AMELEC
SIGNAL CONDITIONING

ABC 815 MULTIPLIER/DIVIDER

The ABC 815 is designed especially for process control application such as:

Mass Flow Compensation
Temperature Correction of Flow
Heat Flow Calculation
Energy Consumption Calculation

The unit has been fitted with input and output span and zero adjustments which have a large range of operation as defined below. These will adequately meet the normal requirements of the above systems. In common with all Amelec units the output is isolated from the inputs and the power supply, often an important consideration in schemes involving mixing several signals.

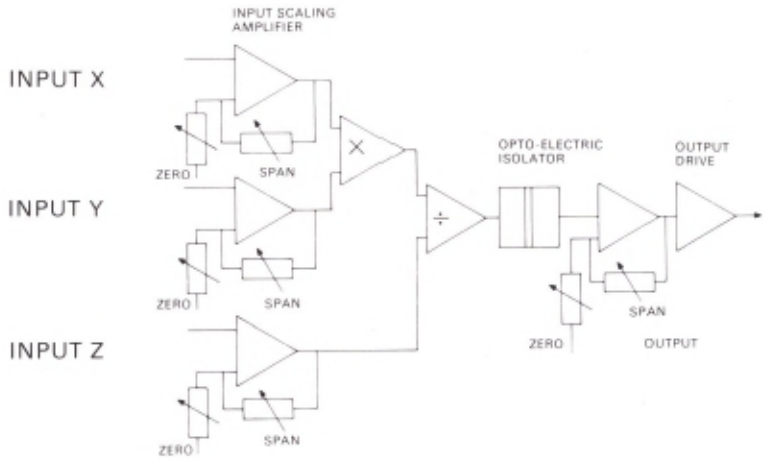
The ABC 815 often forms part of a small system involving other units such as, square root extractors, summators and limiters. Combinations such as this can be built up using the Amelec Instruments 19" Rack System. The units can be supplied fully interconnected.

Formula available within the unit as follows:

$$\text{OUTPUT} = \left[\frac{(K_1X \pm a)(K_2Y \pm b)}{(K_3Z \pm c)}\right] K_4 \pm d$$

where the inputs are X, Y and Z
K_1, K_2, K_3, K_4 are span constants
a, b, c and d are zero constants

INPUT	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	Typically 1MΩ for voltage. When input is current then 400mV signal is developed at input stage.
ACCURACY	Multiply only ±0.2% over 20:1 Span Divide only ±0.5% over 3:1 Span Multiply/Divide ±1.0% over 30:1 Span
TEMPERATURE EFFECT	Span ±0.025%/°C Zero ±0.025%/°C
ADJUSTMENT RANGE	Input zero 300% of input signal Span Gain 5 to 1 change Output zero 200% of signal span
OUTPUT SIGNALS	0 to 10, 4 to 20, 1 to 5mA DC 0 to 1, 0 to 10, 2 to 10, 1 to 5V DC
POWER SUPPLY	AC–110V, 220V, 240V ±20% 50/60Hz; DC–24V ±2.5V
MOUNTING	Double width module



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SIGNAL CONDITIONING

INPUT DATA

Source and Signal see individual specification.

Controls Zero ±25% and Span ±50% accessible by screwdriver from front by 15 turn potentiometers.

Trip Point Adjustment.
Infinitely variable by 15 turn potentiometers.

Trip Point Repeatability <0.2% Span.

Deadband on Trip 1.0% Span.

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

Consumption typically 3 Watts.

INPUT IMPEDANCE	Typically >1MΩ for voltage. 400mV for current

OUTPUT DATA

Relay Specification DPDT for each trip point. Contacts rated at 250V 2AMP 100VA AC. Resistive load.

Relay Function Selected by internal link. Normally set to de-energise relay on operation of trip.

Relay Status Indicated by 150,000 hour rated LED for each trip. Coloured red.

SIGNALS	0 to 10mA into 2400Ω maximum 4 to 20mA into 1200Ω maximum 1 to 5mA into 4800Ω maximum 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.
AMBIENT TEMPERATURE	Working −20 to +60°C Storage −40 to +70°C
HUMIDITY	5 to 95% RH
VIBRATION	1g–15Hz to 150Hz has no effect

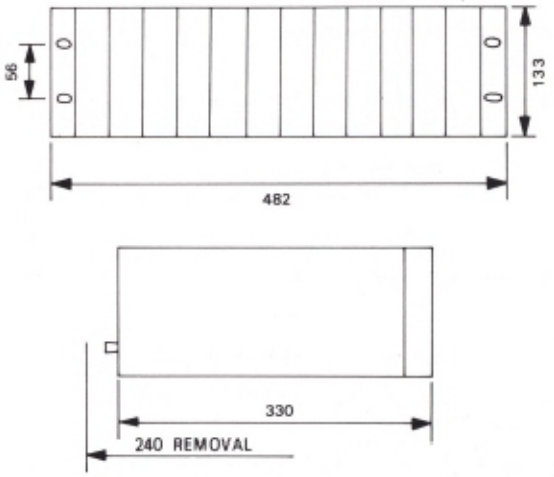
ELECTRICAL STANDARDS

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

MOUNTING

INTERNATIONAL 19" RACK

Up to 12 Amelec AB 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.



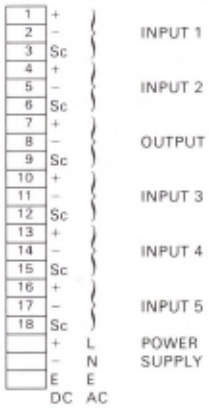
WEIGHT	Typical 1.5kg
POSITION	Any position

TERMINATIONS

TERMINATION For conductors up to 2.5mm²

MODELS ABT and ABM See individual specification.

MODEL ABC See below.



NOTE:–
INPUTS 2, 3, 4, 5
APPLY TO
ABC 813
ABC 814
ABC 815 ONLY

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PERFORMANCE

ABT-TRIP AMPLIFIERS

Response Time <200 milliseconds.

Series Mode Rejection <0.1% error 50Hz input at 5% span amplitude.

Common Mode Rejection <0.1% error for 250V RMS.

Temperature effect on Trip Point <0.01%/°C or 7μV/°C whichever is greater.

Supply Voltage on Trip Point <0.01%/%.

ABM-TRANSMITTERS

Calibration Accuracy ±0.1% Span.

Output Ripple <0.3% RMS of FSD.

Stability Over 24 hours ±0.05% Span. Over 1 year ±0.1% Span.

Response Time <400 milliseconds for within 1% of final value for change of input from 10 to 90% FSD.

Temperature Effect on Zero <±0.02%/°C.

Temperature Effect on Span <±0.01% Span/°C or <±0.02°C Span/°C whichever is greater.

Temperature Effect on Suppression/Elevation <±0.02% of supp./elev. per °C.

Series Mode Rejection <0.1% error 50Hz input at 50% span amplitude.

Common Mode Rejection <0.1% error for 250V RMS.

Supply Volts Effect <0.01%/%.

Output Overrange Maximum output 40V DC under any condition.

For Thermocouple units, Cold Junction Compensation Variations are:

CC, IC, CA	1.5μV/°C	Deviation from
PPR	0.7μV/°C	20°C

Maximum error for 0 to 70°C Variation CJ
=40μV for CC, IC, CA, =18μV for PPR.

ABC-ARITHMETIC UNITS

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

COMMON MODE REJECTION <0.2% error for 250V RMS

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