DATAFLEX®

Torque measuring shaft

Made for Motion KTR

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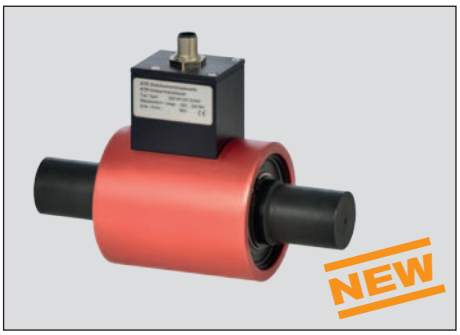
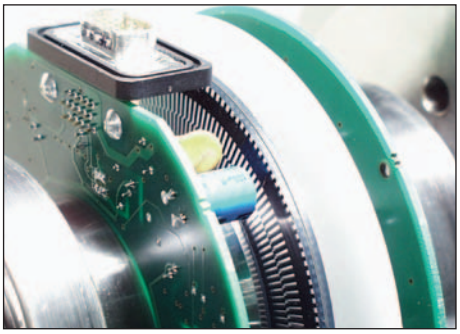
DATAFLEX® 16 and 32 – High precision with each revolution



With the new series of DATAFLEX® 32 KTR extend their range of precision measuring shafts for average torques. Along with the well-established size DATAFLEX® 16 measuring ranges from 10 to 500 Nm are now covered.
With the new series DATAFLEX® 16 or DATAFLEX® 32 the torque is measured using the approved technology of wire strain gauges DMS while processing without contact at a resolution of 24 bit. Thus, the torque measurement achieves an accuracy of 0,1% of the final value.
Supplementary to torque measuring the measuring shafts size 16 and 32 have a speed encoder providing two offset signals with a resolution of 360 or 720 pulses per revolution. The speed display in practice is not an optional extra feature, but already included in the serial scope.

DATAFLEX® 22, 42, 85, 140 – Patented technology at top prices



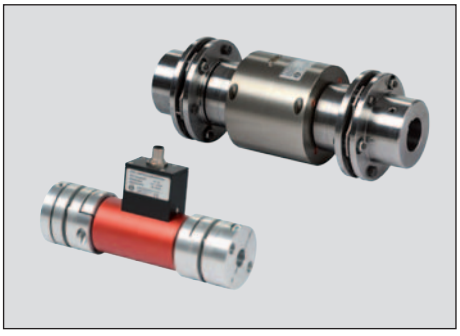
The DATAFLEX® torque measuring shafts sizes 22 to 140 measure the torques without contact and free from wear. Their secret is a patented measuring method acquiring the twisting of the torsion shaft by measuring the quantity of light. For that purpose the light is directed through two disks the transparency of which is amended proportionally to the torque. The overall electronics are situated in a stationary housing to make sure that no signals have to be transmitted by the rotating shaft and the torque is available accurately with a high band width of 16 kHz. This can measure and analize highly dynamic processes accurately.
The analog output values are available both as a voltage signal from 0 – 10 V and as a current signal from 4 – 20 mA. In addition a speed encoder is integrated providing a signal at a resolution of 60 impulses per revolution.

Connection housing DF2 – All Inclusive

The connection housing DF2 can easily be combined with all DATAFLEX® torque measuring shafts disposing of a retainer for top hat rail assembly as well as terminal screws for an easy connection of external devices.
The following features save the purchase of expensive measuring amplifiers and converters:

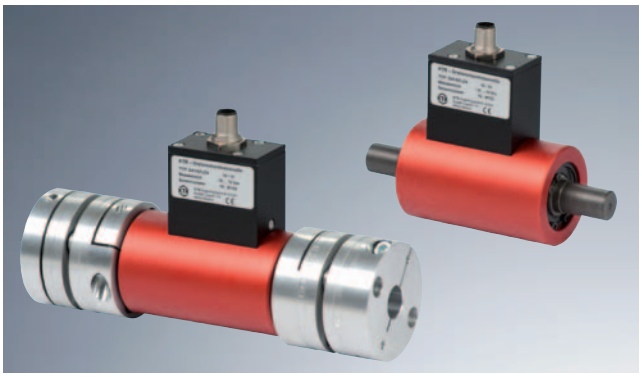
- The torque output can be filtered over 5 steps so that short torque peaks in the display can be reduced.
- The pulse signal of the speed output can be configured both for 5V (TTL) and 24V (HTL). This makes the speed signal compatible for data logging boards and SPS controls.
- In parallel with the pulse signal an integrated frequency voltage converter supplies a DC voltage from 0 – 10 V proportionally to the speed, the scaling of which can be changed individually. This makes an expensive counter superfluous so that the signal can either be processed as a voltage or can be displayed.
- A directional signal indicates the rotational direction of the drive (with DATAFLEX® 16 and 32).

