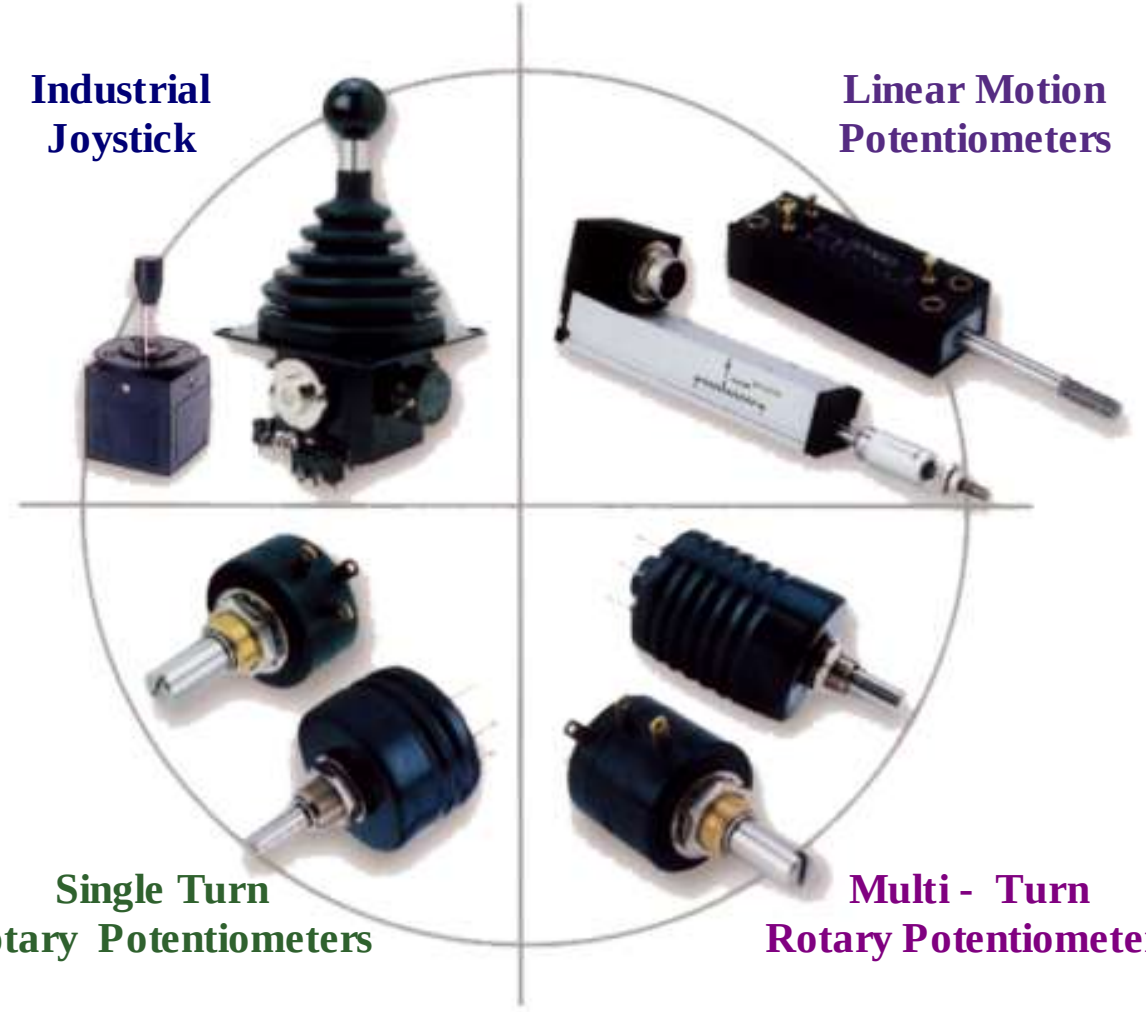
ETI Systems



Industrial Joystick

Linear Motion Potentiometers

Single Turn Rotary Potentiometers

Multi - Turn Rotary Potentiometers

Solutions for Industrial Automation

- Potentiometer Features
- Basics to Selecting a Potentiometer
- Cross Reference
- Joystick Features

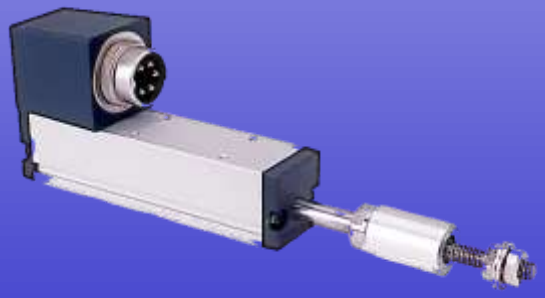
Potentiometers:

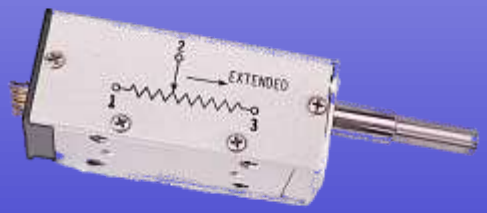
Features, Functions, and Benefits

- Linear Motion Potentiometer
- Single Turn Potentiometer
- Multi Turn Potentiometer

