

## Product Information

### Materials Testing Machines zwickiLine Z0.5 to Z5.0

CTA: 250043 42618



Touch Monitor with a zwickiLine materials testing machine

#### Application

zwickiLine is a powerful, flexible and cost-efficient testing solution for a wide range of materials and components. This materials testing machine is ideal for research and development, as well as routine quality assurance testing.

A wide range of equipment options enable use of the zwickiLine for tests on plastics, elastomers, metals, composites, paper, cardboard, textiles, foams, food products and components for the medical engineering and pharmaceutical industry.

ZwickRoell zwickiLine materials testing machines can be used in production and testing areas of cleanroom classes 5 and 6. Cleanroom suitability of the materials testing machines was validated according to DIN EN ISO 14644 1:2016-06, DIN EN ISO 14644-14 and VDI 2083-9.1.

#### Advantages and features



##### Ergonomic remote control with color display

Tests can be performed entirely via the display-equipped remote control, independent of the PC. All important information is shown on the color display. Machine operation is therefore more ergonomic and effective. Maximum operator safety is guaranteed with the integrated Emergency stop. The rocker-switch with integrated dial makes positioning fast yet highly accurate.

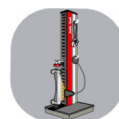


zwickiLine type TS, TN and TH



#### Intuitive and workflow-based from the very start

From the very start, users can easily and intuitively navigate testXpert III. testXpert III contains a wide range of functionalities to meet the requirements of different industries. With more than 600 prepared standard test programs, the requirements of national and international test standards are guaranteed to be met. Master test programs, options and industry packages also offer the flexibility to meet requirements in testing operations that go far beyond the standards.



#### Modern, high-quality load-frame design

- Scalable testing machine with two test areas guarantees optimal capacity utilization, saving both time and money.
- The generous test area depth allows use of larger fixtures and enables bigger components to be tested, which are optimally supported by the wide base crosshead.
- The new zwickiLine profile has six continuous, freely accessible standard-profile slots for individual mounting of specimen materials, fixtures, safety devices, accessories, etc.
- The zwickiLine can be operated in vertical or horizontal position as required, and can be swiveled 180° in horizontal mode.

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#### testControl II machine electronics and testXpert III testing software—a powerful combination

All ZwickRoell materials testing machines are equipped with the powerful testControl II measurement and control electronics, offering the ideal basis for precise, reproducible test results.

testXpert III testing software and testControl II machine electronics are perfectly matched, ensuring safe and efficient operation of the testing system. testXpert III provides the optimal solution for any testing requirement.



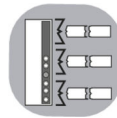
#### ZwickRoell Engineering—Made in Germany

The development and manufacture of materials testing machines, including all mechanical, electronic and software components, together with our comprehensive range of accessories, takes place at ZwickRoell's production facility in Germany, enabling us to create a product that is perfectly harmonized. Each materials testing machine is made of the highest quality standard enabling ZwickRoell to offer the best possible support.



#### Safety for the user and the entire testing system

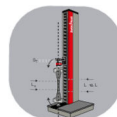
Maximum level of safety for user and testing system is guaranteed. All EC Machinery Directive safety requirements are fulfilled. The CE-compliant safety device with electrical interlocking and mechanical guard locking, transparent design and excellent accessibility, protects the operator. The highest level of safety is achieved with the two-channel safety circuit.



#### Flexibility Through Modularity

testControl II offers six flexible time-synchronized slots. These make it possible to use multiple sensors at the same time, and can be monitored and protected irrespective of use.

- For example, an extensometer and a transverse strain extensometer can be used in addition to the load cell.
- If the testing system is equipped with several load cells or additional sensors, these can all remain plugged in. All plugged-in sensors are automatically protected against overloads.



#### Machine compliance correction

The high-quality drive technology plus online correction of machine compliance enable very high travel-measurement and positioning accuracy.



#### System monitoring

testControl II system monitoring provides the user/laboratory manager with detailed information on the current status and level of utilization of the testing equipment. This enables further increases in testing equipment availability and greatly simplifies maintenance planning and spares/replacement procurement.



