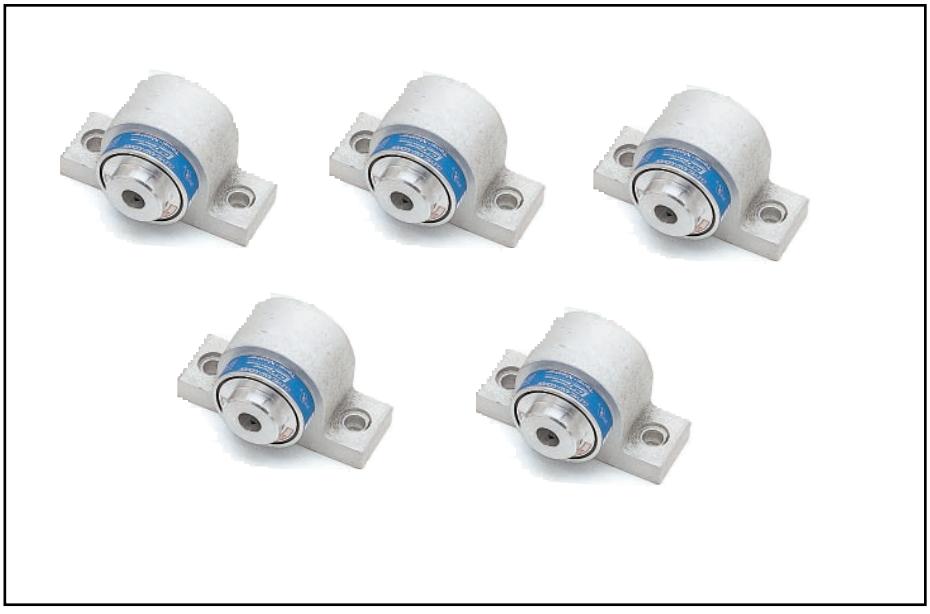
Cleveland-Kidder®

TENSION TRANSDUCERS

CANTILEVERED

Tensi-Master®CR



Cantilevered Load Cells for Measurement and Control of Tension In Wire, Fiber & Ribbon Applications

- Negligible displacement of “twin beam” design resulting in high level linear output signal, high frequency response and overall system stability.
- Easily oriented at any angle to accommodate all web paths.
- Accommodates customer-mounted pulley.
- Heavy duty construction with corrosion resistant finish and dust seal.
- Incorporates a built-in overload stop.
- Accommodates “MS type connectors.
- Wide range of Maximum Force ratings.
- Wide operating temperature range.
- Corrosion-resistant finish and dust seal.

Performance Benefits

Cleveland Motion Controls specializes in the design and application of web tension control product solutions. Included is the family of Cleveland-Kidder® Tensi-Master® CR Tension Transducers, providing measurement and control of tension in wire, fiber and ribbons.

Tensi-Master® CR Tension Transducers are designed for supporting a customer supplied pulley assembly in applications such as printing, coating, cutting, plating, laminating, and embossing; and in the processing of tire cord, textiles, wire, tape, extensible film, thread and yarn, paper, foil, cellophane, and many other products.

Tensi-Master® CR Tension Transducers are easily applied, provide consistent quality, and are highly responsive for enhanced system performance. With heavy duty construction and a low maintenance design, they minimize downtime.

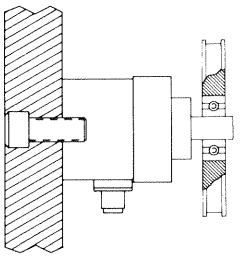
Design Features

Tensi-Master® CR Tension Transducers utilize a cantilevered “twin beam” to render greater sensitivity and response without sacrificing protection from overload and transients common to industrial process machinery.

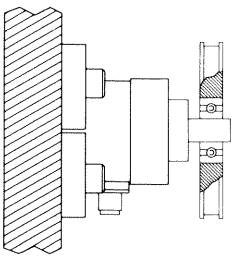
Semiconductor strain gauges are bonded to the beam assembly, and provide a linear output signal as the beam assembly is deflected by the force acting on the pulley or roll.

