SUPB TRANSDUCER SPECIFICATION

(Please return to or fax to DFE)

COMPANY _____ PREPARED BY _____

ADDRESS _____ TELEPHONE _____

CITY _____ STATE _____ ZIP _____ DATE _____

TRANSDUCER LOAD RATING SPECIFICATION:

To select the correct load rating for the SUPB transducer, look at Diagrams 1 and 2. You will need to calculate Net Force from Roll Weight and Net Force from Tension. The sum of these net force components equals the Total Net Force used to select the correct load rating.

A. APPLICATION VARIABLES:

Enter values from your application for the equation variables below.

T = Max. tension in web _____

W = weight of roll and support bearings _____

B = web wrap angle (=180° - C in diagram 2) _____

A = angle between weight 'W' direction and line V_____

D = angle between tension force direction F_T and line V_____

Dimensional Constants inches (mm)

Size 2: **L** = 2.4 (61) **H** = 1.5 (38) + a* **a** = 1.0 (25.4) to 2.5 (63.5) Note: "a" must be at least 1.0

Size 3: **L** = 4.5 (114) **H** = 3.0 (76) + a* **a** = 1.5 (38.1) to 2.5 (63.5) Note: "a" must be at least 1.5

Where " a " is the idler roll shaft center height above the top plate surface.

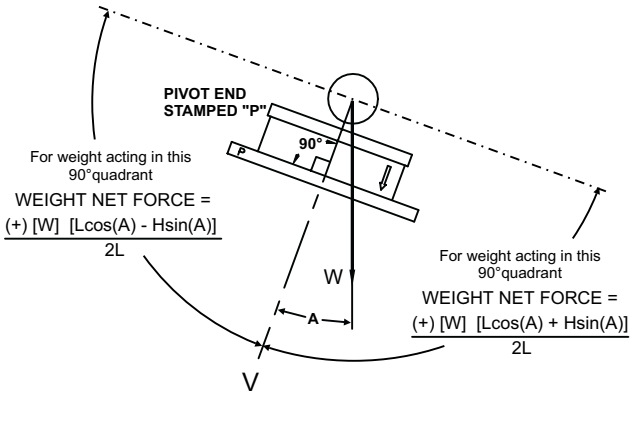
B. INSTRUCTIONS:

1) Refer to the **Diagram 1** formulas for Net Force from roll weight. Determine whether the roll weight will be pushing toward or pulling from the top plate, and whether the direction of the weight from the center of the roll is pointed in the 90° quadrant on the left or the right of line V.
Plug the values for your variables (and the dimensional constants) into the associated equation that most closely matches your application. Calculate the Net Force from Weight. *Note:* It is critical to maintain the algebraic sign ("+" or "-") in the result.

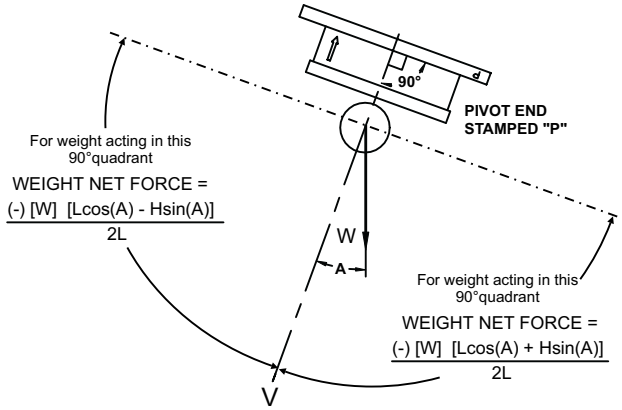
2) Refer to the **Diagram 2** formulas for Net Force from tension. Select the drawing that most closely matches your application in terms of F_T direction relative to line V (observe the pivot end marked "P").
Note: When the calculated Net Force from Tension is negative (i.e. pulling away from the transducer) it is necessary to reverse the signal polarity in associated electronics (indicators or controllers). This optional reverse polarity can be specified when purchasing DFE electronics.

DIAGRAM 1: FORMULAS FOR NET FORCE FROM ROLL WEIGHT

CASE A: Weight pushing toward top plate



CASE B: Weight pulling away from top plate



NOTE: When the transducer is mounted horizontally, the Weight Net Force equations can be simplified to W/2 in the left sketch, and (-) W/2 in the right sketch.

3) Add the Net Force from Weight and the Net Force from Tension paying close attention to the algebraic sign of each component. Use the total to select the appropriate load rating (lbs) from the list below.

