FORCE MEASUREMENT SOLUTIONS

INTERFACE TORQUE TRANSDUCER CHEAT SHEET

COMMON ABBREVIATIONS

kilonewton-meter	kNm	**Volts**	V
ounce-inch	oz-in	**Millivolt per Volt**	mV/V
kilopound-foot	Klbf-ft	**Full Scale**	FS
kilopound-inch	Klbf-in	**Ohm**	Ohm
pound-foot	lbf-ft	**Megohm**	Mohm
pound-inch	lbf-in	**Milliampere**	mA
inch-pound	in-lb	**Rated Output**	RO
newton-meter	Nm	**Degree Fahrenheit**	°F
Hertz	Hz	**Degree Celsius**	°C

ACCURACY

Nonlinearity	The deviation from a perfectly straight calibration curve, expressed as a percentage of full scale
Combined Error	The max deviation from the ideal output curve, including both non-linearity and hysteresis, expressed as a percentage of full scale.
Nonrepeatability	The variation in output when the same load is applied repeatedly under identical conditions, expressed as a percentage of rated output

TEMPERATURE PERFORMANCE

Compensated Range	The range of ambient temperatures over which the load cell is guaranteed to maintain its specified accuracy
Operating Range	The full range of ambient temperatures over which the load cell can safely function without physical or electrical damage
Effect on Zero	How much the zero output, the output signal when no load is applied, changes with temperature
Effect on Output	Describes how the sensitivity or output signal changes as temperature varies, while under load

ELECTRICAL

Rated Output	Signal level at full load
Bridge Resistance	Resistance across the sensor circuit
Electrical Connection	The method by which a torque transducer interfaces with external electronics—typically via a cable, connector, or terminal block—for power supply and signal output

MECHANICAL

Safe Overload	Max load it can handle without damage
Deflection Capacity	How much it bends at full load.
Overhung Moment MAX	The maximum bending moment the transducer shaft can handle from a load applied at a distance from its centerline.
Safe Side Load	The maximum force applied perpendicular to the shaft axis without damaging the transducer.
Safe Axial Load	The maximum force applied along the shaft axis (inward or outward) that the transducer can withstand.
Dimensions	Physical size details
Calibration	Verified output under known loads
Material	What the load cell is made of

CALIBRATION

System Calibration	Verifies the performance of the torque sensor and entire system, ensuring accuracy and reliable performance
ISO/IEC 17025:2017 Scope	Standard certification Interface is certified to

AVAILABLE OPTIONS

Vacuum Rated	Suitable for use in vacuum environments
Cables	Various lengths, gauges, and configurations available
Connectors	Type of electrical interface or connection method

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TORQUE TRANSDUCER COUPLING TYPES

- Floating Mount Keyed Single Flex Couplings
- Floating Mont Shrink Disk Single Flex Couplings
- Floating Mount Clamping Ring Single Flex Couplings
- Pedestal Mount Keyed Double Flex Couplings
- Pedestal Mount Shrink Disk Double Flex Couplings
- Pedestal Mount Clamping Ring Double Flex Couplings

Couplings
- A coupling is a mechanical device that connects two rotating shafts to transmit torque from one to the other.
- It can also compensate for some misalignment, absorb shock/vibration, and protect components from overload.

Floating Mount
- "Floating" refers to the way the torque sensor is mounted or installed.
- A floating mount means the torque housing is not rigidly fixed to the structure. Instead, it is allowed some freedom of movement, especially in axial or radial directions.
- This design is often used when there's misalignment between shafts, or where thermal expansion and vibration

Pedestal Mount
- A pedestal mount means the transducer housing is mounted on a rigid base or structure (like a pedestal).
- It is stationary and firmly secured, unlike floating mounts which allow some movement.
- This kind of mount provides a stable and solid foundation, minimizing external movement or vibration.
  Often used in test setups or lab environments where rigid, repeatable alignment is important.

Single Flex
- Single Flex means the coupling has one flexible element that can accommodate:
- Angular misalignment (the shafts are at a slight angle to each other).
- Axial movement (shafts move closer or farther apart).
- However, it does not allow any radial misalignment.
  Single flex couplings required for floating mount installations

Double Flex
- A double flex coupling has two flexible elements, typically with a spacer between them.
- It accommodates:
  - Angular misalignment
  - Axial movement
- Parallel offset (radial misalignment)
  Double flex designs are required for pedestal mount installations

Shrink Disk
- A shrink disk is an external clamping device used to create a friction connection between a shaft and hub.
- Unlike interference fit (where you heat the hub), a shrink disk uses mechanical tightening (usually with bolts) to shrink an outer ring onto the shaft.
- It's keyless, backlash-free, and provides a very strong, concentric clamping force.
  Think of it like a high-performance clamping collar that presses from the outside

Keyed
- This refers to the shaft attachment method.
- A keyed connection uses:
  - A keyway (slot) in both the shaft and the coupling hub.
  - A metal key inserted between them.
- Provides positive mechanical engagement — meaning the shaft and coupling rotate together without slip.
- It is a simple and reliable method, but not as backlash-free as shrink or clamping types.

Clamping Ring
- Describes the shaft attachment method.
- A clamping ring (or clamping hub) uses a split collar and tightening screws to clamp the coupling onto the shaft.
- Key features:
  - Friction-based connection (no keyway needed).
  - Backlash-free.
  - Easier to install and remove than shrink fit or keyed connections.
  - Maintains good concentricity for smooth rotation.

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