

# Model 153T Yarn Tension Transmitters

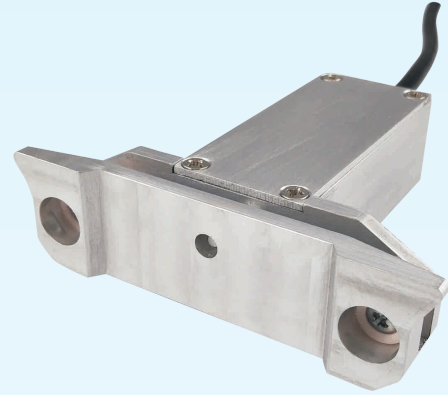
## Description

Model 153T yarn tension transmitter is developed to measure yarn tension or to detect yarn breakdown in the production processes of textile industry, e.g., the false twist texturing process for multi-filament yarns.

The 153T transmitter employs the 1531 force sensor from BCM SENSOR, which has its sensing element manufactured through the thick-film technology on the ceramic sensor body.

The housing of 153T is made from aluminium alloy to feature a light weight and is designed to be easily integrated into a textile yarn processing machine.

With a sensor signal conditioning circuit, the output of 153T can be conditioned to either analogue output (e.g., 4~20mA, 10%~90%Vs ratiometric, 0~5Vdc, 0~10Vdc) or digital output (e.g., I<sup>2</sup>C, SPI).



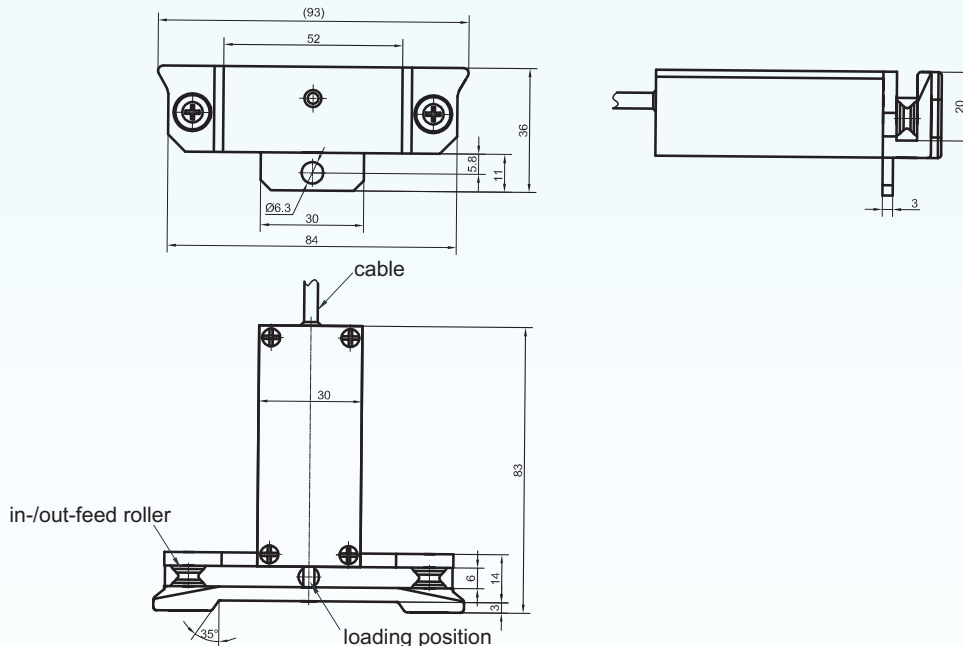
## Features

- capacity: 0.5N, 1N, 2N, 3N, 5N
- manufactured by thick film technology
- single bending beam of piezo-resistive working principle
- low nonlinearity, hysteresis, and nonrepeatability errors
- high sensitivity
- compact and robust design with light weight

## Applications

- yarn break detection
- yarn tension measurement
- fibre tension force monitoring

## Dimensions

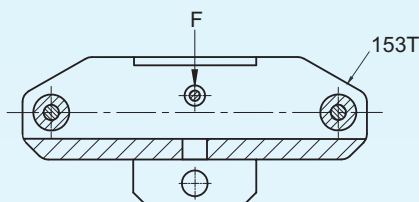


Note: All dimensions are in mm.

