

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

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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

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.
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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 89/336/EEC .
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

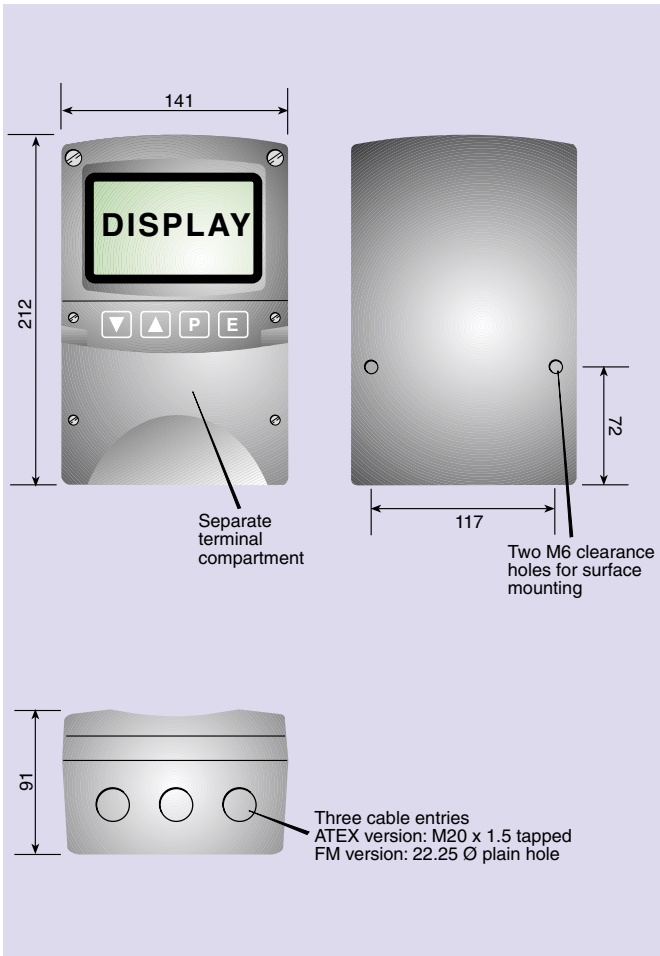
## HOW TO ORDER

Model number	<b>Please specify</b> BA654D
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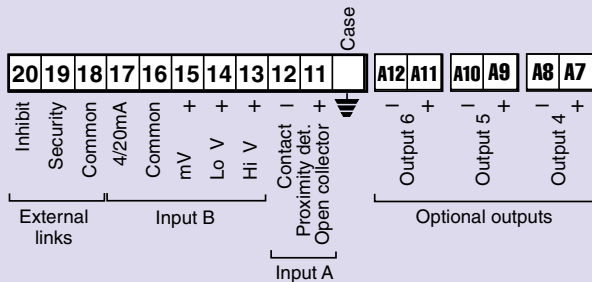
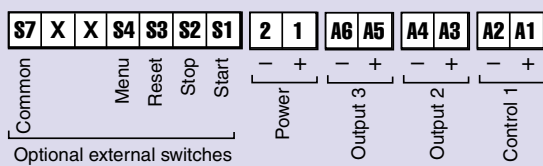
<b>Accessories</b>	<b>Please specify if required</b>
Outputs 4, 5 & 6	Additional 3 solid state dc outputs
Stainless legend plate	Legend required
Pipe mounting kit	BA392D or BA393

## BA454D & BA654D Case and terminal information

### DIMENSIONS (mm)



### TERMINAL CONNECTIONS



'X' Do not use

### TERMINAL DESCRIPTIONS

1	+	Power supply	
2	-		
Case		For earthing the enclosure	
11	+	Proximity detector, switch contact or open collector	Input A
12	-		
13	+	High voltage Low voltage mV (Magnetic pick-off) Common for input 2 4/20mA	Input B
14	+		
15			
16	-		
17	+		
18		Common for links Configure security link Inhibit input link	Externals Links
19			
20			
S1		Start Stop Reset Menu Do not use Do not use Common for switches	External Switches
S2			
S3			
S4			
S5			
S6			
S7			
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	-		

**Note:**

BA654D: Control 1, Output 2 and Output 3 are relay contacts which are not polarised