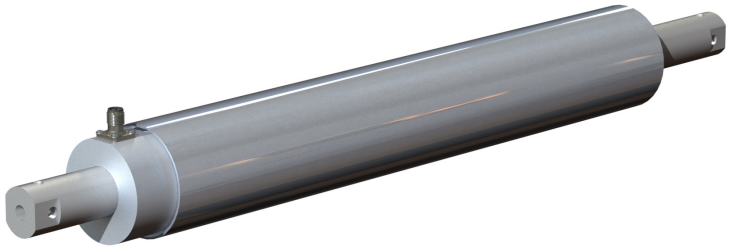
ISR TENSION SENSING ROLLER

MAXCESS®

MAGPOWR

The MAGPOWR ISR series is a dead shaft tension sensing roller supported on both sides that uses tension sensors embedded in the roller to provide a signal proportional to tension in any unwind, rewind or intermediate web processing application.

When installed in place of a standard dead shaft idler roller, the ISR integrated tension sensing roller delivers precise web tension measurement with low temperature drift due to full Wheatstone bridge construction on each load cell inside the roller.



GENERAL SPECIFICATIONS

Product Name
ISR Tension Sensing Roller

Gage Resistance
175 ohms nominal (two 350 ohms full bridges in parallel)

Excitation Voltage
10 VDC maximum

Output Signal
1.05 mV/V, 10.5 mVDC maximum

Operating Temperature
-30°C to 80°C (-22°F to 176 °F)

Combined nonlinearity and hysteresis
0.5% of full scale maximum

Temperature effect on zero
0.02% of rating per °C

Overload Stops Engagement
105% to 200% of full load rating

Overload Protection
5X full load rating

Repeatability
0.2% of full scale maximum

Load Ratings
50, 100, 250, 500, 750, 1000, 2200 Newtons (11, 23, 56, 112, 169, 225, 495 pounds)

Construction
Stainless Steel Center Shaft
Aluminum, Steel and Stainless Steel Roller Body

Roller Diameters
80, 89, 102, 127 and 152 mm (3.15, 3.5, 4, 5 and 6 inches)

Deflection at Full Load
0.15 mm to 0.17 mm (0.005 to 0.007 inch)

Climate Class
3K3 (EN60721)

