Hazardous area
BA458C

Safe area

Pulse or 4/20mA output from flowmeter

Power supply

24V

Galvanic isolators or Zener barriers

Flowmeter

Valve 2

Flow

Valve 1

BA458C

Flow batch controller

Intrinsically safe for use in all gas hazardous areas

◆ **Easy to use**

◆ **Intrinsically safe**

◆ **High contrast display with backlight.**

◆ **Pulse or 4/20mA current source input.**

◆ **3 or 6 outputs**

◆ **9 selectable batch setpoints.**

◆ **IP66 front panel**

◆ **3 year guarantee**

www.beka.co.uk/ba458c

The BA458C is an intrinsically safe second-generation flow batch controller that supersedes the successful BA350BP and BA350BC. This controller is ideal for accurately dispensing liquids, solids or components in a hazardous area and despite its sophisticated control functions, it is very easy to configure and use. Carefully designed display screens, annotated in English, French, or German, lead the user intuitively through the available options. The BA458C accepts a pulse or 4/20mA analogue input and incorporates a square root extractor and sixteen point lineariser allowing use with almost any flowmeter or sensor. Separate total and rate scaling factors enable the dispensed quantity and the rate of dispensing to be displayed in the same or in different engineering units.

Single or two-stage control can be performed by the BA458C with a third output available to control an additional valve or pump. To ensure maximum accuracy, overrun compensation may be selected to automatically minimise batching errors caused by actuator delays.

The backlit display is readable in all lighting conditions. The user screen may be selected so that the operator is only presented with essential process information. Variables that may be displayed include dispensed quantity, batch setpoint, rate of dispensing and controller status. Most of the standard display screens also include a bargraph showing batch progress. A record of total product dispensed is maintained as a grand total together with a history of the last ten batches.

Up to nine setpoints may be pre-entered and selected by the operator when required. To simplify selection, each setpoint may be identified by a plain language name having up to sixteen alphanumeric characters.

The three isolated outputs are individually configured as control or status outputs. If more are required, a factory fitted option provides three additional identical isolated outputs.

Front panel push buttons allow the operator to start and stop the batch and to reset the controller at the end of each cycle. For applications where large or remote push buttons are required, control may be transferred to external switches with or without inhibiting the front panel controls.

Counting may be inhibited during a batch by closing an external contact. Thus product may be re-cycled whilst being heated, or the batching system may be purged without affecting the quantity dispensed.

Selectable automatic restart causes the BA458C batch controller to execute the batching operation a pre-set number of times. The delay between batches may be set between 1 second and 24 hours, thus enabling the controller to perform regular dosing and sampling operations.

ATEX & UKEX certification permits the BA458C to be installed in all hazardous gas areas. The magnetic pick-off, voltage pulse and 4/20mA inputs comply with the requirements for simple apparatus, allowing direct connection to most certified flowmeters. Switch contacts and a wide range of certified proximity detectors may also be directly connected to the BA458C. All three control outputs are galvanically isolated and certified as separate intrinsically safe circuits with output parameters complying with the requirements for simple apparatus. This allows most certified hazardous area loads such as valves, lamps, and sounders to be controlled, or the output may be transferred to the safe area via a wide range of Zener barriers or galvanic isolators.

Controller configuration may be performed via the front panel push buttons or optional external switches. To prevent accidental or unauthorised adjustment, access to the configuration menus is restricted by an external security link and an optional user definable four digit security code.

For field mounting applications the BA454D provides the same batching facilities but is housed in a robust IP66 GRP enclosure suitable for external mounting. A complementary range of non-certified models for use in safe areas is also available.

