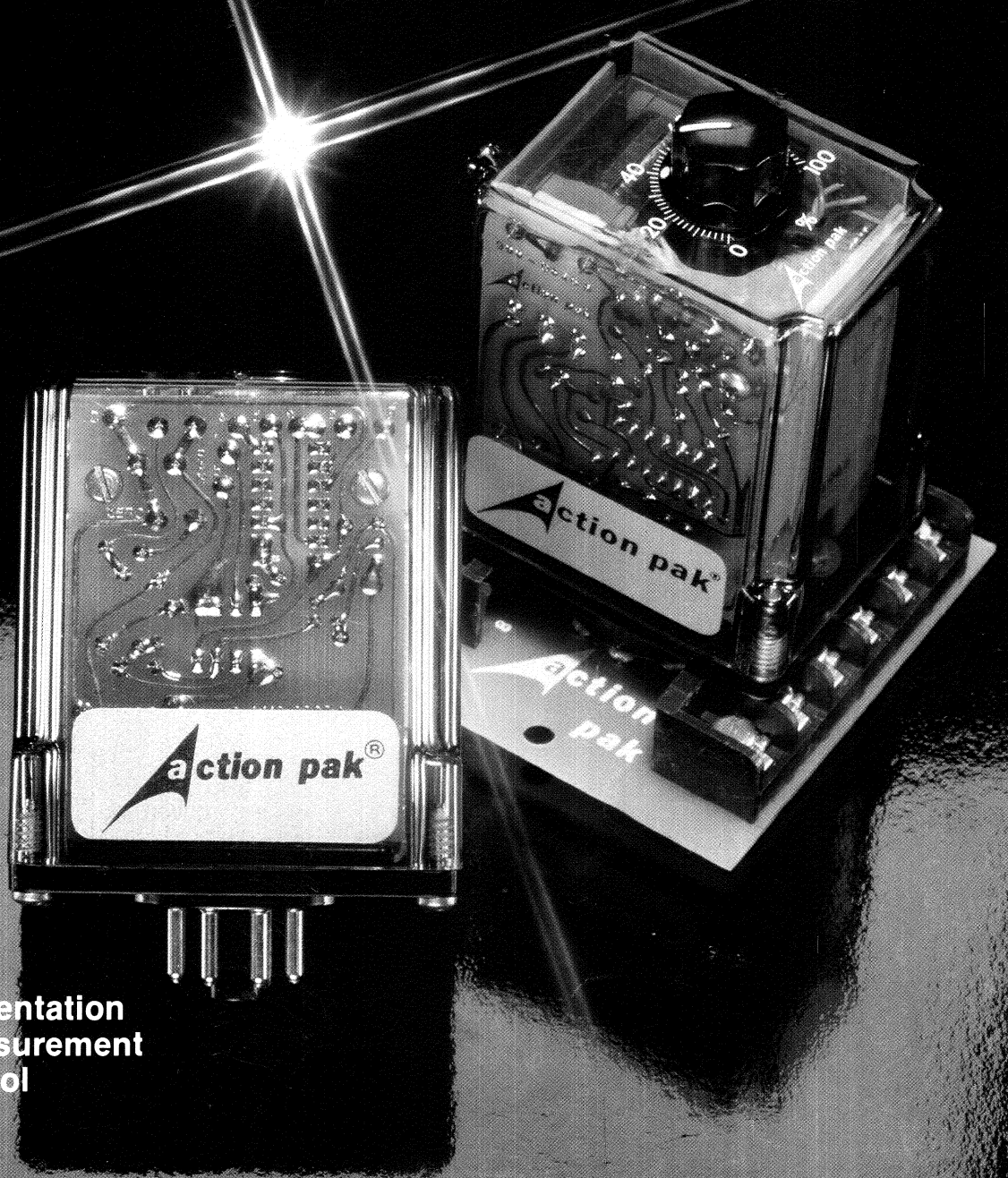


ACTION PAK



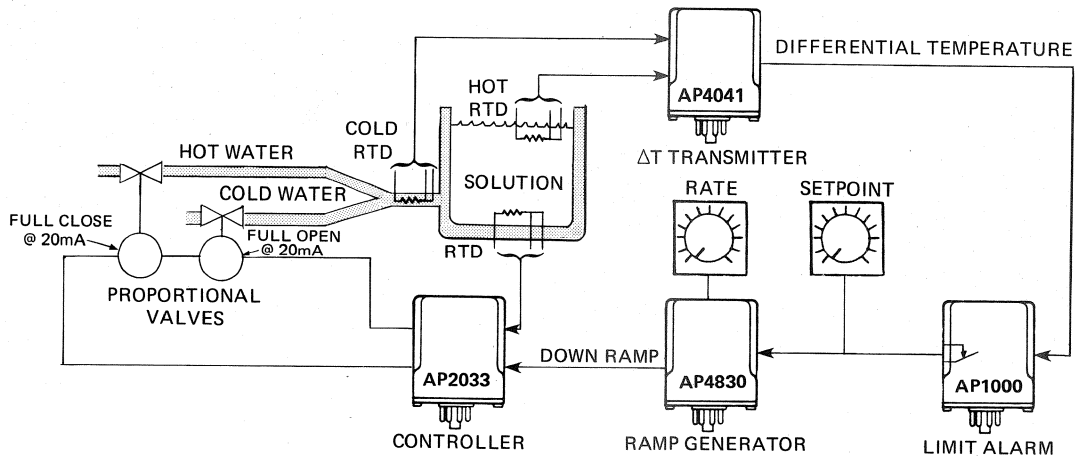
Plug-In Instrumentation
For Process Measurement
and Control



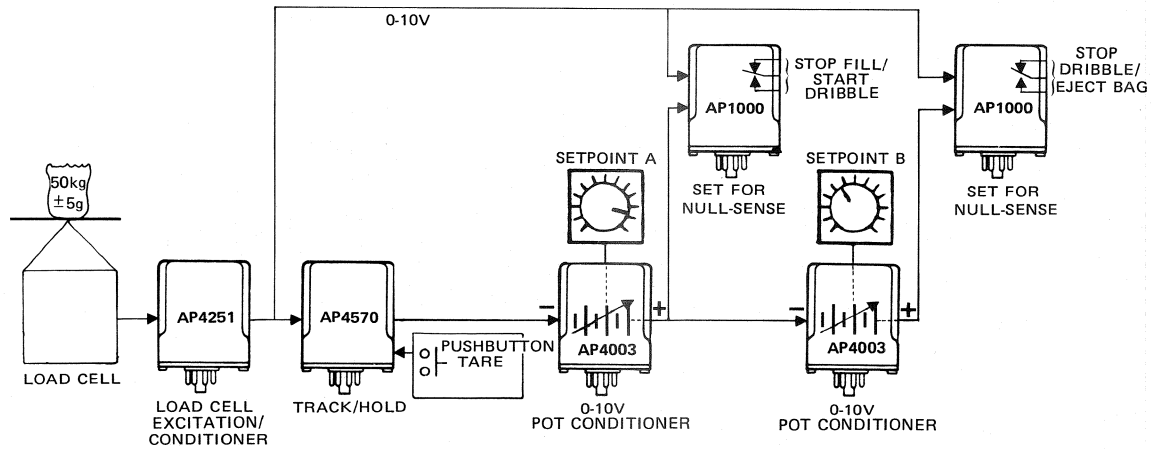
ACTION INSTRUMENTS

TYPICAL APPLICATIONS

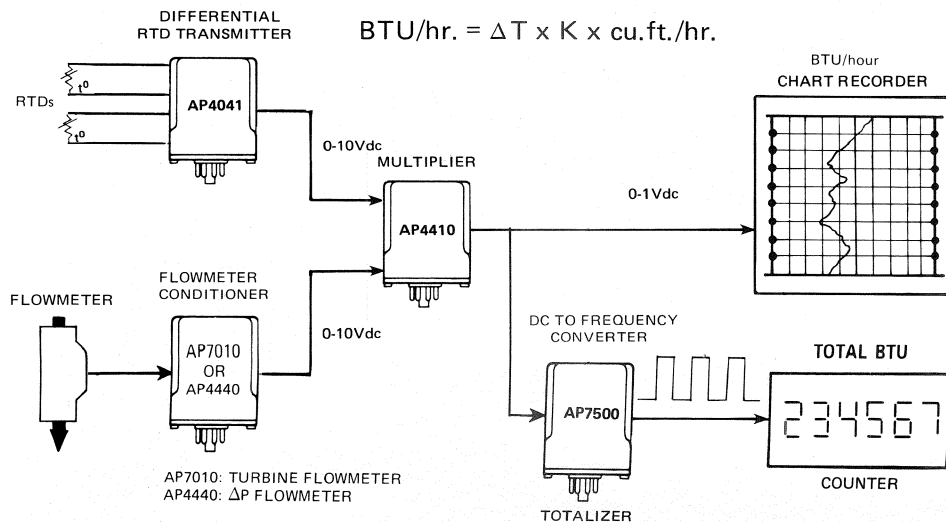
DOWN RAMP CONTROLLED BY DIFFERENTIAL TEMPERATURE FOR PRECISE-RATE LIQUID COOLING



PACKING SCALE CONTROL FOR FILLING BAGS WITH POWDERED MATERIAL



MEASURING BTU TRANSFER RATE FOR EFFICIENT ENERGY USAGE



action pak®

Action Pak is the world-renowned line of reliable, plug-in process instrumentation offering ease of installation, unequalled versatility, and a building-block approach to system design, all at surprisingly low cost.

Action Paks are protecting cranes from overloads in England, running packaging machines in Japan, making perfume in France, refining oil in Mexico, mining ore in South Africa, refining sugar in Australia, processing paper and pulp in Canada, controlling energy consumption in the United States, and doing thousands of other similar and diverse processes on every continent every day.

The broad Action Pak line covers nearly every process-industry instrumentation need. If, however, you are not able to find the Action Pak to suit your requirements, Action also offers Special Action Paks custom-designed to your specifications. Consult the factory for more information.

All Action Paks carry a **three-year warranty**; replacement, if ever needed, is as easy as it looks. Each Action Pak is self-contained, operating directly from 120Vac line power; 24Vdc, 12Vdc, 100Vac, 220Vac, and 240Vac power options are available. Most models feature user-accessible zero and span adjustments for fine in-field calibration.

GENERAL SPECIFICATIONS

CASE MATERIAL

High-impact Lexan® polycarbonate.

BASE MATERIAL

Black phenolic plastic.

POWER

3 Watts typical, 5 Watts maximum.

PIN MATERIAL

Nickel-plated brass.

OPERATING TEMPERATURE RANGE (Ambient)

0-60°C (32-140°F); Standard Industrial Environment.

WEIGHT

200 to 450 grams, 280 grams (10 ounces) average.


