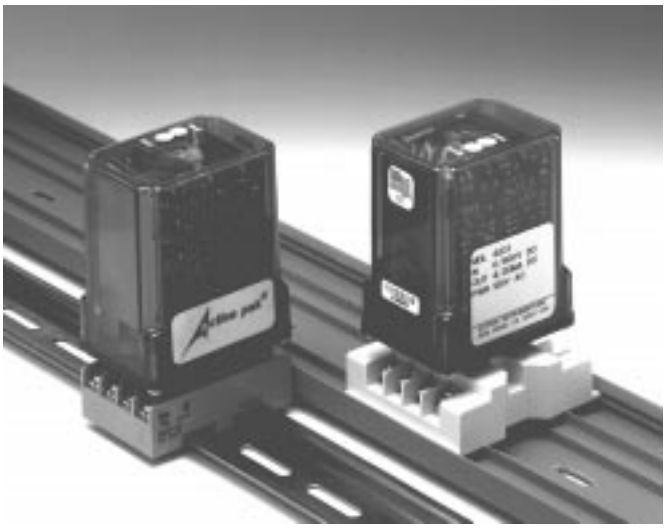
Action Pak®

RTD Input, Signal Conditioners

Models AP4001, AP4151



Provides a DC Output in Proportion to an RTD Input

- **Direct RTD Input**
- **Integral Lead-Length Compensation**
- **Temperature Control/Monitoring Applications**
- **Easy Plug-in Installation/Low Mean-Time-to-Repair**
- **AC Line Powered (DC Optional)**
- **Three Year Warranty**

APPLICATIONS

Action Pak models AP4001 and AP4151 are useful in any application requiring a DC output from an RTD input. Typical applications include energy management and data acquisition of process temperatures. The output of a 4000 series RTD signal conditioner can drive a digital meter for direct display, or interface with a computer for monitoring and control.

DESCRIPTION

The two models of RTD input signal conditioners provide the following input to output relationship

AP4001 Linear to resistance
AP4151 Linear to temperature

OPERATION

The constant current RTD excitation uses the third lead of the RTD to sense and compensate for the RTD lead resistance, resulting in an accurate RTD temperature measurement. The RTD voltage is then amplified and buffered by an output stage which allows adjustment of zero and span. The AP4151 uses feedback linearization, changing the RTD excitation current to correct the temperature/resistance non-linearity. In units having a current output (e.g. 4-20mA), the output is a current source controlled by the output buffer. With voltage output units (e.g. 0-10V), the output is taken directly from the buffer. An internal transformer isolates the process from line power and ground.

OPTIONS

CS Canadian Standards Association Certification.
U Urethane coating of internal circuitry for protection from corrosive atmospheres

CALIBRATION

Top accessed screwdriver adjustments provide typical ±10% zero and span adjustability. Calibration is referred to input in that adjustments are to correct for input/sensor variations.

For models AP4001 and AP4151, zero is adjusted for the specified minimum output with the RTD input at the desired minimum temperature. Span is adjusted for the specified maximum output, with the RTD input at the desired maximum temperature. Repeat adjustments for best accuracy.

FACTORY ASSISTANCE:

For additional information on calibration, operation and installation please contact Action's Technical Services Group. Call toll-free:

800-767-5726

INPUT/OUTPUT RANGES

Tables 1 and 2 lists all the available standard inputs and outputs. For better resolution, non-standard ranges are also available within the limits shown in Table 3 and 4.

*Table 1: AP4001/AP4151 Standard Inputs**

0 to 200°F	0 to 100°C
0 to 300°F	0 to 150°C
0 to 400°F	0 to 200°C
0 to 500°F	0 to 250°C
0 to1000°F	0 to 500°C

*100Ω Pt RTD, 0.00385 Ω/Ω/°C [DIN Standard]

Table 2: AP4001/AP4151 Standard Outputs

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

Table 3: AP4001/AP4151 Output Limits

Minimum Span		Maximum Span	
Voltage 100mV	Current 1mA	Voltage 10V	Current 50mA

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SPECIFICATIONS

RTD Excitation Current
1 to 10mA, depending on RTD type

Leadwire Resistance (Maximum Ohms/Lead)
100Ω RTD: 40
120Ω RTD: 40
500Ω RTD: 100
10Ω RTD: 30

Leadwire Effect
Less than 1% of span error

AP4001 Linearity (Best Straight Line and Linear Input)
±0.1% of span typical (referred to resistance input)

AP4151 Accuracy
±0.1% of span typical (referred to temperature input)

Output Impedance
Voltage Output: Less than 10Ω
Current Output: >100KΩ

Output Drive
Voltage Output:
10mA, max (1KΩ, min.)
Current Output:
15V compliance @ 20mA (750Ω, max.)

