Zwick / Roell

Product Information

Materials Testing Machines ProLine Z005 to Z100

CTA: 42615 98097

ProLine Z050 TN with body-over-wedge grips, makroXtens P, and base option

ProLine Z010 TH with pneumatic grips

Our ProLine materials testing machines were primarily developed for the performance of standardized tests on materials and components. When combined with our intuitive testXpert III testing software, ProLine materials testing machines offer fast, easy operation.

Advantages and features

Integrated safety in accordance with the EC Machinery Directive

Maximum level of safety for user and testing system is guaranteed. All EC Machinery Directive safety requirements are guaranteed. Compliance is documented with an EC Declaration of Conformity. State-of-the-art safety technology and proven industrial components that comply with the highest level of safety and industrial standards (IEC 60947) are used.

Powerful drives

- Extremely low minimum speeds can be set with simultaneous high speed-stability. In addition, the drive delivers high cross-head travel resolution. This is important, for example in the case of component testing with high demands on travel precision and tests on specimens with high stiffness and short test travel.
- The high test-speed range can be used without restriction. In addition, test loads up to 110 % of machine nominal load are permissible to compensate for heavy combinations of test fixtures, accessories etc.
- Faster return speeds mean reduced cycle times and increased test throughput. The motor employs zero-maintenance AC technology.

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Univacco Exhibit 1006
Univacco v. Leonhard Kurz
Case PGR2006-00011

Product Information

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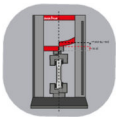
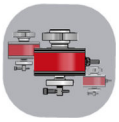


High stiffness and precise crosshead guidance

Two steel columns provide highly accurate guidance for ProLine's moving crosshead. The stiff load-frame profile and generous connecting surfaces reduce the inclination angle of the crosshead under load, enabling very precise alignment and application of force to the specimen. This is advantageous for flexure tests, compression tests, precision tests on components etc.

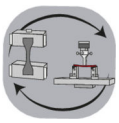
Safety for the entire testing system

The highest level of safety is achieved with the two-channel safety circuit. It includes the crosshead limit switch, the drive-Off switch, motor break function and the operation mode switch. Relevant accessories are also integrated into the safety circuit. The CE-compliant safety device with electrical interlocking and mechanical guard locking prevents interference with the machine during the test.



Exclusively at ZwickRoell: Xforce Load Cells

Patented Xforce load cells are developed and manufactured by ZwickRoell, and offer outstanding accuracy and high resistance to parasitic influences. Parasitic influences such as temperature and transverse forces have significantly less impact on test results than other comparable sensors. Xforce load cells are also very robust and more resistant to factors such as transverse forces during compression and flexure tests.



Mechanical Modularity

Mechanical modularity enables the testing system to be expanded by the wide range of ZwickRoell test fixtures and specimen grips or with customized devices. This is where the highly adaptable, play-free plug and T-slot system comes into its own, backed by a wide variety of crosshead mount options. Specimen grips and test tools can be changed whenever required, enabling a wide range of tests to be performed with the same testing machine and allowing rapid, highly flexible adaptation to the current testing situation.

Short delivery times

With the ProLine materials testing machines' short delivery time of two weeks, test tasks can be taken on quickly, saving valuable time.

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.

Overview of the key advantages of testControl II machine electronics

Innovative testControl II machine electronics

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.
The electronics are mounted vertically on the side of the load frame. This position protects the electronics from penetration of liquids and conductive particles.
The high-quality surfaces protect testControl II from external influences. In addition, the components used are highly durable.

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

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.

All data at ambient temperature.

Subject to change in the course of further development.

Univacco Exhibit 1006
Univacco v. Leonhard Kurz
Case PGR2006-00011

Zwick / Roell

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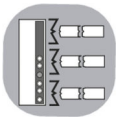
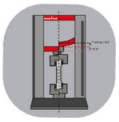
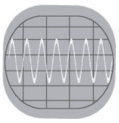


Flexibility Through Modularity
testControl II offers six flexible time-synchronized slots. These make it possible to use multiple sensors at the same time, and can be monitored and protected irrespective of use.

