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## CII Custom High Performance Solenoids

### Product Facts

- Designed and built to customer requirements
- Push, pull or combination motion
- Broad operating temperature range
- Multiple termination and mounting options
- 200°C magnet wire insulation is standard



### Description

Custom-designed linear solenoids for demanding applications

Top-end devices are engineered for applications where extreme temperatures and other severe environmental conditions may exist

High altitude, shock, acceleration and vibration reliable

### Product Options

Linear motion, tubular solenoid line ranges from models only one-half inch (12.7 mm) in diameter producing only a few ounces (<1N) of force at very short strokes, to three-inch (76.2 mm) diameter models capable of 100 pounds (445N) force at one-inch (25.4 mm) strokes

Push, pull or combination motion available

Continuous or intermittent duty coils available

AC voltages can be handled through the use of internal rectifiers

Dual coil models with low holding power requirement may be appropriate in power sensitive equipment

Solenoids with plunger seals can be built for harsh environments

Solenoids can be made water-resistant, fuel-resistant and with encapsulated coils (ferrous parts are plated for protection against corrosion)

Leads are provided with TEFLON and TEFZEL film insulation, but we can use customer-specified MIL-type connectors on the solenoids

Can be provided with flat or conical face depending on stroke

Solenoid plungers can be internally or externally threaded or have clevis attachment

Prototype solenoids can be custom built to a customer's requirements

### Electrical Characteristics

Voltage Rating —  
6 to 270 VDC  
28 to 115 VAC (60 or 400 Hz)

### Mechanical Characteristics

Ambient Temperature Range —  
-65°C to +125°C

Force — 1 oz. to 100 lbs. push, pull, hold

Rated at 100,000 operations  
Built IAW MIL-S-4040 as applicable

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**CII Custom High Performance Solenoids** (Continued)

**Typical Applications**

**Fin Locking Solenoid**

Three of these husky Solenoids are used to lock steering fins in place until the guided weapon is released.



**Voltage** — 22-28 VDC  
**Max. Allowable Current** — Not specified  
**Actuating Force** — 12 to 15.4 lb. (depends on input V)  
**Stroke** — .095"  
**Time On** — Bomb drop time  
**Time Off** — Continuous  
**Cycling Rate** — Not applicable  
**Type Operation** — Pull  
**Temperature Range** — Ambient -65°F to +125°F  
**Coil Connections** — TEFLON Insulated 8" to 8 3/4"  
**Approximate Dimensions** — 2.20" diameter x 2.05" long  
**Type Mounting** — Integral tapped holes  
**Special Environmental Consideration** — Exposure to sand, dust, aircraft oils and fuels, will require an "O" ring seal on plunger.

**Primer Firing Solenoid**

This extremely powerful Solenoid together with its companion pulse control module is designed to fire a standard Military #41 arsenal primer, as part of an advanced mine detection system.



**Voltage** — 26 VDC  
**Max. Allowable Current** — 10.4 Amps @ 26 VDC  
**Actuating Force** — 90 oz. force inches (.64 joules)  
**Stroke** — .38"  
**Time On** — W/pulse control module, 25 ms  
**Time Off** — 3 seconds  
**Cycling Rate** — 20 operations/minute  
**Type Operation** — Push  
**Temperature Range** — Ambient -65°F to +85°F  
**Coil Connections** — TEFLON Insulated #20 stranded 6' long  
**Approximate Dimensions** — 3/4" diameter x 3 1/2" long  
**Type Mounting** — Integral 1/2" - 20 threaded base  
**Special Environmental Consideration** — Sand and dust

**Aero Medical Valve Solenoid**

A scant 3/8" in diameter, this tiny precision Solenoid is capable of 100,000 reliable operations, controlling various airborne gas systems.



**Voltage** — 28 VDC  
**Max. Allowable Current** — .18 Amps @ 28 VDC  
**Actuating Force** — 190 grams @ .030 Amps  
**Stroke** — .030" minimum  
**Time On** — Continuous duty  
**Time Off** — Not specified  
**Cycling Rate** — Not applicable  
**Type Operation** — Pull  
**Temperature Range** — Ambient -65°F to +125°F  
**Coil Connections** — #32 AWG TEFLON insulated, 24" minimum  
**Approximate Dimensions** — 3/8" diameter x 3/4" long  
**Type Mounting** — None

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**CII Custom High Performance Solenoids** (Continued)

**Typical Applications** (Continued)

**Fuel Valve Solenoid**

This is a unique application in which the Solenoid is mounted inside an aircraft fuel tank submerged in JP-8 jet fuel. The coil is potted, completely fuel proof.



