

**APEM**  
an IDEC company

# TS SERIES





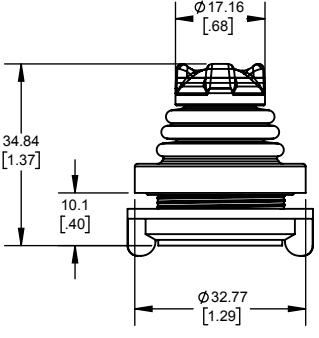
New LED illuminated option



## KEY FEATURES

- New LED backlighting options in red or blue
- Low consumption - current draw no greater than 16mA
- Overmolded polycarbonate “castle” actuator
- IP67 above panel sealed
- LED function: Constant on or user controlled

# OPTION SELECTION

<b>TS</b>								
<b>SERIES</b>								
<b>HANDLE</b>	<b>TERMINATION</b>	<b>LIMITER PLATE</b>	<b>POWER SUPPLY</b>	<b>LED COLOR</b>				
0 None 1 Castle 2 Winged Hat 3 Conical 4 Fingertip 5 Round Jog 6 Pushbutton 1-2 7 Mushroom 1-2 8 Low Profile 1-2 A Handles 1, 2, 3 B Castle, elastomer C Winged hat, elastomer D Conical, elastomer E Quadcave F Puck G Roller H Castle, LED illumination	1 22AWG 25cm PTFE 2-1 2 28AWG 25cm PTFE 2-2 3 Customer Specified 4 2.54mm (0.100") Pitch TE Connector 5 2.54mm (0.100") Pitch TE Connector 10" Mating Harness	U Single Axis  S Square  G Guided Feel  P Plus 	A Single B Independent 5	BB Blue RR Red				
	<b>MOUNTING</b>	<b>OUTPUT OPTIONS 4</b>		<b>LED CONTROL</b>				
	N None D Drop-in R Rear Mount A Drop-in and Rear Mount T Threaded Bushing P Plastic Threaded Bushing	00 0V to 5V (Rail to Rail) 01 0.25V to 4.75V 02 0.5V to 4.5V 03 1V to 4V 04 0V to 5V - Sensor 1 0V to 5V - Sensor 2 05 0.25V to 4.75V - Sensor 1 0.25V to 4.75V - Sensor 2 06 0.5V to 4.5V - Sensor 1 07 1V to 4V - Sensor 1 1V to 4V - Sensor 2 08 0V to 5V - Sensor 1 5V to 0V - Sensor 2 09 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 <sup>3</sup> 14 USB (Game Controller) 15 Joyball (Cursor emulation)		Blank No illumination 1 ON, driven by joystick supply voltage <sup>6</sup> User controlled <sup>7</sup> 2				
								

- 1-2 Pushbutton, Mushroom and Low profile handle not available with T (threaded housing, metal) or P (threaded housing, plastic),
- 2-1 Wires are thick, robust, and best suited for stand alone applications.
- 2-2 Wires are thin and best suited for tightly constrained wire routing.
- 3 Contact factory for PWM configuration.
- 4 Output voltage is ratiometric to supply voltage.
- 5 Only available on dual output. Not available with Handle 6 (Pushbutton). Not available with termination options 4 or 5.
- 6 LED control is driven by joystick supply voltage. Illumination is constantly on
- 7 LED requires independent 5V supply. Illumination is user controlled

MECHANICAL SPECIFICATIONS (X & Y AXIS)	
Operating Force	- 3.1N ±0.5N (0.70lbf ±0.11lbf) <sup>2</sup>
Maximum Vertical Load	- 200N (45lbf) <sup>2</sup>
Maximum Horizontal Load	- 150N (33.7lbf) <sup>2</sup>
Mechanical Angel of Movement	- 50° X & Y axis (subject to limiter plate)
Expected Life	- 1 million cycles
Mass/weight	- 18.25g ±5.0g (0.64oz ±0.18oz)
Lever Action (centering)	- Spring centering

ENVIRONMENTAL SPECIFICATIONS	
Operating Temperature	- -40°C to +85°C (-40°F to +185°F)
Storage Temperature	- -40°C to +85°C (-40°F to +185°F)
Above Panel Sealing	- IP67, IP69K <sup>1</sup> (subject to mounting styles & final spec)
EMC Immunity Level	- EN61000-4-3
EMC Emissions Level	- EN61000-6-3:2001
ESD	- EN61000-4-2

SENSOR SPECIFICATIONS	
Technology	- Hall effect sensors, single or dual
Supply Voltage Range	- 5.00V ± 0.01VDC
Supply current	- 11mA max
Ratiometric Output Options	- See options on data sheet
Reverse Polarity Max	- -10V
Transient Overvoltage Max	- 16V
Start-up time	- 15ms max
Output Impedance	- 2Ω
Return to Center Voltage Tolerance	- ±200mV initial

<sup>1</sup> All options are IP68 and IP69K rated, however drop-in mounting does not prevent panel ingress  
<sup>2</sup> Force applied to the top of the castle cap