

# U10 M

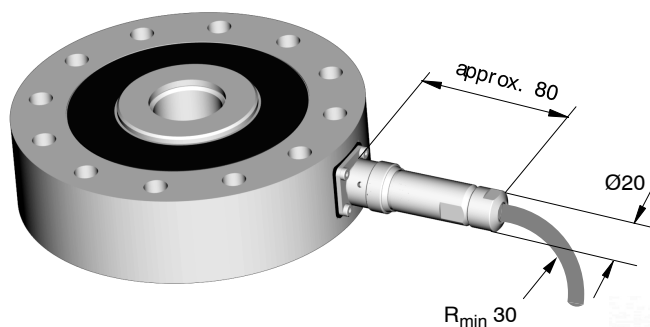
## Force transducers



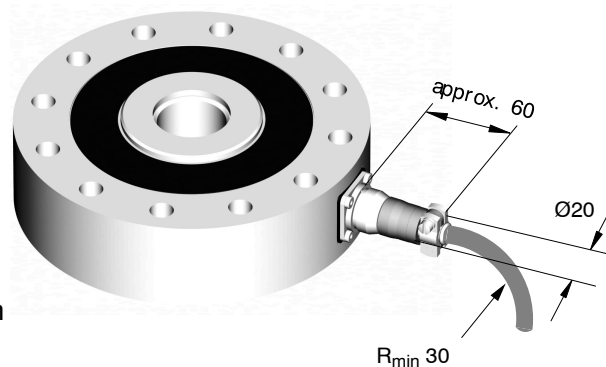
### Special features

- Tensile/compressive force transducer
- For dynamic and static applications
- Fatigue strength to full scale dynamic amplitude
- Electronic bending moment compensation
- Optional double bridge version
- Stainless material

### Mounting dimensions of connection variants

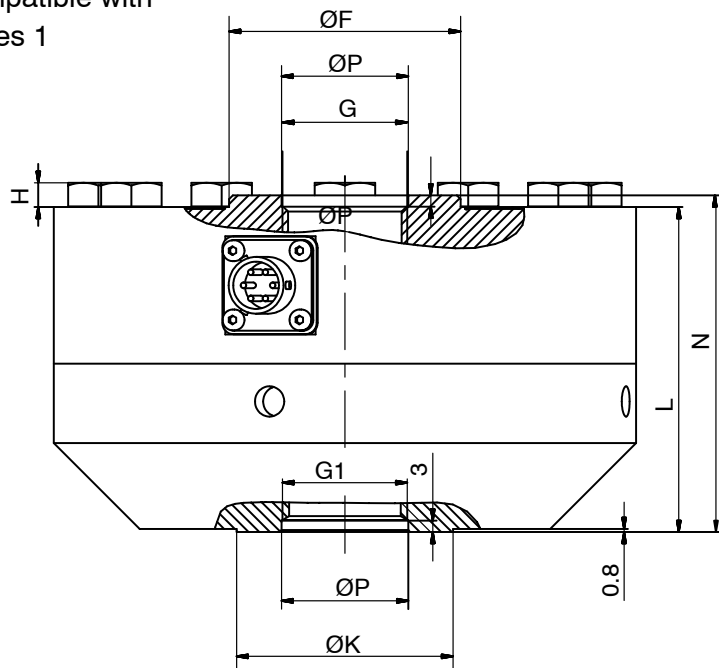
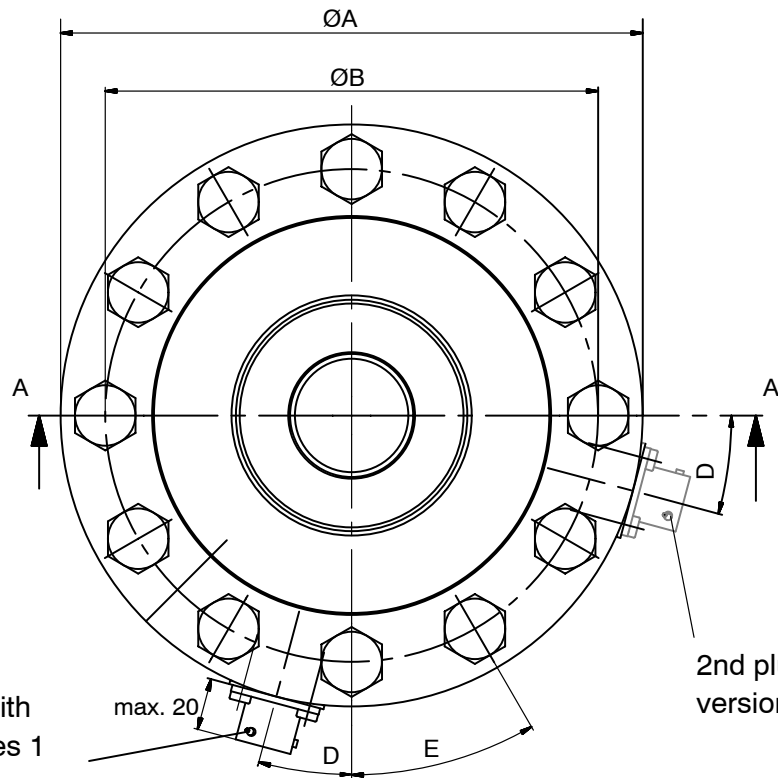


