

# Data sheet

## Force Transducer Series K

(4 kN – 630 kN)



### Benefits/Application

- For static and dynamic tensile and compressive forces
- Hermetically sealed
- Very small force application effect
- Very high-cycle fatigue resistant up to 80 % of nominal load
- Insensitive against parasitic forces and moments
- Easy assembling, lots of possibilities

### Options/Accessories

- Optional solid or plug-in connection
- Bending moment circuits
- Extended temperature range
- Second redundant measuring circuit - without crosstalk at different carrier frequencies
- Tension-Torsion combination with Serie M
- Mounting parts for tension and compression

# Technical data

Nominal force compression/tension		$\pm F_{nom}$	kN	4 5 6,3	10 20 25	40 50 63	100	150	160	200 250	400 500	630
Accuracy class				0,02							0,03	0,05
Force measurement range		%	1 - 100									
Linearity error	$d_{lin}$	%	0,02							0,03		
Interpolation error	$f_c$	%	0,4									
Hysteresis	$h$	%	0,02							0,03	0,05	0,08
Reversibility error	$v$	%	0,2									
Repeatability (f.s.)		%	0,003									
Creep		%	0,025									
Temperature effect on characteristic value per 10 K	$TK_c$	%/10 K	0,04									
Temperature effect on zero signal per 10 K	$TK_0$	%/10 K	0,025									
Eccentricity effect		%/mm	0,015									
Bending moment effect		%/N·m	<0,003									
Lateral force effect		%/(0,1·F <sub>nom</sub> )	0,02									
Torque effect		%/(mm·F <sub>nom</sub> )	0,005									
Characteristic value difference, tension/compression force	$d_{zd}$	%	0,07							0,1		
Rated characteristic value <sup>3)</sup>	$C_{nom}$	mV/V	2			1; 2			1; 2		2	
Characteristic value tolerance	$d_c$	%	0,2									
Zero signal deviation	$d_{s,0}$	%	0,5									
Input resistance	$R_e$	Ω	1000 -	1100 -	1100 -	1200 -			1000 -	1100 -		
Output resistance	$R_a$	Ω	900 -	900 -	900 -	1000 -			800 -	900 -	1000 -	
Insulation resistance	$R_{is}$	Ω	> 10 <sup>9</sup>									
Operating range of excitation voltage	$B_{U,G}$	V	5 - 20									
Protection (DIN EN 60529)			50 <sup>1)</sup> ; 68 <sup>2)</sup>									

Metrological Data

Electrical Data

# Technical data

Mechanical Data	Nominal force compression/tension	$\pm F_{nom}$	kN	4 5 6,3	10 20 25	40 50 63	100	150	160	200 250	400 500	630
	Rated Displacement <sup>4)</sup>	$s_{nom}$	mm	0,093 0,08 0,086	0,071		0,12	0,15	0,16	0,19	0,21	0,32
	Spring rigidity <sup>4)</sup>	$c_{ax}$	kN/mm	43 70 73	140 280 350	560 700 890	830	1000		1050 1300	1900 2400	2000
	Mass	$m$	kg	0,5	1	1,2	3,7			10,4	20	31
	Proportionate moving mass	$m_{mess}$	kg	0,12	0,22	0,35	0,8			2,4	4	5
	Fundamental resonant frequency <sup>4)</sup>	$f_G$	kHz	3 3,5 4	4	6,8	5			3,7	4	3
	Permissible oscillation stress <sup>3)</sup>		%	± 80								
	Force limit		%	150								
	Breaking force		%	300								
	Lateral force limit		%	100								
Limits	Permissible eccentricity	$e_G$	mm	10			15		20	25		
	Bending moment limit	$M_{bzul}$	kN·m	0,25	0,4	1	3,5	5	10	20		
	Rated temperature range	$B_{T,nom}$	°C	10 - 60								
	Operating temperature range	$B_{T,G}$	°C	- 40 - +120								

1) Plug-in connection

2) Permanent connection

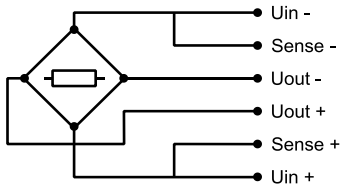
3) Rated characteristic value 1mV/V with permissible oscillation stress ± 100 % available on request.

