C5

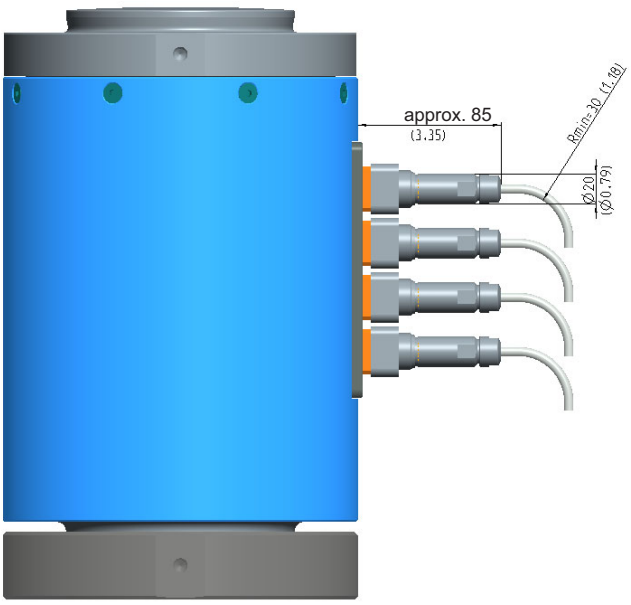
Heavy duty compressive force transducer

Special features

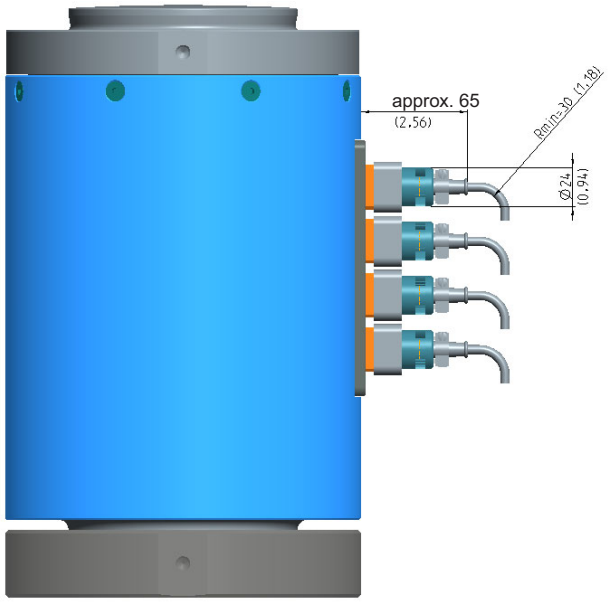
- **Nominal (rated) forces 5 MN … 20 MN**
- **Class 00 to ISO 376 in the force measurement range between 40% and 100% of the nominal (rated) force**
- **Class 0.5 to ISO 376 in the force measurement range between 20% and 100% of the nominal (rated) force**
- **Bending moment bridges, double-bridge version, TEDS chip and other options available on request**
- **Accessories to ISO 376 included with delivery**

