

Series 420 Specification Rotor / Stator Non-contact Rotary Torque Transducers

DESCRIPTION Datum Electronics has further extended its standard range of torque transducers to cater for higher rotary speeds and an increased number of torque ranges.

The 420 Series torque transducers operate with no direct contact from the rotor to the stator, they are available either as complete transducers or as separate rotor/stator assemblies for test rig and OEM applications. They provide a system accuracy of 0.1% of full scale either into a rack-mounted indicator, a PC or a control system.

The standard range of housings cater for torque ranges from 10Nm up to 10kNm, the same modular elements have been applied to bespoke transducers for use down as low as 1Nm and up to 200kNm. The 420 Series is compatible with Datum's full range of torque indicators (Type 300 torque indicator, Type 310 portable torque and speed indicator, Type 370 torque, speed and power indicator) and a range of data-logging software including TorqueLog.

Torque measurement applications often benefit from an engineering input at an early stage in terms of the application of standard transducers or the design of a bespoke unit. We at Datum Electronics have an experienced design team with a wealth of experience and we are confident that we can engineer a design solution which will more than meet your requirements.

Among the enhanced features are the additional options for:

Direct Serial Outputs
Analogue Output (via Type 686 Analogue Output Module)
Increased Sampling Rates
Advanced Analysis Tools

The new range is complemented by Datum's ability to engineer special torque solutions with Transducers, Indicators and Software tailor made to meet customer requirements.

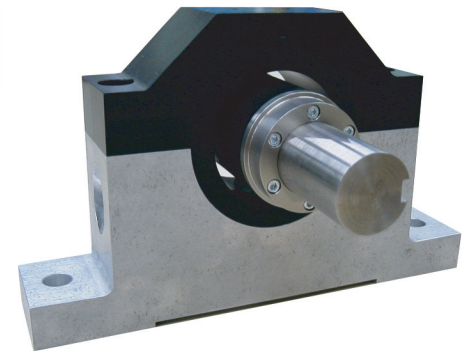
FEATURES

Series 420 Non-Contact Rotary Torque Transducer

- Non-contact Transmission
- High Accuracy
- High Tolerance to Misalignment
- 250 - 100,000Nm High Speed Non-contact Torque Transducers

Types of Specification

- Rotor / Stator Non-Contact Torque Transducers (Type RS420)
- Imperial Replacement Non-Contact Torque Transducers (Type RS420)



SERIES RS420 TECHNICAL RANGE

The transducer element in this case is a keyway or splined shaft with the strain gauges and the rotor electronics mounted either on the shaft, or inside the shaft depending upon shaft size and feasibility. The signal is transmitted across an inductive link to the stator that is mounted around the centre of the coupling, with a visible air gap. This type of torque transducer has no bearings, and there is no secondary load on the test shaft which allows for multiple shaft sizes.

Because the torque transducer has no bearings, it can be used at higher speeds, running much faster and longer than traditional transducers containing bearings. The stator needs to be mounted in relation to the shaft within an operating envelope of +/- 3-5mm.

We have standardised our range of torque transducers for clear and simple applications and specifications.

Size 1, 2 & 3	5Nm to 5-3500Nm
Size 4, 5	4000Nm to 60,000Nm
Size 6	65,000Nm to 100,000Nm

Type RS420 Torque Transducer

Park Road, Ryde, Isle of Wight, PO33 2BE, T: +44 (0) 1983 810310 F: +44 (0) 1983 810318