Couplings adjusted to every application

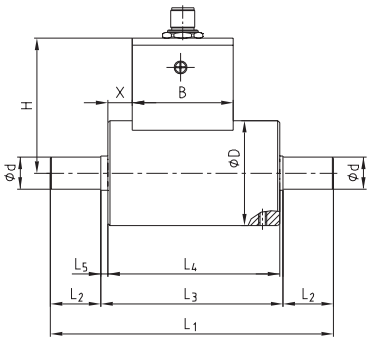


With all DATAFLEX® sizes we recommend the servo lamina coupling RADEX®-NC and the steel lamina coupling RADEX®-N, a compact solution which can be quickly integrated having a high stiffness. In general it is also possible to use backlash-free plug-in couplings such as ROTEX® GS or to integrate an overload coupling.

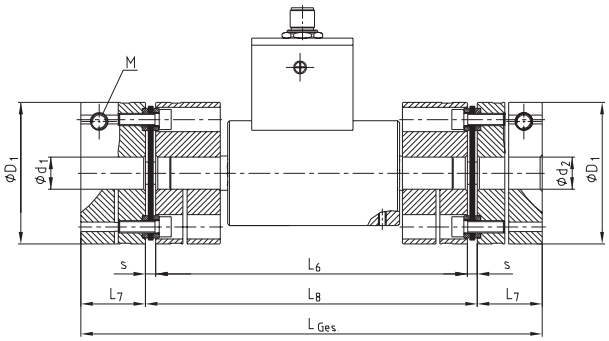
Type 16/10, 16/30, 16/50



- Precision measuring shaft for low torques
- Inaccuracy < 0,1 % of the terminal value
- Double channel speed measurement at 360 pulses/revolution
- Reliable values measured in the machine monitoring, process control, test bench technology
- Additional direct voltage output for speed
- Space-saving combination with servo lamina coupling RADEX®-NC
- Compensating for angular, radial and axial displacements



DATAFLEX® 16



Combination of DATAFLEX® 16 with RADEX®-NC

General features				
DATAFLEX® Type	Rated torque T_{KN} [Nm]	Distribution voltage [V]	Current consumption [mA]	Operating temperature range [°C]
16/10	-10 ... +10			
16/30	-30 ... +30	24 ±4	<100	0 ... 55
16/50	-50 ... +50			

Technical data torque signal					Technical data speed signal				
DATAFLEX® Type	Inaccuracy [1, 2] [%]	Output voltage [V]	Band width [kHz]	Influence of temperature[1] [%/10 °C]	Resolution (pulses/rev.)	Number of channels	Square wave signal [3] [Vss]	Direct voltage signal [3] [V]	Direction signal [3] [V]
16/10									
16/30	<0,1	-10 ... 10	2	0,05	360	2, 90° offset	5/24	0 ... 10, scalable	5/24
16/50									

Mechanical data of torque measuring shaft										
DATAFLEX® Type	Static load limit T_K max [%] [1]	Breaking load T_K Bruch [%] [1]	Max. bending moment [Nm]	Max. radial force [N]	Max. axial force [kN]	Weight [kg]	Torsion spring stiffness C_T [Nm/rad]	Twisting angle with T_{KN} [°]	Mass moment of inertia [kgmm²]	Max. speed [rpm]
16/10			1,07	12	1,1		910	0,63		
16/30	150	300	3,2	37	2,3	0,7	2840	0,61	22,6	10000
16/50			5,3	61	3,1		4100	0,7		

