AMELEC

SIGNAL CONDITIONING

Complete Industry A Series Catalogue

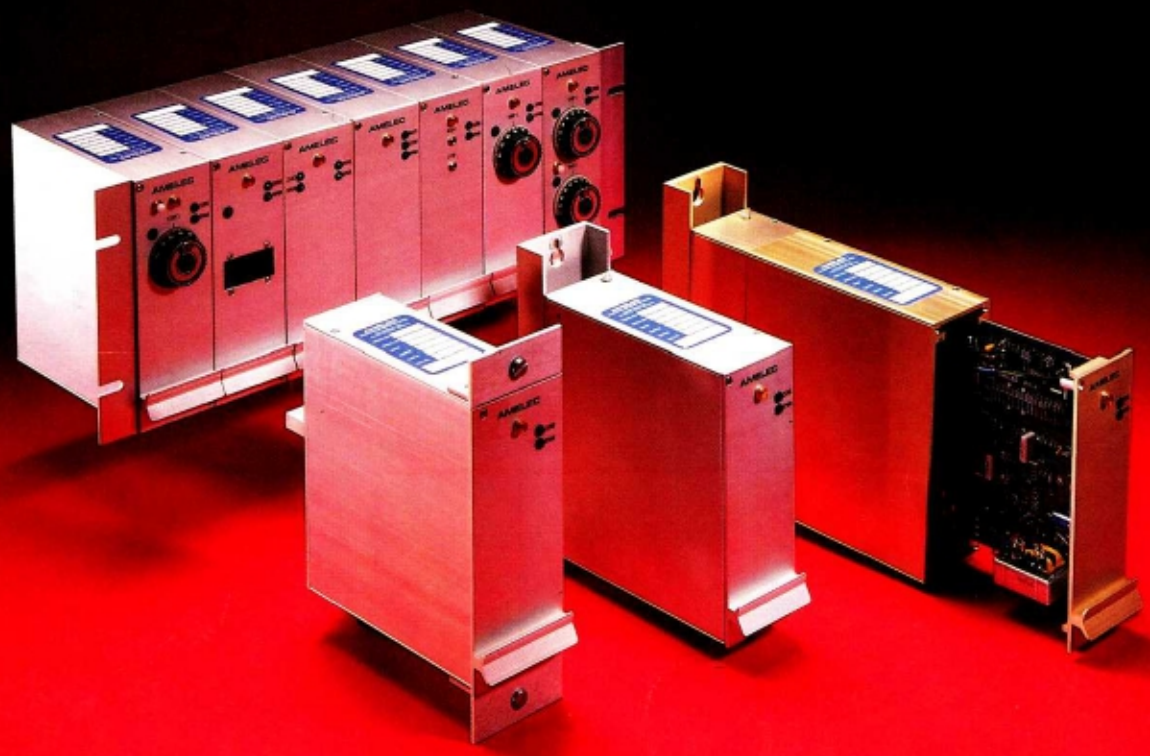
ACC Series

AMELEC
Signal Conditioning

INDUSTRY STANDARD 'A' RANGE

ACC SERIES ARITHMETIC UNITS

The range includes AMT signal transmitters, ATA trip amplifiers and AGS special products
Please see our other catalogues



- Applications include addition, subtraction, multiplication, division, linearisation and many other functions.
- Some models suitable for input from thermocouple, millivolt, RTD, slidewire, single or multiple process sources.
- Supply voltages of 120VAC, 240VAC, or 24VDC available at no additional cost. All units individually fused and front panel supply indicators fitted.
- Digital indication of input may be specified, scaled as a percentage of input span or in engineering units.
- RFI protection to BS6667, Part 3 available for all units.
- Manufactured and tested to BS5750, Part 2.
- AMELEC standard 10 year guarantee.

Specification

PLEASE NOTE: This specification covers all units in the range except where modified by individual instrument specification sheets.

INPUT DATA

Input source

For details see individual specification

Open circuit response

For details see individual specification.

Input impedance (Voltage input)

>1Mohm at amplifier input. This will be shunted by burnout drive or input conditioning components.

SUPPLY DATA

Power supplies

AC models	115VAC ± 20% 230VAC ± 20%
DC models	24VDC ± 2.5V

Consumption

(Typical unit)	3VA

OUTPUT DATA

Response time

<400mSec. Unless otherwise stated.

Output signals (Analogue)

Any constant current from 0-100uA to 0-20mA (at up to 20V loop) or any constant voltage from 0-1V or 0-10V (at up to 20mA loading).

For other types of output, please see the individual instrument specification sheet.

Controls

ZERO	± 25%
SPAN	± 50%

CONDITIONS

Ambient temperature

Working	-20°C to +60°C
Storage	-40°C to +70°C

Humidity

From 5% to 95% R.H.

Vibration

1g at 15Hz to 150Hz.

ELECTRICAL STANDARDS

Insulation input-contacts-earth-channel

1000V RMS continuous. 2000V for 20uSec. Derate to 500VDC for option 'K' enclosures.

Fusing

Power supply fused. Spare fuse mounted on PCB.

WIRING AND MOUNTING

Terminals

For conductors up to 2.5mm².

Weight

1.5kg approximately, when mounted in enclosure.

Position

Any position is acceptable, except if option 'R' is fitted, when the front panel must be vertical.

Types of mounting

Wall, panel, single end access and rack. Precision extruded aluminium construction. Standard units are Anodised, option 'K' units are 'Alochromed'.

Additional protection

Enclosures are available to NEMA 12 oiltight, NEMA 4 watertight and IP54 for N-protection.

PERFORMANCE

Series mode rejection

<0.1% error for 50Hz input at 5% of span amplitude.

Common mode rejection

<0.1% error for 250V RMS.

Temperature effect on zero

<0.02% per °C.

Temperature effect on span

<0.01% of span per °C or <0.1°C per °C, whichever is the greater.

Temperature effect on suppression/elevation

<0.02% of suppression/elevation per °C.

Supply voltage effect

<0.01% per % input change.

RFI rejection

Standard enclosures are inherently RFI proof due to their solid aluminium construction. However, for extra protection to BS6667, specify option 'K'.

Permissible input overload

mV input	20V
DC voltage input	200V
DC current input	500%
AC voltage input	200%
AC current input	500%
Resistance input	6V

ACC311, scale and bias transmitter

Models may be specified for input from thermocouple, millivolt, RTD, slidewire or process source.

When RTD or slidewire input is specified, third wire compensation is standard to reduce the effect of lead resistance. Thermocouple units have automatic cold junction compensation.

The output span may represent any portion of the input span, with control of offset and gain being either by multiturn potentiometers, accessible through the front panel, or by calibrated dials - optionally ten turn - mounted on the front panel.

Output may follow input (rising input = rising output) or have a reversed characteristic (rising input = falling output).

Many other combinations are possible since the unit is designed to be customised to suit individual applications. Please consult our Technical Sales Department for further details.

ACC312, square root extractor

This unit is designed to operate with any standard process voltage or current source.

It regards both input and output span - which need not necessarily be the same - as 0-1 and will convert 0.01 - 1 (1-100%) of input span to 0.1 - 1 (10-100%) of output span, using a square root law.

Since output accuracy is not specified below 1% input (10% output) a zero cut-off is fitted which will operate when the input moves into this region. It is normally preset to 0.5% and, while the input is between 0% and this level, the output will remain at 0%.

ACCURACY:	<0.25% while input remains between 1% and 100%
LINEARITY:	<0.25% while input remains between 1% and 100%.
RESPONSE TIME:	<1Sec for the output to settle within tolerance after an input step change from 5% to 95%.

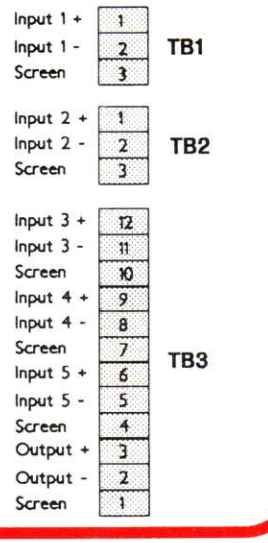
ACC313, high/low selector

This will accept up to five process voltage or current sources, which need not necessarily be of the same type but do share a common 0V.

The output span may be configured to be proportional to either the highest or lowest of these inputs; selection being by on-board link.

Input and output wiring is shown to the right. For supply wiring, please turn to page ten.

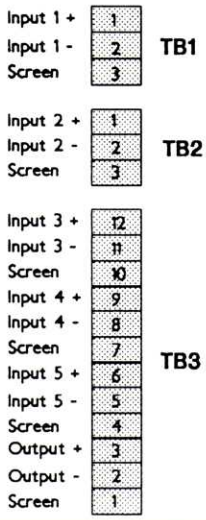
INPUT/OUTPUT WIRING



Arithmetic units

ACC314, averager/adder/subtractor

INPUT/OUTPUT WIRING



These units will accept up to five current or voltage inputs, which need not necessarily be of the same type but do share a common 0V. These inputs may carry any sensible weighting, to suit specific requirements.

The unit may be configured to perform a wide variety of addition and subtraction functions and these are best explained with typical examples:-

(a) $O/P = \frac{I/P1 + I/P2 + I/P3}{3}$ (b) $O/P = \frac{I/P2}{2} + \frac{I/P3}{3} + (5 \times I/P4) - I/P1$

(c) $O/P = (.3 \times I/P1) + (.2 \times I/P2) + (.6 \times I/P3) - (.5 \times I/P4) - (.01 \times I/P5)$

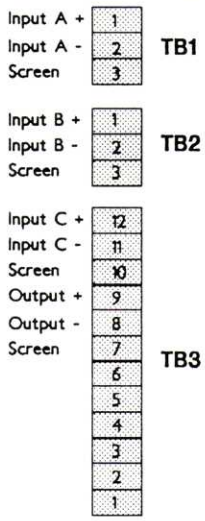
(d) $O/P = \frac{I/P2}{2} + \frac{I/P4}{4} + 0.5$

Many other combinations are possible since the unit is designed to be customised to suit individual applications. Please consult our Technical Sales Department for details.

Input and output wiring is shown to the right. For supply wiring, please see page ten.

ACC315, multiplier/divider

INPUT/OUTPUT WIRING



This will accept up to three standard voltage or current process control signals, which need not necessarily be of the same type but do share a common 0V. To suit specific applications, these inputs may carry any weighting from 10% to 200% or zero offset up to ± 300%.

Assuming equal weighting, the functions carried out by this unit are as follows:

MULTIPLIER = A X B. DIVIDER = $\frac{A}{B}$ or $\frac{A}{C}$ MULTIPLIER/DIVIDER = $\frac{A \times B}{C}$

LINEARITY:	Multiply only.	<0.2% over 20 : 1 range.
	Divide only	<0.5% over 3 : 1 range
	Multiply/divide	<1% over 30 : 1 range

Input and output wiring is shown to the right. For supply wiring, please see page ten.

ACC316, high/low limiter

Models may be specified for input from thermocouple, millivolt, RTD, slidewire or process source.

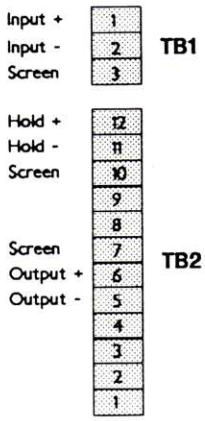
When RTD or slidewire input is specified, third wire compensation is standard to reduce the effect of lead resistance. Thermocouple units have automatic cold junction compensation.

Under normal conditions, the output will follow the input. However, two additional controls are fitted to establish upper and lower limits on the output.

