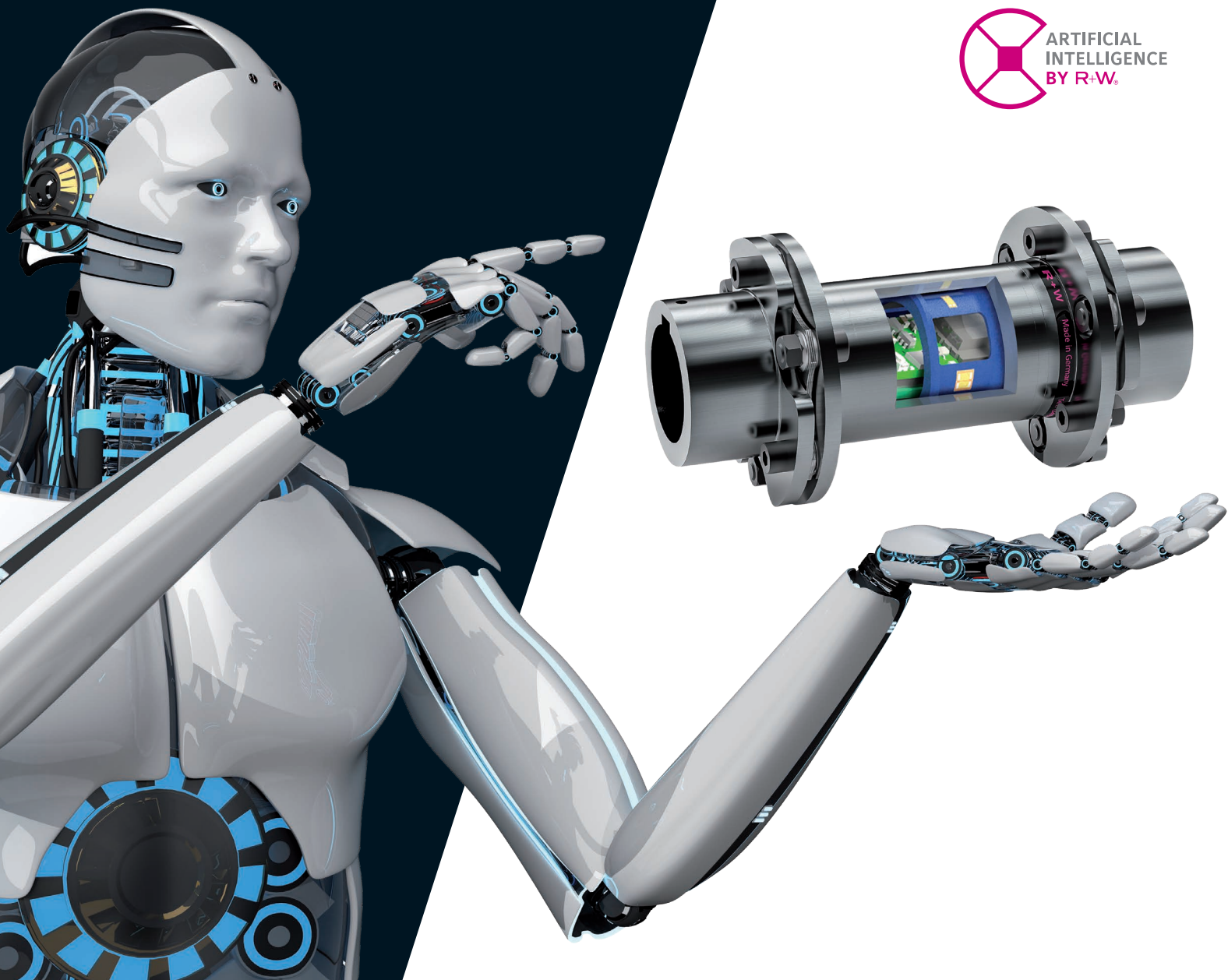
