Data sheet

Force Transducer

Series **RF**

(25 kN – 10 MN)

Benefits/Application

- For static and dynamic tensile and compressive forces
- Outstanding overload-tolerance
- Easy assembling, lots of possibilities
- Very high-cycle fatigue resistant up to 80 % of nominal load
- Extremely robust against side forces and bending moments

Options/Accessories

- Very high-cycle fatigue resistant up to ± 100 % of nominal load with 1,6 mV/V available
- Second redundant measuring circuit
- Bending moment circuits
- Centre through hole

Technical data

25 kN up to 630 kN

Nominal force compression/tension	$\pm F_{nom}$	kN	25	50	63	100	200	250	300	400	500	630
Accuracy class			0,05									
Force measurment range		%	1 - 100									
Linearity error	d_{lin}	%	0,05									
Interpolation error	f_c	%	0,4									
Hysteresis	h	%	0,1									
Reversibility error	v	%	0,5									
Repeatability (f.s.)		%	0,005									
Creep		%	0,025									
Temperature effect on characteristic value per 10 K	TK_C	%/10 K	0,05									
Temperature effect on zero signal per 10 K	TK_0	%/10 K	0,05									
Eccentricity effect		%/mm	0,02									
Lateral force effect		%/(0,1·F_{nom})	0,2									
Torque effect		%/(mm·F_{nom})	0,005									
Characteristic value difference, tension/compression force	d_{ZD}	%	1									

Metrological Data

Rated characteristic value	C_{nom}	mV/V	1			2 [3]						
Characteristic value tolerance	d_c	%	0,4			0,2						
Zero signal deviation	$d_{S,0}$	%	1			0,5						
Input resistance	R_e	Ω	ca. 750									
Output resistance	R_a	Ω	ca. 500			ca. 750						
Insulation resistance	R_{is}	Ω	>10^9									
Operating range of excitation voltage	$B_{U,G}$	V	5 - 12									
Protection (DIN EN 60529)			IP 68[2]			IP 50[1]; IP 68[2]						

Electrical Data

Mechanical Data	Nominal force compression/tension	$\pm F_{nom}$	kN	25	50	63	100	200	250	300	400	500	630
	Rated Displacement	s_{nom}	mm	0,07			0,1			0,2			
	Spring rigidity	c_{ax}	kN/mm	350	700	900	1000	2000	2500	1500	2000	2500	3000
	Mass	m	kg	0,5			3			7,1	7,5	8	8,5
	Proportionate moving mass	m_{mess}	kg	0,25			1,5			4,5			
	Fundamental resonant frequency	f_G	kHz	>9			>5			>4			
	Permissible oscillation stress[3]		%	± 80									
Limits	Force limit		%	150									
	Breaking force		%	300									
	Lateral force limit		%	80									
	Permissible eccentricity	e_G	mm	30			40			50			
	Bending moment limit	$M_{b\,zul}$	kN·m	1	2	4	6	11	14	24	33	40	49
	Rated temperature range	$B_{T,\,nom}$	°C	10 - 60									
	Operating temperature range	$B_{T,\,G}$	°C	-10 – +80									

1) Plug -in connection

2) Permanent connection

3) Rated characteristic value 1,6mV/V with permissible oscillation stress ± 100% available on request.

Technical data

1 MN up to 10 MN

	Nominal force compression/tension	$\pm F_{nom}$	MN	1	1,2	1,5	2	2,5	3	4	5	6	7,5	10
Metrological Data	Accuracy class			0,05										
	Force measurment range		%	1 - 100										
	Linearity error	d_{lin}	%	0,05										
	Interpolation error	f_c	%	0,4					0,5					
	Hysteresis	h	%	0,1										
	Reversibility error	v	%	0,5										
	Repeatability (f.s.)		%	0,005										
	Creep		%	0,025										
	Temperature effect on characteristic value per 10 K	TK_C	%/10 K	0,05										
	Temperature effect on zero signal per 10 K	TK_0	%/10 K	0,05										
	Eccentricity effect		%/mm	0,02										
	Lateral force effect		%/(0,1·F_{nom})	0,2										
	Torque effect		%/(mm·F_{nom})	0,005										
	Characteristic value difference, tension/compression force	d_{ZD}	%	1										
Electrical Data	Rated characteristic value[3)]	C_{nom}	mV/V	2										
	Characteristic value tolerance	d_c	%	0,2					0,4					
	Zero signal deviation	$d_{S,0}$	%	0,5					1					
	Input resistance	R_e	Ω	ca. 750										
	Output resistance	R_a	Ω	ca. 750										
	Insulation resistance	R_{is}	Ω	>10^9										
	Operating range of excitation voltage	$B_{U,G}$	V	5 - 12										
	Protection (DIN EN 60529)			IP 50[1)]; IP 68[2)]										