The HIGH limit may be adjusted over the range 40% to 100% and the LOW limit over the range 0% to 60%. Both these controls may be either blindset potentiometers accessible through the front panel or calibrated dials, optionally ten turn, mounted on the front panel.

ACC319, sample/hold transmitter

INPUT/OUTPUT WIRING



This unit is designed to operate with any standard process voltage or current source.

When the unit is in 'SAMPLE' mode, the output will follow the input with little or no delay but, when put into 'HOLD' mode, the output will remain at the level it was at, when put into this mode, indefinitely. Digital techniques are employed to ensure that the held output will not 'droop', no matter how long the unit is kept in this mode.

'SAMPLE'/'HOLD' control may be by normally open or normally closed contact or by normally high or normally low voltage drive of between 5V and 12V.

Control is effected with a single drive, wired to the 'HOLD' input, with the customer specifying which mode is required for which control condition.

This unit may also be supplied as a peak detector, where the output will follow the input all the while it is rising but will remain at the highest level so far attained if the input falls. When used in this mode, the 'HOLD' input acts as a 'RESET', setting the output to zero.

Input and output wiring is shown to the right. For supply wiring, please see page ten.

ACC321, lead/lag transmitter

This unit is designed to operate with any standard process voltage or current source.

When operated in 'LAG' mode, the output will follow the input with a limit on the output rate of change. This limit is digitally derived and is extremely linear.

When operated in 'LEAD' mode, if the input undergoes a step change, the output will also make a step change, in the same direction, then ramp to the new output level at the desired rate. The output step change may be set anywhere in the range 10% - 1000%.

Two separate digital ramp generators are included, each adjustable from 1 Sec to 6000 Secs for a 100% output change. It is therefore possible, in both modes, to have different rates of change for rising and falling outputs; allowing, for instance, a very slow increase of current into an actuator but a very rapid decrease in current, should the input to the unit drop.

The ACC321, in 'LAG' mode, replaces the analogue version of this product, the ACC318.

ACC322, lineariser

Models may be specified for input from thermocouple, millivolt, RTD, slidewire or process source.

When RTD or slidewire input is specified, third wire compensation is standard to reduce the effect of lead resistance. Thermocouple units have automatic cold junction compensation.

The unit is, however, most notably used to linearise the output of flow transmitters, radiation pyrometers, etc., by means of an eight break point lineariser. This wll give a straight-line approximation to correct the input curve.

The same unit will generate mathematical curves, such as Sine, Cosine, square, square root and many others from a linear input drive.

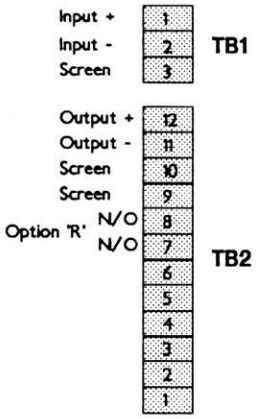
LINEARITY: Better than a 10 : 1 improvement over input curve.

RESPONSE TIME: <500mSec to respond within tolerance to an input 95% step change.

Arithmetic units

ACC353, linear integrator

INPUT/OUTPUT WIRING



This unit is designed to accept input from any standard voltage or current source.

It will provide continuous integration and totalisation of quantities such as; flow, BTU, watt/hours volt/hours, etc.

Output pulses are 24V, 30mSec and are suitable for driving most electro-mechanical counters. If option 'R' is specified, output is also 30mSec pulses from a set of voltage free contacts. When this option is specified, the unit must be mounted with the front panel vertical.

Output pulse rate is continuously adjustable from 0 - 50 to 0 - 50000 pulses per hour.

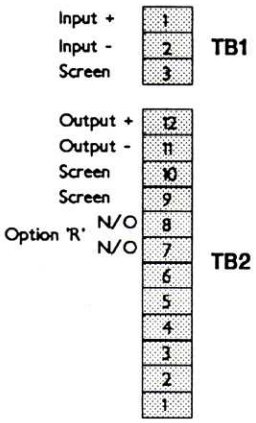
To ensure that spurious pulses are not generated at very low input levels, a zero cut-off control is fitted. This may be adjusted from 0 - 2% of input but is normally preset to .5%.

Additional options for this product:- 'D6'. 6 digit resettable counter on front panel.
'D8'. 8 digit non-resettable counter on front panel.

Input and output wiring is shown to the right. For supply wiring, please see page ten.

ACC354, square root integrator

INPUT/OUTPUT WIRING



This unit is designed to accept input from any standard voltage or current source.

It will provide continuous integration and totalisation of the output of devices such as; d/p flow transmitters, etc and, since it uses a square root law, enables total flow to be displayed in engineering units,

Output pulses are 24V, 30mSec and are suitable for driving most electro-mechanical counters. If option 'R' is specified, output is also 30mSec pulses from a set of voltage free contacts. When this option is specified, the unit must be mounted with the front panel vertical.

Output pulse rate is continuously adjustable from 0 - 50 to 0 - 50000 pulses per hour.

To ensure that spurious pulses are not generated at very low input levels, a zero cut-off control is fitted. This may be adjusted from 0 - 2% of input but is normally preset to .5%.

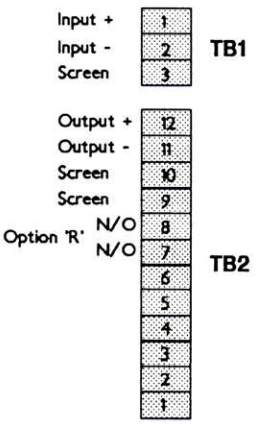
Options 'D6' and 'D8' are not available for this product.

LINEARITY: <0.25% for inputs from 1 - 100%. Below 1% input, output is not specified.

Input and output wiring is shown to the right. For supply wiring, please see page ten.

ACC355, pulse scaler

INPUT/OUTPUT WIRING



This unit will accept input from any sine, square or triangular waveform from 100Hz to 10000Hz, provided the positive peak level exceeds the threshold level.

The pulses are converted to an analogue level, optimised, then used to generate output pulses.

Output pulses are 24V, 30mSec and are suitable for driving most electro-mechanical counters. If option 'R' is specified, output is also 30mSec pulses from a set of voltage free contacts. When this option is specified, the unit must be mounted with the front panel vertical.

Output pulse rate is continuously adjustable from 0 - 50 to 0 - 50000 pulses per hour.

To ensure that spurious pulses are not generated at very low input levels, a zero cut-off control is fitted. This may be adjusted from 0 - 2% of input but is normally preset to .5%.

Additional options for this product:- 'D6'. 6 digit resettable counter on front panel.
'D8'. 8 digit non-resettable counter on front panel.

Input and output wiring is shown to the right. For supply wiring, please see page ten.

ACC371/ACC372, rate of change

When specified as ACC371, the unit will accept input from any standard process voltage or current source.

When specified as ACC372, the unit will accept input from thermocouple, millivolt source, RTD, slidewire or potentiometer input.

When RTD, slidewire or potentiometer input is specified, third wire compensation is standard, to reduce the effect of lead resistance. Thermocouple units have automatic cold junction compensation.

The unit will monitor the rate of change of a rising or falling input ramp. This ramp may be anywher in the range 0 - 10 Secs to 0 - 4000 Secs for a 100% change. Response time is dependant on ramp rate; the unit monitoring period being set to 1% of total ramp time.

Output may be proportional to a rising input, a falling input or both. In this latter case, the output is normally set to be 50% with no input change; rising to 100% for a maximun rate rising ramp and falling to 0% for a maximum rate fallig ramp.

ACCURACY: <1%
LINEARITY: <1%

ACC374/ACC375, ramp generators

These will generate a linear output ramp in response to two inputs; one will produce a rising output and one a falling output.

These two inputs may be normally open or normally closed contacts or normally high or normally low voltage drive from TTL to 12V levels. They may also be fitted as 'RAISE' and 'LOWER' pushbuttons on the front panel.

Two modes of operation are possible. In one mode, each individual contact closure or voltage pulse will give an approximate 0.1% increase or decrease in output level. 1018 such input pulses would be required for a 100% output change.

In the second mode, an internal clock provides the individual pulses; the clock being activated and steered to the 'up' or 'down' drive by an appropriate input pulse and remaining in operation only while the input pulse is active. In this mode, the clock speed may be set for a 100% ramp from 1 Sec to 4000 Secs.

In both modes, the output will remain constant, with no 'droop', in the absense of input signals.

The ACC374, upon reaching 100% output, will 'overflow' to 0% upon receipt of a further 'RAISE' input. Similarly if at 0%, it will 'underflow' to 100% upon receipt of a further 'LOWER' input. The ACC375, however, has limits at 0% and 100% which prevents this occurring

A/D and D/A conversion

ACC376 A/D conversion

Under this generic heading, Amelec supply a wide range of A/D conversion products, including 3, 3½ and 4 digit BCD or 12, 14 and 16 bit binary. Various models offer latched output or computer interrogation.

ACC378 D/A conversion

This is also a generic heading which covers a range of 3, 3½ and 4 digit BCD or 12, 14 and 16 bit binary D/A products.

In both ranges, performance is dependant on requirements. Please ask for our A/D, D/A conversion product list.

Options

Option 'DI', digital display

This is a 3½ digit indicator which is available in 8mm red or green LED or 12mm LCD. It will display any level from -1999 to +1999 and has it's own internal gain and offset controls allowing, for instance, full scale indication over a small portion of actual input span.

When this option is specified, the display will indicate input, output or other variables within the unit; these latter being read by pushbutton.

Under normal conditions, the display will indicate the input to the unit, either as a percentage of total input or in engineering units. When a pushbutton is pressed, the display will indicate that level, in the same units, allowing accurate comparison.

Available with most of the options listed below.

Option 'M', power supply

When fitted, this allows a standard unit to provide power to an external device, such as a strainguage, input pre-amplifier or a 2-wire transmitter.

The output is adjustable over the range 2-25V at any current up to 25mA by an internal potentiometer which may, optionally, be fitted to the front panel. Load variation is better than 10mV over the full current range.

Depending on application, the output of this power supply may be wired to terminal block 2 or to unused terminals on terminal block 3. When used to power a 2-wire transmitter, the power supply output is wired internally on the unit in series with the current sensing shunt resistor, allowing full 2-wire operation.

Available with most of the options listed below.

Other options

Suffix	Description
/D6	6 Digit resettable counter. (ACC353 and ACC355 only)
/D8	8 Digit non-resettable counter. (ACC53 and ACC355 only)
/DA	Analogue indication of input or output llevel
/J	Input test injection jack.
/K	RFI protection to BS6667 Part 3.
/P	Calibration test point.
/R	Pulse output from mercury wetted relay. (ACC353, ACC354 and ACC355 only)

Some combinations of options are physically incompatible. If in doubt, please contact our Technical Sales.

All the units in the range are supplied in an Anodised or Alochromed extruded aluminium enclosure which may be surface or panel mounting, single end access or 7 way 19" rack.

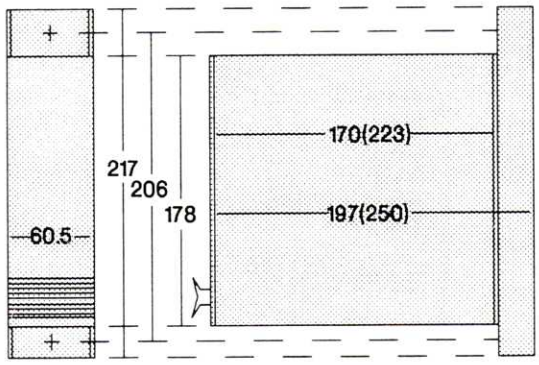
When a unit is fitted into an enclosure, the edge connector at the rear of the main printed circuit board mates with a socket which is wired to the terminal blocks. The unit is retained in the enclosure by two M3 screws which pass through countersunk holes in the front panel and into tapped holes at the front of the enclosure.

