

The **BA388E** is a two input intrinsically safe rate totaliser that can simultaneously display the total flow and the rate of flow of either flowmeter, or the sum or difference of the two inputs. Rate and total displays may have the same or different engineering units. The BA388E is easy to use and each input can be independently configured on-site to operate with a flowmeter having various pulse outputs. A slide-in scale card simplifies identification and international intrinsic safety certification permits worldwide installation.

Main application of the BA388E is to process the pulse output from two hazardous area flowmeters and calculate and display the sum or difference of the two within a hazardous area. Rate and total flow can be simultaneously displayed in the same or different engineering units and the output from each meter can also be shown. The BA388E will compensate for nonlinearity of each flowmeter using up to sixteen flowmeter K-factors which can be entered for each meter on-site.

The large display has high contrast and a very wide viewing angle enabling the rate totaliser to be read in most lighting conditions over a wide temperature range. Rates of flow may be displayed in almost any units of measurement per second, minute or hour. Total flows may be shown in the same or in different units and the total displays may be reset using the front panel push buttons or an external contact closure.

An isolated open collector pulse output can be configured to synchronously retransmit either pulse input, or a pulse each time the least significant digit of the total display is incremented.

IP66 front panel protection with a neoprene gasket to seal the joint between the totaliser and the instrument panel allow the BA388E to be installed in areas that will be washed down.

To simplify installation and maintenance, the totaliser has removable terminal blocks allowing panel wiring to be completed before the instrument is installed.

International intrinsic safety certification allows the BA388E rate totaliser to be installed worldwide. When configured to operate with a flowmeter having a voltage or magnetic pick-off output, the input terminals comply with the requirements for *simple apparatus* reducing system design and documentation.

Display backlighting, which is internally powered from the totaliser, is available as a factory fitted option. It provides green background illumination enhancing daylight viewing and allowing the display to be easily read at night or when the totaliser is installed in a poorly illuminated area.

An optional isolated 4/20mA output may be configured to produce an analogue output proportional to any part of the sum or difference of the two flowmeter rate or total displays. The output is galvanically isolated and has been certified as a separate intrinsically safe circuit complying with the requirements for *simple apparatus* thus simplifying connection to other instruments.

Dual alarms with galvanically isolated solid state outputs which can switch hazardous or safe area loads, such as sounders or solenoid valves, are available as a factory fitted option. Both may be independently configured as rate or total alarms operating on either flowmeter input, or on the sum or difference of the two inputs. Annunciators on the BA388E display show the status of both alarm outputs.

If panel space is limited the BA337E offers similar one input functions in a 96 x 48mm enclosure.

BA388E

Two input rate totaliser

Intrinsically safe for use in all gas hazardous areas

- ◆ **Configurable inputs:** magnetic pick-off, switch contact, proximity detector, open collector or voltage pulse.
- ◆ **Separate rate and total displays.**
- ◆ **Intrinsically safe**
- ◆ **144 x 72mm DIN enclosure with IP66 front protection.**
- ◆ **Isolated pulse output**
- ◆ **Optional:** Backlight
Dual alarms
4/20mA output
- ◆ **3 year guarantee**

