Product Information
Xforce K load cells

Xforce family

Xforce K load cell in an AllroundLine materials testing machine

Patented Xforce load cells - exclusively from ZwickRoell

Xforce load cells are only available from ZwickRoell. These high-accuracy load cells are used for all load-frame ranges, including for ProLine - no compromises here.
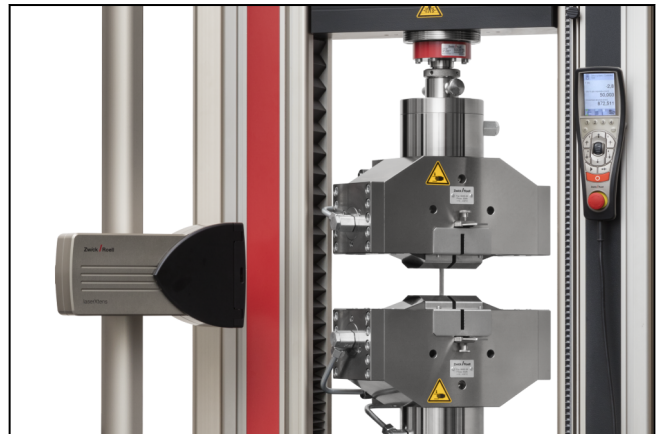
Area of application

Xforce load cells are ideal for tensile, compression and flexure tests and for cyclic tests with zero crossing.

Parasitic influences

All Xforce load cells are highly insensitive to parasitic influences such as transverse forces, bending moments, torque and temperature variations.

Load cell design and construction

- All Xforce load cells are based on a rotation-symmetrical or axis-symmetrical design principle, making them highly resistant to transverse forces.
- The low overall height reduces measurement errors.
- The design delivers high operating forces, very small measurement travel and high stiffness levels.
- A high-quality shielded measurement cable with sensor plug forms the connection to the measurement amplifier for the measuring equipment.

Self-identifying sensor plug

These intelligent load cells have a unique electronic identification system stored on an internal EEPROM.

- The testXpert III testing software automatically identifies the type and properties of the sensor.
- Force and travel limits are read in automatically.
- Sensor overloads, along with the date, are stored in the EEPROM.
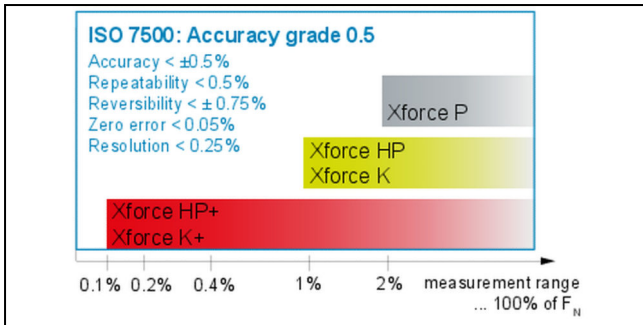
Fast load cell change

If several load cells are to be used, or in the event of frequent load cell changes, we recommend the 'Connection via Mounting Stud' option.

- Saves time and increases flexibility.
- Avoids unnecessary strain on the load cell cable during screwing in and unscrewing.
- The plug-in system delivers better alignment to the test axis than the usual threaded mounting.
- Reference positions for different test arrangements are automatically re-attained (with a threaded mounting, reference positions change according to the number of turns screwed in).

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ISO 7500: Accuracy grade 0.5
Accuracy < ±0.5%
Repeatability < 0.5%
Reversibility < ± 0.75%
Zero error < 0.05%
Resolution < 0.25%

Xforce P
Xforce HP
Xforce K
Xforce HP+
Xforce K+

0.1% 0.2% 0.4% 1% 2% measurement range ... 100% of F_N

Satisfies all 5 criteria for ISO 7500-1, Accuracy Class 0.5

ISO 7500: Accuracy grade 1
Accuracy < ±1%
Repeatability < 1%
Reverseability < ± 1.5%
Zero error < 0.1%
Resolution < 0.5%

Xforce P
HP+
K+
Xforce HP
Xforce K

0.1% 0.2% 0.4% 1% measurement range ... 100% of F_N

Satisfies all 5 criteria for ISO 7500-1, Accuracy Class 1

Simple mechanical plug-in system, including for two test areas
- All load cells are equipped with a precision-fit mounting stud so that the specimen grips and test tools can be inserted quickly, without play and optimally aligned with the test axis.
- Reference positions (e.g., test tool spacing) are only set up once by the operator and stored in the testXpert III testing software system configuration. Every time the test tool is changed, this reference position is automatically and precisely attained. It doesn't get any easier!
- A second mounting stud can be optionally mounted on Xforce K load cells. This allows it to be used in two test areas.

System calibration
Before dispatch, each load cell is calibrated with the testing system, the drive and the measurement and control electronics as a complete system. This is recorded in the accompanying factory calibration certificate.

Calibration and accuracy as per ISO 7500-1
All data apply to measured values in compression and tension directions.
- All load cells are calibrated up to the relevant nominal force F_{nom} and satisfy the requirements of the following standards: EN ISO 7500 -1, EN ISO 7500 -2, ASTM E4.
- Xforce load cells satisfy the calibration requirements and all five criteria of the ISO 7500-1 accuracy classes over a very large measurement range.
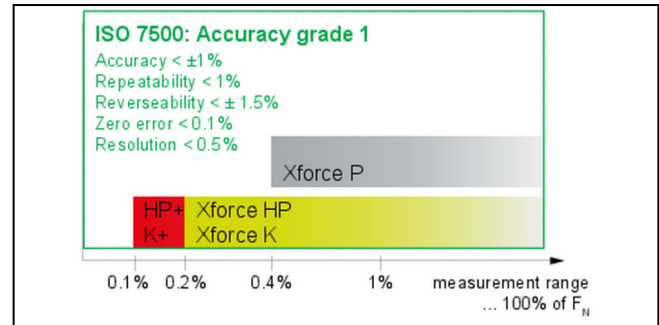
Large measurement range
- The large measurement range often eliminates the need to acquire an additional load cell, saving you purchasing and annual calibration costs.
- Even in the event of large preloads caused by heavy test tools or specimen grips, almost the entire measurement range of the load cells can be used. If the weight of the test tools is 45% of the nominal force, the load cell can still use the full nominal force.

