

TS2 Series

Micro Hall effect thumb controller

MAIN FEATURES

- Micro size
- One or two axis
- IP67 above panel sealing
- 2.5 million lifecycles
- Redundant outputs available



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, Ruffy 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

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SPECIFICATIONS

ELECTRICAL	
Technology:	Hall effect sensor, single or dual
Supply voltage range:	5.00VDC +/- 0.01VDC regulated transient free
Supply current:	12mA max - 24mA max (with redundancy)
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:	EN61000-6-3
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.

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3258 Grey Hawk Ct., Carlsbad, CA 92010
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SPECIFICATIONS

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

CONNECTIONS

SINGLE OUTPUT WIRE COLOR & DESCRIPTION		
PIN #	COLOR	DESCRIPTION
1	RED	Power (+5V)
2	YELLOW	Y Axis Sensor
3	BLUE	X Axis Sensor
4	BLACK	Ground

DUAL OUTPUT - WIRE COLOR & DESCRIPTION		
PIN #	COLOR	DESCRIPTION
1	RED	+5V A
2	GREY	Y Axis B
3	PINK	X Axis B
4	BLACK	GND
5	BROWN	+5V B
6	BLUE	X Axis A
7	YELLOW	Y Axis A

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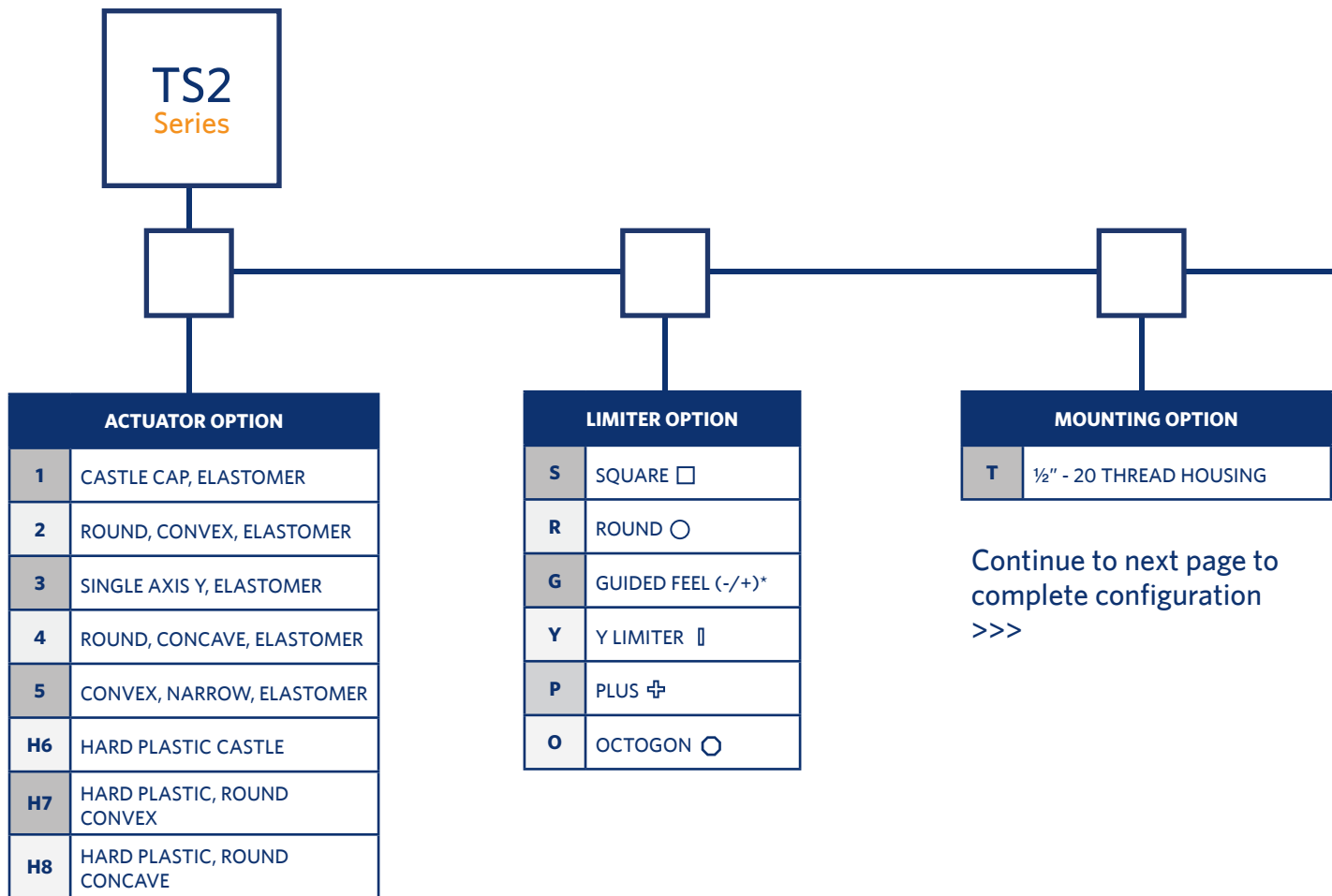
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TS2 SERIES PRODUCT CONFIGURATION GUIDE



* "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.