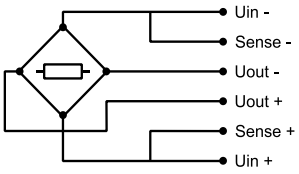
Mechanical Data	Nominal force compression/tension	$\pm F_{nom}$	MN	1	1,2	1,5	2	2,5	3	4	5	6	7,5	10
	Rated Displacement	s_{nom}	mm	0,2		0,3			0,4		0,6			0,7
	Spring rigidity	c_{ax}	MN/mm	5	6	5	6,7	8	7,5	10	8,3	10	12,5	14
	Mass	m	kg	19		46			81	207	285	295	312	490
	Proportionate moving mass	m_{mess}	kg	9,5		23			40,5	104	143	148	156	245
	Fundamental resonant frequency	f_G	kHz	>3		>2			>1		~1			
	Permissible oscillation stress[3]		%	± 80										
Limits	Force limit		%	150										
	Breaking force		%	300										
	Lateral force limit		%	100										
	Permissible eccentricity	e_G	mm	50					75	100				
	Bending moment limit	$M_{b\,zul}$	kN·m	92	112	140	200	240	520	1000	1250	1500	1850	3000
	Rated temperature range	$B_{T,\,nom}$	°C	+10 – +60										
	Operating temperature range	$B_{T,\,G}$	°C	- 10 – +80										

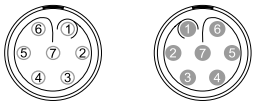
1) Plug -in connection

2) Permanent connection

3) Rated characteristic value 1,6 mV/V with permissible oscillation stress ± 100 % available on request.

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: 

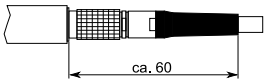
Connection		Wire colour	Pin
Supply voltage (+)	U_{in+}	blue	3
Supply voltage (-)	U_{in-}	black	2
Measurement signal (+)	U_{out+}	white	1
Measurement signal (-)	U_{out-}	red	4
Sense (+)	*Sense+*	green	5
Sense (-)	*Sense-*	grey	6
Shielding		yellow	Housing

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

Plugable connection



- Cable lenght 5 m
- More cable types and lengths on request

Option: 2.Measuring circuit

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

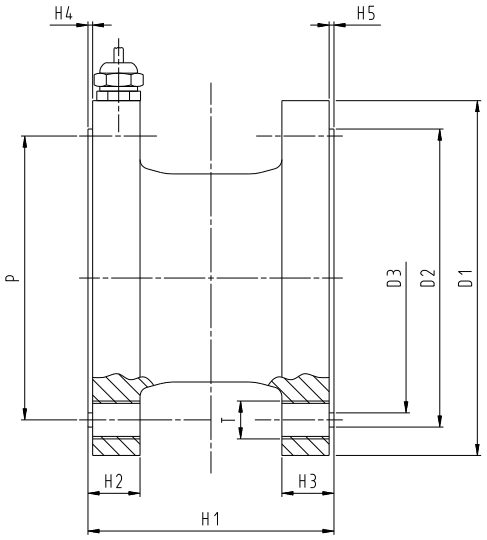
Option: Bending moment

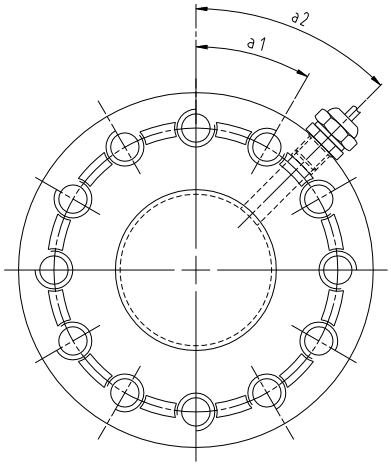
Nominal Force	F_{nom}	kN	25 - 63 (1 mV/V)	100 - 500 (2 mV/V)
Rated bending moment	Mb_{nom}	N·m	F_{nom} · 10 mm	
Reproducibility		%	0,01	
Temperature effect on characteristic value per 10 K	TK_C	%/10 K	0,2	
Temperature effect on zero signal per 10 K	TK_0	%/10 K	0,2	
Rated characteristic value	C_{nom}	mV/V	ca. 1	
Input resistance	R_e	Ω	400	
Operating range of excitation voltage	$B_{U,G}$	V	12	