ACTION PAK APPLICATIONS

Action Pak modules are used in all major industries, in a variety of measurement and control applications. Action Pak customers and applications include:

Dow Chemical, Louisiana and Texas	Petrochemical processing.
E.I. DuPont, Delaware	Hot-roll laminator temperature controls.
General Motors	} Michigan Test installations.
Ford Motors	
Stohtert & Pitt, United Kingdom	Dock-crane overload alarm.
China Light and Power, Hong Kong	Voltage and current limit alarms.
Frito-Lay, Texas	Food processing temperature measurement.
Georgia Pacific, Oregon	Paper and pulp processing.
Hardy Scales, California	Weighing and batching equipment.
Johnson Controls	} Energy management systems, signal-transmission instrumentation.
Honeywell	
Air New Zealand	Maintenance test installations.
Exxon	} Worldwide . . . Petrochemical processing and pipeline instrumentation.
Chevron	
Mobil	
Nakashima, Japan	Packing scale controls.
Celanese Fibers, North Carolina	Temperature measurement and control.
Bay Shipbuilding, Wisconsin	Ship-board pressure monitoring.
Noranda Aluminum	} Mining, measurement and signal transmission.
Stone & Webster	
Bechtel	} Worldwide . . . Engineering and construction, process plant installations.
Braun	
Fluor	
Parsons	

ACTION PAK SELECTION GUIDE





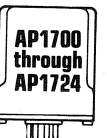
SELECT:



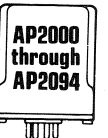
Function	Input
	
Page(s)	




RELATED PRODUCTS







In addition to Action Pak, Action Instruments also offers:

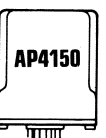
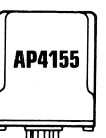
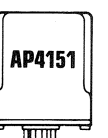
- Visipak —A complete line of direct process sensor input digital indicators, including a microprocessor-based process monitor.
- Unipak —Rack-mounted transmitting limit alarms and isolating transmitters. Ten cards per rack, with plug-on range changing modules.
- Transpak—The most complete line of industrial field-mountable two-wire transmitters. Rugged, with rfi and emi shielding.




	Thermocouple	DC	RTD	AC	Frequency
Limit Alarms					
Pages 4, 5					




	Thermocouple	DC	RTD
Proportional Controllers			
Pages 6, 7			







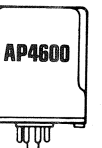
	Valve/Positioner	SCR/Triac	Solenoid/Contactor
Drivers			
Page 8			







	Thermocouple	DC	RTD	AC	Frequency	Potentiometer
General-Purpose Transmitters						
Pages 9, 15						




	Thermocouple	DC	RTD
Linearizing Transmitters			
Page 9			




	Thermocouple	DC	Loop-Powered
Isolating Transmitters			
Pages 9, 13			


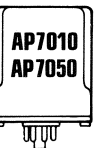


	Strain-Gauge	LVDT	VRT
Transmitters with Excitation Pages 9, 15			




	Thermocouple	DC	RTD	Frequency	Strain-Gauge	Potentiometer	Loop-Powered
Two-Wire Transmitters Page 13							

	Summing	Difference	Multiplication	Division	Power Term	Root Extractor
Math Functions Page 10						

	Lo/Hi Select	Track/Peak Hold	Ratio/Bias
Process Functions Pages 11, 12			

	Ramp Buffer	Up Ramp	Up/Down Ramp
Ramp Functions Pages 12, 14			

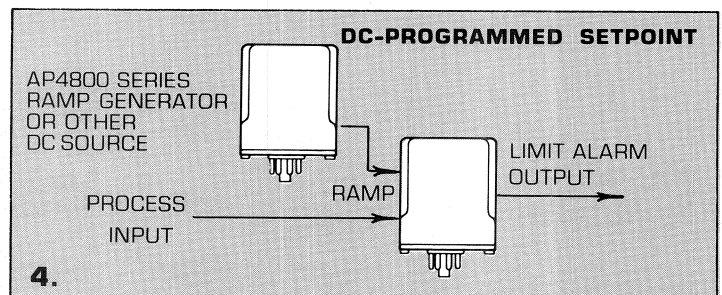
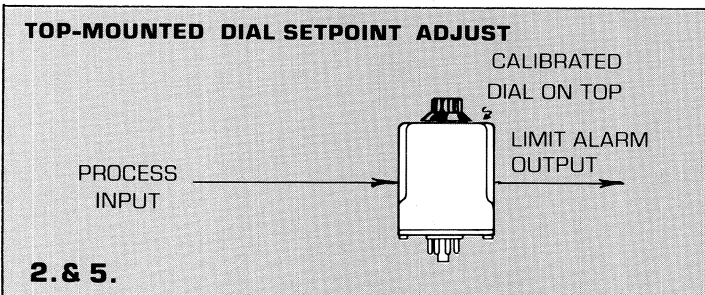
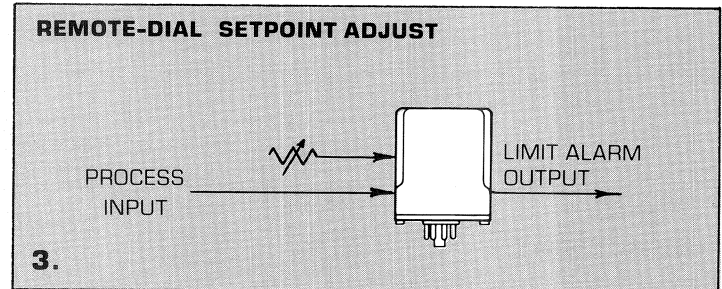
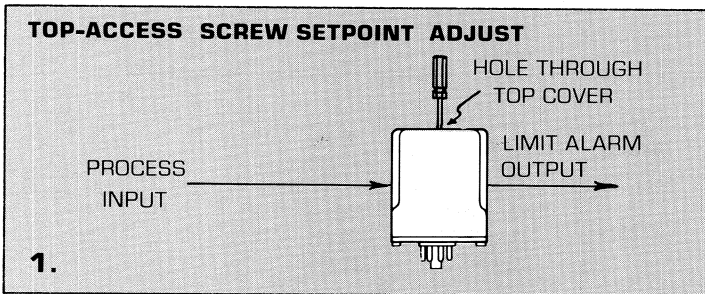
	DC to Frequency	Frequency to Voltage	Frequency Scalers	Pulse Accumulator
Frequency Page 15				

	General-Purpose	Two-Wire Transmitter	Inverter
Power Supplies Page 16			

LIMIT ALARM RELAYS

Action Pak Limit Alarm Relays accept the most popular process sensor inputs—thermocouple, RTD, and magnetic pickup (frequency)—as well as ac and dc voltage or current inputs. Their internal relay trips when the input exceeds the preset setpoint reference. Dual relay configurations allow response to two different setpoints. To prevent false trips, the internal circuitry “screens” input signal changes; the input must remain beyond the setpoint for approximately 80 milliseconds to qualify as a valid trip signal before the relay contacts will transfer. Zero and span are user-adjustable on most models. Five setpoint styles are available:

1. A single-turn screwdriver adjustment, accessible through the top cover, for “set-and-forget” operation.
2. A single-turn top-mounted dial adjustment for use where the setpoint is adjusted frequently.
3. Connections for a remote potentiometer (1k, yours or ours) for panel installation.
4. A dc voltage (0-1V) programmed setpoint for automatic setpoint control.
5. A top-mounted multi-turn precision “sweep second hand” setpoint dial for most precise setpoint adjustment.



OPTIONS

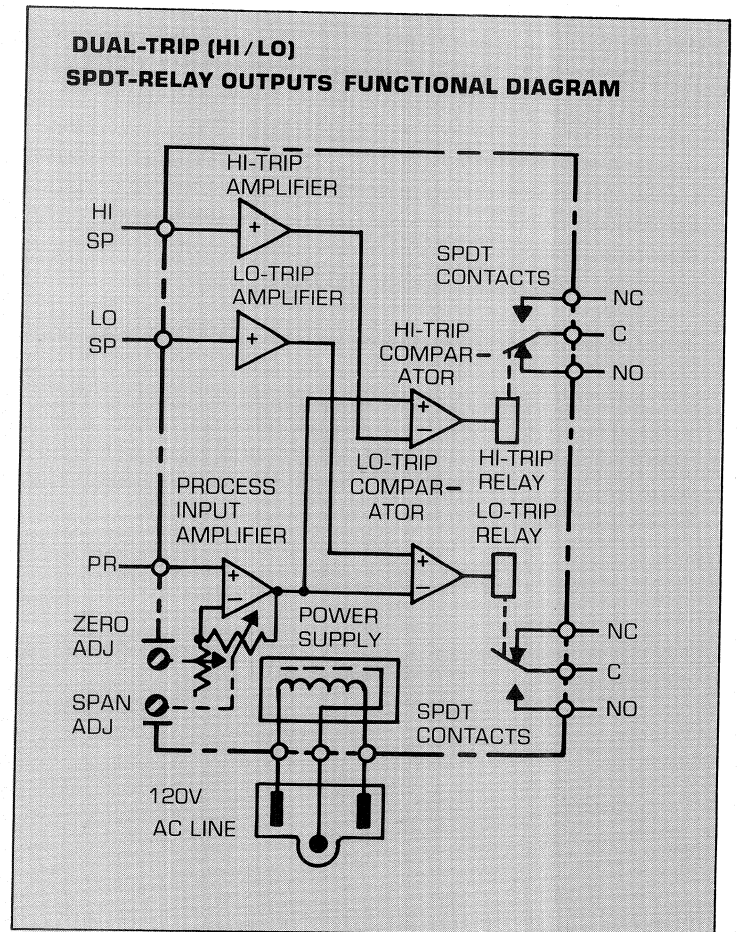
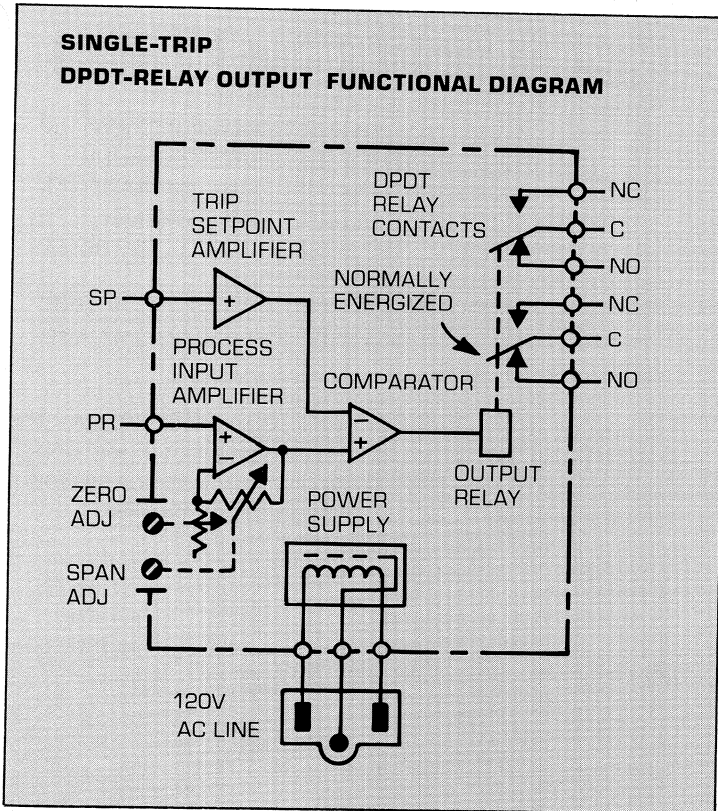
For unequalled versatility, Action Pak Limit Alarms are available with any or all of the following options:

ADJUSTABLE DEADBAND
DOWNSCALE BURNOUT
RELAY STATUS INDICATOR
MULTI-TURN SETPOINT
NON-STANDARD INPUT
REVERSE RELAY SENSE
TRANSMITTER OUTPUTS
CONFORMAL COATING

RELAY DRIVE OUTPUT(S)
LOW-LIMIT FUNCTION

- Option A:** Adjustable 1-100% of span, top-accessed (single-trip only).
Option B: For thermocouple inputs. (Standard is upscale burnout.)
Option L: Top-mounted LED is lit when alarm is in tripped condition.
Option M: Top-accessed. (Standard is single-turn.)
Option N: If requested range is not on Standards List.
Option R: Relay energizes when process exceeds setpoint.
Option T: 0-1Vdc outputs corresponding to input and setpoint(s).
Option U: For moisture-proof circuit boards, Option U provides a reliable urethane coating.
Option V: 0/24V output level instead of relay contacts.
Option X: “Tripped” condition occurs when input falls below setpoint.