www.beka.co.uk/ba388e



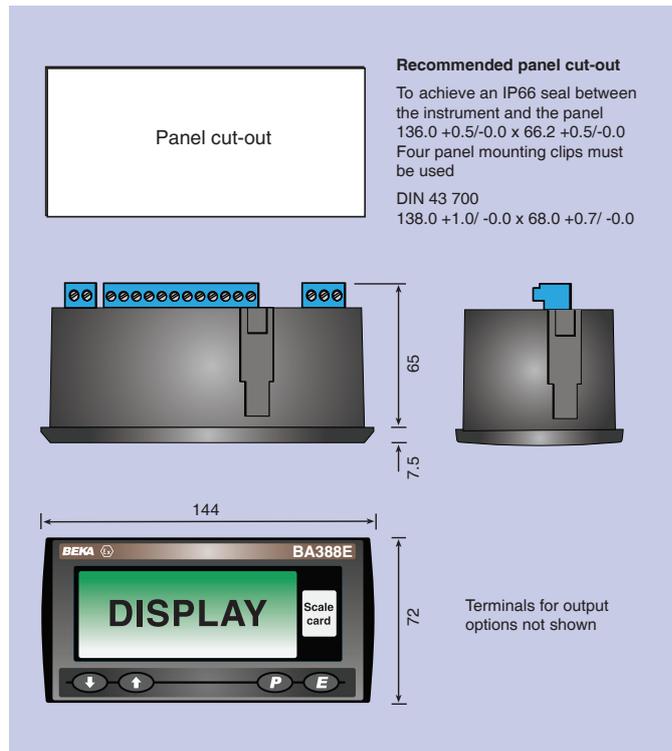
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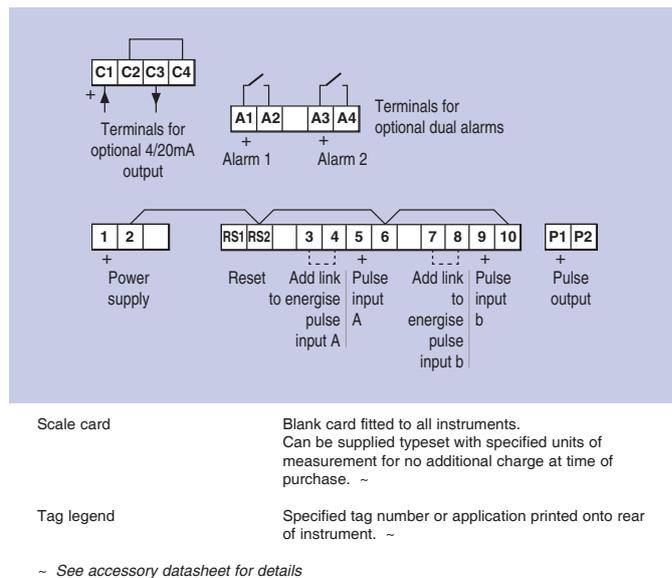
SPECIFICATION