#### Fast, adaptive drive controller

The high drive control frequency of 1,000 Hz delivers fast, precise force and strain control. Benefits include enabling components to be loaded very quickly and accurately with a predetermined force.



#### Eco mode

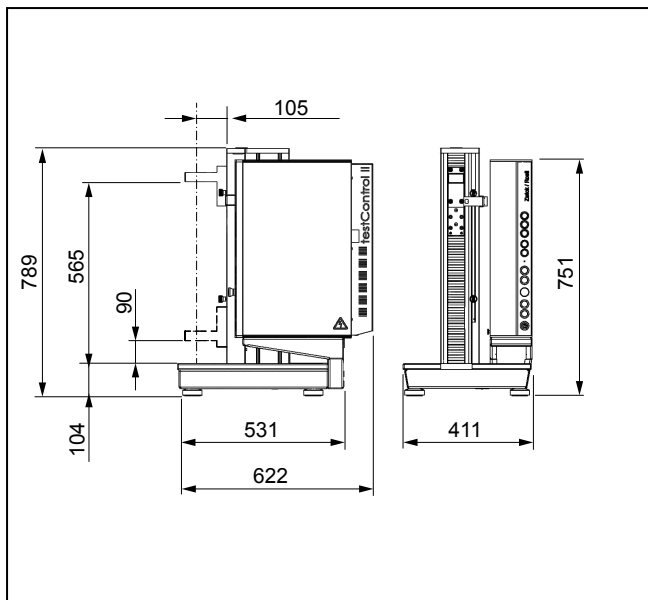
The testControl II machine electronics automatically switch to eco mode when not in use, saving energy.

## Product Information

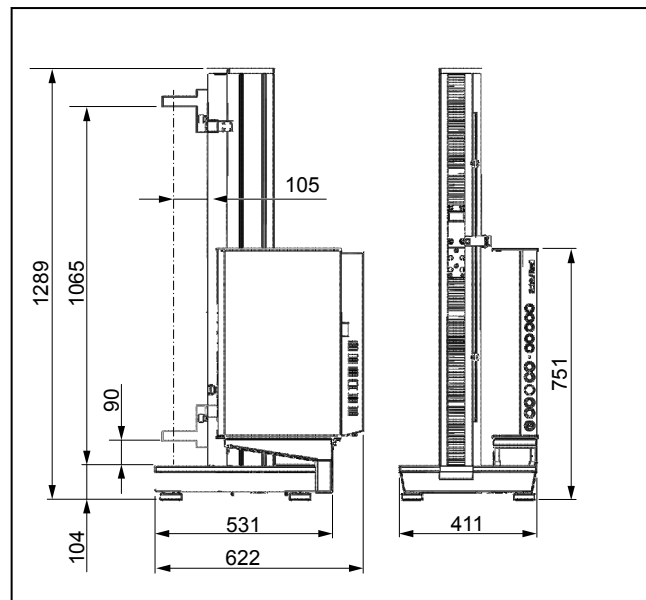
### Materials Testing Machines zwickiLine Z0.5 to Z5.0