AP1000 Series



SELECTION GUIDE

	AP	1			
INPUT DC (Voltage or Current) Thermocouple RTD (3-Wire, Compensated) AC (Voltage or Current) Frequency			0 2 4 6 7		
OUTPUT Single DPDT (5A @ 120Vac or 28Vdc) Dual SPDT (5A @ 120Vac or 28Vdc) Single DPDT, Latching				0 2 1	
SETPOINT STYLE Single-Turn Screwdriver Adjustment Top-Mounted Single-Turn Dial Adjustment Remote Potentiometer Connections DC Programmed Top-Mounted Multi-Turn Precision Dial					0 1 2 3 4

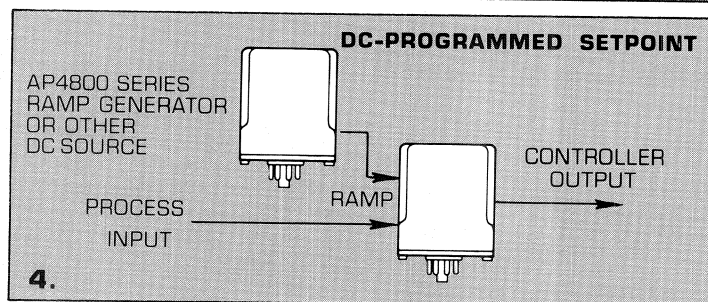
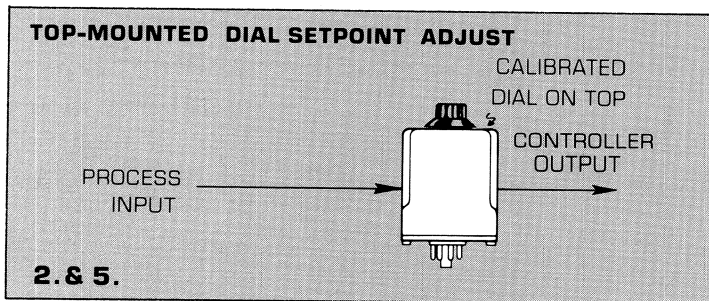
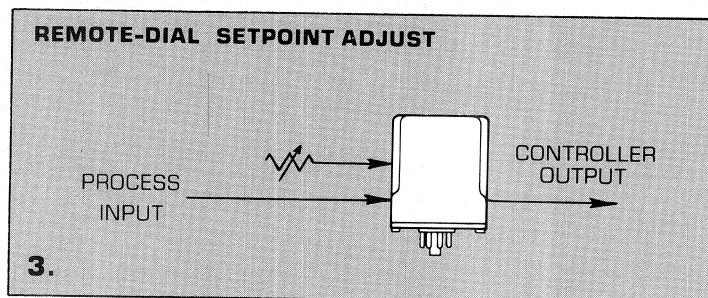
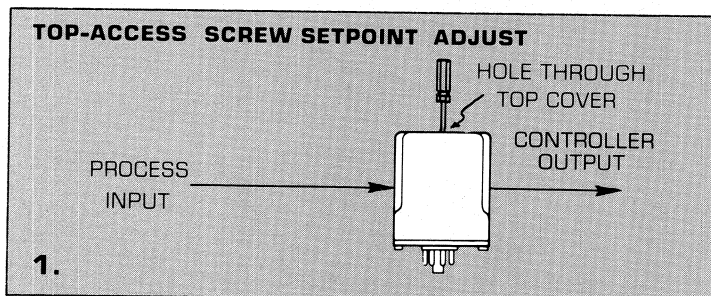
PROCESS CONTROLLERS

Action Pak Process Controllers accept the two most popular temperature sensor inputs—thermocouple and RTD—as well as dc voltage or current inputs. They provide single-mode (P), two-mode (PI), and three-mode (PID) process control dc outputs. Zero-phase thyristor or SCR firing outputs, as well as time proportioning dc outputs, are also available with single- and two-mode operation, and phase-angle thyristor firing is available with single-mode operation.

The controllers provide the output necessary to control a process relative to a setpoint reference; the output increases as the input begins to fall below the setpoint. The setpoint is adjustable over the entire input span of the controller. Zero and span are user-adjustable, accessible through the top cover. Five setpoint styles are available:

1. A single-turn screwdriver adjustment, accessible through the top cover, for "set-and-forget" operation.
2. A single-turn top-mounted dial adjustment for use where the setpoint is adjusted frequently.
3. Connections for a remote potentiometer (1k ohm, yours or ours) for panel installation.
4. A dc-voltage (0-1V) programmed setpoint for automatic setpoint control.
5. A top-mounted ten-turn precision "sweep second hand" setpoint dial for most precise setpoint adjustment.

For other than thermocouple and RTD inputs, the Action Pak AP4000 and AP7000 series of signal conditioners can match practically any process sensor input for use with an Action Pak dc-input controller.



OPTIONS

For added versatility, the Action Pak Controllers are available with any or all of the following options:

DOWNSCALE BURNOUT

Option B: Standard thermocouple input controllers have upscale burnout protection. Option B substitutes downscale burnout protection, useful in cooling control applications.

REVERSE SENSE OPERATION

Option R: Provides an increasing output for an increasing input, useful in cooling control applications.

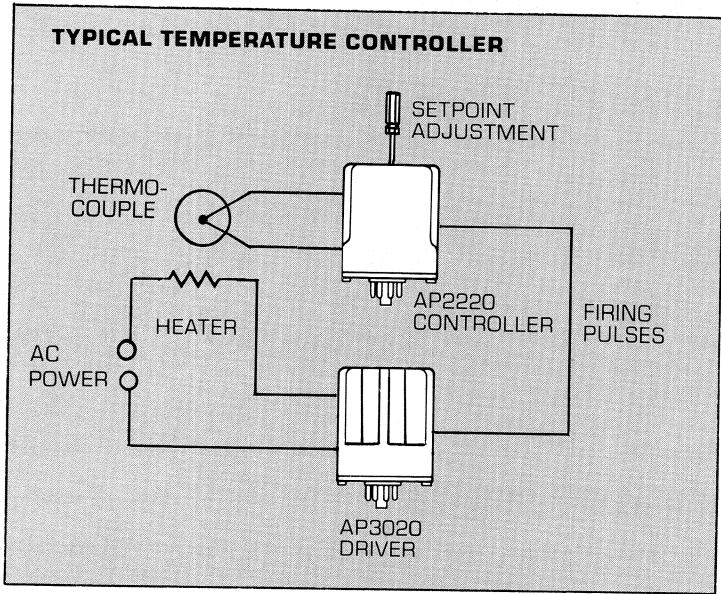
TRANSMITTER OUTPUTS

Option T: Provides a 0-1Vdc analog output signal for both the setpoint and the process input for monitoring, display, or recording needs. All controllers with Option T use a 20-pin base configuration.

CONFORMAL COATING

Option U: For moisture-proof circuit boards, Option U provides a reliable urethane coating.

AP2000 Series



SPECIFICATIONS

PROPORTIONAL BAND (1-, 2-, and 3-Mode Control)

1-50% of span, adjustable.*

RESET ACTION (2- and 3-Mode Control)

1-100 resets per minute, adjustable.

RESET DUMP (2-Mode Control)

Automatic (external contact closure override).

RATE ACTION (3-Mode Control)

0.1-1 minute per repeat.

RATE BYPASS (3-Mode Control)

External contact closure.

TIME-PROPORTIONING DUTY CYCLE

200 milliseconds to 20 seconds at 50% output, adjustable.

*Other ranges available; consult factory or representative.

SELECTION GUIDE

	AP	2			
INPUT					
RTD (3-Wire, Lead-Length Compensation)			0		
Thermocouple (Integral CJC)			2		
DC			1		
OUTPUT					
Single-Mode, DC				0	
Single-Mode, Phase-Angle Thyristor Firing				1	
Single-Mode, Zero-Phase Thyristor Firing				2	
Two-Mode, DC				3	
Two-Mode, Zero-Phase Thyristor Firing				5	
Three-Mode, DC (DC Input Only)				6	
Single-Mode, Time-Proportioning DC				8	
Two-Mode, Time-Proportioning DC				9	
SETPOINT STYLE					
Single-Turn Screwdriver Adjustment					0
Top-Mounted Single-Turn Dial					1
Remote Potentiometer (1k ohm)					2
DC Programmable					3
Multi-Turn Top-Mounted Precision Dial					4

PROCESS DRIVERS — AP3000 Series

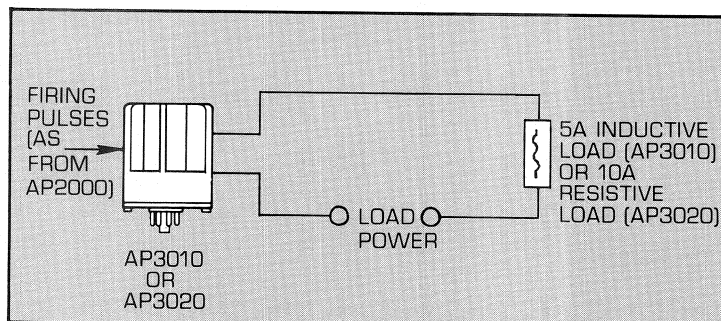
Action Pak Process Drivers provide the interface between the control signal (as from Action Pak Controllers) and the final control elements in process control loops. These drivers include thyristors (triacs and

SCRs) for control of ac and dc power, and optically isolated line power switching for solenoids and contactors, and relay contacts for position proportioning of motorized valves.

INDUCTIVE AND RESISTIVE LOAD DRIVERS

The AP3010 is a dual SCR bridge network to control the delivery of up to 5 amps of ac line power to inductive loads, such as power transformers and variable speed dc motors. The cast-aluminum case of the AP3010 is designed for efficient heat dissipation even at full load.