The 'U' channel terminal cover is supplied in two sizes to suit different mounting requirements. For surface mounting units, the 217mm length is supplied and includes the fixing holes. For panel, single end access or rack mounting, the 178mm length is supplied but only when options 'K' or 'EXI' are specified. When supplied, they must be replaced after wiring.

Units may be mounted at any orientation although they would normally be mounted with the front panel vertical. Surface or single end access units should not be mounted closer than 61mm horizontally or 218mm vertically. Panel units should not be mounted closer than 70mm horizontally or 234mm vertically and racks should not be mounted closer than 485mm horizontally or 189mm vertically. All types would normally be mounted further apart than this to ease wiring. At least 180mm must be left at the front of all enclosures to allow for unit withdrawal.

In the following drawings, all dimensions are in mm. Figures in brackets show the added depth of the 'K' enclosures to house the RFI protection components.

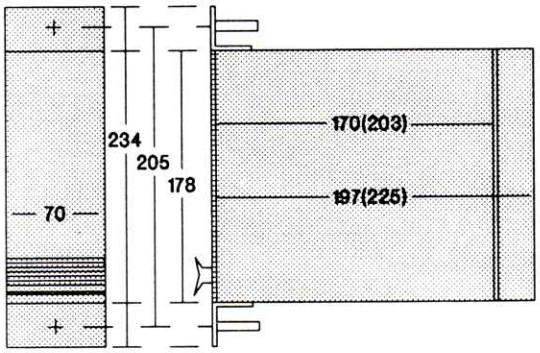
Surface mounting



Before wiring, the unit must be withdrawn from the case, which may then be removed from the 'U' channel by undoing the M4 screw at the top rear of the case, hinging the case downwards and unhooking it from the fixed peg at the lower rear of the case. This exposes the terminal blocks for wiring.

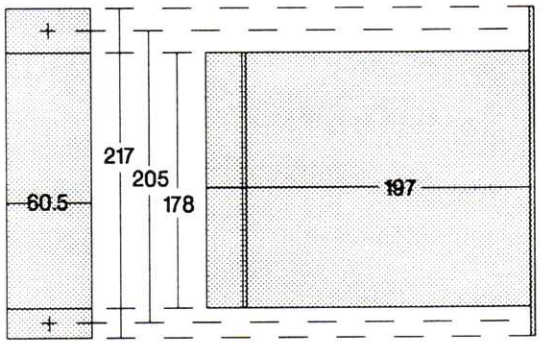
Slots are provided in the terminal plate which allow cables to be passed along the 'U' channel, through the slots and into the terminal blocks. After wiring, the enclosure may be reassembled by reversing these instructions.

Panel mounting



A 65mm wide by 190mm high aperture must be cut in the front panel with 6mm fixing holes above and below. The brackets and front panel are wider than the aperture to obscure any cut edges.

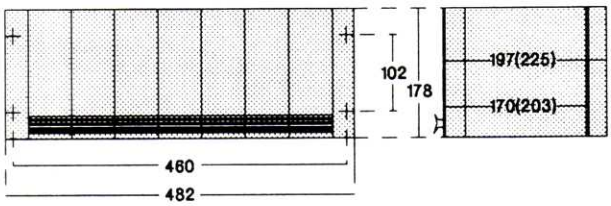
Single end access



This enclosure is not recommended for use with option 'K'

In this arrangement the terminal blocks are mounted on the front panel, although the enclosure is surface mounted. Since the terminals are on the removable part of the unit, allowance must be made, when wiring, to allow for unit withdrawal without disturbing the wiring to adjacent units or the main loom.

19" Rack mounting



Up to seven units may be mounted in a 19" rack, although other widths may be supplied to suit special requirements.

The rack is normally supplied with fixing brackets to suit panel mounting (as shown above) but may also be supplied for single end access if required.

A 179mm high by 440mm wide aperture must be cut in the panel with fixing holes on 102mm by 460mm centres.

WIRING

Input, output and supply connections are made via leaf type terminal blocks which are mounted on the front of single end access enclosures and at the rear on all other 'A' series types. These terminal blocks will accept cables up to 2.5mm².

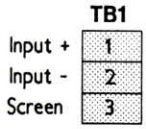
On most enclosures, other than panel mount, the terminals are separated into two groups by an earthed barrier which is part of the terminal mounting plate.

This barrier, together with the 'U' section terminal cover, ensures that input cables must enter from the top of the unit and supply/output cables from below. This helps meet the requirements of 'N' protection for intrinsically safe installations.

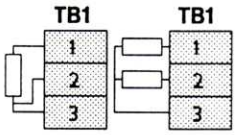
Input wiring

In many cases, particularly with multiple input units, input wiring details are given in the individual instrument specification sheets. However, many units are specified for single input from process, millivolt, RTD or thermocouple sources. Details of all types of connector are given below.

Thermocouple, millivolts, process.

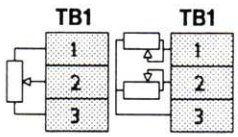


Resistance temperature sensor (RTD)



The above drawing shows the alternative wiring for single and differential input.

Slidewire or potentiometer



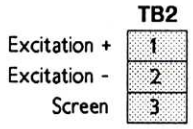
The above drawing shows the alternative wiring for single and differential input.

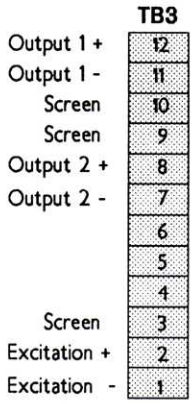
Input access

No matter what type of mountinng is used, input wiring access is almost invariably from the left and this convention has been followed on the input drawings.

Output/excitation wiring

Where output wiring is specific to a particular product, wiring details are given in the individual instrument specification sheets. Standard output wiring is shown below.





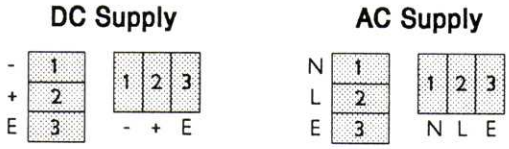
The second output shown above is available only if specified at time of order.

When option 'M' is specified, the excitation output may appear at either of the two alternative positions shown above.

Output access

For panel, single end access or rack mounting units, output wiring access is from the right. For surface mounting units, wiring access is from the left, as shown above.

Supply wiring



Supply access

For panel, single end access or rack mounting units, output wiring access is from below. For surface mounting units, wiring access is from the left.

Expansion to the range

The 'AH' range is still comparativeely recent and is constantly being expanded. If the application you require is not covered in this catalogue, please contact out Technical Sales Department as the product may already be in process of being engineered.

AGS products

Over the years, Amelec have been called upon to solve a wide variety of process control problems. Many of the resultant products have proved so successful they have become part of our standard range. Indeed, some appear in this catalogue as standard products.

Other products, however, are specifically designed to solve a particular problem. These models do not have sufficient demand to become standard products but, since they are manufactured to the same standard, they are kept on file, ready to solve similar problems for subsequent clients.

If you have a process control problem, please ask for our shortform AGS list. Alternatively, contact our Technical Sales Department, giving full details of the problem and they will either recommend an existing AGS product or design one to suit your particular application.

Warranty and service

All Amelec products are guaranteed for ten years against faulty components or manufacture but not against misuse.

To claim under this warranty, equipment should be returned, carriage paid by the customer, to Amelec Instruments, Cochran Close, Crownhill, Miton Keynes, MK8 0AJ, together with details of the fault.

Attempted repairs or component replacement during the warranty period may render the warranty null and void, unless authorised by Amelec.

Amelec will undertake any repairs and will also supply replacement printed circuit board assemblies on an exchange price basis. Please contact the Technical Sales Department for further details.

Where the reported fault is a site problem, Amelec will make their own technical staff available to offer assistance. This service will be charged to the customer at the rate currently in force.

Ordering

When ordering, please give the following details:-

1. Model number
2. Supply voltage and frequency
3. Mounting - Surface, Panel, Single end access or Rack
4. Input span, output span, offset and source
5. Open circuit response - If not specified, default is upscale for thermocouple, millivolt and resistance input units, downscale for process
6. Relay status and mode - If not specified, default is normally energised and single trips are set to Hi, double trips to Hi/Lo. LEDs are lit when relays are energised
7. Any options required
8. Information appropriate to any options ordered

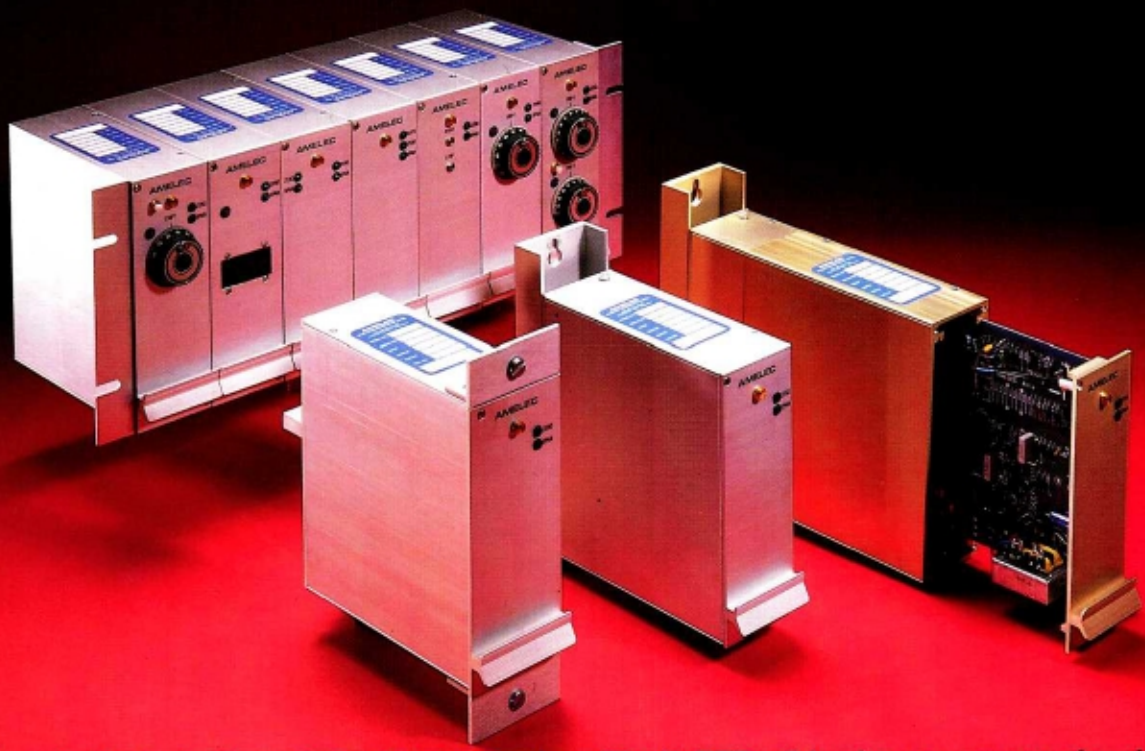
AMT Series

AMELEC
Signal Conditioning

INDUSTRY STANDARD 'A' RANGE

AMT SERIES SIGNAL TRANSMITTERS

The range includes ATA trip amplifiers, ACC arithmetic units and AGS special products
Please see our other catalogues



- Suitable for input from thermocouple, millivolt, RTD, slidewire or process signals.
- Models available for single output, double output (optionally isolated), single trip, double trip or two completely isolated transmitters within one enclosure.
- Trip points set by single turn lockable dial with 100mm scale length. Other controls easily accessible through the front panel.
- Supply voltages of 120VAC, 240VAC, or 24VDC available at no additional cost. All units individually fused and front panel supply indicators fitted.
- Digital indication of input and trip points may be specified, scaled as a percentage of input span or in engineering units.
- RFI protection to BS6667, Part 3 available for all units.
- Manufactured and tested to BS EN ISO 9002
- AMELEC standard 10 year guarantee.

