

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



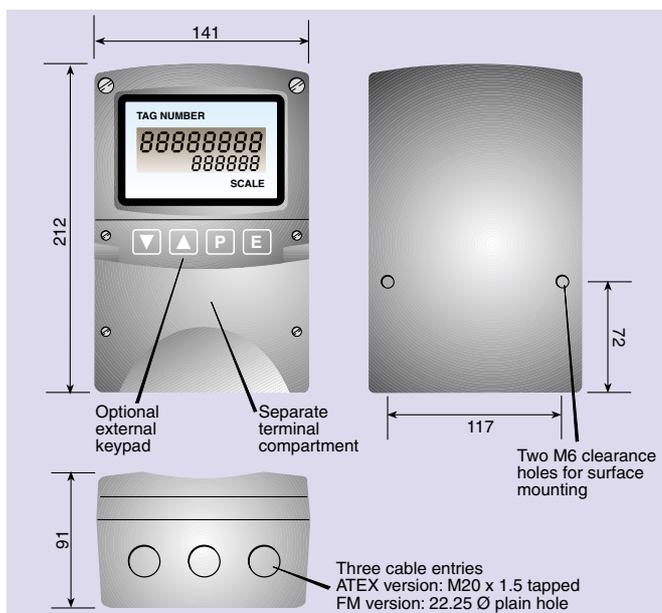
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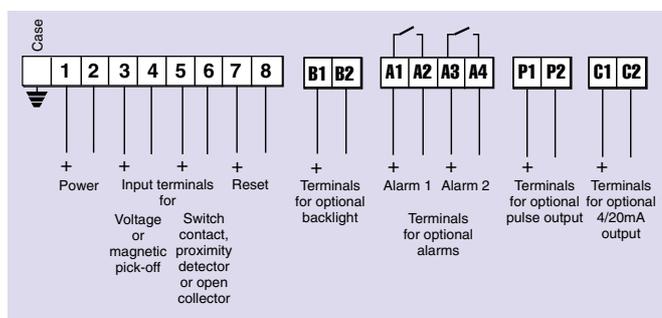
## SPECIFICATION

<b>Power supply</b>	
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.
<b>Input</b>	
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
<b>Display</b>	
Type	Liquid crystal
Rate~	6 digits 9.5mm high
Decimal point	1 of 5 positions or absent
Total~	8 digits 14mm high
Decimal point	1 of 7 positions or absent
Max count	10 <sup>16</sup>
Grand total	
~ Rate or total can be shown	on either display
<b>Remote reset</b>	Contact closure with resistance less than 1kΩ
<b>Programmable functions</b>	
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
<b>Intrinsic safety</b>	
<b>Europe ATEX</b>	
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) <i>Dust option, see How to order</i>
Certificate number	ITS01ATEX2001
Location	Gas Zone 0, 1 or 2: Dust Zone 20, 21 or 22
<b>USA FM</b>	<i>Option, see How to order</i>
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
<b>Environmental</b>	
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
<b>Mechanical</b>	
Terminals	Screw clamp for 0.5 to 2.5mm <sup>2</sup> cables.
Weight	1.6kg
<b>Accessories</b>	
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 <i>simple apparatus</i>
Re-transmitted pulse	Isolated, certified as <i>simple apparatus</i> .
4/20mA output	Isolated current sink, certified as <i>simple apparatus</i>
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	] <i>Note: Cable entries differ for FM &amp; ATEX models</i>
Certification	ATEX gas ATEX gas & dust FM & ATEX gas	
Input	Type	
Rate scaling factor	XXXXXXXX #	
Total scaling factor	XXXXXXXX #	
Rate timebase	Seconds, minutes or hours #	
<b>Accessories</b>	<b>please specify</b>	
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	

# 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.