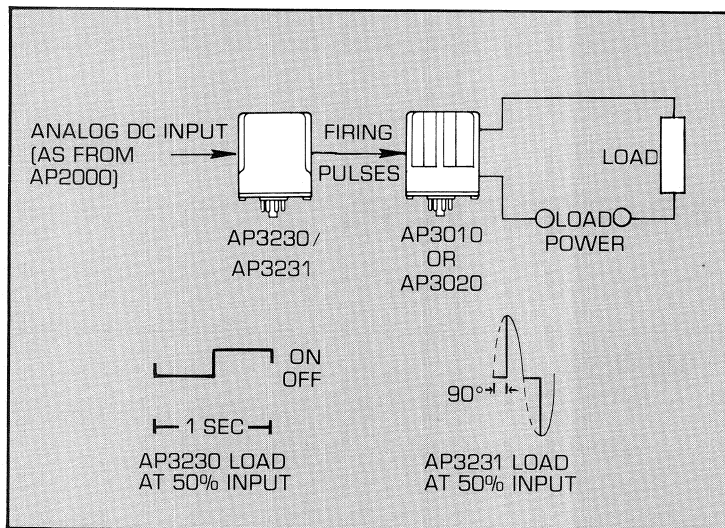
The AP3020 uses a triac in the same aluminum heat sink case as the AP3010 for driving dc or ac resistive loads of up to 10 amps, such as heating elements.



DC TO THYRISTOR FIRING CONVERTERS

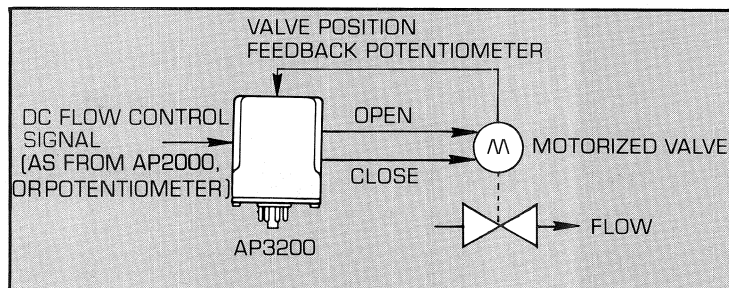
The AP3230 converts an analog dc signal to time-proportioned zero-phase thyristor firing pulses for driving an AP3010 or AP3020, or any other thyristor. The AP3230 controls the power to the load by varying the duty-cycle; when the AP3230 input is at 50%, the load is alternately switched on and off every 500 milliseconds.

The AP3231 converts an analog dc signal to phase-angle firing pulses for 0-100% power control. When the AP3231 input is at 50%, only one-half of the sine wave power is applied to the load. Both the AP3230 and the AP3231 provide dual synchronized-pulse outputs for firing either a single triac (AP3020) or a pair of SCRs (AP3010).



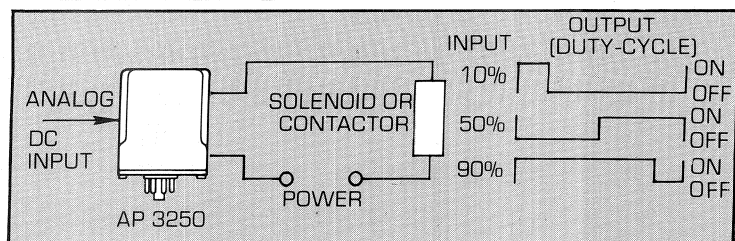
VALVE POSITIONING DRIVERS

The AP3200 accepts a feedback potentiometer or slidewire input and provides a set of SPDT center-off relay contacts to control the position of a motorized valve at any point within its range of travel.



SOLENOID AND CONTACTOR DRIVERS

The AP3250 provides optically isolated time-proportioned on/off switching of up to 1 amp of ac line power, in response to a dc voltage or current input. This output is useful for time-proportioning of power to solenoids and contactors, and electromechanical valves.



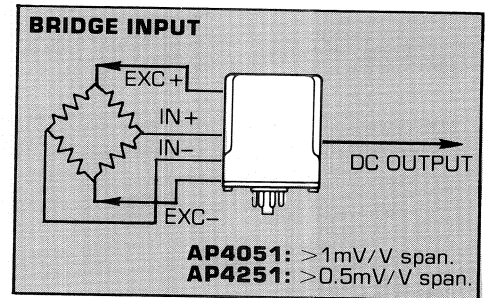
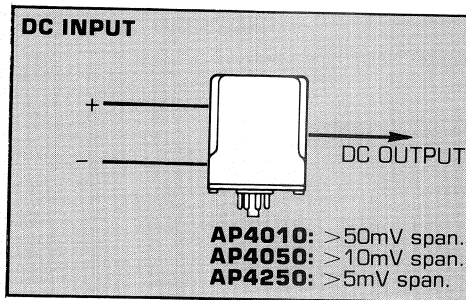
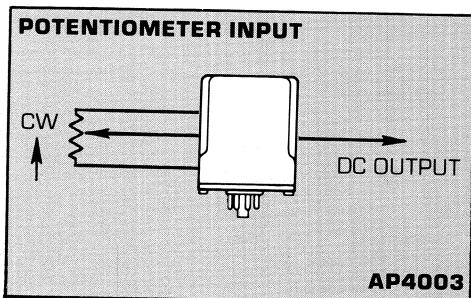
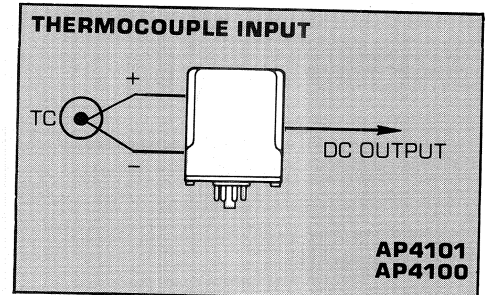
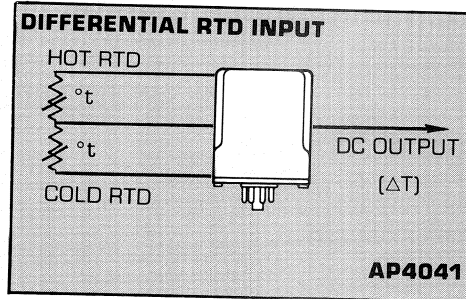
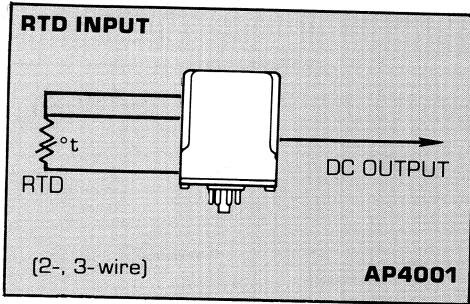
PROCESS TRANSMITTERS

AP4000 Series

The broad Action Pak Process Transmitter Series provides conditioning and amplification, isolation, or linearization of direct sensor or dc inputs. Their dc output can be used to drive indicators, controllers,

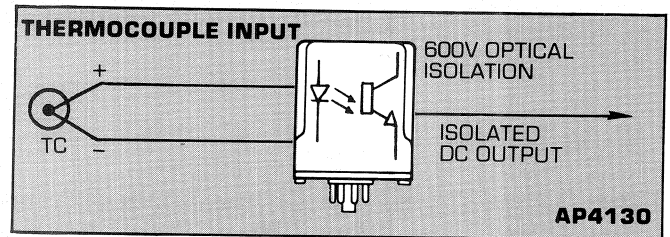
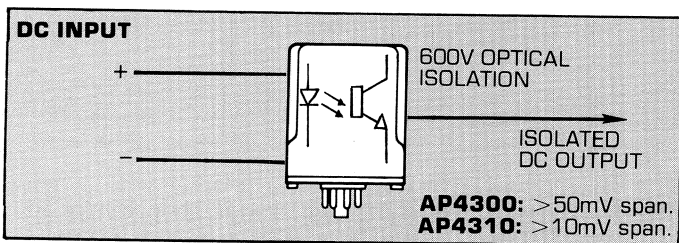
recorders, alarms, or other process instrumentation. All Action Pak Transmitters feature user-adjustable zero and span.

AMPLIFIERS / CONDITIONERS



ISOLATORS

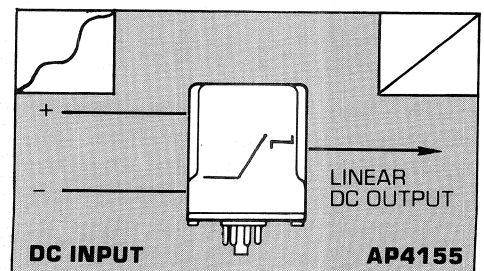
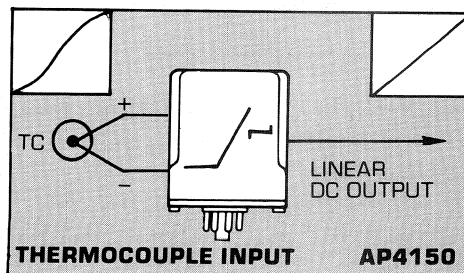
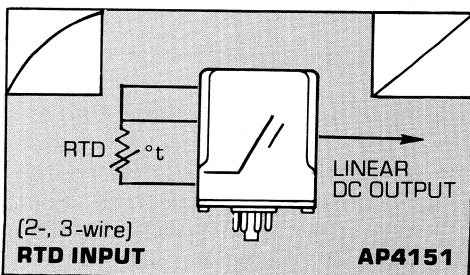
The AP4130, AP4300, and AP4310 provide 600V optical isolation to eliminate system ground loops.



LINEARIZERS

The AP4151 linearizes an RTD input to within 1°C of standard R/T tables. The AP4150 linearizes a thermocouple input for a 10:1 or better improvement

over the non-linearized signal. The AP4155 linearizes a dc input using a 12-segment computer-optimized circuit for your specific curve-fitting needs.



OUTPUT VERSATILITY

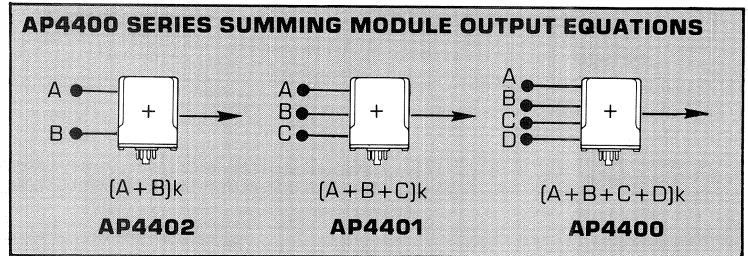
Outputs from the Action Pak Transmitters can be specified to match all conventional process require-

ments: 0-20mA, 4-20mA, 0-1V, 0-5V, 0-10V, and 1-5V or any non-standard output range desired.

MATH FUNCTIONS ————— AP4400 Series

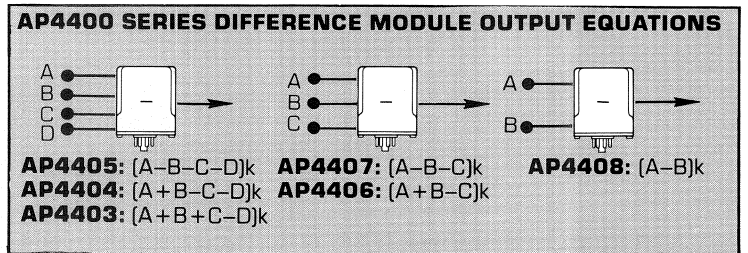
SUMMING

The Action Paks AP4400, AP4401, and AP4402 accept four, three, and two dc inputs, respectively. They provide a dc output which is proportional to the sum of all the inputs. The input as well as the output range may be either voltage (e.g. 0-10V) or current (e.g. 4-20mA).



