

The BA334D is an externally powered, intrinsically safe rate totaliser with separate rate and total displays which will operate from a switch contact, voltage pulse, magnetic pick-off, open collector or a proximity detector input. A novel adaptive measuring technique plus an adjustable digital filter ensure that optimum rate display stability and step response can be achieved over a wide input frequency range.

**Main application** of the BA334D is to process the pulse output from a hazardous area flowmeter and to display the rate of flow and the total flow in the same or different engineering units. Either rate or flow may be shown on the large display. The instrument may be used with any flowmeter having a pulse output proportional to flow rate, such as a turbine flow meter. When fitted with optional alarms, the instrument can perform simple flow batching applications. Optional pulse and 4/20mA outputs enable the rate totaliser to operate remote counters and analogue instruments.

**Control and programming** of the BA334D is performed via four push-buttons which are protected from damage and tampering behind a sealed cover. For applications requiring frequent adjustment, the instrument can be supplied with a robust external membrane keypad. All the programme functions are contained in easy to understand menus which may be protected by a user definable security code. To simplify calibration the rate and total scaling factors employ floating decimal points.

**Intrinsic safety certification** allows installation in most hazardous areas, separate versions are available with ATEX gas and ATEX gas plus dust certi-

fication allowing installation throughout Europe. For applications in the USA, a new version having FM intrinsic safety and nonincendive approvals has recently been introduced.

**The enclosure**, which is moulded in glass reinforced polyester (GRP), has stainless steel fittings, silicone gaskets and an armoured glass window. Its robust construction provides IP66 protection. A separate terminal compartment allows the BA334D to be installed and terminated without exposing the display electronics. To further simplify field wiring and subsequent inspection, the terminal cable entries and clamping screws are forward facing.

**Backlighting** is available as an option to improve readability when the BA334D is installed in a poorly illuminated area. High efficiency amber LEDs provide an even glow to enhance display contrast.

**Optional alarms** provide two galvanically isolated solid state outputs which may be independently programmed for high or low operation on either the rate or total displays. Each output is certified as a separate intrinsically safe circuit and complies with the requirements for *simple apparatus*. Almost any hazardous area certified load such as a solenoid valve or sounder may be controlled by these outputs.

**The optional 4/20mA output** is isolated and complies with the requirements for intrinsic safety simple apparatus allowing connection to a wide range of Zener barriers and galvanic isolators. It may be programmed to produce an analogue output proportional to any part of the rate display, thus making the BA334D an effective hazardous area pulse to 4/20mA converter.

# BA334D

## Externally powered pulse input rate totaliser

*Intrinsically safe for use with pulse output flowmeters in gas and dust hazardous areas*

- ◆ Magnetic pick-off, switch contact, proximity detector, open collector or voltage pulse input
- ◆ Separate rate and total displays
- ◆ Intrinsically safe ATEX gas or ATEX gas & dust or FM & ATEX gas
- ◆ IP66 enclosure for surface or pipe mounting
- ◆ Optional: Display backlight Alarms Pulse and 4/20mA outputs External keypad
- ◆ 3 year guarantee



# BEKA associates

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## SPECIFICATION

**Power supply**  
Voltage The BA334D must be powered via a Zener barrier or galvanic isolator. 10V min between terminals 1 and 2.  
Current 12mA max., plus proximity detector current when used.

**Input**  
Switch contact  
Closed Less than 100Ω  
Open Greater than 1kΩ  
Proximity detector 2-wire NAMUR  
Magnetic pick-off 40mV peak to peak typical  
Voltage pulse  
Low Less than 1V  
High Greater than 3V; 30V max  
Open collector  
Closed Less than 2kΩ  
Open Greater than 10kΩ  
Frequency  
Switch contact 0.01Hz to 100Hz  
Other inputs 0.01Hz to 5kHz max

**Display**  
Type Liquid crystal  
Rate~  
Total~  
Grand total  
~ Rate or total can be shown on either display

**Remote reset** Contact closure with resistance less than 1kΩ

**Programmable functions**  
Total dividing scale factor Adjustable between 0.001 & 99999999  
Rate dividing scale factor Adjustable between 0.001 & 99999999  
Rate timebase Rate may be displayed per second, minute or hour.  
Rate display filter Adjustable digital filter

**Intrinsic safety**  
**Europe ATEX**  
Code Group II Category 1G, Ex ia IIC T5 (Tamb = -40 to 60°C)  
or Group II Category 1GD, T80°C IP66 Ex ia IIC T5 (Tamb = -20 to 60°C) *Dust option, see How to order*  
Certificate number ITS01ATEX2001  
Location Gas Zone 0, 1 or 2: Dust Zone 20, 21 or 22

