

# Flow Batch Controllers

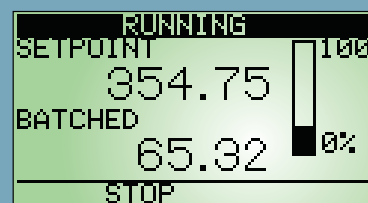
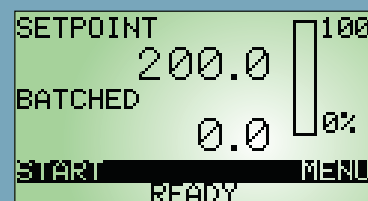


Very easy to use, stand alone batch controllers for dispensing and sampling. Graphical display that can be configured to suit applications including up to 9 named batch setpoints.

- > **Graphical display with backlight**
- > **General purpose and certified hazardous area models**  
ATEX and North American Ex ia intrinsic safety gas and dust certification.
- > **Field mounting models have IP66 impact resistant GRP enclosure**  
Separate terminal compartment  
Pipe mounting accessories.
- > **Panel mounting models**  
IP66 front panel
- > **Input**  
Pulse or 4/20mA
- > **Three isolated outputs**
  - Output 1:**  
control output
  - Outputs 2 & 3 configurable:**
    - control outputs
    - flow alarm
    - reset alarm
    - reset status
    - batch state
    - scaled pulse output
- > **Single or two-stage control with overrun compensation**
- > **Provision for external push buttons**  
Push button control may be transferred to external switches.
- > **-20 to +60°C operating temperature range**
- > **Accessories**  
Three additional configurable isolated outputs.  
Laser engraved stainless steel legend plates.

**Intrinsically safe**

**General purpose**





An **indicator** for every **application** -  
delivered ready for **installation**

#### Flow Batch Controllers available

Model No.	Mounting	Certification					
		Europe ATEX		International IECEx		USA & Canada	
		Gas	Dust	Gas	Dust	Gas	Dust

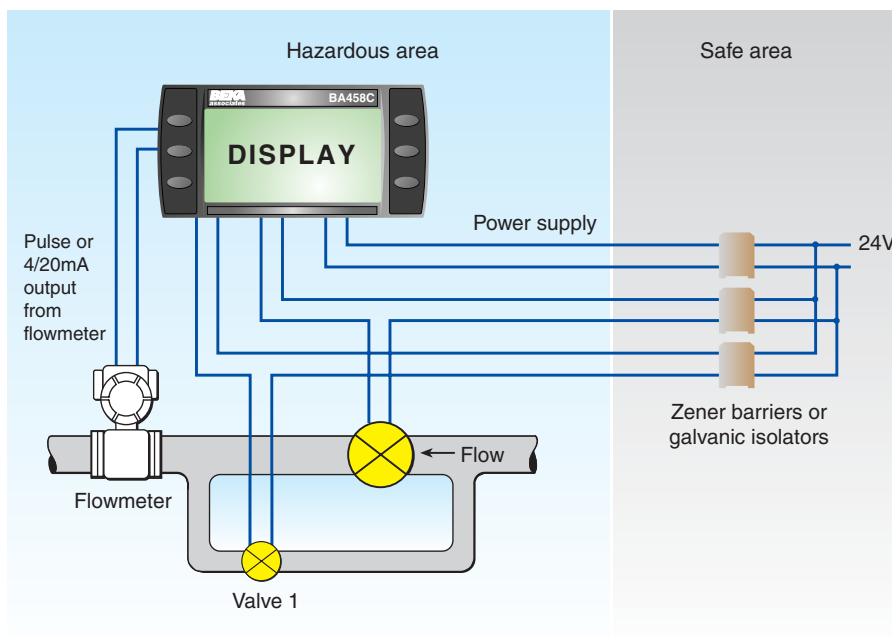
#### Ex ia intrinsically safe - for use in Zones 0, 1 & 2 and 20, 21 & 22

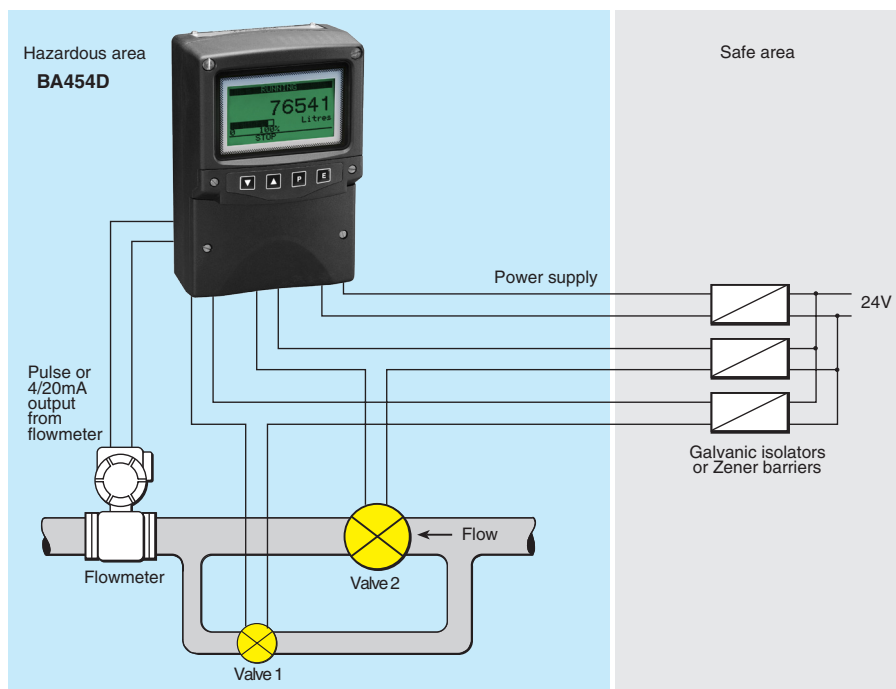
BA454D	Field	✓	✓	—	—	✓	✓
BA458C	Panel	✓	—	—	—	✓	—