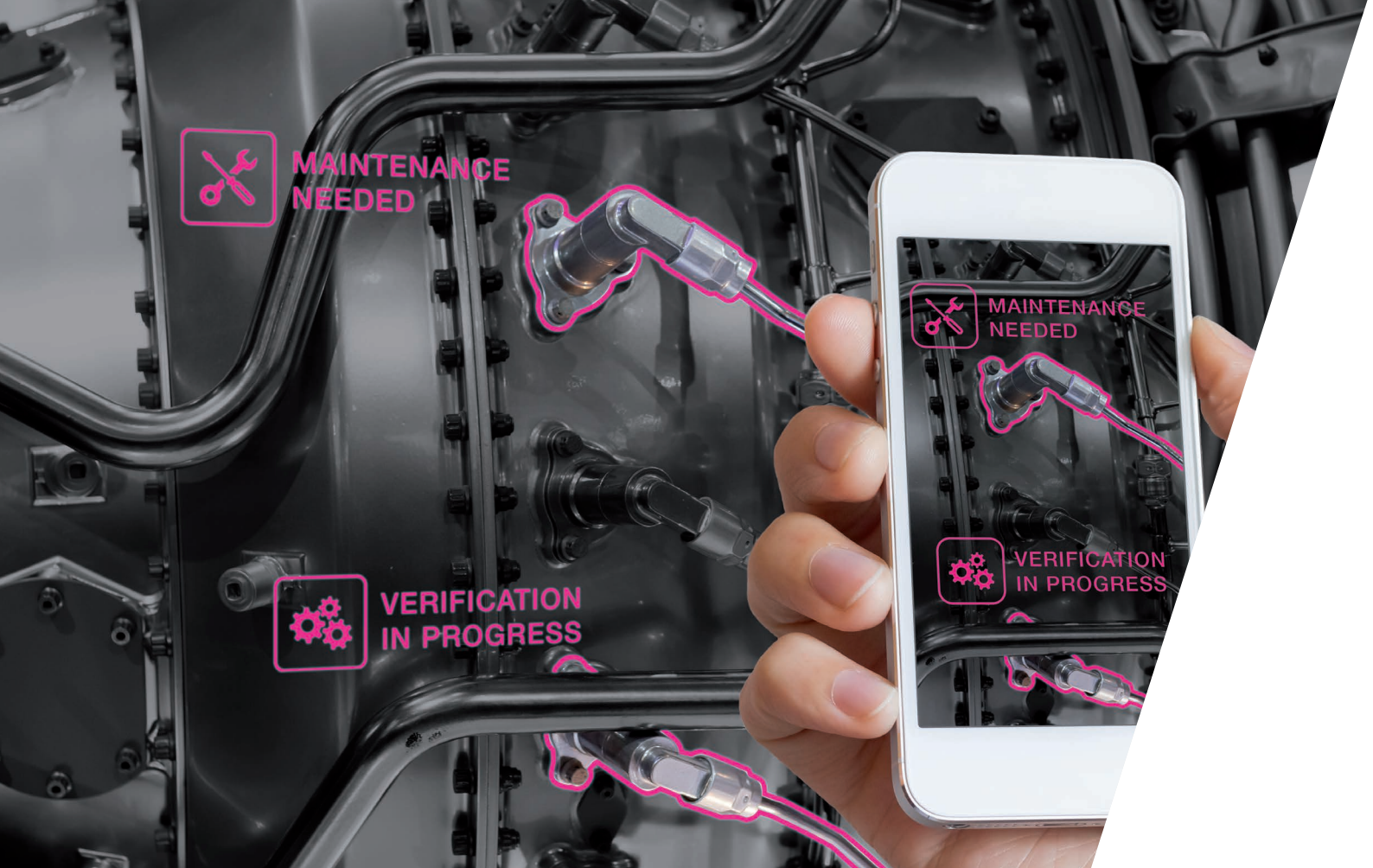


