

The **BA328C** is an intrinsically safe 4<sup>1</sup>/<sub>2</sub> digit panel mounting indicator which displays the current flowing in a 4/20mA loop in meaningful engineering units. The instrument is loop powered, but only introduces a 1V drop allowing it to be installed in series with almost any 4/20mA loop.

**Main application** of the BA328C is to display a measured variable or control signal in a hazardous process area. The zero and span of the display are independently adjustable so that the indicator can easily be calibrated on-site to display any linear or square law signal represented by a 4/20mA current, such as temperature, flow or pressure. An optional 16 point lineariser enables the BA328C to display non linear variables in linear engineering units, and two optional alarms can control hazardous or safe area loads.

**Control and calibration** of the indicator is performed via the front panel tactile push-buttons which 'click' when operated. Using the push-buttons the operator can temporarily select the measured variable as a percentage of span, the input current in mA and the calibration at 4 & 20mA. The calibration functions are contained in easy to understand menus which are protected by a four digit user selectable security code.

**Two backlight** options are available. The loop powered backlight produces green background illumination enabling the display to be read at night and in poor lighting conditions. No additional power supply, IS interface or field wiring are required, but the indicator voltage

drop is increased. Alternatively, the separately powered backlight has a bright orange output which enhances daylight viewing, but an additional IS interface and field wiring are required.

**Optional alarms** provide two galvanically isolated solid state outputs which may be independently programmed as high or low trips with normally open or closed contacts.

**International intrinsic safety certification** allows the BA328C to be installed throughout the world. The 4/20mA input terminals comply with the requirements for *simple apparatus* enabling the indicator to be connected in series with most certified intrinsically safe circuits which, together with the low voltage drop, make the instrument very easy to apply. ATEX, FM and cFM Approvals permit installation in Europe, USA & Canada and the IECEx certification allows installation in a growing number of countries including Australia and New Zealand. Selection of Zener barriers and galvanic isolators is described in Application Guide AG300.

**The front panel** is a robust, easy to clean Noryl moulding sealed with a non-reflective, scratch resistant polyester membrane. A captive neoprene gasket provides an IP65 seal between the enclosure and the panel.

**Reliability is ensured** by an ISO9001 approved quality control system backed by a three year guarantee. The indicator is protected from reverse connection and overrange input current, and incorporates extensive radio frequency filtering to comply with the European EMC Directive.

# BA328C

## 2-wire 4/20mA 4<sup>1</sup>/<sub>2</sub> digit indicator

*Intrinsically safe for use  
in all gas hazardous areas*

- ◆ **Loop powered only 1V drop**
- ◆ **Intrinsically safe ATEX, FM, cFM & IECEx certification**
- ◆ **±19999 display 20mm high**
- ◆ **Optional:**
  - Loop powered backlight**
  - Separately powered backlight**
  - Alarms**
  - Lineariser**
  - Tare function**
- ◆ **IP65 front**
- ◆ **144 x 72mm DIN enclosure**
- ◆ **3 year guarantee**



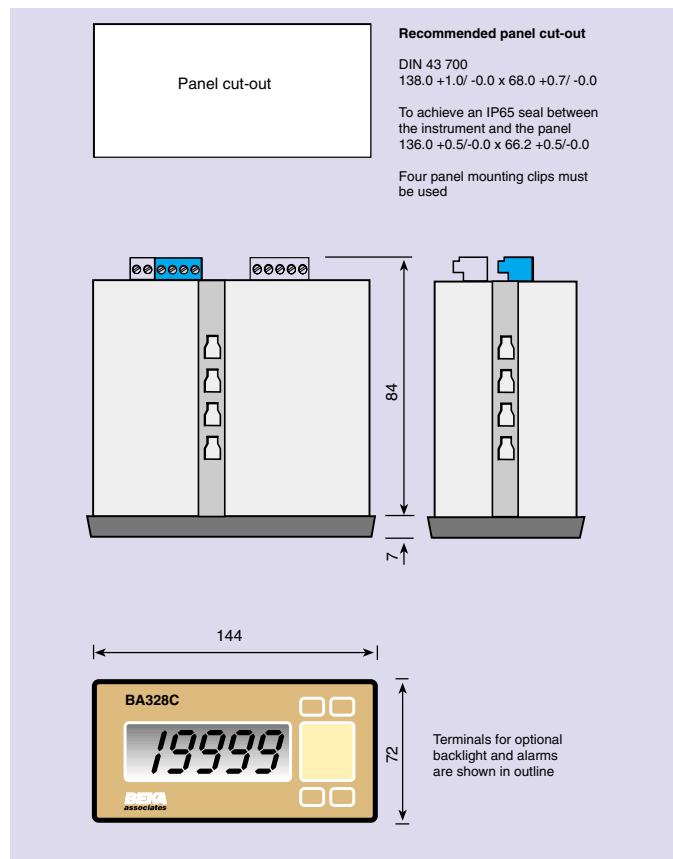
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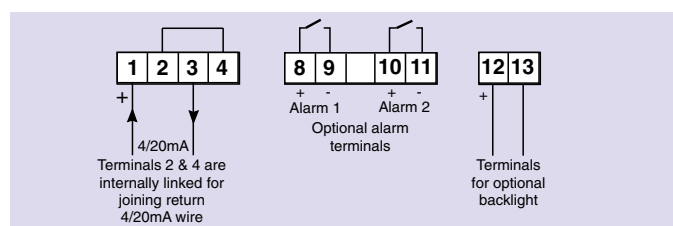
## SPECIFICATION