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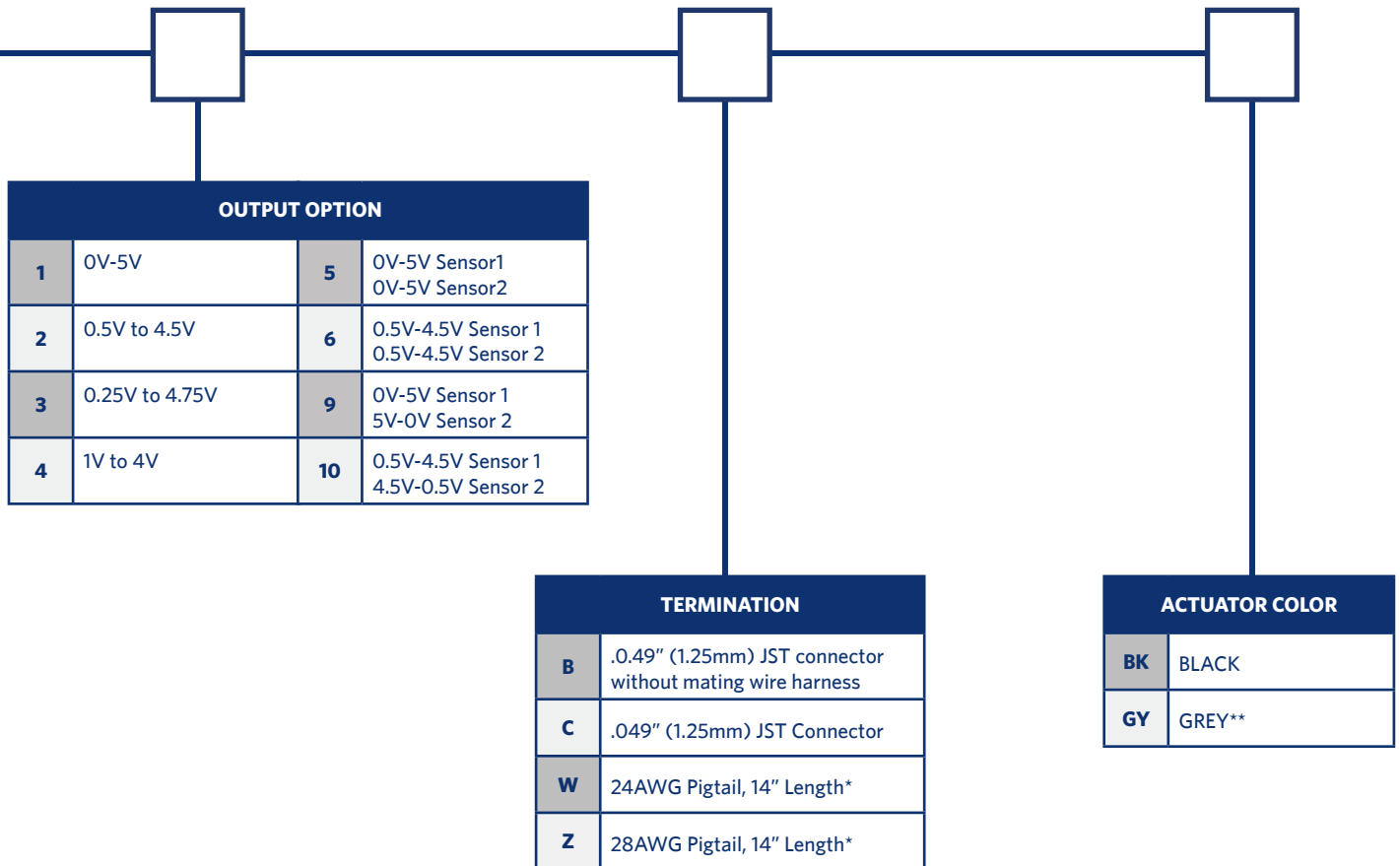
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TS2 SERIES PRODUCT CONFIGURATION GUIDE (Cont.)



