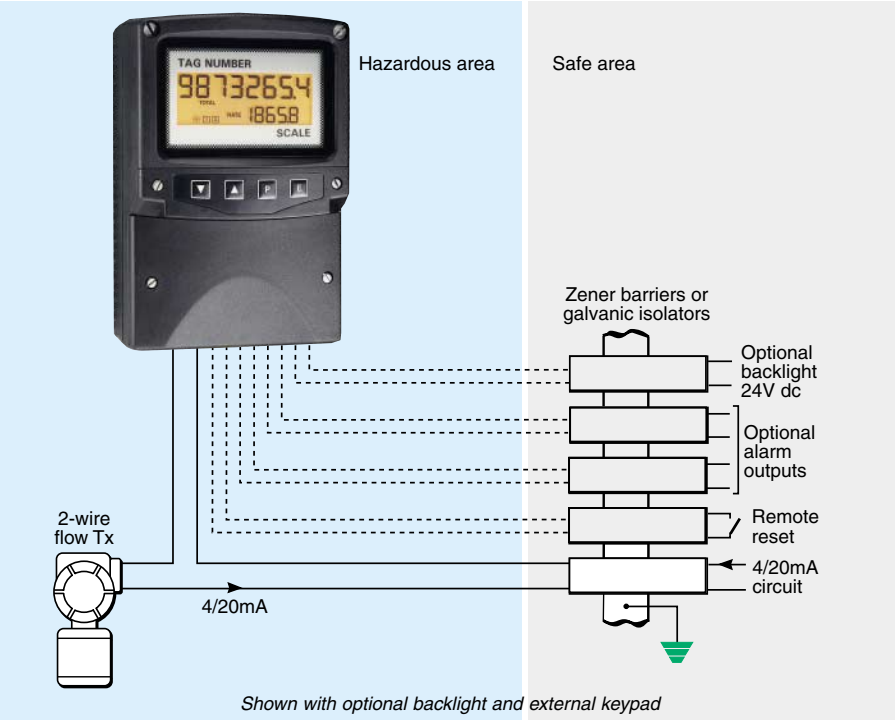

Shown with optional backlight and external keypad

BA354D

2-wire 4/20mA rate totaliser

Intrinsically safe for use with 4/20mA flowmeters in all hazardous areas

- ***Loop powered only 1V drop***
- ***Separate rate and total displays***
- ***Intrinsically safe ATEX certification***
- ***IP66 enclosure for surface, pipe or stem mounting***
- ***Root extractor***
- ***Optional:***
  Alarms
  Backlight
  External keypad
- ***3 year guarantee***

The BA354D is a loop-powered, intrinsically safe, field mounting rate totaliser with separate rate and total displays. When connected in series with a 4/20mA flow transmitter, the BA354D will display the rate of flow in engineering units and total flow in the same or different units. The BA354D only introduces a 1V drop which allows it to be installed in almost any 4/20mA loop. If the 4/20mA loop is disconnected, the displayed total and all programme parameters are stored in permanent memory, and are automatically recovered when the 4/20mA current is restored.

Main application of the BA354D is to integrate the 4/20mA output from a flow transmitter and to display the total flow in engineering units. The flow rate is shown on a second smaller display. A selectable root extractor enables the output from a differential flow transmitter to be displayed in linear units.
When fitted with optional alarms, the BA354D can detect low or high flow rates and can perform simple flow batching applications.

Intrinsic safety certification to the ATEX Directive allows installation throughout Europe. The 4/20mA input terminals comply with the requirements for *simple apparatus* enabling the BA354D to be connected in series with most certified intrinsically safe circuits without the need for an additional system certificate. This, together with the very low voltage drop, makes the BA354D easy to apply.

Control and programming of the BA354D 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 an external membrane keypad. All the programme functions are contained in easy to understand menus which may be protected by a user definable security code. Display scaling factors employ floating decimal points to simplify calibration.

An internal calibrator simulates 4 and 20mA input currents so that the instrument may be quickly calibrated without the need for test equipment or disconnection from the 4/20mA loop.

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 certified intrinsically safe load such as a solenoid valve or sounder may be controlled by these outputs.

Backlighting is available as an option to improve readability when the BA354D is installed in a poorly illuminated area. High efficiency amber LEDs provide an even glow to enhance display contrast. The backlight is powered by a separate Zener barrier or galvanic isolator and does not affect certification of the 4/20mA loop.

The enclosure, which is moulded in glass reinforced polyester (GRP), has stainless steel fittings, neoprene gaskets and an armoured glass window. Its robust construction provides IP66 protection. A separate terminal compartment allows the BA354D 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 to link the return 4/20mA conductor and cable screens.

