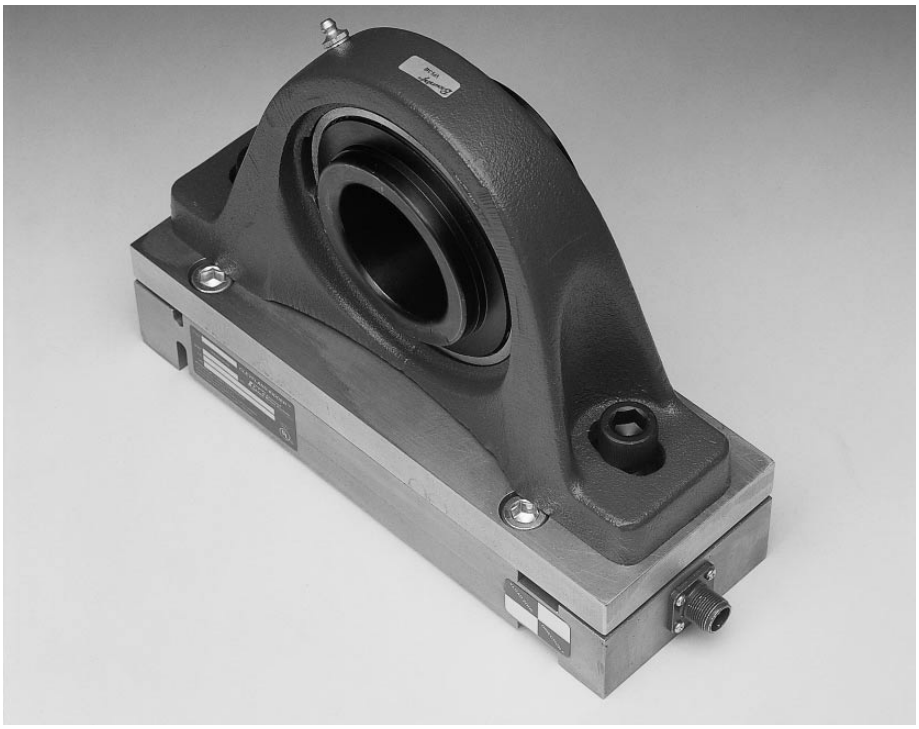
Cleveland-Kidder®

UNDER PILLOW BLOCK WASHDOWN-DUTY LOAD CELL



UPB Washdown-Duty LC

Provides the ultimate solution for measuring and monitoring precise tension on web process or wire machinery in demanding industrial environments

- For use with pillow block bearings and rotating shaft installations.
- Washdown-duty, withstanding impinging liquids and wet environments.
- Designed to comply with NEMA 4x, IP65/67 standards.
- Completely sealed. Corrosion-resisting and chemical-resisting (Stainless Steel 410 or Anodized Aluminum Alloy 6061).
- Competitively priced against common non-sealed, non-corrosive and chemical resistive designs.
- Compact low-profile design fits easily into tight places.
- With an end connector design (instead of on the side), no need for a left hand and right hand configuration.
- Available in a variety of load capacities (25 to 30,000 lb.) and sizes (6.5 to 17 inches long), suiting a wide range of applications.
- Provides 500% overload protection.
- Easily mounted at any angle.
- Convenient mounting plate for easy installation of pillow block bearing.
- Solid block one-piece design.

Performance Benefits

The UPB (Under-Pillow-Block) Washdown-Duty LC (load cell) is part of the Cleveland-Kidder® Tension Transducer product family. It sets the standard for under-pillow-block tension transducers for the web process industry.

The UPB Washdown-Duty LC has a completely sealed corrosion-resisting design, making it ideal for use in demanding industrial environments, including the production of paper, steel, textiles, roofing shingles, linoleum, rubber, foil, and food products.

The UPB Washdown-Duty LC can be mounted at any angle. Its web force direction is not restricted to being either parallel or perpendicular to the UPB top surface (common with other load cell designs). Its compact low profile design makes it perfect for use in both retrofit and OEM applications.

The UPB Washdown-Duty LC is a solid one-piece design, providing a high natural frequency response with a high level, linear output signal.

Design Features

The Cleveland-Kidder UPB Washdown-Duty LC is an under-pillow-block load cell that has been designed for measuring and monitoring tension on web process and wire machinery in demanding environments.