* Termination options W & Z only available with Output Options (1- 4)

** Only available for elastomer Actuator Options (1-5)

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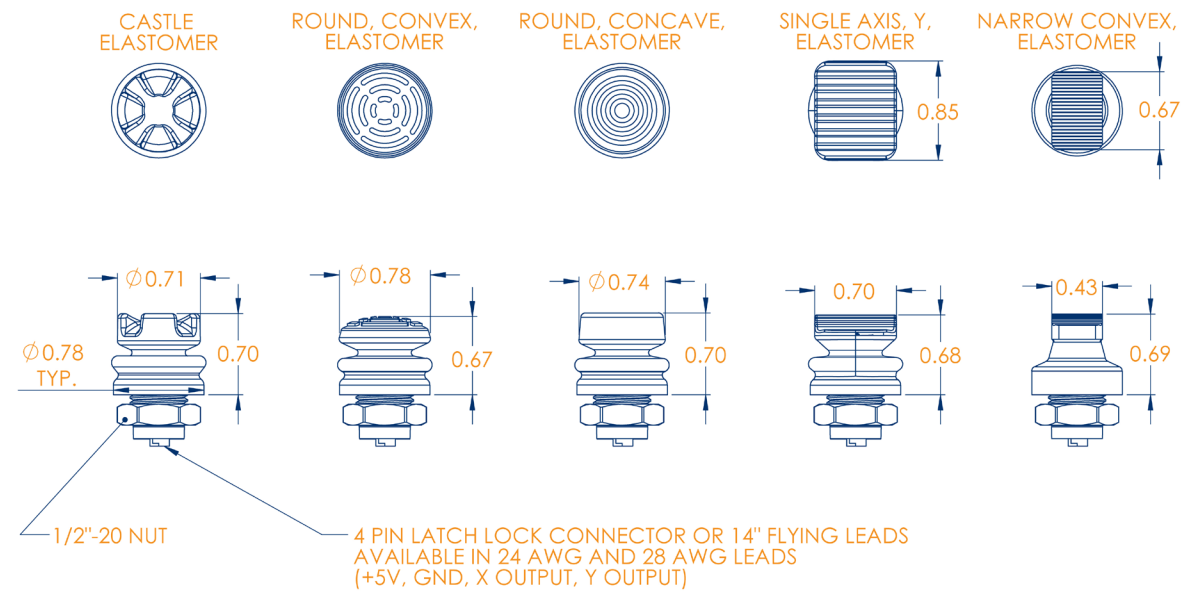


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ACUATOR OPTIONS

TS2 SERIES - ELASTOMER ACTUATOR



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ACTUATOR OPTIONS

TS2 SERIES - PLASTIC ACTUATOR

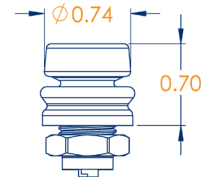
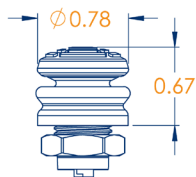
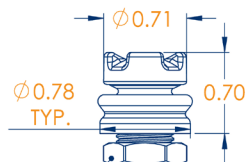
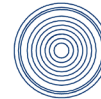
CASTLE,
HARD PLASTIC



ROUND, CONVEX,
HARD PLASTIC



ROUND, CONCAVE,
HARD PLASTIC



1/2"-20 NUT

4 PIN LATCH LOCK CONNECTOR OR 14" FLYING LEADS
AVAILABLE IN 24 AWG AND 28 AWG LEADS
(+5V, GND, X OUTPUT, Y OUTPUT)

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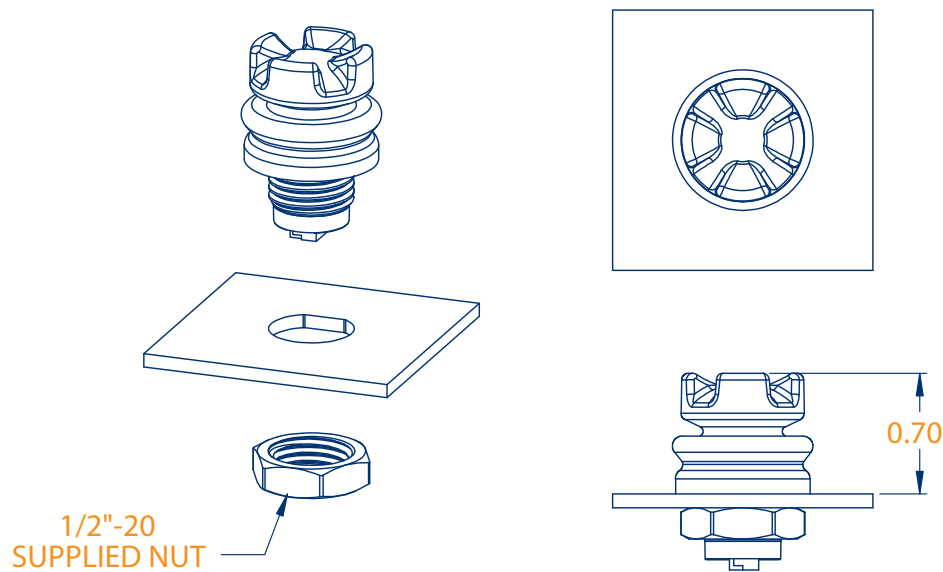
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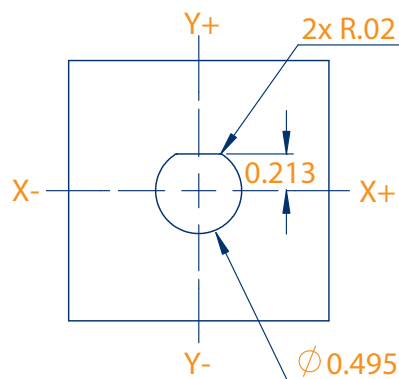
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MOUNTING CUTOUT AND DIMENSIONS