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SPECIFICATION

Input

Current	4 to 20mA
Voltage	Less than 1V at 20˚C
Overrange	±200mA will not cause damage

Display

Type	Liquid crystal
Rate ~	5 digits 9.5mm high
Span	Adjustable between 0 & 20000 for a 4 to 20mA input
Zero	Adjustable between 0 & 20000 with 4mA input.
Decimal point	1 of 4 positions or absent
Timebase	Per second, minute or hour
Overrange	4 least significant digits are blanked
Total ~	8 digits 14mm high
Scaling factor	Adjustable between 0.0001& 65535
Decimal point	1 of 7 positions or absent
Grand total	Max count 10^{16}

~ Rate and total can be shown on either display

Accuracy

Rate display at 20˚C	
Linear	±0.02% of span ±1 digit
Root extracting	±16µA at input ±1 digit
Temperature effect	
Zero	Less than 25ppm/˚C
Span	Less than 50ppm/˚C
Series mode rejection	Less than 0.05% of span error for 1mA pk to pk 50Hz or 60Hz signal.
Total display	Updated every second

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

Intrinsic safety

Europe ATEX	
Standard	EN50020:1994
Code	Group II Category 1G EEx ia IIC T5
Certificate number	ITS00ATEX2009
Output parameters	
Uo	1.1V
Io	70mA dc
Po	22mW
Ceq	20nF
Leq	10µH

Complies with Clause 5.4 of EN50020:1994 *Simple Apparatus*

Installation — The BA354D may be connected to any certified intrinsically safe circuit whose output parameters do not exceed:

Uo	30V
Io	200mA
Po	0.85W

Environmental

Operating temperature	-20 to 60˚C (Certified for use at -40˚C)
Enclosure	IP66 see ITS test report C87IV0383A
EMC	In accordance with EU Directive 89/336/EEC.
Immunity	Less than 1% of rate span error for 10V/m.
Emissions	Undetectable above background noise. Class B equipment

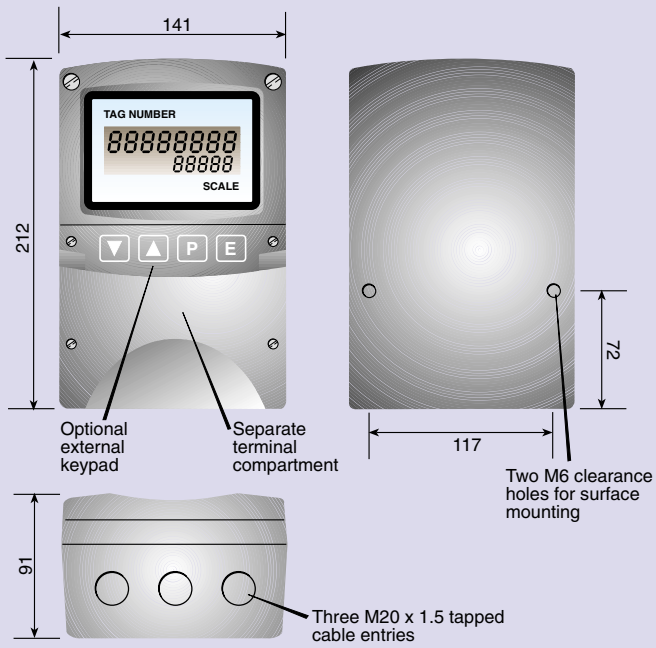
Mechanical

Terminals	Screw clamp for 0.5 to 2.5mm² cables.
Weight	1.6kg

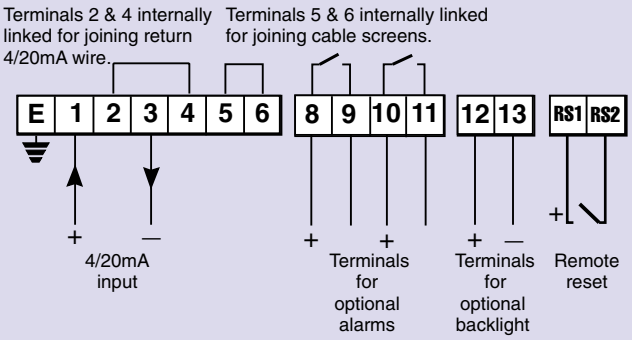
Accessories

Display backlight	LED backlight powered from 28V 300Ω Zener barrier or galvanic isolator.
Alarms	Two independent alarms each of which may be programmed for high or low operation on either the rate or total display with a NC or NO output.
Outputs	Isolated solid state switch
On	Less than 5Ω +0.6V
Off	Greater than 180kΩ
	Certified as *simple apparatus*
External keypad	Membrane keypad enables instrument to be adjusted without removing the control cover.
Scale legend	Units of measurement marked on display escutcheon. *
Tag legend	Tag number or applicational information marked on display escutcheon. *
Stainless legend plate	Stainless steel plate secured to side of instrument, engraved with tagging or applicational information. *

DIMENSIONS (mm)



TERMINAL CONNECTIONS



Pipe mounting kit	2 kits are available BA392D and BA393*
Stem mounting kit	BA395 enables instrument to be mounted directly onto a flowmeter. *

** See accessory datasheet for details*

HOW TO ORDER

	please specify
Model number	BA354D
Rate display at 4mA	XXXXX
Rate display at 20mA	XXXXX
Rate timebase	Seconds , minutes or hours
Total scale factor	(Units of rate display#)÷(Units of total display)

Include position of decimal point #

Accessories	please specify
Display backlight	Backlight
Alarms	Alarms
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
Stem mounting kit	BA395

If calibration information is not supplied, instrument will be set to display rate of 0.00 to 100.00 with a timebase of seconds and a total scale factor of 1