- 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
Due to the high-quality drive technology and real-time correction of the machine compliance during the test, target positions are approached with accuracy and travel is precisely determined with the crosshead travel monitor. The testXpert III testing software automatically sets the optimal correction curve, guaranteeing the highest possible level of precision.



High data transmission rate
Each travel and force peak is acquired with high resolution and recorded synchronously at 500 Hz on all measuring channels. Optionally, the measured value acquisition rate can be expanded to 2,000 Hz. The high data transmission rate enables fast measurement with the highest degree of reproducibility. This is highly advantageous for quick tests, short, brittle fracture events and in tear-growth, adhesion and peel tests.

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.

Maximum accuracy
The smallest force changes on the specimen are quickly and accurately recorded and displayed. The A/D converter guarantees high measured-value accuracy over a wide measurement range with sampling rates of 400 kHz and 24 bit resolution.

Innovative Interfaces
The innovative EtherCat® interface is incorporated as standard. The time-synchronized real-time Ethernet field bus system ensures future-proof integration of sensors and power units.

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

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.

All data at ambient temperature.

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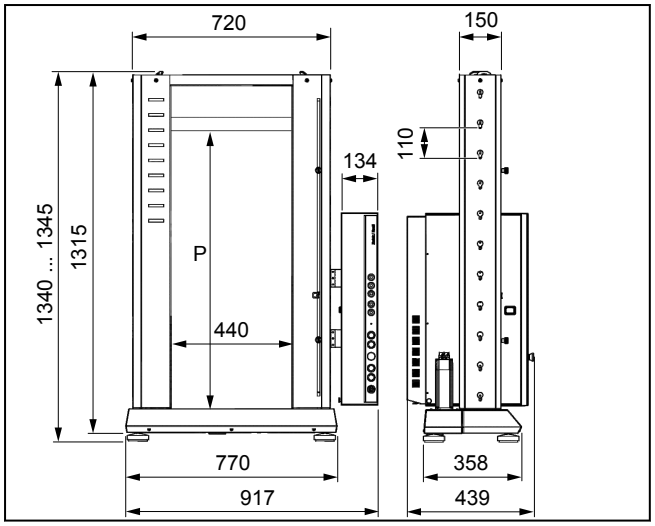
Univacco Exhibit 1006
Univacco v. Leonhard Kurz
Case PGR2006-00011

Product Information

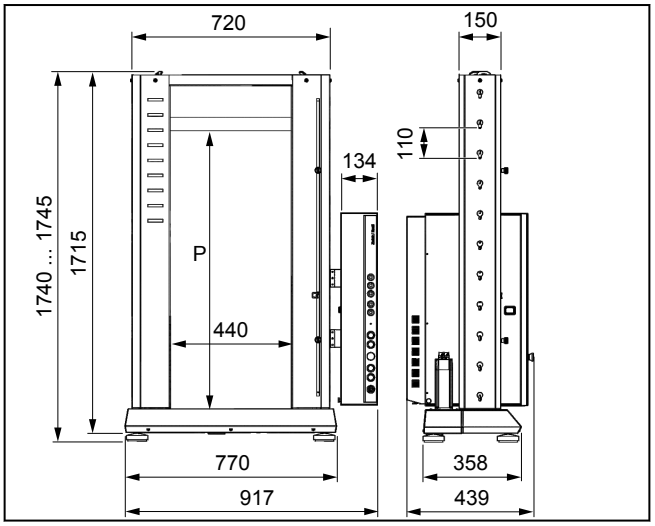
Materials Testing Machines ProLine Z005 to Z100

