Cleveland-Kidder® Ultra

Performance Benefits

Cleveland Motion Controls new Ultra Line Slim Cell Transducer is part of the new Cleveland-Kidder® Ultra Line Tension Transducer family. With a unique low-profile design, it sets the standard for either new machinery or for retrofits where space is tight. With a dust sealed, corrosion resisting, water resisting design, it is ideal for use in demanding industrial environments.

The Ultra Line Slim Cell Transducer can be used with either rotating shafts or dead shaft rollers and has a flat cylindrical shape. It is designed to reduce the required side-frame-to-side-frame width of the machine.

Ultra Line Slim Cells, when used in conjunction with Ultra Line Amplifiers, provide better performance than competitive load cells by increasing the operating tension range from 8:1 to 40:1. They also provide more accurate measurement by eliminating electrical disturbances caused by AC drives, servos, and other modern high frequency devices.

Benefits: Advantages Over Conventional Transducers	Features: Why It Can Be Done	Technical Specifics: How CMC Does It
Operates over a wider tension range. Provides up to 40:1 tension range. Competitive products typically provide tension ranges of only 8:1 or 16:1, at the very best.	Provides a higher output signal which results in better signal resolution.	Full Wheatstone Bridge semi-conductor strain gage transducer design provides a higher and more stable signal. "Twin beam" design provides high mechanical gain with negligible displacement.
Ability to measure lower (light) tensions.	Substantial and stable output signal even at low tensions.	New amplifier technology eliminates drift, which distorts low-tension measurements.
Does not react to electrical noise from AC motors, servo, relay coils, or other electrical disturbances.	Rejects electrical noise resulting in clean and accurate output signal devoid of distortion.	Four-wire differential ended technology provides common mode rejection of electrical disturbances.
Better at maintaining proper tension measurement regardless of ambient temperature changes.	Minimum deviation of signal output due to temperature changes.	Precise temperature compensation network cancels out temperature influences.

LOW PROFILE LOAD CELL

SLIM CELL

ULTRALINE

Low Profile Load Cell Providing up to a 40:1 Tension Range

- Provides up to a 40:1 Tension Range (Ex: Accurately measures from 1.25 lbs. to 50 lbs. of tension when used with a 50 lb. rated Ultra Load Cell and Ultra Amplifier).
- Rejects electrical noise from AC motors, servos, relay coils, or other electrical disturbances.
- Available in 10 lb. to 1000 lb. load ratings.
- Designed to operate over wide tension ranges.
- For use with either rotating shafts or dead shaft rollers.
- Low profile design reduces width requirements of machine frame.
- Low friction bearing ideal for low tension applications.
- Maintenance–free bearing with lifetime lubrication.
- Competitively priced alternative to UPB style load cells.
- Easily oriented to any web path by rotating transducer (if the wrap angle changes) –no remounting necessary.
- Designed to comply with NEMA 4x, IP65 standards.
- Completely sealed—corrosion resisting, chemical resisting (Stainless Steel 410) water resisting, and dust sealed.
- 500-1000% Overload Ratings.

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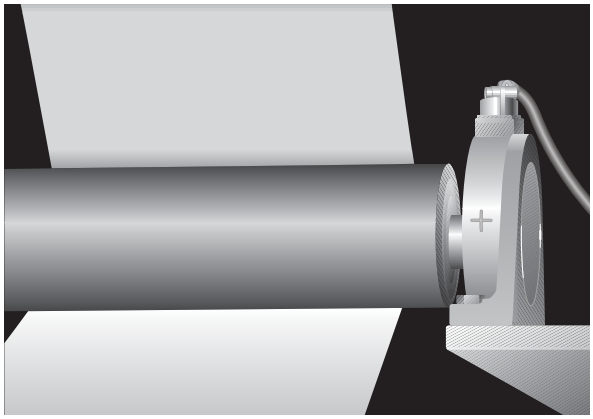

