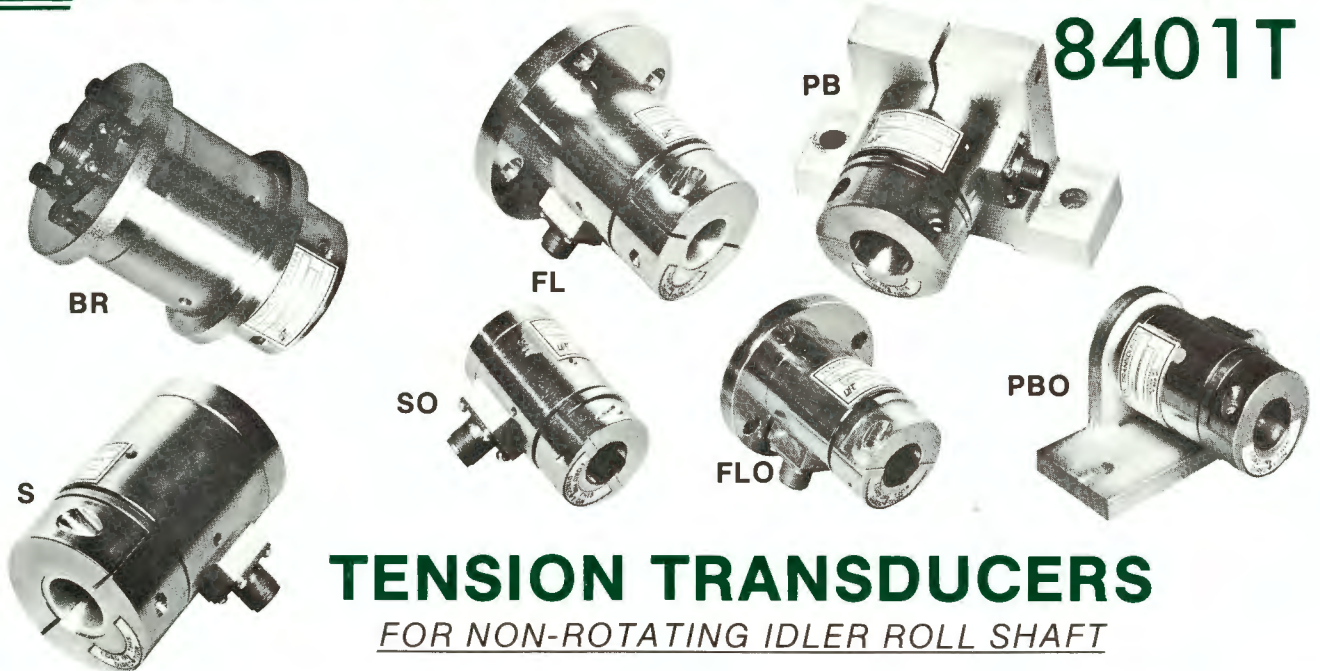


DFE

DATA SHEET

8401T



DESCRIPTION

The tension transducers are used to accurately measure tension in any moving web. They are used extensively in printing presses, coaters, laminators, slitters, rewinders, treaters and other process machinery having both wide and narrow webs. The transducers are used in pairs and are mounted on the ends of an idler roll having a non-rotating shaft. The tension of the web passing over the roll creates a force which is applied to a cantilever beam in each transducer. The beam bends a small amount, proportional to the tension. High-output semiconductor strain gages are mounted on the beam and detect the bending. The resulting electrical signal is directly proportional to tension. Because the signal is large, the transducer has excellent noise immunity. The beam movement is very small so the web is not affected.

The idler roll shaft is firmly clamped into the transducer by a split coupling secured by two bolts. This design allows the transducer to be mounted in the machine before the idler roll is attached. The unique joint design compensates for shaft bending, misalignment and changes in length due to temperature variation. The joint also allows the output signal to be linear and repeatable even at low tensions, while having high strength and reliability. The transducers can be oriented in any position and the web can pass over the idler roll in any direction.

Not sensitive to lateral web position. Built-in stops limit beam deflection and allow high overloads without damage. Steel construction for strength and durability.

ADVANTAGES

- High output.
- 12 load ratings in two sizes.
- Excellent linearity and low hysteresis.
- Negligible movement at point of measurement. Does not disturb the web.
- Four mounting styles. S, PB, FL, BR.
- Simple to install.
- Rugged and dependable. No diaphragm to bend or break.
- Joint is field-replaceable.
- Dust resistant and splash resistant.
- Electrical connector can be mounted in any of four positions on S or FL types. Standard position is 6 o'clock. 3 positions available on PB type.
- Versatile. Mounting style can be changed easily from one to any of the types available (except BR). Load rating can be changed simply and inexpensively. No need to buy new transducers if your requirements change.
- Excellent sensitivity at low tensions.
- Temperature compensated.
- Low cost. Inexpensive to buy and use.
- One year limited warranty.