Table 4: AP4001/AP4151 Input Limits

RTD	Useable Range	Minimum Span
100ΩPt	-328 to 1600°F (-200 to 870°C)	50°F(30°C)
200ΩPt	-328 to 1600°F (-200 to 870°C)	40°F(20°C)
500ΩPt	-328 to 1600°F (-200 to 870°C)	20°F(10°C)
100ΩNi	-148 to 590°F (-100 to 310°C)	40°F(20°C)
120ΩNi	-112 to 608°F (-80 to 320°C)	40°F(20°C)
10ΩCu	-328 to 500°F (-200 to 260°C)	180°F(100°C)

Stability
±0.05% of span/°C typical

Response Time
100 mSec typical

Output Ripple
0.2% of max. span or 5mV rms, whichever is greater
24VDC power: 0.5% of max. span or 10mVrms, whichever is greater

Common Mode Rejection
60 Hz: > 120dB
DC: > 100dB

Common Mode Voltage
500V DC or peak AC, max.

Temperature Range
Operating: 0 to 60°C (32 to 140°F)
Storage:-20 to 85°C (-4 to 185°F)

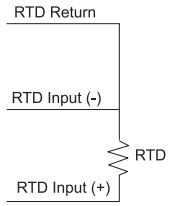
Power
Consumption: 3W typical, 5W max.
Standard: 120VAC (±10%, 50 to 400Hz)
Available: 240VAC, (±10%, 50 to 400Hz)
Optional: 24VDC, ±8V, inverter-isolated, (Mark II Case)

Weight
AP4001 0.54lbs
AP4151 0.52lbs

PIN CONNECTIONS

AP4001 & 4151

1 AC Power (Hot)
2 Shield (Gnd.)
3 AC Power (Neu.)
4 RTD Return
5 RTD Input (-)
6 RTD Input (+)
7 Output (+)
8 Output (-)



MOUNTING

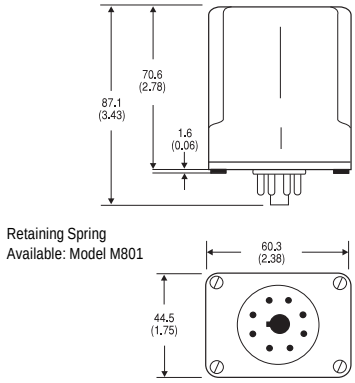
All Action Paks feature plug-in installation. Models AP4001 and AP4151 use 8-pin bases and either molded socket M008 or DIN socket MD08.

ORDERING INFORMATION

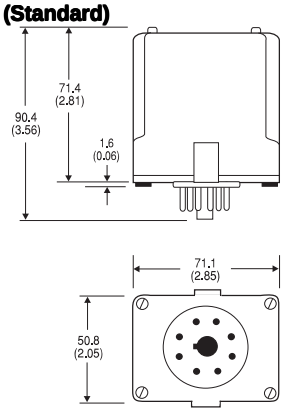
Specify:
1. Model(s): AP4001, AP4151
2. Input Range (see Tables 1, 4)
3. Output Range (see Tables 2, 3)
4. Options: CS, U (see text)
5. Line Power (see specifications)
(All power supplies are transformer-isolated from the internal circuitry.)

DIMENSIONS

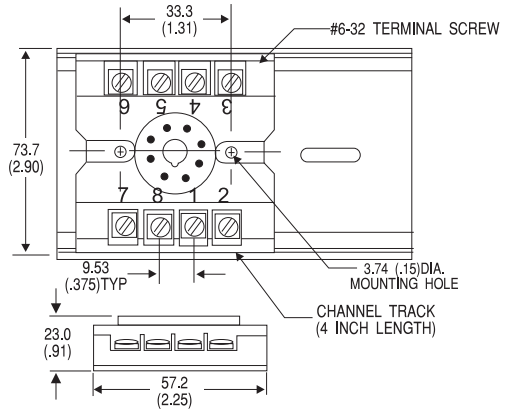
Dimensions are in Millimeters (Inches)



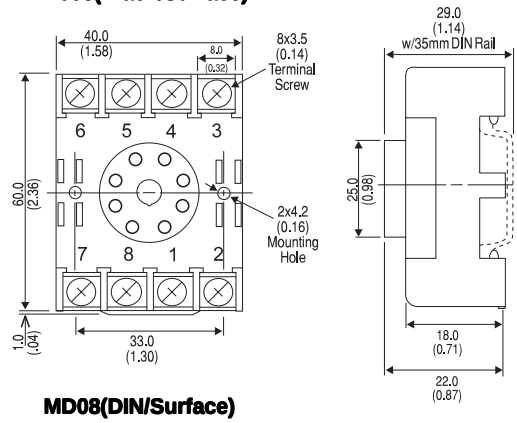
Mark I (Standard)



Mark II (24VDC)



M008(Track/Surface)



MD08(DIN/Surface)

All Prices and Specifications subject to change without notice