# BEKA BA354E Loop Powered Rate Totaliser Instruction Manual

**BEKA BA354E Loop Powered Rate Totaliser**

**Contents**

## DESCRIPTION

The BA354E is a field mounting, intrinsically safe, 4/20mA rate totaliser primarily intended for use with flowmeters. It simultaneously displays the rate of flow (4/20mA current) and the total flow in engineering units on separate displays. It is loop powered but only introduces a 1.2V drop into the loop.

This abbreviated instruction sheet is intended to assist with installation and commissioning, a comprehensive instruction manual describing safety certification, system design and configuration is available from the BEKA sales office or may be downloaded from our website.

The BA354E has IECEx, ATEX and UKEX intrinsic safety certification for use in flammable gas atmospheres. The certification label, which is located on the top of the instrument enclosure shows the certificate numbers and the certification codes. Copies of certificates may be downloaded from our website.
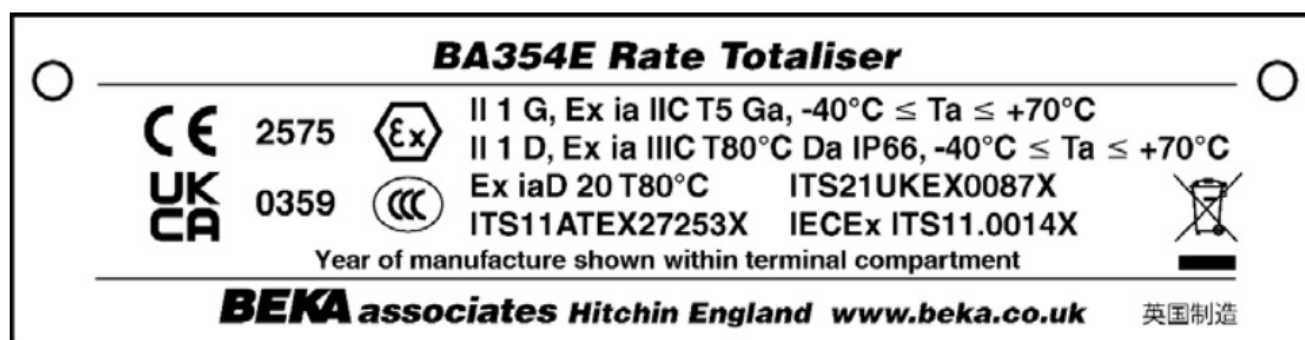
- Gas certification label



**CAUTION**

Special conditions apply for installation in Zone0. See certificates of full instruction manual

Dust certification is available as a factory option, which must be requested when the instrument is ordered. The dust and gas certification label is shown below.

- Dust and gas certification label

## INSTALLATION

The BA354E rate totaliser has a robust IP66 glass reinforced polyester (GRP) enclosures incorporating an armoured glass window and stainless steel fittings. It is suitable for exterior mounting in most industrial environments.
It is surface mounting, but may be pipe mounted using one of the accessory kits.

- Step 1 Remove the terminal cover by unscrewing the two 'A' screws
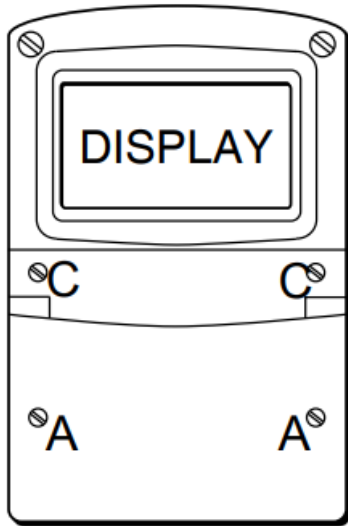


- Step 2 Secure the instrument to a flat surface with M6 screws through the two 'B' holes. Alternatively use a pipe mounting kit.
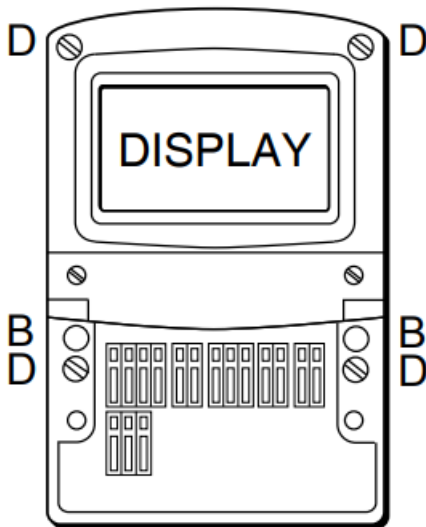