CTA: 36955 36955



ProLine Z005 TN, Z010 TN and Z020 TN, dimensions

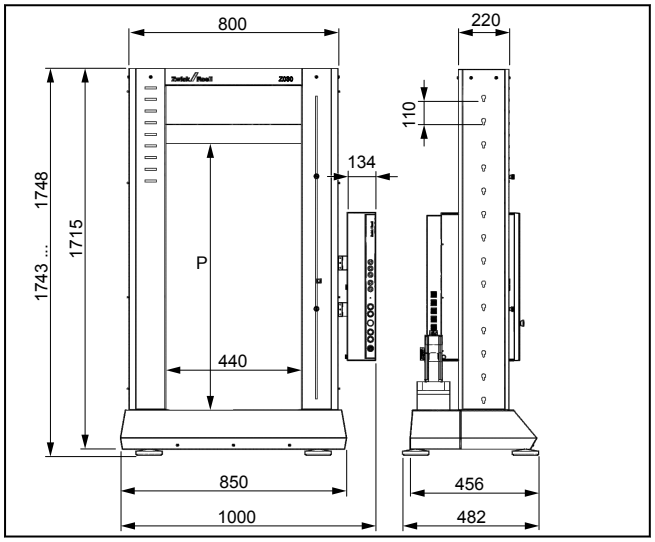
P Height of the test area without accessories



ProLine Z005 and Z010 TH, dimensions

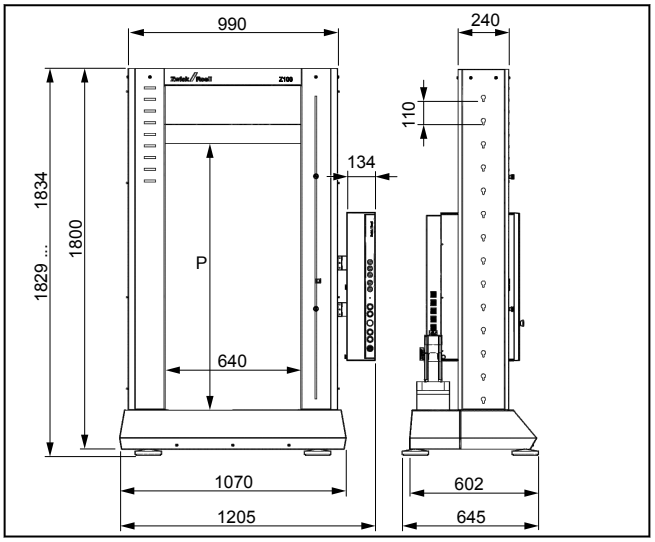
P Height of the test area without accessories

CTA: 54507 54507



ProLine Z030 and Z050 TN, dimensions

P Height of the test area without accessories



ProLine Z100 TN, dimensions

P Height of the test area without accessories

All data at ambient temperature.

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Univacco Exhibit 1006
Univacco v. Leonhard Kurz
Case PGR2006-00011

Zwick / Roell

Product Information

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Technical data

General technical data for ProLine

Load frame		
Paint finish	RAL 7021 black gray/stainless steel metallic, RAL 3031 orient red	
Ambient temperature	+10 ... +35	°C
Relative humidity (non-condensing)	20 ... 90	%
Conformity	ISO 9000 and CE	
Drive system		
Motor	AC servo motor	
Motor holding brake	Yes	
Control, set value preselection	Digital (real-time Ethernet, EtherCAT®)	
Controller	Adaptive	
Cycle time	1000	Hz
Positioning repeatability (without reversal of direction)	±2.0	µm
Power input specifications		
Power supply	230	V, 1Ph/N/PE
Permissible voltage fluctuation	±10	%
Power frequency	50/60	Hz

Description	Value	
Machine electronics		
Number of available slots for measurement and control modules:		
Synchronized module slots	2 (expandable to 5)[1)]	
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 Fmax	
Calculated resolution (e.g., load cell in tensile/compression direction)	24	bits
Effective resolution in tensile/compression direction:		
DCSC module	19 bits (corresponds to ±524,000 points)	
USC module	20 bits (corresponds to ±1,000,000 points)	
Measured value recording rate	400	kHz
Measured-value transmission rate to PC	500 (optional 2000)	Hz
Zero-point correction	Automatic, at start of measurement	
Measurement signal run-time correction	Yes	
Interface to PC	Ethernet	
Eco mode	Yes (time adjustable)	
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).