Connection cable **KAB 157-3** with bayonet locking



Connection cable **KAB 158-3** with threaded locking

## Dimensions of U10M with fitted adapter

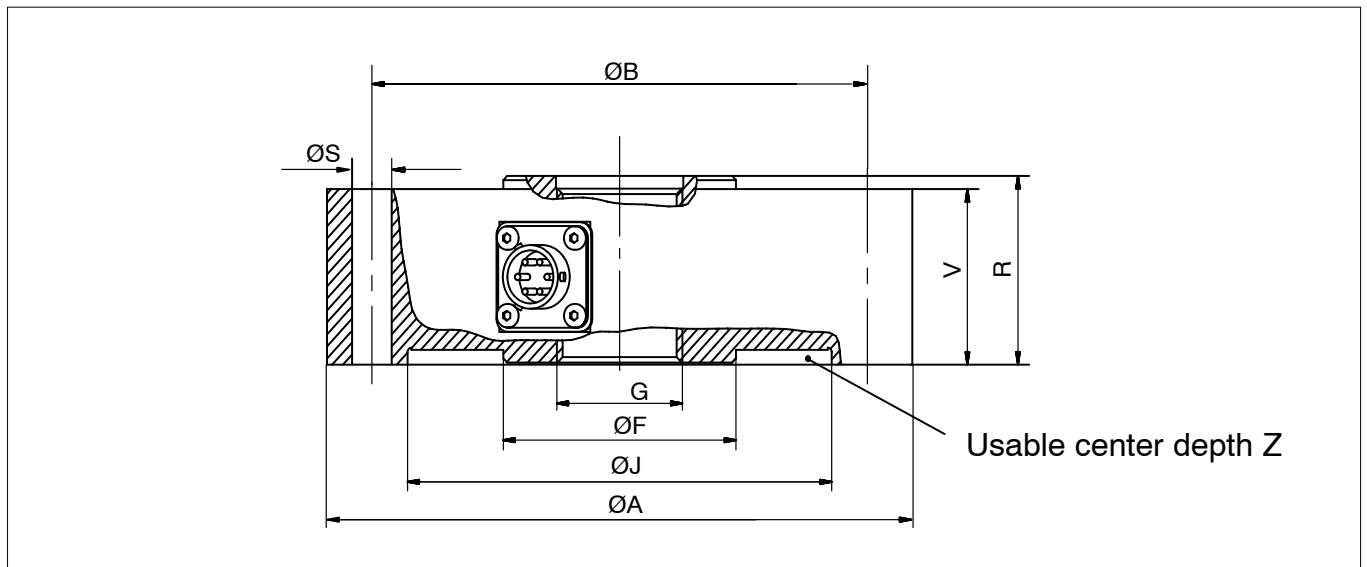


Nom. (rated) force	ØA	ØB	D	E	ØF	G	G1	H	ØK	L	N	ØPH <sup>8</sup>
1.25-25kN	104.8	88.9	22.5°	45°	30.4 <sup>1)</sup>	M16x2-4H 28.4 deep	M16x2-4H 22.1 deep	4	31.8	60.3	63.5	16.5
50-125kN	153.9	130.3	15°	30°	61.2 <sup>2)</sup>	M33x2-4H 35.6 deep	M33x2-4H 35.6 deep	6.4	57.2	85.	89	33.5
250kN	203.2	165.1	11.25°	22.5°	95.5	M42x2-4H 54.6 deep	M42x2-4H 44.5 deep	7.5	76.2	108	114.3	43
