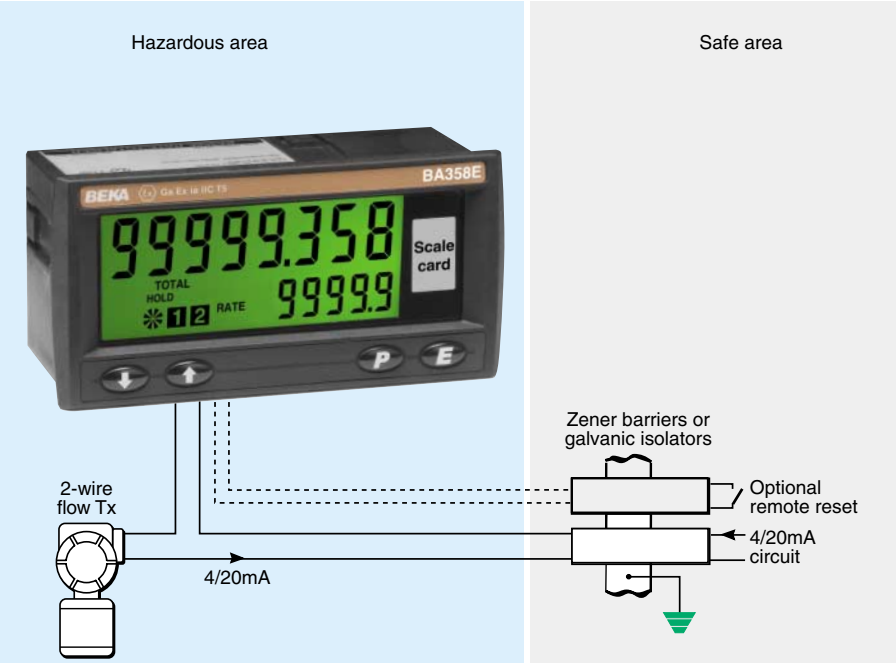

Shown with optional backlight - loop powered

BA358E

2-wire 4/20mA rate totaliser

Intrinsically safe for use in all gas & dust hazardous areas

- **Loop powered only 1.2V drop**
- **Total display 8 digit 18mm high**
  Rate display 5 digit 12mm high
- **Intrinsically safe ATEX, FM, cFM & IECEx**
- **Uni-directional & bi-directional operation**
- **Root extractor and 16 segment lineariser**
- **Optional backlight & alarms**
- **Easy on-site scale card installation**
- **IP66 front**
- **144 x 72mm DIN enclosure**
- **3 year guarantee**

The BA358E loop powered 4/20mA rate totaliser is a third generation instrument that is electrically and mechanically compatible with the earlier BA358C, but has a much larger display with a wider viewing angle providing maximum visibility from a 144 x 72mm instrument. The new model has an extended operating temperature range, dust certification and an even shorter enclosure depth than its predecessor. The scale card can easily be marked to show the units of measurement and can be installed on-site without dismantling the indicator enclosure or removing it from the panel.

The main application of the BA358E is to integrate the 4/20mA output from a hazardous area flow transmitter and display the rate and total flow in engineering units within the hazardous area. A selectable square root extractor enables the output from differential flowmeters to be displayed in linear engineering units and a sixteen segment fully adjustable lineariser provides compensation for nonlinear flowmeters. When fitted with optional alarms the BA358E can detect high and low rates of flow and may be used for simple batching applications.

The large display provides maximum contrast and has a very wide viewing angle, allowing the BA358E itotaliser to be easily read in most lighting conditions over a wide temperature range. An optional factory fitted backlight is available for applications in poorly illuminated areas. The 18mm high eight digit total display may be configured to show total flow in any units of measurement. The display may be reset to zero using a front panel push button or an external contact closure. The rate display may be calibrated to show flow in the same or in different engineering units to those used for the total display.

IP66 front panel protection and a neoprene gasket sealing the joint between the totaliser and the panel making the instrument suitable for use 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 BA358E is installed.

