



# INTEGRATOR

## TYPE 112-5A

### FUNCTION

To convert an analogue signal (voltage or current) into pulses with respect to time. The pulse rate is proportional to the magnitude of the analogue signal.

The module can be used for continuous integration and totalisation where any 'rate' signal is available in analogue form, e.g. flow, B.T.U. watts etc.

### DESCRIPTION

The input signal drives a voltage controlled oscillator running at a high frequency proportional to the input voltage. A programmable divider stage reduces the pulse rate to a value appropriate for the application.

The output stage provides electromagnetic counter drive (internal / external), open collector transistor or relay contact outputs.

Input signal zero cut-off is provided and may be set between 0 - 10% of the input signal range.

The front panel provides a LED indicator for 'Power On'.

### INSTALLATION

Installation information is given in the 112 Series General Information Sheet.

#### Information required When Ordering

- Input Signal
- Full Scale Rate represented by input signal (e.g. Full Scale Input = 10m<sup>3</sup> per day)
- The integrated quantity represented by one output pulse (e.g. 1 pulse = 1 litre)
- Zero Cut-off setting
- Type of Output (see specification overleaf)
- Internal Counter Option (8 digit non-reset, 6 digit resettable or none)
- Desired Pulse Width for open collector output option.
- Supply Voltage and Frequency



### Features

- \* *Optional Relay or Open Collector Outputs*
- \* *Zero Cut-off*
- \* *Isolated Output*
- \* *Optional Internal Counter*

## SPECIFICATION

### INPUTS

- 0 - 10 mA into 100  $\Omega$
- 0 - 20 mA into 50  $\Omega$
- 4 - 20 mA into 62.5  $\Omega$
- 0 - 5v into 300 k $\Omega$
- 1 - 5v into 300 k $\Omega$

*NB - Other inputs available to order.*

### OUTPUT OPTIONS

*(The type required must be specified at the time of order)*

- a) Optically isolated open collector transistor.
- b) 24 Volt pulse of duration 60ms, suitable for electromagnetic counters.
- c) Relay change-over contact. (FSD=10Hz Max)

*NB - Other pulse output voltages (e.g. 5V) and pulse widths available to order.*

### PULSE RATE

Calibrated as required within the following full scale limits:

- 0.05 to 600 counts per minute  
(3 to 36000 counts per hour).
- or 0.001Hz to 5kHz square wave.

### CALIBRATED ACCURACY

Set at 100% to be within  $\pm 0.1$  % FSD.

### LINEARITY ERROR

$\leq \pm 0.1$  % FSD.

### SUPPRESSION/ ELEVATION ERROR

$\leq \pm 0.1$  % FSD.

### ZERO CUT-OFF OPTION

Set to 5% FSD unless otherwise requested.

### EXTERNAL COUNTER

**Units Without an Internal Counter** - the external counter used must have an impedance  $\geq 80\Omega$ , be suitable for 24 volt dc operation and pulses of 60 ms in duration.

**Units With Internal Counter Fitted** - can drive an external counter with an impedance  $\geq 180\Omega$ .

### STABILITY

Over 24 hours  $\pm 0.05$  % FSD.  
Over 1 year  $\pm 0.1$  % FSD.

### INTERFERENCE REJECTION

Filtering is incorporated to reject RF and other industrial noise.

### SERIES MODE REJECTION

< 0.2% error for 50 Hz RMS Signal equal to half span.

### INPUT OVER-RANGE PROTECTION

250 volts RMS or DC (*voltage inputs only*)

### TEMPERATURE COEFFICIENTS

Zero:  $\pm 0.02$  % span/ $^{\circ}$ C  
Span:  $\pm 0.02$  % span/ $^{\circ}$ C

### TEMPERATURE RANGE

Operating:  $-10^{\circ}$ C to  $+60^{\circ}$ C  
Storage:  $-20^{\circ}$ C to  $+70^{\circ}$ C

### SUPPLY VOLTAGE REJECTION

Output change < 0.01% span / % supply change.

### ISOLATION

Input and output are isolated from each other and from the power supply. Maximum voltage 250V RMS or 400V DC.

Resistance  $\geq 50 \times 10^6$  ohms measured at 1000VDC.

### POWER SUPPLY

Standard AC and optional DC powered versions are available. Full details of the Power Supply options appear in the 112 Series General Information Sheet.

### WEIGHT

(with internal counter) Approx. 670 grams.

## TERMINAL CONNECTIONS

Terminal

- 1 no internal connection (nc)
  - 2  $\leftarrow$  Input Signal (+)
  - 3  $\Rightarrow$  Input Signal Common (-)
  - 4 (nc)
  - 5  $\leftrightarrow$  Normally Closed
  - 6  $\leftrightarrow$  Common
  - 7  $\leftrightarrow$  Normally Open
  - 8  $\leftrightarrow$  (nc)
  - 9  $\leftrightarrow$  (nc)
  - 10  $\Rightarrow$  +V
  - 11  $\Rightarrow$  O/p
  - 12  $\leftrightarrow$  0V
  - 13  $\leftrightarrow$  (nc)
  - 14  $\leftrightarrow$  Earth
  - 15  $\leftrightarrow$  Neutral
  - 16  $\leftrightarrow$  Line
- Relay Output Option
- Counter Output (24v 60ms pulse)
- Transistor Output (Open Collector)
- AC Mains Supply
- Earth Negative (-) DC Supply Positive (+) Option

**Please Note:** Options are only available if specified at time of order.

**WARNING** THIS UNIT CAN BE MAINS POWERED, AND ALL INPUTS TO IT MUST BE ISOLATED FROM DANGEROUS VOLTAGES BEFORE THE FRONT COVER IS REMOVED. LIVE TERMINALS WILL BE EXPOSED.



Continuous development may necessitate changes in these details without notice

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