4) Information for rated characteristic value 2mV/V; 1mV/V available on request.

## Version

Nominal force compression/tension	4 5 6,3	10 20 25	40 50 63	100	150	160	200 250	400 500	630
Typ "F" (flange)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Typ "G" (thread)	✓	✓	✓						

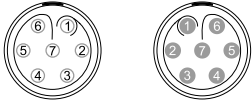
# Cable connection



Permanent connection end not connected	Connection pluggable <sup>1)2)</sup>
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Grey cable  
 Ø 6,5 mm  
 6 x 0,25 mm<sup>2</sup>  
 Temperature range: -35 °C bis +90 °C

7-pin LEMO Series 0  
 Female: - Male:



Connection		Wire colour	Pin
Supply voltage (+)	U <sub>in+</sub>	blue	3
Supply voltage (-)	U <sub>in-</sub>	black	2
Measurement signal (+)	U <sub>out+</sub>	white	1
Measurement signal (-)	U <sub>out-</sub>	red	4
Sense (+)	Sense+	green	5
Sense (-)	Sense-	grey	6
Shielding		yellow	Housing

1) View too weldingside

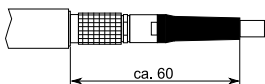
2) Female LEMO S.A. Typ: EGG.1B.307.CLL; Male: FGG.1B.307.CLA.D72



Permanent connection  
 End not connected



Connection pluggable



- Cable length 5 m. More cable types and lengths on request
- Connector types on cable end: D-Sub 9; D-Sub 15; M-S 7pol
- In case of order please chose "solid conection" or "plug-in connection"

# Option: Bending moment



Nominal force	$F_{nom}$	kN	4 - 630 (2mV/V)	100 - 630 (1 mV/V)
Rated bending moment	$Mb_{nom}$	N·m	$F_{nom} \cdot 8 \text{ mm}$	$F_{nom} \cdot 12 \text{ mm}$
Reproducibility		%	0,01	
Temperature effect on characteristic value per 10 K	$TK_C$	%/10 K	0,2	
Temperature effect on zero signal per 10 K	$TK_0$	%/10 K	0,2	
Rated characteristic value	$C_{nom}$	mV/V	ca. 0.3	
Input resistance	$R_e$	$\Omega$	400	
Operating range of excitation voltage	$B_{U,G}$	V	5 - 12	

- The bending moment circuits may be advantageously used for the adjustment of the force introduction

# Option: 2.Measuring circuit



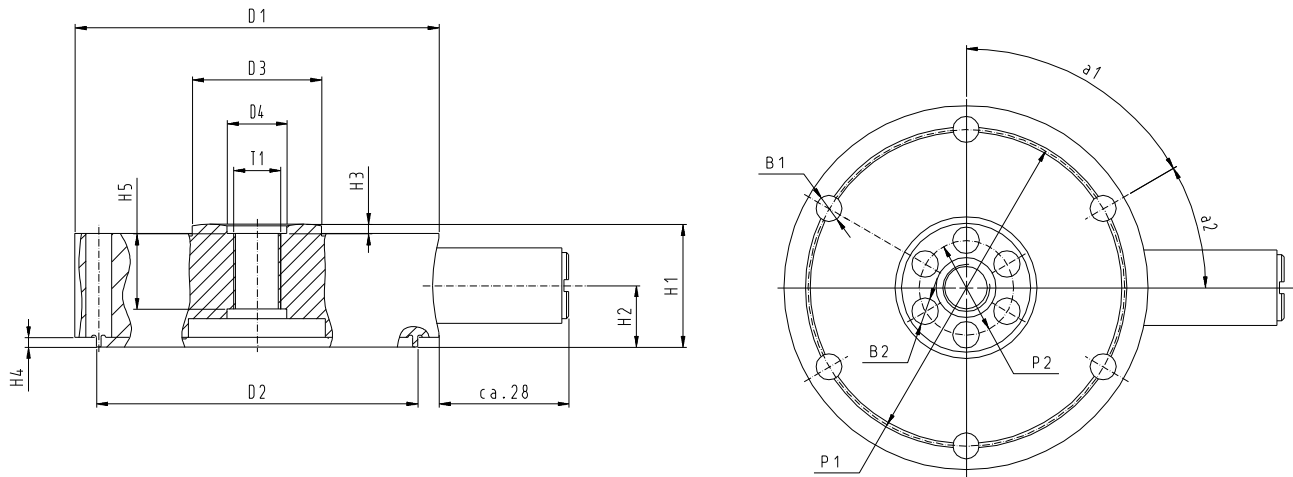
- In case of two circuits the technical data are similarly valid for both circuits