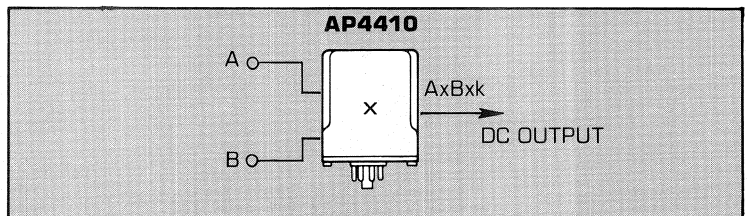
DIFFERENCE

The Action Paks AP4403 through AP4408 also accept two, three, or four dc inputs and provide various combinations of adding and subtracting inputs, as shown in the diagrams, to suit any difference equation requirements.



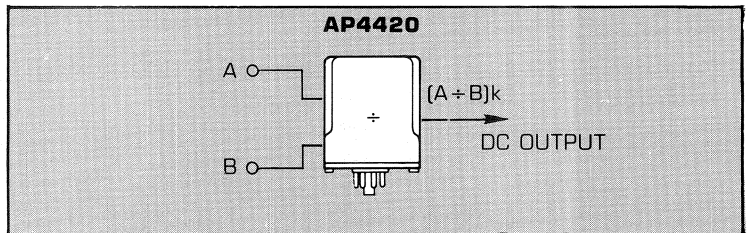
MULTIPLICATION

The Action Pak AP4410 provides an output proportional to the product of the two dc inputs. This function is useful for determining heat flow (flow rate x DT), horsepower (torque x RPM), etc.



DIVISION

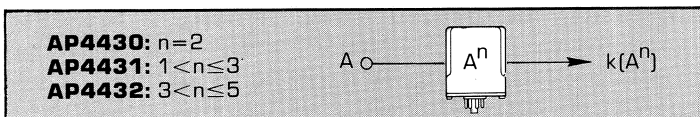
The Action Pak AP4420 provides an output proportional to the quotient of the two dc inputs, a function useful for compensating flow rate relative to reference temperatures and pressures ($FLOW\ RATE^2 = \Delta P / T$), and similar applications.



POWER TERM

IN² The AP4430 modules provide an output in proportion to the square of the dc input. The internal signal conditioning allows a built-in "k" factor, as specified [$OUT = k (IN^2)$].

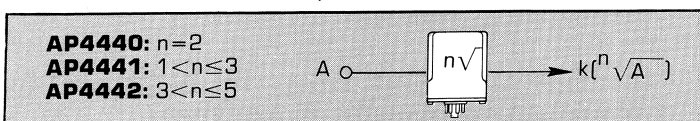
IN¹⁻⁵ The AP4431 and AP4432 modules provide an output in proportion to a power greater than 1, up to 5, as specified. The AP4431 is for powers greater than 1, up to 3, and the AP4432 is for powers greater than 3, up to 5. Specify power desired. For a power of 2 [squarer] see the AP4430. Like the AP4430, the AP4431 and AP4432 allow a built-in "k" factor, as specified.



ROOT EXTRACTION

\sqrt{IN} The AP4440 provides an output in proportion to the square root of the dc input. This function is useful in deriving actual flow rates from a differential pressure signal, or any other process requiring square-root extraction. The internal signal conditioning allows a built-in "k" factor, as specified [$OUT = k \sqrt{IN}$].

$1-5 \sqrt{IN}$ The AP4441 and AP4442 provide extraction of roots greater than 1, up to 5. The AP4441 is for roots greater than 1, up to 3, and the AP4442 is for roots greater than 3, up to 5. Specify root desired. For square-root [2] extraction, see the AP4440. Like the AP4440, the AP4441 and AP4442 allow a built-in "k" factor.



PROCESS FUNCTIONS — AP4500 Series

HIGHEST INPUT SELECTION

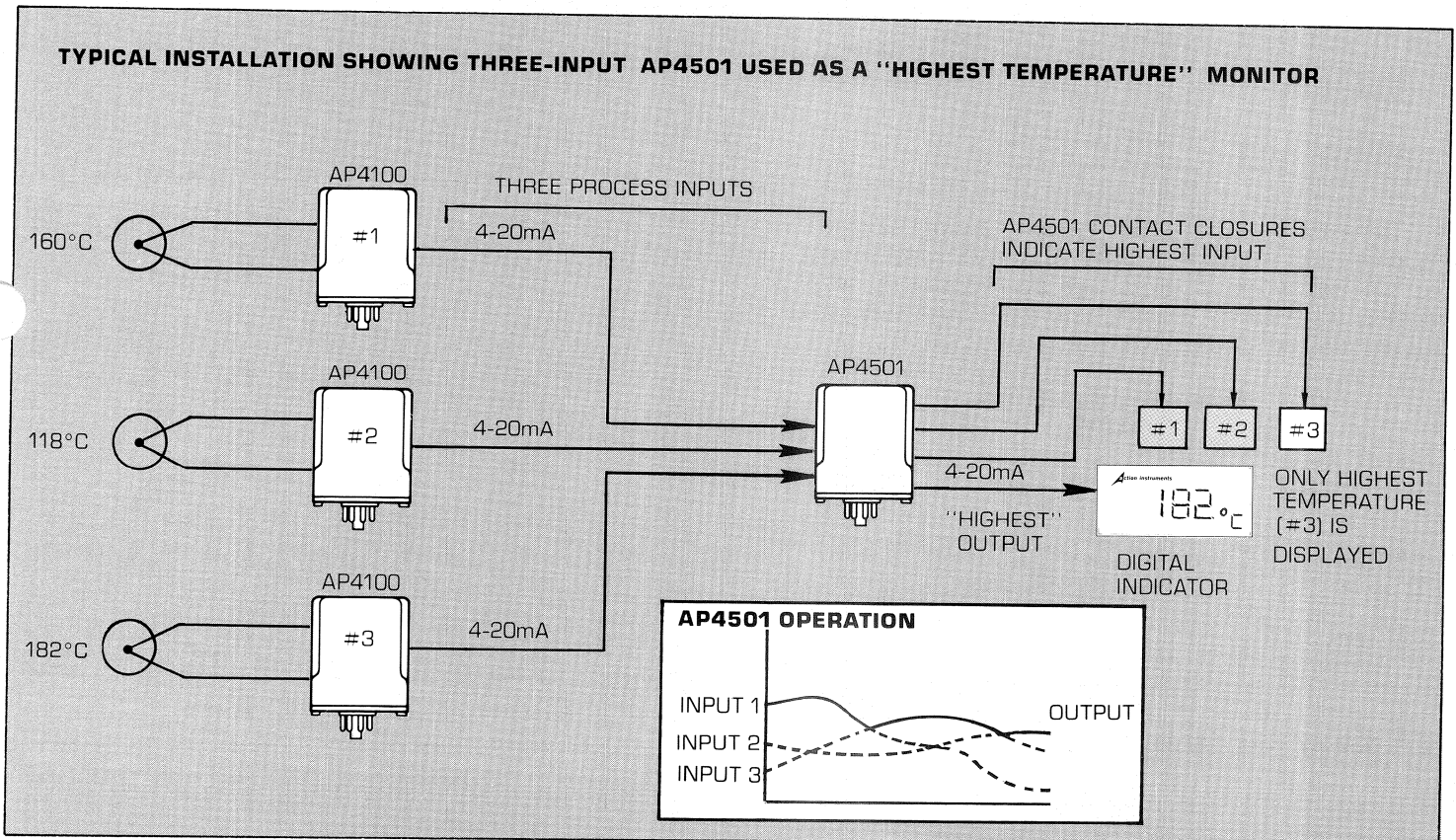
The Action Pak AP4500, AP4501, and AP4502 accept four, three, and two dc inputs, respectively, and provide an output proportional to the highest input. When one input level passes the others, the output

transfers smoothly to the new highest input. A set of SPST relay contacts is provided for each input; the closed contacts identify the highest input for indicating or switching needs. (See diagram.)

LOWEST INPUT SELECTION

The Action Pak AP4505, AP4506, and AP4507 accept four, three, and two dc inputs, respectively, and provide an output proportional to the lowest input. As

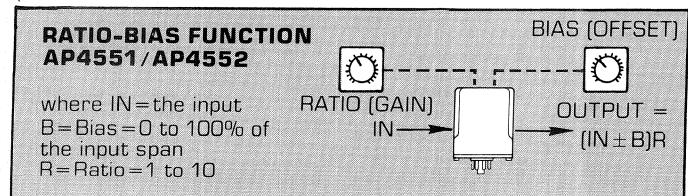
with the HIGH SELECT modules above, transfer is "bumpless" and contact closures are provided to identify the lowest input.



RATIO / BIAS

Action Pak Ratio/Bias modules provide precise universal matching of the control signal to the final control element in an open or closed process control loop. The Ratio/Bias modules are essentially dc signal conditioners with a zero adjustability of $\pm 100\%$ of span, and a span adjustability up to $+1000\%$. With a minimum control signal input, the AP4551 or AP4552 output may be shifted $\pm 100\%$ of span using the BIAS (zero) adjustment. The gain of the AP4551 or AP4552 may be increased by a factor of ten or decreased to unity gain (1) by means of the RATIO (span) control. This ratio and bias adjustability allows any adjustment of the

control signal needed for proper operation of the final control element. The AP4551 features top-mounted RATIO and BIAS adjustments, while the AP4552 provides connections for external RATIO and BIAS potentiometers.