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Univacco Exhibit 1006
Univacco v. Leonhard Kurz
Case PGR2006-00011

Zwick / Roell

Product Information

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Z005, Z010

Type Item No.	Z005 TN 059008	Z005 TH[1)] 1097346	Z010 TN 059010	Z010 TH[2)] 059011	
Test load F_{max}	5	5	10	10	kN
Test area					
Height (dimension P)	1070[3)]	1470[3)]	1050[3)]	1450[3)]	mm
Height, travel distance of the moving crosshead	1000[3)]	1400[3)]	980[3)]	1380[3)]	mm
Width	440	440	440	440	mm
Load frame					
Dimensions					
Height with leveling elements	1340 ... 1345	1740 ... 1745	1340 ... 1345	1740 ... 1745	mm
Width	770	770	770	770	mm
Width with machine electronics	917	917	917	917	mm
Depth with machine electronics	439	439	439	439	mm
Weight					
With machine electronics, approx.	110	125	135	150	kg
Connection, stud	Ø 20	Ø 20	Ø 20	Ø 20	mm
Average noise level at v_{max} measured in 1 m distance to the front side of machine	59	59	57	57	dB(A)
Drive system					
Crosshead speed v_{min} ... v_{max}	0.0005 ... 1500[4)]	0.0005 ... 1500[4)]	0.0005 ... 1000[4)]	0.0005 ... 1000[4)]	mm/min
Crosshead return speed, max.	2000[4)]	2000[4)]	1500[4)]	1500[4)]	mm/min
Deviation from the set drive speed, max.	0.05	0.05	0.05	0.05	% of v_{actual}
Drive travel resolution	0.0348	0.0348	0.0232	0.0232	µm
Power input specifications					
Power supply	230	230	230	230	V, 1Ph/N/PE
Power consumption (full load), approx.	800	800	800	800	VA

1) For the ProLine Z005 TH testing machine, the maximum total weight of the specimen grips and tools mounted on the crosshead is limited to 20 kg.

2) For the ProLine Z010 TH testing machine, the maximum overall weight for specimen grips and tools mounted on the crosshead is 20 kg.

3) Height of the (lower) test area without accessories

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

Z020; Z030; Z050; Z100

Type Item No.	Z020 TN 059012	Z030 TN 059013	Z050 TN 059021	Z100 TN 1025089	
Test load F_{max}	20	30	50	100	kN
Test area					
Height, travel distance of the moving crosshead	980[1)]	1285[1)]	1285[1)]	1275[1)]	mm

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Case PGR2006-00011

Zwick / Roell

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Materials Testing Machines ProLine Z005 to Z100

Type **Item No.**	**Z020 TN** **059012**	**Z030 TN** **059013**	**Z050 TN** **059021**	**Z100 TN** **1025089**	
Width	440	440	440	640	mm
Load frame					
Dimensions					
Height with leveling elements	1340 ... 1345	1743 ... 1748	1743 ... 1748	1829 ... 1834	mm
Width	770	850	850	1070	mm
Width with machine electronics	917	1000	1000	1205	mm
Depth with machine electronics	439	462	462	645	mm
Weight					
With machine electronics, approx.	135	330	330	530	kg
Connection, stud	Ø 36	Ø 36	Ø 36	Ø 60	mm
Average noise level at v_{max} measured in 1 m distance to the front side of machine	58	68	69	60	dB(A)
Drive system					
Crosshead speed v_{min} ... v_{max}	0.0005 ... 500	0.0005 ... 300	0.0005 ... 600	0.0005 ... 300	mm/min
Crosshead return speed, max.	750[2)]	500	800[2)]	400	mm/min
Deviation from the set drive speed, max.	0.05	0.05	0.05	0.05	% of v_{actual}
Drive travel resolution	0.0115	0.0076	0.0122	0.0123	µm
Power input specifications					
Power supply	230	230	230	230	V, 1Ph/N/PE
Power consumption (full load), approx.	800	800	1600	1600	VA

1) Height of the (lower) test area without accessories

2) Values apply to machines with the safety doors closed in automatic mode and to machines without safety devices. For machines with the safety door open, the speed is reduced to 600 mm/min.

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Case PGR2006-00011