<b>Input</b>	
Current	4 to 20mA
Voltage	Less than 1V at 20°C Less than 1.1V at -20°C Less than 5V when loop-powered backlight is fitted
Overrange	200mA will not cause damage.
<b>Display</b>	
Type	4 1/2 digit (-19999 to 19999) Liquid crystal 20mm high
Span	Adjustable between 0 & ±19999 for a 4 to 20mA input.
Zero	Adjustable between -19999 & 19999 with 4mA input.
Decimal point	1 of 4 positions or absent
Zero blanking	Only one leading zero is displayed
Polarity	Automatic minus sign
Direction	Display may increase or decrease with increasing current.
Reading rate	2 per second
Overrange	4 least significant digits are blanked
<b>Push-buttons</b>	
▼ button	(Function in operating mode)
▲ button	Shows display with 4mA input
'P' button	Shows display with 20mA input Displays input current in mA, or as a percentage of span. When tare or alarms are fitted has modified function.
<b>Accuracy</b>	
At 20°C	Linear: ±0.02% ±1 digit Root extracting: ±16µA at input ±1digit
Temperature effect on:	
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
<b>Intrinsic safety</b>	
<b>Europe ATEX</b>	
Code	Group II, Category 1G Ex ia IIC T5 ITS02ATEX2028
Cert No	
Output parameters	
Uo	1.1V dc
Io	70mA dc
Wo	23mW
Ceq	20nF
Leq	10µH
Location	Zone 0, 1 or 2
Installation	The BA328C may be connected to any certified intrinsically safe circuit whose output parameters do not exceed:
	Uo 30V dc
	Io 200mA dc
	Wo 0.8W
<b>USA FM</b>	
Standard	3610 Entity
Code	CL I: Div 1: GP A, B, C, D
Temperature code	T4 at 60°C
File No	4B3A7.AX
Standard	3611 Nonincendive
Code	CL I: Div 2: GP A, B, C & D
File No	4B3A7.AX
<b>Canada cFM</b>	
File No.	3032632
<b>International IECEx</b>	
Standard	IEC60079-11:1999
Code	Ex ia IIC T5 Ta = -40 to 60°C
Cert. No.	IECEx ITS 05.0003
<b>Environmental</b>	
Operating temp	-20 to +60°C (certified for use at -40°C)
Storage temp	-40 to +85°C
Humidity	To 95% at 40°C non-condensing
Enclosure	Front IP65 Rear IP20
EMC	In accordance with EU Directive 2004/108/EC, full report available.
Immunity	Less than 1% of span error for 10V/m field strength between 27MHz & 1GHz.
Emissions	Undetectable above background noise. Class B equipment.
<b>Mechanical</b>	
Terminals	Blue screw clamp for 0.5 to 1.5mm <sup>2</sup> cables. Terminal block removable.
Weight	0.5kg
<b>Accessories</b>	
Loop powered backlight	Green; powered from 4/20mA current. Voltage drop of indicator plus backlight less than 5V.
Separately powered backlight	Orange; powered from 28V 300Ω Zener barrier or galvanic isolator.

## DIMENSIONS(mm)



## TERMINAL CONNECTIONS



Alarms	Two independent outputs each of which may be programmed as a high or low trip with NC or NO output.
Outputs	Isolated solid state switch Ron less than 5Ω + 0.6V Roff greater than 180k
Certification	Output complies with Clause 5.4 of EN50 020:1994 'Simple Apparatus'. Primarily intended for weighing applications, sets indicator display to zero when the 'P' push-button is operated.
Tare function	Provides 16 fully adjustable straight lines which may be adjusted to compensate for almost any non-linear variable.
Lineariser	Blank scale card fitted to each indicator can be supplied typeset with units of measurement.
Typeset scale card	Thermally printed number on the rear of the instrument.
Tag number	BA398 provides additional mechanical protection: front panel switches can not be operated.

## HOW TO ORDER

<b>Please specify:</b>	
Model number	BA328C
Display mode	Linear or root extracting*
Display at 4mA	XXXX
at 20mA	XXXX
	Include position of decimal point & sign if negative*

<b>Accessories</b>	
Display backlight	<b>Please specify if required:</b> Loop powered backlight or Separately powered backlight
Alarms	Alarms#
Lineariser	Lineariser#
Tare function	Tare
Scale card	Legend
Tag number	Legend

\*Will be set to display 0.00 at 4mA and 100.00 at 20mA with linear display if calibration information is not supplied.  
#Contact BEKA if calibration of accessories is required.