



an APEM Group Company

TS series

Hall effect miniature proportional joystick



The TS Series Thumbstick is a proportional two axes joystick in a miniature package. Featuring non-contacting Hall effect technology for long life performance, the TS Series Thumbstick is available with multiple linear output options including single and dual (redundant) outputs. It is similar in size and operation to “gamepad” controls, but in a rugged industrial package. Typical applications include pendant and remote controls as well as joystick handle and arm rest integration.



KEY FEATURES

- ☐ **1 or 2 axes**
- ☐ **Non-contact Hall effect technology**
- ☐ **Submersible to 1m (3.28ft) per IP68**
- ☐ **Pressure washable to IP69K**
- ☐ **Redundant outputs available**
- ☐ **Rear or drop-in mounting available**



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OPTION SELECTION

TS						
SERIES	HANDLE	TERMINATION*	OUTPUT OPTIONS	MOUNTING HARDWARE	LIMITER	POWER SUPPLY OPTIONS
	-0 None -1 Castle -2 Winged Hat -3 Conical	1 22AWG 25cm PTFE 2 28AWG 25cm PVC	0 0V to 5V (Rail to Rail) 1 0.25V to 4.75V 2 0.5V to 4.5V 3 1V to 4V 4 0V to 5V - Sensor 1 0V to 5V - Sensor 2 5 0.25V to 4.75V - Sensor 1 0.25V to 4.75V - Sensor 2 6 0.5V to 4.5V - Sensor 1 0.5V to 4.5V - Sensor 2 7 1V to 4V - Sensor 1 1V to 4V - Sensor 2 8 0V to 5V - Sensor 1 5V to 0V - Sensor 2 9 0.5V to 4.5V - Sensor 1 4.5V to 0.5V - Sensor 2 10 0.25V to 4.75V - Sensor 1 4.75V to 0.25V - Sensor 2 11 1V to 4V - Sensor 1 4V to 1V - Sensor 2 12 Customer specified 13 PWM**	N None D Drop-in R Rear mount	U Single axis ☐ S Square ☐	A Single B Independent***

NOTES:

 Mounting accessories. Standard hardware includes:

- For the Drop-in option - 4 push in connectors, drop-in bezel and an O-ring.
- For the Rear mount option - 4 x 1/2 FH SS Phil Screws and a rear mount bezel.

* 1 - Wires are thick, robust, and best suited for stand alone applications.
2 - Wires are thin and best suited for tightly constrained wire routing.

** Contact factory for PWM configuration.

*** Only available on dual output.

SPECIFICATIONS

MECHANICAL (FOR X, Y AXES)

Operating Force	–	3.1N±0.5N (0.70lbf±0.11lbf)
Maximum Vertical Load	–	200N (45lbf)
Maximum Horizontal Load	–	150N (33.7lbf)*
Mechanical Angle of Movement	–	±25° (50° total)
Life Cycles	–	>1 million
Mass/weight	–	18.25g ± 3.0g (0.64oz±0.11oz)
Lever Action (Centering)	–	Spring Centering

ENVIRONMENTAL

Operating Temperature	–	-40°C to +85°C (-40°F to +185°F)
Storage Temperature	–	-40°C to +85°C (-40°F to +185°F)
Sealing	–	IP68, IP69K**
EMC Immunity Level	–	EN61000-4-3
EMC Emissions Level	–	EN61000-6-3:2001
ESD	–	EN61000-4-2

ELECTRICAL SENSOR

Resolution	–	1.22mV
Supply Voltage Range	–	5.00V±0.01V
Reverse Polarity Max	–	-10V
Overvoltage Max	–	20V
Output Impedance	–	2Ω
Return to Center Voltage Tolerance	–	±250mV
Error Signal	–	1.0%

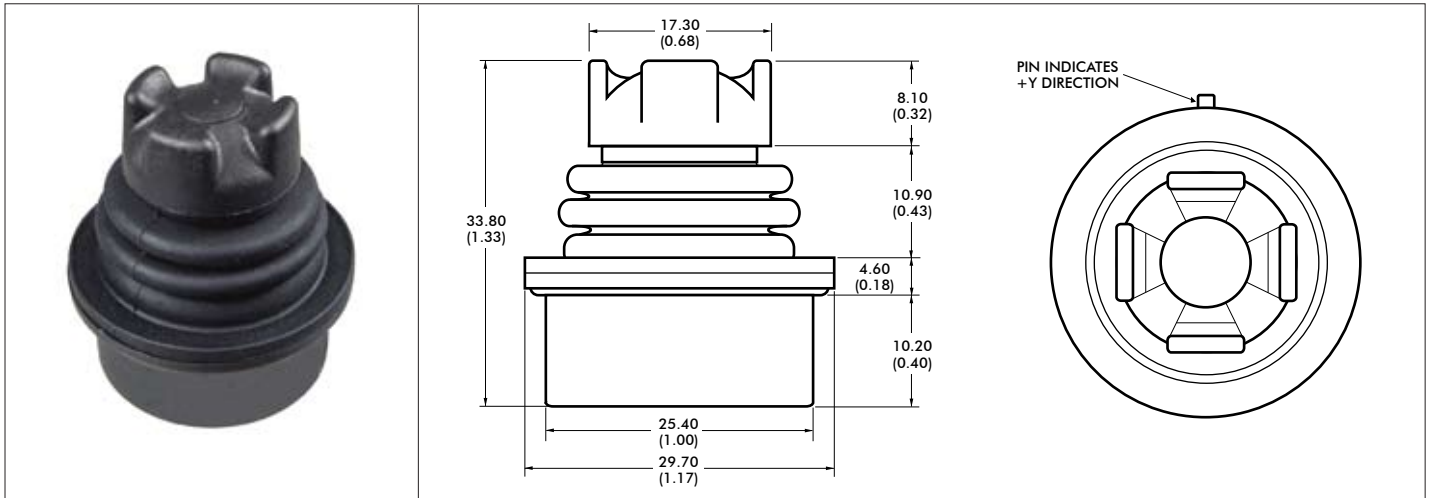
* Force applied to the top of the cap at full displacement.
** All options are IP68 and IP69K rated, however Drop-in mounting does not prevent panel ingress.