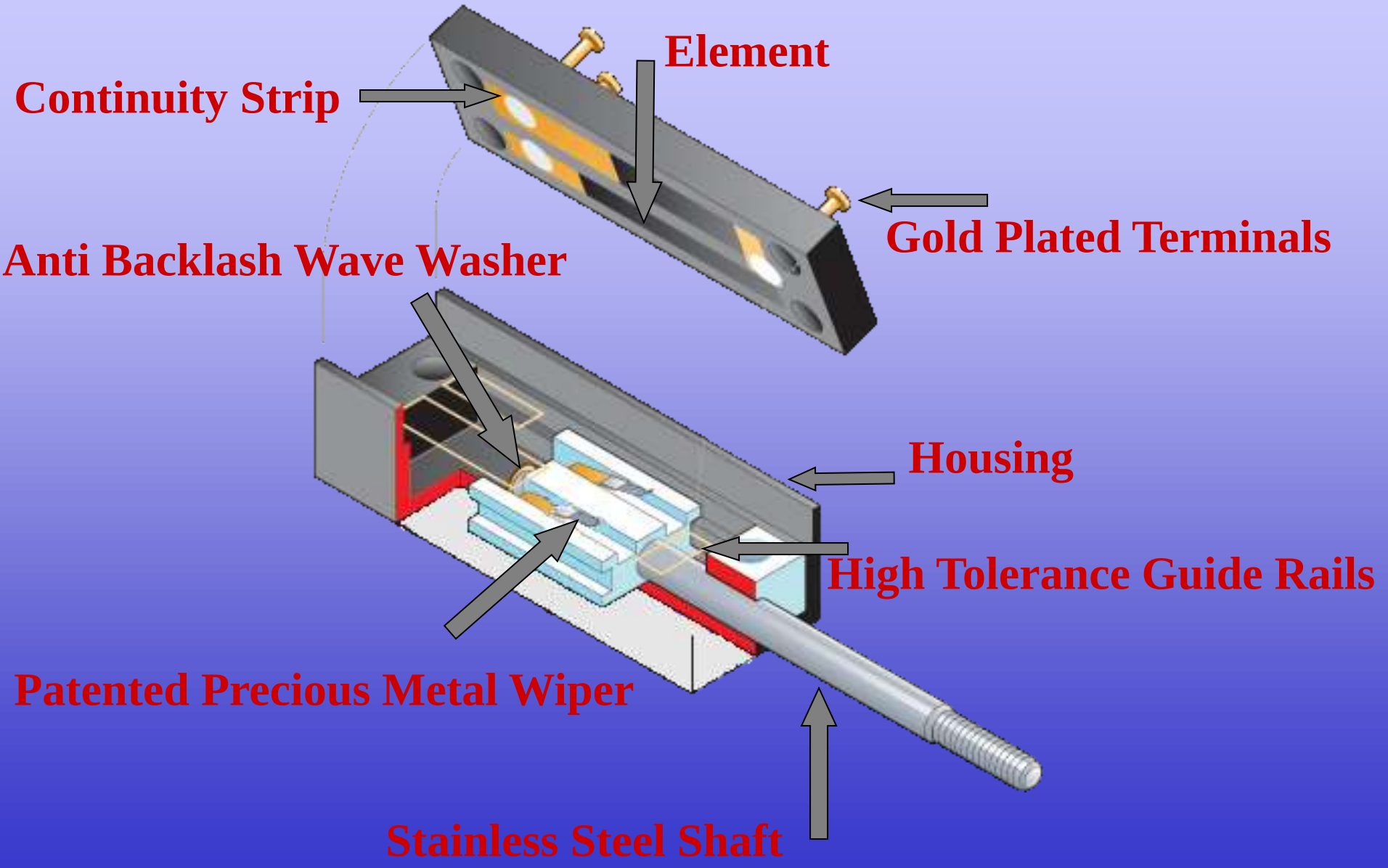
Home

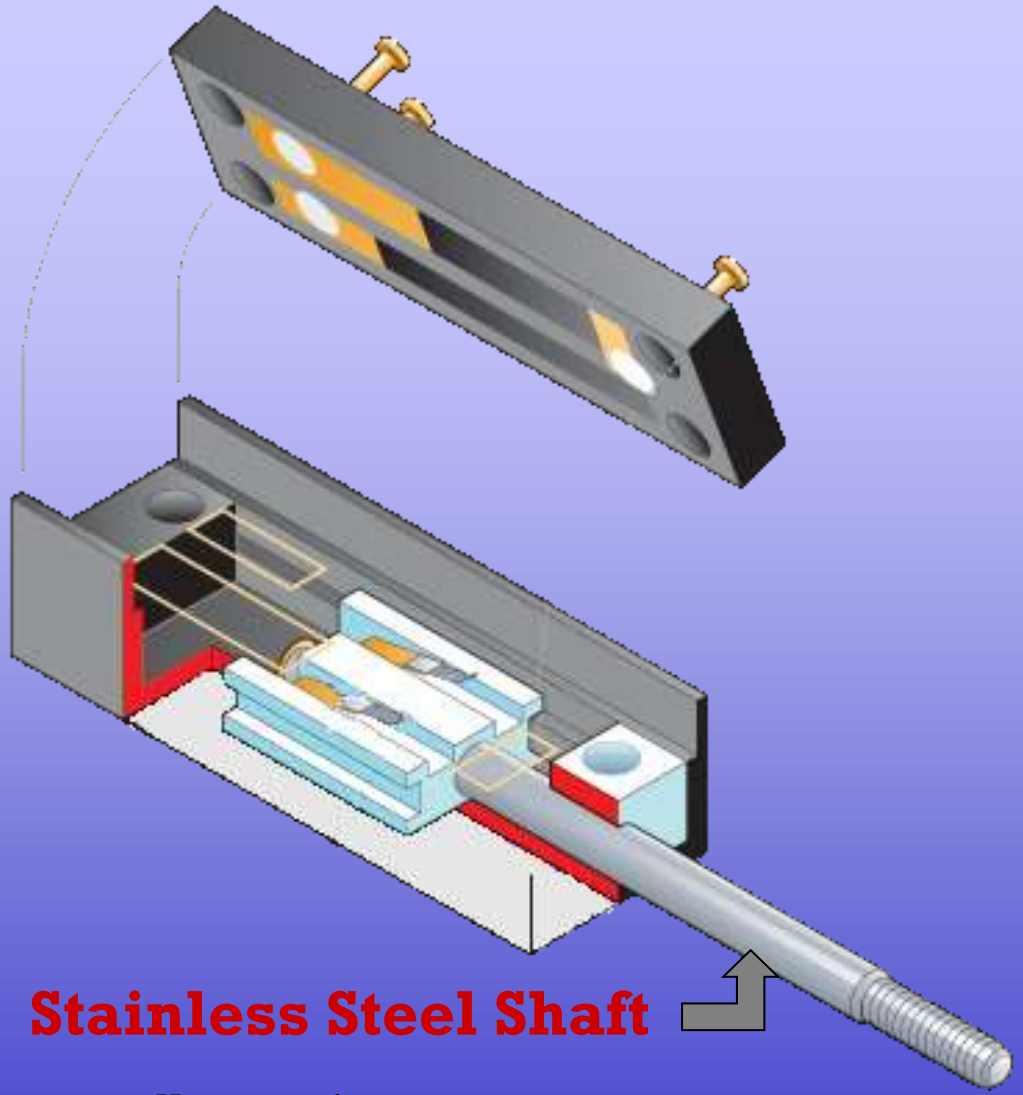
Linear Motion Potentiometers





Linear Potentiometer Features

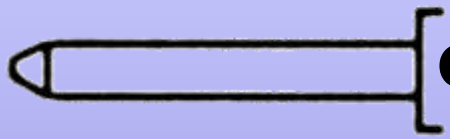




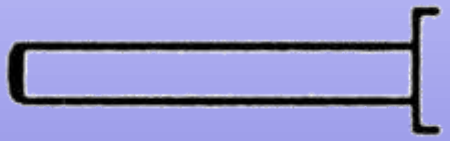
Stainless Steel Shaft

- Non-corrosive
- Superior shaft strength
- Multiple stroke lengths

Shaft Options



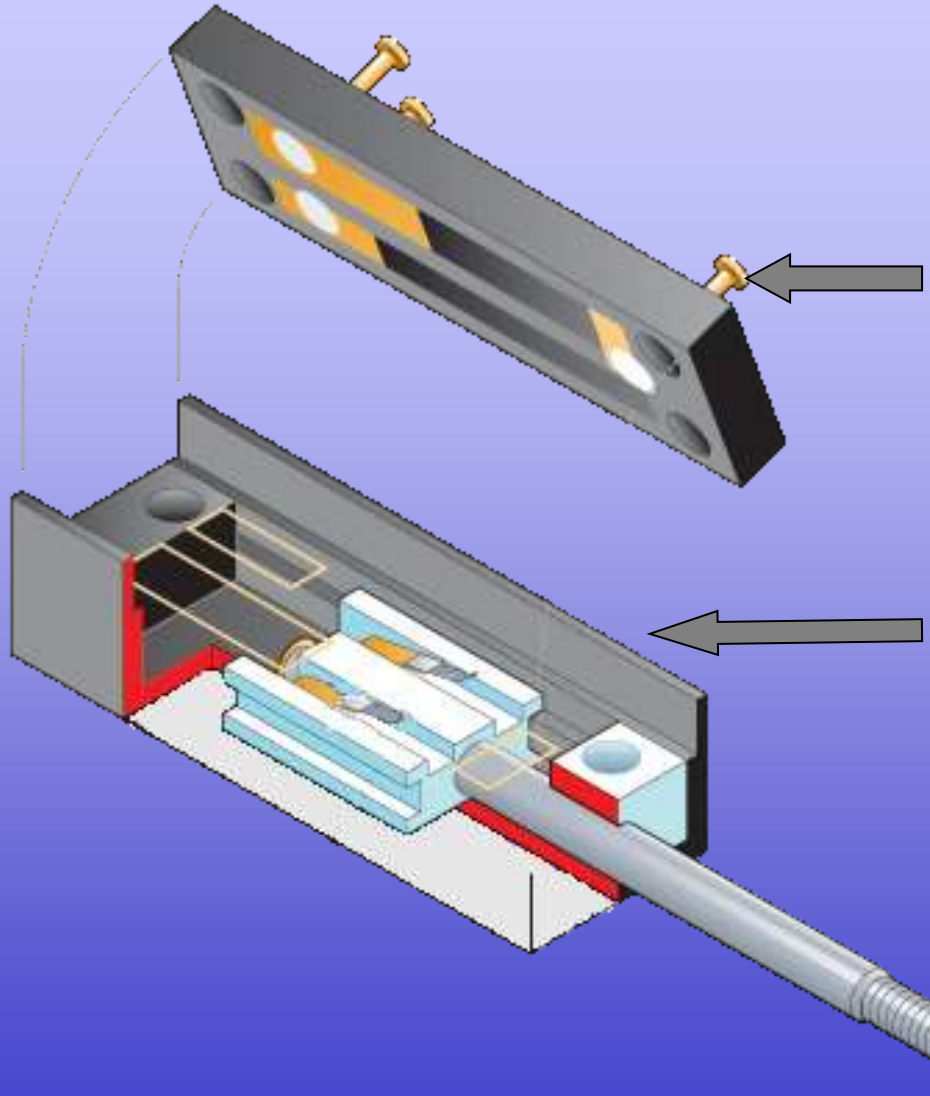
Chamfered



Plain

Threaded

Spring Return

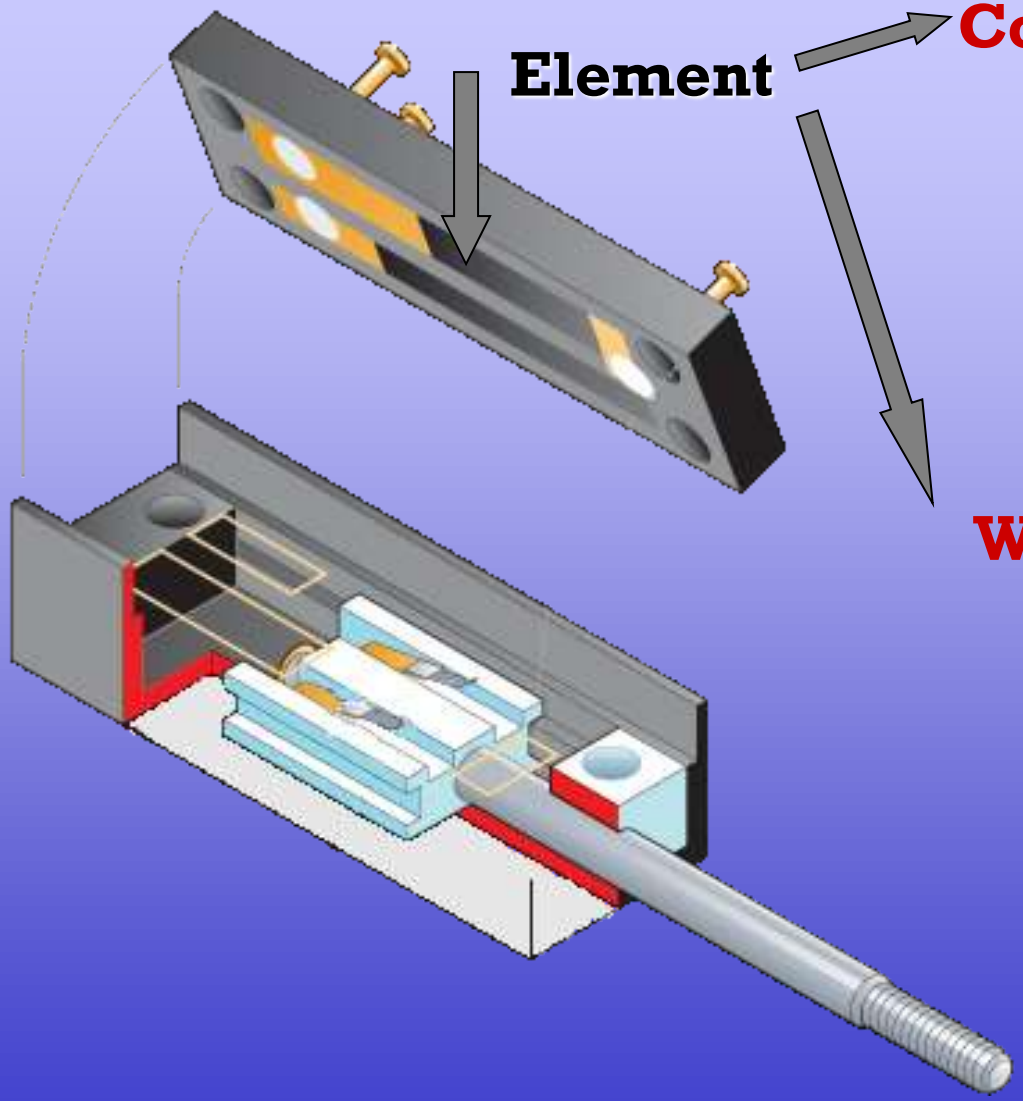


Gold Plated Terminals

- Do not corrode or tarnish
- Superior conductivity
