Zwick / Roell

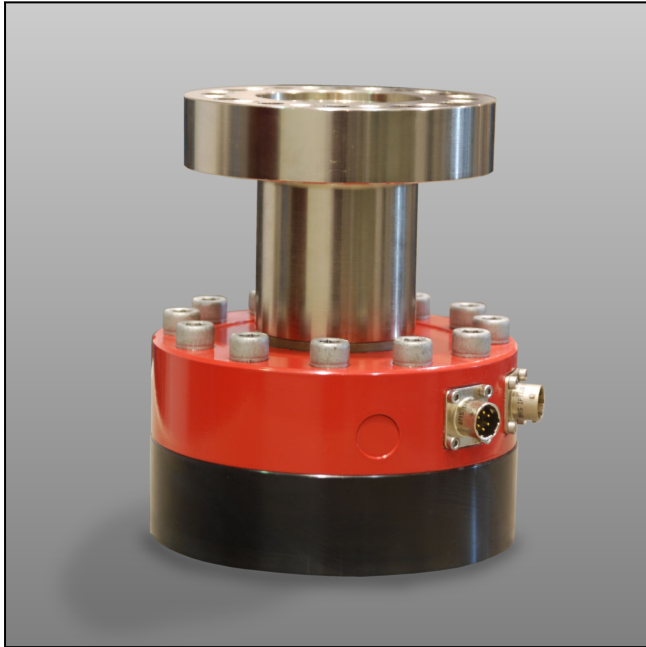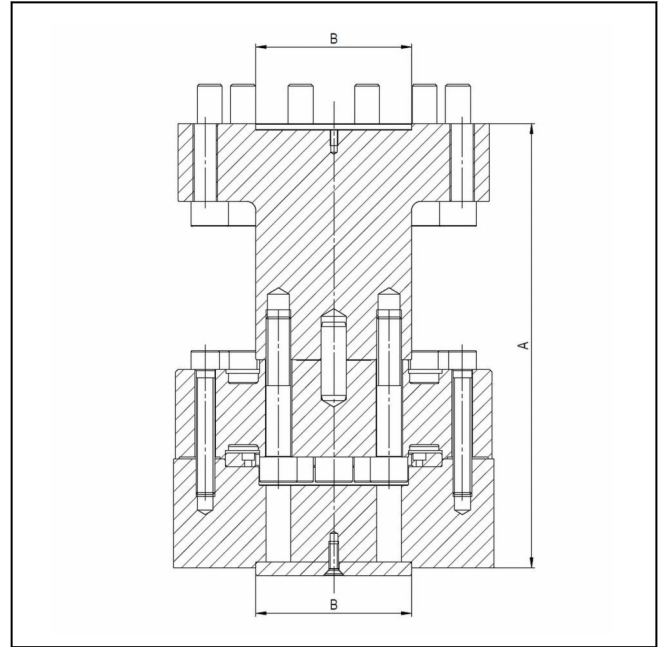## Product Information
ZwickRoell Xforce Dynamic load cell for Vibrophores

Xforce Dynamic with mounting flange

Xforce Dynamic: general layout drawing

Range of application
Load cells in the Xforce Dynamic range have been specially developed for use in dynamic testing machines and enable highly accurate measurement of tensile and compression forces under both static and oscillating/ fatigue loading. They are fatigue-resistant and suitable for alternating-load tests.

Description of operation
Xforce Dynamic load cells have strain gages attached to the measuring body in accordance with the shear-web measurement principle. Their high stiffness and natural frequency make them the natural choice for dynamic applications.

The accelerations occurring on load cells during dynamic tests, in combination with the connected masses, lead to distortion of the actual specimen force being measured. Xforce Dynamic load cells are therefore additionally equipped with two accelerometers to compensate for the inertial forces which arise. As the two accelerometers have different measurement ranges, optimum matching of the acceleration measurement to the design/layout of the machine or to the test is possible. To avoid parasitic oscillations influencing the

measurement signal the sensors are arranged exactly in the force measurement plane.

Xforce Dynamic load cells possess an intelligent EEPROM plug for connection to the ZwickRoell electronics. All relevant load cell data, including calibration data, are stored on the plug, enabling the ZwickRoell testing software to identify the sensor automatically and among other things set the force limits accordingly.

All mounting surfaces are in the form of a flange with centering spigot, ensuring alignment of the load string.