#### General Purpose - for use in safe areas

BA654D	Field
BA658C	Panel

A **Flow Batch Controller** for every **application**.....  
delivered ready for **installation**





The **BA454D** is an intrinsically safe, second generation batch controller based on the successful BA350B. This field mounting controller is ideal for accurately dispensing liquids, solids or components in a hazardous area and despite its sophisticated control functions, it is easy to use and configure. Carefully designed display screens annotated in English, French, or German, lead the user intuitively through the available options. The BA454D 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 BA454D 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 BA454D 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 certification** permits the BA454D to be installed in gas and dust hazardous 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 BA454D. 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. For use in the USA and Canada the BA454D has FM and cFM intrinsic safety and nonincendive approval.

**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.

The **GRP enclosure** has stainless steel fittings, neoprene gaskets and an armoured glass window. The robust construction provides IP66 protection which has been independently assessed by ITS – report available. A separate terminal compartment allows the instrument to be installed and terminated without exposing the electronic assembly. To further simplify field wiring and subsequent inspection, the terminal cable entries and clamping screws are both forward facing.

# BA454D

## Flow batch controller

*Intrinsically safe for use in gas and dust hazardous areas*

- ◆ **Easy to use**
- ◆ **Intrinsically safe**  
ATEX gas  
or ATEX gas & dust  
or FM, cFM & ATEX gas
- ◆ **High contrast display with backlight.**
- ◆ **Pulse or 4/20mA current source input.**
- ◆ **3 or 6 outputs**
- ◆ **9 selectable batch setpoints.**
- ◆ **IP66 field mounting GRP enclosure with separate terminal compartment.**
- ◆ **3 year guarantee**

[www.beka.co.uk/ba454d](http://www.beka.co.uk/ba454d)



# BEKA

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## 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

Switch contact	Linear or via 16 point lineariser
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

Function	From current source
Voltage drop	Linear or root extracting
Accuracy at 20°C	0.6V at 20mA
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	Ui=28V; Ii=200mA; Pi=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	
Code	Group II Category 1G Ex ia IIC T5 Ga (Tamb = -40 to 60°C) Group II Category 1D Ex ia IIIC T80°C Da (Tamb = -40 to 60°C) IP66 ITS03ATEX21378 Ex03E21380 & Ex03E21381 Gas Zone 0, 1 or 2: Dust Zone 20, 21 or 22
or	
Cert. No.	
System	
Location	

### USA FM

Standard	3610 Entity
Code	CL I, II, III; Div 1 GP A, B, C, D, E, F & G T4; Ta = 60°C
Standard	3611 Nonincendive
Code	CL I, II, III; Div 2 GP A, B, C, D, E, F & G T4; Ta = 60°C
File	3033262

### Canada cFM

File	3033262C
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### Environmental

Operating temp	-20 to 60°C (ATEX gas certification -40 to 60°C) Storage temp -40 to 85°C
Humidity	To 95% @ 40°C
Enclosure	IP66
EMC	In accordance with EU Directive 2004/108/EC
Immunity	No error for 10V/m field strength between 150kHz and 1GHz.
Emissions	Complies with the requirements for Class B equipment.

### Mechanical

Terminals	See page 147 for enclosure & terminal details. Screw clamp for 0.5 to 1.5mm <sup>2</sup> cable. See page 119.
Weight	1.6 kg