- Flux free soldering

Housing

- High temperature plastic
- Durable in harsh environments

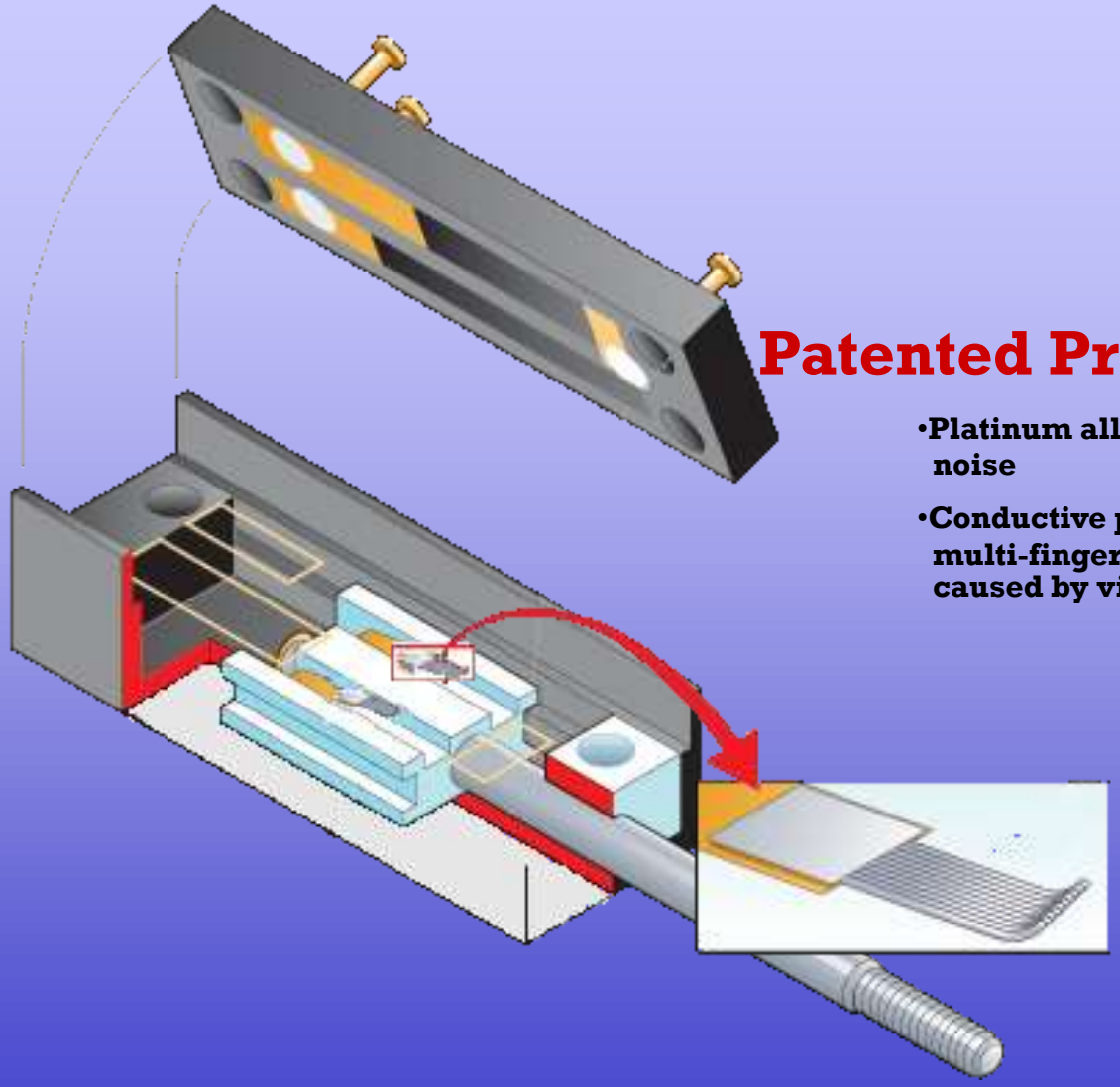


Conductive Plastic

- High temperature conductive plastic resin molded on substrate for better reliability
- Provides essentially infinite resolution
- Longer life and low noise
- Excellent high speed tracking capability
- Superior in high frequency applications

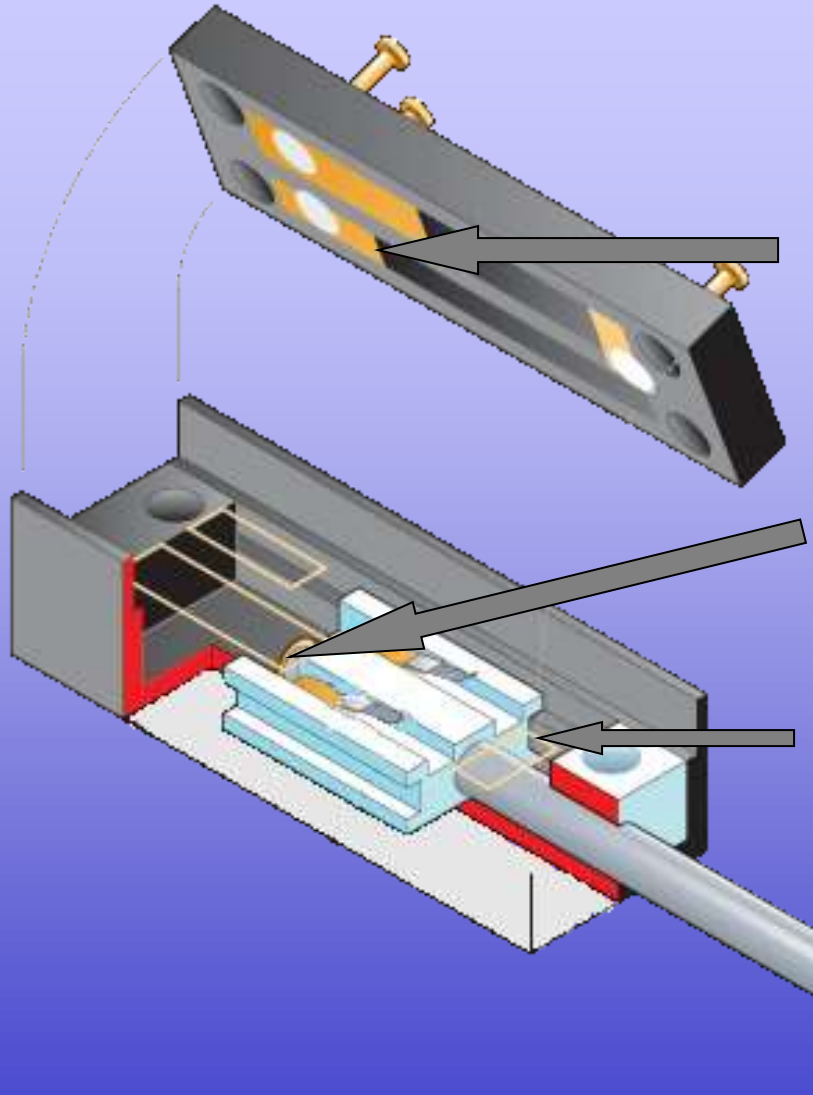
Wirewound

- Provides better setting stability
- Lower temperature coefficients
- Excellent power rating