E: sales@datum-electronics.co.uk W: datum-electronics.co.uk

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TECHNICAL SPECIFICATIONS

TRANSDUCER SIZE	TORQUE RANGE	SPEED	COMBINED ERROR	SAMPLE RATE	SIGNAL RESOLUTION
RS420 - Size 1	0-5 Nm to 0-100Nm	0 - 12,000rpm	0.1% FSD (standard)	100sps	12 bit resolution
RS420 - Size 2	0-100Nm to 0-750Nm	0 - 12,000rpm	0.1% FSD (standard)	100sps	12 bit resolution
RS420 - Size 3	0-750Nm to 0-3,500 Nm	0 - 12,000rpm	0.1% FSD (standard)	100sps	12 bit resolution
RS420 - Size 4	0-3,500Nm to 0-15,000Nm	0 - 8,000rpm	0.1% FSD (standard)	100sps	12 bit resolution
RS420 - Size 5	0-18,000Nm to 0-60,000Nm	0 - 8,000rpm	0.1% FSD (standard)	100sps	12 bit resolution
RS420 - Size 6	0-60,000Nm to 0-100,000Nm	0 - 8,000rpm	0.1% FSD (standard)	100sps	12 bit resolution

These are our standardised range of torque transducers. If your requirements dictate anything above our standard transducer range of 100,000Nm we can and have engineered torque measurement solutions up to 250,000Nm.

Torque Output Digital RS232
Speed Output Digital RS232

Analogue Output Options 4-20mA / +/-10Vdc for torque and speed
Serial Data Options Digital RS485 / CAN Bus

Signal Transmission Non-Contact Inductive

Combined Error (Accuracy) 0.1% FSD (standard) 0.05% of full scale to order
(including non-linearity, hysteresis, signal transmission)

Output Sample Rate 10 - 100sps (Samples Per Second) - see notes for higher data rates to 5KHz

Operating Temperature Range - 10 to + 70C
Service Temperature Range - 20 to 85C (- 20 to + 125C Series 430*)
Storage Temperature Range - 40 to + 85C

* If you require a greater temperature range than the ones quoted, the Series 430 torque transducer can be adapted to meet your needs. Contact Datum Electronics for further information (T: +44 (0) 1983 810310 E: sales@datum-electronics.co.uk.)

Temperature Effect on Span 0.001% per degree C
Temperature Effect on Zero 0.002% per degree C
Calibration (normal temp) 22 degree C

Environmental Protection IP54 (IP65 to order if required)

Cable Length 4 metres (standard) longer if required
Connection Connector (TRIAD01 4-Way Plug) transducer
Mechanical Overload 150% of rated load (standard) up to 400% if required
Signal Convention + ve clockwise
 - ve anti-clockwise

Power Supply 11 - 15 Vdc, (24Vdc and 110 / 240Vac)

Speed Measurement Integral Magnetic pick off
(not effected by oil / dust etc...)

Other Options available Fast data in burst mode for transient analysis to 30000Hz
(Non-standard) AC Coupled signal output
 Signal Filtering
 Shaft Torque, Bending and Thrust Outputs
 Built into customer shaft

Compatible Instrumentation Type 370 / Type 310 / Type 300 and Datum Torque-Log Software

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Series 420 Specification Rotor / Stator
Non-contact Rotary Torque Transducers**DIMENSIONS****DIMENSIONS**

		Size 1	Size 2	Size 3	Size 4
A	Total length	184 mm	240 mm	315 mm	425 mm
B	Stator body length	128 mm	128 mm	119 mm	200 mm
C	End of stator body - to end of shaft	28 mm	56 mm	98 mm	112.5 mm
D	Shaft diameter	15 mm	30 mm	50 mm	75 mm
E	Stator body diameter	60 mm	85 mm	105 mm	150 mm
F	Keyway width	5 mm	8 mm	12 mm	20 mm
G	Keyway depth	3 mm	6.6 mm	6.6 mm	12 mm
H	Keyway length	25 mm	44 mm	78 mm	75 mm