Note: The company reserves the right to change specifications without notice.

TS series

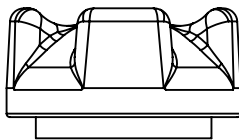
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DIMENSIONAL DRAWINGS

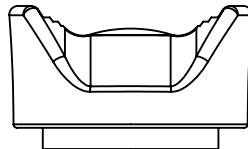


HANDLE OPTIONS

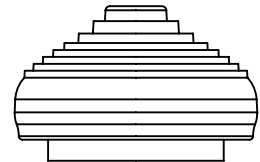
CASTLE



WINGED HAT

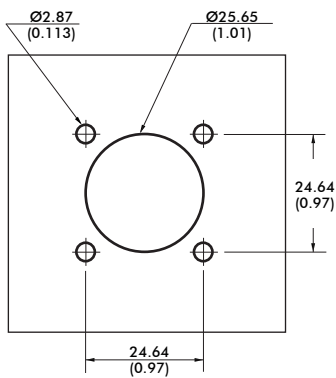


CONICAL



MOUNTING OPTIONS

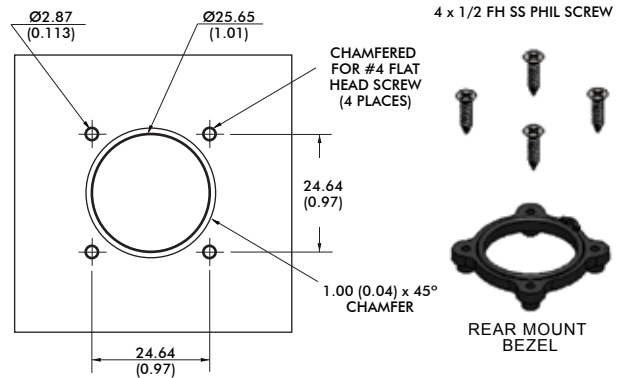
DROP-IN OPTION CUTOUT DIMENSIONS



4 x PUSH IN CONNECTORS

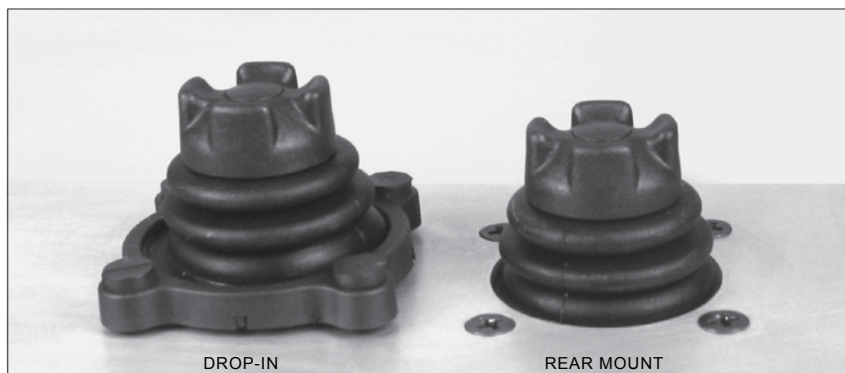


REAR MOUNT OPTION CUTOUT DIMENSIONS



Note: Maximum panel thickness is 0.32mm (0.08in)

Note: Dimensions are in mm/(inch)