#### Scale diagrams

CTA: 110410 165223

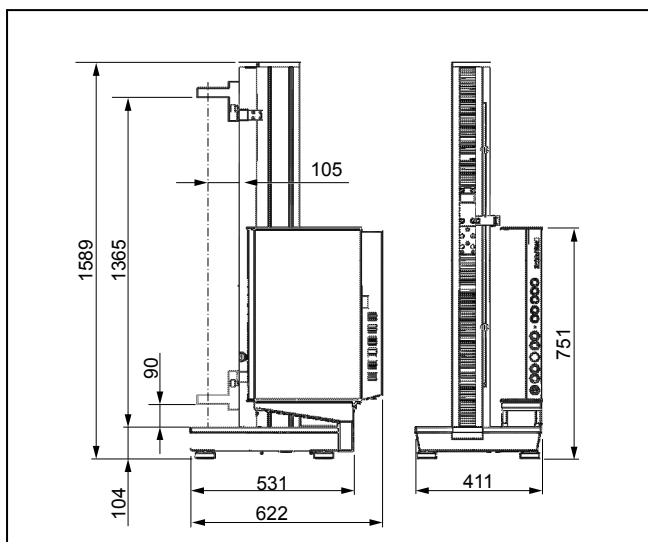


Dimensions, TS testing system



Dimensions, TN testing system

CTA: 165223 42630



Dimensions, TH testing system



Swivelable front safety device, with electrical interlocking

## Product Information

### Materials Testing Machines zwickiLine Z0.5 to Z5.0

#### Technical data

##### General technical data for zwickiLine

Load frame		
Finish	A6-C31, RAL 7021 and RAL 3038	
Ambient temperature	+10 ... +35	°C
Relative humidity (non-condensing)	20 ... 90	%
Conformity	ISO 9000 and CE	
Drive system		
Motor	DC servo motor	
Control, set value preselection	Digital	
Controller	Adaptive	
Cycle time	1000	Hz
Positioning repeatability (without reversal of direction)	±2	µm

Description	Value	
Machine electronics		
Number of available slots for measurement and control modules:		
Synchronized module slots	2 (expandable to 5) <sup>1)</sup>	
Synchronized PCIe slots	1	
Force measurement	Class 0.5/1, depending on load cell, compliant to DIN EN ISO 7500-1, ASTM E4	
Measurement range	Up to 165% of F <sub>max</sub> <sup>2)</sup>	
Calculated resolution (e.g., load cell in tensile/compression direction)	24	bit
Effective resolution in tensile/compression direction:		
DCSC module	19 bits (corresponds to ±512,000 points)	
USC module	20 bits (corresponds to ±1,000,000 points)	
Measured value recording rate	400	kHz
Measurement value transmission rate to PC	500 (optional 2000)	Hz
Zero-point correction	Automatic, at start of measurement	
Measurement signal run-time correction for all channels	Yes	
Interface to PC	Ethernet	
Eco mode	Yes, automatic switch off of power section (time can be set)	
CE conformity	Yes, according to Machinery Directive 2006/42/EC	

1) A DCSC module is included in the scope of delivery (occupies one module slot). The drive requires an optional module slot.

2) For load cells with F<sub>max</sub> 2.5 kN: up to 130% of F<sub>N</sub>

Description	Value	
Power specifications		
Power supply	100 ... 240	V, 1Ph/N/PE
Tolerance range	±10	%

## Product Information

### Materials Testing Machines zwickiLine Z0.5 to Z5.0

Description	Value	
Power consumption (full load), approx.	500	VA
Power frequency	50/60	Hz

#### Z0.5

Type	Z0.5 TS	Z0.5 TN	Z0.5 TH	
Item No.	058992	058993	058996	
Test load $F_{max}$	0.5	0.5	0.5	kN
<b>Test area</b>				
Height, $P_{min} \dots P_{max}$ (each without mounting stud)				
Moving crosshead mounted with angle up	235 ... 565 <sup>1)</sup>	235 ... 1065 <sup>1)</sup>	235 ... 1365 <sup>1)</sup>	mm
Moving crosshead mounted with angle down	90 ... 420	90 ... 920	90 ... 1220	mm
Depth	105	105	105	mm
Width	No limitation	No limitation	No limitation	
<b>Load frame</b>				
Dimensions				
Height without top crosshead	789 <sup>2)</sup>	1289 <sup>2)</sup>	1589 <sup>2)</sup>	mm
Width	408 <sup>3)</sup>	408 <sup>3)</sup>	408 <sup>3)</sup>	mm
Width with machine electronics	411 <sup>3)</sup>	411 <sup>3)</sup>	411 <sup>3)</sup>	mm
Depth	480 <sup>3)</sup>	480 <sup>3)</sup>	480 <sup>3)</sup>	mm
Depth with machine electronics	622 <sup>3)</sup>	622 <sup>3)</sup>	622 <sup>3)</sup>	mm
Weight				
With machine electronics, approx.	68	76	81	kg
Average noise level at $v_{max}$ measured at 1 m distance from the front of the machine	61	61	61	dB(A)
<b>Drive system</b>				
Crosshead speed $v_{min} \dots v_{max}$	0.0005 ... 2000 <sup>4)</sup> (optional 3000) <sup>5)</sup>	0.0005 ... 2000 <sup>4)</sup> (optional 3000) <sup>5)</sup>	0.0005 ... 2000 <sup>4)</sup> (optional 3000) <sup>5)</sup>	mm/min
Drive travel resolution	0.0830	0.0830	0.0830	$\mu$ m

