

Shown with optional loop powered display backlight

The BA304ND is a Type nL certified field mounting indicator housed in a robust IP66 GRP enclosure incorporating a separate terminal compartment and dedicated access to the instrument controls. Retaining all the features of the popular BA304NC, this replacement indicator provides improved display visibility, plus simplified installation, calibration and routine inspection facilities.

Like its predecessor, the BA304ND displays the current flowing in a 4/20mA loop in accurate 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 BA304ND is to display a measured variable or control signal in a Zone 2 hazardous process area. The zero and span of the display are independently adjustable so that the indicator may be calibrated to display any variable represented by a 4/20mA current, such as temperature, pressure, level or actuator position. When used with a differential flow transmitter an optional square root extractor enables the BA304ND to display flow in linear engineering units.

**The enclosure**, which is moulded in glass reinforced polyester (GRP), has stainless steel fittings, silicone gaskets and an armoured glass window. Its 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 display electronics. To further simplify field wiring and subsequent inspection, the terminal cable entries and the clamping screws are both forward facing. Additional terminals are provided which may be used to link the return 4/20mA conductor and the cable screens. A separate sealed cover provides access to the plug-in calibration links and potentiometers without exposing the display electronics or field terminals.

**A Type nL** Certificate of Conformity has been issued by ITS confirming compliance with the EN50021:1999 standard for Zone 2 electrical apparatus. Based on this third party assess-

ment, an EC Declaration of Conformity shows that the BA304ND complies with the requirements for Group II, Category 3G equipment defined in the ATEX Directive 94/9/EC. This allows the indicator to be installed in Zone 2 hazardous areas without Zener barriers or galvanic isolators. For Zone 2 applications the BA304ND offers a less expensive alternative to intrinsic safety or flameproof instrumentation.

**Two alternative 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. It does not require an additional power supply but the indicator voltage drop is increased. The separately powered backlight provides a bright orange output to enhance daylight viewing, but an additional power supply and field wiring are required.

**An optional internal calibrator** simulates a 4 and 20mA input current so that the indicator may be recalibrated without the need for test equipment or disconnection from the 4/20mA loop. Although not providing independent verification, it is an effective way to quickly check performance or to recalibrate.

**Units of measurement** and the instrument application or tag number can be economically marked onto the display escutcheon prior to despatch or after installation on-site. Alternatively, for customers who prefer an etched stainless steel label, the indicator can be supplied with a custom etched stainless steel plate mounted on the front of the instrument.

**Reliability is ensured** by an ISO9001 approved quality control system supported by a three year guarantee. The BA304ND is protected from reverse connection and over-range input currents and incorporates extensive radio frequency filtering to comply with the European EMC Directive. The indicator assembly can be removed from the enclosure without disconnecting the field wiring or disturbing the 4/20mA loop, continuity being maintained by a diode within the terminal assembly.

# BA304ND

**2-wire 4/20mA  
3½ digit indicator**

*Type nL certified for use in  
Zone 2 hazardous areas*

◆ **Loop powered  
only 1V drop**

◆ **Type nL  
ATEX certification**

◆ **±1999 display  
25.4mm high**

◆ **IP66 GRP  
enclosure with  
separate terminal  
compartment**

◆ **Optional:  
Loop powered  
backlight  
Separately  
powered  
backlight  
Root extractor  
Calibrator**



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## SPECIFICATION

### Input

Current	4 to 20mA
Voltage	Less than 1V at 20°C Less than 1.1V at -20°C
Overrange	±200mA will not cause damage

### Display

Type	Liquid crystal 25.4mm high 3½ digit (-1999 to 1999)
Zero	Adjustable between ±1000 with 4mA input.
Span	Adjustable between 0 & 1999 for a 4 to 20mA input.
Decimal point	1 of 3 positions or absent
Polarity	Automatic minus sign
Direction	Display may increase or decrease with increasing current. Factory set option.
Reading rate	2.5 per second
Over & underrange	3 least significant digits are blanked

### Accuracy

At 20°C	± 1 digit
Temp. effect	
Zero	Typ ±0.05 digit ± 100ppm/°C Max ±0.1 digit ± 200ppm/°C
Span	Typ ±50ppm/°C: Max ±100ppm/°C
Series mode	Typ 1 digit error for 1mA pk to pk 50Hz or 60Hz signal.

### Type nL certification

#### Certificate of Conformity

Standard	BS EN50021:1999
Code	EEx nL T5
Temp	-40 to 60°C
Cert. No	ITS Ex99Y4003

#### ATEX

#### EC Declaration of Conformity

Code	Group II, Category 3G
Location	Zone 2
Cert. No.	N0010
Installation	The BA304ND may be connected in series with any 4/20mA circuit providing maximum current in normal operation is less than 30mA.