Size	Max. Net Force lbs. (Newtons)	Load Rating
2	up to 120 (550 N)	100 lbs. (450 N)
	240 (1075 N)	200 lbs. (900 N)
	480 (2150 N)	400 lbs. (1800 N)
	960 (4275 N)	800 lbs. (3600 N)
	1440 (6425 N)	1200 lbs. (5350 N)
3	up to 1200 (5350 N)	1000 lbs (4450 N)
	3000 (13350 N)	2500 lbs (11125 N)
	6000 (26700 N)	5000 lbs (22250 N)

TABLE 1

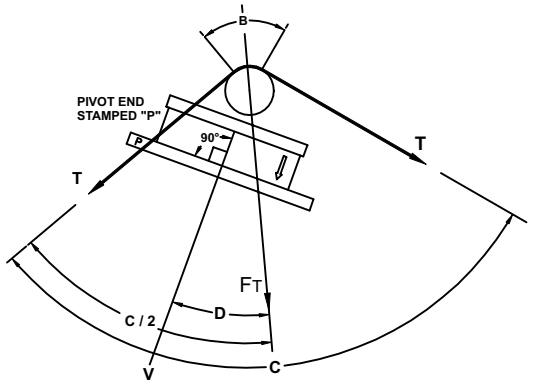
Angle (Degrees)	SINE	COSINE
0	.000	1.000
5	.087	.996
10	.174	.985
15	.259	.966
20	.342	.940
25	.423	.906
30	.500	.866
35	.574	.819
40	.643	.766
45	.707	.707
50	.766	.643
55	.819	.574
60	.866	.500
65	.906	.423
70	.940	.342
75	.966	.259
80	.985	.174
85	.996	.087
90	1.000	.000

DIAGRAM 2: FORMULAS FOR NET FORCE FROM TENSION

Notes: 1. If F_T is perpendicular (Angle D = 0°) and toward the top plate, either of the two drawing/formulas on the left can be used.
If F_T is perpendicular (Angle D = 0°) and pulling away from the top plate, either of the two drawing/formulas

WRAP 1

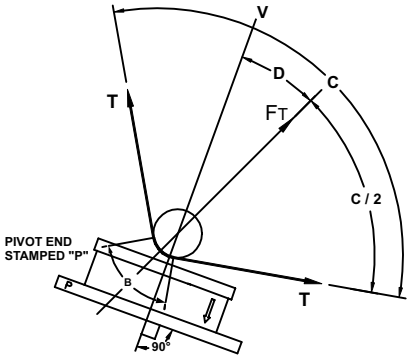
FT **pushes toward** top plate and away **from** pivot end



TENSION NET FORCE =
$\frac{(+)\ [4T\sin(B/2)]\ [L\cos(D) + H\sin(D)]}{2L}$

WRAP 3

FT **pulls away from** the top plate and away **from** pivot end

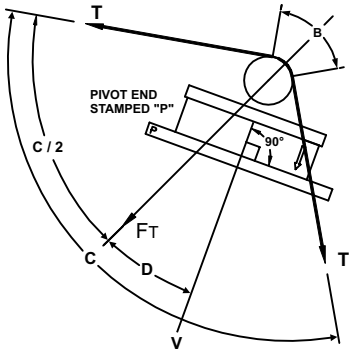


TENSION NET FORCE =
$\frac{(-)\ [4T\sin(B/2)]\ [L\cos(D) - H\sin(D)]}{2L}$

D must not exceed 45°

WRAP 2

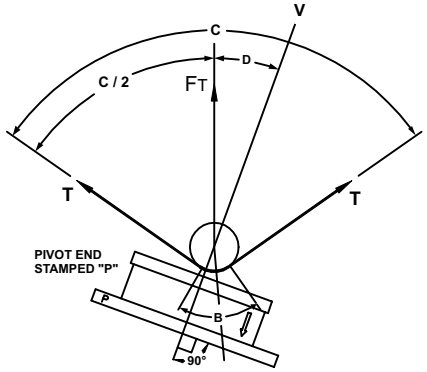
FT **pushes toward** top plate and **toward** pivot end



TENSION NET FORCE =
$\frac{(+)\ [4T\sin(B/2)]\ [L\cos(D) - H\sin(D)]}{2L}$

WRAP 4

FT **pulls away from** the top plate and **toward** pivot end



TENSION NET FORCE =
$\frac{(-)\ [4T\sin(B/2)]\ [L\cos(D) + H\sin(D)]}{2L}$

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