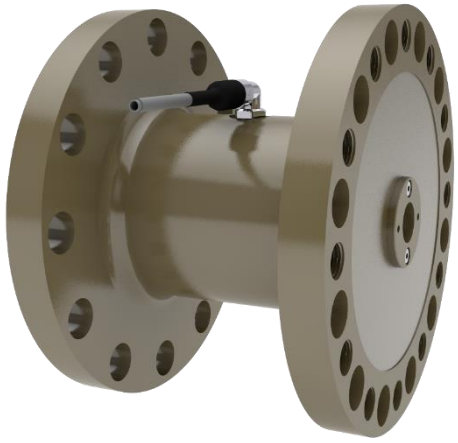
Data sheet

Torque Transducer

Series MF

(100 N·m – 150000 N·m)



Benefits/Application

- For static and dynamic moments
- Non-rotational construction
- Very high-cycle fatigue resistant up to 100 % of nominal load
- Extremely robust against side forces and bending moments
- Easy assembling, lots of possibilities

Options/Accessories

- Fixed cable connection either straight or angled
- Second redundant measuring circuit

Technical data

100 up to 5000 N·m

Metrological Data	Rated Torque	M_{nom}	N·m	100 200	500	1000	2000	4000	5000
	Accuracy class			0,05					
	Torque measurement range		%	1 - 100					
	Linearity error	d_{lin}	%	0,05					
	Interpolation error	f_c	%	0,5					
	Hysteresis	h	%	0,05					
	Reversibility error	v	%	0,2					
	Repeatability (f.s.)		%	0,005					
	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					
	Bending moment effect		%/N·m	$2 \cdot 10^{-4}$	$4 \cdot 10^{-5}$	$2 \cdot 10^{-5}$	$1 \cdot 10^{-5}$	$5 \cdot 10^{-6}$	$4 \cdot 10^{-6}$
	Lateral force effect		%/kN	$5 \cdot 10^{-2}$	$2 \cdot 10^{-2}$	$1 \cdot 10^{-2}$	$7 \cdot 10^{-3}$	$5 \cdot 10^{-3}$	$4 \cdot 10^{-3}$
Electrical Data	Rated characteristic value	C_{nom}	mV/V	1,6					
	Characteristic value tolerance	d_c	%	0,2					
	Zero signal deviation	$d_{S,0}$	%	0,5					
	Input resistance	R_e	Ω	560 - 650					
	Output resistance	R_a	Ω	400 - 500					
	Insulation resistance	R_{is}	Ω	$>10^9$					
	Operating range of excitation voltage	$B_{U,G}$	V	5 - 12					
	Protection (DIN EN 60529)			IP 64					

Mechanical Data	Rated Torque	M_{nom}	N·m	100 200	500	1000	2000	4000	5000
	Rated torsion angle	j_{nom}	rad	0,0047	0,0046	0,0052	0,0028	0,0022	
	Torsional rigidity	c_T	N·m/rad	2,0E+05	1,1E+05	2,0E+05	7,2E+05	1,8E+06	
	Mass	m	kg	3			5	10	
	Proportionate moving mass	m_{mess}	kg	1			1,7	3	
	Permissible oscillation stress		%	100					
Limits	Torque limit		%	150					
	Breaking torque		%	>300					
	Rated temperature range	$B_{T,\,nom}$	°C	10 - 60					
	Operating temperature range	$B_{T,\,G}$	°C	-40 - 120					

