

The new BA304D is a third generation intrinsically safe 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 BA304C, this new indicator provides improved display visibility, plus simplified installation, calibration and routine inspection facilities.

Like its predecessor, the BA304D 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 BA304D 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 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 BA304D 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

International intrinsic safety certification allows the BA304D 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; together with the low voltage drop, this makes the instrument very easy to apply. ATEX, FM and cFM approvals permit installation in Europe, USA and Canada and IECEx certification allows installation in a growing number of countries including Australia and New Zealand.

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, IS interface or field wiring, but the indicator voltage drop is increased. The separately powered backlight provides a bright orange output to enhance daylight viewing, but it requires an additional IS interface and field wiring.

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 removable blank or 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 BA304D 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.

BA304D

2-wire 4/20mA 3½ digit indicator

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

- ◆ Loop powered only
1V drop

- ◆ Intrinsically safe
ATEX gas
or ATEX gas & dust
or FM, cFM &
ATEX gas

**All models have IECEx
certification**

- ◆ ±1999 display
25.4mm high

- ◆ IP66 GRP enclosure
with separate terminal
compartment

- ◆ Optional:
Backlight:
loop or separately
powered
**Root extractor
Calibrator**

- ◆ 3 year guarantee



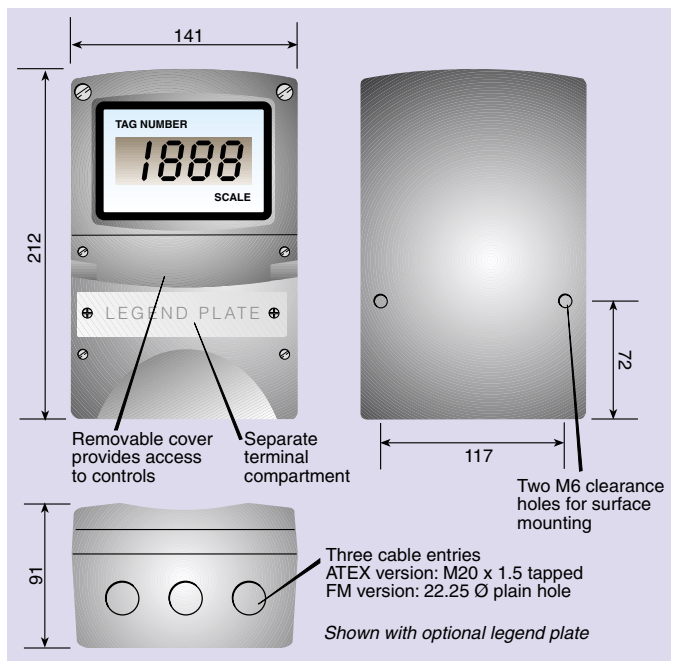
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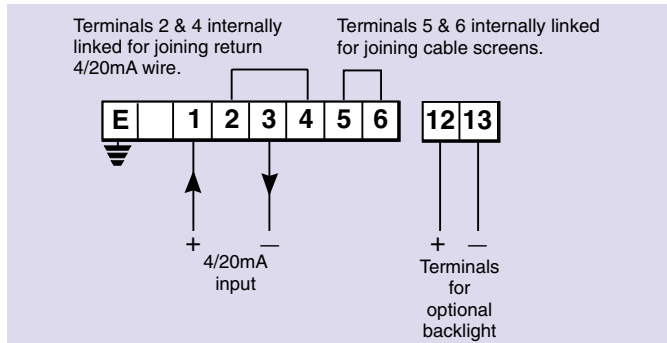
SPECIFICATION

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) Adjustable between ±1000 with 4mA input.
Zero	Adjustable between 0 & 1999 for a 4 to 20mA 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.
Intrinsic safety	
Europe ATEX	
Code	Group II Category 1G, Ex ia IIC T5 (Tamb = -40 to 60°C)
or	Group II Category 1GD, T80°C IP66 EEx ia IIC T5 (Tamb = -20 to 60°C)] <i>Dust option, see How to order</i>
Cert. No	ITS99ATEX2001
Output parameters	
Uo	1.1V dc
Io	70mA dc
Po	23mW
Ceq	20nF
Leq	10µH
Location	Gas Zone 0, 1 or 2: Dust Zone 20, 21 or 22
Installation	The BA304D may be connected to any certified intrinsically safe circuit whose output parameters do not exceed:
	Uo 30V
	Io 200mA
	Po 0.85W
USA FM	<i>Option, see How to order</i>
Standard	3610 Entity
Code	CL I, II, III: Div 1: GP A, B, C, D, E, F & G T4 @ 60°C
File	3008809
Standard	3611 Nonincendive
Code	CL I: Div 2: GP A, B, C & D, T4 @ 60°C CL II, III: Div 2: GP F & G, T4 @ 60°C
File	3008809
Canada cFM	
File	3032631C
International IECEx	
Standard	IEC60079-11:1999
Code	Ex ia IIC T5 Ta = -40 to 60°C Ex ia IIC T5 DIP A21 TA 80°C IP66] <i>Dust option, see How to order</i>
or	Ta = -20 to 60°C
Cert. No	IECEx ITS 05.0004
Environmental	
Operating temp	-20 to +60°C (ATEX gas certification -40 to 60°C)
Storage temp	-40 to +85°C
Humidity	To 95% at 40°C
Enclosure	IP66 (see ITS test report C87IV0383)
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 and 1GHz.
Emissions	Undetectable above background noise Class B equipment
Mechanical	
Terminals	Screw clamps for 0.5 to 1.5mm² 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 28V 300Ω Zener barrier or galvanic isolator.
Root extractor	
Accuracy	±16µA at input ±1 digit for inputs between 4.16 and 20mA (10 to 100% flow)

DIMENSIONS (mm)



TERMINAL CONNECTIONS



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>
Scale legend	Units of measurement marked onto display escutcheon.
Tag legend	Tag number or applicational information marked onto display escutcheon.
Stainless legend	Stainless steel plate secured to front of enclosure, etched with tagging or applicational information.#
Pipe mounting kit	2 kits are available BA392D and BA393 # # See accessory datasheet for details

HOW TO ORDER

Please specify	
Model number	BA304D
Certification	ATEX gas] <i>All models have IECEx certification.</i> ATEX gas & dust] <i>Note: Cable entries differ for FM & ATEX models</i> FM, cFM & ATEX gas]
Display at 4mA	XXXX] Include position of decimal
Display at 20mA	XXXX] point & sign if negative *
Accessories	Please specify if required
Display backlight	Loop powered backlight or Separately powered backlight
Root extractor	Root extractor] Only one can be fitted
Calibrator	
Escutcheon marking	
Scale	Scale legend
Tag	Tag legend
Stainless legend plate	Legend
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.