THE INTELLIGENT COUPLING.

R+W[®]
A POPPE + POTTHOFF COMPANY



SENSING
WITHIN



A NEW ERA IN DRIVE TECHNOLOGY

WELCOME TO THE WORLD OF R+W – A WORLD OF PROGRESS

Smart and secure into the future - the intelligent coupling from R+W is our innovative answer to modern requirements for digitalization, automation, and the Industrial Internet of Things (IIoT).

As the technical leader and specialist in metal bellows couplings, it was already a given that with the shift to Industry 4.0, and the increasing value of data and its bottom line impact, we don't just want to keep up, but rather to create change and to work proactively to make it a reality.

Until now real-time data collection in drive technology was especially challenging, with rotating powertrains difficult to access with wiring and instrumentation.

But with the R+W intelligent coupling this is a problem of the past!

FORWARD-LOOKING AND APPLICATION ORIENTED

In addition to providing all of the advantages of an R+W coupling, the intelligent coupling system serves as a wireless data source. This is made possible through on-board sensor technology which measures torque, speed, vibration, and axial force (optional) directly within the rotating drive line.

Data is processed by an internal electronic system and transmitted via low energy Bluetooth signal to a connected smartphone, tablet, or gateway to machine controls. This valuable information about operating status and changing conditions can be key to condition monitoring and predictive maintenance.

These state of the art tools of the IIoT benefit greatly from the opportunity to integrate data from couplings into intelligent algorithms.

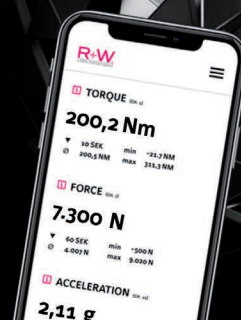
Keeping you up to date "from a distance" about wear, durability and other data critical to the performance of the application and neighboring components, helping you anticipate and prevent expensive failures and down time.

INTELLIGENT. FLEXIBLE. UPGRADABLE.

So smart, so simple: the intelligent coupling can be installed as an upgrade to existing coupling applications. The quick and easy assembly and setup minimize both hardware and installation costs. In many cases there is no additional assembly space or mechanical construction required, since the system can function without an external power supply, owing to an integral 2500 mAh battery.

Read on to learn more about the range of intelligent sensor coupling solutions.
Our R+W team is happy to help with questions and application inquiries.

PLEASE VISIT OUR WEBSITE
WWW.AI-COUPLING.COM



NEXT LEVEL INFORMATION

SENSOR TECHNOLOGY WITHIN THE COUPLING. EXPERIENCE THE FUTURE TODAY

FOR THE FIRST TIME, PRECISION MEASUREMENT DATA ACQUIRED DIRECTLY FROM THE DRIVE LINE.

With intelligent couplings from R+W performance data can be taken directly from the drive line in near real time.

This kind of data collection was especially challenging in the past, with rotating drive lines difficult to access with wiring and instrumentation.

This is now history, thanks to the technology from R+W – available for integration into existing applications for simple and smart retrofitting.



SMART DRIVE, MANY ADVANTAGES.



INTEGRATES INTO EXISTING APPLICATIONS

there is often no additional assembly space or mechanical construction needed. Previously installed couplings get an intelligent retrofit.



POWERFUL DATA

better assessment of dynamic behavior in the rotating drive line



COMBINABLE AND TIME DEPENDENT MEASUREMENTS

various scalable charts and graphs accurately track the course of events in your machinery process



BETTER VISIBILITY

keep an eye on important data at any time via smartphone app or wireless gateway



COMPATIBLE WITH VARIOUS COUPLINGS

available in disc couplings, bellows couplings, elastomer couplings, torque limiters, and rigid flanges



ECONOMICAL SOLUTION

low cost for integration and commissioning

NEXT LEVEL INFORMATION

THE SMART DATA SOLUTION FOR PERFORMANCE MEASUREMENT

Wireless sensing and transmission from directly within the drive line – a concept as simple as it is brilliant:

1. Measure torque, speed, acceleration and axial loading (optional) and get an accurate recording of operating status and overload events.
2. Data is processed directly inside the coupling while being broadcast to a paired smart device, or to the machine control via the R+W gateway.
3. All of this with the proven mechanical performance of R+W couplings, compensating for axial, lateral and axial misalignment while transmitting torque smoothly and precisely.