Specification

INPUT DATA

Input source

For details see individual specification

Open circuit response

For details see individual specification.

Input impedance (Voltage input)

>1Mohm at amplifier input. This will be shunted by burnout drive or input conditioning components.

SUPPLY DATA

Power supplies

AC models	115VAC ± 20% 230VAC ± 20%
DC models	24VDC ± 2.5V
2 wire	12 - 60VDC

Consumption

Single transmitter	3VA
Double transmitter	4VA
Transmitter/single trip	4VA
Transmitter/double trip	5VA
Dual channel transmitter	6VA
2 Wire transmitter	250mW

OUTPUT DATA

Output signals (Each output)

Standard units.

Any constant current from 0-100uA to 0-20mA (at up to 20V loop) or any constant voltage from 0-1V to 0-10V (at up to 20mA loading). Double transmitters need not necessarily be specified for similar outputs.

2 Wire units.

4-20mA or 10-50ma into up to 48V loop when operated from a 60VDC power supply.

Response time

<400mSec. Unless otherwise stated

Relay specification

DP/DT for each trip, unless otherwise stated. Contacts are rated at 250VAC, 5A, 100VA (Resistive).

Relay function

Selected by PC link. Default is normally energised, relay to de-energise on trip (fail safe operation).

Relay status

Indicated by a red LED for each trip, mounted on the front panel. Lit when relay is energised.

Controls

ZERO	± 25%
SPAN	± 50%
TRIP (When fitted)	0-100%
DEADBAND (When fitted)	1-20%

CONDITIONS

Ambient temperature

Working	-20°C to +60°C
Storage	-40°C to +70°C

Humidity

From 5% to 95% R.H.

Vibration

1g at 15Hz to 150Hz.

ELECTRICAL STANDARDS

Insulation Input-output-contacts-earth-channel

1000V RMS continuous. 2000V for 20uSec. Derate to 500VDC for option 'K' enclosures.

Fusing

Power supply fused. Spare fuse mounted on PCB.

WIRING AND MOUNTING

Terminals

For conductors up to 2.5mm².

Weight

1.5kg approximately, when mounted in enclosure.

Position

Any position is acceptable.

Types of mounting

Wall, panel, single end access and rack. Precision extruded aluminium construction. Standard units are Anodised, option 'K' units are 'Alochromed'. An IP65 enclosure is also available for 2 wire units only.

Additional protection

Enclosures are available to NEMA 12 oiltight, NEMA 4 watertight and IP54 for N-protection.

PERFORMANCE

Input/output linearity

<0.1% error, unless otherwise stated.

Series mode rejection

<0.1% error for 50Hz input at 5% of span amplitude.

Common mode rejection

<0.1% error for 250V RMS.

Temperature effect on zero

<0.02% per °C.

Temperature effect on span

<0.01% of span per °C or <0.1°C per °C, whichever is the greater.

Temperature effect on suppression/elevation

<0.02% of suppression/elevation per °C.

Supply voltage effect

<0.01% per % input change.

Trip adjustment

Infinitely variable by single turn 260° dial on front panel, calibrated 0-100 and lockable. Alternatively, by multi-turn potentiometer accessible through front panel.

Deadband

Standard 1%. Also available adjustable from 1 to 20% by single turn 260° dial or by multiturn potentiometer.

RFI rejection

Standard enclosures are inherently RFI proof due to their solid aluminium construction. However, for extra protection to BS6667, specify option 'K'.

Permissible input overload

mV input	20V
DC voltage input	200V
DC current input	500%
AC voltage input	200%
AC current input	500%
Resistance input	6V

AMT210 series, thermocouple and millivolt

These units will accept input from any BS4937 and ISA B,E,J,K,S,R,T or Pallaplat thermocouple; or millivolt source.

Thermocouple input units have automatic cold junction compensation.

Normal minimum span 4mV, lower ranges available to special order.

Source resistance up to 1000ohms for specified performance.

Open circuit response may be specified as upscale or downscale.

Input impedance 1Mohm, shunted by burnout drive.

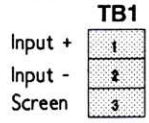
Output proportional to input voltage, or temperature when option 'G' is specified.

Models available

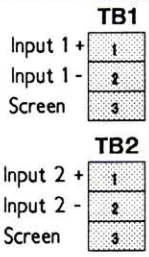
INPUT	Single output	Double output	Transmitter single trip	Transmitter double trip	Double channel
Thermocouple	AMT210	AMT211	AMT212	AMT216	AMT218
Millivolts	AMT213	AMT214	AMT215	AMT217	AMT219

INPUT WIRING

Single channel



Double channel



For output and supply wiring, please turn to page 10.

AMT220 series, resistance temperature sensor

These units will accept input from any 2, 3 or 4 wire resistance temperature sensor.

Third wire compensation is standard to overcome lead resistance variation.

Normal minimum span 10 ohms, lower ranges available to special order.

Differential operation may be specified using 2 X 2 wire sensors.

Open circuit response is normally upscale but may be specified downscale.

Input and third wire drives are constant current, for improved linearity.

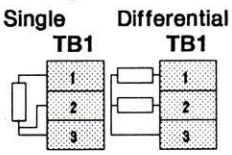
Output proportional to resistance, or temperature when option 'G' is specified.

Models available

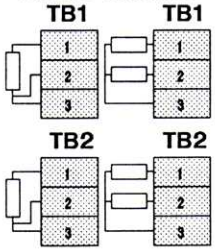
INPUT	Single output	Double output	Transmitter single trip	Transmitter double trip	Double channel
Single	AMT220	AMT221	AMT222	AMT226	AMT228
Differential	AMT223	AMT224	AMT225	AMT227	AMT229

INPUT WIRING

Single channel



Double channel



For output and supply wiring, please turn to page 10.

Transmitters

AMT230 series, process

These units will accept input from any standard DC voltage or current source.

On voltage units, input impedance is 1Mohm.

On current units, the input shunt resistor absorbs a maximum of 400mV, allowing many units to be used in series, even on a modest loop.

Input currents from 0-100uA to 0-100mA or voltages from 0-400mV to 0-200V may be used and any input may carry a 20% offset

The range includes the AMT239 deviation transmitter. This gives an output of 0% when both inputs are equal, rising to 100% at maximum deviation.

Models available

INPUT	Single output	Double output	Transmitter single trip	Transmitter double trip	Double channel
Single	AMT230	AMT231	AMT232	AMT233	AMT238
Deviation	AMT239				

INPUT WIRING

Single channel

TB1

Input + 1
Input - 2
Screen 3

Deviation

TB1

Input 1 + 1
Input 1 - 2
Screen 3

TB2

Input 2 + 1
Input 2 - 2
Screen 3

For output and supply wiring, please turn to page 10.

AMT240 series, slidewire or potentiometer

These units will accept input from any 2 or 3 wire slidewire or potentiometer.

Third wire compensation is standard to overcome lead resistance variation.

Normal minimum span 100 ohms, lower ranges available to special order.

Differential operation may be specified using 2 X 2 wire sensors.

Open circuit response is normally upscale but may be specified downscale.

Input and third wire drives are constant current, for improved linearity.

Output proportional to resistance.

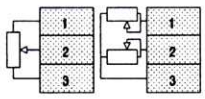
Models available

INPUT	Single output	Double output	Transmitter single trip	Transmitter double trip	Double channel
Single	AMT240	AMT241	AMT242	AMT246	AMT248
Differential	AMT243	AMT244	AMT245	AMT247	AMT249

INPUT WIRING

Single channel

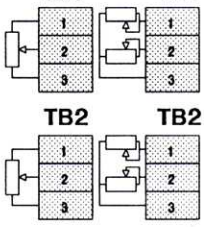
Single TB1 | Differential TB1



Double channel

TB1 TB1

TB2 TB2



For output and supply wiring, please turn to page 10.

AMT250 series, AC voltage or current

These units will respond to the amplitude of an AC voltage or current input.

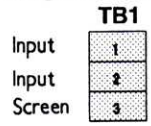
No external transformers are required when monitoring mains supplies. Voltages between 150V and 600V or currents between 1A and 10A are isolated and converted by appropriate transformers mounted on the back plate.

Models available

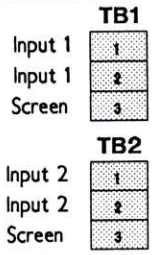
INPUT	Single output	Double output	Transmitter single trip	Transmitter double trip	Double channel
Current	AMT250	AMT251	AMT252	AMT256	AMT258
Voltage	AMT253	AMT254	AMT255	AMT257	AMT259

INPUT WIRING

Single channel



Double channel



For output and supply wiring, please turn to page 10.

AMT270 series, strainguage

The 270 series will accept input from - and supply excitation to - devices such as strain-guages or solid state devices using strainguages to monitor pressure, level, flow etc.

Normal minimum input span is 4mV but lower ranges may be specified to special order.

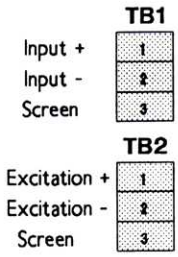
Unit has the facility of very large zero elevations to give a TARE effect in weighing applications. This elevation may be up to ± 400% of span.

Excitation voltage may be adjusted from 3V to 24V and will supply up to 20mA at a regulation of 0.1%. When higher excitation current is required, a range of separately mounted power supplies are available which will supply up to 1A.

Models available

Single output	Double output	Transmitter single trip
AMT270	AMT271	AMT272

INPUT WIRING



For output and supply wiring, please turn to page 10.

AMT280 series, pulse

These units will respond to the frequency of any regular repetitive waveform.

Any waveform may be used, provided the positive peak level exceeds the threshold level.

The threshold is adjustable over a wide range to assist in suppressing input noise.

Any input frequency between 0-25Hz and 0-25kHz may be specified.

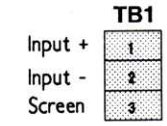
Input level may be anywhere between 50mV and 30V p-p.

Response time is determined by input frequency. Typically it is less than 500mSec but when the maximum input frequency is under 1kHz, it is proportionately increased.

Models available

Single output	Double output	Transmitter single trip	Transmitter double trip
AMT280	AMT281	AMT282	AMT286

INPUT WIRING



For output and supply wiring, please turn to page 10.

Two-wire transmitters

ATW510 series, thermocouple and millivolt

These units will accept input from any BS4937 and ISA B,E,J,K,S,R,T or Pallaplat thermocouple, or millivolt source.

Thermocouple input units have automatic cold junction compensation.

Normal minimum span 4mV, lower ranges available to special order.

Source resistance up to 1000ohms for specified performance.

Open circuit response may be specified as upscale or downscale.

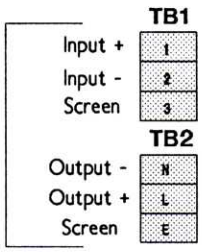
Input impedance 1Mohm, shunted by burnout drive.