Mechanical data of the combination DATAFLEX® 16 and RADEX®-NC							
DATAFLEX® Type	Coupling			Mechanical data of the entire system			
	RADEX®-NC Size	Clamping screw M		Mass moment of inertia [kgmm²]	Torsion spring stiffness C_T [Nm/rad]	Weight [kg]	Max. speed [rpm] [4]
		M	T_A [Nm]				
16/10	20	M6	10	177	860	1,30	
16/30	25	M8	25	416	2600	1,75	7500
16/50					3600	1,75	

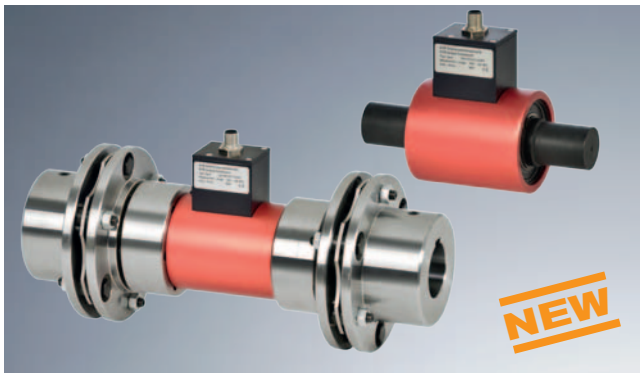
Dimensions (mm) of torque measuring shaft and coupling combination																		
DATAFLEX® Type	d	D	L_1	L_2	L_3	L_4	L_5	H	B	X	RADEX®-NC Size	D_1	d_1/d_2 max	s	L_6	L_7	L_8	$L_{Ges.}$
16/10											20	59	25	4	138	24	146	194
16/30	16	52	140	25	90	85	3,5	67	50	12	25	70	35	5	154	32	164	228
16/50																		

[1] Referring to rated torque T_{KN}
[2] Errors in linearity incl. hysteresis
[3] See page 323: with connection housing DF2
[4] Higher speed on request; with high speeds please use coupling hubs balanced.

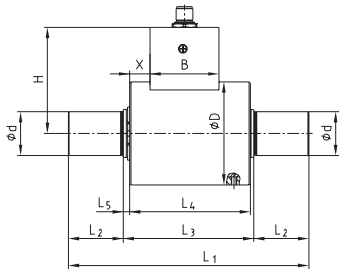
Ordering example:

DATAFLEX® 16/30	DF2	2 m	RADEX®-NC 25 EK Ø16/20-Ø16/30
Type of measuring shaft with measuring range	Connection housing (cannot be freely selected)	Length of connection cable in metres	In case that accessories are requested: coupling type, finish bores d/d_1-d/d_2

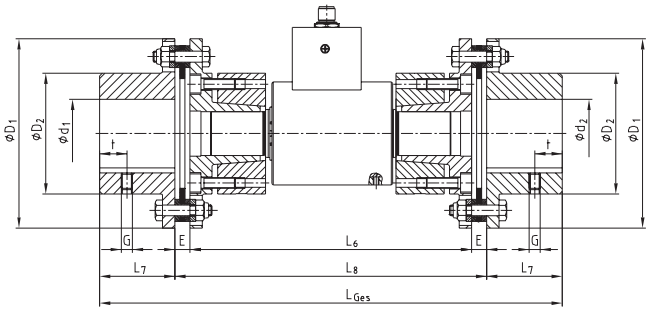
Type 32/100, 32/300, 32/500



- Precision measuring shaft for average torques
- Inaccuracy < 0,1 % of the terminal value
- Double channel speed measurement with 720 pulses/revolution
- Reliable values measured in the machine monitoring, process control and test bench technology
- Additional direct voltage output for speed
- Space-saving combination with steel lamina coupling RADEX®-N
- Compensating for angular, radial and axial displacements



DATAFLEX® 32



Combination of DATAFLEX® 32 with RADEX®-N

General features				
DATAFLEX® type	Rated torque T_{KN} [Nm]	Supply voltage [V]	Current consumption [mA]	Operating temperature range [°C]
32/100	-100 ... +100			
32/300	-300 ... +300	24 ±4	<100	0 ... 55
32/500	-500 ... +500			

Technical data of torque signal					Technical data of speed signal				
DATAFLEX® type	Inaccuracy 1, 2) [%]	Output voltage [V]	Band width [kHz]	Influence of temperature [1] [%/10 °C]	Resolution (pulses/rev.)	Number of channels	Square wave signal [3] [Vss]	Direct voltage signal [3] [V]	Direction signal [3] [V]
32/100									
32/300	<0,1	-10 ... 10	2	0,05	720	2, 90° offset	5/24	0 ... 10, scalable	5/24
32/500									