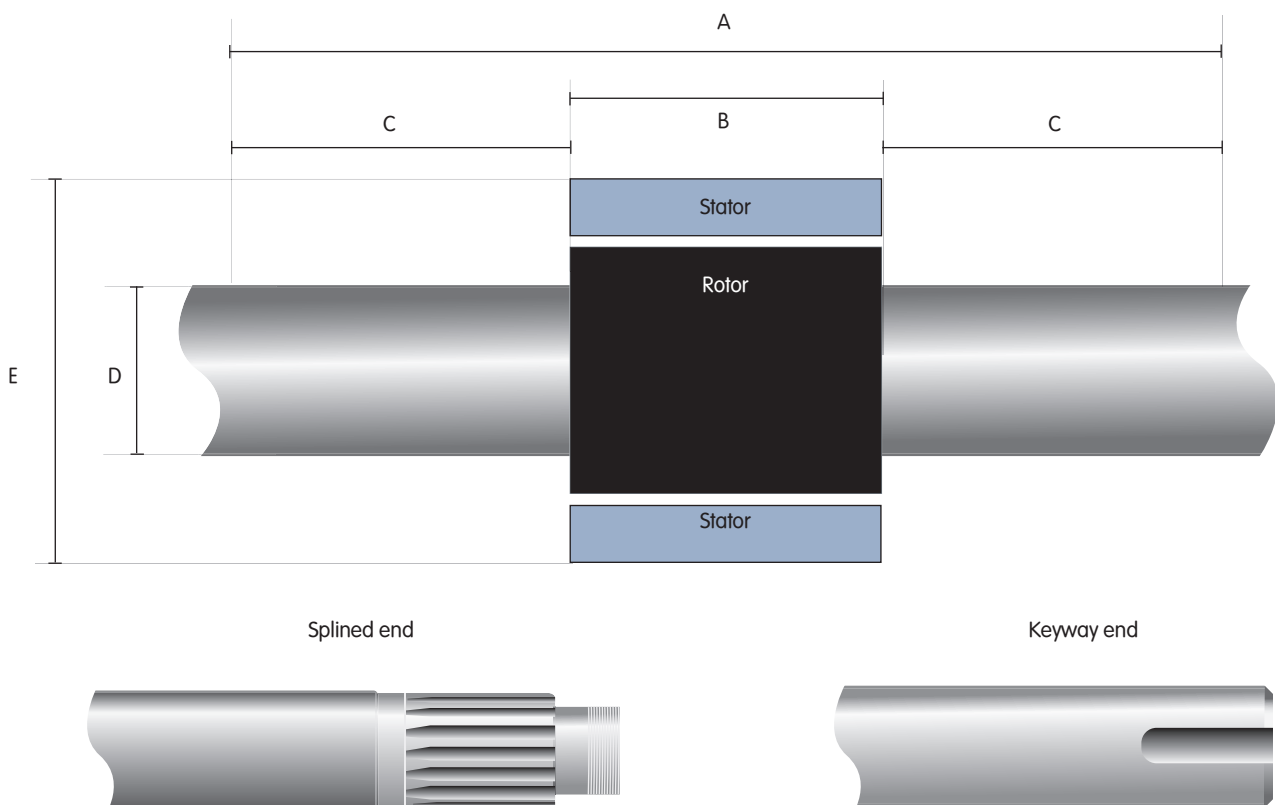
STATOR DIMENSIONS

Size	Max Rating	Width	Depth	Height	Fixing Base
1,2,3	3500Nm	45 mm	150 mm	134 mm	220 x 45 mm
4,5	60,000Nm	45 mm	200 mm	205 mm*	270 x 45 mm
6	100,00 Nm	45 mm	250 mm	260 mm*	320 x 45 mm

* Height will increase with shaft diameter

Rotor / Stator Torque Transducer without bearings

This type of torque transducer has no bearings, and there is no secondary load on the test shaft and allows for multiple shaft sizes. This type of transducer is very similar to the FF420 but has a keyway shaft as opposed to flanges.



