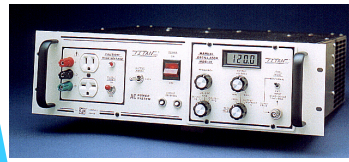


ETREMA Products PROUDLY uses:

TITAN SERIES AC POWER SOURCES



ETREMA PRODUCTS INC.
Subsidiary of Edge Technologies, Inc.

DATA SHEET

Actuator Line Specifications

NEXT GENERATION TERFENOL-D BASED ACTUATOR

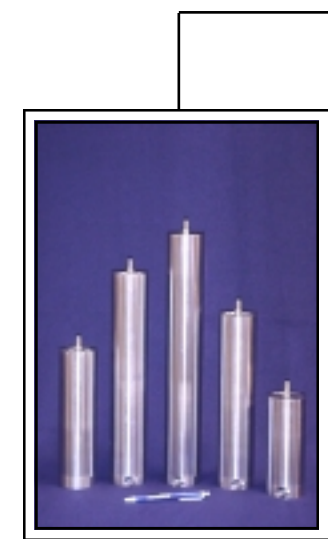
The TITAN SERIES of AC power sources delivers a much higher level of performance than has been previously obtained by competitive linear products. A totally new design approach using patented, switchmode, thick-film power hybrid circuitry enables the unit to deliver an impressive 70% to 82% power transfer efficiency across the **full** output voltage range, resulting in cool operation at **any** output level. In sharp contrast, traditional linear AC power sources have an efficiency of only 5% to 50%, depending on output level and load conditions. In addition, since the output stages have four-quadrant topology, the unit is capable of delivering its full rated output voltage and current **without derating** into **any** reactive load with **any** power factor **without any** excessive heating, shutdown, or possible damage as would be encountered in the traditional linear amplifier designs. Reactive power is recirculated back to the unit with 90% efficiency, as opposed to being wasted and dissipated in the form of excess heat in conventional designs. This fact alone dramatically cuts utility bills for both operating the unit itself and air conditioning for the housed facility. Reliability and safety are greatly enhanced as the operator need not check an instruction manual for a derating curve, since the power factor may change, not always be known, or be difficult to measure. All these application headaches are eliminated by specifying the TITAN SERIES AC power sources with their completely protected outputs and **no** confusing derating curves.

HALF the Price, Size, and Weight! TWICE the Bandwidth, Ruggedness, and Flexibility!

| | Description | Volts RMS | Amps RMS | Height/ Inches | Width/ Inches | Depth/ Inches | Weight/ Lbs. | Comments |
|----------|------------------|-----------|----------|----------------|---------------|---------------|--------------|--|
| ACP-01 | 165 VA Mainframe | 0-130/260 | 1.4/0.7 | 5.25 | 19 | 13.5 | 31 | Includes External Input Module EIM-01 ¹ |
| ACP-01E | 165 VA Mainframe | 0-130/260 | 1.4/0.7 | 5.25 | 19 | 13.5 | 31 | European Version with EIM-01 |
| ACP-01A | 165 VA Mainframe | 0-130/260 | 1.4/0.7 | 5.25 | 19 | 13.5 | 31 | Includes sinewave oscillator MOS-01 ² |
| ACP-01AE | 165 VA Mainframe | 0-130/260 | 1.4/0.7 | 5.25 | 19 | 13.5 | 31 | European Version with MOS-01 |
| ACP-02 | 500 VA Mainframe | 0-130/260 | 4.0/2.0 | 5.25 | 19 | 13.5 | 38 | Includes External Input Module EIM-01 ¹ |
| ACP-02E | 500 VA Mainframe | 0-130/260 | 4.0/2.0 | 5.25 | 19 | 13.5 | 38 | European Version with EIM-01 |
| ACP-02A | 500 VA Mainframe | 0-130/260 | 4.0/2.0 | 5.25 | 19 | 13.5 | 38 | Includes sinewave oscillator MOS-01 ² |
| ACP-02AE | 500 VA Mainframe | 0-130/260 | 4.0/2.0 | 5.25 | 19 | 13.5 | 38 | European Version with MOS-01 |
| ACP-03 | 1 kVA Mainframe | 0-130/260 | 8.0/4.0 | 5.25 | 19 | 13.5 | 56 | Includes External Input Module EIM-01 ¹ |
| ACP-03A | 1 kVA Mainframe | 0-130/260 | 8.0/4.0 | 5.25 | 19 | 13.5 | 56 | Includes sinewave oscillator MOS-01 ² |