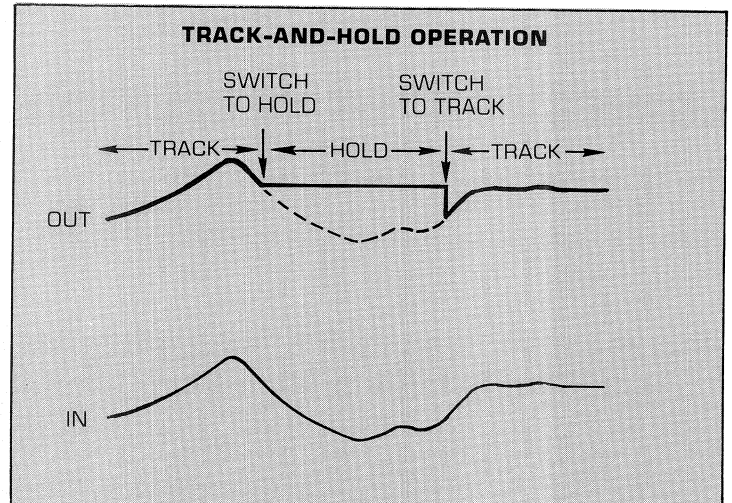
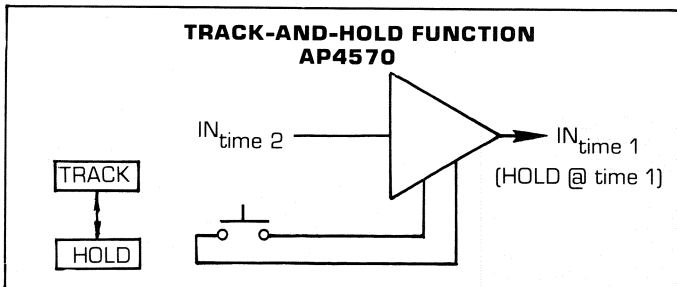


PROCESS FUNCTIONS — AP4500 Series (continued)

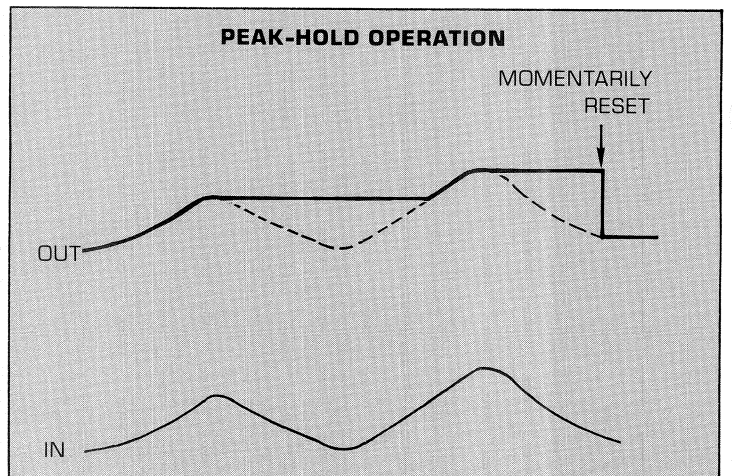
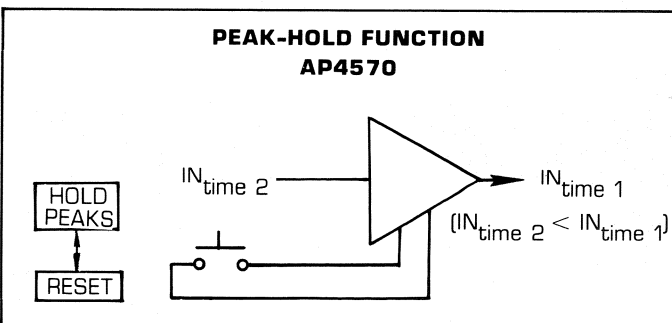
TRACK AND HOLD / PEAK-HOLD

All Action Pak AP4570 modules feature two modes of operation:

1. "Track and Hold," where the output normally tracks the input. When an external contact is closed, the input level is "memorized" and the corresponding output level is held indefinitely until the external contact is opened.

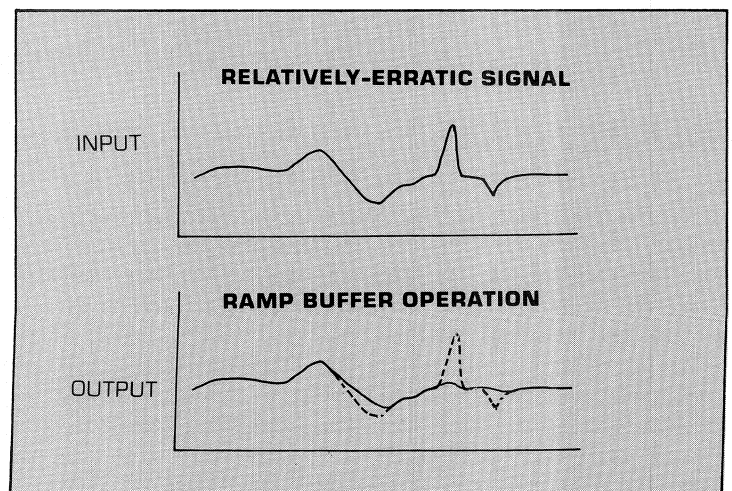
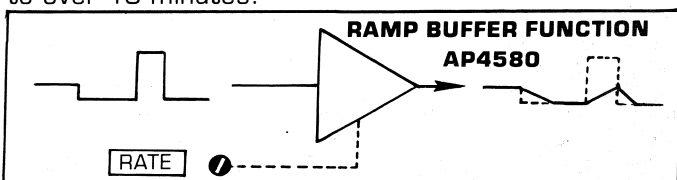


2. "Peak-Hold," where the highest input presented in any given time period is automatically "memorized" and the output is held at the corresponding level. Opening an external contact defeats the Peak-Hold function so that the output tracks the input.



RAMP BUFFER

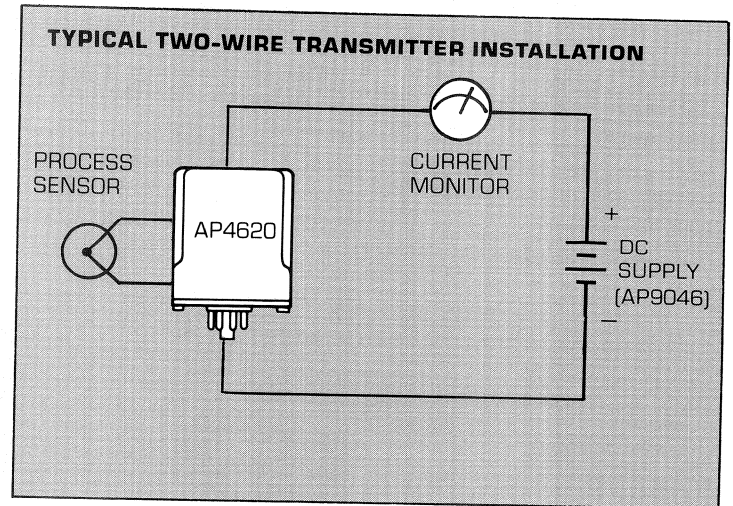
The Action Pak AP4580 Ramp Buffer (or Ramp Filter) modules operate as electronic dampeners or "shock absorbers"; their output never changes faster than a preset maximum rate, no matter how fast their input changes. Maximum rate of output change is defined as the time required to go from a zero output to a full-scale output with a full-scale step input. Rate is set by means of a top-accessed screwdriver adjustment which allows setting the rate anywhere from 1 second to over 15 minutes.



TWO-WIRE TRANSMITTERS

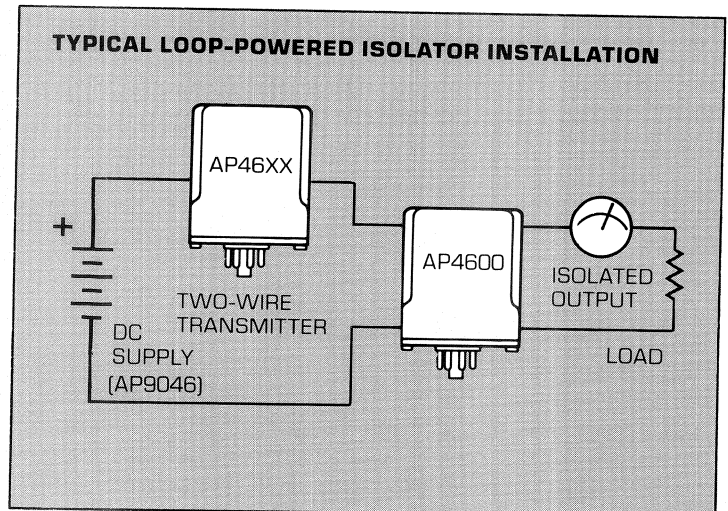
AP4600 Series

Action Pak AP4600 Series Two-Wire Transmitters draw current from a remote power supply in proportion to their sensor input signal. This results in the use of only two wires to carry both the output signal and power. There is an AP4600 model for every popular process sensor, including RTDs, thermocouples, potentiometers, strain-gauges, magnetic pickups, and dc voltage or current inputs as well as a loop-powered isolator, as shown in the selection guide. The output is a standard 4-20mA, and 10-50mA is available optionally.



LOOP-POWERED ISOLATOR

The Action Pak model AP4600 accepts any 1-50mA input and provides a fully isolated proportional 1-50mA output. A small amount of the input current signal is used by the internal circuitry to perform the isolating function; no other power supply is used.



SELECTION GUIDE

INPUT	MODEL
CURRENT LOOP (Loop-Powered Isolator)	AP4600
RTD (Two-Wire)	AP4610
THERMOCOUPLE (E,J,K,R,S,T, Integral CJC)	AP4620
POTENTIOMETER	AP4630
STRAIN-GAUGE (4-Arm Bridge)	AP4640
DC (Voltage or Current)	AP4650
FREQUENCY (Magnetic Pickup)	AP4670

RAMP GENERATORS — AP4800 Series

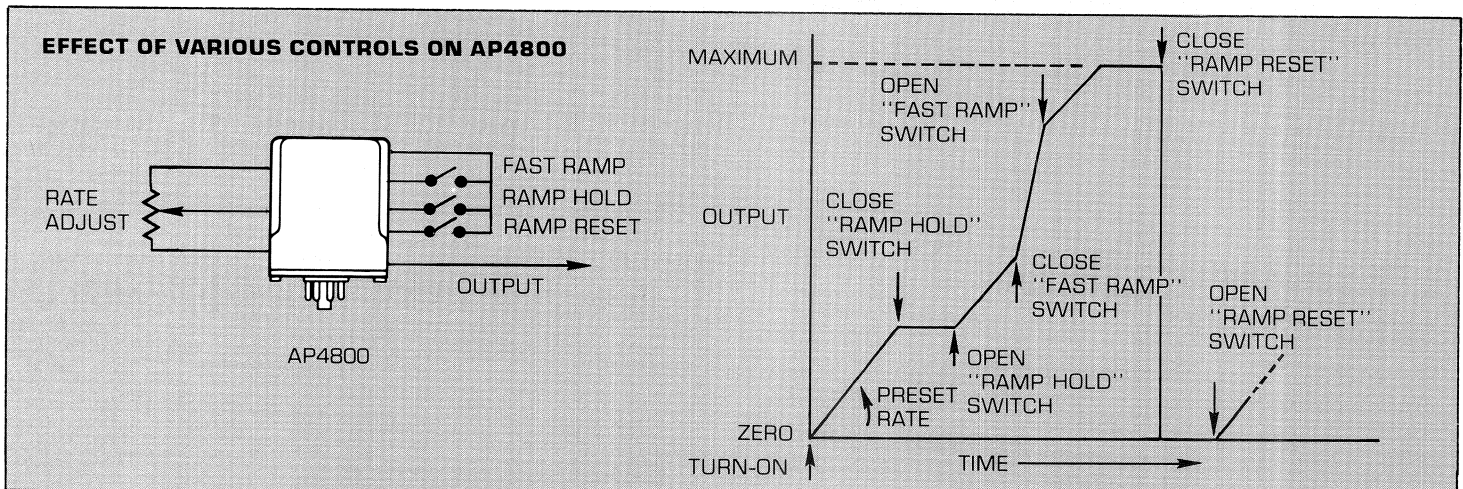
Action Pak Ramp Generators are ideal for programmed process control, as they provide gradual increases or decreases and holding of process variables.

