MEASUREMENT AND CONTROL SOLUTIONS

PRECISION TRANSDUCERS FOR TENSION MEASUREMENT
FB SERIES

Features and Benefits

- Force range 1000 to 25000 Newtons
- 10V excitation
- 2mV / V output
- M12 series connectors fitted
- Positive mechanical overload
- Usable at any angle
- Optional stainless steel cover plate and tray
- Supplied with removable top plate for mounting bearing housing

The FB1 and FB2 transducer series from TTS Systems are a high precision tension measurement product for use in web tension applications. These transducers are ideal for use on heavy duty applications.

A physical overload is cut into the body of the transducer to prevent overloads in both loading and unloading conditions. The transducer may be rotated over 360 degrees which helps where heavy deadweights are involved.

Typically used in pairs each transducer is supplied with a removable adaptor plate that allows the positioning and mounting of a bearing housing. We recommend that self aligning bearings with end float capability are used.

For increased security and protection an optional cover plate and tray can be fitted as shown above.

Let's Talk

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Specifications

General

Excitation voltage	10V DC
Gauge type	350Ω full bridge foil gauge network
Output signal at rated force	16mV nominal
Temperature range	+5 to 90˚C
Humidity	95% R.H.
Combined non linearity & hysteresis	better than 0.5% of maximum rated output
Repeatability	better than 0.2% of maximum rated output
Precision class	better than 0.5%
Minimum overload capacity	30,000 Newtons
IP rating	IP40 without cover IP45 with protective cover IP65 available on request

Mechanical

Weight FB1 with adaptor plate	3.3 kg in HE15, 10 kg in SS
Weight FB2 with adaptor plate	10 kg in HE15, 28 kg in SS
Overall dimensions size 1	230w x 73d x 75h mm
Overall dimensions size 2	320w x 100d x 130h mm

Ordering Details

FB1 - xxx - HE15 for Aluminium type
FB1 - xxx - SS for Stainless Steel type
FB2 - xxx - HE15 for Aluminium type
FB2 - xxx - SS for Stainless Steel type
Where **xxx** is the force rating as shown below

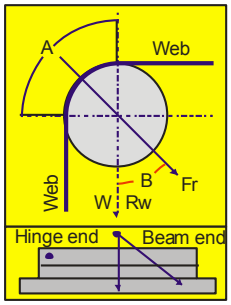
Available force ratings are:
Size 1 ..... 1000, 2500, 5000 Newtons
Size 2 ..... 10,000, 15,000, 25,000 Newtons

Accessories:
FB1 - 001 ..... stainless steel cover plate and tray for size 1
FB2 - 002 ..... stainless steel cover plate and tray for size 2

Complete drawings and installation guidance available at :-
www.tts-systems.com/prod-index.htm

Calculating The Transducer Rating

Configuration 1
Mounted horizontally
Fr is below horizontal

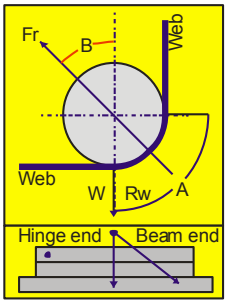


Where B is > 0 and < 45

Size 1
Fr = T * sin(A/2) (sinB + cosB)
Rw = (W/2)
MWF = (K * Fr) + Rw

Size 2
Fr = T * sin(A/2) [(1.36 * sinB)+cosB]
Rw = (W/2)
MWF = (K * Fr) + Rw

Configuration 2
Mounted horizontally
Fr is above horizontal

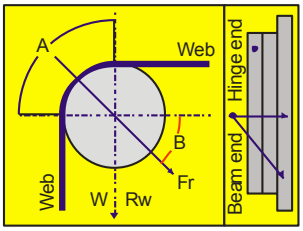


Where B is > 0 and < 45

Size 1
Fr = T * sin(A/2) (sinB + cosB)
Rw = (W/2)
MWF = -(K * Fr) + Rw

Size 2
Fr = T * sin(A/2) [(1.36 * sinB)+cosB]
Rw = (W/2)
MWF = -(K * Fr) + Rw

Configuration 3
Mounted vertically
Fr is below horizontal

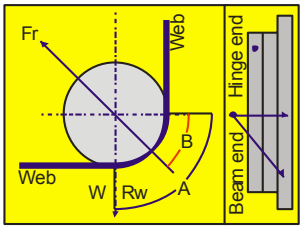


Where B is > 0 and < 45

Size 1
Fr = T * sin(A/2) (sinB + cosB)
Rw = (W/2)
MWF = (K * Fr) + Rw

Size 2
Fr = * sin(A/2) [(1.36 * sinB)+cosB]
Rw = (W/2) * 1.36
MWF = (K * Fr) + Rw

Configuration 4
Mounted vertically
Fr is above horizontal



Where B is > 0 and < 45

Size 1
Fr = T * sin(A/2) (sinB + cosB)
Rw = (W/2)
MWF = -(K * Fr) + Rw

Size 2
Fr = T * sin(A/2) [(1.36 * sinB)+cosB]
Rw = (W/2) * 1.36
MWF=-(K * Fr) + Rw

Key

T.....Maximum working tension
B .....Wrap angle bisector
W.....Idler roll weight
Rw.....Resultant force due to idler roll load
A.....Wrap angle of material
K.....Constant for calibration
MWF.....Total calculated per cell

To calculate transducer ratings you require the following parameters, maximum working tension (T), wrap angle (A) and angular offset (B). The formula given for the configuration, allows you to calculate the total load, termed MWF, that will be measured by the transducer. When calculated select the next rating above the MWF.

The following should be considered when selecting the transducer rating:

- (K) is a constant to allow for calibration. This figure is normally 2
- (T) should be the maximum working tension
- The wrap angle should be greater than 15 degrees and must not vary. Ideally, the sensing roll should be placed between an infeed and outfeed idler roller.
- Where multiple loads are applied to the same transducer rating, consideration has to be given to the upper and lower tension forces to ensure that the transducer generates an adequate signal for amplification.

Please contact TTS on 01233 624422 or through the internet on www.tts-systems.com if you require any assistance or further guidance for alternative arrangements.