500kN	279	229	11.25°	22.5°	122.2	M72x2-4H 82.6 deep	M72x2-4H 69.8 deep	10	114	152.4	165.1	73

<sup>1)</sup> 12.5 kN and 25 kN: 31.5;

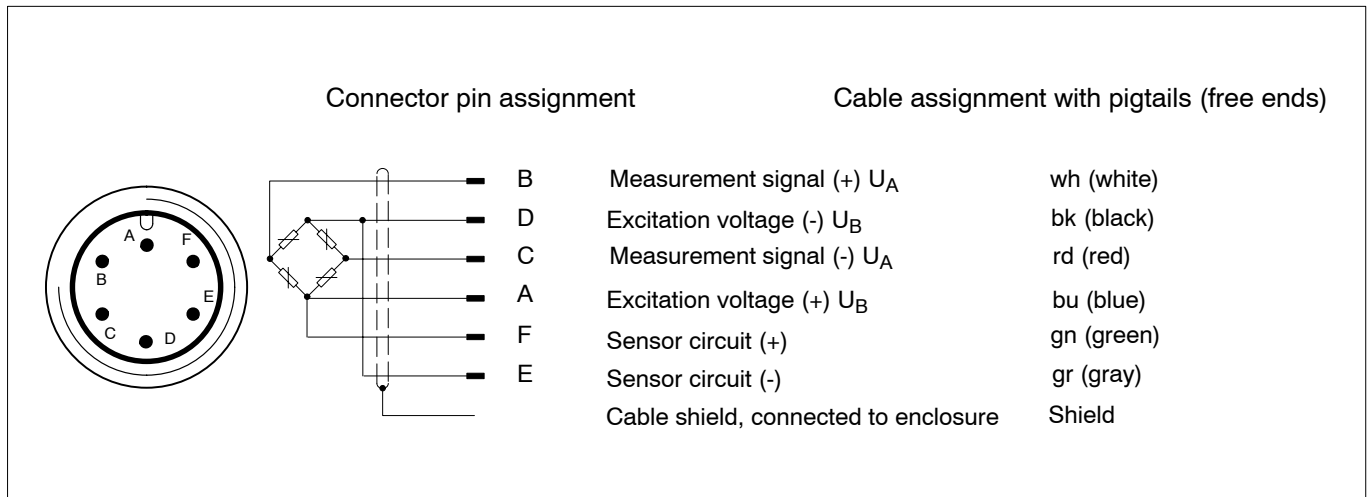
<sup>2)</sup> 125 kN: 67.3

## Dimensions of U10M without adapter



Nominal (rated) force	ØA	ØB	ØS	ØF	ØJ	G	V	R	Z
1.25	104.8	88.9	6.8	30.4	78 H8	M16x2-4H	31.7	34.9	2,5
2.5				30.4					
5				30.4					
12.5				31.5					
25				31.5					
50	153.9	130.3	10.4	62.2	111.5 H8	M33x2-4H	41.4	44.5	3.5
125				67.3					
250	203.2	165.1	13.5	95.5	143 H8	M42x2-4H	57.2	63.5	6
500	279	229	16.8	122.2	175 H8	M72x2-4H	76.2	88.9	6