BEKA associates

BEKA associates Ltd. Old Charlton Rd. Hitchin, Hertfordshire, SG5 2DA, U.K. Tel.(01462) 438301 e-mail sales@beka.co.uk website: www.beka.co.uk

SPECIFICATION

Power supply

Voltage	Must be powered via a Zener barrier or galvanic isolator, 11V min required between terminals 1 and 2.
Current	33 mA typical when powered from 24V via 28V 300Ω Zener barrier

Pulse inputs — Linear or via 16 point lineariser

Switch contact
Closed	Less than 100Ω
Open	Greater than 1kΩ

Proximity detector	2-wire NAMUR
Magnetic pick-off	40mV peak to peak min

Voltage pulse (low)
Low	Less than 1V
High	Greater than 3V; 30V max.

Voltage pulse (high)
Low	Less than 3V
High	Greater than 10V; 30V max.

Open collector
Closed	Less than 2kΩ
Open	Greater than 10kΩ

Frequency
Switch contact	100Hz maximum
All other pulse I/P	5kHz maximum

4/20mA input — From current source
Function	Linear or root extracting
Voltage drop	0.6V at 20mA
Accuracy at 20°C	
Linear	0.3 % of span
Root extracting	±16 µA at input ±0.3 % of span
Frequency	2Hz maximum
Temperature effect	Less than 0.025%/°C

Inhibit	Linking terminals 18 & 20 prevents input signal being counted.

Display

Size	86.5 mm x 45 mm LCD
Backlight	Green
6 selectable operator screens showing combinations of:	Batch controller status Quantity dispensed Batch setpoint Rate of dispensing Status of control outputs

Outputs — Three galvanically isolated solid state dc switches.

On	Less than 5Ω + 0.7V
Off	Greater than 1MΩ
IS parameters	U_i=28V; I_i=200mA; P_i=0.85W
Switching time	0.2s max

Control 1	Closes when start button is operated and opens when dispensed quantity equals the batch setpoint.

Outputs 2 & 3 may be configured as:

Control 2 or Control 3 (parameters for each are separately adjustable)
Closes a pre-set time after Control 1 closes and open a pre-set dispensed quantity before the dispensed quantity equals the batch setpoint.

Flow alarm
Closes when the rate of dispensing falls below a pre-set value. Also causes batch controller to pause.

Reset status
Closes when controller is reset and opens when batch is started.

Batch status
Opens when batch is started and closes when batch is complete.

Pulse output
Scaled number of pulses proportional to quantity dispensed. Frequency 4 Hz max.

Front panel push buttons

(Control may be transferred to external switches with or without disabling the front panel push buttons.)

Start	Energises Control 1
Stop	During a batch de-energises Control 1, 2 & 3 causing the batch to pause.
Reset	Resets the batch display to zero or to the batch setpoint if the controller is counting down.

Menu	Provides access to four functions if they are enabled:
	   Select pre-entered batch setpoint
	   Adjust batch setpoint
	   View size of last 10 batches
	   Configuration menu

Security

Operator menu	May be protected by an optional four digit code.
Configuration menus	Protected by external link or switch, plus optional four digit code.

Intrinsic safety

Europe ATEX and UKEX
Code	Group II Category 1G Ex ia IIC T5 Ga (Tamb = -40°C to 60°C)
Cert. Nos.	ITS03ATEX21379X & ITS21UKEX0081X *Special condition only apply for installations in Zone 0*
Location	Zone 0, 1 or 2

Environmental
Operating temp	-20 to 60°C (certified for use at -40°C)
Storage temp	-40 to 85°C
Humidity	To 95% @ 40°C
Enclosure	Front IP66, rear IP20
EMC	Complies with EMC Directive 2014/30/EU
Immunity	No error for 10V/m field strength between 150kHz and 1GHz.
Emissions	Complies with the requirements for Class B equipment.

Mechanical — See page 148 for enclosure & terminal details
|	
Terminals	Removable with screw clamp for 0.5 to 1.5mm^2 cable.
Weight	0.7 kg

Accessories
Additional outputs	Three programmable outputs having the same specification as outputs 2 & 3.
Tag number	Thermally printed strip on rear of instrument.