Technical data

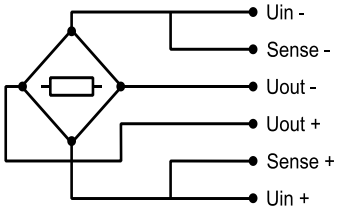
8 up to 150 kN·m

Metrological Data	Rated Torque	M_{nom}	N·m	8000	10000	16000 20000	25000 32000	50000	64000	100000 150000
	Accuracy class			0,05						
	Torque measurement range		%	1 - 100						
	Linearity error	d_{lin}	%	0,05						
	Interpolation error	f_c	%	0,5						
	Hysteresis	h	%	0,05						
	Reversibility error	v	%	0,2						
	Repeatability (f.s.)		%	0,05						
	Creep		%	0,25						
	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						
	Bending moment effect		%/N·m	$2{,}5 \cdot 10^{-6}$	$2 \cdot 10^{-6}$	$1{,}25 \cdot 10^{-6}$	$6{,}25 \cdot 10^{-7}$	$4 \cdot 10^{-7}$	$3{,}125 \cdot 10^{-7}$	
	Lateral force effect		%/kN	$3 \cdot 10^{-3}$	$2{,}5 \cdot 10^{-3}$	$2 \cdot 10^{-3}$	$1 \cdot 10^{-3}$	$8 \cdot 10^{-4}$	$7 \cdot 10^{-4}$	
Electrical Data	Rated characteristic value	C_{nom}	mV/V	1,6						
	Characteristic value tolerance	d_c	%	0,2						
	Zero signal deviation	$d_{S,0}$	%	0,5						
	Input resistance	R_e	Ω	560 - 650						
	Output resistance	R_a	Ω	400 - 500						
	Insulation resistance	R_{is}	Ω	$>10^9$						
	Operating range of excitation voltage	$B_{U,G}$	V	5 - 12						
	Protection (DIN EN 60529)			IP 64						

Mechanical Data	Rated Torque	M_{nom}	N·m	8000	10000	16000 20000	25000 32000	50000	64000	100000 150000
	Rated torsion angle	j_{nom}	rad	0,0025		0,0036		0,0045		0,0029
	Torsional rigidity	c_T	N·m/rad	3,1E+06		4,5E+06	8,8E+06	1,4E+07		3,4E+07
	Mass	m	kg	15		25	40	65		148 213
	Proportionate moving mass	m_{mess}	kg	4		6	10	16		40 58
	Permissible oscillation stress		%	100						
Limits	Torque limit		%	150						
	Breaking torque		%	>300						
	Rated temperature range	$B_{T,\,nom}$	°C	10 - 60						
	Operating temperature range	$B_{T,\,G}$	°C	-40 - 120						

1) Data on request

Cable connection

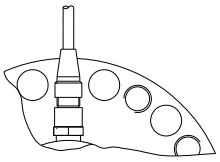


Permanent connection end not connected
Grey cable Ø 6,5 mm 3 x 2 x 0,25 mm² Temperature range: -35 °C to +90 °C

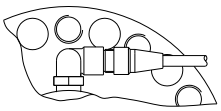
Connection		Color
Supply voltage (+)	U_{in+}	blue
Supply voltage (-)	U_{in-}	black
Measurement signal (+)	U_{out+}	white
Measurement signal (-)	U_{out-}	red
Sense (+)	Sense+	green
Sense (-)	Sense-	grey
Shielding		yellow

1) View too weldingside

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



Straight cable connection



Angled cable connection (90°)