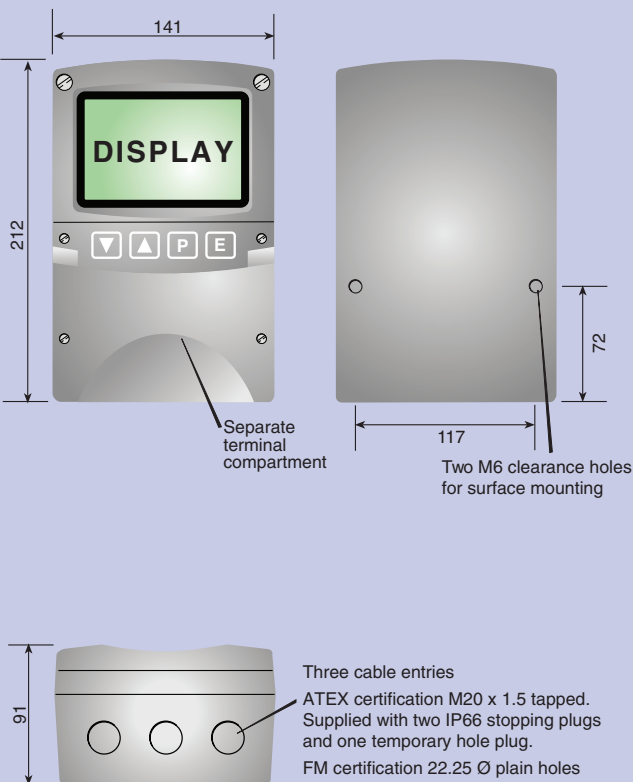
### Accessories

Additional outputs	Three programmable outputs having the same specification as outputs 2 & 3.
Stainless legend plate	Stainless steel plate secured to front of instrument etched with tagging or applicational information.
Pipe mounting kit	BA392D or BA393

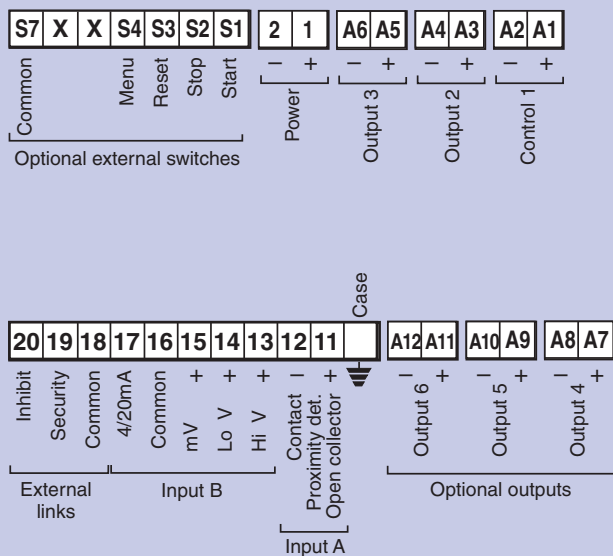
## HOW TO ORDER

Model number	Please specify
Certification	BA454D
	ATEX gas
	ATEX gas & dust
	FM, cFM & ATEX gas
Accessories	Please specify if required
Outputs 4, 5 & 6	Additional 3 outputs
Stainless legend plate	Legend required
Pipe mounting kit	BA392D or BA393

# DIMENSIONS (mm)



# TERMINAL CONNECTIONS



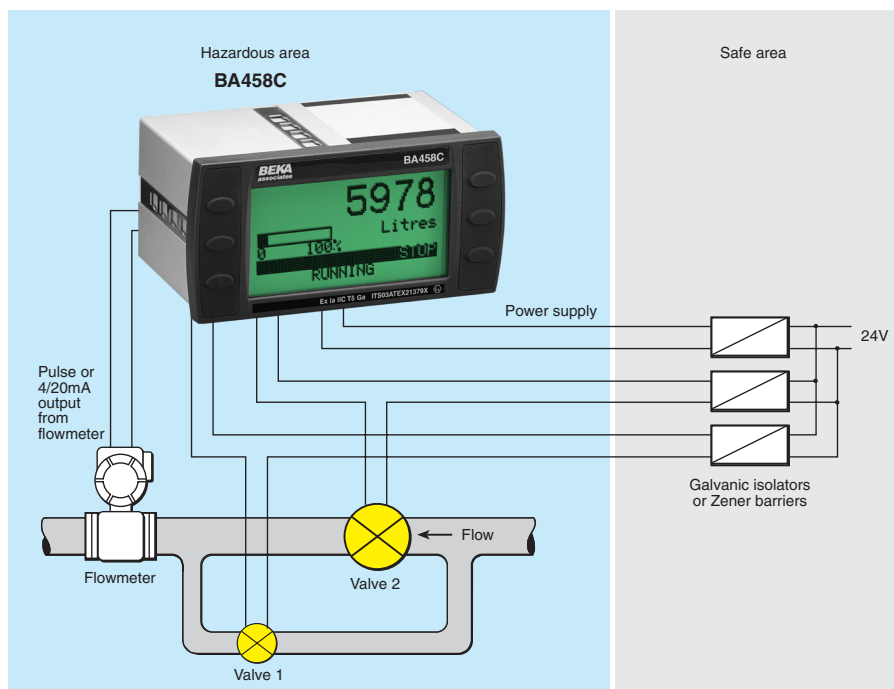
'X' Do not use

# TERMINAL DESCRIPTIONS

Case		For earthing the enclosure		
1	+			
2	-	Power supply		
11	+	Proximity detector, switch	Input A	<i>only one input may be used</i>
12	-	contact or open collector		
13	+	High voltage	Input B	
14	+	Low voltage		
15		mV (Magnetic pick-off)		
16	-	Common for input B		
17	+	4/20mA		
18		Common for links	Externals Links	
19		Configure security link		
20		Inhibit input link		
S1		Start	External Switches	
S2		Stop		
S3		Reset		
S4		Menu		
S5		Do not use		
S6		Do not use		
S7		Common for switches		
Case		For earthing the enclosure		
A1	+			
A2	-	Control 1		
A3	+	Output 2	Outputs 2 and 3 may each be configured to have one of six functions	
A4	-			
A5	+	Output 3		
A6	-			
A7	+	Output 4	If fitted optional outputs 4, 5 and 6 may each be configured to have one of six functions.	
A8	-			
A9	+	Output 5		
A10	-			
A11	+	Output 6		
A12	-			







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 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. For use in the USA and Canada the BA458C has FM and cFM intrinsic safety and nonincendive approval.