Data sheet

Mounting dimensions of connection variants

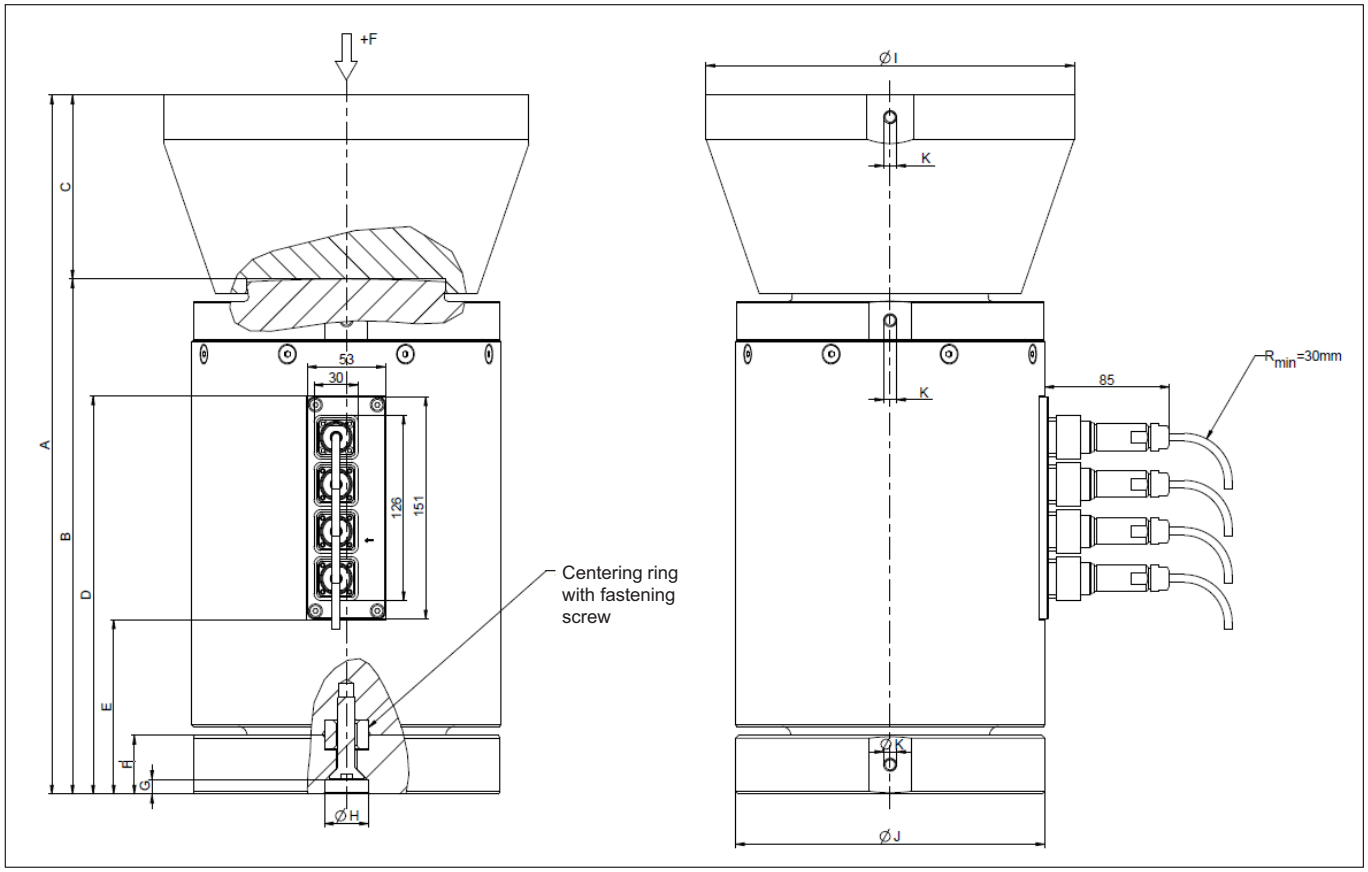


Version with bayonet connector



Version with threaded connector

Dimensions of C5



Dimensions [mm]	Nominal (rated) force			
	5 MN	7.5 MN	10 MN	20 MN
A	475	635	635	900
B	350	455	455	650
C	125	180	180	250
D	270	340	340	521
E	119	189	189	370
F	40	55	55	80
G	10	10	10	10
ØH	30	30	30	30
ØI	250	360	360	505
ØJ	210	269	269	368
K	M8, 15 mm deep	M12, 23 mm deep	M12, 23 mm deep	M16, 29 mm deep

