



# ADTECH

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## ADDER SUBTRACTOR MODULE MODEL NO. ASM 54

THE ADTECH MODEL ASM 54 ADDER SUBTRACTOR MODULE PROVIDES AN ACCURATE AND ECONOMICAL MEANS OF ADDING AND/OR SUBTRACTING UP TO FOUR PROCESS SIGNAL INPUTS TO PROVIDE A SINGLE PROCESS SIGNAL OUTPUT REPRESENTING THE SUM AND/OR DIFFERENCE OF THE INPUTS.

A UNIQUE STANDARD FEATURE OF EACH OF THE FOUR INPUTS PROVIDES AN INDIVIDUAL INPUT SCALING FACTOR OF 0 TO 1.25 FOR NORMALIZING TRANSDUCER FACTORS.

THE OUTPUT BIAS IS ADJUSTABLE FROM 0-50% OF FULL SCALE.

AN EXCLUSIVE STANDARD FEATURE OF THE ASM 54 IS ITS LOSS OF INPUT PROTECTION. ANY INPUT SIGNAL LOSS IS TREATED AS A ZERO VALUE, NOT A NEGATIVE VALUE, TO PROVIDE THE HIGHEST SECURITY. ANOTHER EXCLUSIVE FEATURE ELIMINATES THE NEED TO CHANGE ANY INTERNAL COMPONENTS OR WIRING WHEN CONVERTING ANY OF THE FOUR INPUTS FROM AN ADDING OR SUBTRACTING MODE.

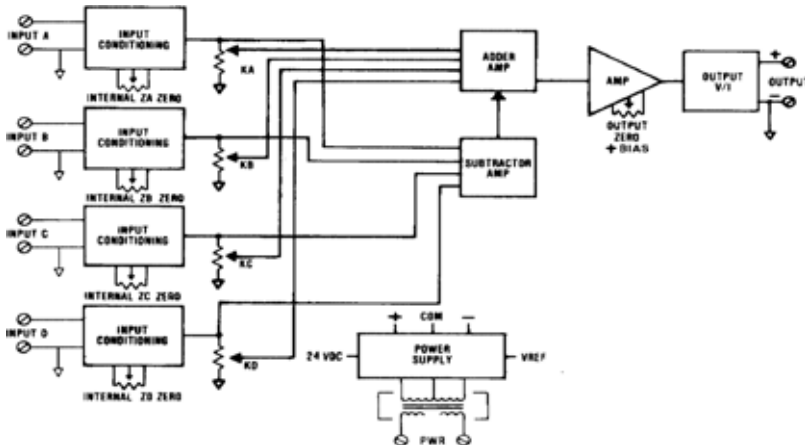
THE POSITION OF POTENTIOMETERS KA THROUGH KD DETERMINES THE MAGNITUDE AND (+) OR (-) COEFFICIENTS FOR EACH INPUT AS SHOWN IN THE BLOCK DIAGRAM BELOW.

THE ASM 54 PROVIDES STANDARD PROCESS CURRENT OR VOLTAGE SIGNALS ON THE OUTPUT WITH A MAXIMUM OF 10 mV P/P OUTPUT RIPPLE. IT OFFERS A CONVENIENT WAY OF INTERFACING THE SUM OR DIFFERENCE OF SIGNALS TO A COMPUTER SYSTEM OR OTHER PROCESS INSTRUMENTATION.

RECALIBRATION TO OTHER DESIRED RANGES IS ACCOMPLISHED EASILY. TEMPERATURE-STABLE, LOW-NOISE COMPONENTS PROVIDE EXCELLENT STABILITY AND NOISE IMMUNITY.

### TYPICAL APPLICATIONS

- TOTAL FLOW COMPUTATION
- NET ENERGY CONSUMPTION
- ELECTRIC POWER SUMMATION
- TOTAL HEAT LOAD (BTU'S)
- EQUATION COMPUTATION

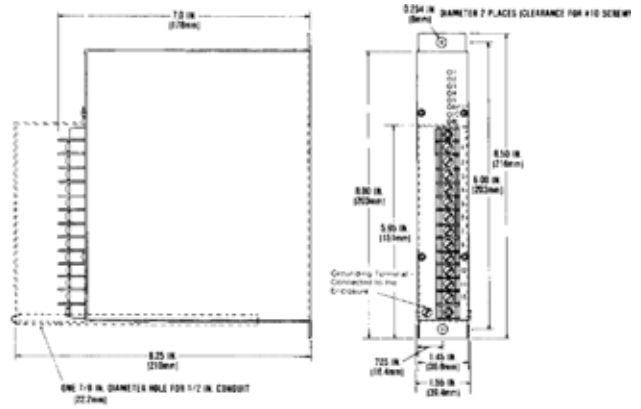
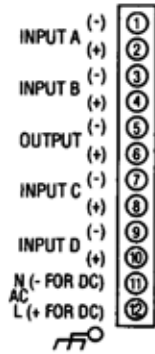