Mechanical data of torque measuring shaft										
DATAFLEX® type	Static load limit TK max [%] [1]	Breaking load T_K Break [%] [1]	Max. bending moment [Nm]	Max. radial force [N]	Max. axial force [kN]	Weight [kg]	Torsion spring stiffness C_T [Nm/rad]	Twisting angle with T_{KN} [°]	Mass moment of inertia [kgmm²]	Max. speed [rpm]
32/100			11	110	5,0		18000	0,32	219	
32/300	150	300	32	320	10,4	1,9	46000	0,37	221	7500
32/500			53	530	14,6		60000	0,48	224	

Mechanical data of the combination of DATAFLEX® 32 and RADEX®-N								
DATAFLEX® type	Coupling				Mechanical data of the combination			
	RADEX®-N Size	Setscrew			Mass moment of inertia [kgmm²]	Torsion spring stiffness C_T [Nm/rad]	Weight [kg]	Max. speed [rpm] [4]
		G	t	T_A [Nm]				
32/100	42				5900	16000	6,95	7500
32/300	60	M8	20	10	17900	40000	11,65	6700
32/500						49000	11,70	

Dimensions (mm) of torque measuring shaft and coupling combination																		
DATAFLEX® type	d	D	L_1	L_2	L_3	L_4	L_5	H	B	X	RADEX®-N size	D_1	D_2	d_1/d_2 max	s	L_6	L_7	L_8	$L_{Ges.}$
32/100											42	104	68	42	10	185	45	205	295
32/300	32	75	175	40	95	88	4,5	77,3	50	15	60	138	88	60	22	205	55	227	337
32/500																			

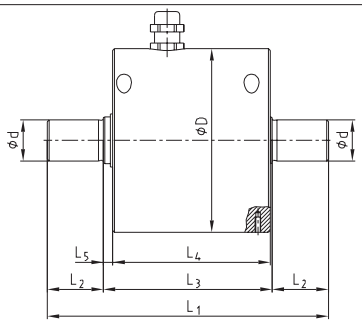
[1] Referring to rated torque T_{KN}
[2] Errors in linearity incl. hysteresis
[3] See page 323: with connection housing DF2
[4] Higher speed on request.

Ordering example:

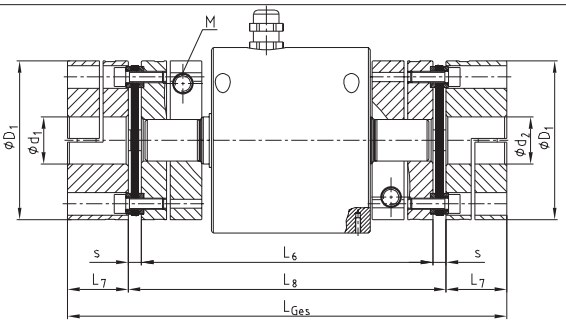
DATAFLEX® 32/300	DF2	2 m	RADEX®-N 60 NN Ø32/50NnD Ø32/60NnD
Type of measuring shaft with measuring range	Connection housing (cannot be freely selected)	Length of connection cable in metres	In case that accessories are requested: coupling type, finish bores d/d_1-d/d_2

Type 22/20, 22/50, 22/100

- DATAFLEX® 22 for low torques
- Contactless measurement
- Integrated speed measurement
- Very wide signal band width
- Reliable values measured in the machine monitoring, process control and test bench technology
- Space-saving combination with servo lamina coupling RADEX®-NC
- Compensating for angular, radial and axial displacements



DATAFLEX® 22



Combination of DATAFLEX® 22 with RADEX®-NC

General features				
DATAFLEX® Type	Rated torque T_{KN} [Nm]	Distribution voltage [V]	Current consumption [mA]	Rated temperature range [°C]
22/20	-20 ... +20			
22/50	-50 ... +50	24 ±4	<100	0 ... 55
22/100	-100 ... +100			