Models available

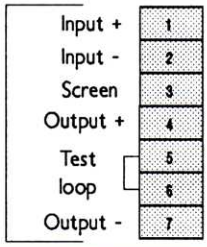
INPUT	Standard mount	IP65 mount
Thermocouple	ATW511	ATW512
Millivolts	ATW516	ATW517

WIRING

Standard mount



IP65 mount



ATW520 series, resistance temperature sensor

These units will accept input from any 2, 3 or 4 wire resistance temperature sensor.

Third wire compensation is standard to overcome lead resistance variation.

Normal minimum span 10 ohms, lower ranges available to special order.

Open circuit response is normally upscale but may be specified downscale.

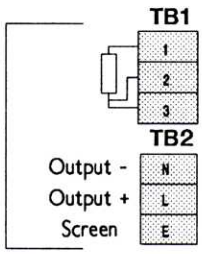
Input and third wire drives are constant current, for improved linearity.

Models available

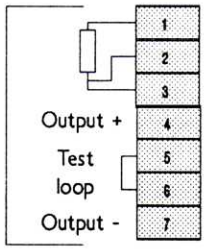
Standard mount	IP65 mount
ATW521	ATW522

WIRING

Standard mount



IP65 mount



ATW530 series, process

These units will accept input from any standard DC voltage or current source.

On voltage units, input impedance is 1Mohm.

On current input units, the shunt resistor absorbs a maximum of 400mV allowing many units to be used in series, even on a modest loop.

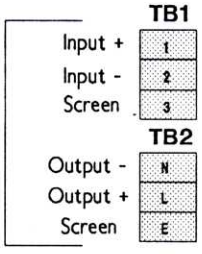
Input currents from 0-100uA to 0-100mA or voltages from 0-400mV to 0-200V may be used and any input may carry a 20% offset.

Models available

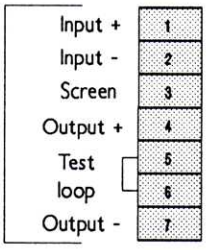
Standard mount	IP65 mount
ATW531	ATW532

WIRING

Standard mount



IP65 mount



ATW540 series, slidewire and potentiometer

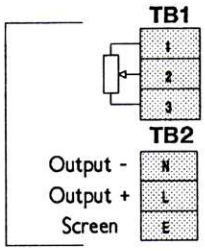
These will accept input from any 2 or 3 wire slidewire or potentiometer.
Third wire compensation is standard to overcome lead resistance variation.
Normal minimum span 100 ohms, lower ranges available to special order.
Open circuit response is normally upscale but may be specified downscale.
Input and third wire drives are constant current, for improved linearity.

Models available

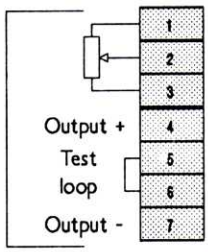
Standard mount	IP65 mount
ATW541	ATW542

WIRING

Standard mount



IP65 mount



APS901 series, power supplies

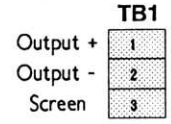
These units are available as single or double channel.
When double channel is specified, the two channels are totally isolated.
Each channel will operate in constant current or constant voltage mode.
Outputs are adjustable over the range 1-25V at up to 25mA: Normally by blindset potentiometer but optionally by single or ten turn calibrated dials.
A prolonged output short circuit will cause no damage to the unit.
Load variation, <0.2%. Supply variation, <0.1%.

Models available

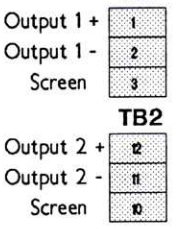
Single channel	Double channel
APS901/1	APS901/2

WIRING

Single channel



Double channel



Other power supplies

When greater output current is required, to operate multiple units for instance, a range of other power supplies are also available from Amelec.

Types available include 12V, 24V and 48V, at output currents of 0.25A, 0.5A and 1A, with output regulation to suit the required application.

Mounting type and size will depend on the actual power requirements but most units are available in single or double width 'A' series enclosures.

Please contact our Technical Sales Department with your specific requirements.

Options

Option 'DI', digital display

This is a 3½ digit indicator which is available in 8mm red or green LED or 12mm LCD. It will display any level from -1999 to +1999 and has it's own internal gain and offset controls allowing, for instance, full scale indication over a small portion of actual input span.

When this option is specified, the calibrated trip dials are replaced with blindset potentiometers and 'READ' pushbuttons for each trip point.

Under normal conditions, the display will indicate the input to the unit, either as a percentage of total input or in engineering units. When a pushbutton is pressed, the display will indicate that tripset level, in the same units, allowing very accurate adjustment.

Available with most of the options listed below.

Option 'M', power supply

This is very similar to the APS901/1 described on page 7 but is mounted internally. When fitted, it allows a standard unit to provide power to an external device, such as a strainguage, input pre-amplifier or a 2-wire transmitter.

The output is adjustable over the range 2-25V at any current up to 25mA by an internal potentiometer which may, optionally, be fitted to the front panel. Load variation is better than 10mV over the full current range.

Depending on application, the output of this power supply may be wired to terminal block 2 or to unused terminals on terminal block 3. When used to power a 2-wire transmitter, the power supply output is wired internally on the unit in series with the current sensing shunt resistor, allowing full 2-wire operation.

Available with most of the options listed below.

Other options

Suffix	Description
/B	Remote tripset potentiometers
/C	Ten turn tripset potentiometers with calibrated dials.
/DA★	Analogue indication of input or output level.
/J★	Input test injection jack.
/K★	RFI protection to BS6667 Part 3.
/L	Latched relay - normally reset by pushbutton on front panel.
/P★	Calibration test point.
/S	Sealed relay.
/T	Timed relay - optionally with timer control mounted on the front panel.
/V	Variable deadband (1-20% of span).

Some combinations of options are physically incompatible. If in doubt, please contact our Technical Sales.
Those options marked with an asterisk are also suitable for 2-wire transmitters.

All the units in the range are supplied in an Anodised or Alochromed extruded aluminium enclosure which may be surface or panel mounting, single end access or 7 way 19" rack. Alternatively, some 2-wire transmitters are supplied in a diecast or plastic IP65 enclosure.

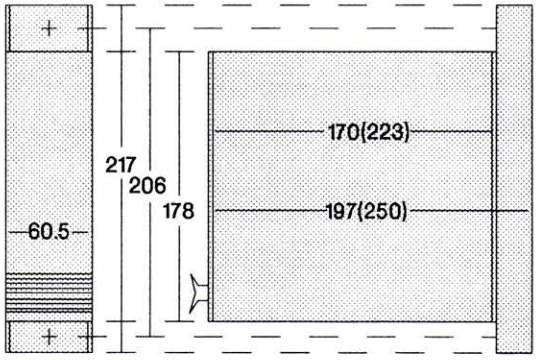
When a unit is fitted into an enclosure, the edge connector at the rear of the main printed circuit board mates with a socket which is wired to the terminal blocks. The unit is retained in the enclosure by two M3 screws which pass through countersunk holes in the front panel and into tapped holes at the front of the enclosure.

The 'U' channel terminal cover is supplied in two sizes to suit different mounting requirements. For surface mounting units, the 217mm length is supplied and includes the fixing holes. For panel, single end access or rack mounting, the 178mm length is supplied but only when options 'K' or 'EXI' are specified. When supplied, they must be replaced after wiring.

Units may be mounted at any orientation although they would normally be mounted with the front panel vertical. Surface or single end access units should not be mounted closer than 61mm horizontally or 218mm vertically. Panel units should not be mounted closer than 70mm horizontally or 234mm vertically and racks should not be mounted closer than 485mm horizontally or 189mm vertically. All types would normally be mounted further apart than this to ease wiring. At least 180mm must be left at the front of all enclosures to allow for unit withdrawal.

In the following drawings, all dimensions are in mm. Figures in brackets show the added depth of the 'K' enclosures to house the RFI protection components.

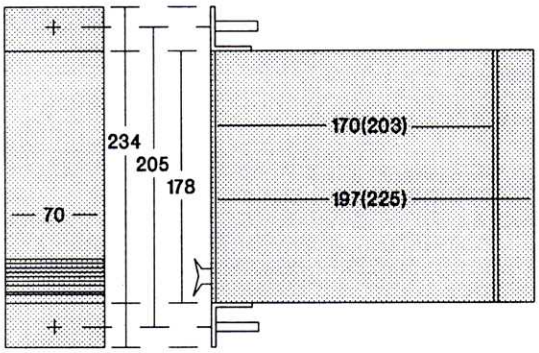
Surface mounting



Before wiring, the unit must be withdrawn from the case, which may then be removed from the 'U' channel by undoing the M4 screw at the top rear of the case, hinging the case downwards and unhooking it from the fixed peg at the lower rear of the case. This exposes the terminal blocks for wiring.

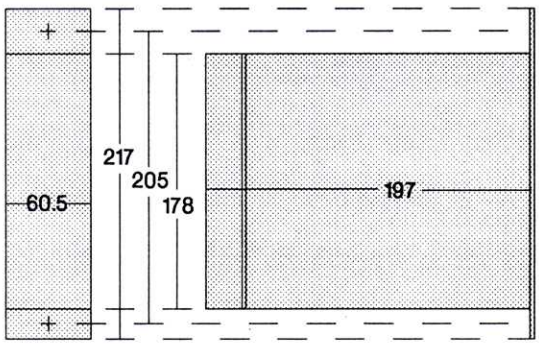
Slots are provided in the terminal plate which allow cables to be passed along the 'U' channel, through the slots and into the terminal blocks. After wiring, the enclosure may be reassembled by reversing these instructions.

Panel mounting



A 65mm wide by 190mm high aperture must be cut in the front panel with 6mm fixing holes above and below. The brackets and front panel are wider than the aperture to obscure any cut edges.

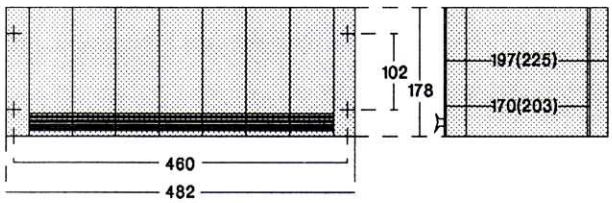
Single end access



This enclosure is not recommended for use with option 'K'

In this arrangement the terminal blocks are mounted on the front panel, although the enclosure is surface mounted. Since the terminals are on the removable part of the unit, allowance must be made, when wiring, to allow for unit withdrawal without disturbing the wiring to adjacent units or the main loom.

19" Rack mounting



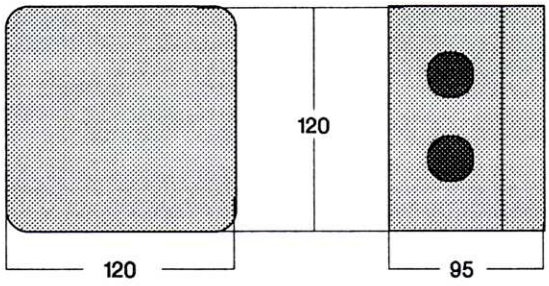
Up to seven units may be mounted in a 19" rack, although other widths may be supplied to suit special requirements.

The rack is normally supplied with fixing brackets to suit panel mounting (as shown above) but may also be supplied for single end access if required.

A 179mm high by 440mm wide aperture must be cut in the panel with fixing holes on 102mm by 460mm centres.