DOVER FLEXO ELECTRONICS, INC.

93 Pickering Road, Rochester, N.H. 03867 (603) 332-6150 Telex 944351

SELECTION OF LOAD RATING

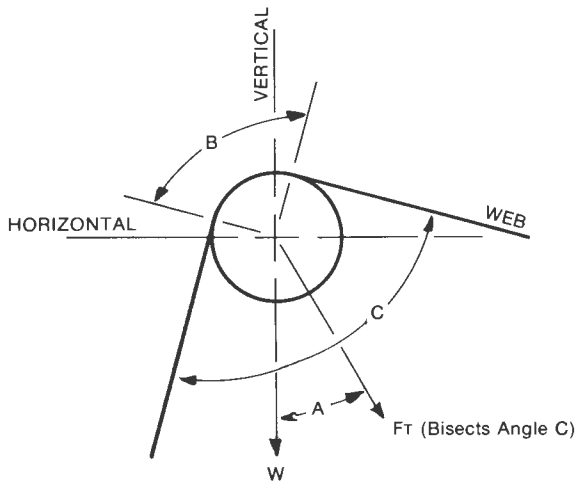
Proper selection of load rating requires that the effects of web tension, guide roll weight, and tension transients be considered. The resultant force, due to tension, is computed and multiplied by 2 in consideration of transients. The effective guide roll weight is then added and the sum is divided by 2 because each transducer takes half of the total force. The resulting equation is:

$$\text{Load Rating} = \frac{4T \sin\left(\frac{B}{2}\right) + W \cos(A)}{2}$$

If F_T points above the horizontal axis, then $+W \cos(A)$ becomes $-W \cos(A)$

Note: $B = 180^\circ - C$

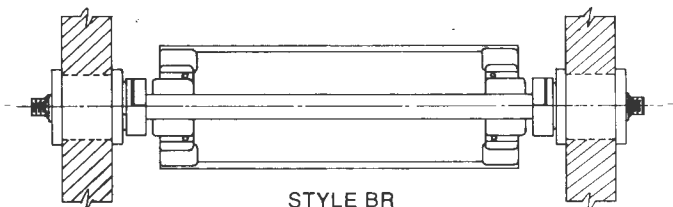
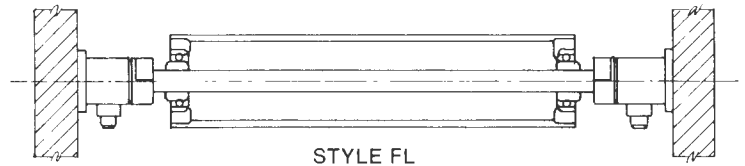
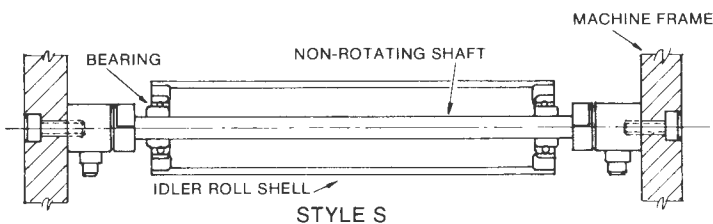
It is not necessary to exactly match the transducer to the load rating computed by the equation. When in doubt, use a larger transducer. Size of wrap angle is not critical. Usual wrap angle lies between 20° and 180° , and must remain constant during all operating conditions.



- B = WRAP ANGLE
- W = WEIGHT OF GUIDE ROLL
- T = TENSION
- F_T = FORCE DUE TO TENSION
- A = ANGLE BETWEEN F_T AND VERTICAL AXIS
- C = ANGLE BETWEEN ENTERING AND EXITING WEB

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	.767
45	.707	.707
50	.767	.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

MOUNTING STYLES



SPECIFICATIONS

- Excitation 5 volts, D.C.
- Output 250 mv, nominal
- Gage resistance 120 ohms, nominal
- Repeatability $\pm 1/4\%$ full span (FS) max.
- Combined linearity and hysteresis $\pm 1/2\%$ FS max.
- Temperature range -10°F to $+200^{\circ}\text{F}$
- Temperature Coefficient02% per $^{\circ}\text{F}$ Typical
- Finish Nickel plated
- Overload stops Adjustable, factory set at 120%

- Deflection001" to .003" typical, at full load
- Alignment007" per inch max. transducer axis misalignment
- Dust resistant and splash resistant
- Connector is Amphenol MS3102A-10SL-3P
- Standard connector position for types "S" and "FL" is 6 o'clock. Type "PB" is furnished with connectors at 3 and 9 o'clock. (Looking into shaft coupling, load direction arrow points in 6 o'clock direction).