# Mating dimensions

Typ „F/G”

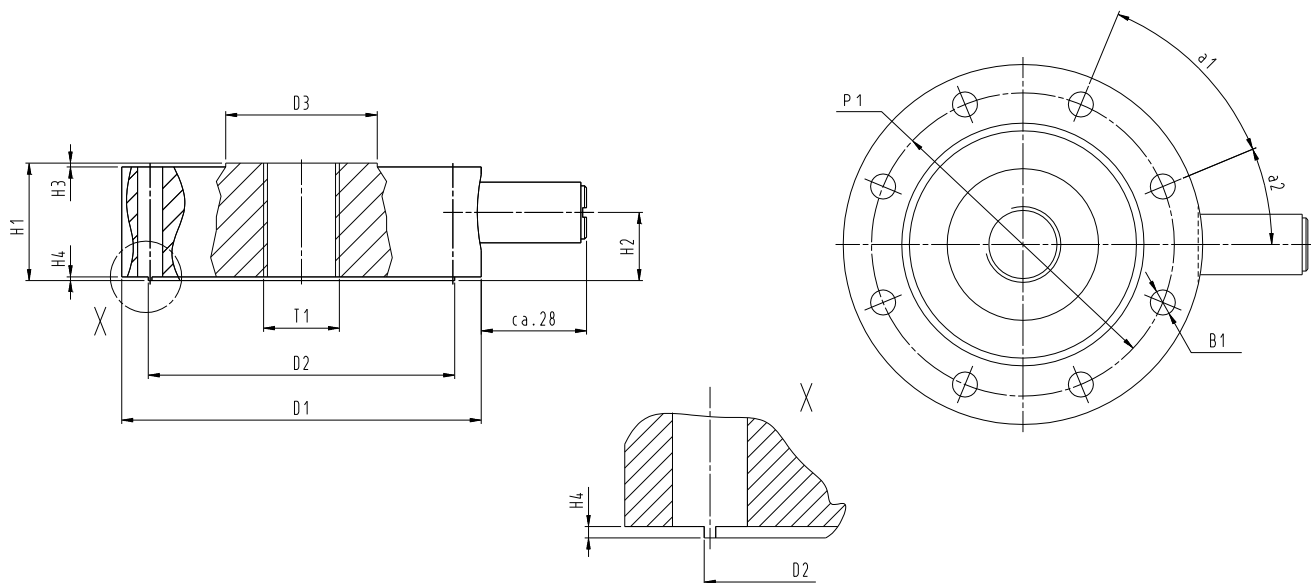
up to 6,3 kN

Size: 4 kN – 6,3 kN



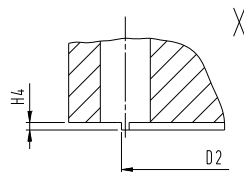
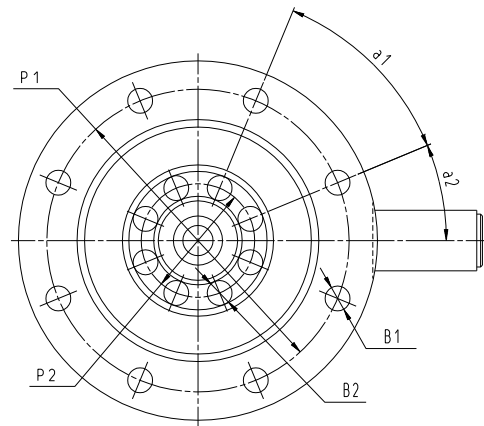
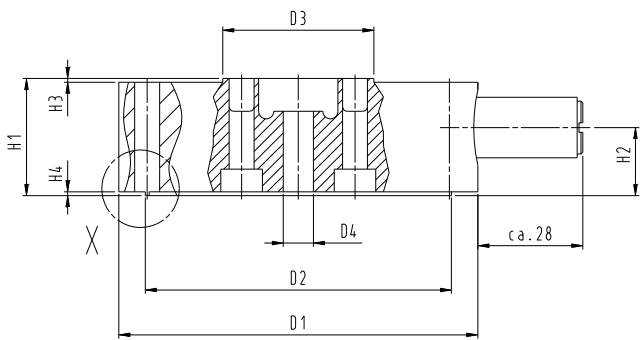
Nominal force compression/tension	$\pm F_{nom}$	kN	4 5 6,3
Bore	$\varnothing B_1$	mm	5,3
Bore	$\varnothing B_2$	mm	20 $\pm$ 0,1
Diameter	$\varnothing D_1$	mm	77-0,1
Diameter	$\varnothing D_2$	mm	68-0,05
Diameter	$\varnothing D_3$	mm	27,3
Diameter	$\varnothing D_4$	mm	12,7 $\pm$ 0,05
Pitch circle diameter	$\varnothing P_1$	mm	67 $\pm$ 0,1
Pitch circle diameter	$\varnothing P_2$	mm	20 $\pm$ 0,1
Thread	$T_1$		M10 x 1
Height	$H_1$	mm	26-0,1
Height	$H_2$	mm	13
Height	$H_3$	mm	2
Height	$H_4$	mm	2
Height	$H_5$	mm	16
Angle	$a_1$		6 x 60°
Angle	$a_2$		30°

Size: 10 kN – 63 kN



Nominal force compression/tension	$\pm F_{nom}$	kN	10	25	40
			20		50
Bore	$\varnothing B_1$	mm	6,6		
Diameter	$\varnothing D_1$	mm	95-0,1		101-0,1
Diameter	$\varnothing D_2$	mm	81-0,1		87,5-0,1
Diameter	$\varnothing D_3$	mm	40-0,1		38,6-0,1
Pitch circle diameter	$\varnothing P_1$	mm	80±0,1		86±0,1
Thread	$T_1$		M20 x 1,5		
Height	$H_1$	mm	31-0,1		
Height	$H_2$	mm	18		
Height	$H_3$	mm	1		1,5
Height	$H_4$	mm	1		
Angle	$a_1$		8 x 45°		
Angle	$a_2$		22,5°		