1) Height of the test area without accessories

2) The dimension increases by 9 mm with the additional crosshead option (top crosshead)

3) With "large base" option: width 583 mm, width with machine electronics 585 mm, depth 565 mm, depth with machine electronics 707 mm.

4) Values apply to machines with closed safety door and closed safety guard in automatic mode and to machines without safety device and/or without safety guard. For machines with the safety door and/or safety guard open, the speed is reduced to 600 mm/min.

5) The speed can be increased to 3000 mm/min (optional).

#### Z1.0

Type	Z1.0 TS	Z1.0 TN	Z1.0 TH	
Item No.	058997	058998	058999	
Test load $F_{max}$	1	1	1	kN
<b>Test area</b>				

## Product Information

### Materials Testing Machines zwickiLine Z0.5 to Z5.0

Type	Z1.0 TS	Z1.0 TN	Z1.0 TH	
Item No.	058997	058998	058999	
Height, $P_{min} \dots P_{max}$ (each without mounting stud)				
Moving crosshead mounted with angle up	235 ... 565 <sup>1)</sup>	235 ... 1065 <sup>1)</sup>	235 ... 1365 <sup>1)</sup>	mm
Moving crosshead mounted with angle down	90 ... 420	90 ... 920	90 ... 1220	mm
Depth	105	105	105	mm
Width	No limitation	No limitation	No limitation	
<b>Load frame</b>				
Dimensions				
Height without top crosshead	789 <sup>2)</sup>	1289 <sup>2)</sup>	1589 <sup>2)</sup>	mm
Width	408 <sup>3)</sup>	408 <sup>3)</sup>	408 <sup>3)</sup>	mm
Width with machine electronics	411 <sup>3)</sup>	411 <sup>3)</sup>	411 <sup>3)</sup>	mm
Depth	480 <sup>3)</sup>	480 <sup>3)</sup>	480 <sup>3)</sup>	mm
Depth with machine electronics	622 <sup>3)</sup>	622 <sup>3)</sup>	622 <sup>3)</sup>	mm
Weight				
With machine electronics, approx.	68	76	81	kg
Average noise level at $v_{max}$ measured at 1 m distance from the front of the machine	55	55	55	dB(A)
<b>Drive system</b>				
Crosshead speed $v_{min} \dots v_{max}$	0.0005 ... 2000 <sup>4)</sup>	0.0005 ... 2000 <sup>4)</sup>	0.0005 ... 2000 <sup>4)</sup>	mm/min
Drive travel resolution	0.0554	0.0554	0.0554	$\mu\text{m}$

1) Height of the test area without accessories

2) The dimension increases by 9 mm with the additional crosshead option (top crosshead)

3) With "large base" option: width 583 mm, width with machine electronics 585 mm, depth 565 mm, depth with machine electronics 707 mm.

4) Values apply to machines with closed safety door and closed safety guard in automatic mode and to machines without safety device and/or without safety guard. For machines with the safety door and/or safety guard open, the speed is reduced to 600 mm/min.

### Z2.5

Type	Z2.5 TS	Z2.5 TN	Z2.5 TH	
Item No.	059001	059003	059004	
Test load $F_{max}$	2.5	2.5	2.5	kN
<b>Test area</b>				
Height, $P_{min} \dots P_{max}$ (each without mounting stud)				
Moving crosshead mounted with angle up	235 ... 565 <sup>1)</sup>	235 ... 1065 <sup>1)</sup>	235 ... 1365 <sup>1)</sup>	mm
Moving crosshead mounted with angle down	90 ... 420	90 ... 920	90 ... 1220	mm
Depth	105	105	105	mm
Width	No limitation	No limitation	No limitation	
<b>Load frame</b>				