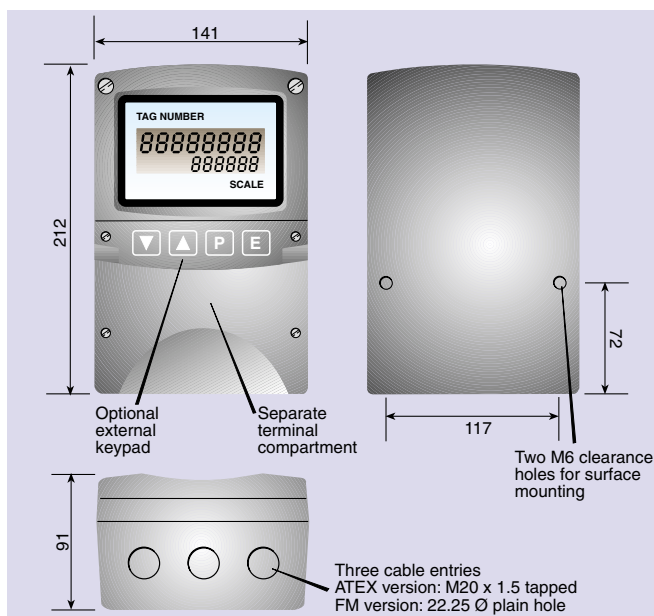
**USA FM** *Option, see How to order*  
Standard 3610 Entity  
Code CL I, II, III: Div 1: GP A, B, C, D, E, F & G T4 @ 60°C  
File 3022309  
Standard 3611 Nonincendive  
Code CL I: Div 2: GP A, B, C & D, T4 @ 60°C  
CL II, III: Div 2: GP E F & G, T4 @ 60°C  
File 3022309

**Environmental**  
Operating temperature -20 to 60°C (Certified for use at -40°C)  
Storage temp -40° to 85°C  
Enclosure IP66 ITS test report C87IV0383A available  
EMC In accordance with EU Directive 2004/108/EC.  
Immunity Less than 1% of rate span error at 10V/m  
Emissions Undetectable above background noise. Class B equipment

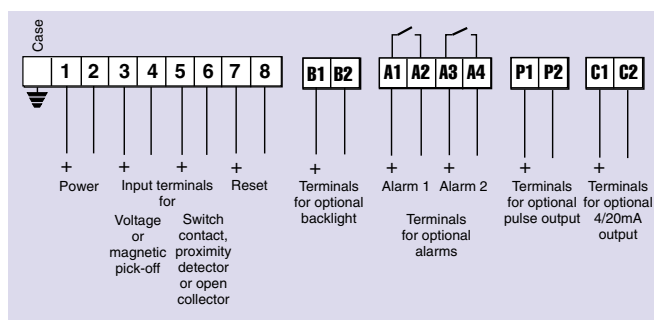
**Mechanical**  
Terminals Screw clamp for 0.5 to 2.5mm<sup>2</sup> cables.  
Weight 1.6kg

**Accessories**  
Display backlighting LED backlight powered from 28V, 93mA Zener barrier or galvanic isolator.  
Alarms Two independent alarms each of which may be programmed for high or low operation with NC or NO output.  
Outputs Isolated solid state switch  
On Less than 5Ω +0.6V  
Off Greater than 180kΩ  
Certified as *simple apparatus*  
Re-transmitted pulse Isolated, certified as *simple apparatus*.  
4/20mA output Isolated current sink, certified as *simple apparatus*  
Voltage drop 5V max.

## DIMENSIONS (mm)



## TERMINAL CONNECTIONS



**External keypad** Membrane keypad enables instrument to be adjusted without removing the control cover.  
**Scale legend** Units of measurement marked onto display escutcheon. \*  
**Tag legend** Tag number or applicational information marked onto display escutcheon. \*  
**Stainless legend plate** Stainless steel plate secured to front of the instrument, etched with tagging or applicational information. \*  
**Pipe mounting kit** 2 kits are available BA392D and BA393. \*

\* See accessory datasheet for details

## HOW TO ORDER

**Model number** BA334D  
**Certification** ATEX gas, ATEX gas & dust, FM & ATEX gas  
**Input Type** XXXXXXX #  
**Rate scaling factor** XXXXXXX #  
**Total scaling factor** XXXXXXX #  
**Rate timebase** Seconds, minutes or hours #

**Accessories** please specify  
Display backlight Backlight  
Alarms Alarms  
Re-transmitted pulse output Pulse output  
4/20mA output 4/20mA output  
External keypad External keypad  
Escutcheon marking  
Scale Scale legend required  
Tag Tag legend required  
Stainless legend plate Legend required  
Pipe mounting kit BA392D or BA393

Note: Cable entries differ for FM & ATEX models

# If calibration information is not supplied, instrument will be set for open collector input with rate timebase of seconds, rate scaling factor of 1 and total scaling factor of 1.