HOW TO ORDER

	Please specify
Model number	BA458C

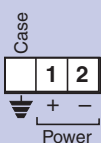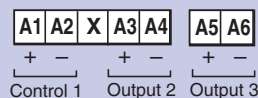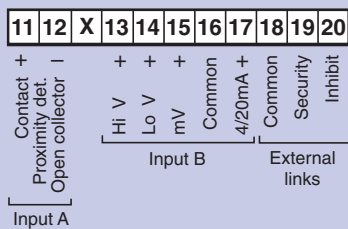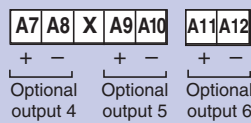| **Accessories**	**Please specify if required**
Outputs 4, 5 & 6	Additional 3 outputs
Tag strip	Legend

DIMENSIONS (mm)
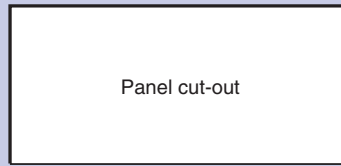
Panel cut-out

Recommended panel cut-out

To achieve an IP65 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

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

84
10
144

BEKA associates   BA458C

DISPLAY

72

TERMINAL CONNECTIONS

A7	A8	X	A9	A10
+	–		+	–

Optional output 4 | Optional output 5

A11	A12
+	–

Optional output 6

11	12	X	13	14	15	16	17	18	19	20
Contact +	Proximity det. –	Open collector I	Hi V +	Lo V +	mV +	Common	4/20mA +	Common	Security	Inhibit

Input A   Input B   External links

A1	A2	X	A3	A4
+	–		+	–

Control 1 | Output 2

A5	A6
+	–

Output 3

Case

1	2
+	–

Power

S1	S2	S3	S4	X	X	S7
Start	Stop	Reset	Menu			Common

Case

'X' Do not use   External switches
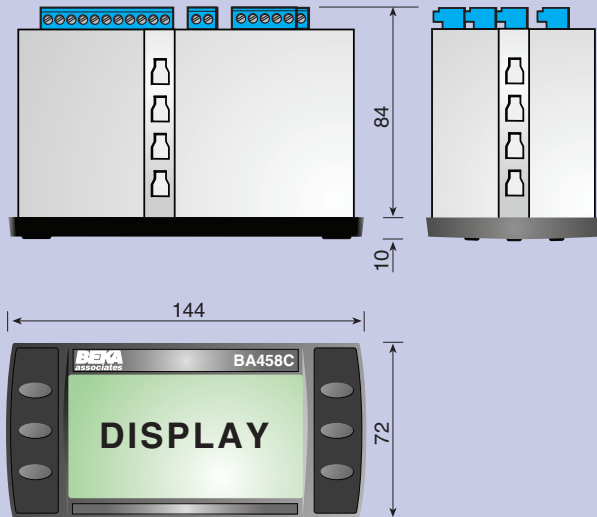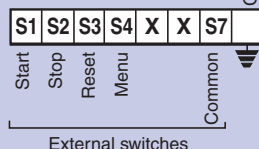
TERMINAL DESCRIPTIONS

Case		For earthing the enclosure
1	+	Power supply
2	–	
11	+	Proximity detector, switch
12	–	contact or open collector

Input A

13	+	High voltage
14	+	Low voltage
15		mV (Magnetic pick-off)
16	–	Common for input B
17	+	4/20mA

Input B

only one input may be used

18		Common for links
19		Configure security link
20		Inhibit input link

Externals Links

S1	Start
S2	Stop
S3	Reset
S4	Menu
S5	Do not use
S6	Do not use
S7	Common for switches

External Switches

Case		For earthing the enclosure
A1	+	Control 1
A2	–	
A3	+	Output 2
A4	–	
A5	+	Output 3
A6	–	

Outputs 2 and 3 may each be configured to have one of six functions

A7	+	Output 4
A8	–	
A9	+	Output 5
A10	–	
A11	+	Output 6
A12	–	

If fitted optional outputs 4, 5 and 6 may each be configured to have one of six functions.