Transducer Instruction Manual

Range: Advance

Type: UPB300

Revision: V1.0

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1. Overview

The Load cell Type UPB300 Series is an all new designed load cell to meet today's demands of wide webs, rotating live shaft applications in paper - and converting machines. Featuring a unique beam design, it is a very long life product.

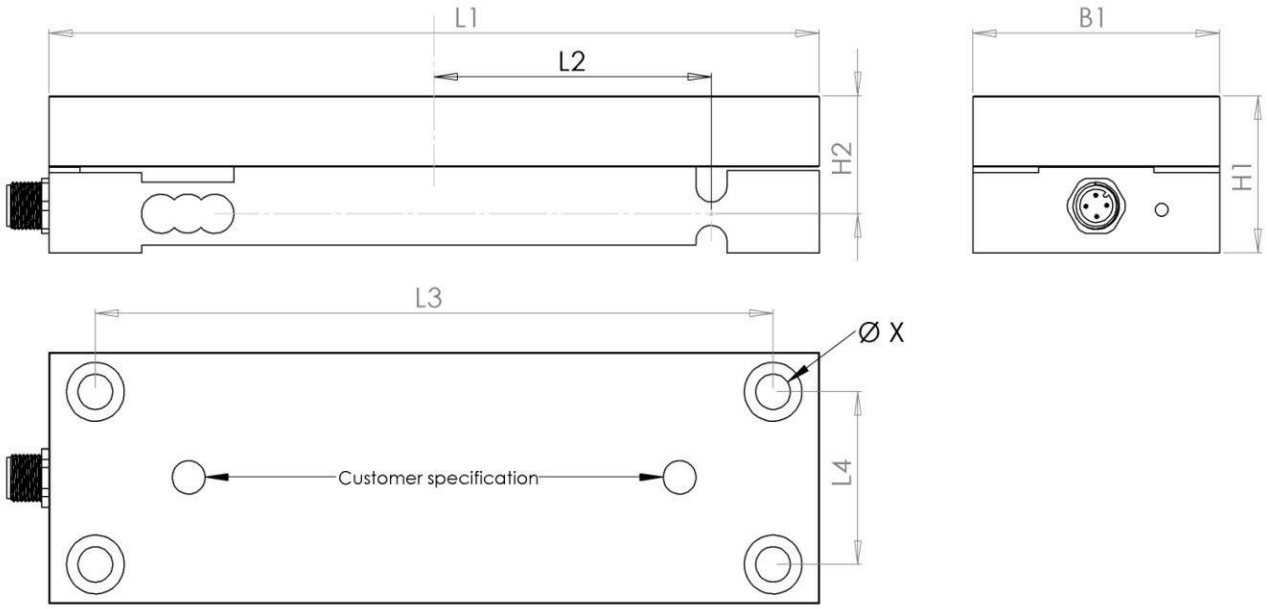
The UPB300 is a block type load cell for use with a top mounted pillow block bearing, for very high load applications. Various load ratings available.

The UPB300 Series cover a load range from 100N to 50.000N

2. Key Features

- ✓ Compact, sleek design, clean closed surface. Aluminium housing, available in stainless steel.
- ✓ Custom beam design ensuring very precise, repetitive performance and long life.
- ✓ All metric dimensions.
- ✓ Wash down duty, corrosive and chemical resistant.
- ✓ Industry standard 1x M12 connector.
- ✓ Easy to install.
- ✓ Price / performance competitive.

3. Dimensions



Dimensions in millimetres (mm)									
Type	**L1**	**L2**	**H1**	**H2**	**B1**	**L3**	**L4**	**X**	**Connector**
UPB305	134	47	28	25	44	118	28	7	1x M12 on cable
UPB310	200	72	40	30	64	176	44	9	1x M12 integrated
UPB315	210	77	40	25	68	180	44	9	1x M12 integrated
UPB320	280	95	48	42	94	230	66	11	1x M12 integrated

4. Load Rating

Nominal Force (F_n) in Newtons (N)										
Type										
UPB305	100	250	500	1,000						
UPB310		250	500		1,250	2,500	5,000			
UPB315			500		1,250	2,500	5,000			
UPB320							5,000	12,500	25,000	50,000

5. Technical Data

5.1 Half bridge technical data

UPB300 Technical Data

Supply	
Power Supply Voltage	5VDC
Outputs	
Nominal Output	50mV/V
Configuration	
Strain gauge configuration	Half bridge
Material	Aluminium or Stainless steel
Characteristics	
Strain gauge resistance	80…130 Ohms
Max operating force relative to F_n	150%
Force limit relative to F_n	500%
Deflection at F_n	0.1…0.2mm
Combined error relative to F_n	<0.5%
Temperature	
Operating Range	(-4…185°F) -20…+85°C
Temperature coefficient	<0.4% / 10K

5.2 Full bridge technical data

UPB300 Technical Data

Supply	
Power Supply Voltage	10VDC
Outputs	
Nominal Output	1mV/V
Configuration	
Foil gauge configuration	Full bridge
Material	Aluminium or Stainless steel
Characteristics	
Foil gauge resistance	350 Ohms
Max operating force relative to F_n	150%
Force limit relative to F_n	500%
Deflection at F_n	0.1…0.2mm
Combined error relative to F_n	<0.5%
Temperature	
Operating Range	(-4…185°F) -20…+85°C
Temperature coefficient	<0.4% / 10K

6. Dimensioning the UPB300 Load Cell

The correct Load Cell load rating for an application is determined by maximum web tension, web wrap angle around the roller and the mass of the roll.