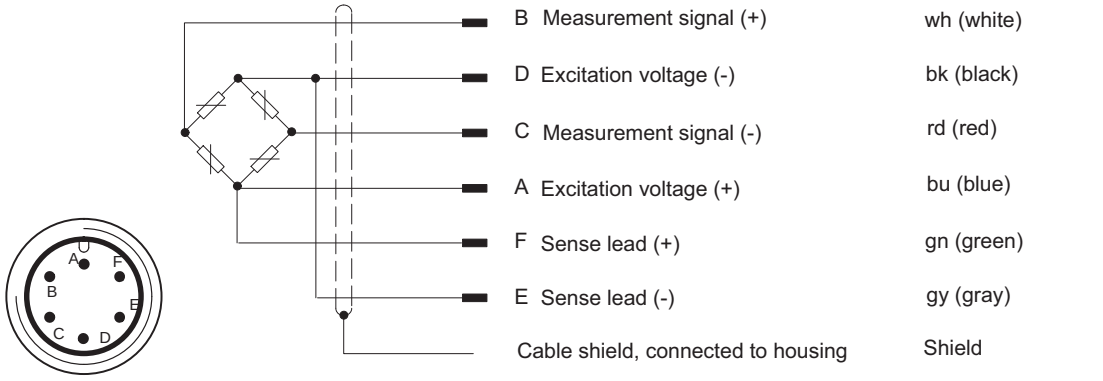
Specifications

Type			C5			
Nominal (rated) force	F_{nom}	MN	5	7.5	10	20
Accuracy to ISO 376						
Class to ISO 376 (0.2 F_{nom} to F_{nom}) [1)]			0.5			
Class to ISO 376 (0.4 F_{nom} to F_{nom}) [1)]			00			
Reproducibility	b	%	± 0.03			
Repeatability	b‘	%	± 0.025			
Rel. deviation from the fitting curve (0.2 F_{nom} to F_{nom})	f_c	%	± 0.012			± 0.015
Rel. zero error (zero signal return)	f_0	%	± 0.02			
Rel. reversibility error (0.4 F_{nom} to F_{nom})			0.07			
Rel. reversibility error (0.2 F_{nom} to F_{nom})	v	%	0.15	0.13	0.08	0.07
Creep	c	%	0.02			
Accuracy to VDI/VDE 2638						
HBM accuracy class			0.09			
Rel. repeatability error in a constant mounting position	b_{rg}	%	± 0.025			
Rel. reversibility error (hysteresis) at 0.4 F_{nom} (based on the full scale value)	$v_{0.4}$	%	0.05			
Rel. non-linearity	d_{lin}	%	0.09			
Zero point return	$d_{s,0}$	%	1			
Rel. creep over 30 mins	d_{crF+E}	%	< ± 0.02			
Effect of temperature on zero signal/10K based on sensitivity	T_{C0}	%	< ± 0.05			
Effect of temperature on sensitivity/10K based on the measured value	T_{CS}	%	< ± 0.05			
Electrical properties						
Rated output range	C	mV/V	2…. 3			
Nominal (rated) output	C_{nom}	mV/V	2.5			
Rel. zero signal deviation (zero point tolerance)		%	0.01			
Input resistance	R_e	Ω	350			
Output resistance	R_a	Ω	350			
Insulation resistance at 100 V test voltage	R_{is}	GΩ	2			
Reference excitation voltage	U_{ref}	V	5			
Operating range of the excitation voltage	$B_{U,G\,T}$	V	0.5…12			
Connection			6-wire			
Option: Bending moment bridges						
Input resistance	R_e	Ω	350			
Output resistance	R_a	Ω	350			
Operating range of the excitation voltage	$B_{U,G\,T}$	V	0.5…12			
Reference excitation voltage	U_{ref}	V	5			
Connection			6-wire			
Ambient conditions						
Reference temperature	t_{ref}	°C	23			
Nominal (rated) temperature range	$B_{t,nom}$	°C	10…40			
Operating temperature range	$B_{t,G}$	°C	-10…60			
Storage temperature range	$B_{t,S}$	°C	-20…70			

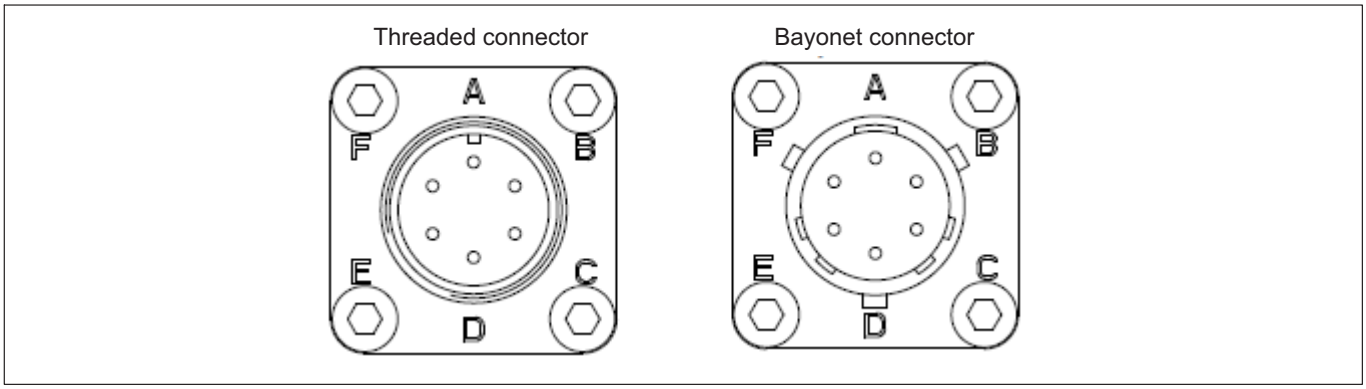
Characteristic mechanical quantities						
Max. operating force[2]	F_G	%	120			
Force limit	F_L	%	120			
Breaking force[2]	F_B	%	200			
Max. static lateral limit force [2), 3)]	F_Q	%	7	7	8	8
Permissible eccentricity	e_G	mm	10	15	20	25
Nominal (rated) displacement with thrust piece	s_{nom}	mm	1.3	1.6	1.9	2.6
Natural frequency	f_G	kHz	3.71	2.84	3.14	2.13
Permissible oscillation stress	f_{rb}	$\%/F_{nom}$	85	85	85	85
Stiffness with thrust piece	F/S	10^6 N/mm	6.33	7.33	10.08	13.66
Other information						
Weight of force transducer without thrust piece		kg	81	158	170	437
Weight of thrust piece		kg	40	120	120	309
Degree of protection in accordance with DIN EN 60529			Min. IP54			
Measuring body material	1.2714					
Measuring point protection	Silicone cover, sensor housing					