**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.

# BA458C

## Flow batch controller

*Intrinsically safe for use in all gas hazardous areas*

- ◆ Easy to use
- ◆ Intrinsically safe ATEX, FM & cFM certification.
- ◆ 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](http://www.beka.co.uk/ba458c)



# BEKA

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## 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

Switch contact	Linear or via 16 point lineariser
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

Function	From current source
Voltage drop	Linear or root extracting
Accuracy at 20°C	0.6V at 20mA
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	Ui=28V; Ii=200mA; Pi=0.85W
Switching time	0.2s max

Control 1	Closes when start button is operated and opens when dispensed quantity equals the batch setpoint.
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Outputs 2 & 3 may be configured as:	<p><i>Control 2 or Control 3 (parameters for each are separately adjustable)</i></p> <p>Closes a pre-set time after Control 1 closes and open a pre-set dispensed quantity before the dispensed quantity equals the batch setpoint.</p> <p><i>Flow alarm</i></p> <p>Closes when the rate of dispensing falls below a pre-set value. Also causes batch controller to pause.</p> <p><i>Reset status</i></p> <p>Closes when controller is reset and opens when batch is started.</p> <p><i>Batch status</i></p> <p>Opens when batch is started and closes when batch is complete.</p> <p><i>Pulse output</i></p> <p>Scaled number of pulses proportional to quantity dispensed. Frequency 4 Hz max.</p>
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### 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

Code	Group II Category 1G Ex ia IIC T5 Ga (Tamb = -40°C to 60°C)
Cert. No.	ITS03ATEX21379X <i>Special condition only apply for installations in Zone 0</i>
Location	Zone 0, 1 or 2

### USA FM

Standard Code	3610 Entity CL I; Div 1; GP A, B, C D T4; Ta = 60°C
Standard Code	3611 Nonincendive CL I; Div 2 GP A, B, C & D T4; Ta = 60°C
File	3033262

### Canada cFM

File	3033262C
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### 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

Terminals	See page 148 for enclosure & terminal details
Weight	Removable with screw clamp for 0.5 to 1.5mm <sup>2</sup> cable. 0.7 kg

### Accessories

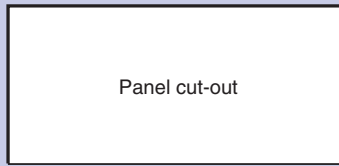
Additional outputs	Three programmable outputs having the same specification as outputs 2 & 3.
Tag number	Thermally printed strip on rear of instrument.

## HOW TO ORDER

Model number	<b>Please specify</b> BA458C
<b>Accessories</b> Outputs 4, 5 & 6 Tag strip	<b>Please specify if required</b> Additional 3 outputs Legend

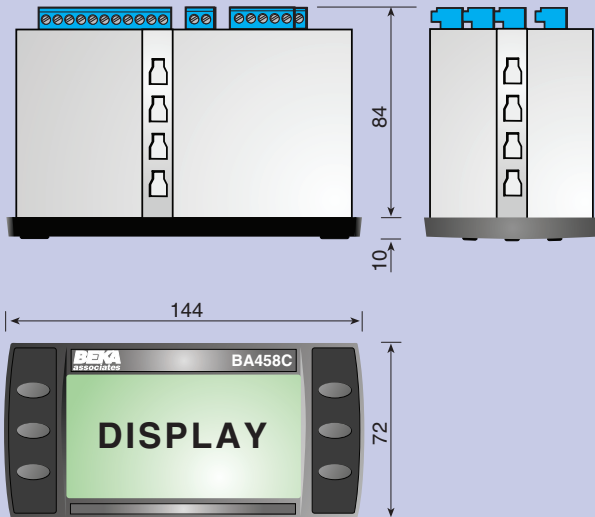


## DIMENSIONS (mm)

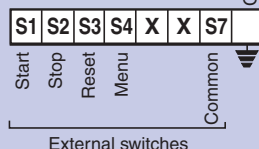
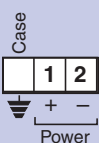
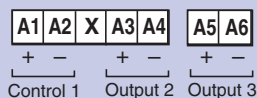
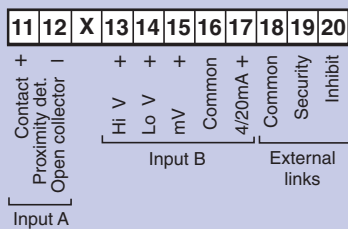
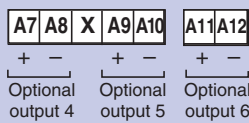