Technical data torque signal						Technical data speed signal				
DATAFLEX® Type	Inaccuracy [1] [%]	Output voltage [V]	Output current [mA]	Band width [kHz]	Influence of temperature[1] [%/10 °C]	Resolution (pulses/rev.)	Number of channels	Square wave signal [2] [Vss]	Direct-voltage signal [2] [V]	Direction signal [2] [V]
22/20										
22/50	<±0,5	0 ... 10	4 ... 20	16	0,5	60	1	5/24	0 ... 10, scalable	–
22/100										

Mechanical data of torque measuring shaft										
DATAFLEX® Type	Static limit load TK max [%][1]	Breaking load TK Break [%] [1]	Max. bending moment [Nm]	Max. radial force [N]	Max. axial force [N]	Weight [kg]	Torsion spring stiffness C_T [Nm/rad]	Twisting angle with T_{KN} [°]	Mass moment of inertia [kgmm²]	Max. Speed [rpm]
22/20			5	42	3		2865		131	
22/50	150	300	10	84	5	1,5	7163	0,4	132	8000
22/100			18	150	7,5		14325		134	

Mechanical data of the combination DATAFLEX® 22 and RADEX®-NC							
DATAFLEX® Type	Coupling			Mechanical data of the entire system			
	RADEX®-NC Size	Clamping screw M		Mass moment of inertia [kgmm²]	Torsion spring stiffness C_T [Nm/rad]	Weight [kg]	Max. speed [rpm] [3]
		M	T_A [Nm]				
22/20	25	M8	25	940	2521	2,56	
22/50	35	M10	49	2000	6383	3,15	6000
22/100					11448	3,16	

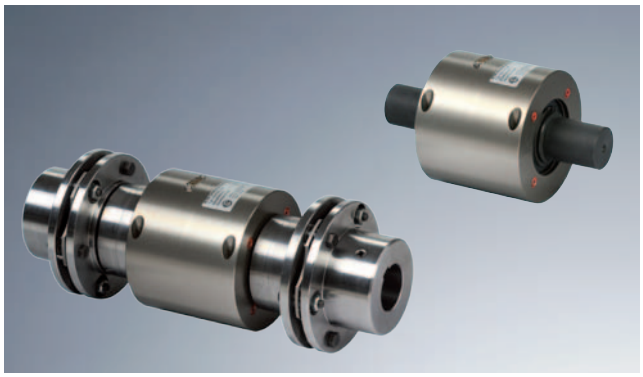
Dimensions (mm) of torque measuring shaft and coupling combination														
DATAFLEX® Type	d	D	L_1	L_2	L_3	L_4	L_5	RADEX®-NC Size	D_1	d_1/d_2 max.	s	L_6	L_7	L_8	$L_{Ges.}$
22/20								25	70	35	5	154	32	164	228
22/50	22	98	150	30	90	84	5	35	84	40	7	160	35	174	244
22/100															

[1] Reffering to rated torque T_{KN}
[2] See page 323: with connection housing DF2
[3] Higher speed on request

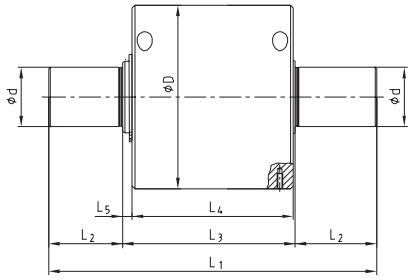
Ordering example:

DATAFLEX® 22/50	DF2	2 m	RADEX®-NC 35 EK Ø22/30-Ø22/35
Type of measuring shaft with measuring range	Connection housing (cannot be freely selected)	Length of connection cable in metres	In case that accessories are requested: coupling type, finish bores d/d1-d/d2

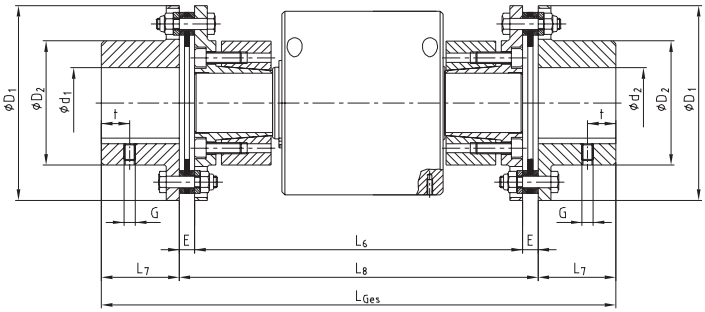
Type 42/200, 42/500, 42/1000



- DATAFLEX® 42 for average torques
- Contactless measurement
- Integrated speed measurementl
- Very wide signal band width
- Reliable values measured in the machine monitoring, process control and test bench technology
- Space-saving combination with steel lamina coupling RADEX®-N
- Compensating for angular, radial and axial displacements