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## Loading Direction



Note: The capacity of 153T is calibrated by applying the load along the direction as indicated above.

## Technical Data

Parameters		Units	Specifications	Notes
capacity		N	0.5, 1, 2, 3, 5	1
safe load limit		%fs	120	2
ultimate overload		%fs	150	
output signal		mA	4~20 (standard)	
		V	10%~90%Vs ratiometric, 0~5, 0~10	
		digital	I <sup>2</sup> C, SPI	
accuracy		%fs	±0.5 (standard), ±1	3
long-term stability		%fs/year	≤ ±0.2	
power supply (Vs)		Vdc	8, ..., 30, if output = 4~20mA, or 0~5V	
			12, ..., 30, if output = 0~10V	
			3, ..., 5, if output = 10%~90%Vs ratiometric, I <sup>2</sup> C, or SPI	
load resistance (R <sub>L</sub> )	current loop	kΩ	≤ (Vs - 12V) / 0.02 - R <sub>0</sub> , R <sub>0</sub> refers to cable resistance	4
	voltage output	Ω	≥ Vout / 0.005	5
insulation resistance		MΩ	500 @100Vdc	
compensated temperature range		°C	-20 ~ +55	
operating temperature range		°C	-25 ~ +85	
storage temperature range		°C	-25 ~ +85	
temperature coefficient of zero		%fso/°C	≤ ±0.04	6
temperature coefficient of span		%fso/°C	≤ ±0.04	6
life time		cycles	10 <sup>5</sup>	
response time		ms	≤ 1	7
loading position material			ceramics (96% Al <sub>2</sub> O <sub>3</sub> )	
electronics housing material			aluminum alloy	
electrical interface			Φ5.5mm PVC shielded cable (standard)	
			Φ5.5mm PVC shielded cable with Molex connector	8
environment protection			IP43	
net weight		gram	~120	

Notes: 1. For customized pressure ranges, consult BCM.

2. "fs" refers to full scale or rated capacity.

3. Accuracy = sqrt(non-linearity<sup>2</sup> + hysteresis<sup>2</sup> + repeatability<sup>2</sup>)

4. For the current loop, R<sub>L</sub> can be zero.

5. For the voltage output, R<sub>L</sub> the bigger the better.

6. Calculated as a rate of output change between -20°C and +55°C, and normalized by the output at 25°C.

7. Response time for a 0 to fs step change, 10% to 90% rise time.

8. The part numbers for Molex connector are:

1) housing: MOX70066-3R/50-57-9403/part no. 221284

2) contact: MOX70058/16-02-0102/part no. 231108

## BCM SENSOR TECHNOLOGIES BVBA

### Ordering Information

<b>position (pos.) 1: model</b>					
153T					
<b>pos. 2: capacities</b>					
0/0.5N		0/1N		0/2N	
				0/3N	
				0/5N	
<b>pos. 3: output signal</b>					
4/20mA (standard)		10%/90%Vs		0/5V	
				0/10V	
				I2C	
				SPI	
<b>pos. 4: accuracy</b>					
0.5%fs (standard)		1%fs			
<b>pos. 5: electrical interface</b>					
standard: cable(100mm) = $\Phi$ 5.5mm PVC shielded cable, cable length = 100mm(^)					
option: MOX(100mm) = $\Phi$ 5.5mm PVC shielded cable with Molex connector, cable length = 100mm(^)					
^: Cable length can be customized on request.					
<b>pos. 6: customized specifications</b>					
“(*)” is necessary only if any customized parameter is required, otherwise it is neglectable.					
<b>pos.1</b>	<b>pos. 2</b>	<b>pos. 3</b>	<b>pos. 4</b>	<b>pos. 5</b>	<b>pos. 6</b>

### Examples of Ordering Code

- standard transmitter:

153T-0/1N-4/20mA-0.5%fs-cable(100mm)

- customized transmitter:

153T-0/1.5N-10%/90%Vs-0.5%fs-MOX(500mm)-(\*)

(\*): Customized specifications:

- 1) capacity = 0~1.5N;
- 2) cable length = 500mm.

The listed dimensions, specifications and ordering information are subject to change without prior notice.