The force $F_{(roll)}$ in Newtons (N) from the mass of the roller/shaft $m_{(roll)}$ in grams (g), is determined as:

$F_{(roll)} = m_{(roll)} \times 9.82$ (9.82 = acceleration in m/s^2)

The force $F_{(Load)}$ in Newtons (N) from the web tension $F_{(web)}$ in Newtons (N) and the web wrap angle X in Degrees (°) is determined as:

$F_{(Load)} = 2\ F_{(web)} \times \mathrm{Sin}(X/2)$

Force action arm H in millimetres (mm), from the centre height of the bearing H_c in millimetres (mm) and the load cell height H_2 in millimetres (mm) is determined as:

$H = H_c + H_2$

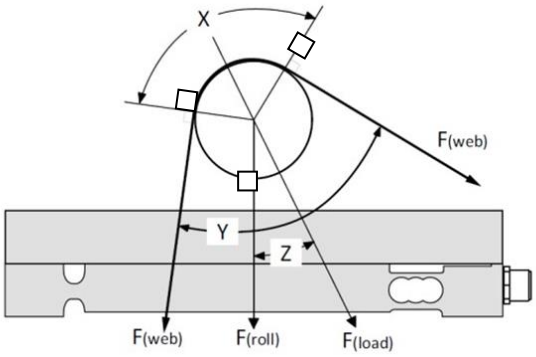
The force $F_{(dim)}$ in Newtons (N) from the transient safety factor K given as (1.5), the force $F_{(Load)}$ in Newtons (N), the force action arm in millimetres (mm), the angle between $F_{(Load)}$ and the vertical $F_{(roll)}$ shown as Z in Degrees (°), the force $F_{(roll)}$ in Newtons (N) and L_2 the centre hinge distance in millimetres (mm) as shown in section 3.Dimentions is determined as:

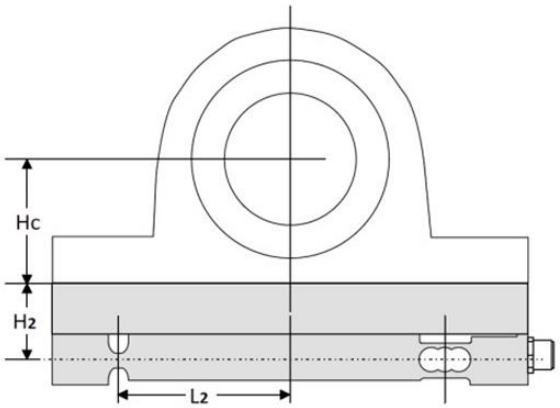
$F_{(dim)} = (2\ K\ F_{(Load)}\ (H \sin(Z))\ \mathbf{(“+”/”-“)^*}\ F_{(roll)}\ L_2)\ /\ 2\ L_2$

(**(“+”/”-“)***: If Z is below horizontal, use ”+”; above horizontal, use ”–”)

Select the next higher nominal load for the right size of UPB300 load cell.

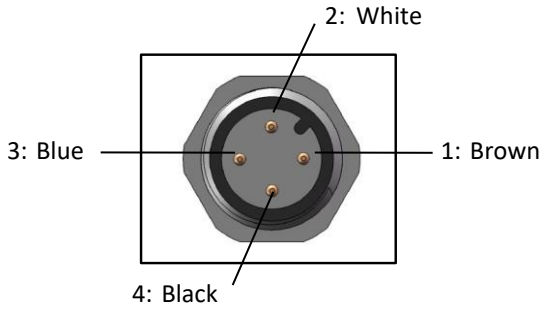
Note:
The minimum load cell size must be > ½ x $F_{(roll)}$
For mounting situations different from horizontal or vertical, ask CMC Controls for advice.





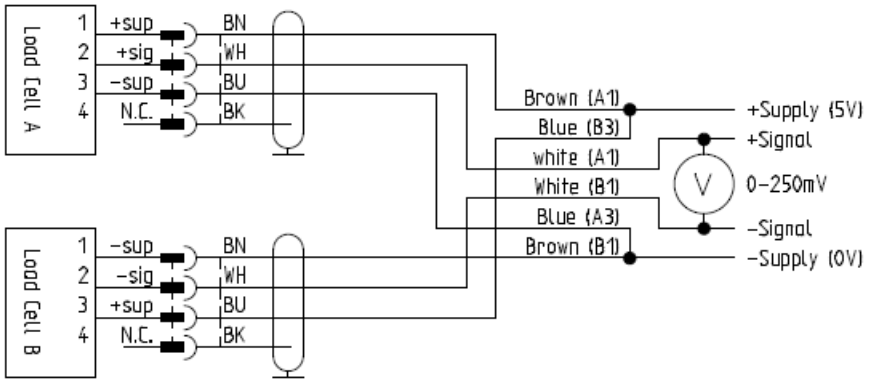
7. Electrical Connector

M12 - 4 pin male, Code A, IEC61076-2-101



8. Wiring Diagrams

8.1 Half bridge wiring diagram



8.2 Full bridge wiring diagram