Patented Precious Metal Wiper

- **Platinum alloy wiper for longer life and low noise**
- **Conductive plastic models employ patented multi-finger wipers to prevent intermittence caused by vibration, shock or contamination**



Continuity Strip

- Thermo setting high temperature substrate

Anti Backlash Wave Washer

- Provides superior setability

High Tolerance Guide Rails

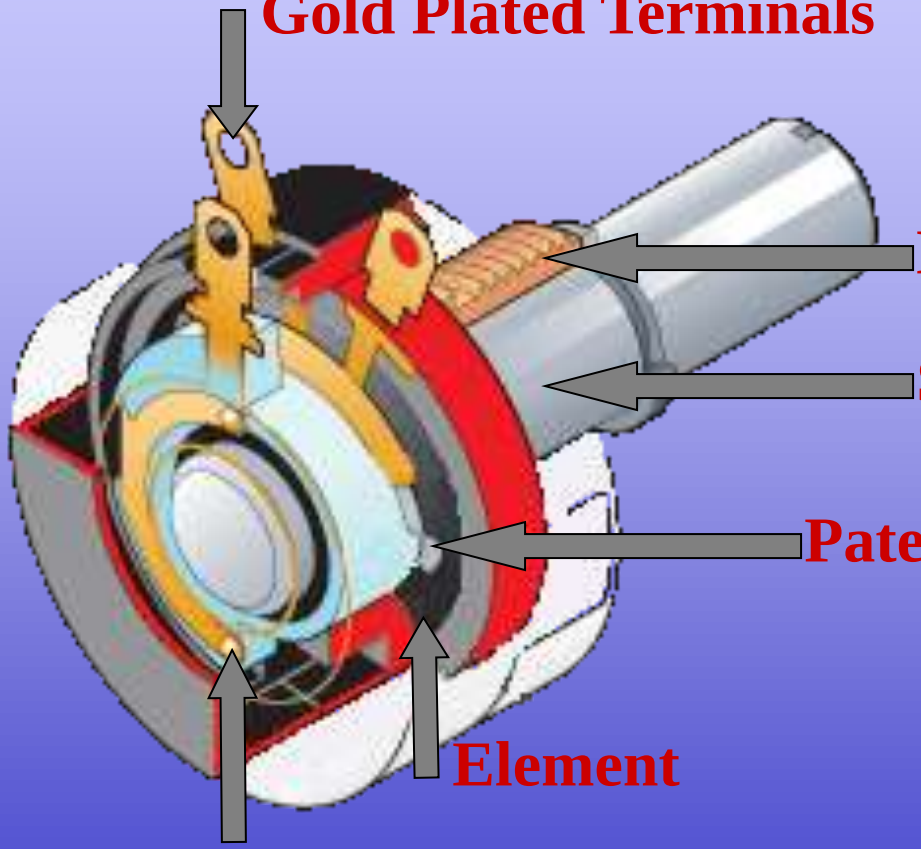
- Reduces setability shift

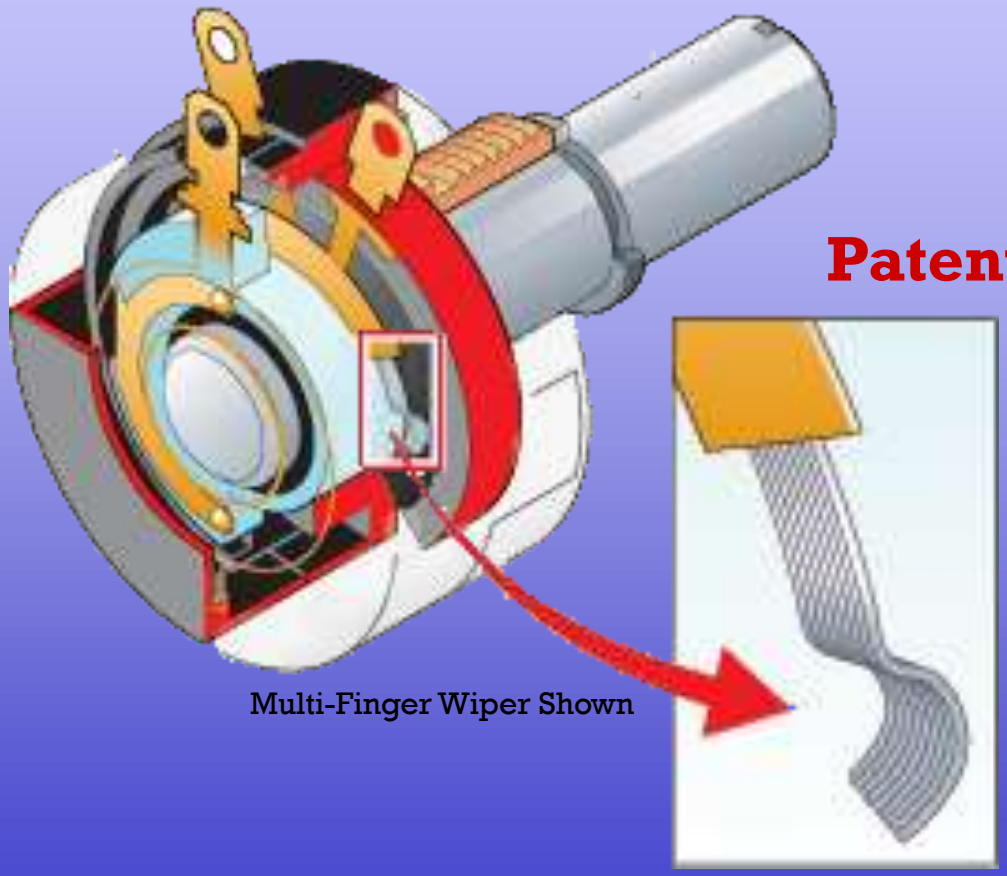
Options for Linear Potentiometers

- **Spring Return**
- **Center Tap**
  - **Available as a voltage or current tap**
- **Sealed Body**
  - **Protects internal parts from dirt and moisture in harsh environments**
  - **Includes: o'ring shaft seal, sealed housing, and internal moisture lube**
- **Shaft Options**
  - **Chamfered**
  - **Plain**
  - **Threaded**
  - **Multiple lengths available**
- **Special Mech/Elect Angles**
  - **ETI can custom mechanical and electrical angles to your specifications**
- **Precision Linearity & Resistance Tolerances**
  - **For critical specifications**

Single Turn Rotary Potentiometers

Single Turn Potentiometer Features

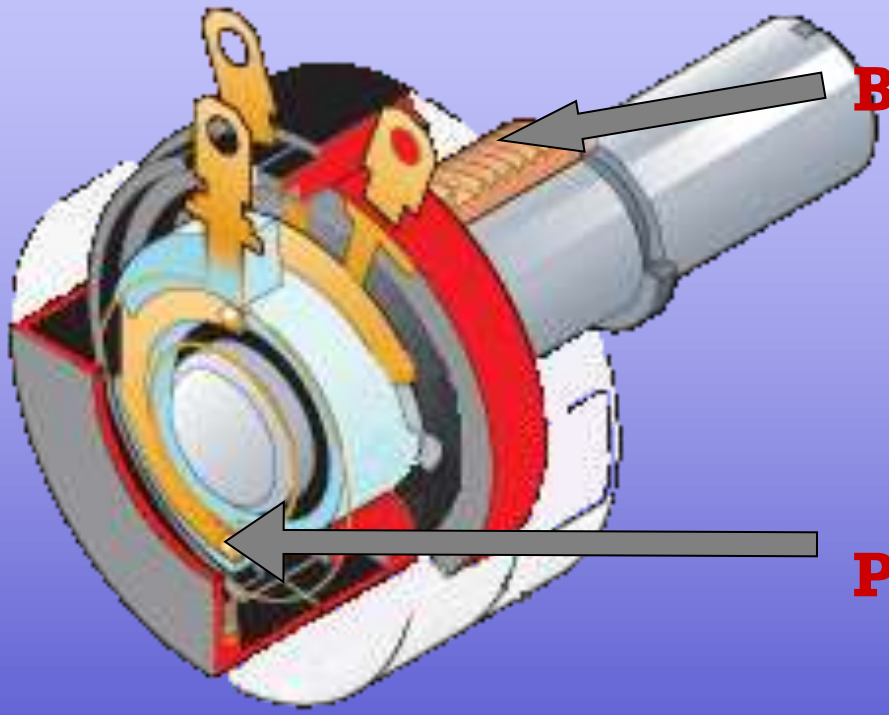




Multi-Finger Wiper Shown

Patented Precious Metal Wiper

- **Platinum alloy wiper for longer life and low noise**
- **Conductive plastic models employ a multi-finger wiper cut on a bias preventing intermittence in higher shock and vibration applications**

