

# AMELEC instruments

## ACC ARITHMETIC UNITS

Amelec Instruments offer a wide range of electronic analogue arithmetic units which are compatible with Process Control signals and system requirements.

All units have full input/output/power supply isolation, and are available in any of the range of mountings.

Each unit has its own power pack.

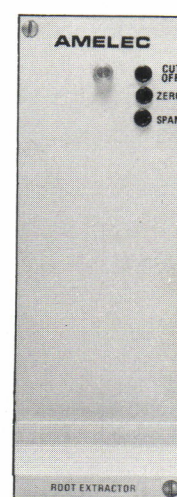
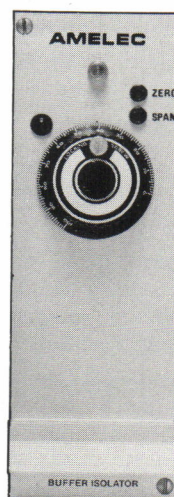
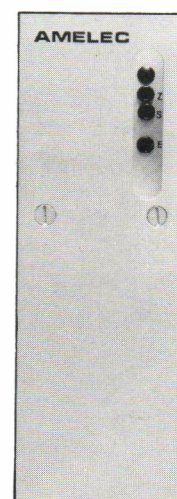
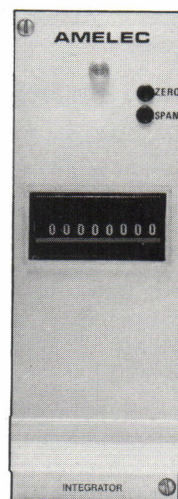
All arithmetic units have input buffer amplifiers which include scaling and bias (span and zero) adjustments, this facilitates conversion into engineering units and performance of several functions within one unit. Included in the range are both root and linear input integrators.

Counter units can also be fitted to the front face of arithmetic units.

Various application notes are available on request covering subjects such as Mass Flow, Long Range Flow measurement and Sequencing of signals. Our units are capable of extensive adaption to provide functions too numerous to list below. Should your requirements not be shown please call our Sales Office who will be delighted to assist.

Input span of all units is typically 400mV and input conditioning is adjusted accordingly.

**Full specifications are given in the following pages and prices are given on page 70.**



## arithmetic units

### ACC 371 RATE OF CHANGE

First time derivative of the input signal is provided as output. Zero rate of change can be zero output or mid scale output. In latter case unit gives positive and negative rates of change.

INPUT	0 to 10, 4 to 20, 1 to 5mA DC 0 to 1, 0 to 10, 2 to 10, 1 to 5V DC
ACCURACY	±0.2% of SPAN
OUTPUT	0 to 10, 4 to 20, 1 to 5mA DC 0 to 1, 0 to 10, 2 to 10, 1 to 5V DC
INPUT IMPEDANCE	> 1MΩ for voltage
ISOLATION	1000V RMS Input/Output and Power Supply
SPEED OF RESPONSE	5% to 95% response in approx. 0.5 second
MIN. SIGNAL FOR F.S.D.	0.5% per minute
CONTROLS	Zero, span and damping
POWER SUPPLY	AC—110V, 220V, 240V ±20% 50/60Hz; DC—24V ±2.5V

### ACC 372 RATE OF TEMPERATURE CHANGE

As ACC 371 but suitable for thermocouple or resistance thermometer input. Automatic cold junction included on thermocouple input. Minimum SIGNAL for F.S.D. 20°C per minute.

### ACC 374 RAMP GENERATOR

On receipt of contact closure output ramps up, linearly with time, from ZERO to MAXIMUM. Can be stopped at any level. Time span fully adjustable. After power failure unit output is reset to zero.

INPUT	Contact closure to start, stop and reset
OUTPUTS	0 to 10, 4 to 20, 1 to 5mA DC 0 to 1, 0 to 10, 2 to 10, 1 to 5V DC
TIME RATE	3 to 3600 seconds
RESET RATE	1 second
ISOLATION	1000V RMS Input/Output and Power Supply
POWER SUPPLY	AC—110V, 220V, 240V ±20% 50/60Hz; DC—24V ±2.5V

### ACC 375 RAMP GENERATOR

As ACC 374 but with LIMITS at MINIMUM AND MAXIMUM OUTPUT SIGNAL LEVELS. Limits set by blind potentiometers on unit face.

# arithmetic units specification

## GENERAL SPECIFICATION

### INPUT DATA

Source and Signal see individual specification.

Controls for zero and range are available at instrument front face.

POWER 110V  $\pm 20\%$  50/60Hz  
SUPPLIES 220V  $\pm 20\%$  50/60Hz  
240V  $\pm 20\%$  50/60Hz  
DC Models  
24V  $\pm 2.5V$  DC

Consumption typically 3 Watts.

