

Series 293

3-in-1 Joystick, Optical Encoder & Pushbutton Switch

Description

- 4-Directional Joystick with Excellent Tactile Feedback
- Integrated Pushbutton Switch
- Built-In Optical Encoder with 20 Positions
- Joystick Life up to 500k Cycles
- Switch & Encoder Rotational Life up to 1M Cycles
- Wide Operating Temperature Range: -40°C to 85°C
- Fully RoHS Compliant



The series 293 is a combined joystick, encoder and pushbutton switch solution from CTS Corporation. This 3-in-1 joystick offers excellent control in four directions, and the integrated optical encoder grants high precision and resolution with a total of 20 positions. The series 293 is ideal for controls in medical applications such as power wheelchair navigation, ultrasound scan control panels and patient positioning tables. It is also well-suited for industrial control units and remote controls for unmanned aerial vehicles e.g., drones.

Ordering Information

Series	Joystick	Encoder	Pushbutton Switch Function	Termination										
293	4	20	1	0										
	↓	↓	↓	↓										
	<table><tr><th>Code</th><th>Joystick</th></tr><tr><td>4</td><td>4 Directions</td></tr></table>	Code	Joystick	4	4 Directions		<table><tr><th>Code</th><th>Push Switch Function</th></tr><tr><td>1</td><td>With Push Switch</td></tr></table>	Code	Push Switch Function	1	With Push Switch			
Code	Joystick													
4	4 Directions													
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		↓		↓										
		<table><tr><th>Code</th><th>Encoder</th></tr><tr><td>20</td><td>20 Positions (5P/R)</td></tr></table>	Code	Encoder	20	20 Positions (5P/R)		<table><tr><th>Code</th><th>Termination</th></tr><tr><td>0</td><td>Connector</td></tr><tr><td>1</td><td>50mm wire with connector</td></tr></table>	Code	Termination	0	Connector	1	50mm wire with connector
Code	Encoder													
20	20 Positions (5P/R)													
Code	Termination													
0	Connector													
1	50mm wire with connector													

Electrical Specifications

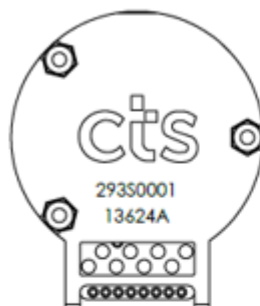
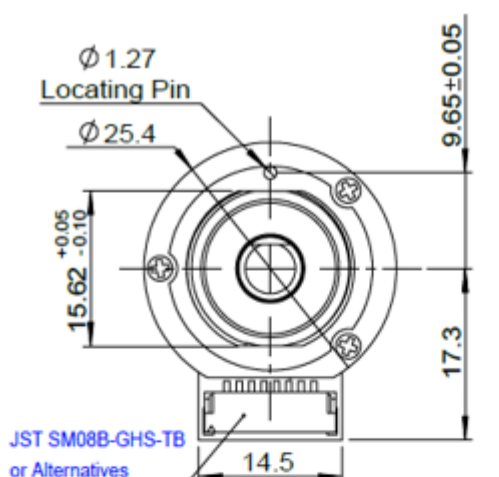
Parameter	Conditions & Remarks	Min	Nominal	Max	Unit
Encoder Function					
Input Voltage		4.75	5.0	5.25	V _{DC}
Input Current	5 V _{DC}			20	mA
Output Signal (High)		3.5			V _{DC}
Output Signal (Low)				1.0	V _{DC}
Sink Current		2.0			mA
Power Consumption				100	mW
Resolution	5				Pulses per Revolution
Joystick Function					
Input Current				5	mA
Output Signal (Neutral)		2.0	2.5	3.0	V _{DC}
Output Signal (High)		4.5			V _{DC}
Output Signal (Low)				0.5	V _{DC}
Switch Function					
Rating	5 V _{DC}		10		mA
Contact Resistance				10	Ω
Contact Bouncing		4(make)		10(break)	ms