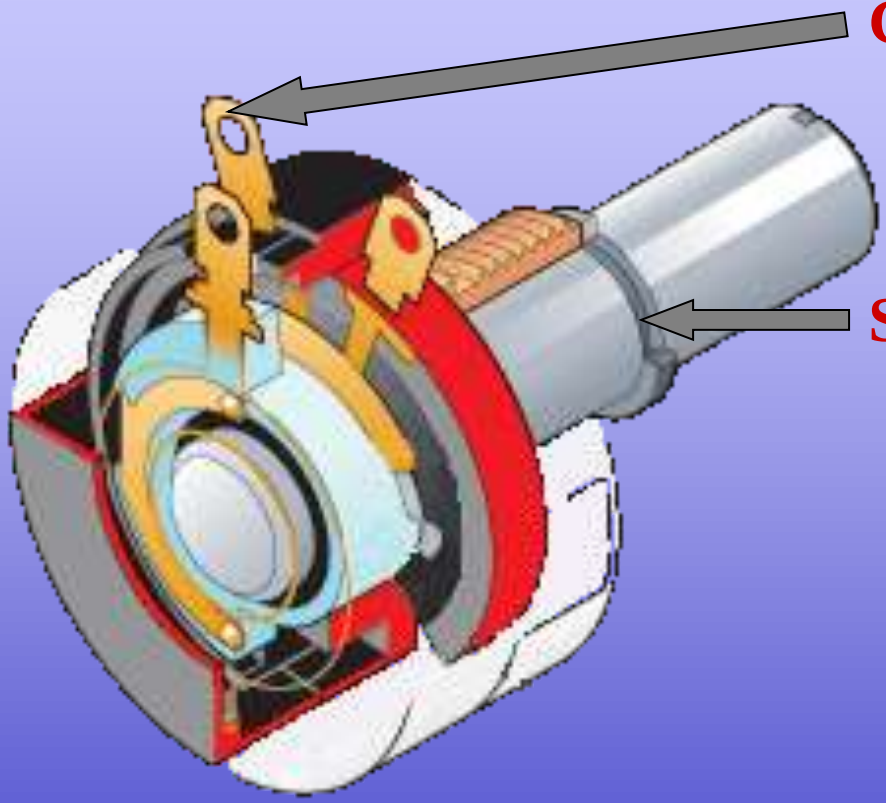


Brass Bushing

- High quality brass bushings provide better support for potentiometer shaft side loads.

Precious Metal Slip Ring

- For low noise and long life

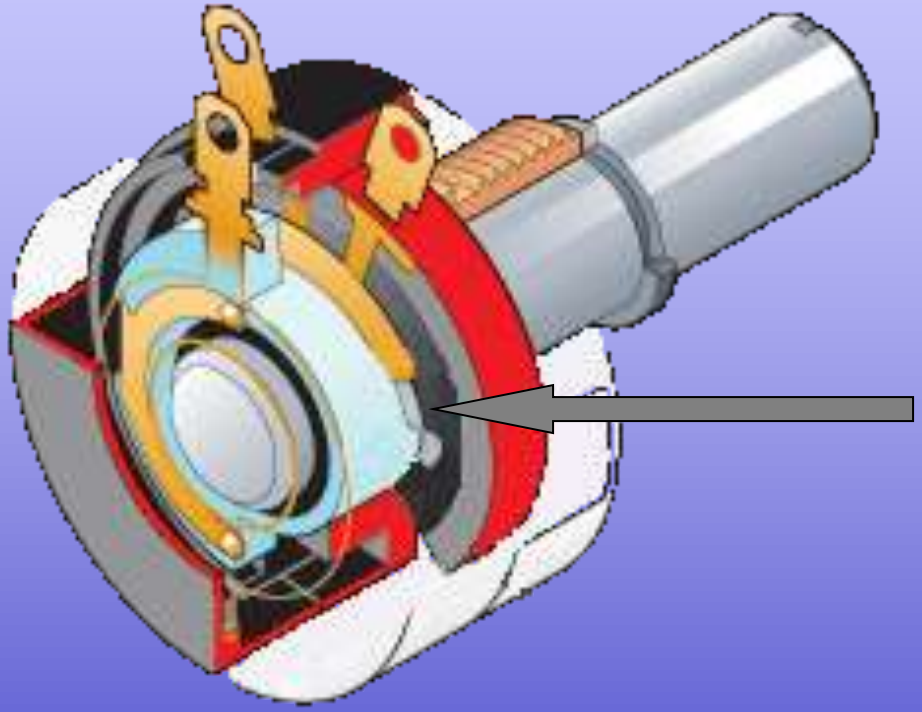


Gold Plated Terminals

- Do not corrode or tarnish
- Superior connectivity
- Flux free soldering

Stainless Steel Shaft

- Non-corrosive
- Many modifications are available for ease of linking to your system



ELEMENT

Conductive Plastic

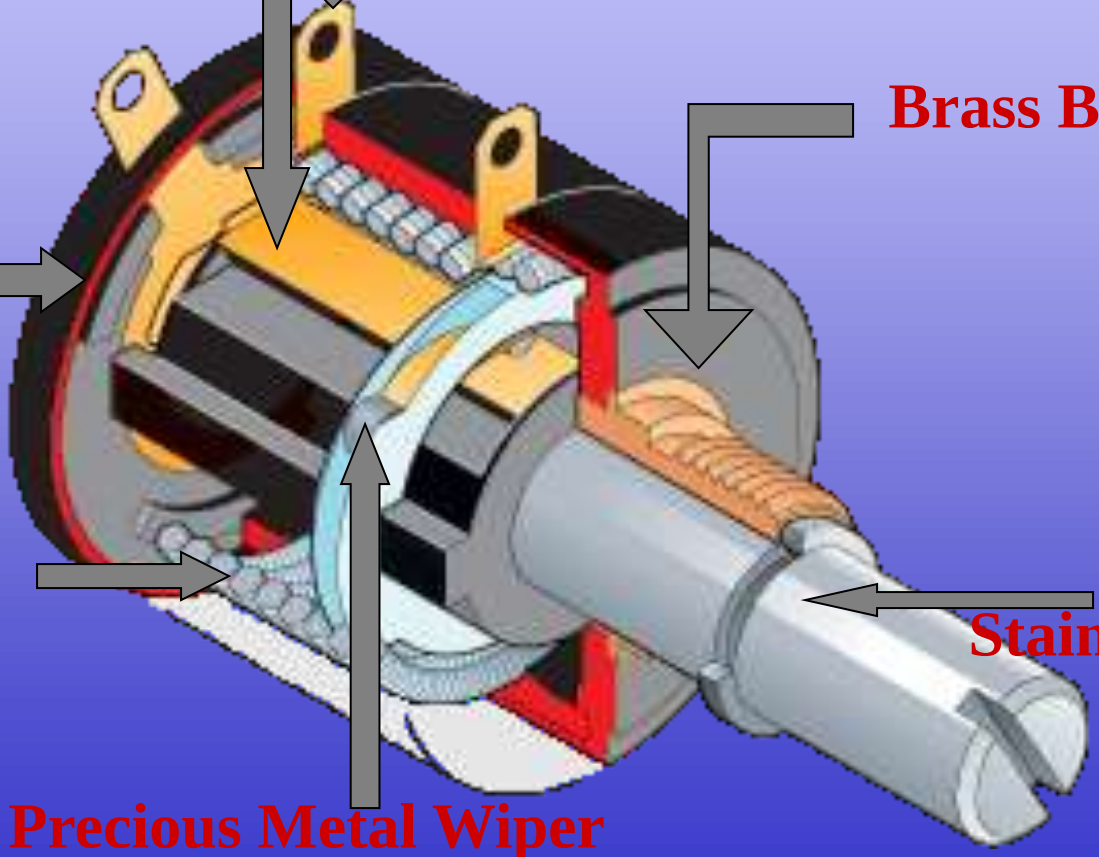
- High temperature conductive plastic resin molded on substrate for better reliability
- Provides essentially infinite resolution
- Longer life
- High speed tracking capability
- Good characteristics in high frequency applications

