



## MEASUREMENT AND CONTROL SOLUTIONS

### PRECISION TRANSDUCERS FOR TENSION MEASUREMENT CRF AND CRL SERIES

#### Features and Benefits

- Force range 100 to 5000 Newtons
- 10V excitation
- 2mV / V output
- M12 series adjustable connectors fitted
- Positive mechanical overload
- Taper lock assembly option
- Self aligning bearing included
- End float capability
- Fixed or rotating head assembly
- Wide variety of mounting options



The CRF and CRL transducer series from TTS Systems is a high precision tension measurement product for use in web tension applications. This product has been designed to allow maximum versatility with a number of mounting options and is especially practical in retrofit applications.

Typically used in pairs each transducer is fitted with either a 2201 (size 2) or 2205 (size 3) high quality self aligning bearing . The forces range from 100 Newtons up to 5000 Newtons per cell. The head assembly may be supplied in a locked form (CRF) for sensing rollers which have bearings integrated or in a rotating form (CRL) negating the need for bearings in the idler roller. An optional taper lock is available.

Various fixing kits provide maximum versatility. The transducer can be fixed using the M16 mount or alternatively a flange, pillow block or bore hole arrangements. An adjustable M12 connector allows the cabling to be positioned away from any interference.

**Let's Talk**

[www.tts-systems.com](http://www.tts-systems.com)



14 Highpoint Business

Ashford

Kent

United Kingdom

Phone: +44 (0) 1233 624422

Fax: +44 (0) 870 705 9678

E-mail: [support@tts-systems.com](mailto:support@tts-systems.com)

**Specifications**

Excitation Voltage ..... 10V DC  
 Gauge Type ..... 350Ω full bridge foil gauge network  
 Output signal at rated output ..... 20mV nominal  
 Temperature range ..... +5 - 90°C  
 Humidity ..... 95% R.H.  
 Precision class ..... better than 0.5%  
 Combined non linearity  
 & hysteresis ..... better than 0.5% of maximum rated output  
 Repeatability ..... better than 0.2%  
 Minimum overload capacity ..... 8000 Newtons size 2  
 20,000 Newtons size 3  
 IP Rating ..... IP50

**Mechanical**

Weight size 1 ..... 1.5 kg typ. plus fixing kit if used  
 Weight size 2 ..... 1.8 kg typ. plus fixing kit if used

Complete drawings and installation guidance available on request.

**Ordering Details**

**CRL/CRF(s)-xxx-S-L**..... for use with bolt and flange fixing accessories  
**CRL/CRF(s)-xxx-E-L**..... for use with pillow block and bore hole mounting accessories  
 Where..... **CRL** live shaft transducer  
 ..... **CRF** fixed shaft transducer  
 ..... **(s)** is the body size  
 ..... **xxx** is the selected force rating  
 ..... **S** - side connector for flange and bore fixing  
 ..... **E** - end connector for pillow block and bore hole mounting  
 ..... **L** - M12 Connector  
 ..... **OR**  
 ..... **A** - Amphenol Connector  
 ..... **TL** - Taper Lock

**Available force ratings are:**

**Size 2** ..... 100, 250, 500, 1000 Newtons  
**Size 3** ..... 2500, 5000 Newtons

**Accessories:**

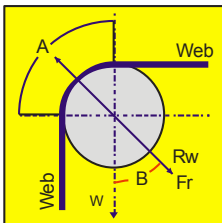
**FK-001** ..... flange fixing kit  
**FK-004** ..... pillow block fixing kit, style 2  
**FK-005** ..... bore hole kit, style 2  
**TL**..... taper lock

**Example:** ..... CRL2-250-S-L-TL loadcell  
 FK-001 Flange Kit  
 Cartridge live shaft transducer, 250 Newton rating with M12 side connector, taper lock with flange fixing kit accessory.

**Calculating The Transducer Rating**

**Configuration 1**

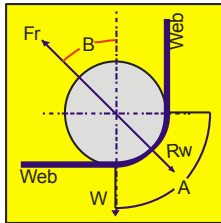
Fr is below horizontal



$Fr = T * \sin(A/2)$   
 $Rw = (W/2) * \cos B$   
**MWF = (K \* Fr) + Rw**

**Configuration 2**

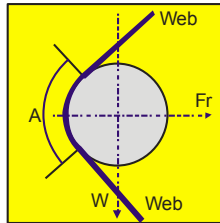
Fr is above horizontal



$Fr = T * \sin(A/2)$   
 $Rw = (W/2) * \cos B$   
**MWF = (K \* Fr) - Rw**

**Configuration 3**

Fr is horizontal



$Fr = T * \sin(A/2)$   
 $Rw = 0$   
**MWF = (K \* Fr)**

**Key**

**T**..... Maximum working tension  
**Fr**..... 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 calculate load 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](http://www.tts-systems.com) if you require any assistance or further guidance for alternative arrangements.