### Recommended panel cut-out

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



## TERMINAL CONNECTIONS



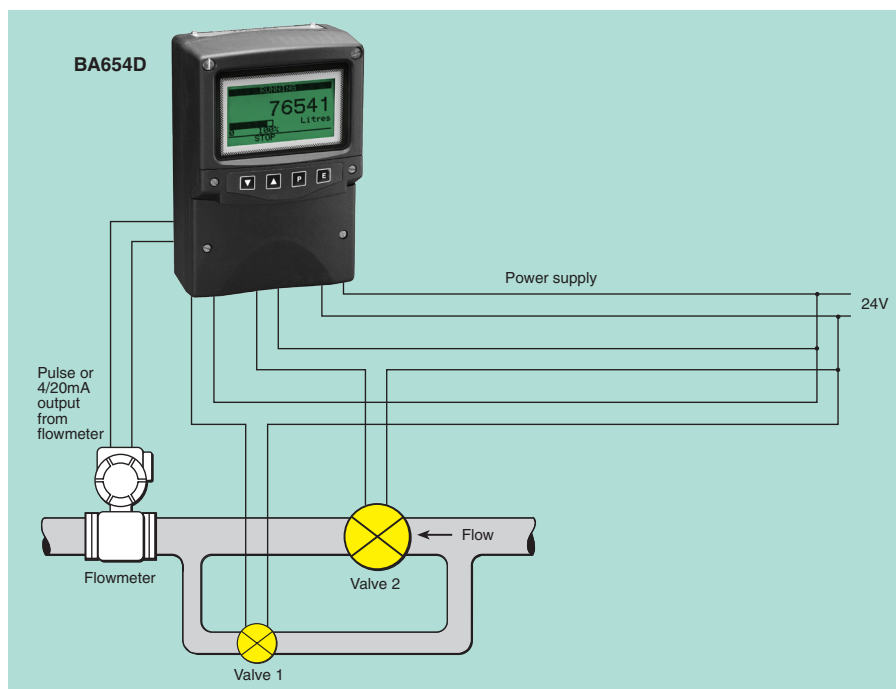
'X' Do not use

## TERMINAL DESCRIPTIONS

Case		For earthing the enclosure	
1	+	Power supply	
2	-		
11	+	Proximity detector, switch	Input A
12	-	contact or open collector	
13	+	High voltage	Input B
14	+	Low voltage	
15		mV (Magnetic pick-off)	
16	-	Common for input B	
17	+	4/20mA	
18		Common for links	Externals Links
19		Configure security link	
20		Inhibit input link	
S1		Start	External Switches
S2		Stop	
S3		Reset	
S4		Menu	
S5		Do not use	
S6		Do not use	
S7		Common for switches	
Case		For earthing the enclosure	
A1	+	Control 1	
A2	-		
A3	+	Output 2	Outputs 2 and 3 may each be configured to have one of six functions
A4	-		
A5	+	Output 3	
A6	-		
A7	+	Output 4	If fitted optional outputs 4, 5 and 6 may each be configured to have one of six functions.
A8	-		
A9	+	Output 5	
A10	-		
A11	+	Output 6	
A12	-		

only one input may be used





The **BA654D** is a second-generation, field mounting, general-purpose flow batch controller based on the successful BA550. This controller is ideal for accurately dispensing liquids, solids or components and despite its sophisticated control functions, it remains very easy to use and configure.

The **backlit display** is readable in all lighting conditions and the user screen may be selected so that the operator is only presented with essential process information. Displayed variables 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 the 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 for selection 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 controller can also be configured so that the operator can adjust an existing setpoint or enter a new value.

**Single or two-stage control** can be performed by the BA654D with a third output available to control an additional valve or pump, or even to provide three-stage control. To ensure maximum accuracy, overrun compensation may be selected to automatically minimise batching errors caused by actuator delays.

**Pulse and analogue 4/20mA signals** are accepted by the batch controller. All inputs are galvanically isolated allowing earthed or floating signals to be connected. Pulse inputs may be from switch contacts, a 2-wire proximity detector or a wide range of voltage sources. An easily adjustable sixteen-point lineariser will accurately correct almost any flowmeter non-linearity. The BA654D also incorporates a root-extractor so 4/20mA analogue inputs may be linear, or have a square law relationship with flow.

**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.

The **three relay contact outputs** may be individually configured as control or status outputs. If more are required, a factory fitted option provides three additional galvanically isolated solid state 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 BA654D 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.

**Controller configuration** is performed via the front panel push buttons or optional external switches. Carefully designed configuration menus lead the installer intuitively through the available functions. Configuration menus and user screens may be displayed in English, French or German.

A **security link** and an optional user definable four digit security code prevent accidental or unauthorised access to the configuration menus.

The **enclosure**, which is moulded in glass reinforced polyester (GRP), has stainless steel fittings and provides IP66 protection. A separate terminal compartment allows the instrument to be installed and terminated without exposing the instrument electronics. To further simplify installation and subsequent inspection, the terminal cable entries and the clamping screws are both forward facing.

For **panel mounting applications** the BA658C provides the same batching facilities as the BA654D but is housed in a 144 x 72mm DIN enclosure. A complementary range of intrinsically safe models is also available.