- Step 3 and 4 Remove the temporary hole plug and install appropriate IP rated cable gland or conduit fitting and terminate field wiring. Replace the terminal cover and tighten the two 'A' screws.
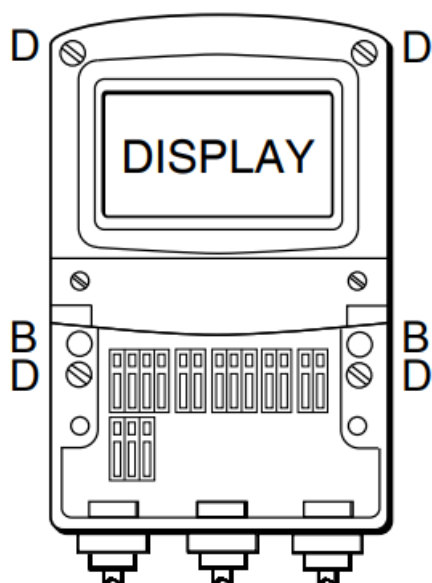
## Dimensions

The rate totaliser's earth terminal is connected to the carbon loaded GRP enclosure. If this enclosure is not bolted to an earthed post or structure, the earth terminal should be connected to the plant potential equalising conductor.
A bonding plate is provided to ensure electrical continuity between the three conduit / cable entries.
Terminals 8, 9, 10 & 11 are only fittted when the rate totaliser includes optional alarms. See full manual for details.
Terminals 12, 13 & 14 are only fitted when the rate totaliser includes an optional backlight. See full manual for details.

- Dimensions and terminal connections

91
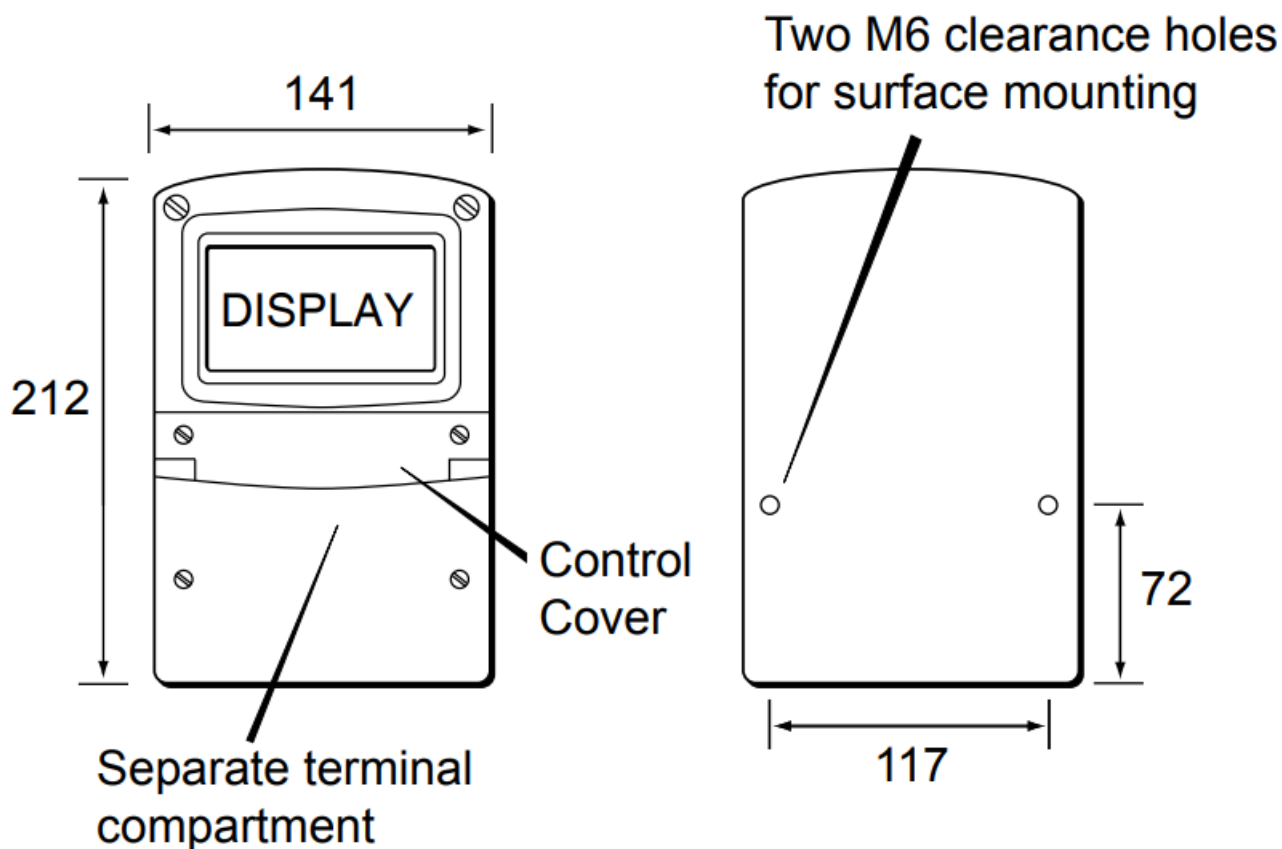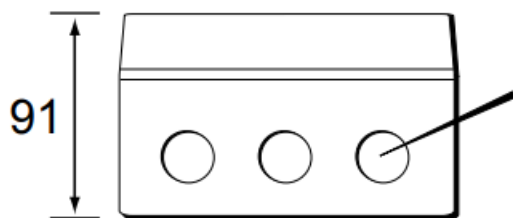
ATEX version: M20 x 1.5 tapped. Supplied with two IP66 stopping plugs & one temporary hole plug.