¹ The EIM-01 external input module is used to safely isolate and input an external drive signal into the ACP-01, -02, or -03 AC power mainframes. The unit can accept input from laboratory oscillators, programmable oscillators, or, when used as a slave unit, from an MOS-01 oscillator. Input is completely isolated with 1500VAC breakdown and excellent common mode rejection. A recessed +/- 8% gain adjustment control is also provided.

² The MOS-01 manual oscillator module is used as a quality, general purpose sinewave oscillator and digital readout monitoring system in the ACP-01, -02, or -03 AC power mainframes. The unit has a guaranteed operating range of 45 Hz to 20 kHz, which is covered in three one-decade scales. The LCD digital metering system is switch-selectable to readout either frequency voltage or current. A toggle switch selects the input for the attached mainframe to originate from the manual oscillator itself or from an external laboratory or programmable oscillator source. With oscillator mode switch to Internal position, the BNC connector delivers the signal to drive additional slave units or for oscilloscope sync or monitoring. BNC input/output is completely isolated with 1500 VAC breakdown and excellent common mode rejection.



FEATURE SUMMARY

- Up to 250 μm displacement
- Broadband operation 0-2500 Hz
- High power
- Highly reliable
- Very low flux leakage
- Low hysteresis
- Will not de-pole
- Stainless steel housing withstands harsh and industrial environments

Magnetostrictive actuators from Etrema Products convert electrical current inputs, ranging from DC to high frequency, into corresponding mechanical outputs. Standard off-the-shelf magnetostrictive actuators provide an efficient way to harness the power of Terfenol-D technology. These actuators respond quickly to input current with repeatable, forceful mechanical motion.

Core Technology

Etrema's Terfenol-D is a "giant" magnetostrictive metal alloy. When placed in a magnetic field aligned with the material's magnetostrictive axis, it expands quickly and forcefully. Proportional, repeatable motion occurs in both positive and negative directions.

Magnetostriction is optimized when Terfenol-D is both mechanically and magnetically biased. Mechanical pre-stress orients magnetic domains normal to the compression axis, maximizing displacement. Magnetic bias from permanent

magnets partially expands a Terfenol-D drive rod into the middle of its linear strain region, minimizing electrical requirements and increasing sensitivity.

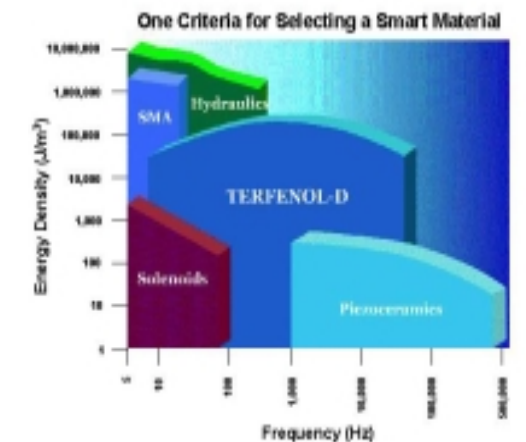
Terfenol-D Makes it Possible

Terfenol-D is extremely energy-dense; even a small piece converts electrical energy (or any changing magnetic field) into mechanical energy with exceptional speed and force. Terfenol-D has no moving parts to wear out and no known failure mechanism, so its theoretical MTBF is infinite.

Those qualities, along with its wide bandwidth, high force and extremely rapid response time, make Terfenol-D based systems uniquely suited to benefit a wide array of high power applications.

