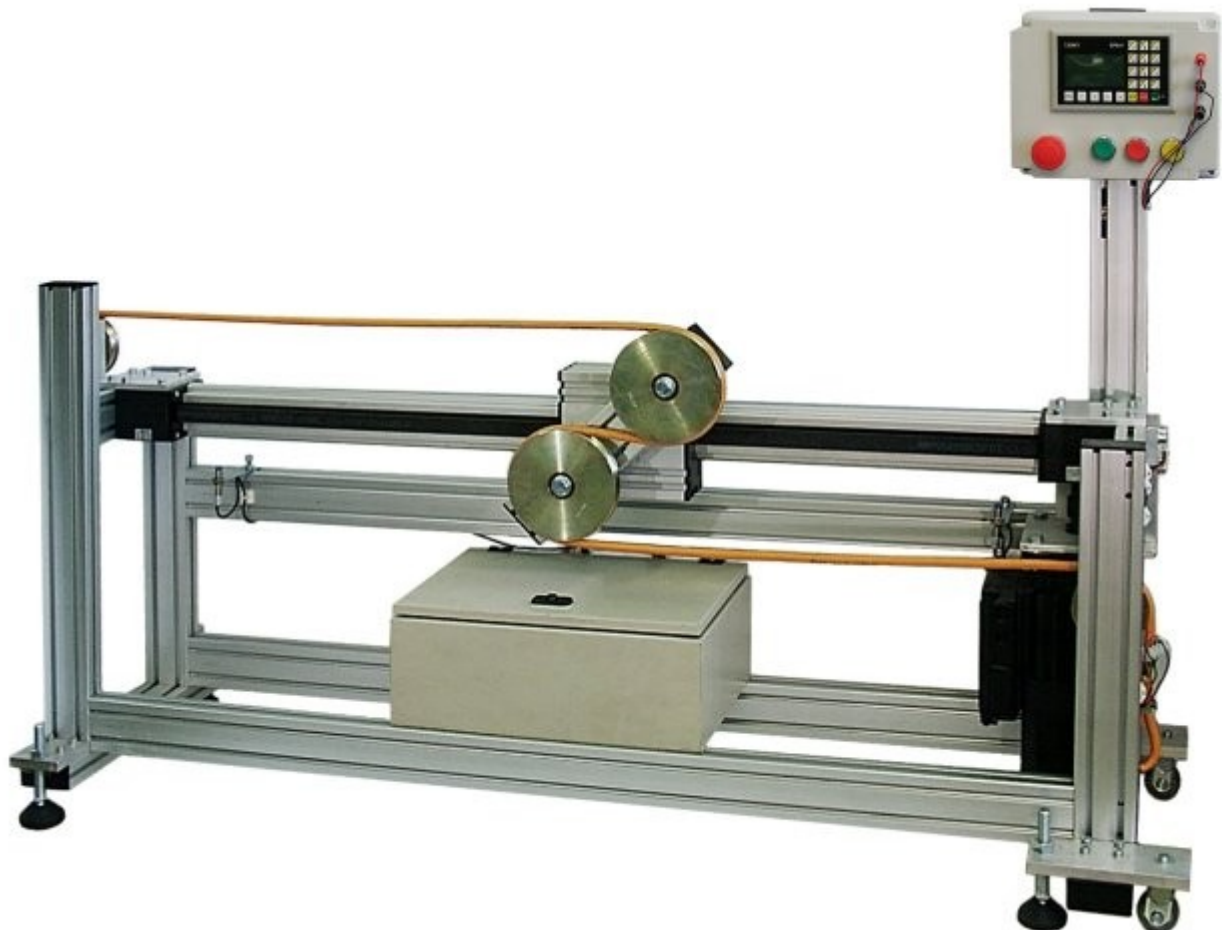
## Cable test machine for 4 cables

### Technical data

Power supply	3 x 400 V, 50/60 Hz
Motor type	HSR0950L4-045
- Nominal motor current	7.88 A
- Nominal motor power	approx. 3.5 kW
- Nominal motor speed	4,500 UPM
Reduction of the gear	5:1
Diameter of the gearwheel of the drive	86 mm
Nominal motor torque	7.5 Nm
Maximum traverse distance	approx. 1.65 m
Maximum speed	3.9 m/s
Acceleration	10 m/s <sup>2</sup>
Servo amplifier, digital operation	MDR 400/8-17
Touch screen, IDEC	HG2F-SB2
SPS-Module, IDEC	FC5A-C24R2
Dimension of the table housing (B x D x H)	510 x 560 x 400 mm
Number of devices under test	4
Current through the devices under test	approx. 0.1 A DC
Period of a cycle	approx. 1.7 s
Number of cycles n per minute	approx. 35
Measuring range of the counter	up to 655,369,999 cycles