They generate a voltage or current output which changes linearly with time (i.e. V/minute or mA/minute).

GENERAL PURPOSE RAMP

The output of the AP4800 starts at its zero point on turn-on and begins increasing at a rate preset by an external potentiometer. External contact closures reset the ramp to zero (Ramp Reset), accelerate the normal ramp speed by a factor of ten (Fast Ramp), and

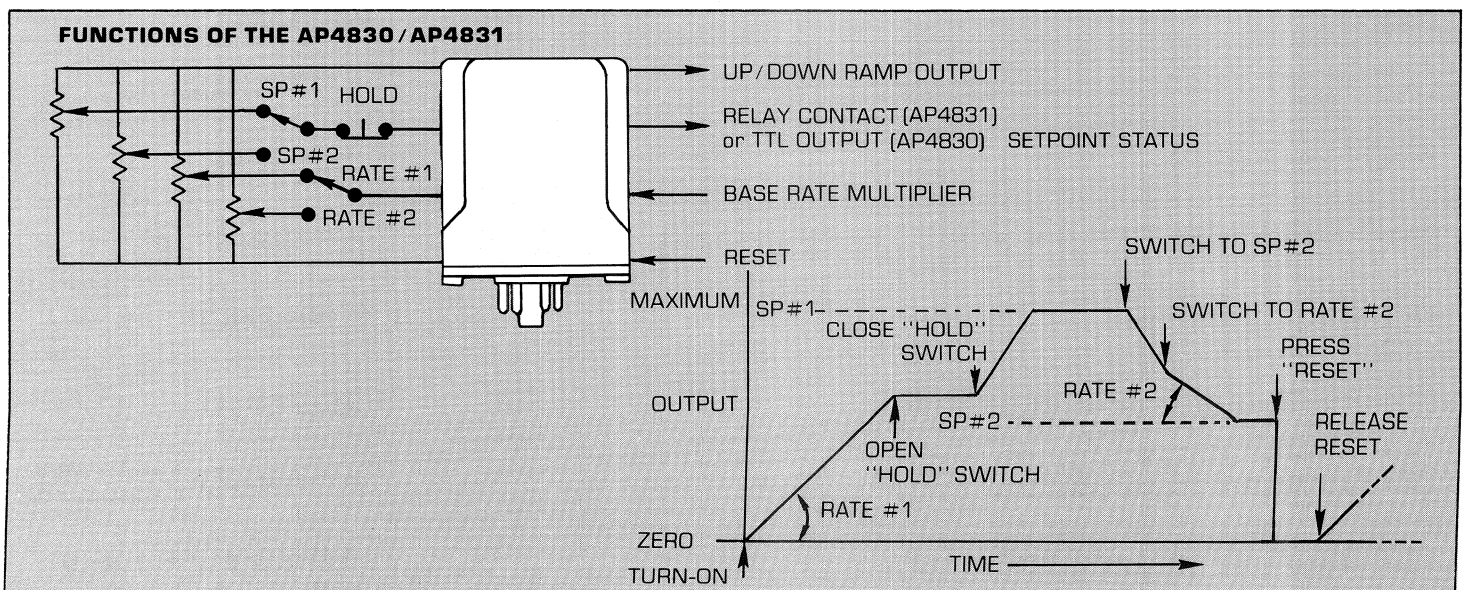
allow the ramp to be stopped and held at any level (Ramp Hold). If uninterrupted, the ramp will continue to the maximum specified output, where it will hold until reset.



UP/DOWN RAMP

The Action Pak AP4830 and AP4831 provide highly versatile control of ramp rate and direction. Setpoint and ramp rate are voltage programmed; an internal reference supply can be used for potentiometer control of setpoint and rate. Because the setpoint and rate are voltage programmed, various ramp rates and setpoints can be selected at any time by means of a switch, as shown in the diagram. The AP4830 and AP4831 are bi-directional and will always ramp toward

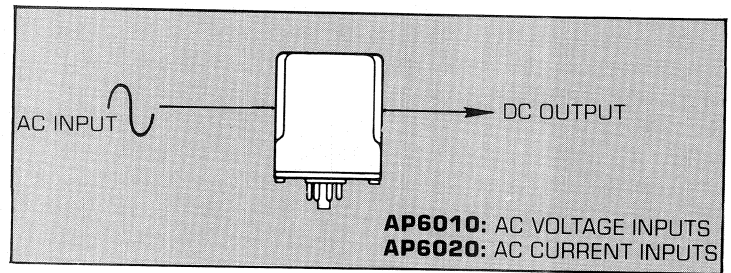
the selected setpoint, whether it is above or below the ramp level at the time of selection. The AP4830 and AP4831 also offer push-button reset to zero, ramp hold, and connections for an external capacitor to decrease the ramp rate range as desired. The AP4830 features a 0/5V TTL output for "ramp at setpoint" indication. The AP4831 is identical to the AP4830, except that a relay contact closure indicates "ramp at setpoint" instead of a TTL output, as in the AP4830.



AC TRANSMITTERS

Action Pak AC Transmitters accept an ac voltage or current input and provide rectification, amplification and conditioning necessary to produce a dc output proportional to the amplitude of the input. The AP6010 accepts ac voltage inputs, while the AP6020 is for ac current inputs. Both the AP6010 and the AP6020 accept inputs from 40 to 1000Hz. For high current inputs (above 1 amp), use an AP6010 voltage input model with an external shunt resistor (Action Instruments part number 479-5018 or equivalent).

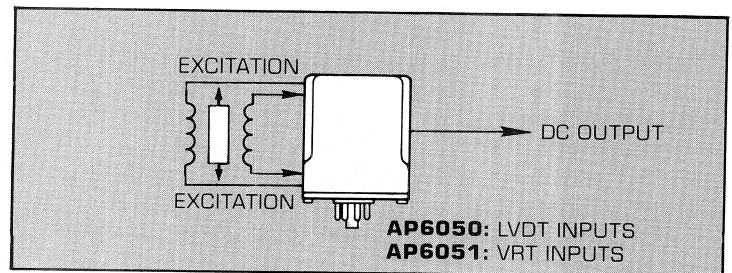
AP6010 and AP6020



LVDT AND VRT TRANSMITTERS

Action Pak LVDT and VRT Transmitters provide the necessary ac excitation for either Linear Variable Differential Transformers (AP6050) or Variable Reluctance Transducers (AP6051). This excitation is typically 4kHz, and is adjustable from six to ten volts peak-to-peak. Both models provide amplification, conditioning and synchronous demodulation of the sensor output signal. As for all Action Pak Transmitters, a wide variety of output ranges is available including 4-20mA and $\pm 5V$.

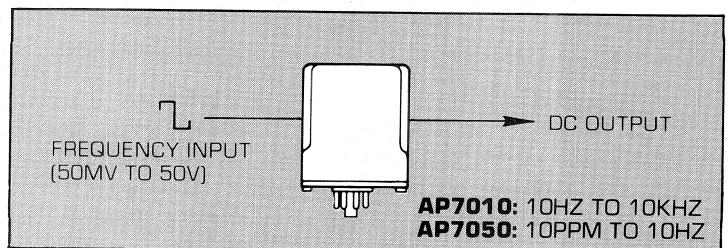
AP6050 and AP6051



FREQUENCY TRANSMITTERS

Action Pak Frequency Transmitters accept "clean" or irregular wave-shape inputs from 50mV rms (such as from magnetic pickups) to 50V rms, and provide a fully conditioned and amplified linear dc output corresponding to the input frequency. The AP7010 accepts spans from 10Hz to 10kHz, and the AP7050 accepts spans from 10ppm to 600ppm. Both feature an input sensitivity adjustment for optimum noise rejection.

AP7010 and AP7050

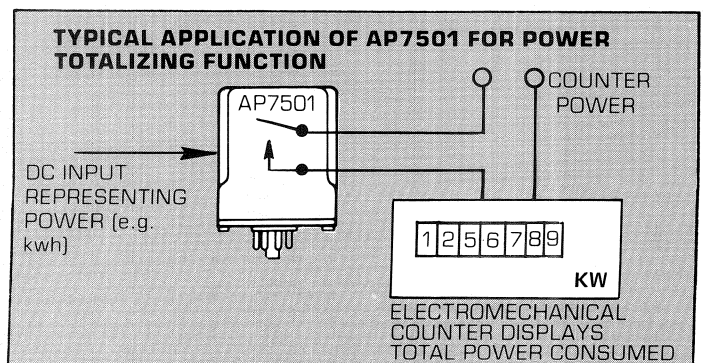
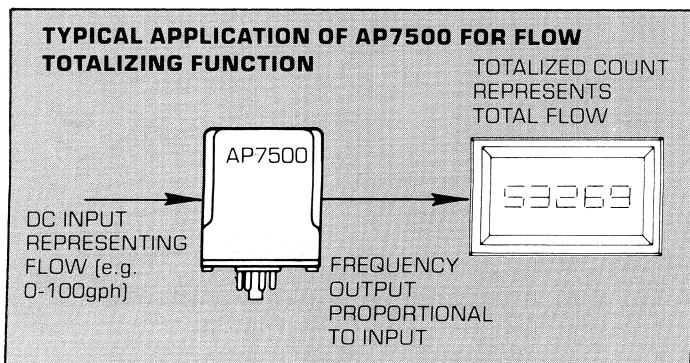


DC-TO-FREQUENCY CONVERTERS

Action Pak DC-to-Frequency Converters provide an output frequency in proportion to an analog dc input. The AP7500 provides a 5V square wave output for driving electronic counters or totalizers, while the AP7501 features a DPDT relay contact output for

AP7500 and AP7501

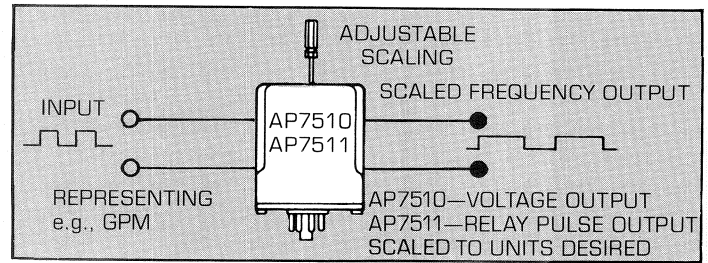
driving electromechanical counters. The AP7500 is available with output spans from 5ppm to 10kHz. The AP7501 is available with output spans from 5ppm to 60ppm. Standard inputs for both models include 0-5V, 0-10V, and 4-20mA.



FREQUENCY SCALERS

AP7510 and AP7511

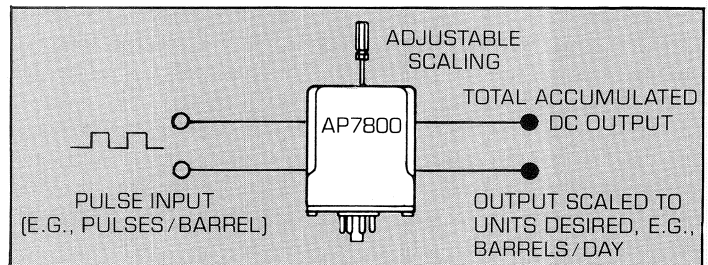
Action Pak Frequency Scalers can directly interface between totalizers and turbine flowmeters, magnetic tachometer sensors, and other frequency transducers. A continuously adjustable scaling factor (input-to-output ratio) of 0.00001 to 0.99999 precisely matches the frequency transducers and the totalizer. The AP7510's square wave output can drive electronic counters compatible with DTL, TTL, CMOS, or 24V square wave. The AP7511 provides an internal relay (standard) or a 24Vdc pulse of 30ms (optional) for an external relay.