INTELLIGENT ALSO MEANS A SMART CHOICE FOR YOUR APPLICATION

R+W intelligent couplings are designed to save space, without even increasing length in many cases.

For applications ranging from
10 - 5,000 Nm

Sensor technology for integration into a wide range of existing applications, such as:

- ▶ Pump packages
- ▶ Extruders
- ▶ Gear motors
- ▶ Industrial transmissions
- ▶ Test stands
- ▶ Machine tools



PERFORMANCE

The standard version measures torque and speed, with acceleration available to be unlocked.

Standard:

- ▶ **Torque**
- ▶ **Speed**
- ▶ **Acceleration (optional)**

The sensor plus package includes all of the standard features plus axial loading and vibration.

Sensor plus package:

- ▶ **Torque**
- ▶ **Speed**
- ▶ **Acceleration (optional)**
- ▶ **Tractions**
- ▶ **Compressive forces**

CHARACTERISTICS:

- ▶ torque measurement accuracy <1%
- ▶ integrated measuring amplifier
- ▶ direct and wireless: integrated chip for evaluation by smart device, PC or controller (gateway required)
- ▶ CSV data export from app
- ▶ low energy Bluetooth output signal
- ▶ sampling rate 500 Hz
- ▶ transmission rate up to 500 Hz
- ▶ wireless charging option
- ▶ no wiring needed for installation

MEASUREMENT DATA SUPPLY

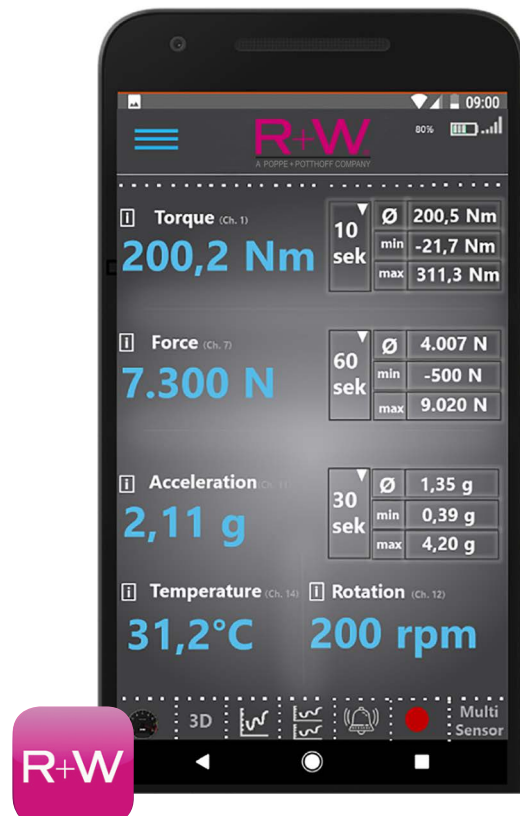
R+W APP (STANDARD VERSION)

Display and collect measurement data with the R+W App

- ▶ simple and intuitive operation
- ▶ dashboard view with min. max. and average values
- ▶ chart view with time dependent X-Y graphs
- ▶ up to four connected couplings at one time
- ▶ recording function for all values with CSV export
- ▶ information and settings information for both the intelligent coupling and the R+W gateway

REQUIREMENTS:

- ▶ Tablet or smartphone with Android
- ▶ Android version 6.0 or newer
- ▶ Minimum 30 MB of available memory
- ▶ Bluetooth 4.0 or newer



GATEWAY

The R+W industrial gateway supports the wireless transfer of sensor signals from the coupling into downstream systems for measurement, control, and data processing.