The UPB Washdown-Duty LC is made from a solid block that results in a completely sealed design with a very low profile. It is typically applied in pairs, one under each of the supporting guide roll's pillow block bearings. Mounting the pillow block bearing to the UPB Washdown-Duty LC is simple and convenient:

> Rather than having to drill into the top of the load cell, the UPB Washdown-Duty LC uses a convenient mounting plate, making installation and replacement easier. Held in place by four corner bolts, the mounting plate is easily removed, drilled and tapped to match the pillow block mounting dimensions. The plate is then remounted and the pillow block bearing is bolted into place.

To assure maximum corrosion and chemical resistance, the UPB Washdown-Duty LC is made from either Stainless Steel or Aluminum Alloy depending on the size rating. Displacement from loads is negligible (typically 0.002 in.) and the output is temperature compensated.

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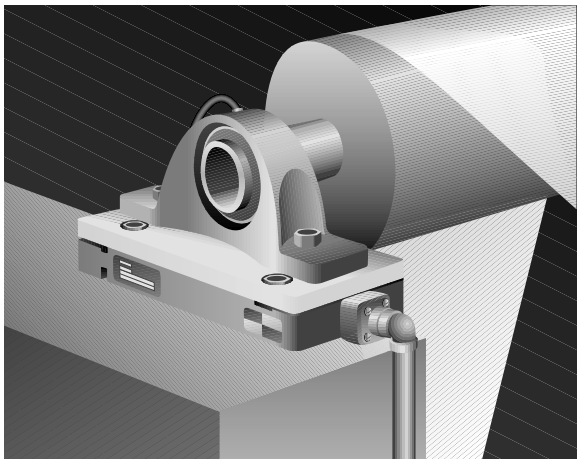

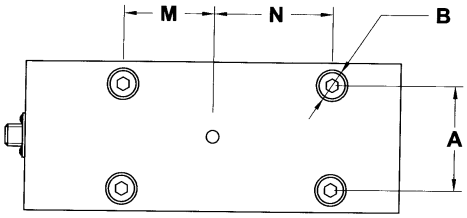

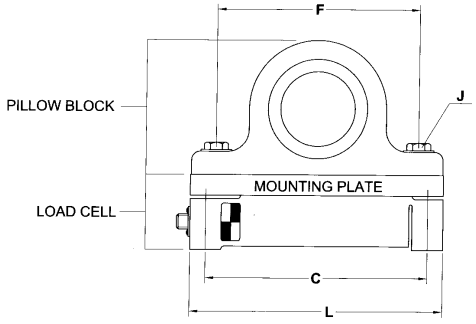

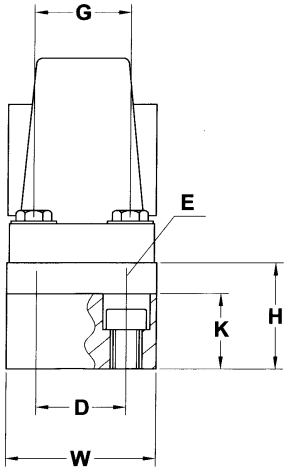

DIMENSION TABLES

Size No.	Dimensions in Inches*														Maximum Working Force (lb.)
	A	B	C	D	E	F(Max.)	G	H	J(Max.)	K	L	M	N	W	
UPB1	1.5	0.55	5.8	1.5	5/16 (4)	5.8	1.6	1.95	1/2	1.40	6.5	1.3	2.2	2.2	25, 50, 100, 250, 500, 1000
UPB2	3	0.80	10.0	3.0	1/2 (4)	10.0	3.0	2.47	3/4	1.68	11.0	3.3	3.95	4.0	1000, 2500, 5000, 10000, 20000
UPB3	4.5	1.63	15.0	4.5	1 (4)	15.6	5.0	4.2	1-1/8	2.80	17.0	4.8	5.2	6.5	10000, 20000, 30000

Size No.	Dimensions in Millimeters*														Maximum Working Force (N)**
	A	B	C	D	E	F(Max.)	G	H	J(Max.)	K	L	M	N	W	
UPB1	38	14	147.5	38	M8	147	40.5	49.5	M12	35.5	165	33	56	56	110, 225, 450, 1100, 2250, 4500
UPB2	76	20	254	76	M12	254	76	63	M20	42.5	279.5	84	100	101.5	4500, 11000, 22000, 45000, 90000
UPB3	114	41.5	381	114	M24	396	127	106.5	M30	71	432	122	132	165	45000, 90000, 135000

*Allow 2.5 inches clearance (64mm) for connector.
**Approximate rating in Newtons.