## Product Information

### Materials Testing Machines zwickiLine Z0.5 to Z5.0

Type	Z2.5 TS	Z2.5 TN	Z2.5 TH	
Item No.	059001	059003	059004	
<b>Dimensions</b>				
Height without top crosshead	789 <sup>2)</sup>	1289 <sup>2)</sup>	1589 <sup>2)</sup>	mm
Width	408 <sup>3)</sup>	408 <sup>3)</sup>	408 <sup>3)</sup>	mm
Width with machine electronics	411 <sup>3)</sup>	411 <sup>3)</sup>	411 <sup>3)</sup>	mm
Depth	480 <sup>3)</sup>	480 <sup>3)</sup>	480 <sup>3)</sup>	mm
Depth with machine electronics	622 <sup>3)</sup>	622 <sup>3)</sup>	622 <sup>3)</sup>	mm
<b>Weight</b>				
With machine electronics, approx.	68	76	81	kg
Average noise level at $v_{max}$ measured at 1 m distance from the front of the machine	55	55	55	dB(A)
<b>Drive system</b>				
Crosshead speed $v_{min} \dots v_{max}$	0.0005 ... 1000 <sup>4)</sup>	0.0005 ... 1000 <sup>4)</sup>	0.0005 ... 1000 <sup>4)</sup>	mm/min
Drive travel resolution	0.0277	0.0277	0.0277	$\mu\text{m}$

1) Height of the test area without accessories

2) The dimension increases by 9 mm with the additional crosshead option (top crosshead)

3) With "large base" option: width 583 mm, width with machine electronics 585 mm, depth 565 mm, depth with machine electronics 707 mm.

4) Values apply to machines with closed safety door and closed safety guard in automatic mode and to machines without safety device and/or without safety guard. For machines with the safety door and/or safety guard open, the speed is reduced to 600 mm/min.

### Z5.0

Type	Z5.0 TS	Z5.0 TN	Z5.0 TH	
Item No.	059005	059006	059007	
Test load $F_{max}$	5	5	5	kN
<b>Test area</b>				
Height, $P_{min} \dots P_{max}$ (each without mounting stud)				
Moving crosshead mounted with angle up	365 ... 540 <sup>1)</sup>	365 ... 1040 <sup>1)</sup>	365 ... 1340 <sup>1)</sup>	mm
Moving crosshead mounted with angle down	125 ... 300	125 ... 800	125 ... 1100	mm
Depth	105	105	105	mm
Width	No limitation	No limitation	No limitation	
<b>Load frame</b>				
<b>Dimensions</b>				
Height without top crosshead	789 <sup>2)</sup>	1289 <sup>2)</sup>	1589 <sup>2)</sup>	mm
Width	408 <sup>3)</sup>	408 <sup>3)</sup>	408 <sup>3)</sup>	mm
Width with machine electronics	411 <sup>3)</sup>	411 <sup>3)</sup>	411 <sup>3)</sup>	mm
Depth	480 <sup>3)</sup>	480 <sup>3)</sup>	480 <sup>3)</sup>	mm
Depth with machine electronics	622 <sup>3)</sup>	622 <sup>3)</sup>	622 <sup>3)</sup>	mm
<b>Weight</b>				
With machine electronics, approx.	70	78	83	kg

## Product Information

### Materials Testing Machines zwickiLine Z0.5 to Z5.0

Type	Z5.0 TS	Z5.0 TN	Z5.0 TH	
Item No.	059005	059006	059007	
Average noise level at $v_{max}$ measured at 1 m distance from the front of the machine	55	55	55	dB(A)
<b>Drive system</b>				
Crosshead speed $v_{min}$ ... $v_{max}$	0.0005 ... 600	0.0005 ... 600	0.0005 ... 600	mm/min
Drive travel resolution	0.0168	0.0168	0.0168	$\mu\text{m}$

- 1) Height of the test area without accessories
- 2) The dimension increases by 9 mm with the additional crosshead option (top crosshead)
- 3) With "large base" option: width 583 mm, width with machine electronics 585 mm, depth 565 mm, depth with machine electronics 707 mm.