



AP7500-5012 (0-20mA in; square wave output)
AP7500-5016 (4-20mA in; square wave output)
AP7500-5065 (0-1Vdc in; square wave output)
AP7500-5068 (0-5Vdc in; square wave output)
AP7500-5070 (0-10Vdc in; square wave output)
AP7500-5085 (1-5Vdc in; square wave output)
AP7501-6007 (0-1mA in; relay contact output)
AP7501-6012 (0-20mA in; relay contact output)
AP7501-6016 (4-20mA in; relay contact output)
AP7501-6065 (0-1Vdc in; relay contact output)
AP7501-6068 (0-5Vdc in; relay contact output)
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AP7501-6085 (1-5Vdc in; relay contact output)

Action PAK®

AP7500 & AP7501

DC to Frequency Converters

Provides a Field Selectable Frequency Output
in Proportion to a DC Input

- Switch Selectable Output Range
- Adjustable Low End Cutout (0-10%)
- Totalization/Integration Applications
- Plug-In Installation
- Square Wave (AP7500) or Relay Contact (AP7501) Output
- Selectable 120/240VAC Input Power

Application

The AP7500 and AP7501 are useful in totalizing applications, where the total number of pulses counted in a given time period represents the time integral of the DC input. If, for example, the input represents a flow in gallons per hour, then the time integral of this flow signal (total count) will represent total gallons. The AP7500's 6V square wave output can be used to drive electronic counters (DTL, TTL, CMOS). The AP7501 can be used to drive electromechanical counters when connected to an external AC or DC power source. In the AP7501, the DPDT relay contacts are pulsed (closed) for only a short duration (100 milliseconds) for compatibility with standard electromechanical counters. The AP7500 can also be used in telemetry systems, where the dc signal is converted to a frequency, transmitted over long lines, and then decoded at the receiving end by means of a frequency to DC converter, such as the AP7380.

Options

- CS** Canadian Standards Association Certification.
- U** Urethane coating of internal circuitry for protection from corrosive atmospheres.
- C** Open collector output instead of the standard 6V output, sinks up to 50mA, up to 30V (AP7500 only).

Output Ranges

The output frequency range is selectable via the 16-position rotary switch accessible through the top cover. See tables 1 and 2 for output selection. Since ranging is accomplished through digital circuitry, the accuracy of the unit is unaffected by the switch position; each successive position exactly halves (clockwise) or doubles (counterclockwise) the previous output frequency (see "Calibration").

Input Ranges

Standard input ranges and limits are included in Tables 3 and 4.

Cutout

The top accessed Cutout adjustment determines the input (level) at which the AP7500 or AP7501 no longer responds (i.e., the unit is effectively "off") and is adjustable from 0-10% of the input span. This feature is especially useful with low frequency spans, where the time between output pulses is excessively long at low input levels. A light-emitting diode (LED) visible through the top-cover aids in adjusting cutout. This LED lights when the unit is no longer responding to the input. With the input at the desired cutout level, adjust Cutout slowly clockwise until the LED lights. Then turn the adjustment counterclockwise until the LED just goes out. Cutout is now set for the input level present.

Calibration

Zero, Span and Low-End Cutout adjustments are screwdriver adjustable, accessible through the top cover.

Zero and Span: Monitor the unit's output using an accurate frequency counter. Apply an input equal to 5% of the specified input span. If the cutout LED (visible through the top cover) is lit, adjust Cutout counterclockwise until it turns off. Adjust Zero for 5% of the desired full scale output frequency. Apply full scale input and adjust Span for the desired maximum output frequency. Repeat these adjustments for best accuracy.

Note: For faster calibration of low frequency spans, use the range selector switch to multiply the output frequency. Each position counterclockwise exactly doubles the output frequency. After calibration, return the selector switch to the proper range position.