International intrinsic safety certification permits the BA358E to be installed throughout the world. The 4/20mA input terminals comply with the requirements for simple apparatus which, together with the low voltage drop, allow the totaliser to be connected in series with most intrinsically safe 4/20mA loops. The BA358E may also be installed in dust hazardous areas. All input safety parameters are the same or greater than those for the preceding BA358C, thus allowing the BA358E to safely replace the earlier model.

A backlight that may be loop or separately powered is available as a factory fitted option. It provides green background illumination allowing the display to be read at night or in poorly illuminated areas. When powered from the 4/20mA loop no additional intrinsically safe interface or wiring is required and the indicator input remain compliant with the requirements for simple apparatus. Powering from a separate supply produces a brighter backlight but requires an additional intrinsically safe interface and field wiring.

Optional dual alarms which can switch hazardous or safe area loads, such as sounders, beacons or solenoid valves, are available as a factory fitted option. The two galvanically isolated solid state outputs may be independently conditioned as total or rate alarms with normally open or closed outputs. Annunciators on the display show the status of both alarm outputs.

Reliability is ensured by component conformal coating, protection from incorrect connection and radio frequency interference. The totaliser has been subjected to vibration testing and is supported by a three year guarantee.

For field mounting applications the BA354E has a similar specification as the BA358E, but is housed in a robust IP66 GRP enclosure suitable for external mounting. For safe area applications the BA554E and BA558E are equivalent uncertified field and panel mounting models.

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SPECIFICATION

Input

Current	4 to 20mA
Voltage	Less than 1.2V at 20˚C Less than 1.3V at –20˚C Less than 5V with optional loop powered backlight.
Overrange	±200mA or ±30V will not damage the instrument.

Display

Type	Liquid crystal, multiplexed 2:1
Zero blanking	Blanked apart from 0 in front of decimal point.
Rate~	5 digits 12mm high.
Span	Adjustable between 0 & ±99999 for a 4/20mA input.
Zero	Adjustable between 0 & ±99999 with 4mA input.
Decimal point	1 of 4 positions or absent
Timebase	Per second, minute or hour
Total~	8 digits 18mm high
Scaling factor	Adjustable between 0.0001 & 99999
Decimal point	1 of 5 positions or absent
Grand total	Maximum count 10^{16}

~ Rate & Total can be shown on either display

Push buttons	*(Function in display mode)*
▼	Shows rate display with 4mA input
▲	Shows rate display with 20mA input
'P'	Displays input in mA or a % of span, has a modified function when alarms are fitted.
'E'	Time since total display was reset

Accuracy

Rate display at 20˚C

Linear	±0.02% of span ±1digit
Root extracting	±16µA at input ±1 digit
Temperature effect on:	
Zero	Less than 25ppm of span/˚C
Span	Less than 50ppm of span/˚C
Series mode rejection.	Less than 0.05% of span error for 1mA pk to pk 50 or 60Hz interference.
Total display	Updated every second

Remote total reset — Contact closure with resistance less than 1kΩ.

Intrinsic safety

Europe ATEX

Code	Group II Category 1GD Ex ia IIC T5 Ga Ex ia IIIC T80˚C Da IP20 Tamb = -40 to 70˚C
Input parameters	
Ui	30V dc
Ii	200mA
Pi	0.84W
Output parameters	Complies with requirements for *simple apparatus.*
Cert. No.	ITS11ATEX27254X (Special conditions only apply for use in Group IIIC conductive dusts)

USA FM

Standard	3610 Entity
Code	CL I: Div 1 Gp A, B, C, & D T5 @ 70˚C
Standard	3611 Nonincendive
Code	CL I, II, III: Div 2 Gp A, B, C, D, E, F & G T5 @ 70˚C
File	3041487

Canada cFM

File	3041487C

International IECEx

Code	Ex ia IIC T5 Ga Ex ia IIIC T80˚C Da IP20 Tamb = -40 to 70˚C
Cert. No	IECEx ITS11.0015X (Special conditions only apply for use in Group IIIC conductive dusts)