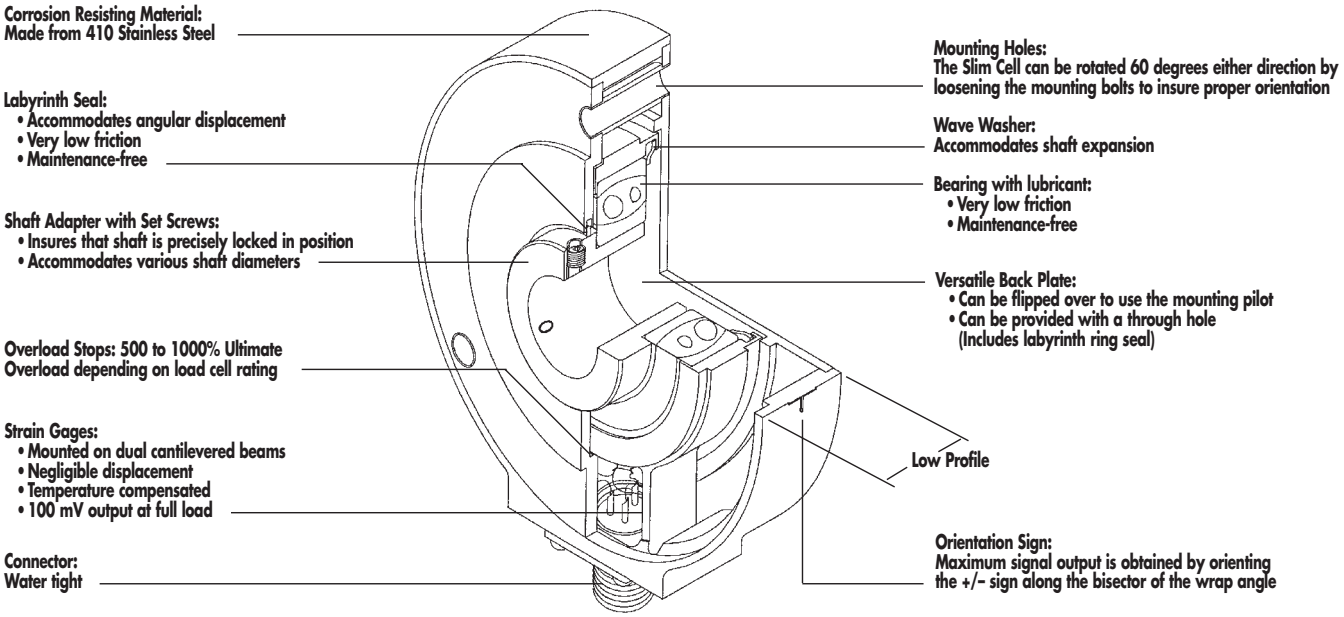

Weight lb. (kg.)	UltraSLM 1	UltraSLM 2
Ultra Slim Cell	2.8 (1.3)	6.6 (3.0)
Slim Cell + Bracket	5.5 (2.5)	11.6 (5.3)

* Linear overload: Maximum force applied on the transducer before hitting the safety stops.
The output is linear until that point.
** Ultimate overload: Maximum force applied on the transducer without risking permanent deformation.

Table 1: Ultra Slim Cell Ratings

SIZE	MWF (lb.)	Linear Overload (%)*	Ultimate Overload (%)**
UtraSLM1	10	400	800
	25	400	800
	50	400	1000
	100	300	1000
	250	300	1000
	500	150	500
UltraSLM2	500	200	1000
	1000	150	500

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PART NUMBER CONFIGURATOR

25	—	0.750	–	UltraSLM 1	—	BF	—	RS
LOAD CELL RATING		ROLLER SHAFT DIAMETER		LOAD CELL BODY SIZE		LOAD CELL BACK PLATE		ROLLER SHAFT TYPE

LOAD CELL RATING

10 lb. (45 N)
25 lb. (110 N)
50 lb. (225 N)
100 lb. (450 N)
250 lb. (1100 N)
500 lb. (2250 N)
***1000 lb.** (4500 N)

ROLLER SHAFT DIAMETER

In. **0.625**
0.750
1.000
***1.250**
***1.500**
***1.750**

mm **15mm**
20mm
25mm
***30mm**
***35mm**
***40mm**

LOAD CELL BODY SIZE

(See Table 2)

UltraSLM 1
UltraSLM 2

LOAD CELL BACK PLATE

(See Table 3 Installation Choices)

Blank/Flush **BF**
Blank/Pilot **BP**
Hole/Flush **HF**
Hole/Pilot **HP**

ROLLER SHAFT TYPE

Rotating (Live) **RS**

Stationary (Dead) **SS**

*Note — SLM 2

ORDERING PROCEDURE:

Slim Cell part numbers are configured according to your requirements:

1. Calculate the Maximum Working Force (MWF) rating from the Sizing Calculation equation. From the Part Number Configurator, select a Load Cell Rating that equals or exceeds the MWF from your sizing calculation. This becomes position 1 of your part number.
2. Refer to Table 2, Slim Cell Body Size: Roller Shaft Diameter vs. Load Cell Rating. Determine the diameter of your roller shaft and select the Slim Cell Body Size (SLM 1 or 2) that accommodates both your load cell rating and shaft diameter. Refer to the Part Number Configurator. The Roller Shaft Diameter and Load Cell Body Size become positions 2 and 3 of your part number. (Note: It may be necessary to turn down the end of your roller shaft on a lathe to accommodate the roller diameter choices offered.)
3. Refer to Table 3, Installation Choices and the Part Number Configurator. The Slim Cell may be mounted inside or outside the machine frame, or mounted on top by utilizing the optional pillow-style mounting bracket. The Slim Cell back plate is supplied with a through hole (H) or blank, without a through hole (B). The Slim Cell back plate is offered either with an alignment pilot (P) or flush mount (F). Determine the type of back plate required for your installation (BF, BP, HF, HP). The Load Cell Back Plate becomes position 4 of your part number.
4. Determine if your roller shaft is rotating or stationary. The Roller Shaft Type becomes position 5 of your part number.

Example: If you calculate a MWF of 21 lb., you have a rotating roller shaft and your shaft diameter is 0.750 inches. Your installation does not require a through hole in the back plate and you are flush mounting the Slim Cell inside the machine frame. Your part number is 25-0.750-UltraSLM1-BF-RS.

5. If you require the optional mounting bracket, order it separately. Refer to the chart below:

Mounting Bracket	Part Number
For Slim Cell Size 1 (UltraSLM 1)	SLM BR 1
For Slim Cell Size 2 (UltraSLM 2)	SLM BR 2

6. Obtain pricing and delivery information by contacting a CMC Sales Representative, Distributor or the factory.

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SIZING CALCULATION

T = Max Tension
A = Wrap Angle (Degrees)
W = Roll Weight
B = Angle of Tension Force (Degrees)
K = Overload for Transients (Nominal 1.5 for most applications)
MWF = Maximum Working Force (Used to select the proper force rating of the transducer)

$$MWF^{*} = T \times K \times \sin(A/2) \pm (W/2) \times \sin(B)^{**}$$

* The MWF calculation defines the force on each individual load cell
** If Angle B is below horizontal, use (+) in calculation. If Angle B is above horizontal, use (-) in calculation.

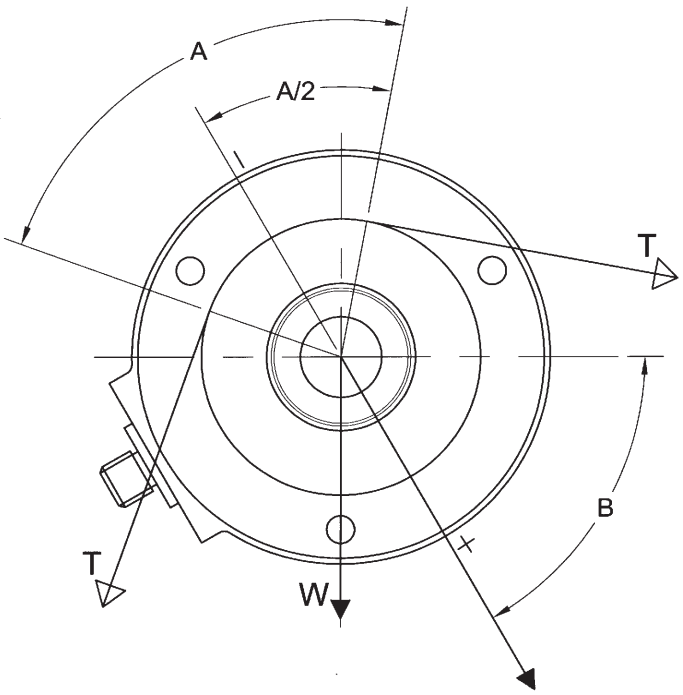

Table 2: Slim Cell Body Size (Roller Shaft Diameter vs. Load Cell Rating)