INPUT Typically  $> 1M\Omega$  for voltage.  
IMPEDANCE

### OUTPUT DATA

SIGNALS 0 to 10mA into 2000 $\Omega$  maximum  
4 to 20mA into 1000 $\Omega$  maximum  
1 to 5mA into 4000 $\Omega$  maximum  
1V to 5V  
2V to 10V  
0 to 1V  
0 to 10V  
Overrange limit to 40V DC open circuit output.

POWER ON Indicator

### CONDITIONS

ISOLATION 1000V RMS Input to Output and Power Supply by opto-electric devices.

TEMPERATURE Working  $-20$  to  $+60^\circ\text{C}$   
Storage  $-40$  to  $+70^\circ\text{C}$

HUMIDITY 5 to 95% RH

VIBRATION 1g 15Hz to 150Hz has no effect

### ELECTRICAL STANDARDS

INSULATION 1000V. 2000V for 20 $\mu$  Second.  
FUSING Power supply fused.  
Spare fuse on PC Board.

### MOUNTING AND TERMINATIONS

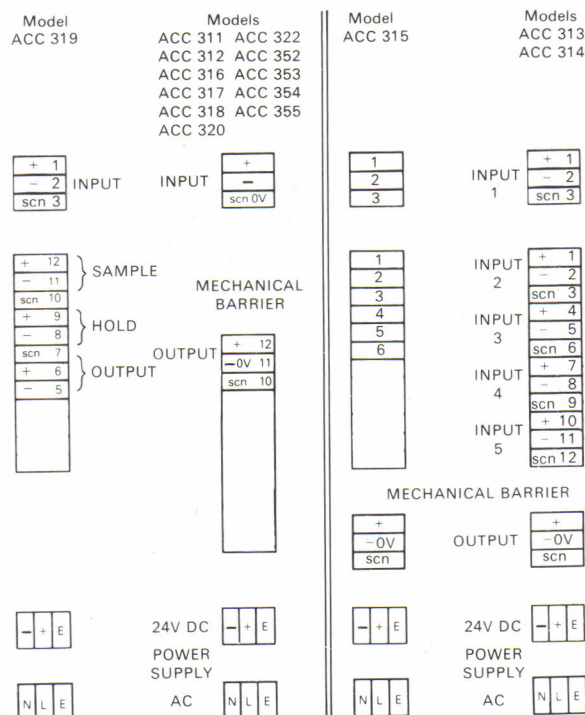
TERMINATION For conductors up to 2.5mm<sup>2</sup>

WEIGHT Typical 1.5kg

POSITION Any position. Reed Relay option vertical only.

TYPES OF MOUNTING Wall, Panel, Back of Panel or Rack, Precision extruded aluminium case and rack. Details Page 35.  
Up to 7 units in 19" Rack.

ENCLOSURES IP54 for N-Protection  
AVAILABLE NEMA 4 Watertight  
NEMA 12 Oiltight



### PERFORMANCE

SERIES MODE  $< 0.2\%$  error for 50Hz at 50%  
REJECTION Span

COMMON  $< 0.2\%$  error for 250V RMS  
MODE  
REJECTION

R.F. All normal industrial interference  
REJECTION and R.F. up to 460MHz has no  
effect outside specification. Option  
K.



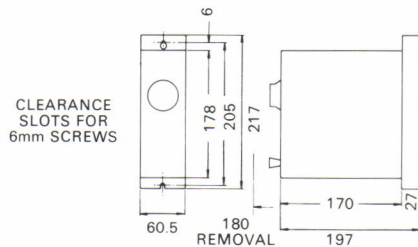
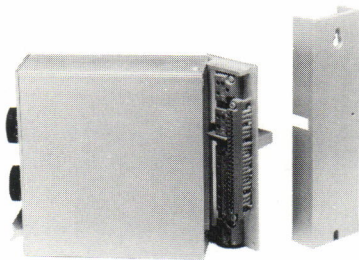
# mounting data

**Mounting shown below applies to all ATA, AMT, ACC & APS Series Units.**

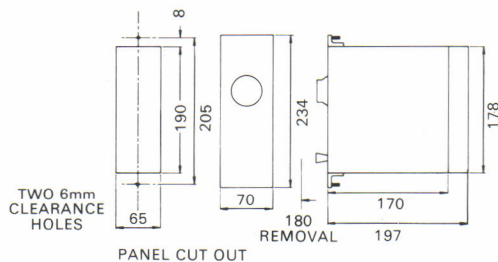
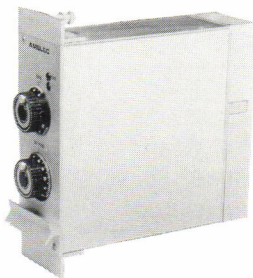
Illustrated are the most standard methods of mounting. All dimensions are in millimetres. The dimension of 180mm marked **REMOVAL** is clearance required at front of instrument to allow removal of the plug-in PC Board.