# BA654D

## Flow batch controller

### General purpose

- ◆ Easy to use
- ◆ High contrast display with backlight.
- ◆ Pulse or 4/20mA current source input.
- ◆ 3 or 6 outputs
- ◆ 9 selectable batch setpoints.
- ◆ IP66 field mounting GRP enclosure with separate terminal compartment.
- ◆ 3 year guarantee

[www.beka.co.uk/ba654d](http://www.beka.co.uk/ba654d)

# BEKA

## associates

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## SPECIFICATION

### Power supply

Voltage	20 to 36V dc.
Current	95mA max

### Pulse Inputs

Switch contact	Linear or via 16 point lineariser
Closed	Less than 100Ω
Open	Greater than 1kΩ

Proximity detector	2-wire NAMUR
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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

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

### 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:	Digital & bargraph display of quantity dispensed. Batch setpoint Rate of dispensing Status of control outputs Batch controller status

### Outputs

Rating	Three single pole relay contacts. 250V; 5A; 1.25kVA ac 30V; 5A; 150W dc Reactive loads must be suppressed.
--------	---

Switching time	0.2s max
----------------	----------

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

Outputs 2 & 3 may be configured as:

*Control 2 or Control 3 (parameters for each are individually adjustable)*  
Closes a programmable time after Control 1 closes and open a programmable dispensed quantity before the dispensed quantity equals the batch setpoint.

### Flow alarm

Closes when the rate of dispensing falls below a pre-entered 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 output proportional to total volume dispensed.  
Frequency 4 Hz max.

### 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.

### Environmental

Operating temp	-20 to 60°C
Storage temp	-40 to 85°C
Humidity	To 95% @ 40°C
Enclosure	Front IP66
EMC	In accordance with EU Directive 2004/108/EC
Immunity	No error for 10V/m field strength between 150kHz and 1GHz.
Emissions	Complies with the requirements for Class B equipment.

### Mechanical

Terminals	See page 147 for enclosure & terminal details.
Weight	Screw clamp for 0.5 to 1.5 mm <sup>2</sup> cable. 1.6 kg

### Accessories

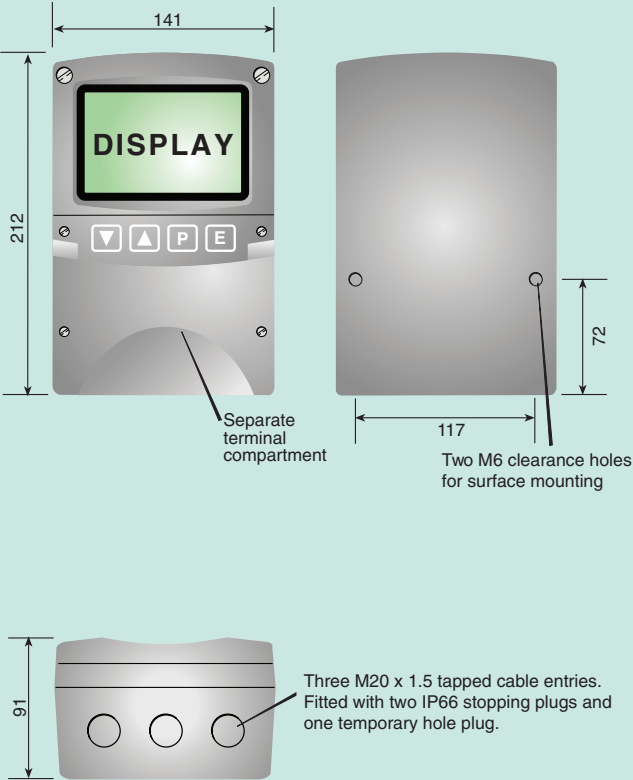
Additional outputs	Three configurable galvanically isolated, single pole solid state dc switch outputs. Rating: 30V; 100mA dc
Stainless legend plate	Stainless steel plate secured to front of instrument etched with tagging or applicational information.
Pipe mounting kit	BA392D or BA393

## HOW TO ORDER

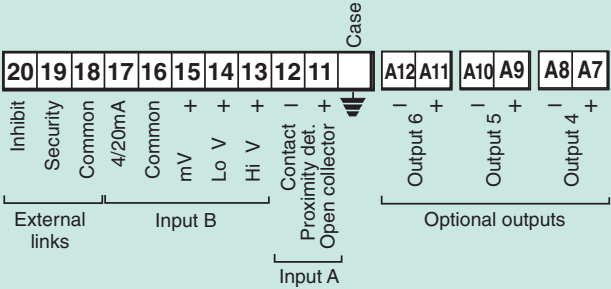
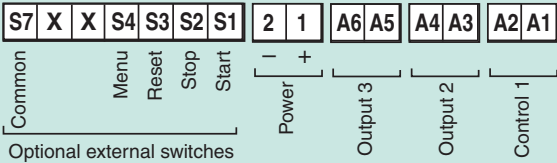
Model number	<b>Please specify</b> BA654D
--------------	---------------------------------

<b>Accessories</b>	<b>Please specify if required</b>
Outputs 4, 5 & 6	Additional 3 solid state dc outputs
Stainless legend plate	Legend required
Pipe mounting kit	BA392D or BA393

