

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**



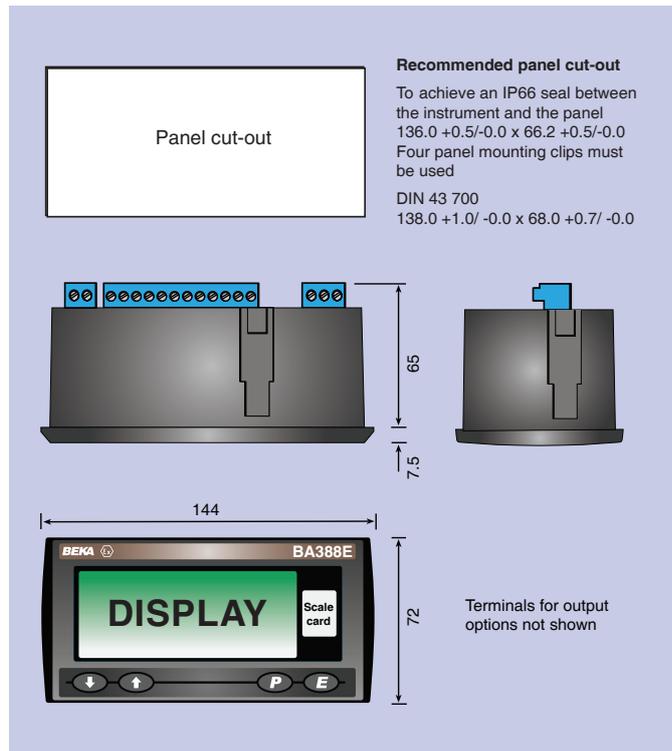
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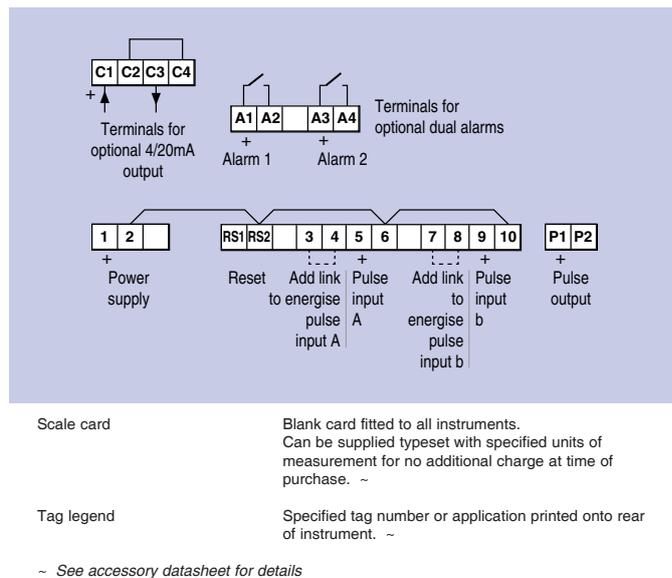
SPECIFICATION

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	} <i>Depends upon pulse width and debounce setting.</i>
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		
Europe ATEX		
Code	Group II Category 1G Ex ia IIC T5 Ga	
Cert. No.	-40°C ≤ Ta ≤ 70°C ITS16ATEX28408X	
International IECEx		
Code	Ex ia IIC T5 Ga	
Cert. No.	-40°C ≤ Ta ≤ 70°C IECEx ITS 16.0004X	
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	
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 4008610	
ETL Control No.		
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 EMC Directive 2014/30/EU	
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.	
Outputs	Isolated single pole, voltage free solid state switch certified as a separate intrinsically safe circuit complying with the requirements for <i>simple apparatus</i> .	
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
Tag	No charge if ordered with totaliser. 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.