Size: 10 kN – 160 kN



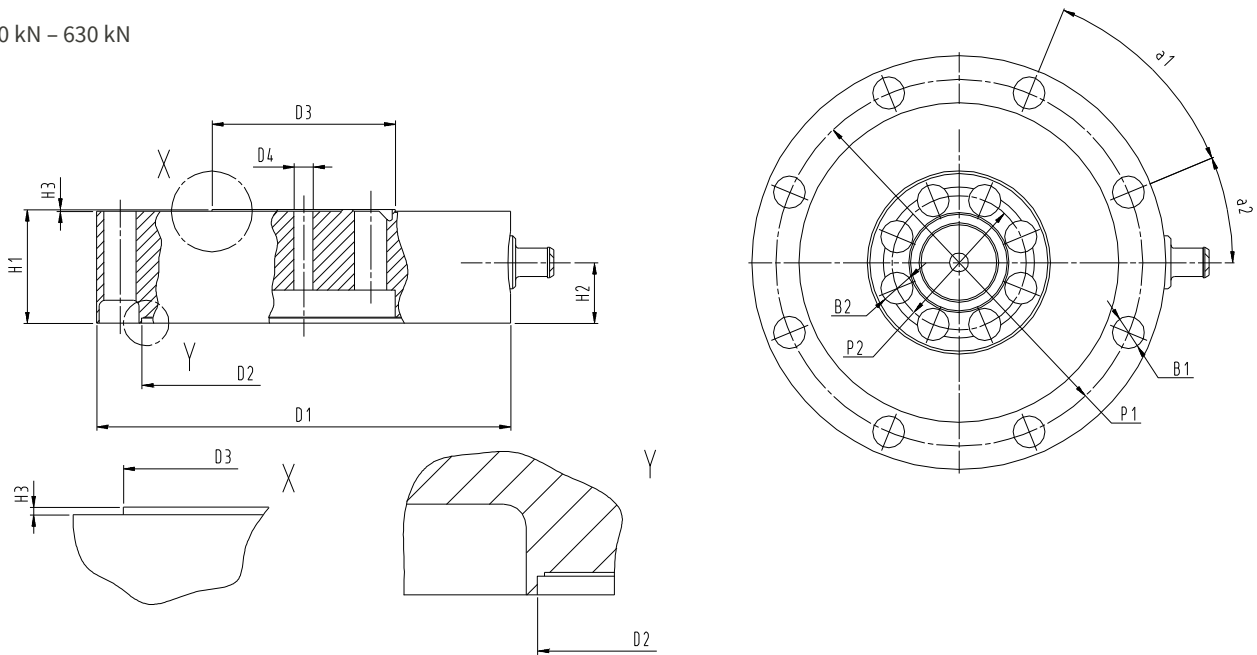
Nominal force compression/tension	$\pm F_{nom}$	kN	10	25	40	100
			20		50	150
Bore	$\varnothing B_1$	mm	6,6			11
Bore	$\varnothing B_2$	mm	6,6			11
Diameter	$\varnothing D_1$	mm	95-0,1		101-0,1	148-0,1
Diameter	$\varnothing D_2$	mm	81-0,1		87,5-0,1	131,4-0,1
Diameter	$\varnothing D_3$	mm	40-0,1		38,6-0,1	63
Diameter	$\varnothing D_4$	mm	8+ $\varnothing$			10+0,1
Pitch circle diameter	$\varnothing P_1$	mm	80 $\pm$ 0,1		86 $\pm$ 0,1	130 $\pm$ 0,1
Pitch circle diameter	$\varnothing P_2$	mm	30 $\pm$ 0,1			45 $\pm$ 0,1
Height	$H_1$	mm	31-0,1			49-0,1
Height	$H_2$	mm	18			25
Height	$H_3$	mm	1		1,5	0,5
Height	$H_4$	mm	1			
Angle	$a_1$		8 x 45°			
Angle	$a_2$		22,5°			



# Typ „F”

up to 630 kN

Size: 200 kN – 630 kN



Nominal force compression/tension	$\pm F_{nom}$	kN	200 250	400 500	630
Bore	$\varnothing B_1$	mm	17	22	26
Bore	$\varnothing B_2$	mm	17	22	26
Diameter	$\varnothing D_1$	mm	219 $_{-0,1}$	270 $_{-0,1}$	312 $_{-0,2}$
Diameter	$\varnothing D_2$	mm	171,05 $_{+0,1}$	203 $_{+0,1}$	226 $_{+0,1}$
Diameter	$\varnothing D_3$	mm	97 $_{-0,1}$	128 $_{-0,1}$	151 $_{-0,1}$
Diameter	$\varnothing D_4$	mm	10 $_{+0,1}$		
Pitch circle diameter	$\varnothing P_1$	mm	194 $\pm 0,1$	235 $\pm 0,1$	267 $\pm 0,1$
Pitch circle diameter	$\varnothing P_2$	mm	71 $\pm 0,1$	95 $\pm 0,1$	112 $\pm 0,1$
Height	$H_1$	mm	60 $_{-0,1}$	80 $_{-0,1}$	90 $_{-0,1}$
Height	$H_2$	mm	32	40	45
Height	$H_3$	mm	1		
Angle	$a_1$		8 x 45°		
Angle	$a_2$		22,5°		

Änderungen vorbehalten. Alle Angaben beschreiben unsere Produkte in allgemeiner Form. Sie stellen keine vereinbarte Beschaffenheit im Sinne des § 434 Abs. 1 BGB dar.

**GTM**  
DEFINING PRECISION

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