Tensi-Master® CR Tension Transducers are available in eight different load ratings, providing tension sensing of wire, fiber and ribbons over an extremely wide range. With a versatile transducer orientation capability, they easily accommodate tension forces applied in any direction. Flexibility of installation is accomplished by adding mounting hardware to a basic module to complete the body style.

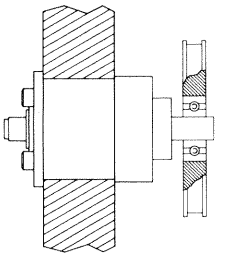
METHODS OF INSTALLATION



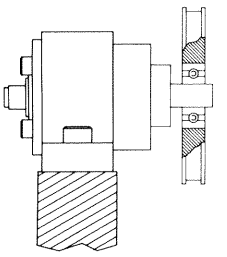
TYPE "S"
Stud Mounted



TYPE "FL"
Flange Mounted



TYPE "BR"
Bearing Replacement

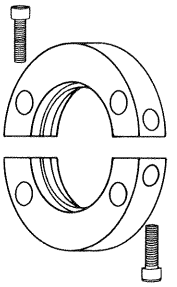


TYPE"PB"
Pillow Block

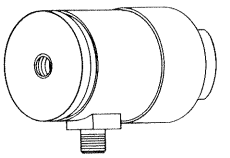
Tensi-Master CR CONFIGURATION GUIDE

This diagram illustrates the various configurations provided by the Tensi-Master modular design.

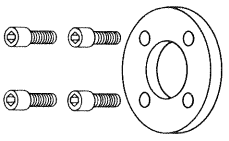
Note: Tensi-Master CR transducers are designed for use with a cantilevered roller only.
See operating parameters.



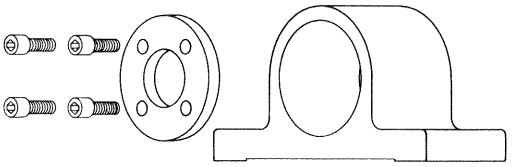
TYPE FL MOUNTING KIT
FL SIZE 1 (MO-04493)



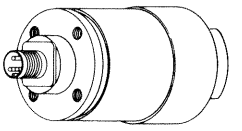
TRANSDUCER CARTRIDGE
TNSC-1T (MO-08282-X)



TYPE BR MOUNTING KIT
BR SIZE 1 (MO-04495)



TYPE PB MOUNTING KIT
PB SIZE 1 (MO-04494)



TRANSDUCER CARTRIDGE
TNEC-1T (MO-08283-X)

HOW TO ORDER

CARTRIDGES

TYPE	SIZE	CATALOG NO.	MWF RATING (lbs.) 5	10	15	25	50	75	100	150
TNSC TNEC	1T 1T	MO-08282- MO-08283-	0	1	2	3	4	5	6	7

MATING CONNECTORS

TYPE	CATALOG NO.	DESCRIPTION
Standard Connector	X43-07218	MS-3106A-10SL-3S
90°Connector	X43-08093	MS-3018A-10SL-3S
Clamp and Bushing	X43-07248	97-3057-1004-1

MOUNTING KITS

TYPE	SIZE 1
FL	MO-04493
BR	MO-04495
PB	MO-04494

SELECT:

1. Maximum Working Force (MWF) rating, based upon the value determined by using the equation provided in the calculation section.
2. Transducer Cartridge Type and Size:
   TNSC-1T for Type S and FL installations.
   TNEC-1T for Type BR and PB installations.
3. Required Mounting Kit for Type FL, BR and PB installations.
4. Standard length (17 ft. or 23 ft.) or custom length (up to 150 ft.). Transducer Cables, or Mating Connectors. (specify mating electronic equipment when ordering Transducer Cables.)