DATAFLEX® 42



Combination of DATAFLEX® 42 with RADEX®-N

General features				
DATAFLEX® Type	Rated torque T_{KN} [Nm]	Distribution voltage[V]	Current consumption [mA]	Operating temperature range [°C]
42/200	-200 ... +200			
42/500	-500 ... +500	24 ±4	<100	0 ... 55
42/1000	-1000 ... +1000			

Technical data torque signal						Technical data speed signal				
DATAFLEX® Type	Inaccuracy [1] [%]	Output voltage [V]	Output current [mA]	Band width [kHz]	Influence of temperature [1] [%/10 °C]	Resolution (pulses/rev.)	Number of channels	Square wave signal [2] [Vss]	Direct voltage signal [2] [V]	Direction signal [2] [V]
42/200										
42/500	<±0,5	0 ... 10	4 ... 20	16	0,5	60	1	5/24	0 ... 10, scalable	–
42/1000										

Mechanical data of torque measuring shaft										
DATAFLEX® Type	Static limit load $T_{K\,max}$ [%] [1]	Breaking load $T_{K\,Break}$ [%] [1]	Max. bending moment [Nm]	Max. radial force [N]	Max. axial force [kN]	Weight [kg]	Torsion spring stiffness C_T [Nm/rad]	Twisting angle with T_{KN} [°]	Mass moment of inertia [kgmm²]	Max. speed [rpm]
42/200			50	280	12	4,7	40929		734	
42/500	150	300	135	750	20	4,8	102321	0,28	760	6000
42/1000			270	1500	30	5,0	204643		804	

Mechanical data of the combination DATAFLEX® 42 and RADEX®-N								
DATAFLEX® Type	Coupling				Mechanical data of the entire system			
	RADEX®-N Size	Setscrew			Mass moment of inertia [kgmm²]	Torsion spring stiffness C_T [Nm/rad]	Weight [kg]	Max. speed [rpm] [3]
		G	t	T_A [Nm]				
42/200	60	M8	20	10	17300	29605	13,90	6000
42/500					17400	52304	14,03	
42/1000	80	M10	20	17	56900	86888	24,39	5100

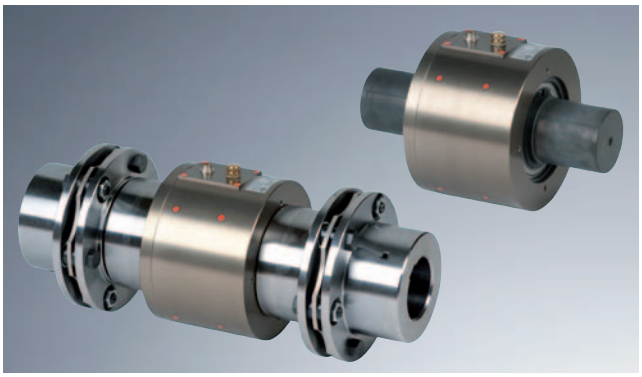
Dimensions (mm) of torque measuring shaft and coupling combination															
DATAFLEX® Type	d	D	L_1	L_2	L_3	L_4	L_5	RADEX®-N Size	D_1	D_2	d_1/d_2 max	E	L_6	L_7	L_8	$L_{Ges.}$
42/200								60	138	88	60	11	232	55	254	364
42/500	42	130	232	55	122	114	6,5									
42/1000								80	179	117	80	14	242	75	270	420

[1] Referring to rated torque T_{KN}
[2] See page 323: with connection housing DF2
[3] Higher speed on request

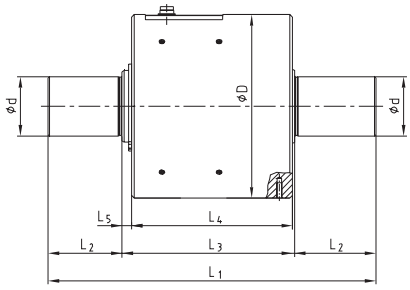
Ordering example:

