Data sheet

Force Transducer

Series K

(4 kN – 630 kN)

Benefits/Application

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

Options/Accessories

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

Technical data

Metrological 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 measurment 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		$\%/(0{,}1 \cdot F_{nom})$	0,02								
	Torque effect		$\%/(mm \cdot F_{nom})$	0,005								
	Characteristic value difference, tension/compression force	d_{ZD}	%	0,07						0,1		
Electrical Data	Rated characteristic value[3]	C_{nom}	mV/V	2			1 ; 2	2	1	1 ; 2		2
	Characteristic value tolerance	d_c	%	0,2								
	Zero signal deviation	$d_{S,0}$	%	0,5								
	Input resistance	R_e	Ω	1000 - 1200	1100 - 1400	1100 - 1200	1200 - 1500			1000 - 1200	1100 - 1500	
	Output resistance	R_a	Ω	900 - 1000	900 - 1200	900 - 1100	1000 - 1200			800 - 1000	900 - 1100	1000 - 1200
	Insulation resistance	R_{is}	Ω	› 10^9								
	Operating range of excitation voltage	$B_{U,G}$	V	5 - 20								
	Protection (DIN EN 60529)			50[1] ; 68[2]								

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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[4]	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[4]	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[4]	f_G	kHz	3 3,5 4	4	6,8	5			3,7	4	3
	Permissible oscillation stress[3]		%	± 80								
Limits	Force limit		%	150								
	Breaking force		%	300								
	Lateral force limit		%	100								
	Permissible eccentricity	e_G	mm	10			15			20	25	
	Bending moment limit	$M_{b\,zul}$	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 1 mV/V with permissible oscillation stress ± 100 % available on request.

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

Design

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)	✓	✓	✓						

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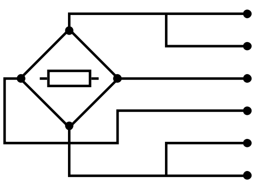
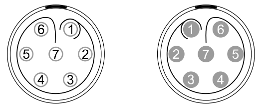
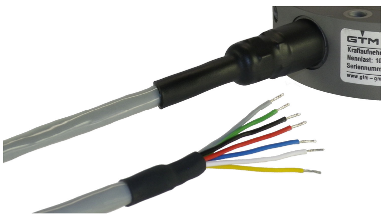
Cable connection

		Permanent connection end not connected	Connection pluggable[1)2)]
		Grey cable Ø 6,5 mm 6 x 0,25 mm² Temperature range: -35 °C bis +90 °C	7-pin LEMO Series 0 Female: - Male: 
Connection		Wire colour	Pin
Supply voltage (+)	U_{in+}	blue	3
Supply voltage (-)	U_{in-}	black	2
Measurement signal (+)	U_{out+}	white	1
Measurement signal (-)	U_{out-}	red	4
Sense (+)	Sense+	green	5
Sense (-)	Sense-	grey	6
Shielding		yellow	Housing

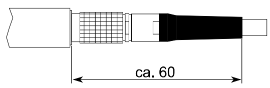
1) View too weldingside

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



Permanent connection end not connected

Connection pluggable



- Cable lenght 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"

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Option: Bending moment

Nominal force	F_{nom}	kN	4 - 630 (2mV/V)	100 - 630 (1 mV/V)
Rated bending moment	Mb_{nom}	N·m	$F_{nom} \cdot 8$ mm	$F_{nom} \cdot 12$ 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. 0,5	
Input resistance	R_e	Ω	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