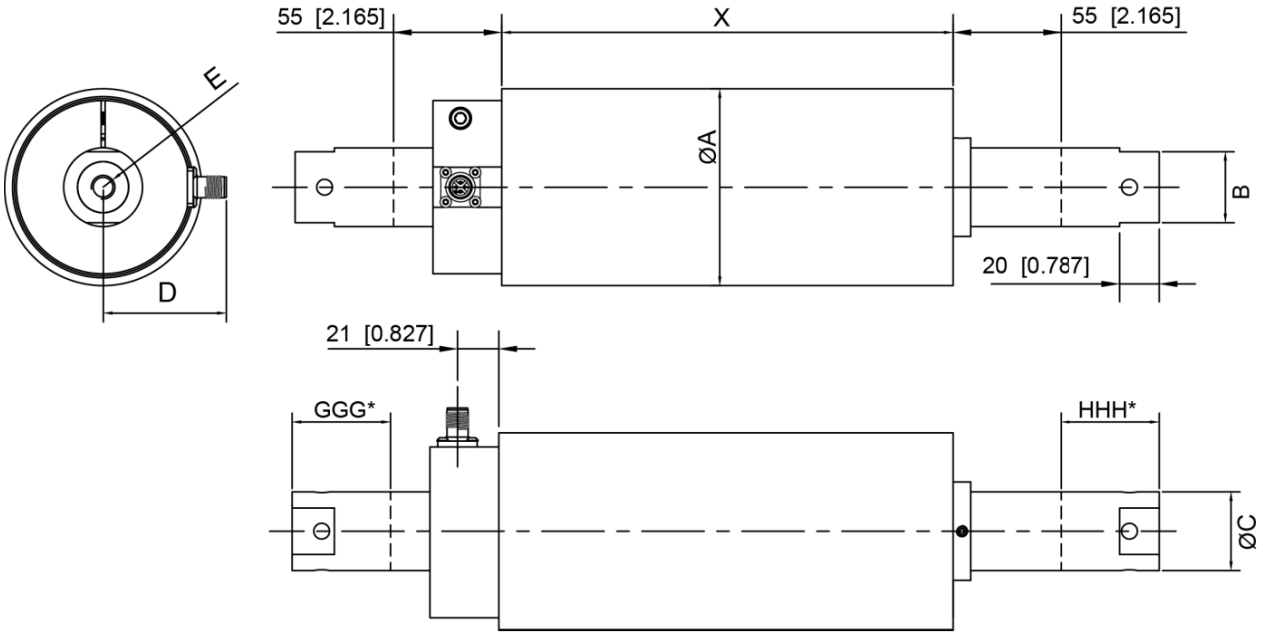
Certifications
IP54
CE
RoHS

Mating Cable
LCC series with straight connector
LCCRA series with 90 degree connector

KEY FEATURES

- Fast and easy installation
- Connector on one side only
- Several diameters available between 80 and 152 mm (3.15 to 6 inches)
- Roller materials in Aluminum, Steel and Stainless Steel
- Seven load ratings
- Lengths from 235 to 3000 mm (9.3 to 118.1 inches)
- Force measurement in positive or negative direction
- Single bolt mounting on each end
- Five times overload protection
- Works with any MAGPOWR tension amplifier or tension control

DIMENSIONS



Dimensions shown in mm (inches)

A	B	C	D	E
80 (3.150)	30 (2.087)	35 (1.378)	54.8 (2.157)	M12, 30 DEEP
89 (3.500)	30 (2.087)	35 (1.378)	54.8 (2.157)	M12, 30 DEEP
102 (4.000)	36 (1.417)	40 (1.575)	62.4 (2.465)	M12, 30 DEEP
127 (5.000)	36 (1.417)	40 (1.575)	62.4 (2.465)	M16, 30 DEEP
152 (6.000)	46 (1.811)	50 (1.969)	62.4 (2.465)	M16, 30 DEEP

*See model numbering key on following page

MODEL NUMBERING KEY

The model number consists of the base model "29ISR" followed by optional alphanumeric characters.

29-ISR-AAAA-BBB-CCCC-D-EEE-F-GGG-HHH

AAAA = rated load in Newtons

BBB = roller diameter in mm

CCCC = roll face length in mm

D = Roller material
- A = Aluminum
- S = Steel
- K = Stainless steel
- Others are possible

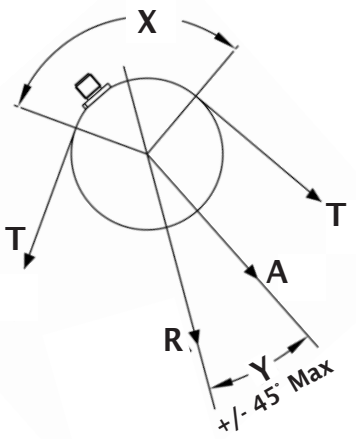
EEE = roller finish
- 000 = No finish
- 001 = Nickel plated
- 002 = Hard coated Anodize
- Others are possible

F = balancing option
- 1 = G2.5 (standard)
- Others are possible

GGG = length of end shaft on connector side in mm

HHH = length of end shaft on non-connector side in mm

SIZING



To size and select the correct load rating of the ISR, the total load on the sensing roll must be calculated. This load consists of the tension components in the sensing plane. Using the known maximum tension and angles as shown, apply the equation below to calculate the actual load.

LOAD = 2T (sin X/2)(cos Y)

This is the total load, but since we need to be able to read tension transients, the "T" should be multiplied by 1.35 to add 35% measuring capability. The final equation for the load rating required for the ISR is:

L= 2.7T (sin (X/2)(cos Y)

After calculating L, select a ISR with a load rating greater than L.