## SURFACE MOUNTING

This mounting can also be used for Back of Panel.



## FRONT OF PANEL MOUNTING

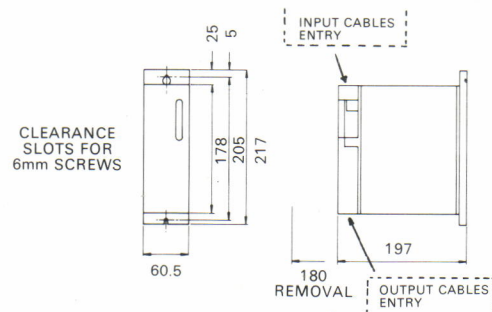
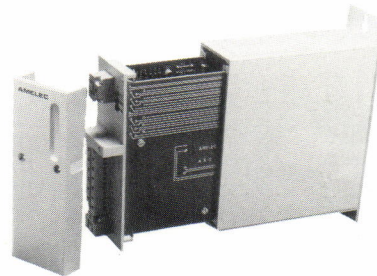


## SINGLE END ACCESS

With this mounting arrangement the terminal blocks are at the front of the unit.

All adjustments are available at the front, trip settings are by 15 turn blind potentiometers. LED indicators are also fitted on the front of the unit.

Single end access can be supplied in Wall mounting or 19" Rack mounting configurations.

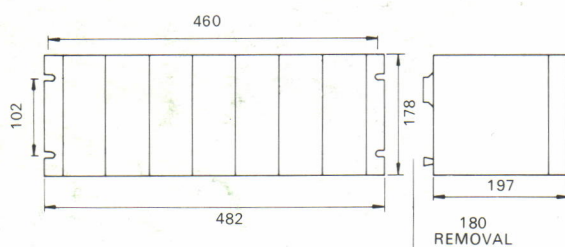
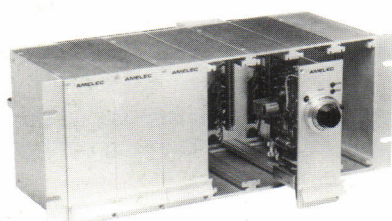


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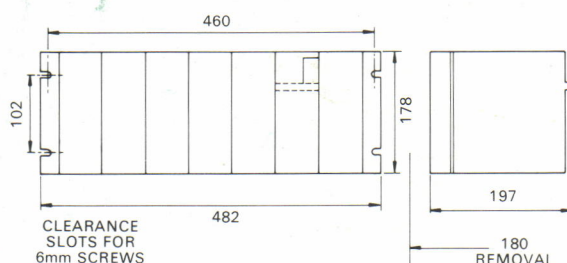
# mounting data

## INTERNATIONAL 19" RACK

Up to 7 Amelec units can be housed in one 19" rack section. The rack section to Amelec design is made of precision extruded aluminium and fits into any 19" International rack. It is recommended the wiring or cabling be carried out in plastic trunking. Can be supplied as standard access (shown) or single end access.

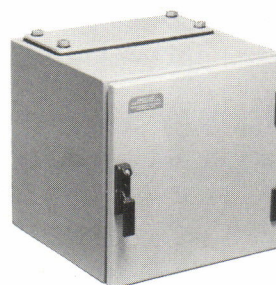


*standard access rack*



*single end access rack*

## ENCLOSURES TO IP65



A range of Enclosures to IP65 specification is available, details are given in the following schedule.

Enclosures are constructed of seam welded 1.2mm cold rolled steel plate. Two profile bars for mounting plates and rails are fitted to rear, tapped M5 on 15mm centres complete with earthing clamp. Fixing holes have sealed rubber bushes. Door has fitted rubber gasket and lift up locking device.

Mounting plate is zinc plated and chrome etched 2mm steel plate.

Glanding plate is sealed with rubber gasket.

Enclosure is finished in two colour grey paint.

Enclosure No.	Max. No. of AMT, ATA, ACC APS Units	Size mm		
		Height	Width	Depth
AE3224	1	360	240	240
AE3324	3	360	360	240
AE3424	19" Rack	360	480	240
AE4424	2 off 19" Rack	480	480	240
AE7724	3 off 19" Rack	720	720	240

## OTHER ENCLOSURES

Enclosures are available for single and multiple units to meet the following and other requirements:

- IP54 for N-Protection conditions
- NEMA 4 Watertight
- NEMA 12 Oiltight

For full details contact our Sales Office.