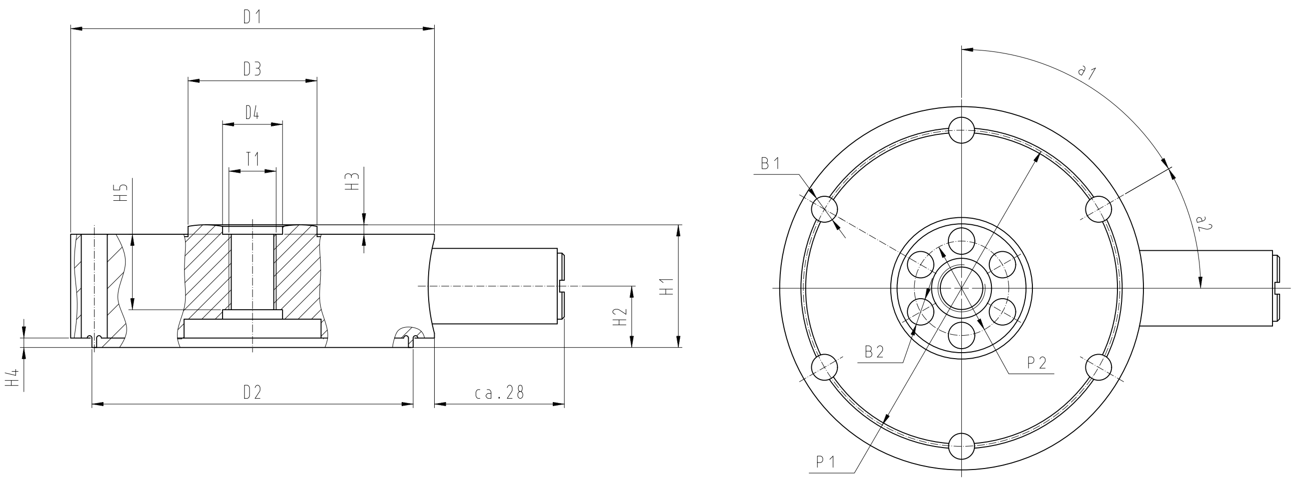
Option: 2.Mesuring circuit

- 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	5,3
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	$12{,}7_{+0,05}$
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°

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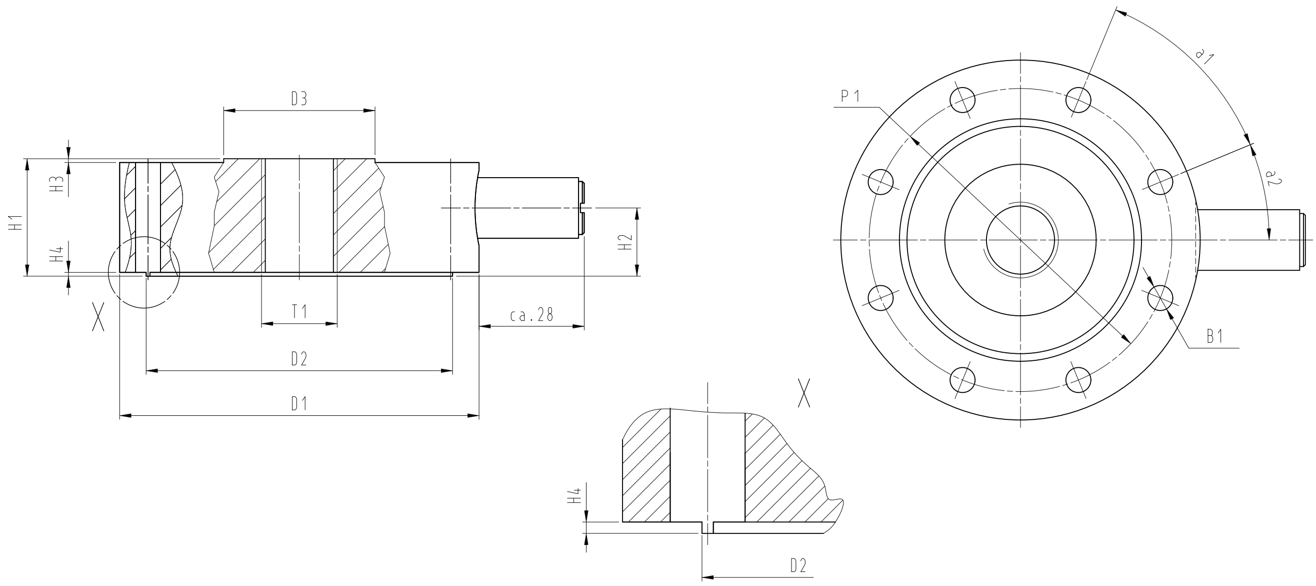
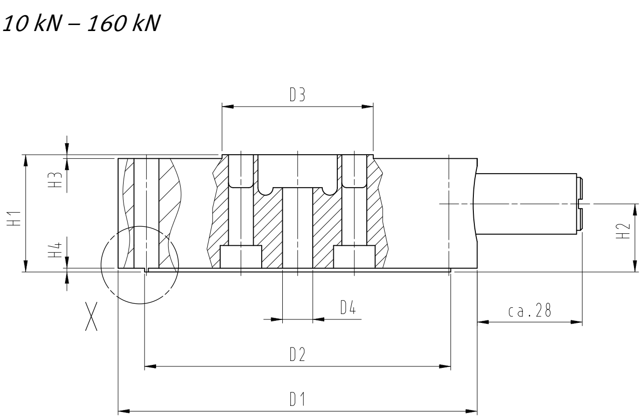
Typ „G“ up to 63 kN