FM version: 22.25 Ø plain holes.

| 1 | 2 | 3 | 4 | RS1 | RS2 | 12 | 13 | 14 | 8 | 9 | 10 | 11 |

+ − RS1

4/20mA input    RS2
                Reset

E 5 6    Common

Loop powered

Separately powered

Terminals for optional backlight, see full manual

Terminals for optional alarm, see full manual
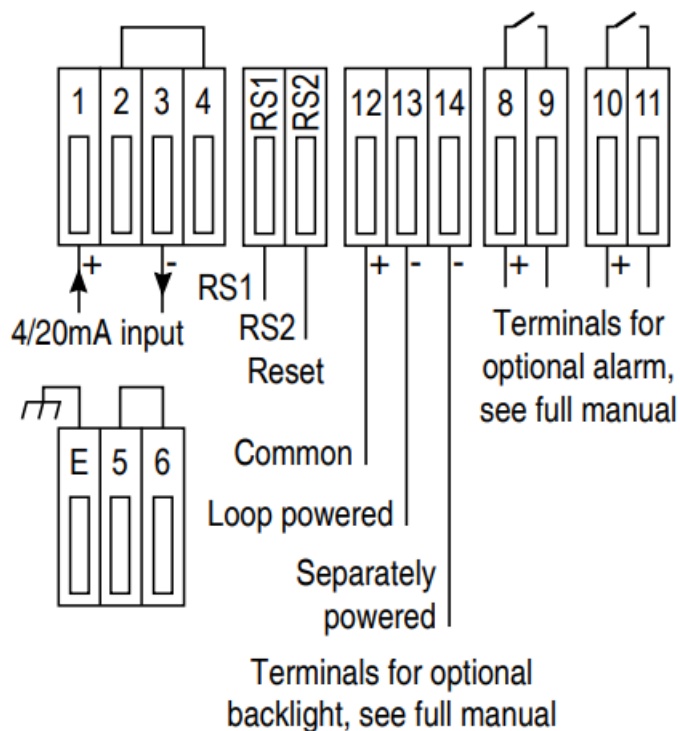
Terminals 2 & 4 internally linked for joining return 4/20mA wire.

Terminials 5 & 6 internally linked for joining cable screens

**EMC**
For specified immunity all wiring should be in screened twisted pairs, with the screens earthed in the safe area.