## Connector and cable assignment



### Accessories (to be ordered separately):

#### Cables / plugs

Connection cable with bayonet locking; IP67

3 m long; TPE outer sheath; 6 x 0.25 mm<sup>2</sup>; pigtails, shielded

Connection cable with threaded locking; IP54

3 m long; TPE outer sheath; 6 x 0.25 mm<sup>2</sup>; pigtails, shielded

Loose connector socket, bayonet locking

Loose connector socket, threaded terminal end

#### Ordering number:

1-KAB157-3

1-KAB158-3

3-3312.0350

3-3312.0354

## Specifications (VDI/VDE 2638)

Nominal (rated) force	$F_{nom}$	kN	1.25	2.5	5	12.5	25	50	125	250	500	
Nominal (rated) sensitivity	$C_{nom}$	mV/V	1 to 1.5 <sup>1)</sup>			2 to 2.5 <sup>1)</sup>						
Relative deviation from zero	$d_{s,o}$	%	1									
Relative reversibility error ( $0.4F_{nom}$ )	$u_{0,4}$	% <sub>vl</sub>	< 0.075		0.1		0.125		0.15			
		% <sub>vc</sub>	0.03		0.04		0.05		0.06			
Relative repeatability error without rotation		%	0.025									
Linearity deviation	$d_{lin}$	%	< 0.03		< 0.04		< 0.04		< 0.06			
Temperature influence on sensitivity/10K relative to the sensitivity	$TK_C$	%	< 0.015									
Temperature influence on zero signal/10K relative to the sensitivity	$TK_0$	%	< 0.015									
Bending moment influence (at 10 % x $F_{nom}$ x 10 mm)	$d_Q$	%	0.01									
Relative creep over 30 min	$d_{crF+E}$	%	< 0.04		< 0.025							
Input resistance	$R_i$	$\Omega$	> 345									
Output resistance	$R_o$	$\Omega$	300 to 360									
Insulation resistance	$R_{is}$	$\Omega$	> $5 \times 10^9$									
Reference excitation voltage	$U_{ref}$	V	5									
Operating range of the excitation voltage	$B_{U,G T}$	V	0.5 to 12									
Nominal (rated) temperature range	$B_{t,nom}$	$^{\circ}C$	-10 to +45									
Operating temperature range	$B_{t,G}$	$^{\circ}C$	-30 to +85									
Storage temperature range	$B_{t,S}$	$^{\circ}C$	-30 to +85									
Reference temperature	$t_{ref}$	$^{\circ}C$	+23									
Maximum operating force	$(F_G)$	%	230									
Breaking force	$(F_B)$	%	> 400									
Static lateral limit force (transducer with adapter) <sup>2)</sup>	$(F_Q)$	%	100									
Maximum permissible torque		Nm	31	63	127	317	635 <sup>3)</sup>	1270	3175 <sup>3)</sup>	5715	11430	
Maximum permissible bending moment		Nm	30	60	125	315	635	1270	3175	5715	11430	
Material measuring body			high-strength aluminium alloy				stainless material					
Weight with adapter without adapter		kg	1.2		3		10		23		60	
		kg	0.5		1.3		5		11		28	
Rel. permissible vibrational stress to DIN 50100	$F_{rb}$	%	200									
Degree of protection to DIN 60529			IP67 <sup>5)</sup>									
Natural frequency	$f_g$	kHz	4.5	5.9	9.3	6.6	9.2	6.5	8.1	6.6	6.1	
Nominal (rated) displacement	$s_{nom}$	mm	0.02		0.03		0.03		0.04		0.05	0.06

1) Option: Adjustment of sensitivity to 2 mV/V (or 1 mV/V)

2) Specifications at 200 % typically corresponds to those at nominal (rated) force