Table 1: AP7500 Output Ranges

Switch Position	Minimum Range	Maximum Range
0	0-5kHz	0-10kHz
1	0-2.5kHz	0-5kHz
2	0-1.25kHz	0-2.5kHz
3	0-625Hz	0-1.25kHz
4	0-312Hz	0-625Hz
5	0-156Hz	0-312Hz
6	0-78Hz	0-156Hz
7	0-39Hz	0-78Hz
8	0-20Hz	0-39Hz
9	0-10Hz	0-20Hz
A	0-5Hz	0-10Hz
B	0-2.5Hz	0-5Hz
C	0-1.25Hz	0-2.5Hz
D	0-36ppm	0-1.25Hz
E	0-18ppm	0-36ppm
F	0-9ppm	0-18ppm

Table 2: AP7501 Output Ranges

Switch Position	Minimum Range	Maximum Range
0	0-65ppm	0-130ppm
1	0-32ppm	0-65ppm
2	0-16ppm	0-32ppm
3	0-8ppm	0-16ppm
4	0-4ppm	0-8ppm
5	0-2ppm	0-4ppm
6	0-1ppm	0-2ppm
7	0-0.5ppm	0-1ppm
8	0-0.25ppm	0-0.5ppm
9	0-8pph	0-16pph
A	0-4pph	0-8pph
B	0-2pph	0-4pph
C	0-1pph	0-2pph
D	0-0.5pph	0-1pph
E	0-0.24pph	0-0.5pph
F	0-0.12pph	0-0.24pph