Features
- fatigue-resistant up to ±100% of nominal force
- high natural resonance for use at high test-frequencies
- inertial force compensation via two integrated accelerometers
- high safety margin against overload
- intelligent EEPROM plug with sensor data for simple connection to ZwickRoell electronics
- 6-conductor technology for maximum measurement accuracy
- flange adapter with centering spigot for easy installation

Product Information

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Nominal force	5	10	25	50	kN
Item No.	1015190	1015191	1015192	1015193	
Electrical / technical measurement data					
Linearity deviation[1][2]	0.03	0.04	0.04	0.04	%
Hysteresis[1]	0.03	0.04	0.04	0.05	%
Reproducibility[1]	0.025	0.025	0.025	0.025	%
Temperature influence on the zero-signal TK_0, max.	0.0015	0.0015	0.0015	0.0015	% F_{nom}/K
Temperature influence on characteristic value TK_C, max.	0.0015	0.0015	0.0015	0.0015	% F_{lst}/K
Nominal characteristic value	1	2	2	2	mV/V
IP protection class			67		
Mechanical data / limit values					
Nominal measured displacement	0.02	0.03	0.03	0.03	mm
Basic resonance[3]	9.3		9.2	6.2	kHz
Fatigue load[4]	100	100	100	100	%
Limit force[5]	230	230	230	230	%
Force at break	400	400	400	400	%
Limit transverse force[6]	100	100	100	100	%
Limit bending moment[7]	0.140	0.330	0.635	1.750	kNm
Nominal temperature range		-10° ... +45° C			
Dimensions / connection size					
Height with adapter (A)	105	119	119	183	mm
Mounting hole pattern					
Pitch circle Ø	70	70	70	105	mm
Screws	6 x M8	6 x M8	6 x M8	12 x M10	
Hole	6 x 9	6 x 9	6 x 9	12 x 11	
Centering gauge Ø (B)	30 H7	30 H7	30 H7	70 H7	mm

[1] Related to the end value

[2] Maximum deviation of displayed value from reference line

[3] Frequency at which the unloaded load cell without any mounting parts vibrates after a pulse-like force

[4] Permissible load range of a sinusoidal pulsating or alternating load which the load cell tolerates for more than 10^7 cycles without any significant changes in its measurement properties

[5] Limit force refers to the greatest force with which the load cell can be loaded without resulting in significant mechanical deformation or change in the zero signal

[6] Largest permissible static transverse force, perpendicular to the measurement axis without resulting in a significant change in properties

[7] Static bending moment, e.g. as a result of eccentric force application that does not lead to a significant change in properties

Nominal force	100	250	500	600	1000	kN
Item No.	1011630	1011631	3005209	1065577	3001507	
Electrical / technical measurement data						
Linearity deviation[1][2]	0.04	0.04	0.06	0.06	0.06	%
Hysteresis[1]	0.05	0.05	0.06	0.06	0.06	%

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Nominal force Item No.	100 1011630	250 1011631	500 3005209	600 1065577	1000 3001507	kN
Reproducibility[1]	0.025	0.025	0.025	0.025	0.025	%
Temperature influence on the zero signal TK_0, max.	0.0015	0.0015	0.0015	0.0015	0.0015	% F_{nom}/K
Temperature influence on the characteristic value TK_C, max.	0.0015	0.0015	0.0015	0.0015	0.0015	% F_{actual}/K
Nominal characteristic value	2	2	2	2	2	mV/V
IP protection class			67			
Mechanical data / limit values						
Nominal measured displacement	0.04	0.06	0.07	0.07	0.08	mm
Basic resonance[3]	8.5	6.0	4.8	4.8	5.0	kHz
Fatigue load[4]	100	100	100	100	100	%
Limit force[5]	230	230	230	230	230	%
Force at break	400	400	400	400	400	%
Limit transverse force[6]	100	100	100	100	100	%
Limit bending moment[7]	4.5	7.5	15.0	15.0	30.0	kNm
Nominal temperature range			-10° ... +45° C			
Dimensions / connection size						
Height with adapter (A)	183	275	333	333	428	mm
Mounting hole pattern						
Pitch circle Ø	105	165	240	240	280	mm
Screws	12 x M10	12 x M16	12 x M20	12 x M20	12 x M24	
Hole	12 x 11	12 x 17.5	12 x 22	12 x 22	12 x 26	
Centering gauge Ø (B)	70 H7	100 H7	100 H7	100 H7	100 H7	mm

[1] Related to the end value

[2] Maximum deviation of display value from the reference line

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