



## TS2 Series

### MAIN FEATURES

- Micro size
- One or two axis
- IP67 above panel sealed
- Precise center tolerance: +/-100mV
- 2.5 million lifecycles
- Full voltage outputs at corner positions



### DESCRIPTION

The TS2 Series is the world's smallest industrial two axis Hall effect joystick with an IP67 above panel sealing rating. Featuring a 1/2"-20 threaded body mount, this micro joystick is ideal for small remote controls and large hand grip controllers where space is limited. Without compromising electrical performance and user feel, Althen Sensors & Controls has developed the TS2 Series to deliver exceptional performance in the smallest possible package.

### SPECIFICATIONS\*

MECHANICAL (X & Y AXIS)	
Angular travel:	30° total (15° each direction from center)
Expected life:	2.5 million operations
Centering:	Spring return
Mass/weight:	10 grams**
Maximum vertical load:	50 lbF
Maximum horizontal load:	15 lbF***

\* Specifications subject to change without notice.

\*\* Approximate weight. Actual weight dependent on configuration.

\*\*\* Measured 0.50" above surface.

ELECTRICAL	
Technology:	Hall effect sensor, single
Resolution:	12 bit
Supply voltage range:	5.00VDC +/- 0.01VDC regulated transient free
Supply current:	20mA max
Ratiometric output voltage:	See output options
Return to center voltage tolerance:	+/- 100mV initial***
Transient overvoltage max:	20VDC
Reverse polarity max:	-10VDC
Output impedance:	2Ω
Start up time:	15ms max

ENVIRONMENTAL	
Operating temperature:	-40°C +85°C
Storage temperature:	-40°C +85°C
Above panel sealing:	IP67*
EMC immunity level:	EN61000-4-3 Compliance to 30A/m**
EMC emissions level:	EN6100-6-3
ESD immunity level:	EN61000-4-2 Compliance to +/-15kV/+/-8kV**
Vibration:	Per SAE J1455 Section 4.9 & MIL-STD810G 514.6
Mechanical shock:	Per SAE J1455 Section 4.10 & MIL-STD-202G

\* Above panel sealing. All configurations. Product is static, not in use.

\*\* Extended testing levels.

\*\*\* Based on supply voltage 5.00VDC +/- .01VDC. Outputs are ratiometric and dependent upon supply voltage.