Mechanical and Environmental

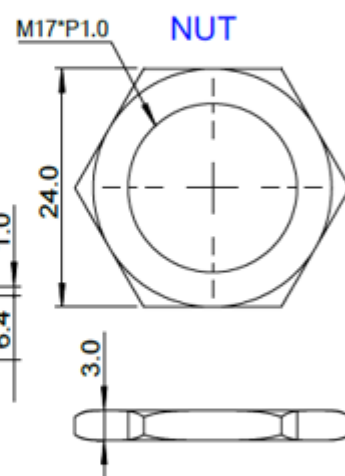
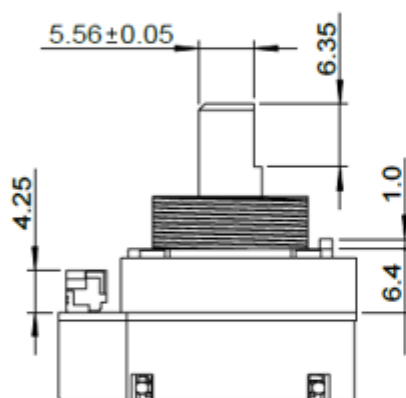
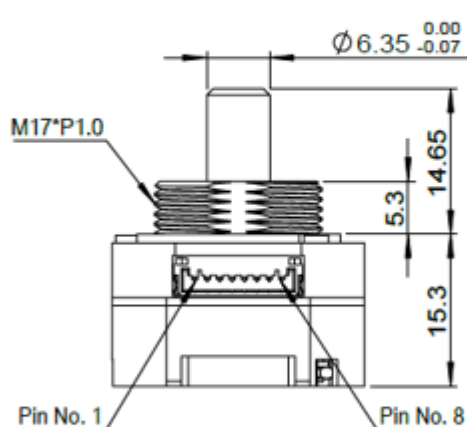
Encoder	Rotational Torque: 100 ± 50 gf · cm Click per Rotation: 20
Joystick	Angle of Throw: $8^\circ \pm 2^\circ$ Operation Force: 150 ± 75 gf
Switch	Operation Force: 350 ± 150 gf Shaft Travel: 0.5 ± 0.2 mm
Others	Mounting Torque: 12 kgf · cm (maximum) Actuator Force: 2 kg (maximum) Shaft Pull-out Force: 10 kg (maximum) Shaft Push-out Force: 10 kg (maximum)
Operating Temperature:	-40°C to +85°C
Storage Temperature:	-50°C to +95°C
RoHS	Fully compliant to RoHS Directive

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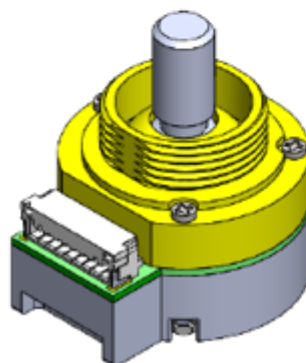
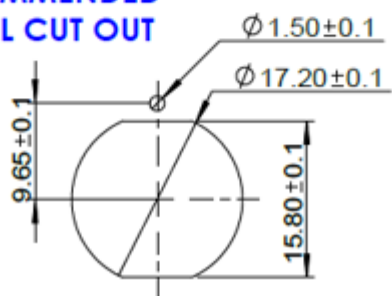
(Unit: mm)



293S0001 — P/N
136 24 A — DATE CODE
SHIFT CODE
YEAR CODE
"24" FOR 2024
DATE CODE
136th DAY



RECOMMENDED PANEL CUT OUT

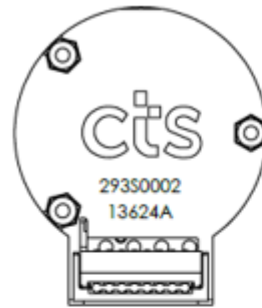
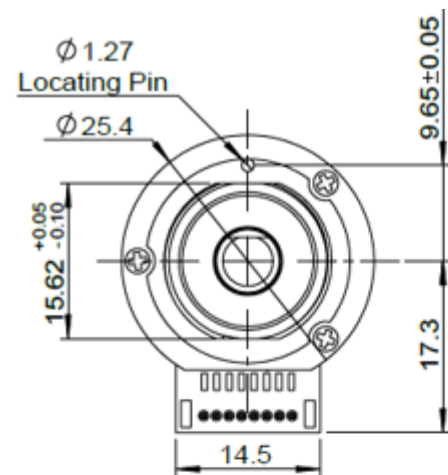