**Voltage** — 115 VAC 400 Hz  
**Actuating Force** — 1 lb. minimum @ 160°F  
**Stroke** — .030"  
**Time On** — Continuous duty rating  
**Time Off** — Not specified  
**Type Operation** — Push  
**Temperature Range** — Ambient -65°F to +160°F  
**Coil Connections** — IAW customer drawing, TEFLON Insulated Leads  
**Approximate Dimensions** — Tubular, 3/4" diameter x 3" long  
**Type Mounting** — Flange IAW customer drawing  
**Special Environmental Consideration** — Coil must be air tight, plunger operates while submerged in JP-8 jet fuel

**Directional Valve Solenoid**

A major valve company selected this rugged type Solenoid to control a directional hydraulic valve in heavy industrial machinery. The valve assembly has a 20 year expected life.



**Voltage** — 92 VDC  
**Max. Allowable Current** — 7.2 Amps inrush, .08 Amps hold  
**Actuating Force** — 30 lbs. minimum  
**Holding Force** — 40 lbs. minimum  
**Stroke** — .500"  
**Time On** — Continuous duty  
**Time Off** — Not applicable  
**Cycling Rate** — Not applicable  
**Type Operation** — Push and hold  
**Temperature Range** — Ambient -55°F to +85°F  
**Coil Connections** — TEFLON insulated #18 AWG, 72" L  
**Approximate Dimensions** — 2 3/16" dia. x 4 3/16"  
**Type Mounting** — Plate  
**Special Environmental Consideration** — Sand, dust, rain

**Refueling Release Solenoid**

This complex Solenoid with internal current limiting switch is part of an "Air to Air" refueling system.



**Voltage** — 18 to 30 VDC  
**Max. Allowable Current** — 10 Amps/50 ms - 1 Amp continuous holding  
**Actuating Force** — 20 lbs. min. for .10" of initial stroke  
**Holding Force** — Plunger must hold at bottom  
**Stroke** — .17 to .20"  
**Time On** — Continuous duty  
**Time Off** — Not applicable  
**Cycling Rate** — Not applicable  
**Type Operation** — Pull  
**Temperature Range** — Ambient -65°F to +160°F  
**Coil Connections** — Connector MS 30ZE-10SL-4P per MIL-C-5015  
**Approximate Dimensions** — 2 1/4" dia. x 2 13/16"  
**Type Mounting** — Integral with refueling receptacle  
**Special Environmental Consideration** — High performance aircraft exposure

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**CII Custom High Performance Solenoids** (Continued)

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**Application Information Form**

Customer Firm Name: \_\_\_\_\_

Customer Name: \_\_\_\_\_

Customer Address: \_\_\_\_\_  
\_\_\_\_\_

Telephone number: \_\_\_\_\_

Email address: \_\_\_\_\_

Voltage: \_\_\_\_\_ ± \_\_\_\_\_ % AC or DC (circle one)

Maximum allowable current: \_\_\_\_\_ Amps

Actuating force: \_\_\_\_\_ (Energy produced when coil is energized at start of stroke)

Holding force: \_\_\_\_\_ (Energy required at zero stroke, plunger seated on butt flange with coil energized).

Stroke: \_\_\_\_\_ inches or millimeters (circle one)

Duty cycle: Time On: \_\_\_\_\_ Time Off: \_\_\_\_\_

Cycle rate: \_\_\_\_\_ cycles per hour

Type of operation: Push or Pull (circle one)

Temperature range if other than -65°C to +125°C: \_\_\_\_\_

Coil connections: \_\_\_\_\_ Leads or Mil-type connector (circle one)

Approximate dimensions: \_\_\_\_\_

Type of mounting: \_\_\_\_\_

Applicable Mil-specs: \_\_\_\_\_

Special environmental considerations (i.e., exposure to salt spray, jet fuel, water, sand and dust): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

End application of solenoid: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Special tests: \_\_\_\_\_  
\_\_\_\_\_

Application Type:     New Design     Replacement

Approximate quantity (annual requirement): \_\_\_\_\_

**Please return completed form to John Gilbert, Product Manager for custom solenoids.  
Fax: 828-338-1103 E-mail: gilbartj@tycoelectronics.com**

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**Engineering Notes**

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