# DIMENSIONS (mm)



# TERMINAL CONNECTIONS



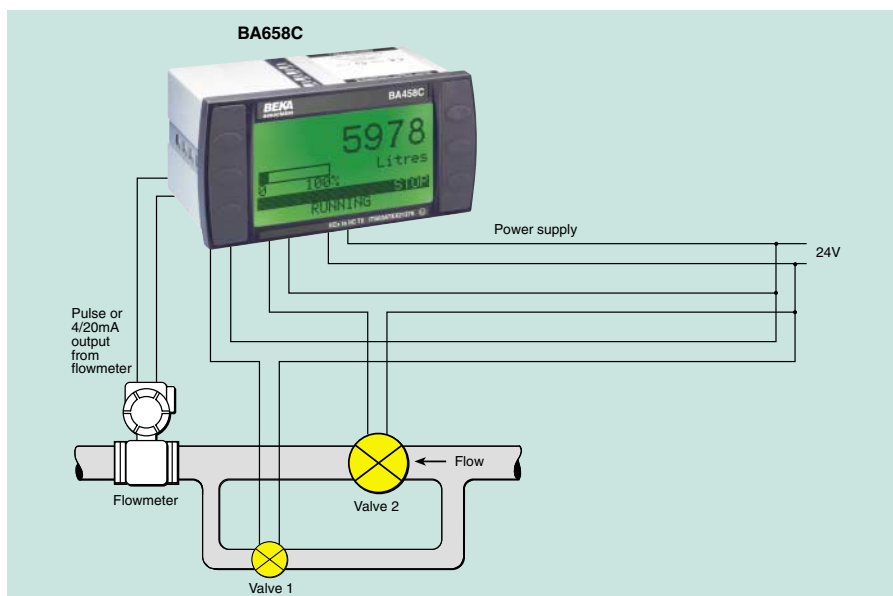
'X' Do not use

# TERMINAL DESCRIPTIONS

Case		For earthing the enclosure		
1	+			
2	-	Power supply		
11	+	Proximity detector, switch	Input A	<i>only one input may be used</i>
12	-	contact or open collector		
13	+	High voltage	Input B	
14	+	Low voltage		
15		mV (Magnetic pick-off)		
16	-	Common for input B		
17	+	4/20mA		
18		Common for links	Externals Links	
19		Configure security link		
20		Inhibit input link		
S1		Start	External Switches	
S2		Stop		
S3		Reset		
S4		Menu		
S5		Do not use		
S6		Do not use		
S7		Common for switches		
Case		For earthing the enclosure		
A1	+			
A2	-	Control 1		
A3	+	Output 2	Outputs 2 and 3 may each be configured to have one of six functions	
A4	-			
A5	+	Output 3		
A6	-			
A7	+	Output 4	If fitted optional outputs 4, 5 and 6 may each be configured to have one of six functions.	
A8	-			
A9	+	Output 5		
A10	-			
A11	+	Output 6		
A12	-			







The **BA658C** is a second-generation, general-purpose flow batch controller that supersedes the successful BA550P and BA550C. This controller is ideal for accurately dispensing liquids, solids or components and despite its sophisticated control functions, it remains very easy to use and configure.

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 the 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 for selection 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 controller can also be configured so that the operator can adjust an existing setpoint or enter a new value.

**Single or two-stage control** can be performed by the BA658C with a third output available to control an additional valve or pump, or even to provide three-stage control. To ensure maximum accuracy, overrun compensation may be selected to automatically minimise batching errors caused by actuator delays

**Pulse and analogue 4/20mA signals** are accepted by the batch controller. All inputs are galvanically isolated from the controller power supply and outputs so that earthed signals may be connected. Pulse inputs may be from switch contacts, a 2-wire proximity detector or a wide range of voltage sources. An easily adjustable sixteen point straight line lineariser will accurately correct almost any flowmeter non-linearity. The BA658C also incorporates a root-extractor so 4/20mA analogue inputs may be linear, or have a square law relationship with the rate of flow.

**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.

The **three relay contact outputs** may be individually configured as control or status outputs. If more are required, a factory fitted option provides three additional galvanically isolated solid state 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 BA658C 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.

**Controller configuration** is performed via the front panel push buttons or optional external switches. Carefully designed configuration menus lead the installer intuitively through the available functions. Configuration menus and user screens may be displayed in English, French or German.

A **security link** and an optional user definable four digit security code prevent accidental or unauthorised access to the configuration menus.

For **field mounting applications** the BA654D provides the same batching facilities as the BA658C but is housed in a robust IP66 GRP enclosure suitable for external mounting. A complementary range of field and panel mounting intrinsically safe models is also available for use in potentially flammable atmospheres.