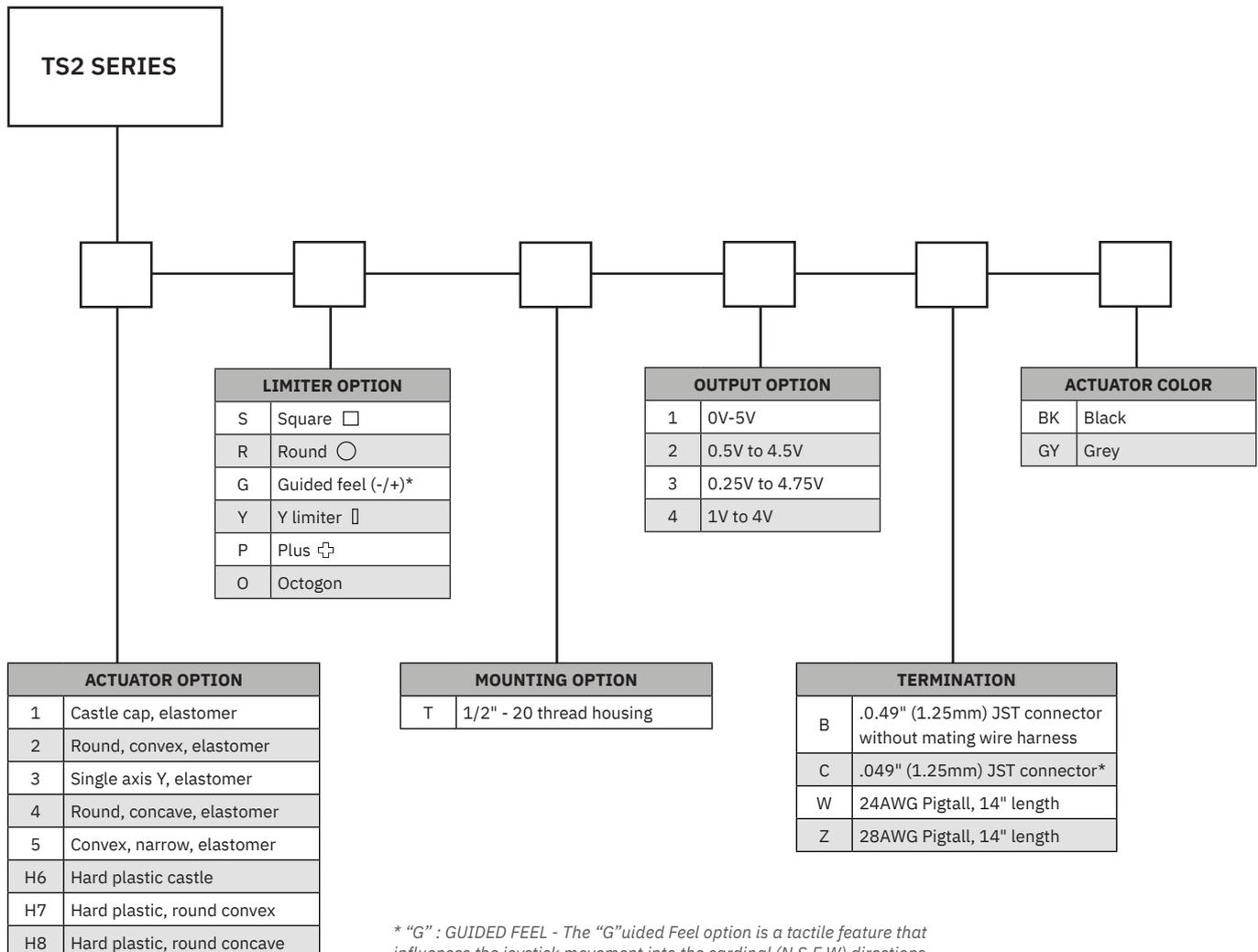
**SPECIFICATIONS**

MATERIALS	
Plastic housing:	Mineral & glass filled nylon
Boot & actuators:	Silicone (with tear resistant additive)

**CONNECTIONS**

PIN #	WIRE COLOR	DESCRIPTION
1	RED	Power (+5VDC)
2	BLACK	Ground
3	BLUE	X axis sensor
4	YELLOW	Y axis sensor