Weight lb. (kg.) Each		
UPB1	UPB2	UPB3
3.7 (1.7)	22 (10)	102 (47)

RATINGS

SIZE	RATING (LB)	* ULTIMATE OVERLOAD (%)
UPB1	25 to 1000	500
UPB2	1000 to 10000	500
	20000	250
UPB3	10000 to 30000	500

*Ultimate overload: Maximum force applied on the transducer without risking permanent deformation. For the Washdown duty UPB the output is linear up to the point of the ultimate overload.

INDUSTRIAL PRODUCTS

7550 Hub Parkway
Cleveland, Oh 44125-5794
Tel: 216-524-8800 or (800) 321-8072
Fax: 216-642-2100
Visit Us: www.cmccontrols.com

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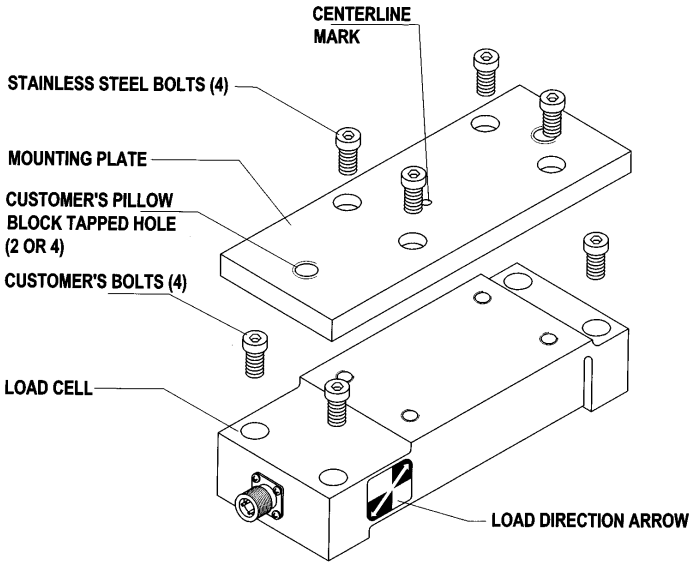

Procedure for Mounting the UPB Load Cell to the Machine Frame (see picture above)

Remove the pillow block mounting plate (it is held in place by four stainless steel corner bolts) in order to gain access to the four load cell mounting holes. Drill and tap the machine frame to match the load cell mounting holes.

Note: The UPB must be oriented so that the resultant tension force direction (bisector of the wrap angle) is in the same quadrant as the load direction arrow on the side of the UPB.

Bolt the load cell in place. The UPB load cell is designed so that either imperial or metric mounting bolts can be used when mounting the load cell to the machine frame. Refer to E in the Dimensions Table for the proper bolt size. Before remounting the pillow block mounting plate refer to the procedure below.

Procedure for Mounting the Pillow Block Bearing to the UPB Load Cell (see picture above)

Mounting the pillow block bearing to the UPB is simple and convenient. The UPB is offered with a pillow block mounting plate. The mounting plate is held in place by four stainless steel corner bolts. Remove the mounting plate, then drill and tap it to match the pillow block mounting dimensions. A centerline mark is provided on the mounting plate. The plate is to be drilled and tapped by utilizing this centerline mark to insure that the pillow block bearing is centered on the plate. Remount the plate and bolt the pillow block bearing to it. The mounting plate is 304 Stainless Steel, which is amenable to drilling but offers corrosive and chemical resistance. Refer to J in the Dimensions Table for the maximum bolt diameter recommended for bolting the pillow block bearing to the mounting plate.