FFT-ANALYSIS

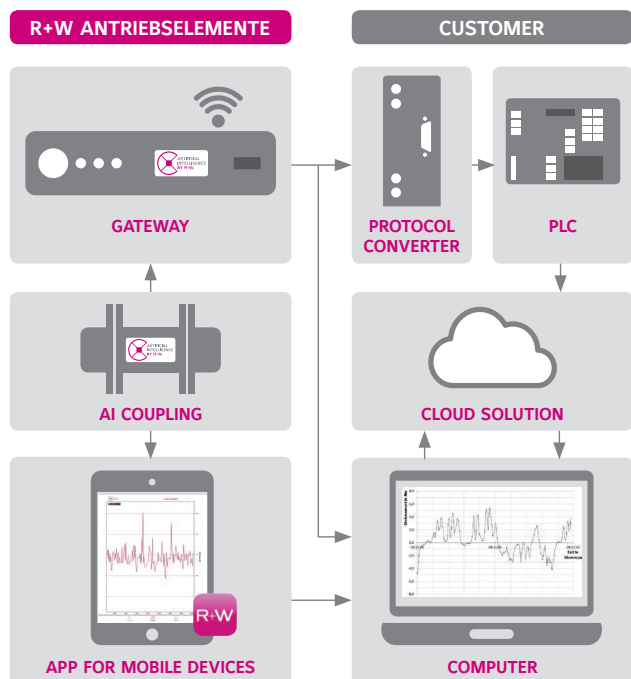
Measured values of torque, speed, force and vibration can be broken down into frequency components with the fast Fourier transform (FFT) algorithm, providing for early detection of potentially harmful mechanical frequencies which can reduce component life.

OPTION: DATA LOGGER AND EVENT TRACKING

Specific threshold events can be defined and recorded via the app.

The system automatically records values leading up to the specified event, allowing for earlier detection in future cases.

TECHNICAL DATA	GATEWAY
Connection	PC / SPS / cloud solution
USB-Port	USB-C (UART)
8 digital outputs	24 V
8 analogue outputs	-10 to 10 V
Case dimension (w x d x h)	24 x 120 x 100 mm
Weight	130 g
Mounting	profile rail (EN 50022)
Power supply	24 V



POWER SUPPLY

INTEGRATED BATTERY

(standard version)

Magnetic charging port on the coupling spacer.

INDUCTIVE POWER SUPPLY

(on request)

In lieu of battery charging, the coupling can be configured with an inductive power supply mounted adjacent to the sensor.

This enables continuous operation without interruption.

The non-contact stationary device is connected to the main power supply.

Energy transmission is by ISM-band while data transmission is still by Bluetooth.

ENERGY HARVESTING

(coming soon)

On board generation, bringing the best of both power supply options.



SENSORS FOR INTEGRATION INTO THE FOLLOWING COUPLINGS

DISC PACK COUPLINGS

iLP2

from 350 – 5,000 Nm
standard lengths
from 220 – 295 mm



iLP3

from 350 – 5,000 Nm
standard lengths
from 201–270 mm



iLPA

from 350 – 5,000 Nm
on request



iLPH

from 350 – 50,000 Nm
standard lengths
from 216 – 329 mm



iLP5

from 350 – 50,000 Nm
standard lengths
from 216 – 323 mm



DRIVE SHAFTS

iZA

from 10 – 200 Nm
standard lengths
from 240 – 370 mm



iZAE

from 10 – 150 Nm
standard lengths
from 225 – 305 mm



iEZ2

from 10 – 1350 Nm
standard lengths
from 216 – 410 mm



more lengths on request

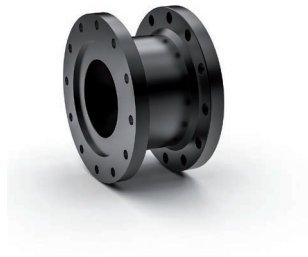
MISCELLANEOUS

iSTF

from 200 – 5,000 Nm

ADAPTER FLANGE

on request



Additional couplings and higher torques available on request.
Technical modifications reserved.

FOR MORE INFORMATION

Learn more about all of our couplings at
www.rw-couplings.com or in our technical **guide books**.





TORQUE TRANSDUCER WITH SPEED MEASUREMENT

8 sensing ranges from 5 to 1,000 Nm

CHARACTERISTICS DSC TORQUE TRANSDUCER

DSC torque transducers are a compact solution for torque measurement, whether in the laboratory or industrial environment.

The non-contact power supply and signal transmission enable continuous operation with minimal wear and zero maintenance.