DATAFLEX® 42/500	DF2	2 m	RADEX®-N 60 NN Ø42/50NnD Ø42/60NnD
Type of measuring shaft with measuring range	Connection housing (cannot be freely selected)	Length of connection cable in metres	In case that accessories are requested: coupling type, finish bores d/d1-d/d2

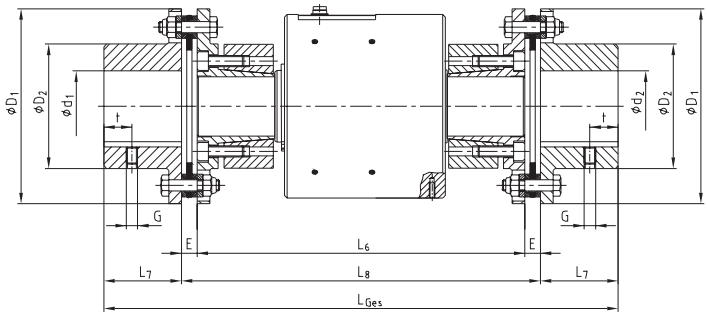
Type 85/2000, 85/5000, 85/10000



- DATAFLEX® 85 for high torques
- Contactless measurement
- Integrated speed measurement
- Very wide signal band width
- Reliable values measured in the machine monitoring, process control and test bench technology
- Space-saving combination with steel lamina coupling RADEX®-N
- Compensating for angular, radial and axial displacements



DATAFLEX® 85



Combination of DATAFLEX® 85 with RADEX®-N

General features				
DATAFLEX® Type	Rated torque T_{KN} [Nm]	Distribution voltage [V]	Current consumption [mA]	Operating temperature range [°C]
85/2000	-2000 ... +2000			
85/5000	-5000 ... +5000	24 ±4	<100	0 ... 55
85/10000	-10000 ... +10000			

Technical data torque signal						Technical data speed signal				
DATAFLEX® Type	Inaccuracy [1] [%]	Output voltage [V]	Output current [mA]	Band width [kHz]	Influence of temperature [1] [%/10 °C]	Resolution (pulses/rev.)	Number of channels	Square wave signal [2] [Vss]	Direct-voltage signal [2] [V]	Direction signal [2] [V]
85/2000										
85/5000	<±0,5	0 ... 10	4 ... 20	16	0,5	60	1	5/24	0 ... 10, scalable	–
85/10000										

Mechanical data of torque measuring shaft										
DATAFLEX® Type	Static limit load T_K max [%] [1]	Breaking load T_K Break [%] [1]	Max. bending moment [Nm]	Max. radial force [N]	Max. axial force [kN]	Weight [kg]	Torsion spring stiffness C_T [Nm/rad]	Twisting angle with T_{KN} [°]	Mass moment of inertia [kgmm²]	Max. speed [rpm]
85/2000			380	1500	50	22,6	382000	0,30	16360	
85/5000	150	300	760	3000	80	23,3	818570	0,35	16790	2500
85/10000			1270	5000	110	23,9	1273330	0,45	17420	

Mechanical data of the combination DATAFLEX® 85 and RADEX®-N								
DATAFLEX® Type	Coupling				Mechanical data of the entire system			
	RADEX®-N Size	Setscrew			Mass moment of inertia [kgmm²]	Torsion spring stiffness C_T [Nm/rad]	Weight [kg]	Max. speed [rpm] [3]
		G	t	T_A [Nm]				
85/2000	105	M12	30	40	225000	29300	61,5	
85/5000	115	M12	30	40	473500	55600	85,6	2500
85/10000	135	M20	40	140	1006700	92800	130,2	