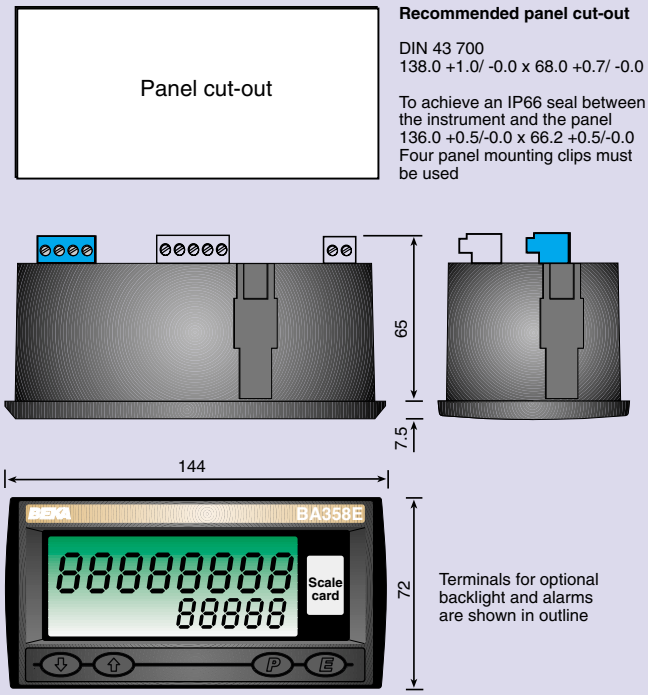
Environmental

Operating temperature	-40 to +70˚C
Display	-20 to +70˚C
Storage temperature	-40 to +85˚C
Humidity	to 95% at 40˚C noncondensing
Vibration	Report available
Enclosure	Front IP66, rear IP20
EMC	Complies with 2004/108/EC

Mechanical

Terminals	Screw clamp for 0.5 to 1.5mm² cable, removable.
Weight	0.35kg

DIMENSIONS (mm)



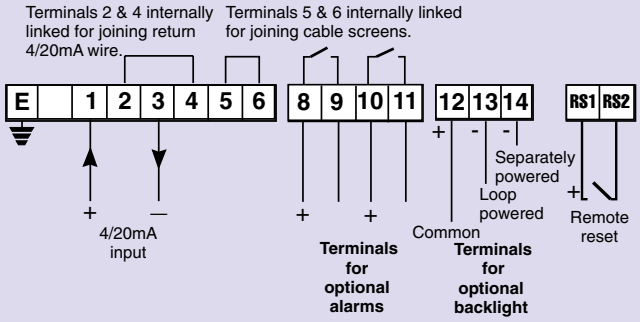
Recommended panel cut-out

DIN 43 700
138.0 +1.0/ -0.0 x 68.0 +0.7/ -0.0

To achieve an IP66 seal between the instrument and the panel
136.0 +0.5/-0.0 x 66.2 +0.5/-0.0
Four panel mounting clips must be used

Terminals for optional backlight and alarms are shown in outline

TERMINAL CONNECTIONS



Accessories

Backlight	Green, may be loop or separately powered.
Loop powered	Totaliser voltage 5V
Separately powered.	10.5V at 35mA from IS interface
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.
Output	Isolated solid state switch complying with requirements for Simple apparatus.
Ron	5Ω + 0.7V max
Roff	IMΩ min
Printed scale card	Blank card fitted to each totaliser can be supplied printed with specified units of measurement.
Pack of printed scale cards	Contains 26 common units of measurement and four blanks.
Tag legend	Specified tag number or application thermally printed onto rear of the instrument.

HOW TO ORDER

	Please specify
Model number	BA358E
Display mode	Linear, root or linear iser*
Rate display at:	
4.000mA	XXXXX
20.000mA	XXXXX
	Include position of decimal point & sign if negative, plus intermediate points if linearisation is required.*
Rate timebase	Seconds, minutes or hours*
Total scale factor	(Units of rate display)÷(Units of total display)*

Accessories	**Please specify if required**
Display backlight	Backlight
Dual alarms	Alarms
Scale card	Legends required
Tag	Legend required

** If calibration information is not supplied totaliser will be set to display a rate of 0.00 at 4mA and 100.00 at 20mA with a linear display, a timebase of seconds and a total scale factor of 1. Can easily be recalibrated on-site.*