- Typical measurement loop
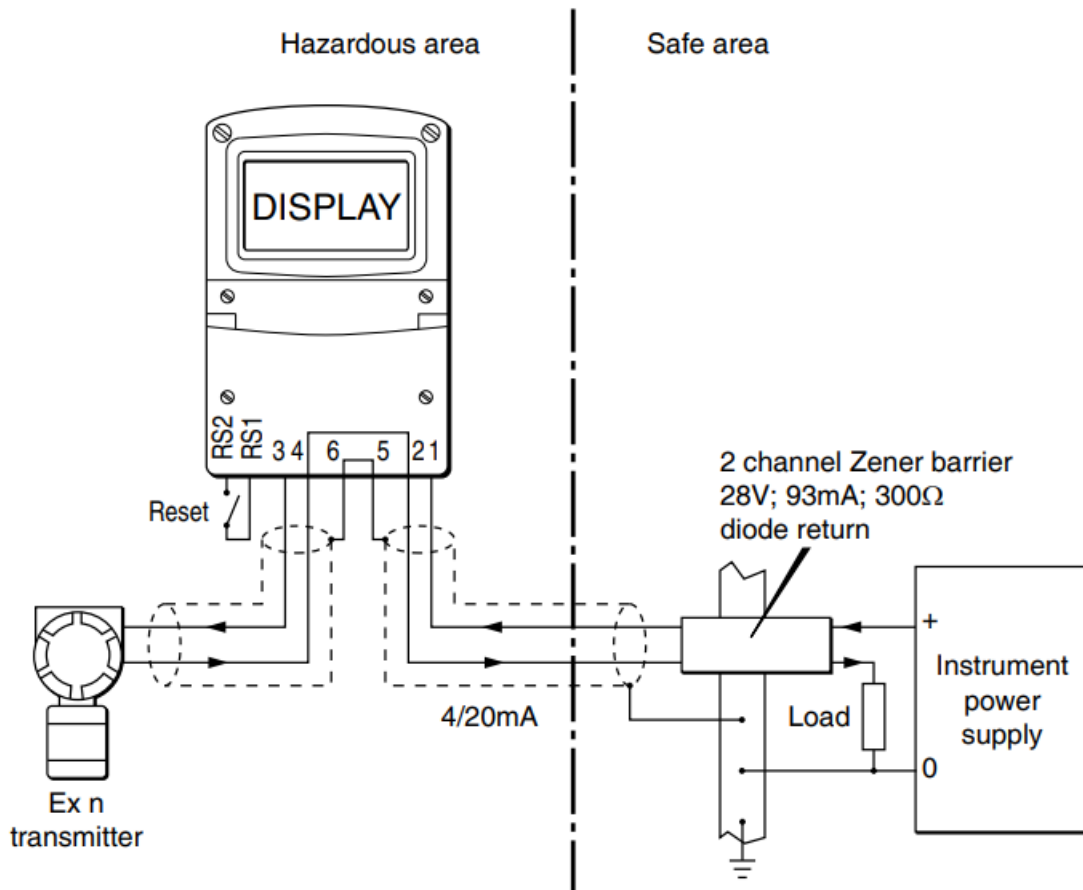
**Units of measurement & tag number**

The BA354E has an escutcheon around the liquid crystal display which can be supplied printed with any units of measurement and tag information specified when the instrument was ordered. If no information was supplied a blank escutcheon will be fitted but legends may be added on-site via an embossed strip, dry transfer or a permanent marker. Custom printed escutcheons are available from BEKA as an accessory which should be fitted on top of the blank escutcheon. Do not remove the blank escutcheon.

To gain access to the escutcheon remove the terminal cover by unscrewing the two 'A' screws which will reveal two concealed 'D' screws. If the instrument is fitted with an external keypad, also unscrew the two 'C' screws securing the keypad and un-plug the five way connector. Finally unscrew all four 'D' screws and carefully lift off the front of the instrument. Add the required legend to the escutcheon, or stick a new printed self-adhesive escutcheon on top of the existing escutcheon.

## OPERATION

The BA354E is controlled and configured via four push buttons located behind the instrument control cover, or via an optional keypad on the outside of the control cover. In the display mode i.e. when the instrument is totalising, these push buttons have the following functions:

| | |
|---|---|
| **P** | Displays input current in mA or as a percentage of span. (configurable function)<br>Modified when optional alarms are fitted. |
| ▼ | Shows rate display calibration at 4mA input |
| ▲ | Shows rate display calibration at 20mA input |
| **E** | Shows time since instrument was powered or total display was reset. |
| **E+** ▼ | Grand total displays least significant 8 digits |
| **E+** ▲ | Grand total displays most significant 8 digits |
| ▼ **+** ▲ | Resets total display (configurable function) |
| **P+** ▼ | Shows firmware version |
| **P+** ▲ | Optional alarm setpoint access |
| **P+E** | Grand total displays most significant 8 digits |

## CONFIGURATION

Totalisers are supplied calibrated as requested when ordered, if not specified default configuration will be supplied but can easily be changed on-site.
**Fig4** shows the location of each function within the configuration menu with a brief summary of the function. Please refer to the full instruction manual for detailed configuration information and for a description of the lineariser and the optional dual alarms.
Access to the configuration menu is obtained by pressing the P and E buttons simultaneously. If the totaliser security code is set to the default '0000' the first parameter 'FunC' will be displayed. If the totaliser is protected by a security code, 'CodE' will be displayed and the code must be entered to obtain access to the menu.