SPECIFICATIONS

Material:	Body: Size 1- Anodized Aluminum Alloy 6061 Size 2 & 3 Stainless Steel 410 Mounting Plates: Stainless Steel 304 Bolts for Mounting Plates: Stainless Steel
Gage Resistance:	Each transducer contains a half-bridge, having a nominal end-to-end resistance of 440-480 Ohms.
Gage Factor:	100 nominal
Excitation Voltage:	10 VDC or VAC (rms) maximum
Output Signal @ Rated M.W.F.:	100 mV nominal / transducer 200 mV nominal / pair (With 10 VDC or VAC rms excitation voltage)
Operating Temperature Range:	0˚F to 200˚F
Sensitivity Change with Temp.	Less than 0.02% of rated output typical
Humidity:	95% R.H.
Combined Non-linearity And hysteresis:	±0.5% maximum of rated output
Repeatability:	±0.2% maximum of rated output
“MS” Connectors:	MS-3102E-10SL-3P (Sealed 3 Pin Connector)
Input Impedance required: (Transducer Signal Amplifier if not CMC supplied)	5K Ohms per transducer
Output impedance:	880 Ohms for UPB2 and UPB3 120 Ohms for UPB1

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UPB Washdown-Duty LC

ORDERING PROCEDURE:

1. Calculate the Maximum Working Force (MWF) rating based upon your calculations from the sizing calculation equation.
2. From the Selection Chart, determine the part number for the UPB Washdown-Duty LC. Select a MWF rating that equals or exceeds the MWF from your sizing calculation. Then, make sure that your pillow block bearing fits the UPB type that you selected (UPB 1, 2, or 3).

   Example: If you calculate a MWF of 2,204 lbs., select a UPB 2 rated at 2,500 lbs. MWF from the Selection Chart. Your part number is M846-12172-100. Then, from the Dimensions Table, make sure that your pillow bearing fits on the Size 2 transducer. If it does not, please consult factory.
3. Obtain pricing and delivery information by contacting a CMC sales representative, distributor, or the factory.

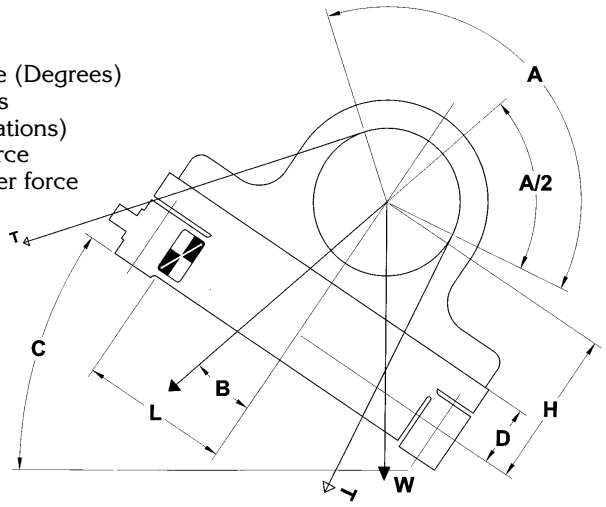
ACCESSORIES

Load Cell Cable —The load cell cable end is provided with a straight or right angle connector as specified. The controller end is provided with tinned leads. The controller end of the cable can be cut to length if the standard length provided is not the exact length required.

SIZING CALCULATION

T = Max Tension
A = Wrap Angle (Degrees)
W = Roll Weight
B = Angle of Tension Force (Degrees)
K = Overload for Transients
(Nominally 1.4 for most applications)
MWF = Maximum Working Force
(This is used to select the proper force rating of the transducer)
C = Mounting Angle
H = Bearing Height + D

SIZE	L (in.)	D (in.)
UPB1	2.5	0.98
UPB2	4.5	1.25
UPB3	6.5	2.10



SIZING CALCULATION:

$$MWF^{*} = \frac{\left[2KT \sin \frac{A}{2}\right] [HsinB + LcosB] \pm W[L\ cosC - HsinC]^{**}}{2L}$$

*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

Note: Consult CMC for assistance in sizing the load cell to your specific application.

SELECTION CHART

Transducer		MWF (lbs.)					
UPB1	Rating	25	50	100	250	500	1000
	Part No. M846-12171-	000	100	200	300	400	500
UPB2	Rating	1000	2500	5000	10000	20000	
	Part No. M846-12172-	000	100	200	300	400	
UPB3	Rating	10000	20000	30000			
	Part No. M846-12173-	000	100	200			

ACCESSORIES CHART*

Cable Length	Part Number - Straight Connector	Part Number - Right Angle Connector
20 Feet	M0-01948-020	M0-01957-020
25 Feet	M0-01948-025	M0-01957-025
50 Feet	M0-01948-050	M0-01957-050
75 Feet	M0-01948-075	M0-01957-075
100 Feet	M0-01948-100	M0-09157-100
150 Feet	M0-01948-150	M0-01957-150

*Cables are not washdown-duty. For washdown-duty cables consult CMC.

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