Mounting and wiring

IP65 mounting (2-wire only)



This mounting is available in fibre filled plastic; or diecast aluminium when RFI protection is required. Fixing holes should be drilled on 102mm by 92mm centres.

Access to the fixing screws is obtained by removal of the enclosure lid, although they do not intrude into the actual interior. Two tapped holes are provided which will accept 20mm conduit fittings. When correctly fitted, this will allow pressurised air purged operation.

WIRING

Input, output and supply connections are made via leaf type terminal blocks whinh are mounted on the front of single end access enclosures and at the rear on all other 'A' series types. These terminal blocks will accept cables up to 2.5mm². The IP65 enclosure uses a barrier strip which accepts 4mm spades or eyelets.

On most enclosures, other than panel mount, the terminals are separated into two groups by an earthed barrier which is part of the terminal mounting plate.

This barrier, together with the 'U' section terminal cover, ensures that input cables must enter from the top of the unit and supply/output cables from below. This helps meet the requirements of 'N' protection for intrinsically safe installations.

Input wiring

This is given in the individual specification sheets for the various instrument types.

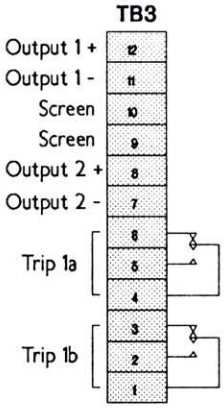
Input access

This is almost invariably from the left, except where shown otherwise. This convention has been followed on input wiring drawings.

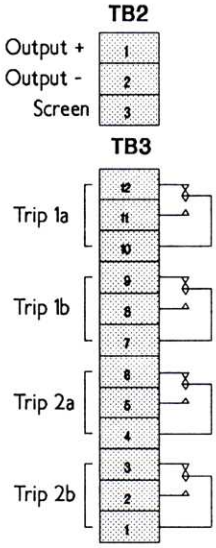
Output/relay wiring

The following two drawings show the combinations of outputs available with this range of instruments. The second output and trip connections shown in the first drawing are only available if specified at time of order.

Single output. Double output.
Single output/single trip. Double channel



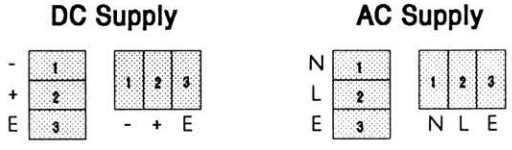
Single output/double trip



Output access

For panel, single end access or rack mounting units, output wiring access is from the right. For surface mounting units, wiring access is from the left, as shown above.

Supply wiring



Supply access

For panel, single end access or rack mounting units, output wiring access is from below. For surface mounting units, wiring access is from the left.

Expansion to the range

The 'AH' range is still comparativeely recent and is constantly being expanded. If the application you require is not covered in this catalogue, please contact out Technical Sales Department as the product may already be in process of being engineered.

AGS products

Over the years, Amelec have been called upon to solve a wide variety of process control problems. Many of the resultant products have proved so successful they have become part of our standard range. Indeed, some appear in this catalogue as standard products.

Other products, however, are specifically designed to solve a particular problem. These models do not have sufficient demand to become standard products but, since they are manufactured to the same standard, they are kept on file, ready to solve similar problems for subsequent clients.

If you have a process control problem, please ask for our shortform AGS list. Alternatively, contact our Technical Sales Department, giving full details of the problem and they will either recommend an existing AGS product or design one to suit your particular application.

Warranty and service

All Amelec products are guaranteed for ten years against faulty components or manufacture but not against misuse.

To claim under this warranty, equipment should be returned, carriage paid by the customer, to Amelec Instruments, Cochran Close, Crownhill, Miton Keynes, MK8 0AJ, together with details of the fault.

Attempted repairs or component replacement during the warranty period may render the warranty null and void, unless authorised by Amelec.

Amelec will undertake any repairs and will also supply replacement printed circuit board assemblies on an exchange price basis. Please contact the Technical Sales Department for further details.

Where the reported fault is a site problem, Amelec will make their own technical staff available to offer assistance. This service will be charged to the customer at the rate currently in force.

Ordering

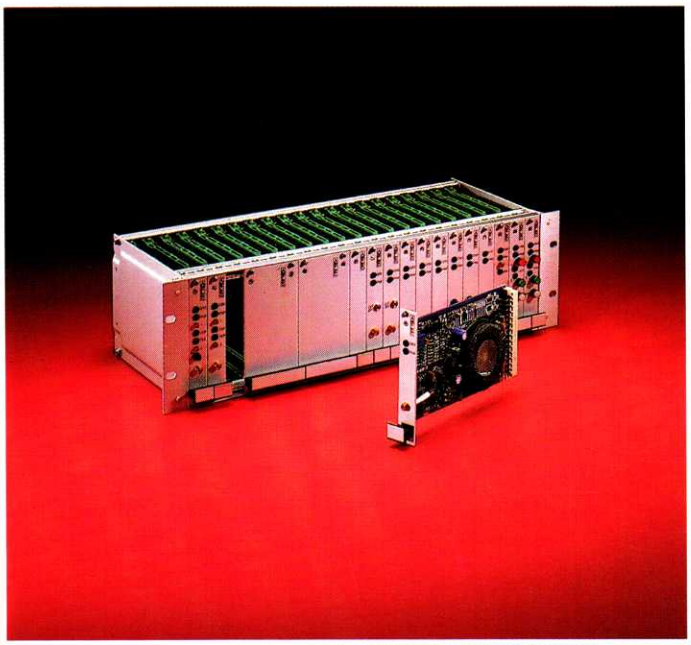
When ordering, please give the following details:-

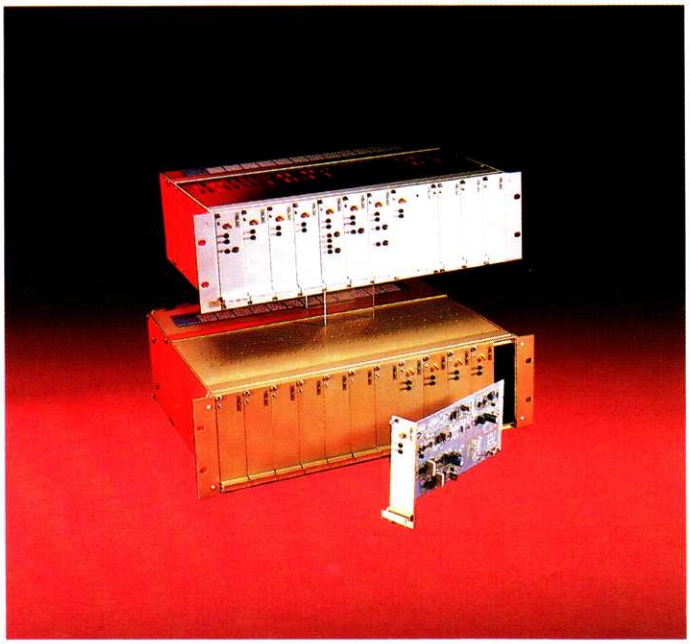
1. Model number
2. Supply voltage and frequency
3. Mounting - Surface, Panel, Single end access or Rack
4. Input span, output span, offset and source
5. Open circuit response - If not specified, default is upscale for thermocouple, millivolt and resistance input units, downscale for process
6. Relay status and mode - If not specified, default is normally energised and single trips are set to Hi, double trips to Hi/Lo. LEDs are lit when relays are energised
7. Any options required
8. Information appropriate to any options ordered

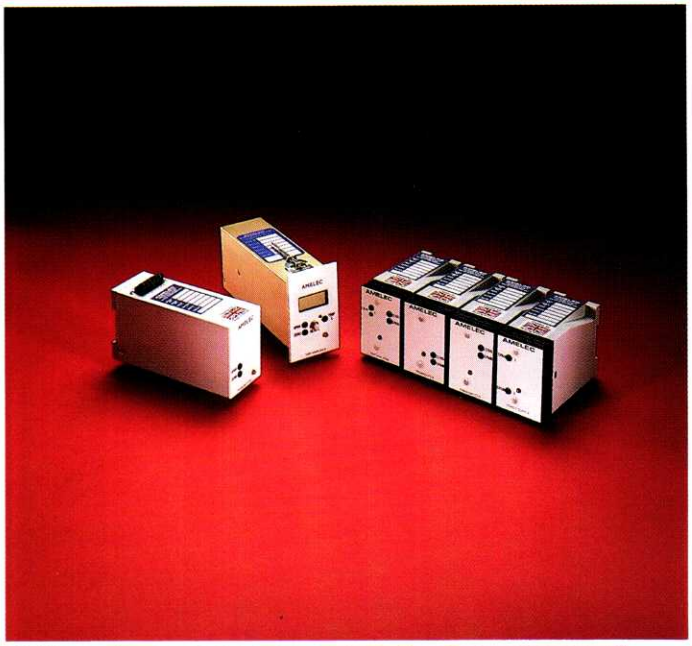
A complete range of Trip amplifiers, Signal conditioners and Arithmetic units are also available in these complementary ranges:-

A 4U X 12E Surface, Panel, SEA and Rack **AB** 3U X 7E Rack. **AD** DIN rail and Surface. **AH** 3U X 4E Rack

Please ask for our other catalogues







Cochran Close Crownhill Milton Keynes MK8 0AJ

www.amelec-uk.com Tel: 01908 567003 Fax: 01908 566735 sales@amelec-uk.com

Specification

INPUT DATA

Input source

For details see individual specification

Open circuit response

For details see individual specification.

Input impedance (Voltage input)

>1Mohm at amplifier input. This will be shunted by burnout drive or input conditioning components.

SUPPLY DATA

Power supplies

AC models	115VAC ± 20% 230VAC ± 20%
DC models	24VDC ± 2.5V

Consumption

Single trip	3VA
Double trip	4VA
Quadruple trip	6VA

OUTPUT DATA

Response time

<400mSec. Unless otherwise stated.

Relay specification

DP/DT for each trip point, unless otherwise stated. Contacts are rated at 250VAC, 5A, 100VA (Resistive).

Relay function

Selected by PC link. Default is normally energised, relay to de-energise on trip (fail safe operation).

Relay status

Indicated by a red LED for each trip, mounted on the front panel. Lit when relay is energised.

Controls

ZERO	± 25%
SPAN	± 50%
TRIP	0-100%
DEADBAND	1-20%

CONDITIONS

Ambient temperature

Working	-20°C to +60°C
Storage	-40°C to +70°C

Humidity

From 5% to 95% R.H.

Vibration

1g at 15Hz to 150Hz.

ELECTRICAL STANDARDS

Insulation Input-contacts-earth-channel

1000V RMS continuous. 2000V for 20uSec. Derate to 500VDC for option 'K' enclosures.

Fusing

Power supply fused. Spare fuse mounted on PCB.

WIRING AND MOUNTING

Terminals

For conductors up to 2.5mm².

Weight

1.5kg approximately, when mounted in enclosure.

Position

Any position is acceptable.

Types of mounting

Wall, panel, single end access and rack. Precision extruded aluminium construction. Standard units are Anodised, option 'K' units are 'Alochromed'.

Additional protection

Enclosures are available to NEMA 12 oiltight, NEMA 4 watertight and IP54 for N-protection.

PERFORMANCE

Series mode rejection

<0.1% error for 50Hz input at 5% of span amplitude.

Common mode rejection

<0.1% error for 250V RMS.

Temperature effect on zero

<0.02% per °C.

Temperature effect on span

<0.01% of span per °C or <0.1°C per °C, whichever is the greater.

Temperature effect on suppression/elevation

<0.02% of suppression/elevation per °C.