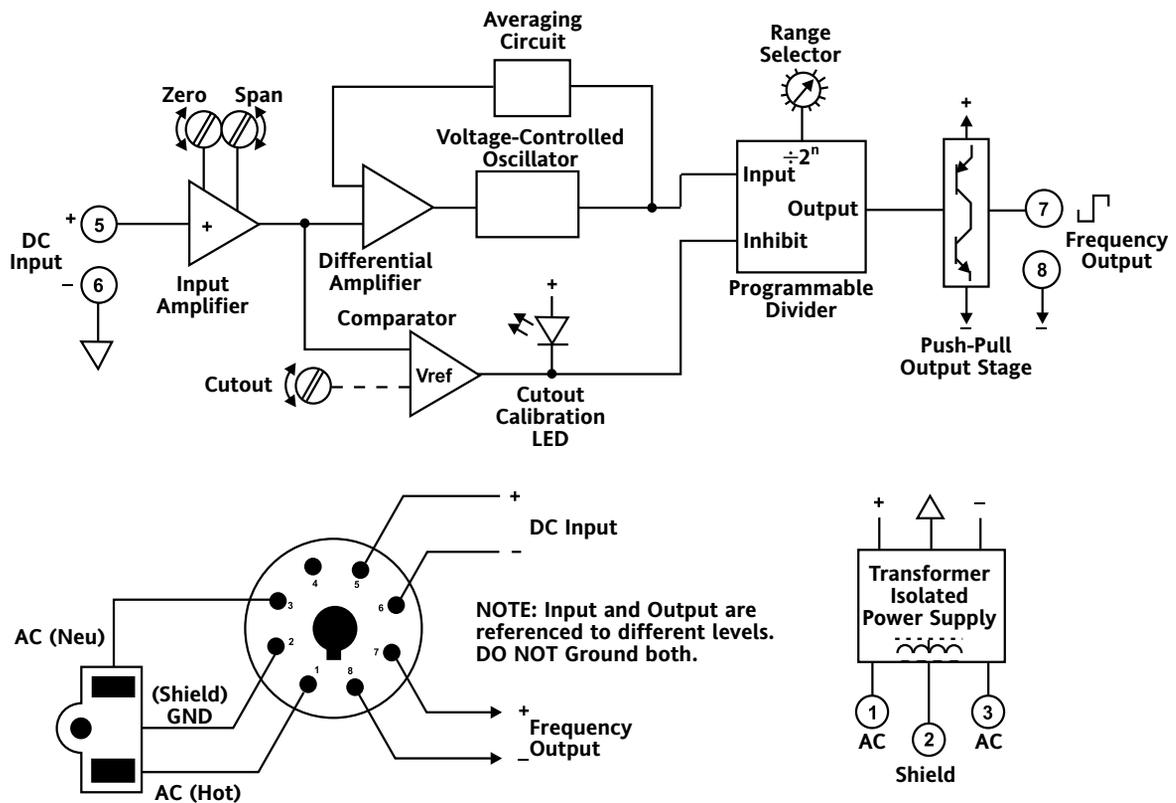
Table 3: AP7500/AP7501 Standard Inputs

0 to 1V	1 to 5V	4 to 20mA
0 to 5V	0 to 10V	10 to 50 mA

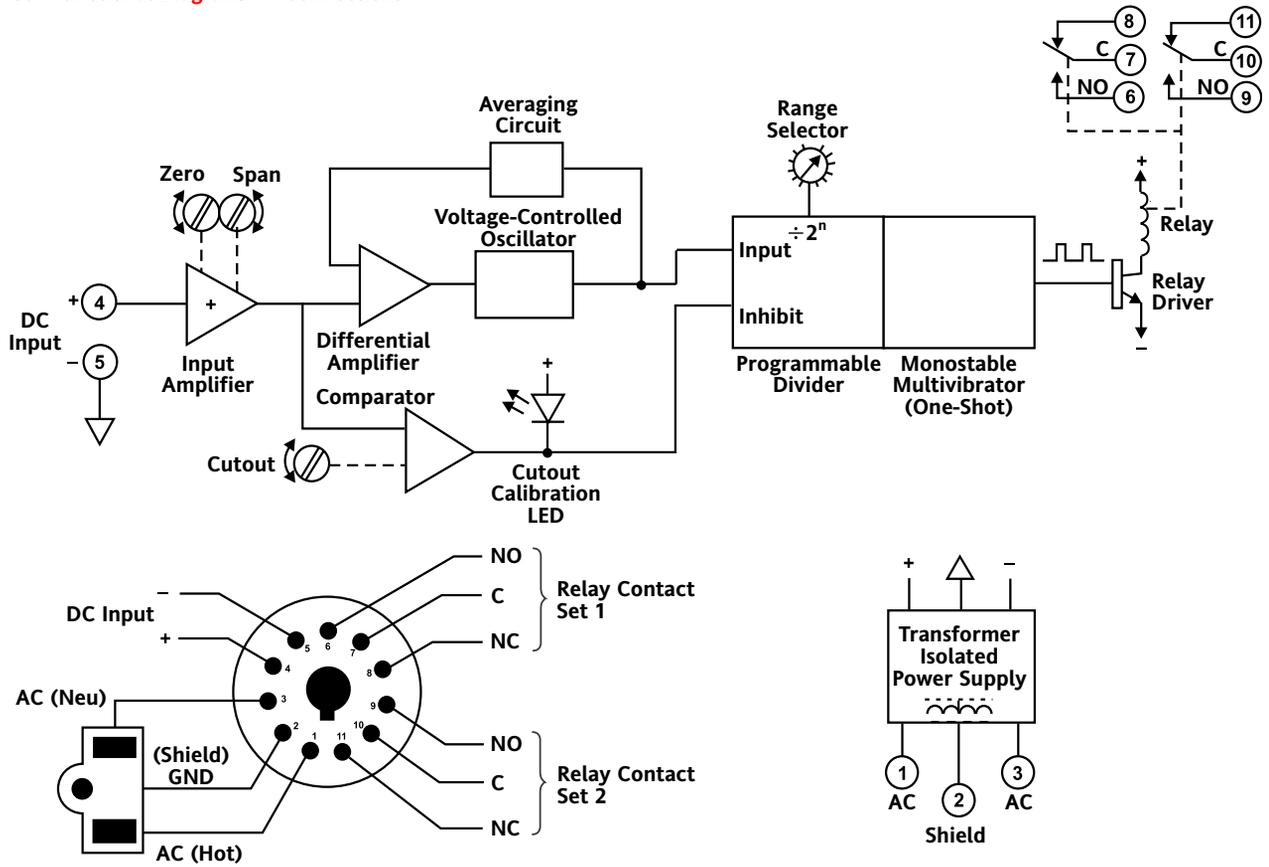
Table 4: AP7500/AP7501 Input Limits

Minimum Span (Voltage)	Minimum Span (Current)	Maximum Input (Voltage)	Maximum Input (Current)
200mV	1mA	200V	100mA

AP7500 Functional Diagram/Pin Connections



AP7501 Functional Diagram/Pin Connections

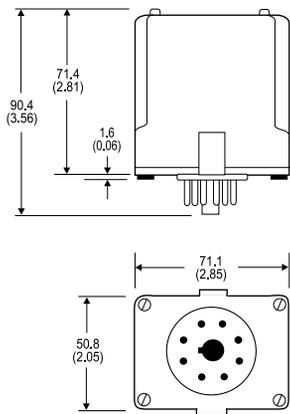


Mounting

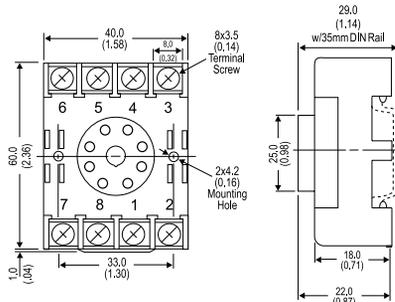
All Action Paks feature plug-in installation. The Action Pak AP7500 uses an 8-pin base and AP7501 uses an 11-pin base and either molded socket M008/M011, or DIN-Rail MD08/MD11 mounting sockets.