Display mode

Security Code
Enter code by pressing ▲ ▼ and P to move to next digit. Code 0000 allows direct access to the menu

CodE
0000

When fitted alarm functions appear here

FunC — rESn — uPdAtE — d. SP-1 — d. SP-2 — dP — CAL — SEt — CL-Gtot — t-bASE — C--P — SCALE-t — CLi P-oFF — LoCrESt — CodE — rSEt

Std | 10 | 1 | totAL | on | 0000.0 | ZEro — SPAn | ZEro — SPAn | no | tb-01 | 4-20 | 00000 | 00000 | Lt-rESt — Gt-rESt | 0000 | ConF

99999 | 99999 | 99999 | 99999 | 0000 | oFF | oFF | 0000

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### Function

▲ or ▼ to select

Function or rate totaliser

'5td' — Linear

'root' — Sq root extraction

'Lin' — 16 segment lineariser

'bi-5td' — Bi-directional linear

'bi-Lin' — Bi-directional 16 segment lineariser

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### Resolution

▲ or ▼ to select resolution of least significant digit of rate display, may be set to 1, 2, 5 or 10 digits

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### Update

▲ or ▼ to select interval between display updates, may be set to 1, 2, 3, 4 or 5 seconds

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### Upper Display

▲ or ▼ to select whether rAtE or totAL is shown on the upper display

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### Lower Display

▲ or ▼ to turn lower display on or oFF

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### Decimal point

▲ or ▼ to select position of decimal point and P to toggle between rate and total displays

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### Calibration of rate display using external current source (Preferred method)

With accurate 4mA input current set required zero display by pressing ▲ ▼ and P to move to the next digit

Similarly, using accurate 20mA input current set required full scale display

Any current between 4 and 20mA may be used providing difference is > 4mA

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### Calibration of rate display using internal references (Input current may be any value)

Using ZEro function set required display at 4mA by pressing pressing ▲ ▼ and P to move to the next digit

Similarly, using 5PAn function set required display at 20mA

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### Clear grand total

Press ▲ ▼ to select YES to reset grand total to zero.

Confirm selection by entering 5urE by pressing ▲ ▼ & P to move to next digit

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### Timebase

▲ or ▼ to select between rate display timebase.

tb-1 for flow/sec

tb-60 for flow/min

tb-3600 for flow/hour

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### Function of P button in display mode

Press ▲ ▼ to toggle between 4-20mA and % of span

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### Total scale factor

Arithmetic relationship between the rate and total displays

Press ▲ or ▼ to adjust value and P to move to next digit or decimal point

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### CLip-oFF

Positive or negitive rate display below which totalisation is inhibited

Press ▲ or ▼ to adjust value and P to move to next digit

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### Local total reset

▲ or ▼ to turn the local total reset function on or oFF. When on, total display is reset to zero when ▲ and ▼ are operated simultaneously for more than 2 seconds

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### Local grand total reset

▲ or ▼ to turn the local grand total reset function on or oFF. When on, grand total display may be reset to zero when E and ▲ are operated simultaneously for more than 10 seconds

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### Define Security Code

Enter by pressing ▲ ▼ & P to move to next digit

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### Reset Rate Totaliser configuration

Press ▲ ▼ to select ConF to reset rate and total or LtAb to reset lineariser to default configuration.

Confirm selection by entering 5urE by pressing ▲ ▼ & P to move to next digit

The BA354E is CE marked to show compliance with the European Explosive Atmospheres Directive 2014/34/EU and the European EMC Directive 2014/30/EU. It is also UKCA marked to show compliance with UK statutory requirements Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations UKSI 2016:1107 (as amended) and with the Electromagnetic Compatibility Regulations UKSI 2016:1091 (as amended)

## Customer Support

BEKA associates Ltd. Old Charlton Rd, Hitchin, Hertfordshire,
SG5 2DA, UK Tel: +44(0)1462 438301 **e-mail: [sales@beka.co.uk](mailto:sales@beka.co.uk)**
**web: [www.beka.co.uk](http://www.beka.co.uk)**

## Documents / Resources

| | |
|---|---|
|  | **BEKA BA354E Loop Powered Rate Totaliser** [pdf] Instruction Manual<br>BA354E Loop Powered Rate Totaliser, BA354E, Loop Powered Rate Totaliser, Powered Rate Totaliser, Rate Totaliser, Totaliser |

## References

- Ⓑ **BEKA associates Ltd.**
- Ⓑ **BA354E 4/20mA Loop powered rate totaliser, Intrinsically safe**