Supply voltage effect

<0.01% per % input change.

Trip adjustment

Infinitely variable by single turn 260° dial on front panel, calibrated 0-100 and lockable. Alternatively, by multi-turn potentiometer accessible through front panel.

Deadband

Standard 1%. Also available adjustable from 1 to 20% by single turn 260° dial or by multiturn potentiometer.

RFI rejection

Standard enclosures are inherently RFI proof due to their solid aluminium construction. However, for extra protection to BS6667, specify option 'K'.

Permissible input overload

mV input	20V
DC voltage input	200V
DC current input	500%
AC voltage input	200%
AC current input	500%
Resistance input	6V

ATA110 series, thermocouple and millivolt

These units will accept input from any BS4937 and ISA B,E,J,K,S,R,T or Pallaplat thermocouple; or millivolt source.

Thermocouple input units have automatic cold junction compensation.

Normal minimum span 4mV, lower ranges available to special order.

Source resistance up to 1000ohms for specified performance.

Open circuit response may be specified as upscale or downscale.

Input impedance 1Mohm, shunted by burnout drive.

Trip level proportional to input voltage, or temperature when option 'G' is specified.

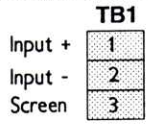
Models available

INPUT	Single channel		Double channel	
	Single trip	Double trip	Single trips	Double trips
Thermocouple	ATA111	ATA112	ATA113	ATA118★
Millivolts	ATA115	ATA116	ATA117	ATA119★

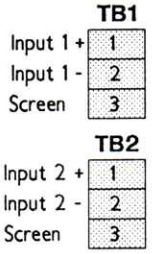
★ These models also available as single input - quadruple trip

INPUT WIRING

Single channel



Double channel



For output and supply wiring, please turn to page 10.

ATA120 series, resistance temperature sensor

These units will accept input from any 2, 3 or 4 wire resistance temperature sensor.

Third wire compensation is standard to overcome lead resistance variation.

Normal minimum span 10 ohms, lower ranges available to special order.

Differential operation may be specified using 2 X 2 wire sensors.

Open circuit response is normally upscale but may be specified downscale.

Input and third wire drives are normally constant current, for improved linearity.

Trip level proportional to resistance, or temperature when option 'G' is specified.

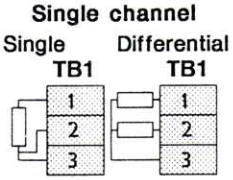
Models available

INPUT	Single channel		Double channel	
	Single trip	Double trip	Single trips	Double trips
Single	ATA121	ATA122	ATA123	ATA128★
Differential	ATA125	ATA126	ATA127	

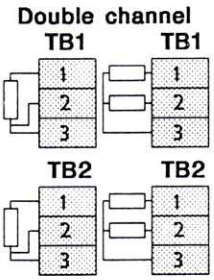
★ This model also available as single input - quadruple trip

INPUT WIRING

Single channel



Double channel



For output and supply wiring, please turn to page 10.

Trip amplifiers

ATA130 series, process

These models will accept input from any standard process voltage or current source.

Any current input from 0-100uA to 0-100mA or voltage input from 0-400mV to 0-200V may be used and any input may carry a 20% offset.

Voltage units have 1 Mohm input impedance.

On current units, the input shunt resistor absorbs only 400mV, allowing many units to be wired in series, even on a modest current loop.

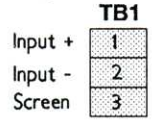
Models available

Single channel		Double channel	
Single trip	Double trip	Single trips	Double trips
ATA131	ATA132	ATA133	ATA138★

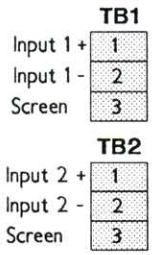
★ This model also available as single input - quadruple trip

INPUT WIRING

Single channel



Double channel



For output and supply wiring, please turn to page 10.

ATA140 series, slidewire and potentiometer

These units will accept input from any 2 or 3 wire slidewire or potentiometer.
Third wire compensation is standard to overcome lead resistance variation.
Normal minimum span 100 ohms, lower ranges available to special order.
Differential operation may be specified using 2 X 2 wire sensors.
Open circuit response is normally upscale but may be specified downscale.
Input and third wire drives are normally constant current, for improved linearity.
Trip level proportional to resistance.

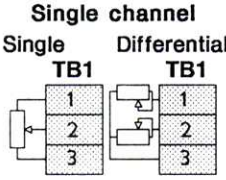
Models available

INPUT	Single channel		Double channel	
	Single trip	Double trip	Single trips	Double trips
Single	ATA141	ATA142	ATA143	ATA148★
Differential	ATA145	ATA146	ATA147	

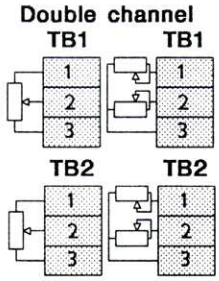
★ This model also available as single input - quadruple trip

INPUT WIRING

Single channel



Double channel



For output and supply wiring, please turn to page 10.

ATA134, valve positioner

Two inputs are provided. The first will accept any standard process signal and is intended as the primary input. The second will accept input from a potentiometer or slidewiire, mechanically linked to the valve and is intended as a feedback signal.

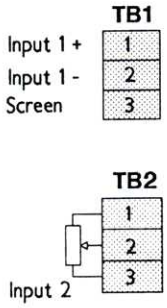
Any potentiometer or slidewire may be specified, from 100 ohms to 10,000 ohms..

A>B or B>A deviation is set by a single blindset potentiometer, representing 0-100% of span.

If the two inputs deviate by more than the level set on the Trip potentiometer, 'Raise' or 'Lower' contacts will close until the valve moves sufficiently to restore the inputs to normal.

Adjustable deadband is fitted, controlled by a blindset potentiometer, to accurately control the point at which the 'Raise' and 'Lower' contacts return to normal.

INPUT WIRING



For output and supply wiring, please turn to page 10.

ATA135, wide calibrated deadband

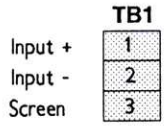
This unit is based on the ATA132 single channel, double trip but is intended for use in an application where Trip occurs at one level and Return to normal at a different level.

Both Trip and Return to normal are set by single turn lockable dials, representing 0-100% of span.

In a typical high trip application, Trip 1 will change state when the input exceeds the level set on the upper dial. It will then latch and not return to normal until the input falls below the level set on the lower dial.

Trip 1 relay has double pole changeover contacts while Trip 2 (Return to normal) contacts are single pole changeover.

INPUT WIRING



For output and supply wiring, please turn to page 10.

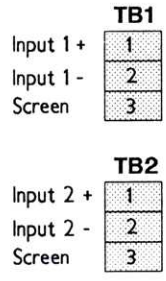
ATA139, process input deviation trip

This unit will compare two inputs which need not necessarily be of the same type but do share a common 0V.

The upper trip will change state when Input 1 exceeds Input 2 by more than the level set on the upper dial. The lower trip will change state when Input 2 exceeds Input 1 by more than the level set on the lower dial. Both dials represent 0-100% of span.

Adjustable deadband may also be fitted, controlled by blindset potentiometers, to accurately control the point at which the trip relays returns to normal. Deadband potentiometers represent 1-20% of span.

INPUT WIRING



For output and supply wiring, please turn to page 10.

Special trip amplifiers

ATA150 series, AC voltage or current

These units will respond to the amplitude of an AC voltage or current input.

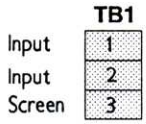
No external transformers are required when monitoring mains supplies. Voltages between 150V and 600V or currents between 1A and 10A are isolated and converted by appropriate transformers mounted on the back plate.

Models available

INPUT	Single trip	Double trip
Current	ATA151a	ATA151b
Voltage	ATA152a	ATA152b

INPUT WIRING

Single channel



For output and supply wiring, please turn to page 10.

ATA151TX, supply monitor

This unit is designed to monitor the mains supply and will go into a trip condition when the supply exceeds the level set on the upper dial.

A timer is fitted to allow a delay to be set between the overvoltage condition occurring and the relay contacts changing state. This time delay is adjusted by the lower dial.

No separate input is used. A transformer is mounted on the back plate to isolate the supply from the electronics and reduce it to a safe level.

In operation, when the supply exceeds the trip level, the upper LED lights, indicating that overvoltage has occurred. If the condition persists until the timer has timed out, the relay will change state and the lower LED will light.

If normal conditions are restored before the timer has timed out, the unit resets and both LEDs turn off. The same will occur if the voltage returns to normal when the unit is already in trip. There is no time delay; reset is immediate.

There is no separate input wiring on this product

ATA170 series, strainguage

The 170 series will accept input from - and supply excitation to - devices such as strain-guages or solid state devices using strainguages to monitor pressure, level, flow etc.

Normal minimum input span is 4mV but lower ranges may be specified to special order.

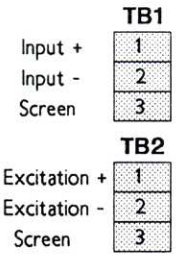
Unit has the facility of very large zero elevations to give a TARE effect in weighing applications. This elevation may be up to ± 400% of span.

Excitation voltage may be adjusted from 3V to 24V and will supply up to 20mA at a regulation of 0.1%. When higher excitation current is required, a range of separately mounted power supplies are available which will supply up to 1A.

Models available

Single trip	Double trip
ATA171	ATA172

INPUT WIRING



For output and supply wiring, please turn to page 10.

ATA180 series, pulse

These units will monitor the frequency of any regular repetitive pulse train.

Any waveform may be used provided the positive peak levels exceed the threshold level.

The threshold level is adjustable over a wide range to assist in the suppression of input noise.

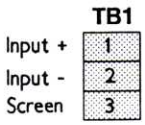
Any input frequency between 0-25Hz and 0-20,000Hz may be specified.

Input level may be anywhere between 50mV and 30V p-p.

Response time is determined by input frequency. Typically it is less than 500mS but for full scale frequencies under 1000Hz it will be proportionately increased.

Unit may be AC coupled where large DC levels have to be accommodated.

INPUT WIRING



Models available

Single trip	Double trip
ATA181	ATA182

For output and supply wiring, please turn to page 10.

ATA190 series, motor winding temperature

These units are specifically designed for three phase motor winding temperature applications.

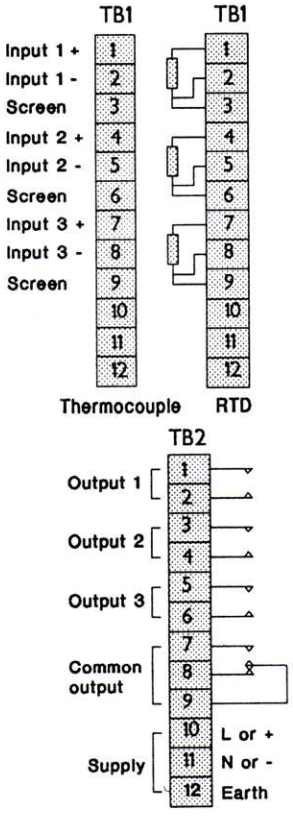
Models will accept input from three thermocouples or RTDs which are embedded in the motor windings. All three circuits are totally isolated from each other.

Each of the three inputs is compared with it's own individual Trip set point and if any exceed that trip point the unit will go into trip.

In the event of any winding overheating there are two outputs. The first is a single pair of contacts, which may be specified as normally open or normally closed. These are used to indicate which particular winding has overheated. Each of these three outputs has a LED status indicator.