| | | |
|--|---|--|
| Power supply | | |
| Voltage | 10 to 28V from a Zener barrier or galvanic isolator | |
| Current | 22mA max plus 16mA for optional backlight | |
| Input | Lower | Upper switching thresholds |
| Switch contact | 100Ω | 1kΩ |
| Proximity detector (NAMUR) | 1.2mA | 2.1mA |
| Open collector | 2kΩ | 10kΩ |
| Magnetic pick-off | 0 | +40mV |
| Voltage pulse (low) | 1V | 3V 28V max |
| Voltage pulse (high) | 3V | 10V 28V max |
| Frequency | | |
| Switch contact | 150Hz typical |] Depends upon pulse width and debounce setting. |
| Other inputs | 100kHz max | |
| All inputs | 0.01Hz min | |
| Display | | |
| Type | Liquid crystal | |
| Zero blanking | Blanked apart from 0 in front of decimal point | |
| Rate ‡ | 6 digits 12mm high | |
| Decimal point | 1 of 4 positions or absent | |
| Total ‡ | 8 digits 18mm high | |
| Decimal point | 1 of 7 positions or absent | |
| ‡ Rate or Total of either input can be shown on 6 or 8 digit display | | |
| Grand total | Maximum count 10 ¹⁶ | |
| Remote reset | Contact closure with resistance less than 10kΩ | |
| Pulse output | Isolated open collector, certified as a separate intrinsically safe circuit complying with the requirements for <i>simple apparatus</i> . | |
| Source | Either input: synchronous pulse output, 5kHz max. or Least significant digit of total display: pulse output divisible by 1, 10, 100, 1000 or 10000; pulse width definable as 0.1, 0.5, 1, 2.5, 5, 10, 25, 50, 100, 250 or 500ms | |
| Ron | 51Ω + 3V max | |
| Roff | 1MΩ min | |
| I max | 10mA | |
| Configurable functions | Each input individually configurable | |
| Input function | Input A + Input b: Input A - Input b: | |
| Flowmeter K-factor | Adjustable between 0.0001 and 99999 | |
| Rate scale factor | Adjustable between 0.0001 and 99999 pulses/unit vol | |
| Lineariser | Up to 16 K-factors may be entered | |
| Rate timebase | Rate may be displayed per second, minute or hour | |
| Rate display filter | Adjustable digital filter | |
| Total scale factor | Adjustable between 0.0001 and 99999 | |
| Intrinsic safety | | |
| International IECEx | | |
| Code | Ex ia IIC T5 Ga | |
| | -40°C ≤ Ta ≤ 70°C | |
| Cert. No. | IECEx ITS 16.0004X | |
| Europe ATEX and UKEX | | |
| Code | Group II Category 1G Ex ia IIC T5 Ga | |
| | -40°C ≤ Ta ≤ 70°C | |
| Cert. No.s | ITS16ATEX28408X ITS21UKEX0098X | |
| ETL & cETL | | |
| Code | Class I Div 1 Gp A, B, C, D T5 (USA & Canada) Class II Div 1 Gp E, F, G. Class III Div 1 (USA & Canada) Class I Zone 0 AEx ia IIC T5 Ga (USA) Ex ia IIC T5 Ga (Canada) | |
| | -40°C ≤ Ta ≤ 70°C | |
| ETL Control No. | 4008610 | |
| China CCC | As IECEx - see certificate | |
| India CCOE/PESO | As ATEX - see certificate | |
| Nonincendive USA & Canada ETL & cETL | | |
| Code | Class I Div 2 Gp A, B, C, D T5 Class II Div 2 Gp F, G. Class III Div 2 | |
| | -40°C ≤ Ta ≤ 70°C | |
| ETL Control No. | 4008610 | |
| Environmental | | |
| Operating temp | -40 to +70°C display -20 to +70°C | |
| Storage temp | -40 to +85°C | |
| Humidity | to 95% at 40°C non condensing | |
| Vibration | Report available | |
| Enclosure | Noryl SE1GFN3. Front IP66, rear IP20 | |
| EMC | Complies with EU and UK Directives | |
| Mechanical | | |
| Terminals | Screw clamp for 0.5 to 1.5mm ² cable, removable terminal blocks. | |
| Weight | 0.35kg | |
| Accessories | | |
| Backlight | Green LED internally powered | |
| 4/20mA output | Isolated current sink representing any part of the sum or difference of the two inputs, certified as a separate intrinsically safe circuit complying with the requirements for <i>simple apparatus</i> . | |
| Voltage drop | 5 to 28V | |
| Alarms | Two alarms each of which may be independently configured as a rate or total, high or low alarm with a NO or NC output operating on either input. Isolated single pole, voltage free solid state switch certified as a separate intrinsically safe circuit complying with the requirements for <i>simple apparatus</i> . | |
| Outputs | | |
| Ron | 5Ω + 0.7V max | |
| Roff | 1MΩ min | |

DIMENSIONS (mm)



TERMINAL CONNECTIONS



HOW TO ORDER

| | |
|--------------------|--|
| Model number | Please specify configuration for both inputs BA388E |
| Input | Type * |
| Flowmeter K-factor | If linearisation is required, up to 16 K-factors may be entered each at a specified flow rate. |
| Rate scale factor | XXXXX * |
| Rate timebase | Seconds, minutes or hours* |
| Total scale factor | XXXXX * |
| Pulse output | Direct retransmission of either input or derived from least significant digit of total display: pulse output divided by 1, 10, 100, 1000 or 10000; pulse width defined as 0.1, 0.5, 1, 2.5, 5, 10, 25, 50, 100, 250 or 500ms.* |
| Accessories | Please specify if required |
| Display backlight | Backlight |
| 4/20mA output | 4/20mA output |
| Dual alarms | Alarms |
| Scale card | Legend required No charge if ordered with totaliser. |
| Tag | Legend required |

* Totaliser can be supplied configured as required for no additional charge. If configuration information is not supplied, instrument will be configured for open collector inputs with rate and total scaling factors of 1.0 and a timebase of seconds with direct pulse retransmission of input A. Can easily be reconfigured on-site.