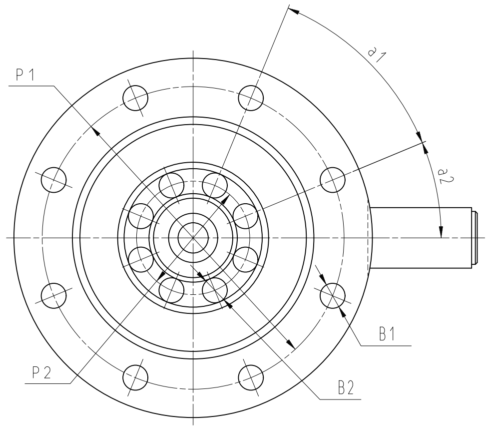
Size: 10 kN – 63 kN

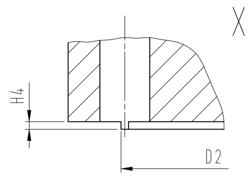


Nominal force compression/tension	$\pm F_{nom}$	kN	10 20	25	40 50 63
Bore	$ØB_1$	mm	6,6		
Diameter	$ØD_1$	mm	$95_{-0,1}$		$101_{-0,1}$
Diameter	$ØD_2$	mm	$81_{-0,1}$		$87{,}5_{-0,1}$
Diameter	$ØD_3$	mm	$40_{-0,1}$		$38{,}6_{-0,1}$
Pitch circle diameter	$ØP_1$	mm	$80_{\pm 0,1}$		$86_{\pm 0,1}$
Thread	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 20	25	40 50 63	100 150 160
Bore	$ØB_1$	mm	6,6			11
Bore	$ØB_2$	mm	6,6			11
Diameter	$ØD_1$	mm	$95_{-0,1}$		$101_{-0,1}$	$148_{-0,1}$
Diameter	$ØD_2$	mm	$81_{-0,1}$		$87{,}5_{-0,1}$	$131{,}4_{-0,1}$
Diameter	$ØD_3$	mm	$40_{-0,1}$		$38{,}6_{-0,1}$	63
Diameter	$ØD_4$	mm	8_{H9}			$10_{+0,1}$
Pitch circle diameter	$ØP_1$	mm	$80_{\pm0,1}$		$86_{\pm0,1}$	$130_{\pm0,1}$
Pitch circle diameter	$ØP_2$	mm	$30_{\pm0,1}$			$45_{\pm0,1}$
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°			

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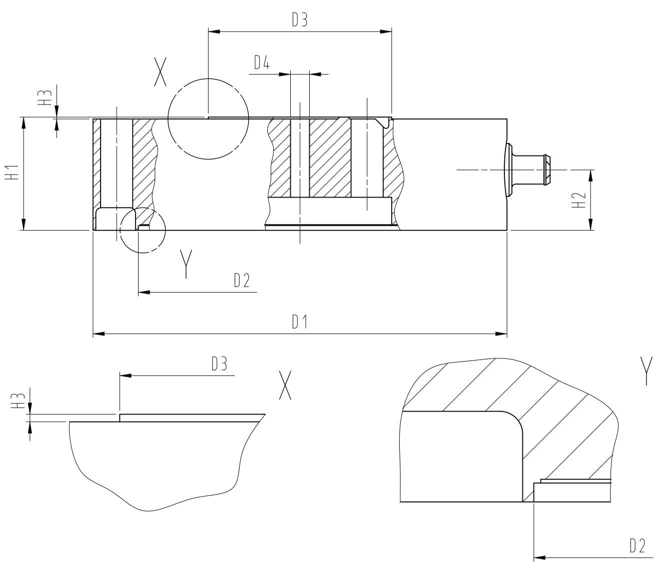
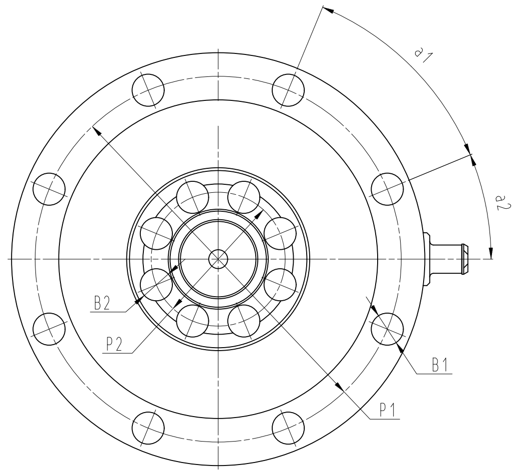
Typ „F“ up to 630 kN

Size: 200 kN – 630 kN





Nominal force compression/tension	$\pm F_{nom}$	kN	200 250	400 500	630
Bore	$ØB_1$	mm	17	22	26
Bore	$ØB_2$	mm	17	22	26
Diameter	$ØD_1$	mm	$219_{-0,1}$	$270_{-0,1}$	$312_{-0,2}$
Diameter	$ØD_2$	mm	$171{,}05_{+0,1}$	$203_{+0,1}$	$226_{+0,1}$
Diameter	$ØD_3$	mm	$97_{-0,1}$	$128_{-0,1}$	$151_{-0,1}$
Diameter	$ØD_4$	mm		$10_{+0,1}$	
Pitch circle diameter	$ØP_1$	mm	$194_{\pm 0,1}$	$235_{\pm 0,1}$	$267_{\pm 0,1}$
Pitch circle diameter	$ØP_2$	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°	

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