3) Pure lateral force related to half the measuring body height ( $0.5 \times V$ , see drawing on page 3)

4) Transducer with 25 kN adapter: 370 Nm; 125 kN: 2640 Nm

5) For plug-in bayonet connector version

## Versions and order numbers

Code	Measuring range	Order number
1k25	1.25 kN	<b>1-U10M / 1.25 kN</b>
2k50	2.5 kN	<b>1-U10M / 2.5 kN</b>
5k00	5 kN	<b>1-U10M / 5 kN</b>
12k5	12.5 kN	<b>1-U10M / 12.5 kN</b>
25k0	25 kN	<b>1-U10M / 25 kN</b>
50k0	50 kN	<b>1-U10M / 50 kN</b>
125k	125 kN	<b>1-U10M / 125 kN</b>
250k	250 kN	<b>1-U10M / 250 kN</b>
500k	500 kN	<b>1-U10M / 500 kN</b>

 Preferential version, available soon

Number of measuring bridges	Sensitivity	Calibration	Transducer identification	mechanical version	Plug protection	Plug version bridge A	Plug version bridge B
Single bridge <b>SB</b>	not adjusted <b>N</b>	100% (dyn.) <b>1</b>	without TEDS <b>S</b>	with adapter <b>W</b>	without plug protection <b>U</b>	Bayonet connector <b>B</b>	Bayonet connector <b>B</b>
Double bridge <b>DB</b>	adjusted <b>J</b>	200% (stat.) <b>2</b>	with TEDS <b>T</b>	without adapter <b>N</b>	with plug protection <b>P</b>	Threaded connector <b>G</b>	Threaded connector <b>G</b>

<b>K-U10-</b>	<b>12k5</b>	<b>DB</b>	<b>J</b>	<b>2</b>	<b>T</b>	<b>W</b>	<b>P</b>	<b>B</b>	<b>G</b>
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<b>Number of measuring bridges</b>	For reasons of redundancy, in devices relevant to safety it is necessary to check the plausibility of the measurement signal with a second measuring bridge (applied on the measuring element). The signals are independently conditioned and evaluated using two separate measuring amplifiers.
<b>Sensitivity</b>	The exact nominal (rated) sensitivity is specified on the identification plate. The transducer can also be adjusted to a linear, adjusted sensitivity of 1 mV/V or 2 mV/V (when 200% calibration is selected: 2 mV/V or 4 mV/V). The rel. sensitivity deviation is then 0.1% of the nominal (rated) sensitivity. The sensitivity range of a non-adjusted transducer is between 1 and 1.3 or 2 and 2.3 mV/V.
<b>Calibration</b>	In the standard version, the transducer is designed for dynamic application up to a vibration bandwidth of $\pm 100\% F_{nom}$ . For quasistatic applications, the transducer can be used up to $200\% F_{nom}$ . The option is available to calibrate accordingly to $200\% F_{nom}$ .
<b>Transducer identification</b>	TEDS integration (integrated electronic data sheet) in accordance with IEEE1451.4
<b>mechanical version</b>	The sensitivity is determined at the factory with the bolted-on adapter. The bolted-on adapter ensures the best-possible screw-fastening conditions and allows the transmission of axial force through a central internal thread. If this is not used, a sensitivity deviation of $< 1\%$ must be taken into account.
<b>Plug protection</b>	Mechanical protection through the installation of an additional square profile around the connector. Approximate dimensions: width x height x depth: 30x30x20
<b>Plug version bridge A</b>	The standard version is the male device connector with bayonet locking (PT02E10-6P-compatible). The option is also available to install a screw-fitting male device connector (PC02E10-6P-compatible).
<b>Plug version bridge B</b>	The standard version is the male device connector with bayonet locking (PT02E10-6P-compatible). The option is also available to install a screw-fitting male device connector (PC02E10-6P-compatible). Both these connection variants are often used for differentiation in the double-bridge version.

Modifications reserved.

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