PIN ASSIGNMENT

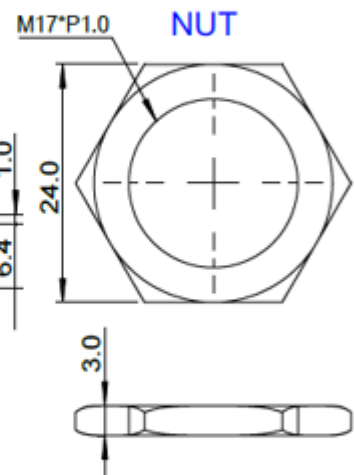
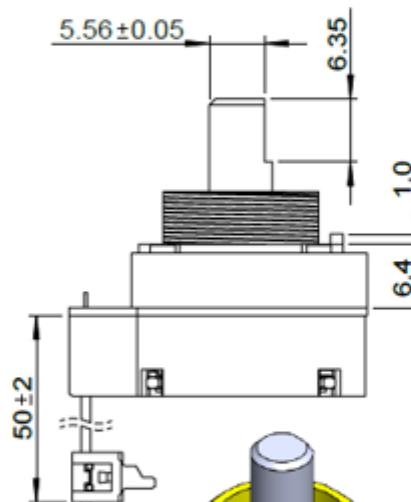
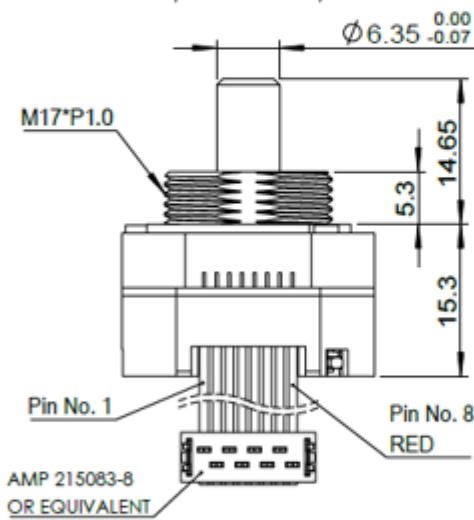
Pin No.	Function
1	Joystick "X"
2	Joystick "Y"
3	Power "+5V"
4	Output "A"
5	Output "B"
6	Switch
7	Switch
8	GND

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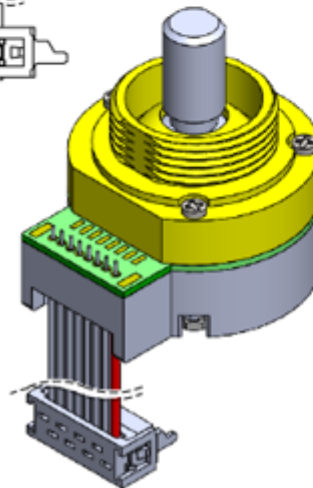
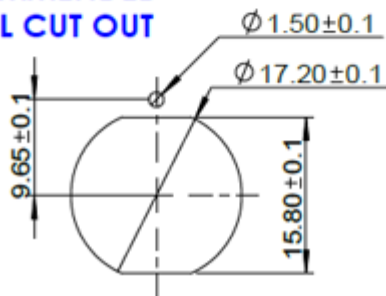
(Unit: mm)



293S0002 — P/N
136 24 A — DATE CODE
SHIFT CODE
YEAR CODE
"24" FOR 2024
DATE CODE
136th DAY



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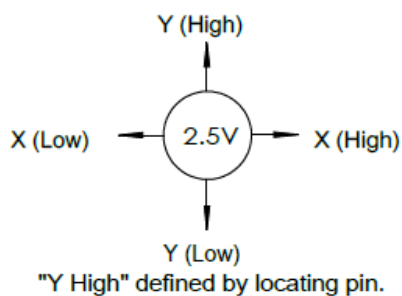


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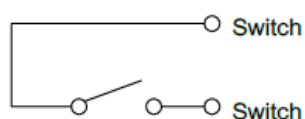
Pin No.	Function
1	Joystick "X"
2	Joystick "Y"
3	Power "+5V"
4	Output "A"
5	Output "B"
6	Switch
7	Switch
8	GND

Output

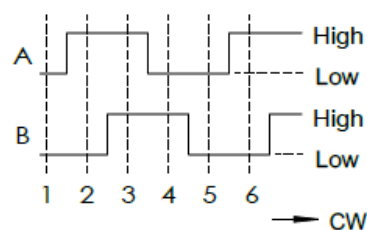
• JOYSTICK



• PUSHBUTTON



• ENCODER Output Waveform



Position \ Output	A	B
1		
2	•	
3	•	•
4		•

• = High
Blank = Low

OUTPUT CIRCUITRY AND RECEIVING CIRCUITRY