**TS2 SERIES PRODUCT CONFIGURATION GUIDE**

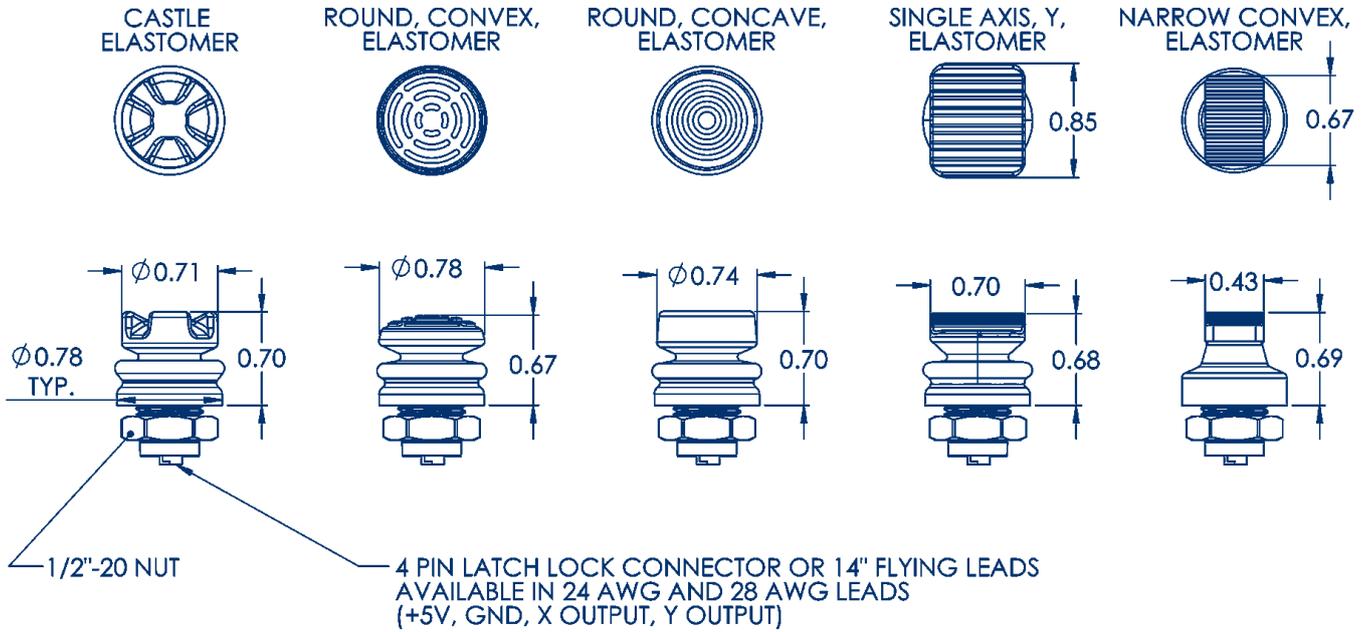


\* "G" : GUIDED FEEL - The "G"uided Feel option is a tactile feature that influences the joystick movement into the cardinal (N,S,E,W) directions.

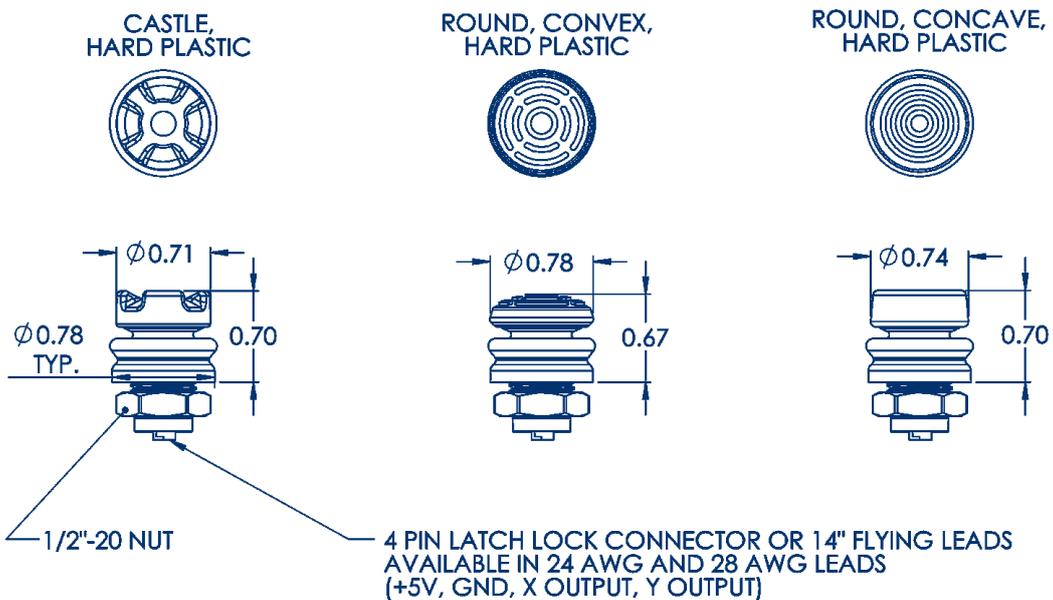
The Guided Feel option allows for 360° movement throughout the diagonal positions, but actuation into the N,S,E,W positions is more pronounced.