PANEL CUTOUT DIMENSIONS, THEADED HOUSING



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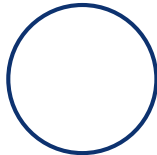
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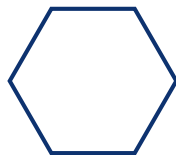
LIMITER PLATE OPTIONS



S: SQUARE



R: ROUND



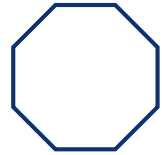
G: GUIDED FEEL



Y: Y AXIS

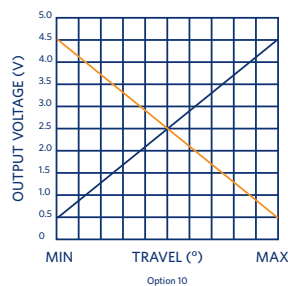
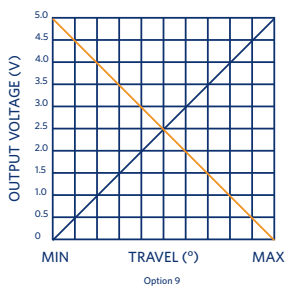
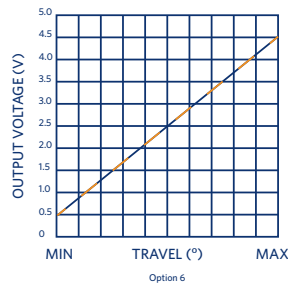
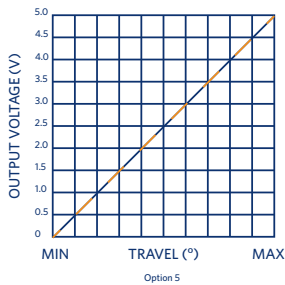
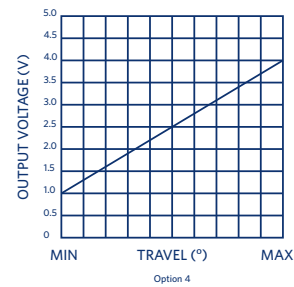
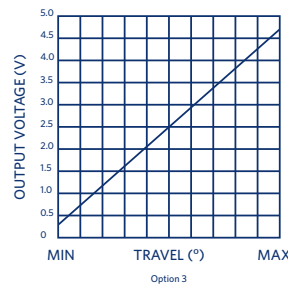
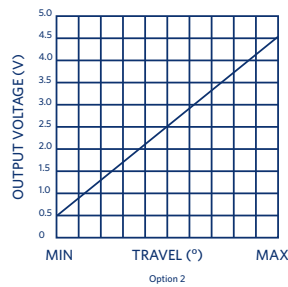
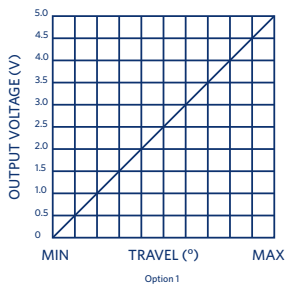


P: PLUS



O: OCTAGON

VOLTAGE OUTPUT OPTIONS



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TERMINATION OPTIONS



TERMINATION OPTION C

OUTPUT OPTIONS 1-4	
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

OUTPUT OPTIONS 5-12	
Housing Body	Friction lock PCB header: JST BM07B-NSHSS-TBT(SN)
Mating wire harness	10" 28awg PTFE to five position connector housing: JST NSHR-07V-S

TERMINATION OPTIONS

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

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