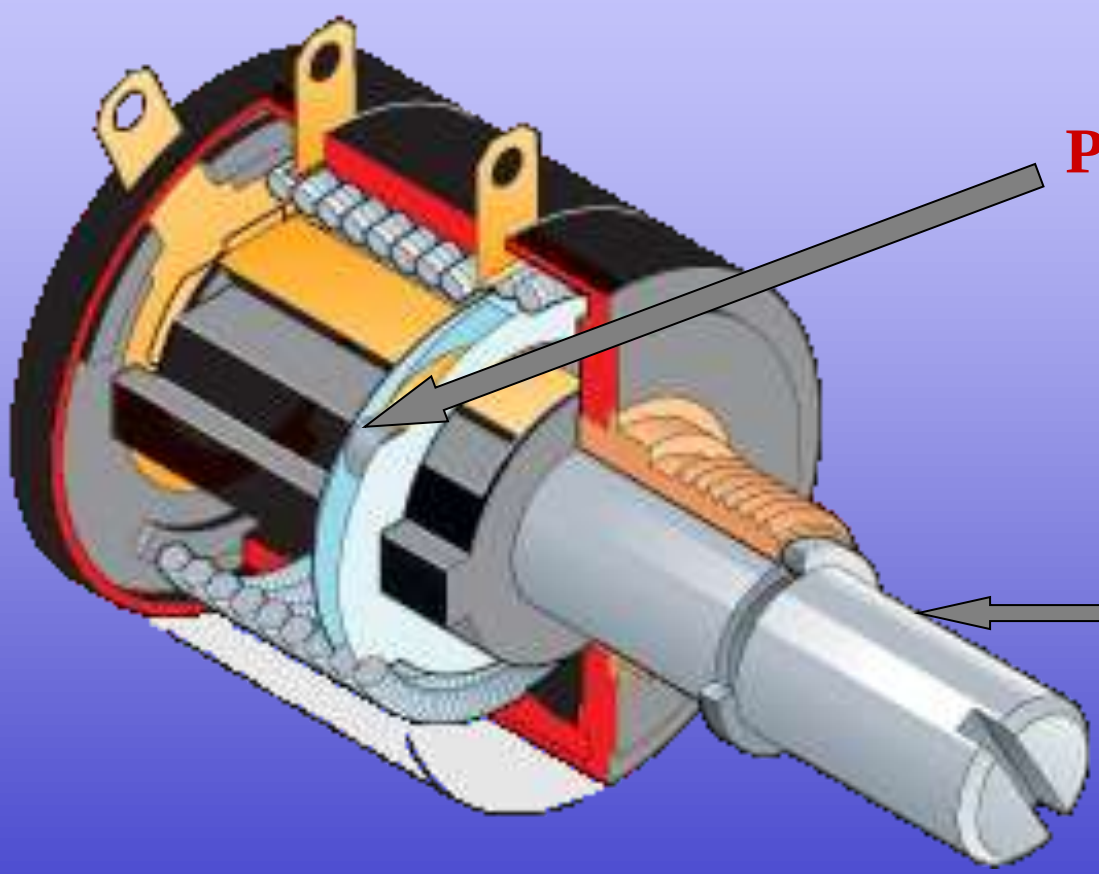
Wirewound

- Provides better stability
- Lower temperature coefficients

Multi-Turn Rotary Potentiometers

Multi –Turn Potentiometer Features





Precious Metal Wiper

- Platinum alloy ensures long life and low noise

Stainless Steel Shaft

- Non-corrosive
- Many modifications available for ease of linking to your system