■ ACTUATOR OPTIONS

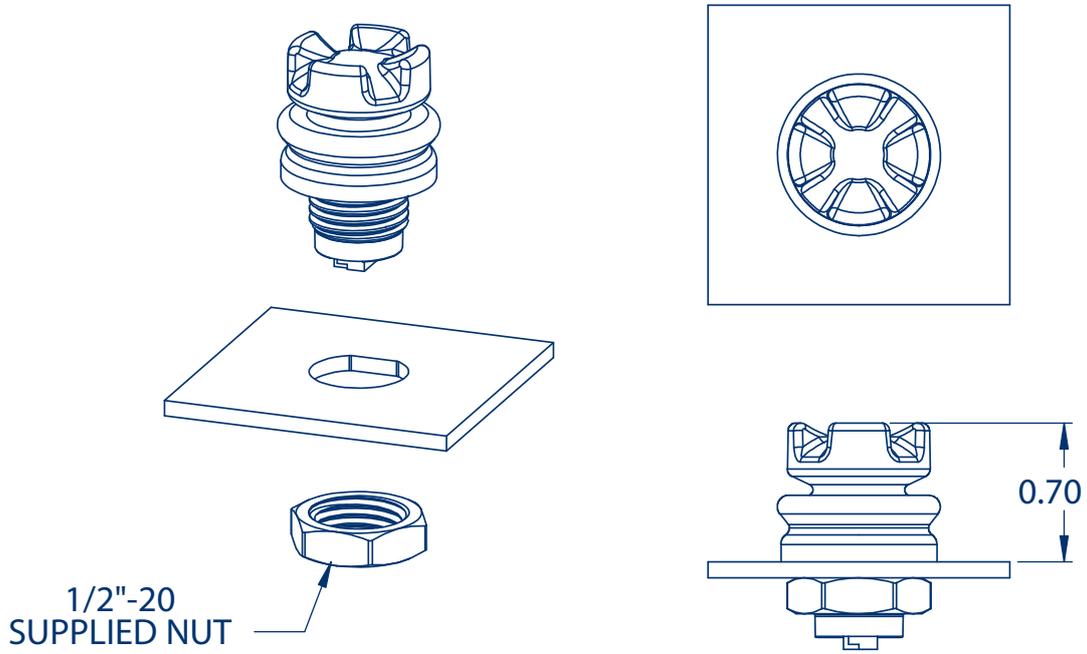
TS2 SERIES - ELASTOMER ACTUATOR



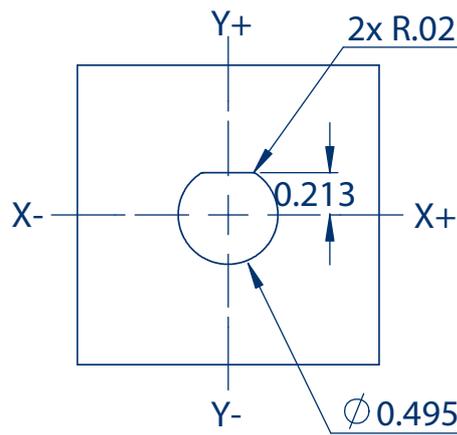
TS2 SERIES - PLASTIC ACTUATOR



■ MOUNTING CUTOUT AND DIMENSIONS



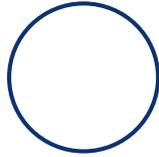
PANEL CUTOUT DIMENSIONS,  
THEADED HOUSING



**LIMITER PLATE OPTIONS**



S: SQUARE



R: ROUND



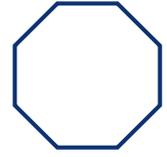
G: GUIDED FEEL



Y: Y AXIS

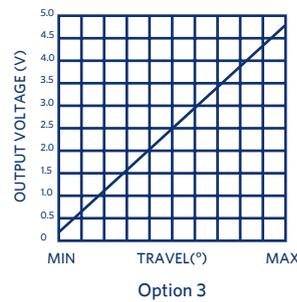
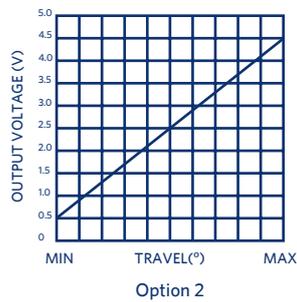
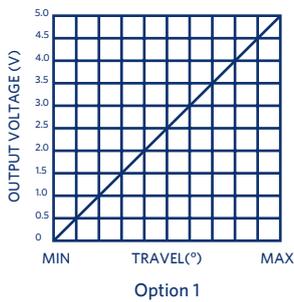


P: PLUS



O: OCTAGON

**VOLTAGE OUTPUT OPTIONS**



**TERMINATION OPTIONS**



**Housing body:** Friction lock PCB header: JST: BM04B-GHS-TBT(LF)(SN)(N)

**Mating wire harness:** 10" 28AWG PTFE to five position connector housing: JST GHR-04V-S

OPTIONS	
Termination Option B:	Connectorized joystick housing without mating wire harness
Termination Option C:	Connectorized joystick housing with mating wire harness
Termination Option W & Z:	Potted flying leads
Termination Option W:	24AWG Pigtail, PTFE 14"
Termination Option Z:	28AWG Pigtail, PTFE 14"