Various applications benefit from additional speed sensing.

The on board measuring amplifier takes a supply voltage of 11.5-30 V DC, and produces an analog output signal of 0 to +/-5 V and a power output of 10 mA +/- 8 mA.

The wide range of input voltages allows the sensor to run directly on an SPS.

FEATURES AND BENEFITS:

- ▶ Cost effective
- ▶ Range of voltages
- ▶ Proven DMS system
- ▶ Easy power supply
- ▶ Extremely short design
- ▶ Accuracy $\leq 0.5\%$ from the high end of the sensing range
- ▶ Non-contact operation
- ▶ On board measuring amplifier
- ▶ Widely useful
- ▶ Optional speed measurement



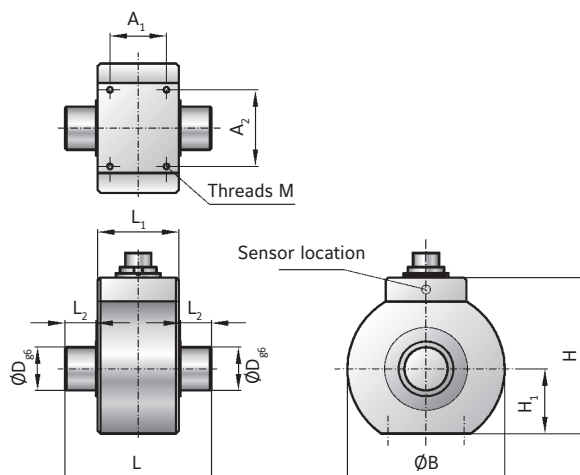
PROPERTIES

FEATURES

- Easy installation
- Non-contact operation
- Optional speed measurement
- Measurement accuracy <0.5%

DESIGN

- Compact construction
- Range of voltages
- On board measuring amplifier
- Proven DMS system



MODEL DSC

SERIES			20			200			1000	
Sensing range	(Nm)	T _{KN}	5	10	20	50	100	200	500	1000
Overall length	(mm)	L	80			90			120	
Outside diameter Ø	(mm)	B	70			75			105	
Height	(mm)	H	72			77.5			97.5	
Shaft center +/- 0.05	(mm)	H ₁	28			30			40	
Shaft diameter Ø g6	(mm)	D	15			24			40	
Housing length	(mm)	L ₁	48			52			65	
Shaft length	(Nm)	L ₂	15			18			26	
Hole spacing	(mm)	A ₁	39			42			55	
Hole spacing	(mm)	A ₂	31			35			50	
Fastening screw		M	M4 x 6 deep			M4 x 6 deep			M5 x 10 deep	
Mounting holes			General tolerances DIN 2768 - m							
Approx. weight	(g)		350			600			2,000	
Speed max.	(rpm)		18,000			16,000			9,000	
Torsional stiffness	(10 ³ Nm/rad)		1.1	2.7	5.4	20	36	52	290	420
Moment of inertia										
- total	(g.cm ²)		130	130	130	400	400	420	3300	3500
- drive side	(g.cm ²)		115	115	115	300	300	310	1900	2000
- measuring side	(g.cm ²)		15	15	15	100	100	110	1400	1500
Allowable axial load	(N)		930	930	930	1580	1580	1580	3920	3920
Allowable radial load	(N)		25	45	90	210	420	845	1420	2875

Allowable axial and radial loads are valid for an unsupported housing.

Supply voltage:	11.5 to 30V DC
Power consumption:	approx. 200mA
Signal rise:	1ms (10-90%)
Cutoff frequency:	1kHz (-3dB)
Voltage output:	0 to ±5V
Internal resistance:	100 Ω
Current output:	10 ± 8 mA liability max. 500 Ω
Residual ripple:	< 100mVss / 0,2mA _{ss}
Error for non-linearity:	< 0.3%
Error for hysteresis:	< 0.3%
Zero point error:	≤ ± 100mV / ≤ ± 200μA
Max. measurement error:	0.5% (from high end of sensing range)
Working temperature range:	0-60°C
Temperature compensation range:	5-45°C
Temperature error zero point:	0.05%/K
Sensitivity:	0.02%/K
Mechanical overload capability:	100%
Protection class:	IP 40 according to DIN 40050
Connection:	12 pin plug
Speed output:	Open collector
Internal Pull Up:	4,7k Ω (5 V level)
External Pull Up:	24 V max / 20mA
Impulses/rotation:	60
Speed sensing option:	up to 10,000 rpm