EXAMPLE:

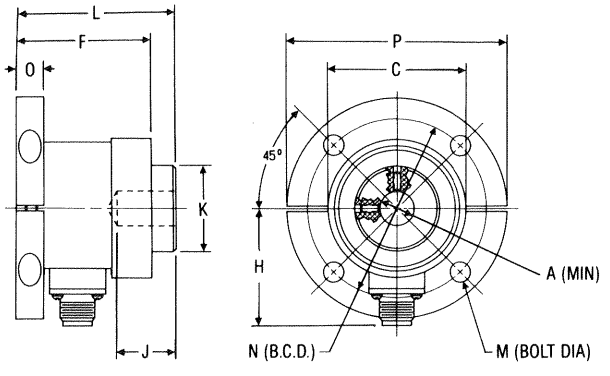
An TNEC-1T Transducer Cartridge with a 75 lb. MWF rating is No. MO-08283-5. For a Type PB installation use Mounting Kit No. MO-04494.

OPERATING PARAMETERS

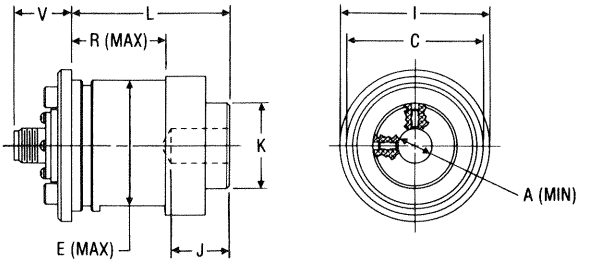
It is recommended that the operating parameters do not exceed the maximum values in the table. Consult the factory if operation outside of these limits is required.

TRANSDUCER MWF - LBS	RECOMMENDED MAXIMUM LIMITS		
	ROLL WEIGHT POUNDS	ROLL WIDTH INCHES	SPEED RPM
5	1.00	2.00	3500
10	1.75	3.00	4000
15	2.50	3.50	4000
25	4.00	3.50	4250
50	8.00	3.25	4500
75	12.00	3.00	4500
100	15.00	3.00	4500
150	25.00	2.50	4500

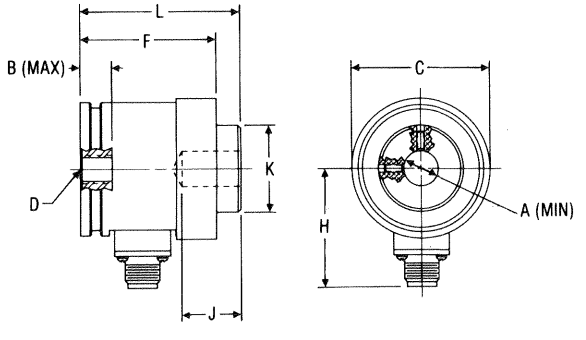
DIMENSIONS



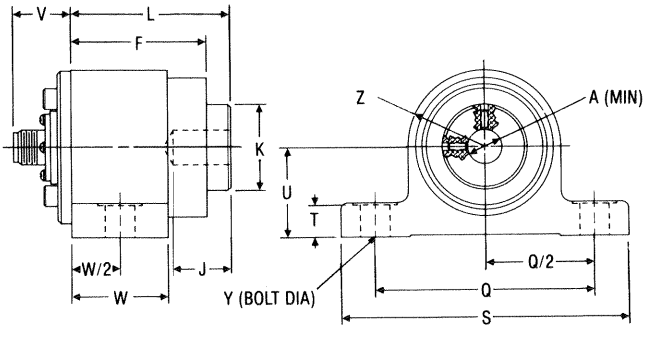
TYPE TNSC CARTRIDGE WITH FL MOUNTING KIT