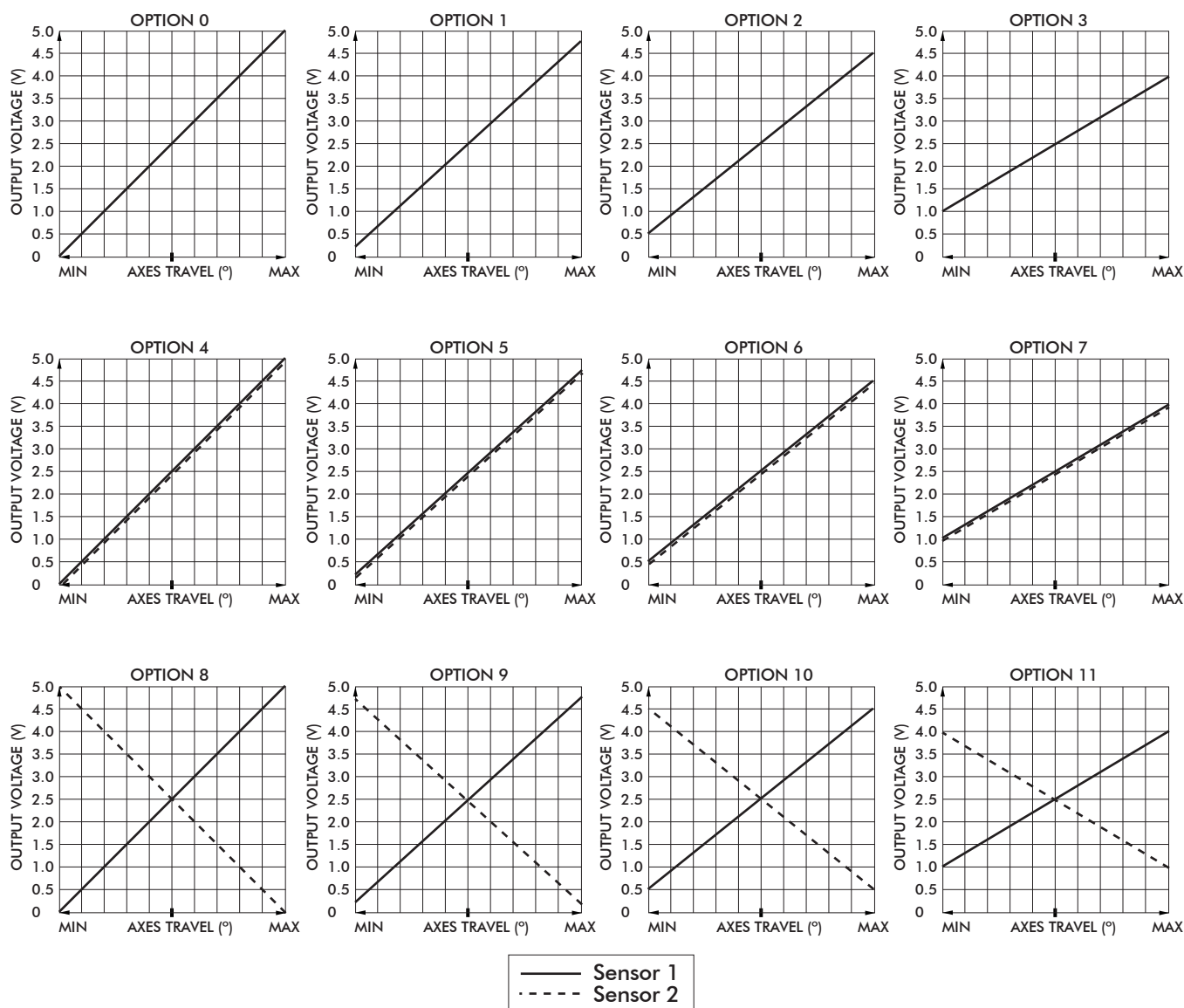
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The graphs are provided for representational purposes only.

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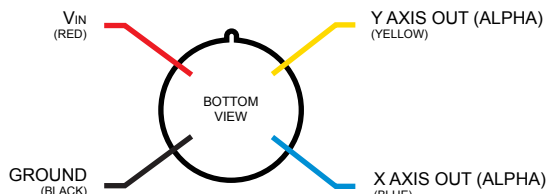
CONFIGURATION OPTIONS

LINEAR OUTPUT OPTIONS

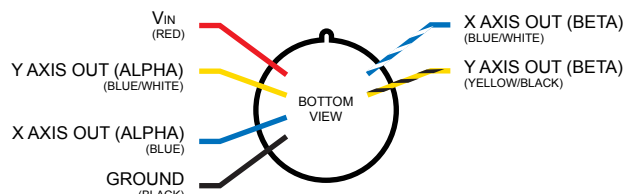


WIRING

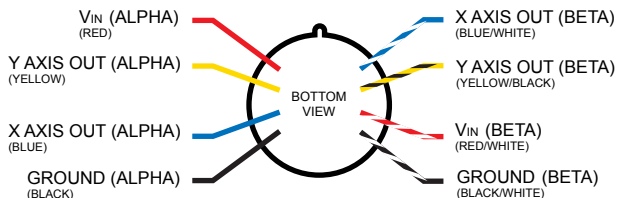
SINGLE OUTPUT



DUAL OUTPUT (SINGLE POWER SUPPLY)



DUAL OUTPUT (INDEPENDENT POWER SUPPLIES)



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