ORDERING EXAMPLE	DSC	20	5	XX
Model	●			
Series		●		
Sensing range (Nm)			●	
For custom features place an XX at the end of the part number and describe the special requirements (e.g. DSC / 20 / 5 / XX)				



TORQUE TRANSDUCER ACCESSORIES

MEASURING CABLE 12 PIN DOUBLE SIDED STRAIGHT PLUG CONNECTION

0.05 mm²; Ø 4.8 mm
0.14 mm²; Ø 6.3 mm

MEASURING CABLE WITH OPEN END (F)

0.14 mm²; Ø 6.3 mm

STANDARD VERSION

DSC VIEW

Supply unit and display unit DSC View is a cost effective option with R+W torque transducers to display torque values in versatile ways.

In standard mode, "instantaneous value", the most recently measured values are displayed. Alternate modes include "display minimum value" and "display maximum value". Measurement period and display update period are programmable.

Unladen weight can be displayed in all operating modes. With the +/- input the effective direction of applied torque can be displayed. Up to four freely programmable limit values can also be established. A special version for passive torque transduction or speed indication is available on request.

SPEED MEASUREMENT VERSION

DSC VIEW PLUS

Supply unit and display unit DSC View is a cost effective option with R+W torque transducers to display both speed and torque values in versatile ways.

In standard mode, "instantaneous value", the most recently measured values are displayed. Alternate modes include "display minimum value" and "display maximum value". Measurement period and display update period are programmable.

Unladen weight can be displayed in all operating modes. With the +/- input the effective direction of applied torque can be displayed. Up to four freely programmable limit values can also be established. A special version for passive torque transduction or speed indication is available on request.

TECHNICAL DATA DSC VIEW AND DSC VIEW PLUS

Resolution	24 bit
Measurement frequency	up to 50 Hz
Permanent min/max display	possible
Tare function	
Sensor supply	
+/- full scale input	
Peak value measurement	
Speed measurement	up to 10,000 rpm (one decimal place) Over 10,000 rpm without decimal place (DSC View plus)
Voltage	230 +/- 10% (50-60 Hz) cold device plug
Sensor supply for torque transducer	12V DC / 500 mA
Input	
Input sensitivity	0 up to ± 5 V; 0 up to ± 10 V;
Input resistance	10 MΩ
Signal output	
Torque	looped through by sensor
Speed	looped through by sensor
Connection	
Input	(12 pin) round plug at the back
Output	(7 pin) round plug at the back
Signal processing	
Input	(12 pin) round plug at the back
Output	(7 pin) round plug at the back
Measuring time: torque	0.02 - 10.00 sec
Speed * 0.1-10.00 sec	
Measurement frequency	up to 50 Hz
Rise time 0 - 100 %	0.5 ms
Peak value measurement with pulse stretching:	20 ms ≈ 98 % ; 100 ms ≈ 90 % (for two consecutive 5 ms impulses)
Delay until output "0"	100-0% max. 3 s
Accuracy	
Measurement accuracy: torque	≤ 0.02 % ± 2 Digit
Speed * ≤ 0.05 %	± 1 Digit
Temperature drift	50 ppm/K
Display	
Screen	4.5-digits; seven-segment LED, 14 mm, red
Overflow	horizontal bar on top
Display range: torque	9999 with decimal point freely selectable
Speed*	9999.9 rpm or 99999 rpm
Environmental conditions	
Operating temperature	0 up to + 50 °C
Storage temperature	-20 up to + 80 °C
Protection class	IP40
Dimensions (w x h x d)	
185 x 87 mm (DSC View) or	148 x 208 mm (DSC View plus)
Weight	
1110 g (DSC View), 1620 g (DSC View plus)	

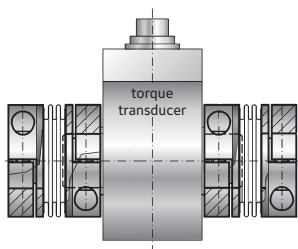
* DSC View plus only

METAL BELLOWS COUPLING WITH CLAMPING HUB FOR THE INSTALLATION ON TORQUE SENSOR 20 – 1,000 NM



Key application:

For connecting a torque transducer to driving and driven shafts.