### FEATURES

- EQUATION:  $OUTPUT = \pm KAA \pm KBB \pm KCC \pm KDD$
- ADDS OR SUBTRACTS: ANY COMBINATION
- TWO-TO-FOUR INPUTS
- SCALING ADJUSTMENT/RANGE: 0.0 TO  $\pm 1.25$  FOR ALL FOUR INPUTS;  
0 TO 0.5 OUTPUT ZERO OFFSET
- SINGLE K FACTOR POTENTIOMETER ADDS OR SUBTRACTS ON EACH INPUT
- LOSS OF INPUT PROTECTION: INPUT SIGNAL LOSS TREATED AS ZERO, NOT AS A NEGATIVE VALUE
- DC INPUTS: 4-20 mA, 1-5 VDC, ETC
- REPEATABILITY:  $\pm 0.02\%$  OF SPAN
- HIGH ACCURACY:  $\pm 0.1\%$  OF SPAN



# CONNECTIONS / DIMENSIONS



## INPUT/OUTPUT

INPUT SIGNALS (ANY MIX 2,3, OR 4 INPUTS)	SIGNAL	AC POWER (RL)	OUTPUT SIGNALS / OUTPUT DRIVE (RL)
4-20 mA DC (Z IN 250 OHMS)	4-20 mA DC	0-1,000 OHMS MAX.	DC POWER (RL)
10-50 mA DC (Z IN 100 OHMS)	4-20 mA DC	0-400 OHMS MAX.	0-900 OHMS MAX.
0-1 mA DC (Z IN 5K OHMS)	10-50 mA DC	0-20,000 OHMS MAX	0-350 OHMS MAX.
0-10 mA DC (Z IN 500 OHMS)	0-1 mA DC	100K OHMS MIN.	0-18,000 OHMS MAX.
1-5 VDC (Z IN 10 MEGOHMS)	1-5 VDC	200K OHMS MIN.	200K OHMS MIN.
0-5 VDC (Z IN 10 MEGOHMS)	0-10 VDC		
0-10 VDC (Z IN 1 MEGOHM)			

OTHER ZERO-BASED CURRENT AND VOLTAGES ARE AVAILABLE.

## PERFORMANCE

CALIBRATED ACCURACY: $\pm 0.1\%$	OUTPUT RIPPLE: 10 mV P/P MAXIMUM
LINEARITY: $\pm 0.1\%$ MAX., $\pm 0.04\%$ TYPICAL	RESPONSE TIME: 150 MILLISECONDS
REPEATABILITY: $\pm 0.05\%$ MAXIMUM	TEMPERATURE RANGE: $0^{\circ}$ TO $140^{\circ}$ F ( $-18^{\circ}$ TO $60^{\circ}$ C)
TEMPERATURE STABILITY: $\pm 0.01\%$ / $^{\circ}$ F MAX.	OPERATING: $-40^{\circ}$ TO $185^{\circ}$ F ( $-40^{\circ}$ TO $85^{\circ}$ C) STORAGE
$\pm 0.004\%$ / $^{\circ}$ F TYPICAL	POWER SUPPLY EFFECT: $\pm 0.05\%$ FOR A
LOAD EFFECT: $\pm 0.01\%$ ZERO TO FULL LOAD	$\pm 10\%$ POWER VARIATION

NOTE: ALL ACCURACIES ARE GIVEN AS A PERCENTAGE OF SPAN.

## POWER

115 VAC: 50/60 HZ, 0.7 PF (STANDARD)	48 VDC: ISOLATED (OPTION P3)
12 VDC: ISOLATED (OPTION P8)	125 VDC: ISOLATED (105-140 VDC) (OPTION P4)
24 VDC: NON-ISOLATED (OPTION P1)	230 VAC: 50/60 HZ, 0.7 PF (OPTION 5)
24 VDC: ISOLATED (OPTION P2)	

NOTE: ALL UNITS 3 WATTS MAXIMUM, AND A  $\pm 10\%$  POWER VARIATION UNLESS NOTED.

## MECHANICAL

ELECTRICAL CLASSIFICATION: GENERAL PURPOSE  
 CONNECTION: BARRIER TERMINAL STRIP (3/8" SPACING, NO.6 SCREWS)  
 CONTROLS: MULTITURN OUTPUT ZERO AND KA, KB, KC, & KD CONTROLS; INTERNAL ZA, ZB, ZC, ZD CONTROLS  
 MOUNTING: SURFACE MOUNTING STANDARD. SEE HOUSINGS SECTION FOR OPTIONS.  
 WEIGHT: NET UNIT: 2.6 POUNDS (1.18 KILOGRAMS); SHIPPING: 3.0 POUNDS (1.36 KILOGRAMS)

## OPTIONS

OPTION NUMBER	DESCRIPTION
I 18	LOW IMPEDANCE DC CURRENT INPUTS (1/10 OF STANDARD Z)
O 10	BIPOLAR CURRENT (LARGER THAN $\pm 1$ MA)
O 11	BIPOLAR VOLTAGE TO $\pm 10$ VDC: AT 1 MA, BIPOLAR CURRENT $\pm 1$ MA
H 10	THIN-LINE CONDUIT MOUNTING PLATE AND TERMINAL COVER
H 13B, H 14B, H 15B	NEMA 4, 7, AND 12 ENCLOSURES
H 16	PFA 12 HIGH-DENSITY, PLUG-IN ENCLOSURE

### Ordering Information

- Model number
- Input signals
- Number of inputs
- Equation and scaling factors
- Output signal
- Prime power with option no.
- Input/output options
- Housing and miscellaneous options

Please refer to the Housing and/or Option Section for more specific and detailed information.