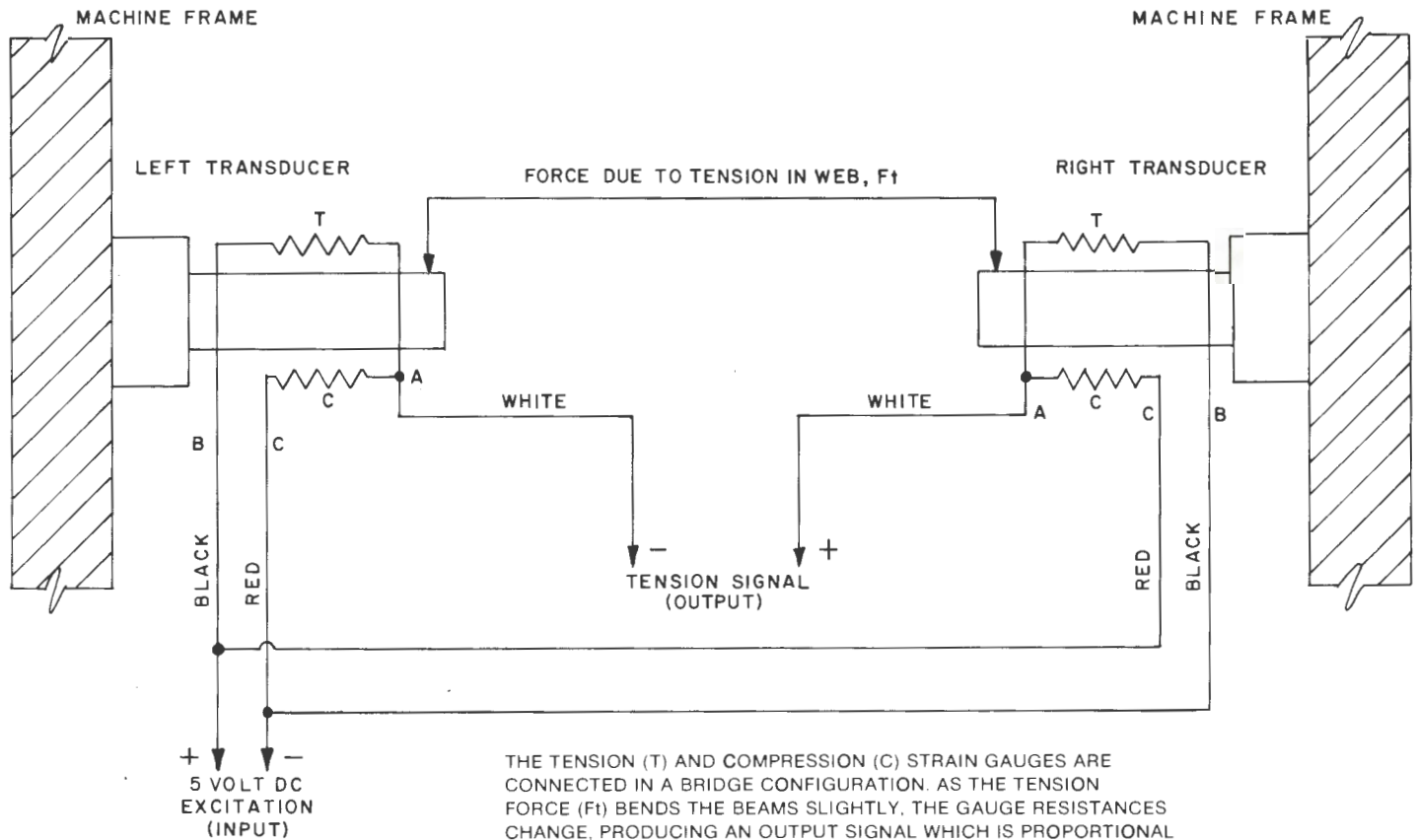
SIZE "2"

Bore Sizes $1/4$ " standard. Bushings are available for smaller shafts.
 Standard Load Ratings (Lbs.) 50, 75, 100, 150, 250, 300, 400, 500, 1000.