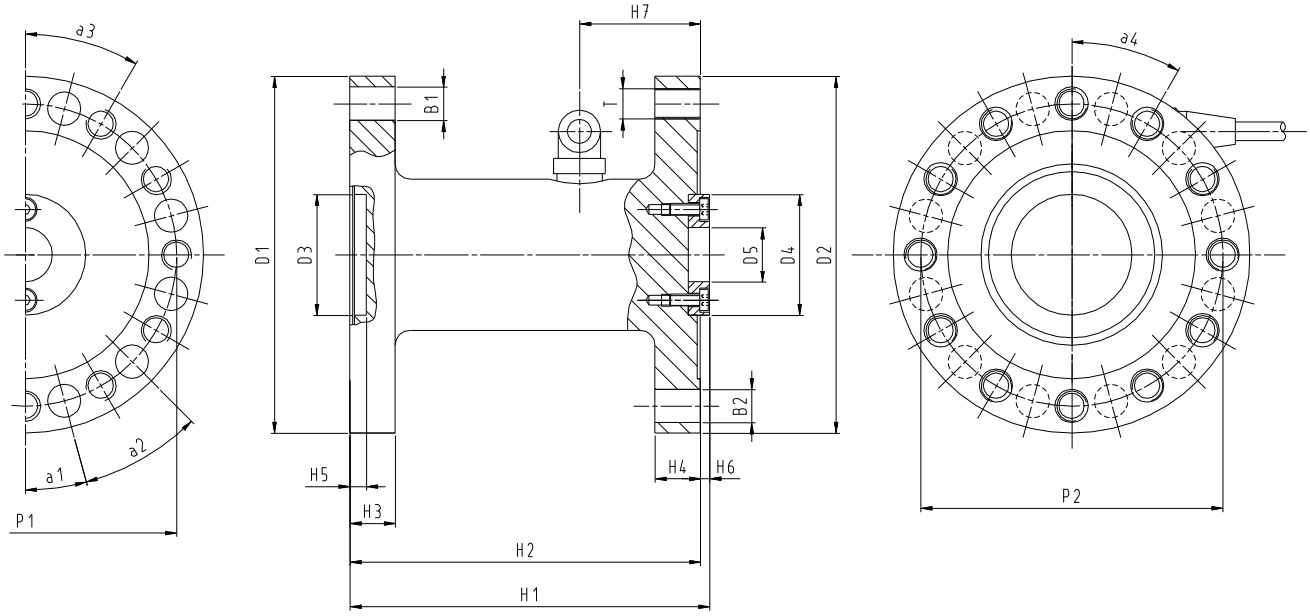
Permanent connection end not connected

- Cable connector straight or 90° angle.
- More cable types and lengths on request
- Available types of connectors for the cable: D-Sub 9 pol ;D-Sub 15pol ;M-S 7pol ;LEMO Series1 7pol
- Configuration with customer defined connection is possible

Option: 2.Measuring circuit

- In case of two circuits the technical data are similarly valid for both circuits
- The location of the cable outlet can be chosen on request

Mating dimensions



GTM
DEFINING PRECISION

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Rated Torque	M_{nom}	N·m	100 200	500 1000	2000	4000 5000	8000 10000	16000 20000	25000 32000	50000 64000	100000 150000
Bore	$ØB_1$	mm	11		14	18	22		26	33	39
Bore	$ØB_2$	mm	11		14	18	22		26	33	39
Diameter	$ØD_1$	mm	118		146	186	235	286	360	460	600
Diameter	$ØD_2$	mm	118		146	186	235	286	360	460	600
Diameter	$ØD_3$	mm	40_{H7}				70_{H7}				
Diameter	$ØD_4$	mm	40_{H6}				70_{H6}				
Diameter	$ØD_5$	mm	18								
Pitch circle diameter	$ØP_1$	mm	$100_{\pm 0,1}$		$125_{\pm 0,1}$	$160_{\pm 0,1}$	$200_{\pm 0,1}$	$250_{\pm 0,1}$	$315_{\pm 0,1}$	$400_{\pm 0,1}$	$510_{\pm 0,2}$
Pitch circle diameter	$ØP_2$	mm	$100_{\pm 0,1}$		$125_{\pm 0,1}$	$160_{\pm 0,1}$	$200_{\pm 0,1}$	$250_{\pm 0,1}$	$315_{\pm 0,1}$	$400_{\pm 0,1}$	$510_{\pm 0,2}$
Thread	T		M10		M12	M16	M20		M24	M30	---
Height	H_1	mm	119		129	143	173	203	243	290	390
Height	H_2	mm	116		126	140	170	200	240	293	
Height	H_3	mm	15		14	18					36
Height	H_4	mm	15		14	18					36
Height	H_5	mm	5,5			4,5	7,5				
Height	H_6	mm	3								
Height	H_7	mm	40		61	73	58	74	108	98	150
Angle	a_1		15°					11,25°			---
Angle	a_2		30°					22,5°			---
Angle	a_3		30°					22,5°			15°
Angle	a_4		30°					22,5°			0°

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