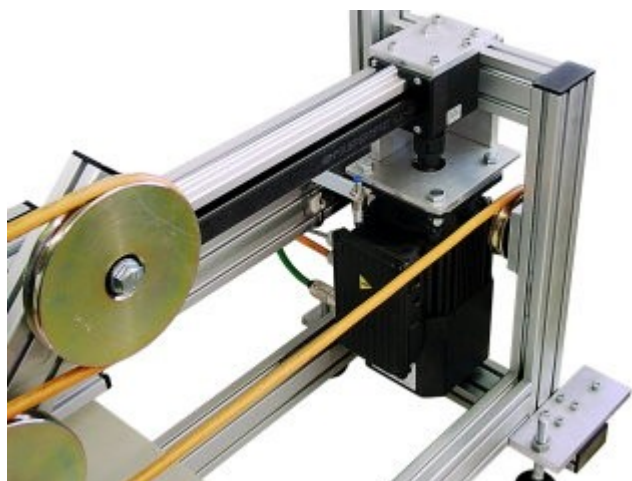
# Flex test machine for 1 cable

The flex test machine determines the flexibility of cables of every description (electrical cables as well as optical fibre cable).



The capacity of the cables to be inspected is tested by flexion.

During the test process, the cables are subject to an external measuring procedure until a cable breaks.



## Flex test machine for 1 cable

### Technical data

Maximum testing length of the cables	2 m
Maximum speed	3 m/sec
Maximum acceleration/deceleration	30 m/sec <sup>2</sup>
Failure storage internal	up to 50.000 processes
Failure display on table	100 processes
Power supply	230 V~ 50 Hz
Dimensions (L x W x H)	2.200 x 800 x 1.600 mm
Mechanical assembling made of	aluminium / steel
Construction composed of	assembling, digital servo drive, brushless motor, control panel with touch screen and OFF-switch
Pulley standard	240 mm

The system is open – other diameters and configurations can be carried out in the basic construction.

The software can be expanded on demand of the customer.

# Flex test machine for 6 cables

The Flex test machine determines the flexibility of any type of cable (electrical and fibre optic).



The capacity of the cables to be inspected is tested by flexion.

During the test process the cables are subject to an external measurement procedure.

If a failure occurs, the system records the time and position, without stopping the machine. (This option can be altered according to the requirements.)

On completion of the test cycle, a test log listing all failures occurred can be exported.

The failure log in the display can register up to 100 events at a time, up to 50,000 events can be stored internally.

All adjustments are carried out using the touchscreen in the control panel.

The system was realized utilizing a digital servo drive, a brushless servo motor with planetary gearbox, as well as an industrial-PC with client-specific software.



**This machine can test 6 cables simultaneously!**

## Flex test machine for 6 cables



Side-view with E-Stop and control panel



Front side



Touchscreen display on the control panel



## Flex test machine for 6 cables



Carriage on the  
Flex test machine



Open side view

## Flex test machine for 6 cables

### Technical data

Maximum cable test length	2,000 mm	
Maximum speed	2,000 mm/sec	
Maximum acceleration / deceleration	4,000 mm/sec <sup>2</sup>	
failure storage - internal	Up to 50,000 events	
failure display on the table of the touchscreen (can be modified)	100 events	
Power supply	230 V~ 50 Hz	
Dimensions (L x W x H)	3,440 x 620 x 1,700 mm	
Assembling made of	aluminium / steel	
Construction composed of	Assembling, digital servo drive, brushless servo motor, control panel with touchscreen and OFF-switch	
Pulley Standard	240 mm	
Optional Pulleys	Cable: 2.5 mm      Diameter: 50 mm Cable: 3.5 mm      Diameter: 70 mm Cable: 4.0 mm      Diameter: 80 mm Cable: 5.0 mm      Diameter: 100 mm Cable: 6.0 mm      Diameter: 120 mm Cable: 8.0 mm      Diameter: 160 mm Cable: 10.0 mm     Diameter: 200 mm Cable: 20.0 mm     Diameter: 400 mm	

The system is open – other diameters and configurations can be carried out in the basic construction.