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TORQUE & LOAD CELL INDICATORS

Datum Electronics offers a choice of Torque Indicators, which compliment the Series 420 Non-contact Rotary Torque Transducers. These indicators output data in various forms including Torque, Speed, Power, Strain and Load. Datum Electronics have also developed a compatible software package called TorqueLog, which allows data measurements to be recorded direct to your PC or laptop. See page 5 for full details.

type300 wall mounted or free standing torque cell indicator



Torque, Load or Strain Indication
Large 5-Digit Displays
Control Outputs 4-20mA, 0-10Vdc
2x relay
Serial Output for PC or Printer
Peak Hold
Simple to Calibrate

Designed for use with all conventional load cells, torque transducers and strain gauges. Available in wall mounted or free standing enclosures.

type310 hand-held torque cell indicator



Torque, Load or Strain Indication
Simple to Calibrate
Outputs 4-20mA, 0-5V
Peak Hold
Load Cell Supply

Compatible with Load Cells 0-3.2mV/V
PC Interface Software
Tare
10 Load Cell Calibration Memory
Rechargeable NIMH Batteries

Designed for use with all conventional load cells, torque transducers and strain gauges. The indicator provides a 2x 20 Character LCD readout of the load, its units and status.

type370 rack or desktop torque cell indicator



Torque, Speed and Power Indication
Control Outputs 4-20mA, 0-10Vdc
Serial Output for PC or Printer
Simple to Calibrate

Large 5-Digit Displays
2x relay
Peak Hold

For use with Datum's digital and slip ring torque transducers Supplied as a 19" rack or instrument case

type686 torque transducer analogue output module



Converts digital output from Torque Transducer and converts to either 4 - 20mA or 0 - 10 V Analogue Output. LED's indicate

level of torque from 0 - 100% rating - ve torque
Very low or 0 torque being recieved Mid range level of torque being received
Very high or 100% torque being received.

Serial port for connection to PC or Laptop Compatible with TorqueLog software
Zero reset allows operator to reset zero at current applied Torque Level.
For use with Datum's Torque Transducer Range

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TORQUELOG

TORQUELOG SOFTWARE

Datum Electronics TorqueLog software is an easy and convenient way of collecting data. Compatible with Windows 2000 and XP, the TorqueLog software provides a direct readout of Torque, Speed and Power on a PC with additional facilities to read peak torque, log data to Excel and provide data for other applications.

Using a Serial Port or USB Port (adapter required) from either a Laptop or desktop PC connected through to the Series 420 Torque Transducer, you can have the data that you require at your fingertips, allowing you to process the information which can be printed, displayed graphically or quickly saved as a Microsoft Excel spreadsheet.

The TorqueLog software is easy to use and easy to install, and provides the user with data access at the touch of a button.

DATA LOGGING

TorqueLog software can log data to the disk drive of your PC in a comma separated value (CSV) format. This format is directly compatible with Microsoft Excel.

Data can be logged, at a selectable interval from the transducer data rate (normally about 15 per second) to once every 30 minutes.

Data is logged as Torque only, or Torque, Speed & Power depending on the display mode selected.

FEATURES

Datum Electronics TorqueLog software is designed work on a Laptop or Desktop Windows™ PC to provide display of Torque, (or Torque Speed and Power) and Data logging facilities for Datum Electronics Range of Digital contact less Torque Transducers.

Calibrated Display of Torque
in Nm or lbf

Display of Speed in RPM

Display of Power in kW or HP

Peak Torque, Speed and
Power Capture Facility

Data logging of Torque
(or Torque Speed and Power)

Compatible for use with all Datum
Electronics Torque Transducer Range
including M420, FF420 & RS420

SYSTEM REQUIREMENTS

The software is compatible with any Windows™ PC but a basic minimum specification is as listed below.

Pentium™ Desktop or Laptop PC with
one spare Com Port (Com1 — Com 4)

Minimum 640 x 480 Screen resolution
(Min 256 colour, preferably 16 bit)

Min 5Mb free HDD space

Windows™ 98, 2000 or XP