Dimensions

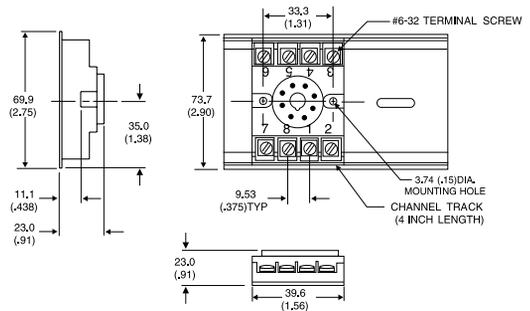
Dimensions are in millimeters (inches)



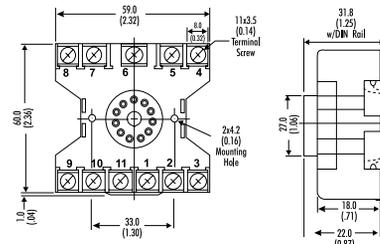
Mark II



MD08 (DIN/Surface)



M008 (8 pin) shown, and M011 (11 pin) (Track/Surface)



MD11 (DIN-Rail)

Specifications

Input Impedance:

Voltage Input: Greater than 100KW

Current Input: Less than 500mV shunt @ full scale (e.g. 20W for 20mA)

Input Protection: Withstands 200% of span

Linearity (Best Straight Line & Linear Input):

0.25% of span, typical

Low Input Cutout:

Adjustable, 0-10% of span (factory set at 1%), LED cutout indication

Output:

AP7500: Square-wave, 0/6V, 1:1 mark/space ratio, source 10mA, sink 50mA. Option C 50mA sink, 30V.

AP7501: Isolated DPDT relay contacts, rated 120VAC @5A or 28VDC @ 5A (100mSec min. on time).

Contact Material: Silver Cadmium Oxide

Life: 10⁵ operations at rated load

Response Time:

100 milliseconds typical, 200 milliseconds max

Overrange Capability:

Output is linear to 120% of input

Stability:

Better than 0.05% of span per degree C

Common Mode Rejection:

DC: > 100dB

60 Hz: > 80dB

Maximum Common Mode Voltage:

50V

Temperature Range:

Operating: 0 to 60°C (32 to 140°F)

Storage: -20 to 85°C (-4 to 185°F)

Power:

Consumption: 3W typical, 5W max

Standard: 120 VAC (±10%, 50-400Hz)

Available: 240VAC (±10%, 50-400Hz)

Weight:

0.62lbs

Agency Approvals:

CSA certified per standard C22.2, No. 0-M1982

(File No. LR42272-8, 9)

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Ordering Information

Specify:

1. Model: **AP7500** or **AP7501** (see above)
2. Options: CS, U, C (see text)
3. Input Range (see Tables 3, 4)
4. Line Power (see specs)
5. C620 Factory Calibration of input, setpoints and output relays.

Accessories:

M801-0000 Retaining Spring
M008-A 8 pin Track Mount Socket
M011-A 11 pin Track Mount Socket
M004-0000 4 ft Long Channel Track
MD08-0000 8 pin DIN Mount Socket
MD11-0000 11 pin DIN Mount Socket

Pin Connections

AP7500

- 1 AC Power (Hot)
- 2 Shield (Gnd)
- 3 AC Power (Neu)
- 4 No Connection
- 5 Input (+)
- 6 Input (-)
- 7 Output (+)
- 8 Output (-)

AP7501

- 1 AC Power (Hot)
- 2 Shield (Gnd)
- 3 AC Power (Neu)
- 4 Input (+)
- 5 Input (-)
- 6 N.O. } Set 1
- 7 C } Set 1
- 8 N.C. }
- 9 N.O. } Set 2
- 10 C } Set 2
- 11 N.C. }

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