1) Classification only guaranteed in conjunction with a calibration certificate to ISO 376
2) Based on the maximum capacity
3) Calculated at 100% maximum capacity plus additional load in each case

Electrical connection



Pin assignment for HBM cables



C5 versions and ordering numbers

Code	Nominal (rated) force
5M00	5 MN
7M50	7.5 MN
10M0	10 MN
20M0	20 MN

No. of measuring bridges	Bending moment bridges	Transducer identification	Plug protection	Electrical connection	Plug version for the "permanently attached cable" option	Overloading
Single bridge **SB**	Without bending moment bridges **NB**	Without TEDS chip **S**	Without plug protection **U**	Bayonet connector **B**	Without cable **O**	Without overloading **N**
Double bridge **DB**	With bending moment bridges **WB**	With TEDS chip **T**	With plug protection **P**	Threaded connector **G**	Free ends **Y**	With overloading **Y**
				Fixed cable, 6 m **K**	D-sub-HD15, 15-pin **F**	
				Fixed cable, 15 m **V**	D-sub-HD15, 15-pin **Q**	
					MS connector ME3106PEMV **N**	

Ordering example:

K-C5 - **7** **M** **5** **0** - **D** **B** - **N** **B** - **T** - **P** - **G** - **O** - **N**

C5 force transducer with a nominal (rated) force of 7.5 MN, double-bridge version without bending moment bridges, with TEDS chip, with plug protection, with threaded connector, without cable, without overloading

- With the “TEDS” option, all measuring bridges are equipped with TEDS chip.
- With the “Electrical connection” option, all measuring bridges (axial and bending moment) are equipped with the chosen option.
- The optional plug protection is not available for fixed cables

Nominal (rated) force	You can purchase force transducers with nominal (rated) forces between 5 MN and 20 MN. The nominal (rated) force is the force at which the sensor provides the rated output specified on the type plate as the output signal.
No. of measuring bridges	You can purchase the force transducer with a single bridge (SB), in which case the C5 comes supplied with one measuring bridge. The double-bridge version (DB) is optionally available. In this case, the C5 is supplied with two electrically isolated bridge circuits, so that two independently working bridge amplifiers can be connected.
Bending moment bridges	You can purchase the force transducer with bending moment bridges (WB). In this case the C5 is supplied with two bending moment bridges, so that you can measure the effective bending moments irrespective of the other measured quantities.
Transducer identification	You can purchase the force transducer with transducer identification (“TEDS”). A TEDS (Transducer Electronic Data Sheet) chip allows you to store the transducer data (rated outputs) in a chip, which can be read by a connected measuring device. In the double-bridge version, each measuring bridge has a dedicated TEDS chip. For more detailed information, refer to the operating manual.
Plug protection	If you wish, we can fit plug protection, consisting of a strong square tube, so that the plug is protected against mechanical damage.

Electrical connection	The standard version is the device plug with a bayonet connection (PT02E 10-6P-compatible). You also have the option of ordering a device plug with screw thread (PC02E 10-6P-compatible). If you order a force transducer in the double-bridge version and/or with bending moment bridges, all measuring bridges will be supplied with the same device plug.
Overloading	You have the option of overloading the force transducer as preparation for calibration.

Accessories

Cables/plugs	Ordering number
Configurable connection cable for connecting the force transducer to the bridge amplifier	K-CAB-F
Connection cable KAB157-3, IP67 (with bayonet connection), 3 m long, outer sheath TPE, 6 x 0.25 mm^2, free ends, shielded, outside diameter 6.5 mm	1-KAB157-3
Connection cable KAB158-3, IP54 (with threaded connector), 3 m long, outer sheath TPE, 6 x 0.25 mm^2, free ends, shielded, outside diameter 6.5 mm	1-KAB158-3
Loose cable socket (bayonet connection)	3-3312.0382
Loose cable socket (screw connection)	3-3312.0354
Ground cable, 400 mm long	1-EEK4
Ground cable, 600 mm long	1-EEK6
Ground cable, 800 mm long	1-EEK8

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