SIZE "0"

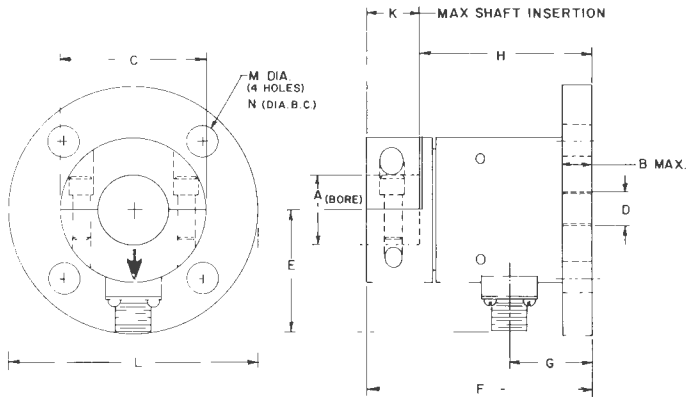
Bore Size $7/8$ " standard. Bushings are available for smaller shafts.
 Standard Load Ratings (Lbs.) 5, 10, 25, 50.

PRINCIPLES OF OPERATION



DIMENSIONS

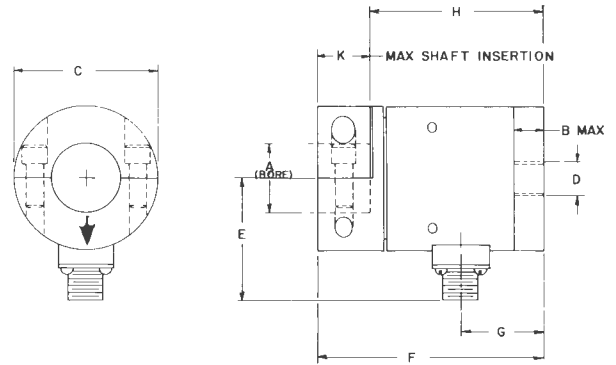
(Expressed in inches)



TYPE FL

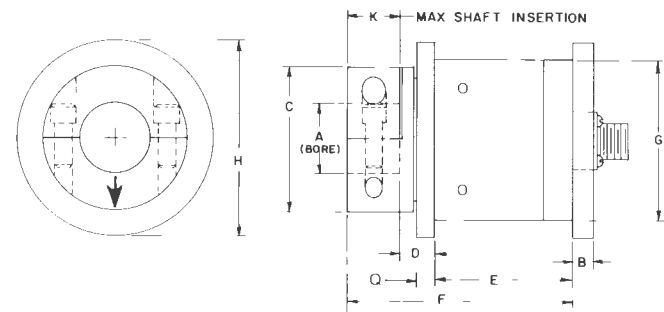
SIZE	A	B	C	D	E	F	G	H	K
2	1.250	.44	2.60	5/8-11	2.19	4.00	1.50	3.03	.97
0	.875	.37	1.75	3/8-16	1.87	3.00	.96	2.44	.56

SIZE	L	M	N
2	4.50	.531	3.500
0	3.12	.34	2.50



TYPE S

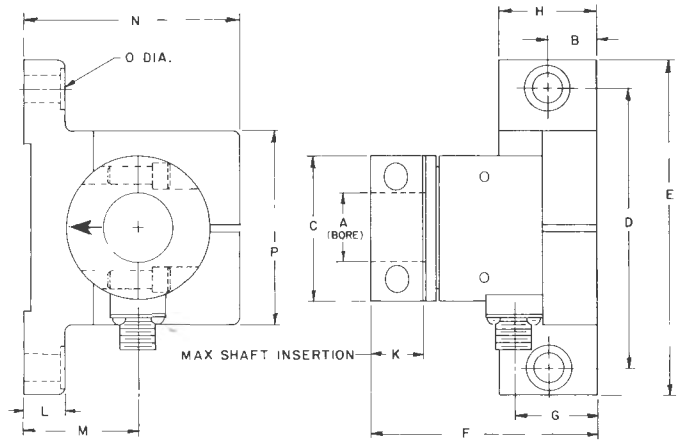
SIZE	A	B	C	D	E	F	G	H	K
2	1.250	.44	2.60	5/8-11	2.19	4.00	1.50	3.03	.97
0	.875	.37	1.75	3/8-16	1.87	3.00	.96	2.44	.56



TYPE BR

SIZE	A	B	C	D	E	F	G	H	K
2	1.250	.37	2.60	.42	2.467	4.00	2.834	3.50	.97

SIZE	Q
2	.188



TYPE PB

SIZE	A	B	C	D	E	F	G	H	K
2	1.250	.875	2.60	5.000	6.00	4.00	1.50	1.75	.97
0	.875	1.12	1.75	3.25	4.25	3.31	1.31	1.87	.56

SIZE	L	M	N	O	P
2	.75	2.06	3.87	.531	3.5
0	.37	1.25	2.5	.391	2.0

DOVER FLEXO ELECTRONICS MANUFACTURES: Tension Transducers, Tension Indicators, Rewind Tension Controllers, Unwind Tension Controllers for electric brakes and clutches, D.C. Motor Tension Controllers, Pneumatic Tension Controllers, and D.C. Motor Drives.