Mating dimensions

up to 63 kN

Type: 25 kN – 63 kN



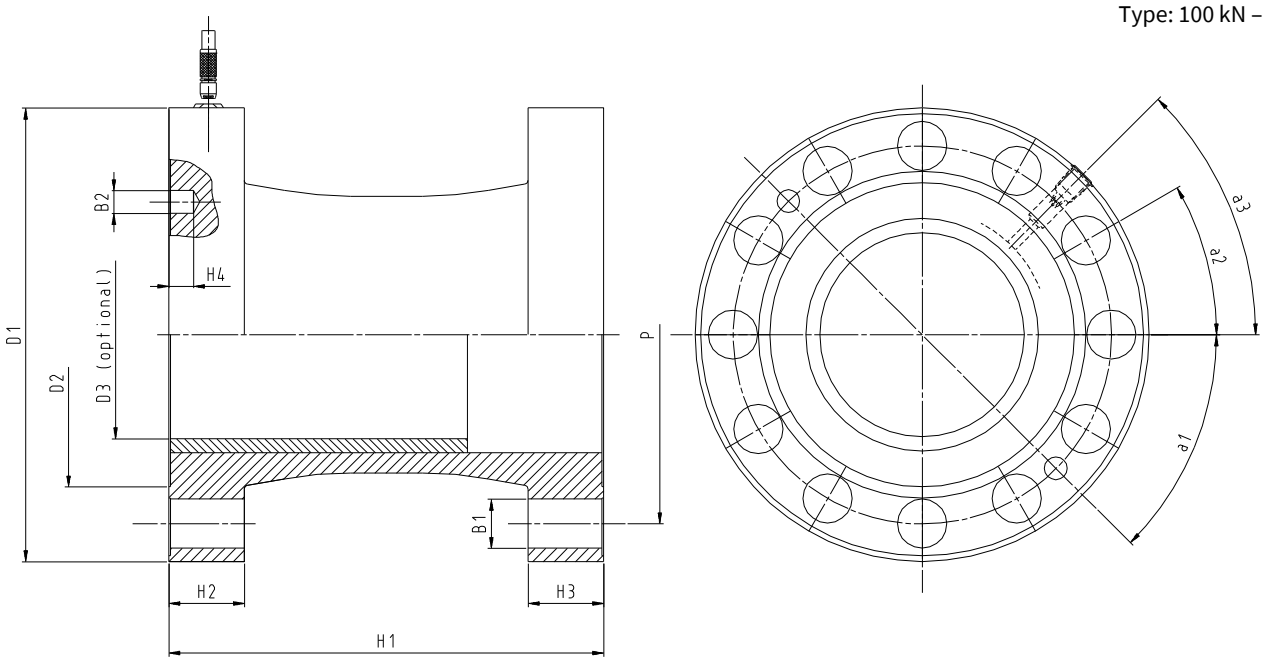


Nominal force compression/tension	$\pm F_{nom}$	kN	25 50 63
Diameter	$ØD_1$	mm	75
Diameter	$ØD_2$	mm	63-0,05
Diameter	$ØD_3$	mm	57+0,01
Pitch circle diameter	$ØP$	mm	60±0,1
Thread	T		M8
Height	H_1	mm	52
Height	H_2	mm	11
Height	H_3	mm	11
Height	H_4	mm	2+0,1
Height	H_5	mm	2+0,1
Angle	a_1		30°
Angle	a_2		45°

Mating dimensions

up to 10 MN

Type: 100 kN – 10000 kN



Nominal force compression/tension	$\pm F_{nom}$	kN	100 200 250	300 400 500 630	1000 1200	1500 2000 2500	3000	4000	5000 6000 7500	10000
Bore	$ØB_1$	mm	11	22	26	33			39	45
Bore	$ØB_2$	mm	8H7	12H7					---	
Diameter	$ØD_1$	mm	130	197	240	305	415	536	570	750
Diameter	$ØD_2$	mm	91	128	161	192	301	380	385	535
Diameter	$ØD_3$	mm	60	88	110	119,7	236	250	---	
Pitch circle diameter	$ØP$	mm	112±0,1	160±0,1	200±0,1	250±0,1	360±0,2	480±0,2	512±0,2	675±0,2
Height	H_1	mm	112	160	230	326	358	400	580	650
Height	H_2	mm	22	25	40	57,5	69	80	130	140
Height	H_3	mm	22	25	40	57,5	69	80	130	140
Height	H_4	mm	14	13			15	20	---	
Angle	a_1		45°				50°	7,5°	---	
Angle	a_2		30°				20°	15°	15°	11,25°
Angle	a_3		45°				50°	7,5°	7,5°	5,63°

GTM
DEFINING PRECISION

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