The software can be expanded upon demand of the customer.

# Torsion test machine

The Torsion test machine determines the flexibility of any type of cable under torsional stress conditions (electrical conductors as well as fibre optic cables).



The capacity of the cables to be inspected is tested during axial torsion.

During the test cycle the cables are checked by one external measuring system.

If a failure occurs, the system records the time and angle, without interrupting the machine operation. (This option can be altered according to the requirements.)

On completion of the test cycle, a test log listing all the failures occurred can be exported.

The failure log in the display registers 100 events at a time, up to 50,000 events can be stored internally.

All adjustments are carried out using the touchscreen in the control panel.

The system was realized utilizing a digital servo drive, a brushless servo motor with planetary gearbox, as well as an industrial-PC with client-specific customer software.

**This machine can test 6 cables simultaneously!**

# Torsion test machine



**Touchscreen-Display  
on control console**



**on top: rotary units  
on the right: rotary heads**

## Torsion test machine

### Technical data

Maximum cable test length	2,000 mm
Cable diameter	1.5 - 44 mm
Maximum rotational speed	120 rpm
Maximum rotational	Freely definable
Temperature range for testing	-45 °C to +85 °C
Failure storage - internal	up to 50,000 events
Failure Table on the touchscreen (can be modified)	100 events
Power supply	3 x 230 - 400 V~ 50 Hz
Dimensions (L x W x H)	2,500 x 500 x 700 – 1,200 mm
Mechanical assembling made of	aluminium / steel
Construction composed of	assembling, digital servo drive, brushless servo motor, control panel with touchscreen and OFF-switch

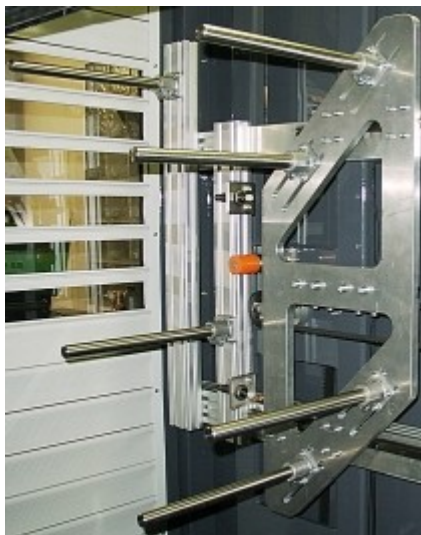
The software can be modified to meet specific customer requirements.

# Flex test machine – high voltage and optical fibre cables

Flex test machine for ribbon cables and round copper cables with adjustable measuring unit as well as for optical fibre cables without measuring equipment.



The machine is suitable for a simultaneous test of up to 4 ribbon cables with a width of up to 140 mm, of up to 8 round cables with a diameter of up to 20 mm or of up to 8 fibre glass cables with a diameter of up to 20 mm.



The maximum diameter of each test pulley is 250 mm. Test process unit with a maximum traveling distance of up to 1600 mm.



The front

plate of the control console contains 4 control sections, each consisting of the current display, the control button, the function display and a protection system. At 400 V AC, a current of 30 mA to 230 mA can be adjusted for each one of the 4 test sample. This allow to test 4 different types of cables simultaneously.

The following failure situations are communicated to the SPS in the process unit:

1. cable interruption
2. short-circuit between 2 cables
3. short-circuit to ground

## Flex test machine – high voltage and optical fibre cables

### Technical data

Maximum test length of the cables	1.600 mm
Up to 4 ribbon cables Up to 8 round cables	max. 140 mm width max. 20 mm diameter
Maximum speed	5 m/sec.
Maximum acceleration/deceleration	50 m/sec. <sup>2</sup>
Temperature range of the test	0 °C to +40 °C
Power supply	3 x 230 - 400 V~ 50 Hz
Dimensions (L x W x H)	3.000 x 800 x 2.300 mm
Mechanical assembling made of	aluminium / steel
Construction composed of	assembling, digital servo drive, brushless motor, control panel with touch screen and OFF-switch

The software can be expanded on demand of the customer.



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