Gold Plated Continuity Bar

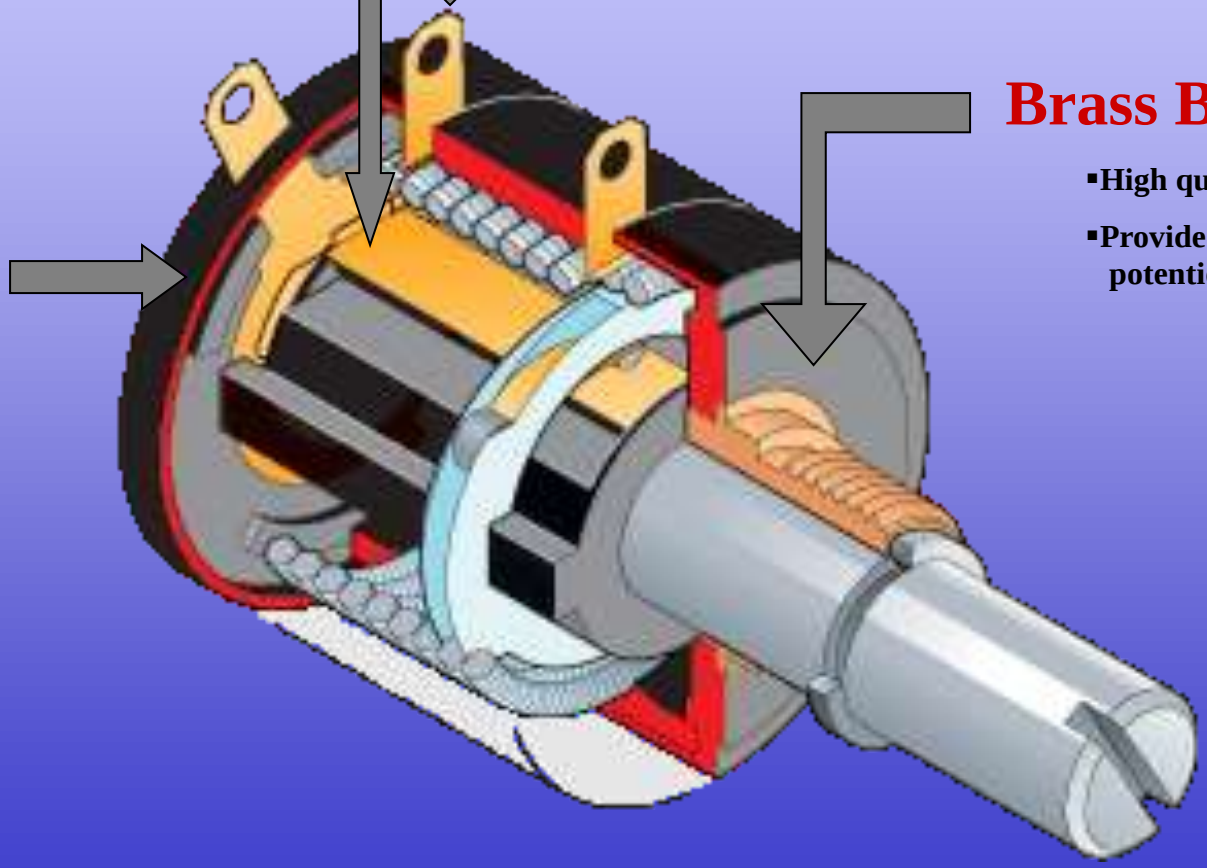
Gold Plated Terminals

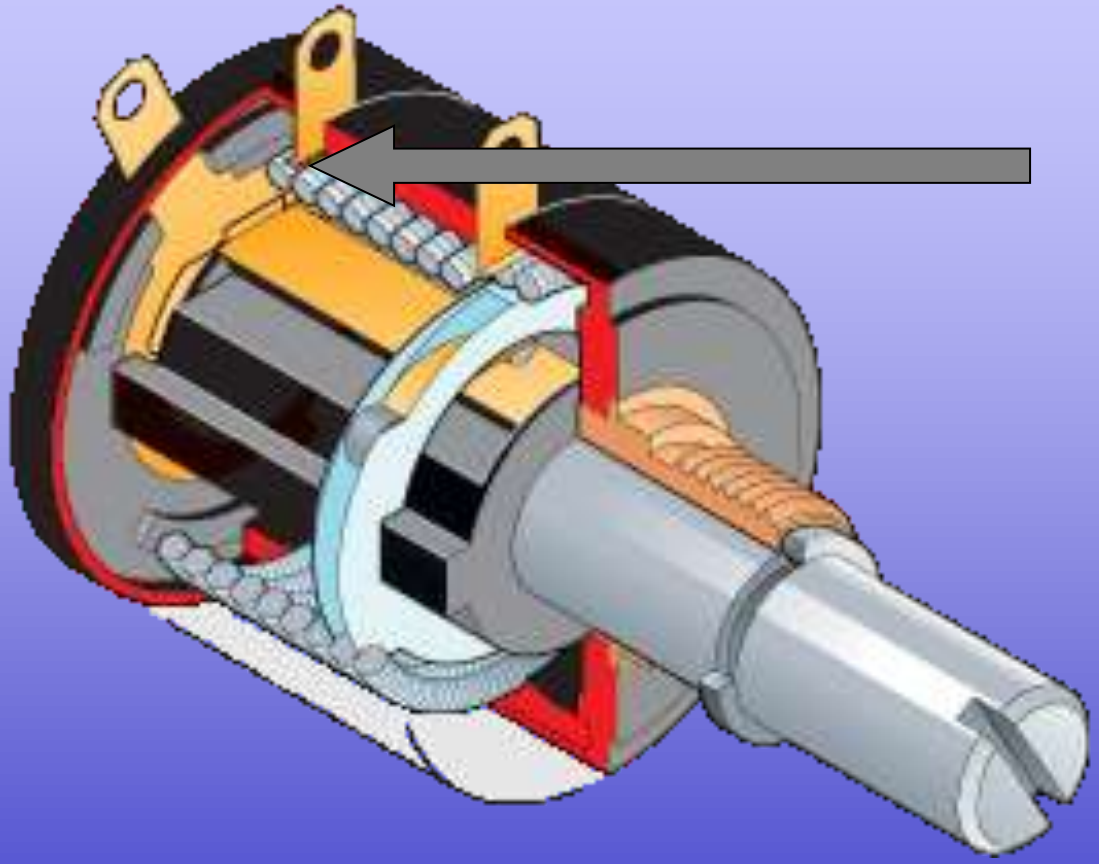
- Do not corrode or tarnish

Brass Bushing

- High quality brass bushing
- Provide better support for potentiometer shaft side loads

Housing





Element

Wirewound (Shown)

- Excellent for general purpose applications
- Offers better stability and linearity
- Low temperature coefficient

Hybrid

- Made with conductive plastic over a wirewound element
- For applications requiring lower inductance, better resolution, and longer life

Options for Rotary Potentiometers

- **Ball Bearings**
  - For use when pot is gear-driven
  - Recommended for high side load applications
- **Center Tap**
  - Available as a voltage or current tap
- **Multi – Gangs**
  - Up to 10 gangs available
- **Special Mech/Elect Angle**
  - ETI can customize mechanical or electrical angles
- **Precision Linearity & Resistance Tolerances**
  - For critical specifications
- **Side Load Treatment**
  - Special low friction treatment to extend bushing life in high *side load* applications
- **Sealed Body**
  - Protects internal parts from dirt and moisture in harsh environments
  - Includes o'ring shaft seal, sealed housing, and internal moisture lubing.
- **Servo Mount**
  - Recommended when shaft is attached to a gear or other mechanism
  - Allows operator to index to zero adjustment
- **Slip Clutch**
  - Prevents potentiometer stop breakage
- **Integrated Switches**
  - Used for circuit reset, motor starts, or limit switches
  - Available on some models
- **Shaft Modifications**
  - Shafts can be flatted, slotted, grooved, threaded, etc.
  - Plastic shaft and bushing available for high voltage applications

Basics to Selecting the Correct Potentiometer

Review the following:

- **Select a single turn, multi turn, or linear motion**
- **Required linearity tolerance**
- **Required resistance element type**
- **Required resistance tolerance**
- **Required power rating**
- **Review the size constraints**

Next

The 5 Common Questions

What is the difference between single and multi turn?

Answer – The single turn offers smaller size and faster resistance changes. A multi turn offers better resolution over several turns and higher power ratings.

Do I need a wire wound, conductive plastic, or hybrid?

Answer - In a single turn, multi-turn, and linear potentiometer use a *wireyound* element when you need a lower temperature coefficient and better stability. In a multi-turn use a *hybrid* element when you need long life and essentially infinite resolution. In a linear and single turn use *conductive plastic* when you need essentially infinite resolution and long life.

What resistance tolerance or linearity do I need?

Answer – Use a low resistance tolerance for a more accurate variable resistor. Use a lower linearity tolerance for a more accurate voltage divider.

What power rating do I need?

Answer – That is dependent upon the amount of current that will be passed through the device. (the amount of heat it will have to dissipate)

What size constraints do I have?

Answer – Size constraints are based upon required power rating, required number of turns or stroke length, and any special features, such as switches, shaft modifications, etc.

Common Terms Home

Commonly Used Terms & Definitions

Brake – A device used to increase the rotational torque or lock a dial.

Center Tap – Additional terminal connection to the center of the resistance element.

Conductive Plastic Element – Conductive plastic resistance element silkscreened onto a smooth base.

Dielectric Strength – A potentiometers ability to withstand a given voltage.

Electrical Angle – Amount of travel(rotation) over total electrical operation measured in degrees.

High Torque – Additional resistance to rotation.

Hybrid Element – A wirewound element coated with conductive plastic. Wiper rides over conductive plastic.

Linearity Tolerance– The amount of allowable **voltage** deviation from theoretical linear reference line.

Load Life – Total number of turns or strokes a potentiometer is capable of while staying within electrical and mechanical specifications.

Next

Commonly Used Terms & Definitions

Mechanical Angle - Amount of physical rotation of electrical output measured in degrees.

Multi Gang – Multiple isolated potentiometers operated by a common shaft.

Output Smoothness/Equivalent Noise Resistance – Amount of electrical noise caused by the wiper moving across the resistance element.

Over the Center Lock – A device that locks a dial into place.

Read Out Accuracy – The ability of a dial to accurately read the resolution or setting of a potentiometer.

Resistance Tolerance – The amount of allowable resistance deviation from theoretical linear reference line.

Resolution – The steps (measure) between changes in resistance or voltage output that a given element can measure expressed as a percentage.

Temperature Coefficient – The amount of allowable resistance change caused by temperature variance.

Wiper - The contact point that moves across and reads the element.

Wirewound Element – Resistance wire wrapped around a central core – i.e. wiper rides along wirewound element.

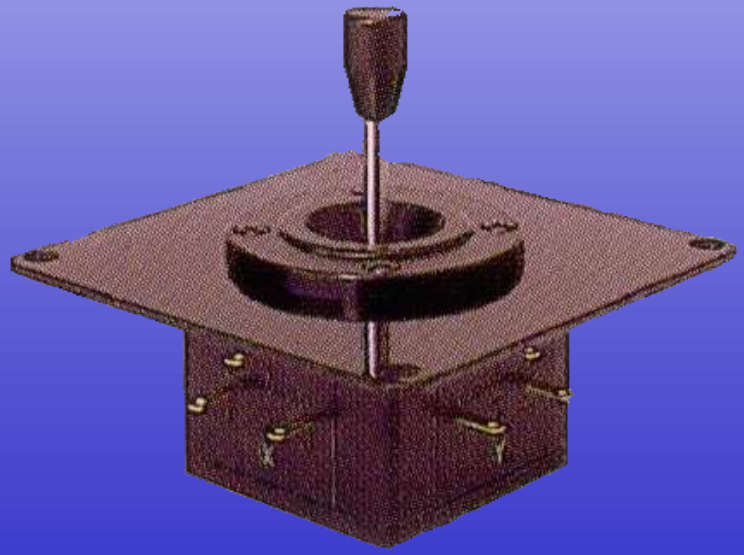
Home

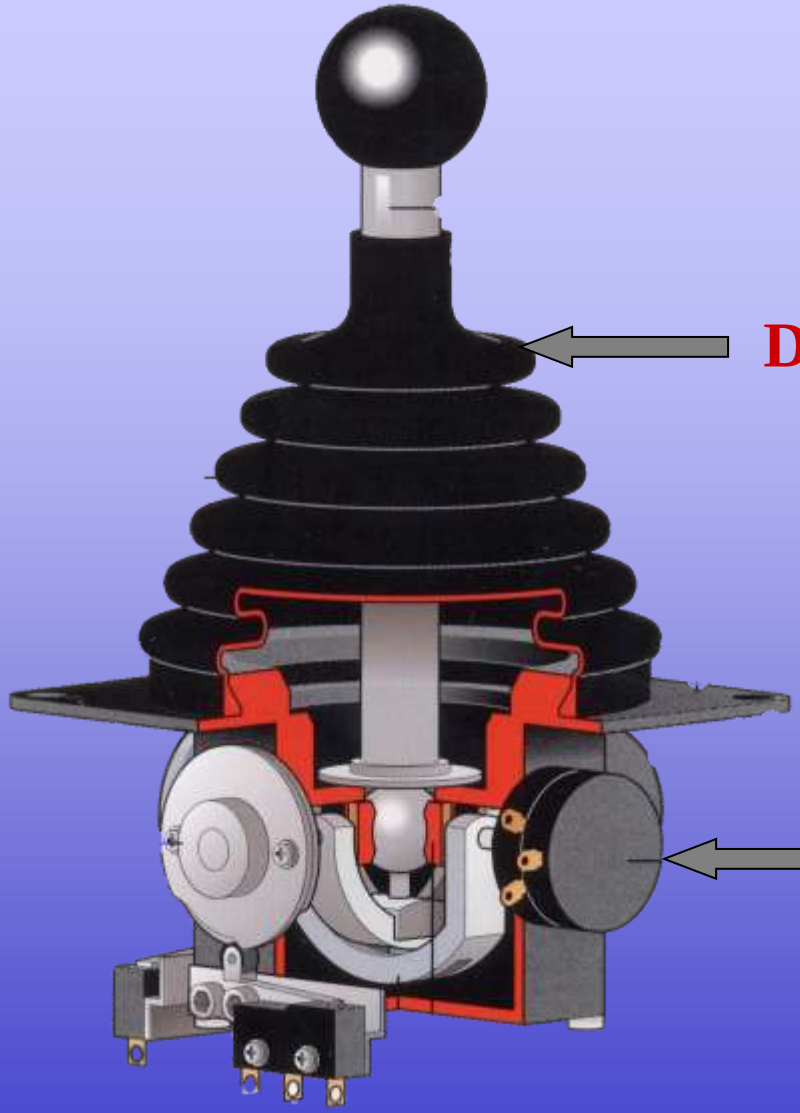
Cross Reference

- ETI / Bourns Cross Reference
- ETI / Spectrol Cross Reference
- ETI / Beckman Cross Reference
- ETI / Clarostat Cross Reference