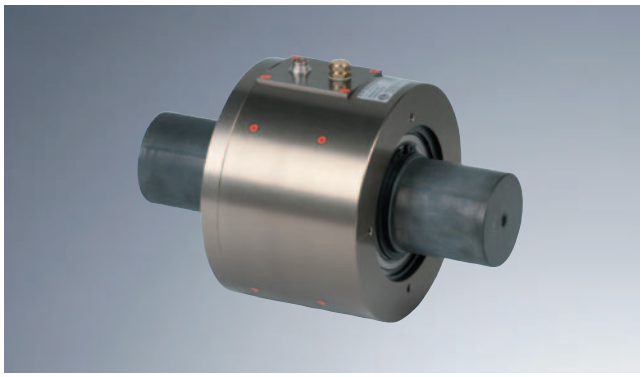
Dimensions (mm) of torque measuring shaft and coupling combination															
DATAFLEX® Type	d	D	L_1	L_2	L_3	L_4	L_5	RADEX®-N Size	D_1	D_2	d_1/d_2 max	E	L_6	L_7	L_8	$L_{Ges.}$
85/2000								105	225	147	105	20	344	90	384	564
85/5000	85	215	344	90	164	153	10	115	265	163	115	23	364	100	410	610
85/10000								135	305	184	135	27	434	135	488	758

[1] Referring to rated torque T_{KN}
[2] See page 323: with connection housing DF2
[3] Higher speed on request

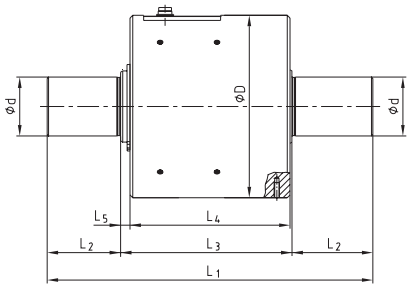
Ordering example:

DATAFLEX® 85/5000	DF2	2 m	RADEX®-N 115 NN Ø65/60NnD Ø65/70NnD
Type of measuring shaft with measuring range	Connection housing (cannot be freely selected)	Length of connection cable in metres	In case that accessories are requested: coupling type, finish bores d/d_1-d/d_2

Type 140/20000, 140/50000



- DATAFLEX® 140 for high torques
- Contactless measurement
- Integrated speed measurement
- Very wide signal band width
- Reliable values measured in the machine monitoring, process control and test bench technology
- Coupling on request



DATAFLEX® 140

General features				
DATAFLEX® Type	Rated torque T_{KN} [Nm]	Distribution voltage [V]	Current consumption [mA]	Operating temperature range [°C]
140/20000	-20000 ... +20000	24 ±4	<100	0 ... 55
140/50000	-50000 ... +50000			

Technical data torque signal						Technical data speed signal				
DATAFLEX® Type	Inaccuracy [1] [%]	Output voltage [V]	Output current [mA]	Band width [kHz]	Influence of temperature [1] [%/10 °C]	Resolution (pulses/rev.)	Number of channels	Square wave signal [2] [Vss]	Direct voltage signal [2] [V]	Direction signal [2] [V]
140/20000	<±0,5	0 ... 10	4 ... 20	16	0,5	60	1	5/24	0 ... 10, scalable	–
140/50000										

Mechanical data of torque measuring shaft										
DATAFLEX® Type	Static limit load $T_{K\,max}$ [%] [1]	Breaking load $T_{K\,Break}$ [%] [1]	Max. bending moment [Nm]	Max. radial force [N]	Max. axial force [kN]	Weight [kg]	Torsion spring stiffness C_T [Nm/rad]	Twisting angle with T_{KN} [°]	Mass moment of inertia [kgmm²]	Max. speed [rpm]
140/20000	150	300	2750	8000	100	73,9	3935000	0,30	170000	2000
140/50000			5500	16000	160	76,5	6750000	0,42	175000	

Dimensions (mm) of torque measuring shaft							
DATAFLEX® Type	d	D	L_1	L_2	L_3	L_4	L_5
140/20000	140	280	486	140	206	191	13
140/50000							

[1] Referring to rated torque T_{KN}
[2] See page 323: with connection housing DF2

Ordering example:

DATAFLEX® 140/50000	DF2	2 m
Type of measuring shaft with measuring range	Connection housing (cannot be freely selected)	Length of connection cable in metres

Connecting housing DF2 and connecting cable

- Overall solution for all the DATAFLEX® series
- Convenient speed output
- Pulse output with reversible signal level converters (5V/24V)
- Scalable direct voltage output by means of integrated f/U converter (0 – 10V)
- Direction signal (DATAFLEX® 16 and 32)
- Adjustable output filter for torque output
- Top assembly of top hat rail
- Integrated switch for automatic zero point correction
- Cable lengths of 2m, 5m and 10m available