Load Cell Rating (lbs.)	Roller Shaft Diameter											
	15mm	0.625"	0.750"	20mm	25mm	1.000"	30mm	1.250"	35mm	1.500"	40mm	1.750"
10	UltraSLM 1											
25												
50												
100												
250												
500							UltraSLM 2					
1000												

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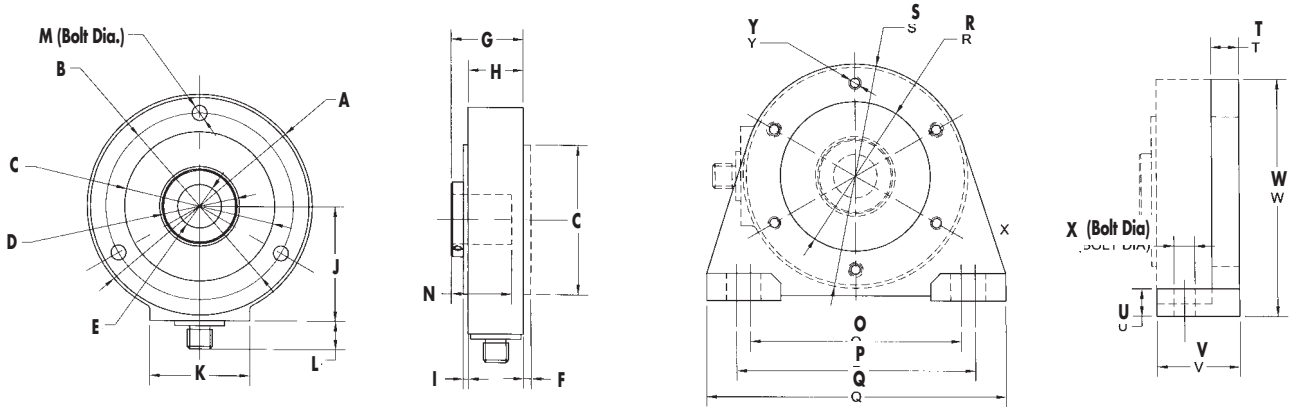

Slim Cell (alone)

Mounting Bracket (with Slim Cell)

DIMENSION TABLES

Dimensions In Inches*

SIZE	A	B	C	D	E**	F	G	H	I	J	K	L	M
UltraSLM1	4.50	3.75	2.996-3.000	1.50	–	0.12	1.31	1.02	0.07	2.30	2.00	0.65	1/4 (3)
UltraSLM2	5.80	4.75	4.196-4.200	2.46	–	0.14	1.70	1.32	0.10	3.05	2.50	0.65	3/8 (3)

SIZE	N	O	P	Q	R	S	T	U	V	W	X	Y***
UltraSLM1	1.02	4.22	4.78	6.00	3.000-3.006	4.50	0.55	0.55	1.60	4.75	3/8 (2)	1/4 (3)
UltraSLM2	1.36	5.50	6.50	8.00	4.200-4.206	5.80	0.65	0.65	2.00	6.2	1/2 (2)	3/8 (3)

* For dimensions in inches, allow 2.5 inch clearance for cable connector.
** See Table 2 for permissible Shaft Diameter. Bore Diameter is typically between Nominal Diameter +0.0007 and +0.0017 inch.
*** Bolts supplied with bracket

Dimensions In Millimeters*

SIZE	A	B	C	D	E**	F	G	H	I	J	K	L	M
UltraSLM1	114.3	95.3	76.10-76.20	38.1	-	3.0	33.3	25.9	1.8	58.4	50.8	16.5	6mm (3)
UltraSLM2	174.3	120.7	106.58-106.68	62.5	-	3.6	43.2	33.5	2.5	77.5	63.5	16.5	8mm (3)

SIZE	N	O	P	Q	R	S	T	U	V	W	X	Y***
UltraSLM1	25.9	107.2	121.4	152.4	76.20-76.35	114.3	14.0	14.0	40.6	120.6	10mm (2)	1/4 (3)
UltraSLM2	34.5	139.7	165.1	203.2	106.68-106.83	174.3	16.5	16.5	50.8	157.5	12mm (2)	3/8 (3)

* For dimensions in millimeters, allow 64 mm clearance for cable connector.
** See Table 2 for permissible Shaft Diameter. Bore Diameter is typically between Nominal Diameter +0.018 and +0.043 mm.
*** Bolts supplied with bracket

ULTRA LOAD CELL MOLDED CORDSETS

The load cell end of the cordset is provided with a straight or right angle M12 Quick –Connect Sealed 4 –pin keyed Connector as specified. The controller/ amplifier end of the cordset is provided with flying leads. (4 signal and 1 shield drain). The controller/amplifier end of the cable can be cut to length by the customer if the standard lengths provided are not the exact lengths required. Suitable for wash-down environments.