Home

Industrial Joysticks



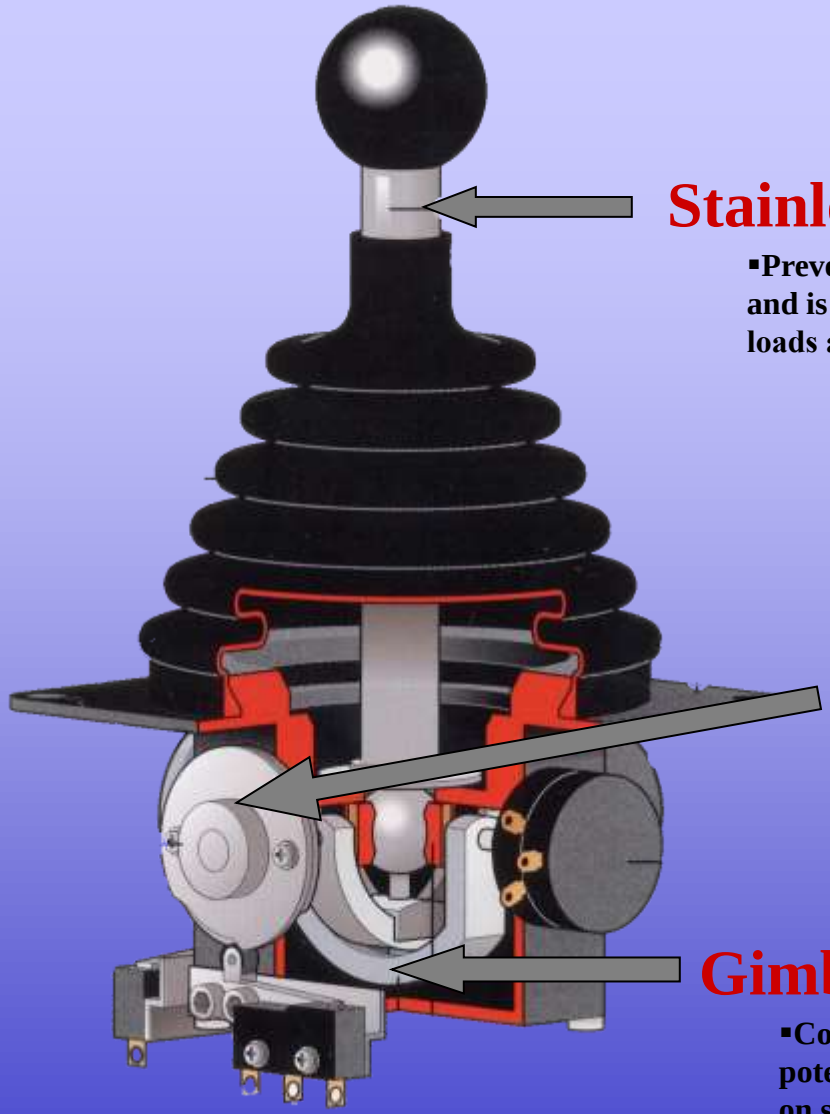


Dust-Proof Rubber Boot

- **Protection in adverse environments. Standard on some models and available on all but the J3R, this protects the unit against dust and splashing water. Higher levels of protection available on some models.**

High Precision Potentiometers

- **10 K ohm conductive plastic precision potentiometers feature essentially infinite resolution and long life expectancies. Patented multi-finger, precious metal wiper ensures contact stability and low noise**



Stainless Steel Shaft

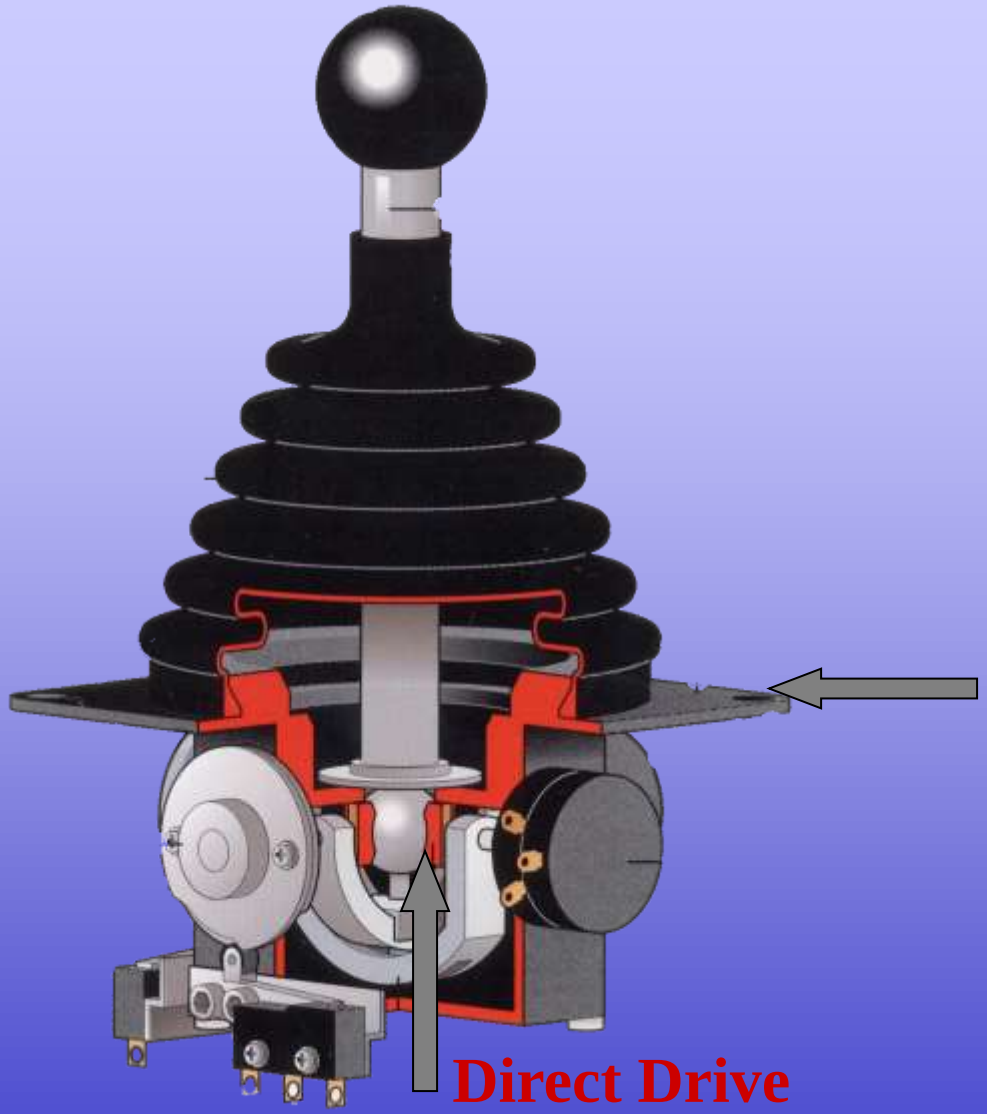
- Prevents corrosion in harsh environments, and is constructed to withstand higher side loads and “push-pull” forces.

Spring Return Device

- Sturdily constructed and highly precise to ensure accurate return to center and protect against unwanted movement. Optional friction hold device available on most models

Gimble

- Construction of handle-to-gimble-to-potentiometer connections produces no stress on shaft of potentiometer, handle or drive device



Sub-Mounting Panel

- **Constructed of sturdy anodized aluminum. Simplifies mounting of joystick into existing panel**

Direct Drive

- **Potentiometer shaft is operated by direct drive from joystick shaft. Absence of gearing means higher accuracy and fewer moving parts to cause setability difficulties**

ETI Systems

Solutions for Industrial Automation

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