TYPE TNEC CARTRIDGE WITH BR MOUNTING KIT



TYPE TNSC CARTRIDGE

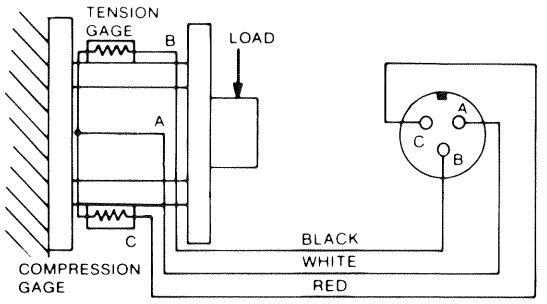


TYPE TNEC CARTRIDGE WITH PILLOW BLOCK MOUNTING KIT

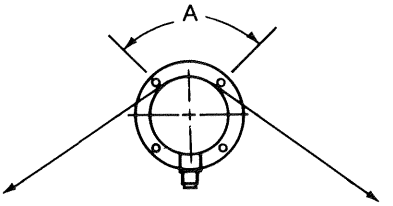
DIMENSIONS ARE IN INCHES. ALLOW 2.5 INCHES CLEARANCE FOR CONNECTOR												
A	B	C	D	E	F	G	H	I	J	K	L	M
0.625	0.55	2.50	1/2 - 13	2.375	2.44	-	2.10	2.75	1.03	1.55	2.88	3/8
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
3.25	0.50	4.00	4.00	1.74	5.38	0.58	1.63	1.02	1.75	-	1/2	1.50

PRINCIPLE OF OPERATION

DIAGRAM OF "TWIN BEAM" TRANSDUCER GAGING AND WIRING



CALCULATION



Determine the M.W.F. required using the following equation:

$$M.W.F. = 2T \times K \times \sin \frac{A}{2}$$

M.W.F. = Maximum Working Force (lbs.)
T = Maximum Total Tension (lbs.)
K = Transient Tension Overload Factor (normally between 1.4 and 2.0)
A = Wrap Angle

SPECIFICATIONS

Gage Resistance:	Each transducer contains half a bridge having a nominal resistance of 120 ohms per gage, wired as shown above.
Gage Factor:	100 nominal
Excitation Voltage:	5.6 VDC or VAC (rms) maximum
Output Signal @ Rated M.W.F.: (Maximum Working Force)	250 mV nominal
Operating Temperature Range:	0°F. to 150°F. (Consult factory if operating temp. is greater than 150°F.)
Sensitivity Change with Temperature:	Less than 0.02%/°F. of rated output typical
Humidity:	95% R.H.
Combined Non-linearity and Hysteresis:	±0.5% maximum of rated output
Repeatability:	±0.2% maximum of rated output
Non-destructive Overload Rating:	150% of M.W.F.
Ultimate Overload Rating:	300% of M.W.F. typical
"MS" Connectors:	MS-3102A-10SL-3P (3 Pin Connector)
Input Impedance Required: (Transducer Signal Amplifier if not CMC supplied)	5K Ohm per transducer.
Output Impedance:	820 Ohms (nominal)
Weight:	
Transducer Cartridge	1.7 lbs.
With Type "FL" Mounting Kit	2.6 lbs.
With Type "BR" Mounting Kit	2.0 lbs.
With Type "PB" Mounting Kit	4.4 lbs.

OTHER PRODUCTS

CLEVELAND-KIDDER™ WEB TENSION CONTROL PRODUCTS

- PRECISION TENSION TRANSDUCERS
  Type TMR for rotating shaft installations
  Type TMT for non-rotating shaft installations
  Type UPB for use with pillow block bearings
  Type CFL for narrow webs
  Type TSN for wire and filament
- TENSION INDICATORS AND MONITORS
  TENSI-MASTER® modular tension indicators
  Type TIX intrinsically safe tension amplifier
- TENSION CONTROLLERS
  Type UCM for electro-magnetic clutches and brakes
  Type UCP for pneumatic clutches and brakes
  Type TCD for electric drives

ELECTRIC DRIVES TO 500 HORSEPOWER

- DC DRIVES
  Pacemaster® 1 & 2 ..... Non-Regenerative
  Pacemaster® 4 & 5 ..... Regenerative
  Pacemaster® 3 ..... 3 Pulse Non-Regenerative
  Pacemaster® 6 ..... 6 Pulse Non-Regenerative
  Pacemaster® 7 ..... Battery Operated DC Servo Drives
  Pacemaster® 12 ..... 6 Pulse Regenerative
  Digimaster® 12 ..... Microprocessor-based, 6 Pulse Regenerative
- AC DRIVES
  Digivec™ ..... Flux Vector
- MULTIMOTOR INDUSTRIAL DRIVE SYSTEMS

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

REPRESENTED BY:

INDUSTRIAL PRODUCTS DIVISION

Cleveland Motion Controls
7550 Hub Parkway • Cleveland, OH 44125-5794
Phone 216-524-8800 • Fax 216-642-2121

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An IMC Company