

The **BA354E loop powered 4/20mA rate totaliser** is a third generation field mounting instrument that is electrically and mechanically compatible with the earlier BA354D, but it has a larger display, extended operating temperature and additional features such as a lineariser and bi-directional flow capabilities. Like its predecessor the BA354E is housed in a robust IP66 GRP enclosure with a separate terminal compartment.

Main application of the BA354E 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 BA354E 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 BA354E totaliser 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.

The robust GRP enclosure has stainless steel fittings, silicone gaskets and an armoured glass window providing IP66 protection. Ingress and impact protection have been independently assessed by Intertek. A separate terminal compartment allows the instrument 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. Additional terminals are provided which may be used for linking the return 4/20mA conductor and the cable screens.

International intrinsic safety certification permits the BA354E 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 BA354E may also be installed in dust hazardous areas. All input safety parameters are the same or greater than those for the preceding BA354D, thus allowing the BA354E to safely replace the earlier model.

A backlight which 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 extensive vibration testing and is supported by a three year guarantee.

For panel mounting applications the BA358E has a similar specification but is housed in a 144 x 72 DIN panel mounting enclosure with an IP66 front panel.

BA354E

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 gas
or ATEX gas & dust
or FM, cFM & ATEX gas
or INMETRO
All versions have IECEx certification.
- ◆ IP66 GRP enclosure with separate terminal compartment.
- ◆ Uni-directional & bi-directional operation.
- ◆ Root extractor and 16 segment lineariser.
- ◆ Optional backlight & alarms.
- ◆ 3 year guarantee



BEKA

associates

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 ±1 digit |
| 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 |
| Total display | Updated every second |

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

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|-------------------------|---|
| Intrinsic safety | |
| Europe ATEX | |
| Code | Group II Category 1GD Ex ia IIC T5 Ga Ex ia IIIC T80°C Da IP66- Ta = -40 to 70°C |
| Input parameters | |
| Ui | 30V dc |
| Ii | 200mA |
| Pi | 0.84W |
| Output parameters | |
| Cert. No. | Complies with requirements for simple apparatus. ITS11ATEX27253 |

Dust option, see How to order

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|---------------|--|
| USA FM | |
| Standard | 3610 Entity |
| Code | CL I, II, III: Div 1 GP A, B, C, D, E, F & G T5 @ 70°C |

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|----------|--|
| Standard | 3611 Nonincendive |
| Code | CL I, II, III: Div 2 GP A, B, C, D, E, F & G T5 @ 70°C |
| File | 3041487 |

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|-------------------|----------|
| Canada cFM | |
| File | 3041487C |

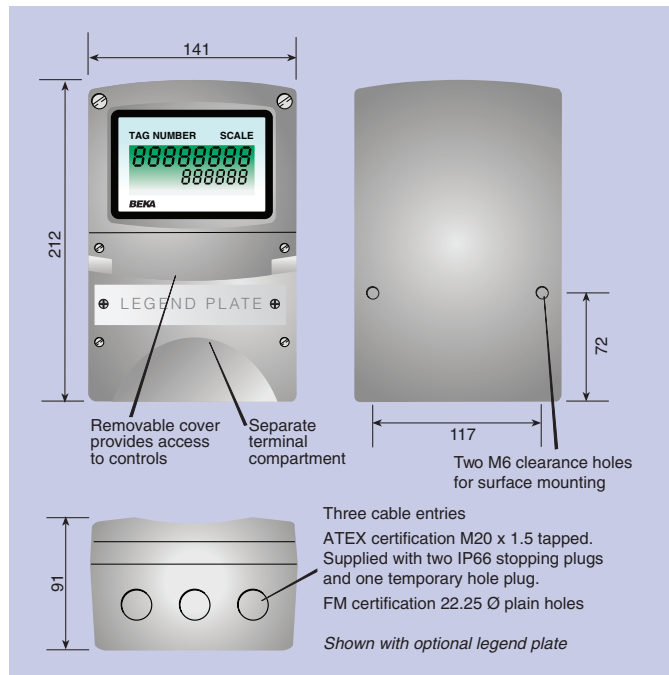
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|----------------------------|--|
| International IECEx | |
| Code | Ex ia IIC T5 Ga Ex ia IIIC T80°C Da IP66- Tamb = -40 to 70°C |
| Cert. No | IECEx ITS11.0014 |
| Brazil INMETRO | NCC 12.0970 |

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|-----------------------|--|
| 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 | IP66 |
| EMC | Complies with EMC Directive 2004/108/EC. |

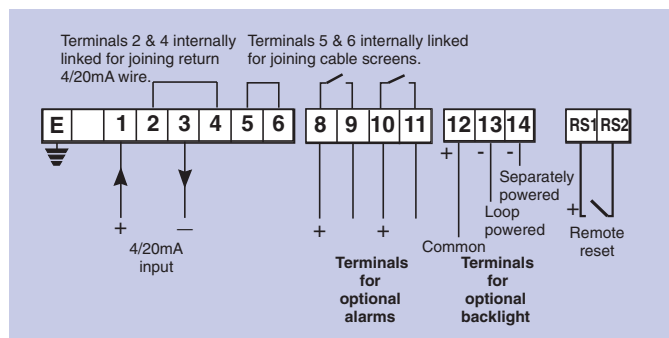
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|-------------------|---|
| Mechanical | |
| Terminals | Screw clamp for 0.5 to 1.5mm ² cable |
| Weight | 1.7kg |

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|---------------------|--|
| 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 <i>Simple apparatus</i> . |
| Ron | 5Ω + 0.7V max |
| Roff | IMΩ min |

DIMENSIONS (mm)



TERMINAL CONNECTIONS



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|-------------------------------|--|
| External keypad | Membrane keypad enables totaliser to be controlled without removing cover. |
| Scale legend | Units of measurement marked onto display escutcheon. |
| Tag legend | Tag number or application marked onto display escutcheon. |
| Stainless steel legend plate. | Stainless steel plate etched with tag number or application attached to front of the instrument. # |
| Pipe mounting kit | BA392D or BA393 # |

See accessory datasheet for details

HOW TO ORDER

| | | |
|------------------------|---|--|
| Model number | BA354E | |
| Certification | ATEX gas | All versions have IECEx certification. |
| | ATEX gas & dust | |
| | FM, cFM & ATEX gas | |
| | INMETRO gas | |
| | INMETRO gas & dust | |
| Display mode | Linear, root or lineariser* | |
| Rate display at: | XXXXX } Include position of decimal point & sign if negative, plus intermediate points if linearisation is required.* | |
| | XXXXX | |
| Rate timebase | Seconds, minutes or hours* | |
| Total scale factor | (Units of rate display)÷(Units of total display)* | |
| Accessories | Please specify if required | |
| External keypad | External keypad | |
| Display backlight | Backlight | |
| Dual alarms | Alarms | |
| Escutcheon marking | Legend required | |
| Scale | Legend required | |
| Tag | Legend required | |
| Stainless legend plate | Legend required | |
| Pipe mounting kit | BA393D or BA393 | |

* If calibration information is not supplied the 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.