Applications

- Metal casting
- Parts cleaning
- Manufacturing processes
- Industrial processing
- Food processing
- Machining





50µ Actuator
Recommended Power Supply:
ACP-01



100µ Actuator
Recommended Power Supply:
ACP-02



150µ Actuator
Recommended Power Supply:
ACP-02



200µ Actuator
Recommended Power Supply:
ACP-03



250µ Actuator
Recommended Power Supply:
ACP-03

50µ

100µ

150µ

200µ

250µ

| FEATURE | DESCRIPTION | |
|-----------------------------------|------------------------|------------------------|
| | 050-LL | 050-LH |
| Frequency Range, Hz | 0-1250 | 0-2500 |
| Maximum Dynamic Force, lb (N) | 250 (1110) | 250 (1110) |
| Maximum Stroke (DC), in (µm) | ±0.001 (± 25) | ±0.001 (± 25) |
| Blocked Force, lb (N) | 500 (2220) | 500 (2220) |
| Temp. Range, °F (°C) | -4 to 212 (-20 to 100) | -4 to 212 (-20 to 100) |
| Max. AC Current, A _{rms} | 5 | 5 |
| DC Resistance, Ω | 1.0 | 1.0 |
| Inductance, mH | 1.8 | 1.8 |
| Weight, lb (kg) | 5.9 (2.7) | 5.9 (2.7) |

| FEATURE | DESCRIPTION | |
|-----------------------------------|------------------------|------------------------|
| | 100-LL | 100-LH |
| Frequency Range, Hz | 0-1250 | 0-2500 |
| Maximum Dynamic Force, lb (N) | 250 (1110) | 250 (1110) |
| Maximum Stroke (DC), in (µm) | ±0.002 (± 50) | ±0.002 (± 50) |
| Blocked Force, lb (N) | 500 (2220) | 500 (2220) |
| Temp. Range, °F (°C) | -4 to 212 (-20 to 100) | -4 to 212 (-20 to 100) |
| Max. AC Current, A _{rms} | 5 | 5 |
| DC Resistance, Ω | 1.9 | 1.9 |
| Inductance, mH | 3.6 | 3.6 |
| Weight, lb (kg) | 8.4 (3.8) | 8.4 (3.8) |

| FEATURE | DESCRIPTION | |
|-----------------------------------|------------------------|------------------------|
| | 150-LL | 150-LH |
| Frequency Range, Hz | 0-1250 | 0-2500 |
| Maximum Dynamic Force, lb (N) | 250 (1110) | 250 (1110) |
| Maximum Stroke (DC), in (µm) | ±0.003 (± 75) | ±0.003 (± 75) |
| Blocked Force, lb (N) | 500 (2220) | 500 (2220) |
| Temp. Range, °F (°C) | -4 to 212 (-20 to 100) | -4 to 212 (-20 to 100) |
| Max. AC Current, A _{rms} | 5 | 5 |
| DC Resistance, Ω | 2.8 | 2.8 |
| Inductance, mH | 5.5 | 5.5 |
| Weight, lb (kg) | 10.6 (4.8) | 10.6 (4.8) |

| FEATURE | DESCRIPTION | |
|-----------------------------------|------------------------|--|
| Frequency Range, Hz | 0-1000 | |
| Maximum Dynamic Force, lb (N) | 250 (1110) | |
| Maximum Stroke (DC), in (µm) | ±0.004 (± 100) | |
| Blocked Force, lb (N) | 500 (2220) | |
| Temp. Range, °F (°C) | -4 to 212 (-20 to 100) | |
| Max. AC Current, A _{rms} | 5 | |
| DC Resistance, Ω | 3.7 | |
| Inductance, mH | 7.3 | |
| Weight, lb (kg) | 13.0 (5.9) | |

| FEATURE | DESCRIPTION | |
|-----------------------------------|------------------------|--|
| Frequency Range, Hz | 0-1000 | |
| Maximum Dynamic Force, lb (N) | 250 (1110) | |
| Maximum Stroke (DC), in (µm) | ±0.005 (± 125) | |
| Blocked Force, lb (N) | 500 (2220) | |
| Temp. Range, °F (°C) | -4 to 212 (-20 to 100) | |
| Max. AC Current, A _{rms} | 5 | |
| DC Resistance, Ω | 4.6 | |
| Inductance, mH | 9.1 | |
| Weight, lb (kg) | 15.5 (7.0) | |

GENERAL INFORMATION

- Actuators are bi-directional (i.e., ± motion about the zero point).
- Each actuator is supplied with a detachable power cable.
- English threads are standard; metric threads available as a special order only.
- Further information can be found at www.etrema-usa.com.
- Contact Customer Service at (515) 296-8030 for all pricing and delivery information.
- Request a quote or place an order via fax at (515) 268-4540.