# BA658C

## Flow batch controller

### General purpose

- ◆ Easy to use
- ◆ 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

**BEKA**  
associates

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e-mail sales@beka.co.uk www.beka.co.uk

## SPECIFICATION

### Power supply

Voltage	20 to 36V dc.
Current	95mA max

### Pulse Inputs

Switch contact	Linear or via 16 point lineariser
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

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

### 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:	Digital & bargraph display of quantity dispensed. Batch setpoint Rate of dispensing Status of control outputs Batch controller status

### Outputs

Rating	Three single pole relay contacts. 250V; 5A; 1.25kVA ac 30V; 5A; 150W dc Reactive loads must be suppressed.
--------	---

Switching time	0.2s max
----------------	----------

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

Outputs 2 & 3 may be configured as:

*Control 2 or Control 3 (parameters for each are individually adjustable)*  
Closes a programmable time after Control 1 closes and open a programmable dispensed quantity before the dispensed quantity equals the batch setpoint.

### Flow alarm

Closes when the rate of dispensing falls below a pre-entered 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 output proportional to total volume dispensed.  
Frequency 4 Hz max.

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

### Environmental

Operating temp	-20 to +60°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

Terminals	See page 148 for enclosure & terminal details Removable with screw clamp for 0.5 to 1.5 mm <sup>2</sup> cable.
Weight	0.7 kg

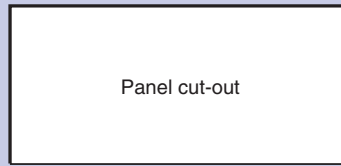
### Accessories

Additional outputs	Three configurable galvanically isolated, single pole solid state dc switch outputs. Rating: 30V; 100mA dc
Tag number	Thermally printed strip on rear of instrument.

## HOW TO ORDER

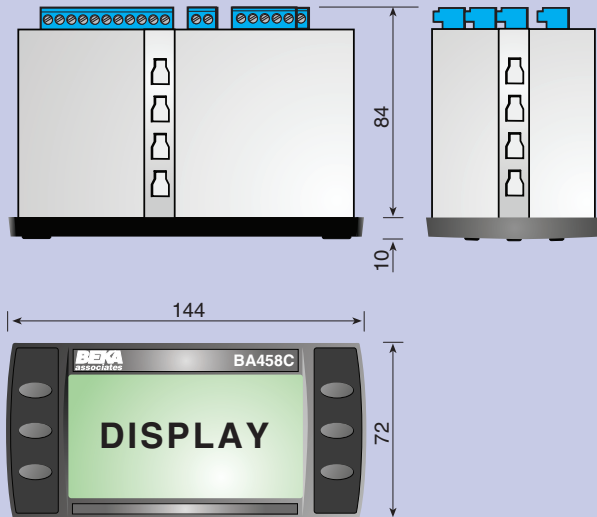
Model number	<b>Please specify</b> BA658C
<b>Accessories</b> Outputs 4, 5 & 6 Tag Strip	<b>Please specify if required</b> Additional 3 solid state dc outputs Legend

## DIMENSIONS (mm)

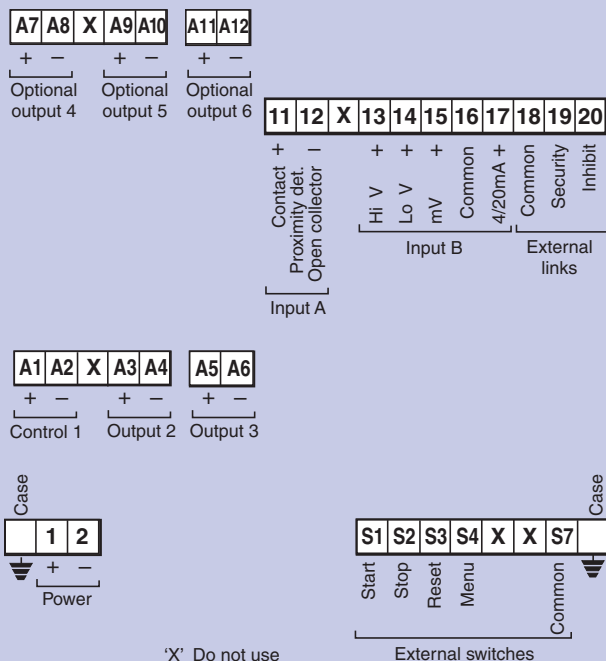


### Recommended panel cut-out

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



## TERMINAL CONNECTIONS



## TERMINAL DESCRIPTIONS

Case		For earthing the enclosure	
1	+	Power supply	
2	-		
11	+	Proximity detector, switch	Input A
12	-	contact or open collector	
13	+	High voltage	Input B
14	+	Low voltage	
15		mV (Magnetic pick-off)	
16	-	Common for input B	
17	+	4/20mA	
18		Common for links	Externals Links
19		Configure security link	
20		Inhibit input link	
S1		Start	External Switches
S2		Stop	
S3		Reset	
S4		Menu	
S5		Do not use	
S6		Do not use	
S7		Common for switches	
Case		For earthing the enclosure	
A1	+	Control 1	
A2	-		
A3	+	Output 2	Outputs 2 and 3 may each be configured to have one of six functions
A4	-		
A5	+	Output 3	
A6	-		
A7	+	Output 4	If fitted optional outputs 4, 5 and 6 may each be configured to have one of six functions.
A8	-		
A9	+	Output 5	
A10	-		
A11	+	Output 6	
A12	-		

only one input may be used