Cable Length	Part Number: Straight Connector	Part Number: Right Angle Connector
26 Feet (8 meters)	X44-33975-026	X44-33976-026
52 Feet (16 meters)	X44-33975-052	X44-33976-052
78 Feet (24 meters)	X44-33975-078	X44-33976-078
105 Feet (32 meters)	X44-33975-105	X44-33976-105
157 Feet (40 meters)	X44-33975-157	X44-33976-157

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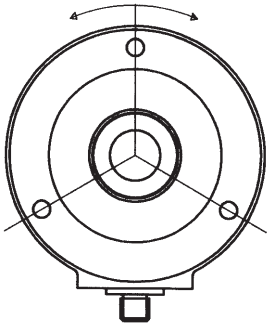
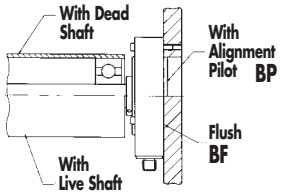
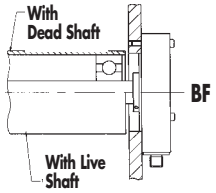
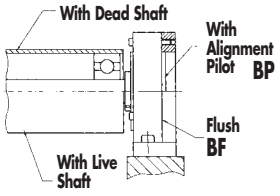
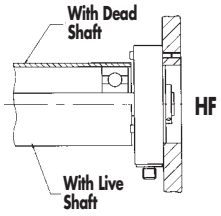
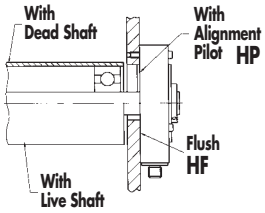
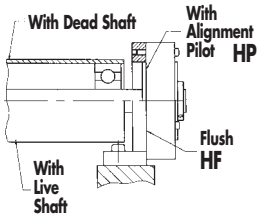
TABLE 3:
Installation Choices

62 degrees of angular alignment with bolt in position



	Inside Frame	Outside Frame	With Mounting Bracket
Blank Back Plate			
Back Plate With Hole			

GENERAL SPECIFICATIONS

Item:	Specification:
Material	Body and Side Plates — Stainless Steel 410
Bridge Resistance	135 - 147 Ohms @ 20°C
Gage Type	Semi-conductor strain gage, gage factor equals 95 (nominal)
Connector Type	M12 Quick-disconnect, 4 conductor, DC keyed
Excitation Voltage	5.6 VDC or VAC (RMS) maximum (Excess voltage can cause permanent damage)
Nominal Output Signal at Rated MWF	±100mV per Transducer (with 5 VDC or VAC rms excitation voltage)
Output Impedance	Approximately 64 Ohms per Bridge leg
Maximum Voltage, Gage to Beam or Base (Ground)	50 Volts peak
Operating Temperature Range	0°F to + 200°F
Maximum RPM	2500 (without derating)
Alignment	±2 degrees angular displacement
Break-away torque	0.6 lb.-in

PERFORMANCE SPECIFICATIONS

Description:	Value:
Transducer Repeatability	Less than or equal to ±0.03% of Maximum Working Force (MWF)
Transducer Linearity	Less than or equal to ±0.1% of MWF
Transducer Hysteresis	Less than or equal to ±0.1% of MWF
Transducer Thermal Drift: Zero Point Drift Span Drift	 Less than or equal to 0.02% per degree F of MWF (0.038% per degree C) Less than or equal to 0.006% per degree F of MWF (0.01% per degree C)
Response Time–Time for transducer and amplifier output to reach 90% of the final value due to a 50% step change.	1.2 milliseconds
Transducer Beam Deflection: Nominal Beam Deflection at MWF Nominal Beam Deflection at Maximum Overload	 .005 inches .011 inches

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