The second output is the main control relay with single pole changeover contacts which will change state if any of the three trip circuits operate.

WIRING



Models available

Thermocouple	RTD
ATA191	ATA195

Options

Option 'DI', digital display

This is a 3½ digit indicator which is available in 8mm red or green LED or 12mm LCD. It will display any level from -1999 to +1999 and has it's own internal gain and offset controls allowing, for instance, full scale indication over a small portion of actual input span.

When this option is specified, the calibrated trip dials are replaced with blindset potentiometers and 'READ' pushbuttons for each trip point.

Under normal conditions, the display will indicate the input to the unit, either as a percentage of total input or in engineering units. When a pushbutton is pressed, the display will indicate that tripset level, in the same units, allowing very accurate adjustment.

Available with most of the options listed below.

Option 'M', power supply

When fitted, this allows a standard unit to provide power to an external device, such as a strainguage, input pre-amplifier or a 2-wire transmitter.

The output is adjustable over the range 2-25V at any current up to 25mA by an internal potentiometer which may, optionally, be fitted to the front panel. Load variation is better than 10mV over the full current range.

Depending on application, the output of this power supply may be wired to terminal block 2 or to unused terminals on terminal block 3. When used to power a 2-wire transmitter, the power supply output is wired internally on the unit in series with the current sensing shunt resistor, allowing full 2-wire operation.

Available with most of the options listed below.

Other options

Suffix	Description
/B	Remote tripset potentiometers
/C	Ten turn tripset potentiometers with calibrated dials.
/DA	Analogue indication of input or trip level.
/J	Input test injection jack.
/K	RFI protection to BS6667 Part 3.
/L	Latched relay - normally reset by pushbutton on front panel.
/P	Calibration test point.
/S	Sealed relay.
/T	Timed relay - optionally with timer control mounted on the front panel.
/V	Variable deadband (1-20% of span).

Some combinations of options are physically incompatible. If in doubt, please contact our Technical Sales.

All the units in the range are supplied in an Anodised or Alochromed extruded aluminium enclosure which may be surface or panel mounting, single end access or 7 way 19" rack.

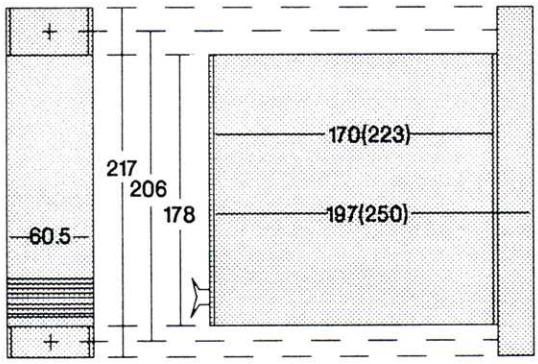
When a unit is fitted into an enclosure, the edge connector at the rear of the main printed circuit board mates with a socket which is wired to the terminal blocks. The unit is retained in the enclosure by two M3 screws which pass through countersunk holes in the front panel and into tapped holes at the front of the enclosure.

The 'U' channel terminal cover is supplied in two sizes to suit different mounting requirements. For surface mounting units, the 217mm length is supplied and includes the fixing holes. For panel, single end access or rack mounting, the 178mm length is supplied but only when options 'K' or 'EXI' are specified. When supplied, they must be replaced after wiring.

Units may be mounted at any orientation although they would normally be mounted with the front panel vertical. Surface or single end access units should not be mounted closer than 61mm horizontally or 218mm vertically. Panel units should not be mounted closer than 70mm horizontally or 234mm vertically and racks should not be mounted closer than 485mm horizontally or 189mm vertically. All types would normally be mounted further apart than this to ease wiring. At least 180mm must be left at the front of all enclosures to allow for unit withdrawal.

In the following drawings, all dimensions are in mm. Figures in brackets show the added depth of the 'K' enclosures to house the RFI protection components.

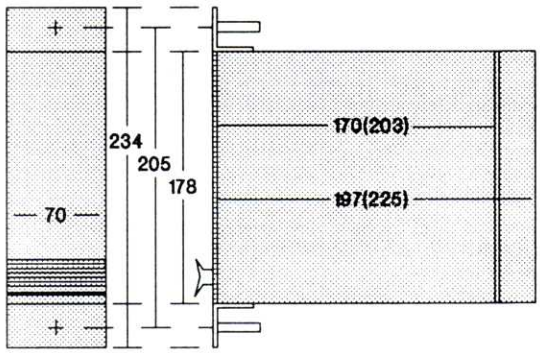
Surface mounting



Before wiring, the unit must be withdrawn from the case, which may then be removed from the 'U' channel by undoing the M4 screw at the top rear of the case, hinging the case downwards and unhooking it from the fixed peg at the lower rear of the case. This exposes the terminal blocks for wiring.

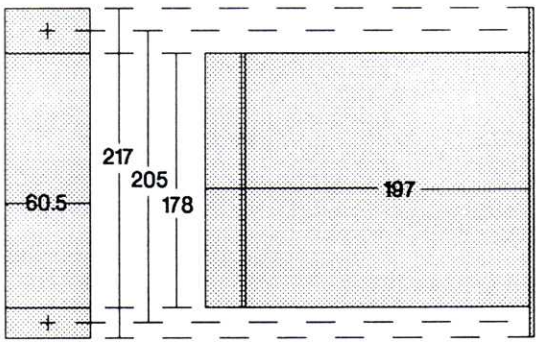
Slots are provided in the terminal plate which allow cables to be passed along the 'U' channel, through the slots and into the terminal blocks. After wiring, the enclosure may be reassembled by reversing these instructions.

Panel mounting



A 65mm wide by 190mm high aperture must be cut in the front panel with 6mm fixing holes above and below. The brackets and front panel are wider than the aperture to obscure any cut edges.

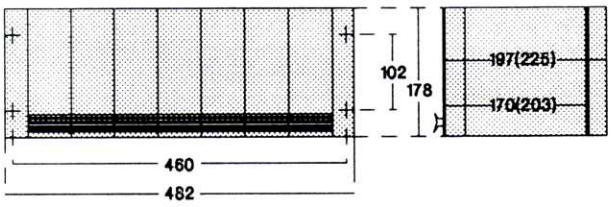
Single end access



This enclosure is not recommended for use with option 'K'

In this arrangement the terminal blocks are mounted on the front panel, although the enclosure is surface mounted. Since the terminals are on the removable part of the unit, allowance must be made, when wiring, to allow for unit withdrawal without disturbing the wiring to adjacent units or the main loom.

19" Rack mounting



Up to seven units may be mounted in a 19" rack, although other widths may be supplied to suit special requirements.

The rack is normally supplied with fixing brackets to suit panel mounting (as shown above) but may also be supplied for single end access if required.

A 179mm high by 440mm wide aperture must be cut in the panel with fixing holes on 102mm by 460mm centres.

WIRING

Input, output and supply connections are made via leaf type terminal blocks whinh are mounted on the front of single end access enclosures and at the rear on all other 'A' series types. These terminal blocks will accept cables up to 2.5mm².

On most enclosures, other than panel mount, the terminals are separated into two groups by an earthed barrier which is part of the terminal mounting plate.

This barrier, together with the 'U' section terminal cover, ensures that input cables must enter from the top of the unit and supply/output cables from below. This helps meet the requirements of 'N' protection for intrinsically safe installations.

Input wiring

This is given in the individual specification sheets for the various instrument types.

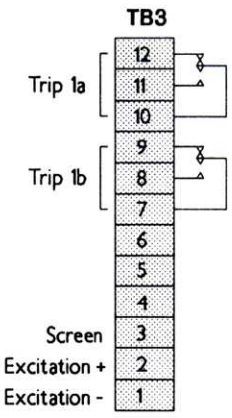
Input access

This is almost invariably from the left, except where shown otherwise. This convention has been followed on input wiring drawings.

Relay wiring

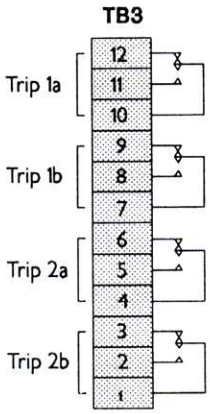
The following drawings show the outputs available for the standard range of products. Where output wiring differs from these, details are given in the individual specification sheet.

Single channel single trip



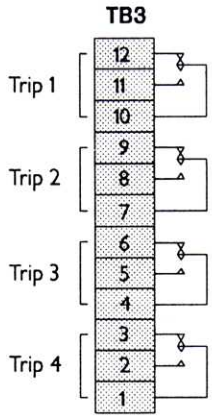
The excitation supply shown in the above drawing is the alternative wiring when option 'M' is fitted. The single relay has double pole changeover contacts.

Single channel double trip
Double channel single trip



The two relays have double pole changeover contacts

Double channel single trip
Single channel quadruple trip



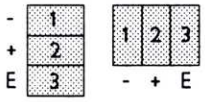
On single channel double trip units, Trips 1 and 2 are operated by the first channel; trips 3 and 4 by the second. On quadruple trip units, all four operate from the single input. The four relays have single pole changeover contacts.

Output access

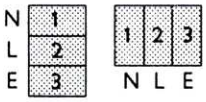
For panel, single end access or rack mounting units, output wiring access is from the right. For surface mounting units, wiring access is from the left, as shown above.

Supply wiring

DC Supply



AC Supply



Supply access

For panel, single end access or rack mounting units, output wiring access is from below. For surface mounting units, wiring access is from the left.

Expansion to the range

The 'AH' range is still comparativeely recent and is constantly being expanded. If the application you require is not covered in this catalogue, please contact out Technical Sales Department as the product may already be in process of being engineered.

AGS products

Over the years, Amelec have been called upon to solve a wide variety of process control problems. Many of the resultant products have proved so successful they have become part of our standard range. Indeed, some appear in this catalogue as standard products.

Other products, however, are specifically designed to solve a particular problem. These models do not have sufficient demand to become standard products but, since they are manufactured to the same standard, they are kept on file, ready to solve similar problems for subsequent clients.

If you have a process control problem, please ask for our shortform AGS list. Alternatively, contact our Technical Sales Department, giving full details of the problem and they will either recommend an existing AGS product or design one to suit your particular application.

Warranty and service

All Amelec products are guaranteed for ten years against faulty components or manufacture but not against misuse.

To claim under this warranty, equipment should be returned, carriage paid by the customer, to Amelec Instruments, Cochran Close, Crownhill, Miton Keynes, MK8 0AJ, together with details of the fault.

Attempted repairs or component replacement during the warranty period may render the warranty null and void, unless authorised by Amelec.

Amelec will undertake any repairs and will also supply replacement printed circuit board assemblies on an exchange price basis. Please contact the Technical Sales Department for further details.

Where the reported fault is a site problem, Amelec will make their own technical staff available to offer assistance. This service will be charged to the customer at the rate currently in force.

Ordering

When ordering, please give the following details:-

1. Model number
2. Supply voltage and frequency
3. Mounting - Surface, Panel, Single end access or Rack
4. Input span, output span, offset and source
5. Open circuit response - If not specified, default is upscale for thermocouple, millivolt and resistance input units, downscale for process
6. Relay status and mode - If not specified, default is normally energised and single trips are set to Hi, double trips to Hi/Lo. LEDs are lit when relays are energised
7. Any options required
8. Information appropriate to any options ordered

AMELEC

SIGNAL CONDITIONING

If you feel you still have any unanswered questions, then please do get in touch:

Tel: 01908 567003

Fax: 01908 566735

Email: sales@amelec-uk.com

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