For example, if the maximum tension is 25 pounds, the angle Y is 0 degrees, the wrap angle is 90 degrees and the resultant force is away from the connector, the resulting ISR rating is:

L=2.7(25)(sin(90/2)(cos 0)

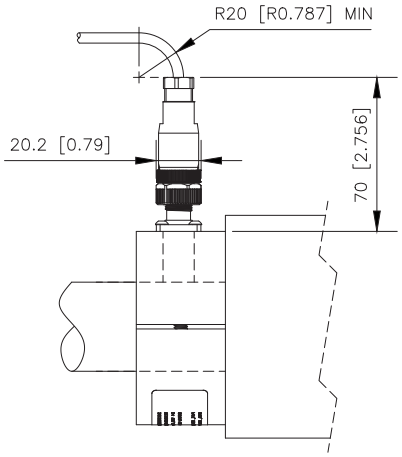
L=47.7 pounds (212.2 Newtons)

Use ISR with 250 Newton rating (56 pounds)

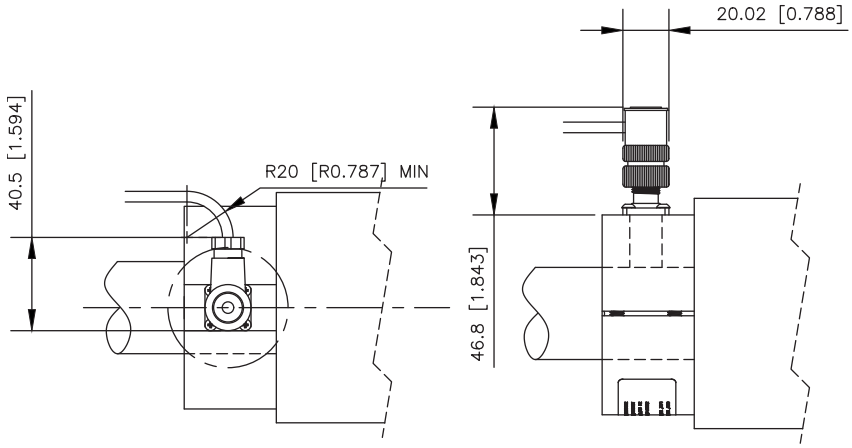
T= web tension
X= web wrap angle
A= center line of sensing roller
R= resultant force direction from web tension that bisects the wrap angle
Y= angle between wrap angle midpoint (R) and the load cell center line (A)
Note: connector is always aligned with the center line of the sensing roller
L= calculated minimum force rating

CABLES AND CONNECTORS

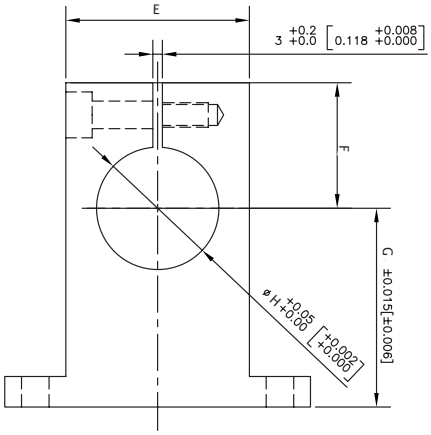
ISR WITH STRAIGHT CABLE

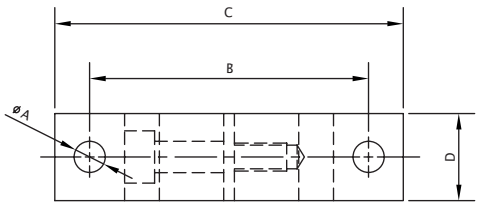


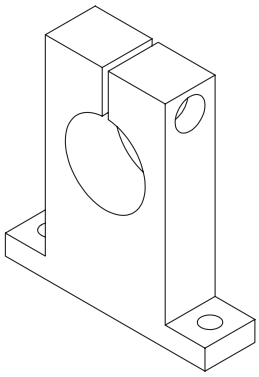
ISR WITH 90˚ CABLE



OPTIONAL PILLOW BLOCK BRACKET







Dimensions shown in mm (inches)

	A	B	C	D	E	F	G	H
ISRPBK1	9 (0.354)	65 (1.378)	85 (3.346)	25 (0.984)	45 (1.772)	36 (1.417)	50 (1.969)	35 (1.378)
ISRPBK2	9 (0.354)	80 (3.150)	100 (3.937)	25 (0.984)	60 (2.362)	41 (1.614)	69 (2.717)	40 (1.575)
ISRPBK3	13 (0.512)	100 (3.937)	125 (4.921)	30 (1.181)	75 (2.953)	51 (2.008)	85 (3.346)	50 (1.969)

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