Overload protection, force limits and operating force
- Xforce load cells are very stable. They can withstand forces up to 300% of the nominal force without break and up to 150% of the nominal force without zero offset. Therefore, overload protections such as preloaded spring assemblies, mechanical stops or links for lateral force absorption are usually not necessary.
- Through software and hardware limit switches, the crosshead's range of movement can be limited, protecting load cells and test tools.
- Force limits can be set in testXpert III, which serve to automatically switch off the testing system and thus protect the load cell.

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Technical data

Type Measurement range	Xforce K 10 - 250					kN
Force limits/ranges						
Operating force F_G, max.	150					% of F_{nom}
Operating range, max.	150					% of F_{nom}
Limit force F_L	150					% of F_{nom}
Force at break F_B	300					% of F_{nom}
Limit transverse force F_Q	100					% of F_{nom}
Influences/limit values						
Torque influence	±0.005					% of F_{nom}/mm
Ambient temperature	+10 ... +60					°C
Other values						
Nominal characteristic value C_{nom}	2					mV/V
Cable length	3.5					m

Xforce K (10 - 50 kN)

Load cells Item No. Item No. for ProLine	10 1008815 -	10 1008732 1008733[1]	20 318936 325222[1]	30 325642 325644[1]	50 318934 325223[1]	kN
Nominal force F_{nom}	10	10	20	30	50	kN
Nominal force F_{nom} [lbf]	2248	2248	4496	6744	11240	lbf
Accuracy						
Accuracy Class 1 (from 0.2 % of F_{nom})	20	20	40	60	100	N
Accuracy Class 0.5 (from 1 % of F_{nom})	100	100	200	300	500	N
Dimensions						
Installation height	74	90	75.5	75.5	75	mm
Connection						
Connection thread	-	M28x1,5	-	-	-	
Connection flange	Flange 1[2]	-	Flange 1[2]	Flange 1[2]	Flange 1[2]	
Mounting stud	Ø20	Ø20	Ø36	Ø36	Ø36	mm
Influences/limit values						
Limit bending moment	500[3]	500[3]	600[3]	700[3]	1100[3]	Nm
Limit torque	500[4]	500[4]	500[4]	500[4]	1800[4]	Nm

[1] Only in combination with a ProLine load frame. Please observe the relevant note.

[2] Flange 1 = pitch circle 115 mm, Flange 2 = pitch circle 220 mm.

[3] Maximum bending moments Mb for a load cell which is unloaded in the direction of measurement. In the case of simultaneous loading with a nominal load, the values must be halved.

[4] Unloaded. In the case of simultaneous loading with a nominal load, these values must be halved.

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Xforce K (100 - 250 kN)

Load cells	100	100	150	250	250	kN
Item No.	318932	068922[1)2)]	320304	318930	068918[3)2)]	
Item No. for ProLine	325328[4)]	-	-	-		
Nominal force F_{nom}	100	100	150	250	250	kN
Nominal force F_{nom} [lbf]	22481	22481	33721	56202	56202	lbf
Accuracy						
Accuracy Class 1 (from 0.2 % of F_{nom})	200	-	300	500	500	N
Accuracy Class 0.5 (from 1 % of F_{nom})	1000	-	1500	2500	2500	N
Accuracy Class 1 (from 0.4 % of F_{nom})	-	400	-	-	-	
Accuracy Class 0.5 (from 2 % of F_{nom})	-	2000	-	-	-	
Dimensions						
Installation height	106	131	106	162	131	mm
Connection						
Connection flange	Flange 2[5)]	Flange 2[5)]	Flange 2[5)]	Flange 2[5)]	Flange 2[5)]	
Mounting stud	60	Flange	60	60	Flange	mm
Influences/limit values						
Limit bending moment	4800[6)]	30000[6)]	8000[6)]	30000[6)]	30000[6)]	Nm
Limit torque	10000[7)]	55000[7)]	[7)]20000	55000[7)]	55000[7)]	Nm

[1)] Flange interface with 70 mm centering gauge instead of mounting stud, for combination with the alignment fixture (Item No. 068902) and hydraulic grip type 8594 "body-over-wedge" (Item No. 072865 and 072869). Design and technical data as for Item No. 068918.

[2)] The load cell cannot be installed on the base crosshead for table-top testing machines. The base crosshead is too narrow, i.e. only 7 out of 8 holes can be attached.

[3)] Flange interface with centering gauge instead of mounting stud (pitch circle 115/220 mm, centering gauge D30/70 mm).

[4)] Only in combination with a ProLine load frame. Please observe the relevant note.

[5)] Flange 1 = pitch circle 115 mm, Flange 2 = pitch circle 220 mm.

[6)] Maximum bending moments Mb for a load cell which is unloaded in the direction of measurement. In the case of simultaneous loading with a nominal load, the values must be halved.

[7)] Unloaded. In the case of simultaneous loading with a nominal load, these values must be halved.