PULSE ACCUMULATOR

AP7800

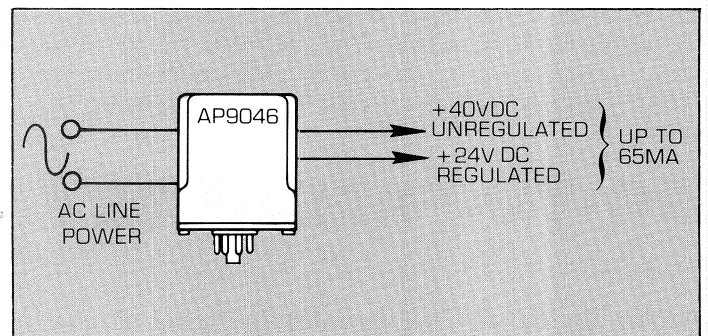
The Action Pak Pulse Accumulator accepts voltage pulse or dry contact closure inputs from electric KW meters, turbine flow meters and other process instrumentation calibrated in pulse-per-unit measure. The AP7800 prescales these input pulses to the desired working range and generates a continuously increasing analog output representing the total value of whichever scaling units have been selected by the user. Upon reaching its full scale output, the AP7800 latches thus inhibiting further accumulation. Reset is accomplished via an external contact closure or a TTL "low" signal.



DC POWER SUPPLIES

AP9046 and AP9050

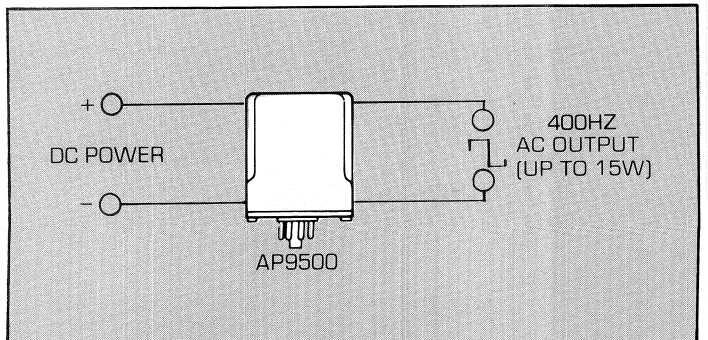
Action Pak Power Supplies are compact sources of low voltage dc power for a variety of applications. The AP9046 features a dual output of 24Vdc regulated and 40Vdc unregulated, designed primarily as a two-wire transmitter loop supply. The 24Vdc output is useful where intrinsic safety is a factor, while the 40V output allows higher loop resistance. The AP9050 provides an adjustable 3-15Vdc (or 5-30Vdc) output for strain-gauge and similar sensor excitation, or for general-purpose low voltage needs. Both models operate directly from 120Vac line power (220V, 240V optional).



DC-TO-AC INVERTER

AP9500

The AP9500 is a general-purpose dc-to-ac square wave inverter that provides up to 15 watts of 120V or 240V power. The AP9500 can be used to power up to four Action Pak modules. The output is electrically isolated from the dc input power. Four models of the AP9500 are available:



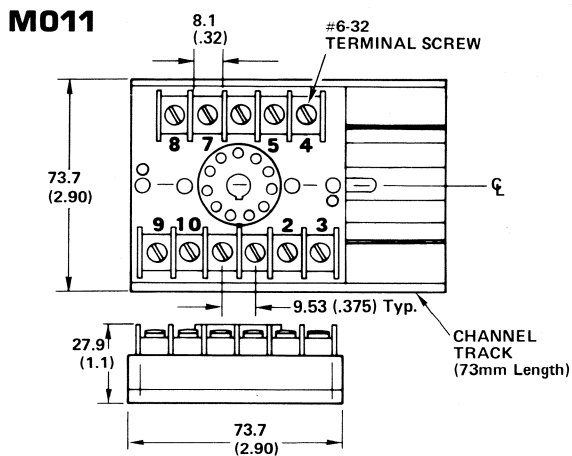
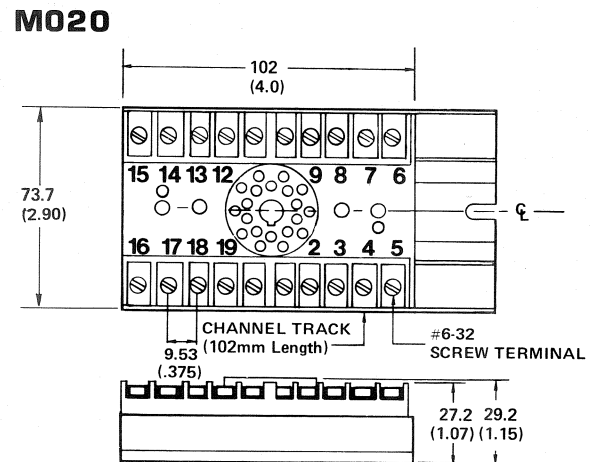
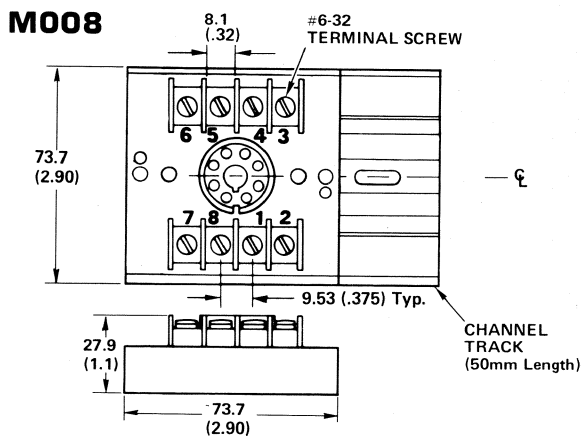
	INPUT	OUTPUT
1.	12Vdc	120Vac
2.	24Vdc	120Vac
3.	12Vdc	240Vac
4.	24Vdc	240Vac

MOUNTING

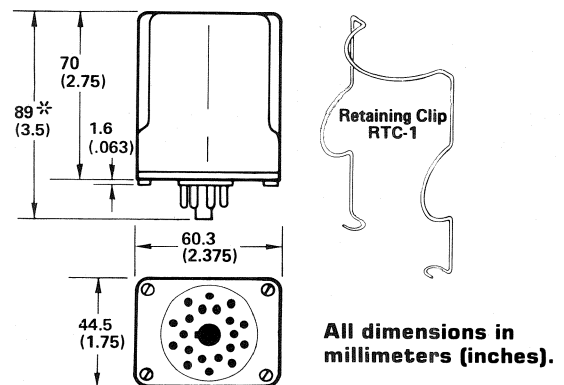
All Action Paks include a mating PC board or wire soldering socket. Barrier terminal strip sockets with matching vinyl snap-track are optional.

Accessories available:

Nema-4 housing, PC board mounting sockets, wire-soldering sockets, explosion-proof housing. (See Action Pak Accessories Catalog.)



DIMENSIONS



*102mm [4.0"] for:
AP1600 through AP1604, AP3200, AP4155,
AP4500 through AP4508, AP4570, AP4830,
and AP4831.

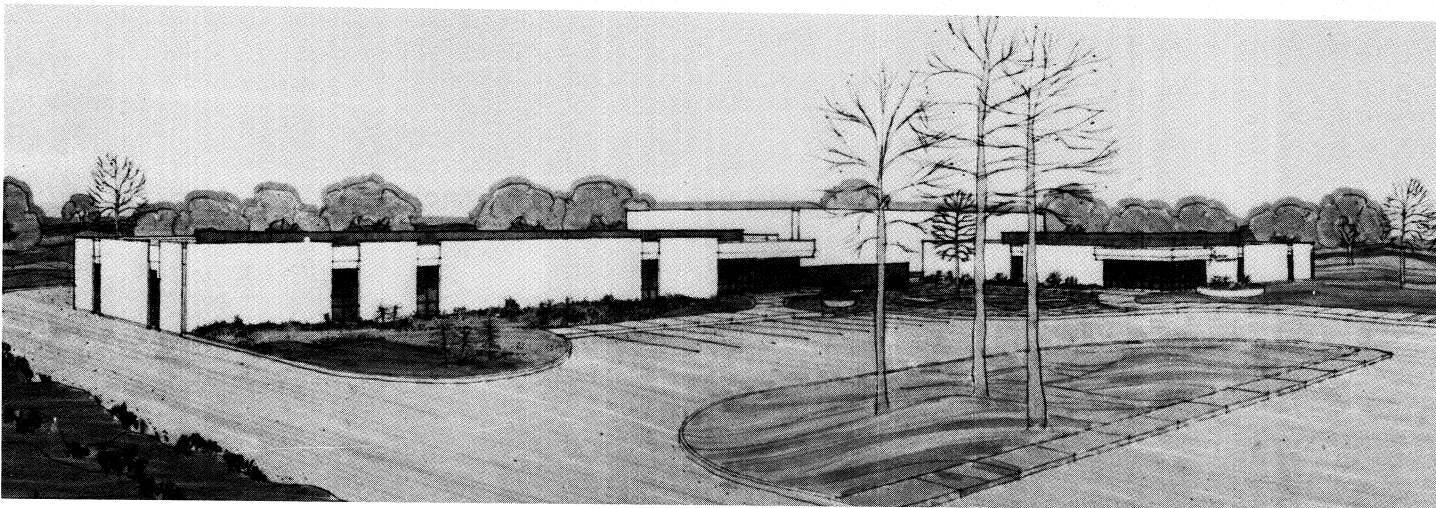
QUALITY AND RELIABILITY POLICY

Action Instruments is committed to an uncompromising and straightforward attitude in setting and maintaining the highest standards of Quality and Reliability.

All instrumentation manufactured by Action Instruments is subjected to stringent Quality Control inspection, engineering tests, burn-in, life tests and calibration procedures to ensure the best competitive Quality, Performance and Reliability. The Action Quality Assurance Manual is available for review, on request.

All Action instrumentation products are backed by responsive Customer Service and the unique, uncomplicated three-year Action Warranty.





Action Instruments, one of the fastest growing instrumentation companies in the U.S., brings high-technology electronic instrumentation to the industrial laboratory, factory automation, and process control markets.

Action's headquarters was completed in 1975 to provide an expanded capacity for rapidly increasing sales of industrial measurement and control instrumentation.

Action Instruments in the United Kingdom provides engineering development and manufacturing operations to better serve the booming industrial markets of Europe and Asia.

Action provides a worldwide network of sales representatives and agents for applications assistance, local stocking, and customer service.

Action Instruments builds its products on a solid foundation of "Quality and Reliability above all." That's why process engineers the world over specify Action instrumentation for low-cost measurement and control solutions.

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Data Brochure 721-0014F
September 1984 Printed in U.S.A.

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