PROPERTIES

FEATURES

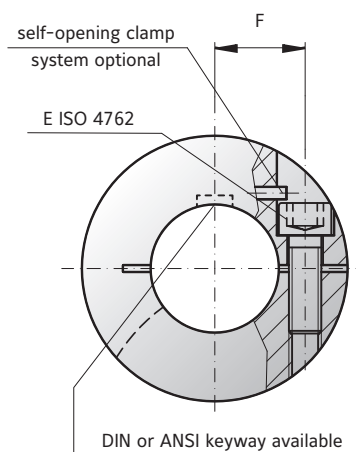
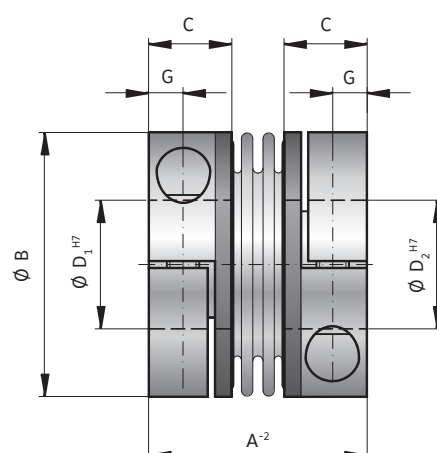
- Extremely compact
- High torque
- High torsional stiffness

MATERIAL

- **BelloWS:** high grade stainless steel
- **Hubs:** see table

DESIGN

Two precision machined hubs with clamping screws, concentrically mounted to the bellows.



MODEL BKM

SERIES			20	200	400	1000
Rated torque	(Nm)	T_{KN}	20	200	400	1000
Overall length	(mm)	A^{-2}	40	59	75	89
Outside diameter	(mm)	B	49	66	82	110
Fit length	(mm)	C	16.5	23	27.5	34
Inside diameter possible from \emptyset to \emptyset H7	(mm)	$D_{1/2}$	15-28	24-35	32-42	40-60
Fastening screw ISO 4762		E	M5	M8	M10	M12
Tightening torque	(Nm)		8	40	60	130
Distance between centers	(mm)	F	17	23	27	39
Distance	(mm)	G	6	9.5	11	13
Moment of inertia	(10^{-3} kgm ²)	J_{ges}	0.05	0.18	0.62	7.2
Hub material			AL	AL	Al	Stahl
Approximate weight	(kg)		0.13	0.4	0.7	3.5
Torsional stiffness	(10^3 Nm/rad)	C_T	41.9	138	170	570
Axial	\pm (mm)	Max. value	1	1.5	1	2
Lateral	\pm (mm)		0.06	0.08	0.1	0.1
Angular	\pm (degree)		0.5	0.5	0.5	0.5
Axial spring stiffness	(N/mm)	C_a	55.8	153	114	148
Lateral spring stiffness	(N/mm)	C_r	3,710	11,000	6,058	9,010
Speed max. with balancing	(min ⁻¹)		80,000	60,000	50,000	40,000

ORDERING EXAMPLE	BKM	20	20	19	XX
Model	●				Special manufacture (e.g. stainless steel hubs) possible by request
Size		●			
Bore \emptyset D1 H7			●		
Bore \emptyset D2 H7				●	

For custom features place an XX at the end of the part number and describe the special requirements (e.g. BKM / 20 / 20 / 19 / XX)

QUESTIONS ABOUT OUR MODERN SENSOR TECHNOLOGY ?



ANTRIEBSELEMENTE GMBH

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