### Environmental

Operating temp	-20 to +60°C (Certified for use at -40°C)
Storage temp	-40 to +85°C
Humidity	To 95% at 40°C
Enclosure	IP66 ITS test report C871V0383A available
EMC	In accordance with EU Directive 89/336/EEC, full report available.
Immunity	Less than 1% of span error for 10V/m field strength between 27MHz and 1GHz.
Emissions	Undetectable above background noise Class B equipment

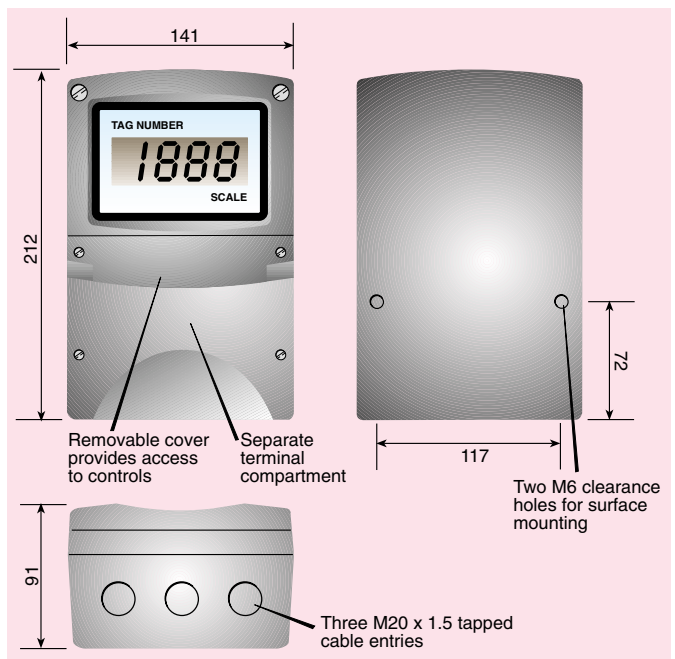
### Mechanical

Terminals	Screw clamps for 0.5 to 1.5mm <sup>2</sup> cables
Weight	1.6kg

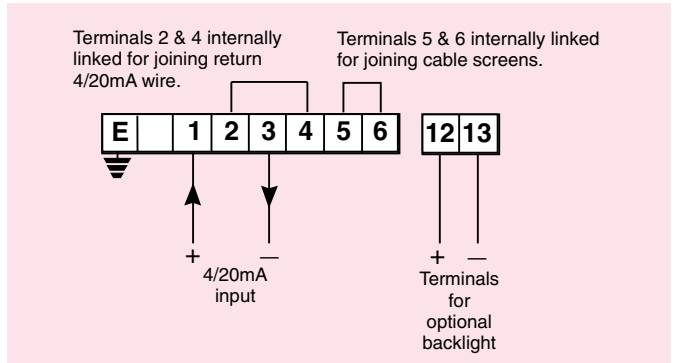
### Accessories

Loop powered backlight	Green; powered from 4/20mA current. Voltage drop of indicator plus backlight less than 5V.
Separately powered backlight	Orange; powered from 18 to 30V dc supply.
Root extractor	
Accuracy	±16µA at input ±1 digit for inputs between 4.16 and 20mA (10 to 100% flow)
Clip-off	Selectable by plug-in link. Operates at 4.04mA (5% flow). <i>Not available with calibrator</i>
Calibrator	Simulates 4 and 20mA input, selected by plug-in link. <i>Not available with root extractor</i>

## DIMENSIONS (mm)



## TERMINAL CONNECTIONS



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 terminal cover, etched with tagging or applicational information. *
Pipe mounting kit	2 kits are available BA392D & BA393 *

\* See accessory datasheet for details

## HOW TO ORDER

Model number	<b>Please specify</b> BA304ND
Display at 4mA	XXXX
Display at 20mA	XXXX } Include position of decimal point & sign if negative #
<b>Accessories</b>	<b>please specify if required</b>
Display backlight	Loop powered backlight or Separately powered backlight
Root extractor	Root extractor } Only one
Calibrator	Calibrator } can be fitted
Escutcheon marking	
	Scale      Scale legend
	Tag        Tag legend
Stainless legend	Legend plate
Pipe mounting kit	BA392D or BA393

# Will be set to display 00.0 at 4mA and 100.0 at 20mA if calibration information is not supplied.