ORDERING INFORMATION

The order example below shows a sealed model 50 actuator with bottom electrical connection.

Model 050 - **L** **L** **S** **B**

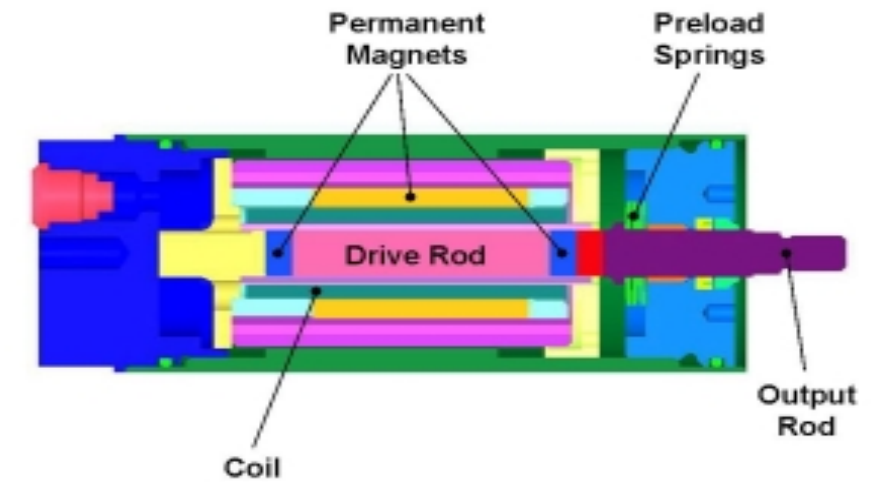
L = low frequency
or
H = high frequency

A = air-cooled
or
S = sealed

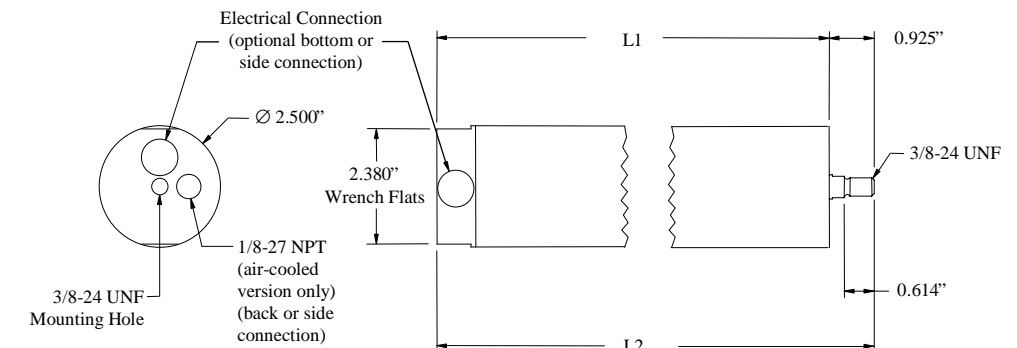
B = bottom connector
or
S = side connector



Etrema Products, Inc.
2500 N. Loop Dr.
Ames, IA 50010
(515) 296-8030
(515) 268-4540 Fax
(800) 327-7291 Toll-Free
www.etrema-usa.com



Actuator Dimensions



MODEL

| | 050 | 100 | 150 | 200 | 250 |
|------------|--------|--------|---------|---------|---------|
| Length, L1 | 6.513" | 9.075" | 11.763" | 14.450" | 17.063" |
| Length, L2 | 7.438" | 10.0" | 12.688" | 15.375" | 17.988" |