

The **BA364D** is an intrinsically safe multi-function instrument which may be programmed to perform a host of counting and timing functions. Easy to use menus allow the instrument to be configured as a counter, timer, tachometer or as a clock. Both of the inputs will operate from 2-wire proximity detectors, switch contacts, magnetic pick-offs, open collectors or voltage pulses. Optional alarm/control outputs further extend the many applications.

Counting may be from one or both inputs. The pulses at each input can be added to, or subtracted from each other, and the result may be scaled to provide a display in engineering units. Alternatively, pulses on one input can increment or decrement the total count depending upon the state of the other input. From two inputs electrically 90° out of phase (quadrature), the BA364D can display the direction of movement and position of a shaft or a cable. The total display may be reset to zero via the instrument controls or by a remote contact closure.

As a timer the BA364D may be started and stopped by one or both inputs or from the instrument push-buttons. Elapsed or remaining time may be displayed in hours, minutes and seconds, or in just hours and minutes. When fitted with optional control outputs the instrument can control any process which is required to operate for a fixed time.

Rotational speed may be measured using the tachometer function which will display revolutions per second, minute or per hour. The instrument contains a run-time counter which can show the total operating time of the monitored machinery on the second display. When fitted with optional alarms, over and under speed warnings can be generated.

Configuration as a digital clock enables time to be displayed in twelve or twenty four hour format within a hazardous area. The instrument may operate as a stand-alone clock, or may be synchronised via the reset terminals with an external reference. Two optional control outputs enable hazardous or safe area loads to be turned on and off at pre-set times twice in each twelve or twenty four hour period.

Control and programming of the BA364D is performed via four push-buttons which are protected from damage and tampering behind a sealed cover. For applications requiring frequent adjustment, the instrument can be supplied with a robust external membrane keypad. All the programme functions are contained in easy to understand menus which may be protected by a user definable security code. To simplify calibration the scaling factors employ floating decimal points.

Intrinsic safety certification allows installation in most hazardous areas, separate versions are available with ATEX gas and ATEX gas plus dust certification allowing installation throughout Europe. For applications in the USA, a new version having FM intrinsic safety and nonincendive approvals has recently been introduced.

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. A separate terminal compartment allows the BA364D to be installed and terminated without exposing the display electronics. To further simplify field wiring and subsequent inspection, the terminal cable entries and clamping screws are forward facing.

Backlighting is available as an option to improve readability when the BA364D is installed in a poorly illuminated area. High efficiency amber LEDs provide an even glow to enhance display contrast.

Optional alarm/control outputs provide two galvanically isolated solid state outputs each of which is a separate intrinsically safe circuit and complies with the requirements for *simple apparatus*. Almost any certified intrinsically safe load such as a solenoid valve or sounder may be controlled by these outputs.

Free of charge programming and calibration to customers requirements is performed prior to despatch, although the BA364D can easily be reconfigured on-site without the need for any test equipment or programming aids.

BA364D

Counter, timer, tachometer, clock

Intrinsically safe for use in gas and dust hazardous areas

- ◆ Separate 8 digit and 6 digit displays
- ◆ Two inputs
- ◆ Intrinsically safe ATEX gas or ATEX gas & dust or FM & ATEX gas
- ◆ IP66 enclosure for surface, pipe or stem mounting
- ◆ Optional: Display backlight Alarms Pulse and 4/20mA outputs External keypad
- ◆ 3 year guarantee



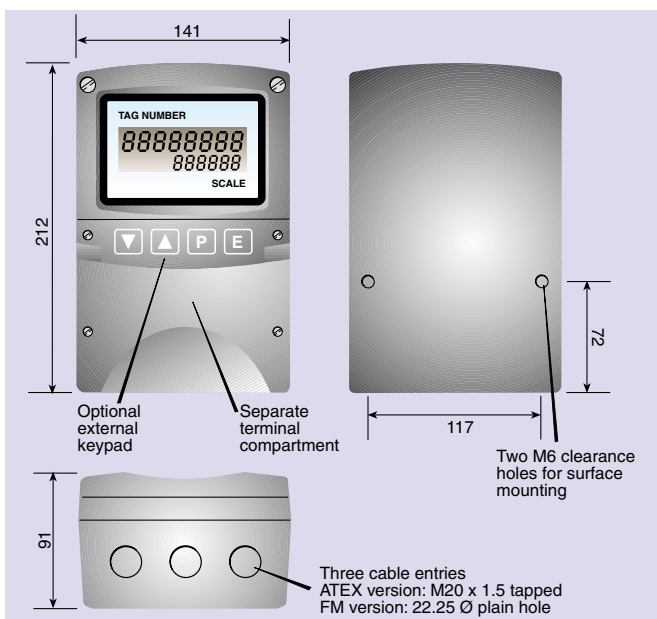
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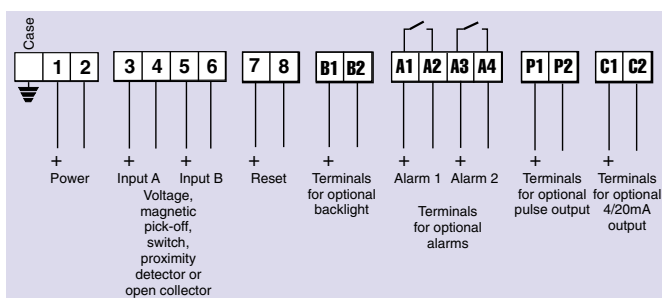
SPECIFICATION

Power supply	
Voltage	The BA364D must be powered via a Zener barrier or galvanic isolator. 10V min between terminals 1 and 2
Current	12mA max., plus proximity detector currents when used.
Inputs A and B	
Switch contact	
Closed	Less than 100Ω
Open	Greater than 1kΩ
Proximity detector	2-wire NAMUR
Magnetic pick-off	40mV peak to peak typical
Voltage pulse	
Low	Less than 1V
High	Greater than 3V; 30V max
Open collector	
Closed	Less than 2kΩ
Open	Greater than 10kΩ
Frequency	
switch contact	100Hz max
other inputs	5kHz max. Reduced to 2kHz for quadrature input
Display	
Type	Liquid crystal
Primary	8 digits 14mm high
Decimal point	1 of 7 positions or absent; colons for h:m:s
Secondary	6 digits 9.5mm high
Decimal point	1 of 5 positions or absent; colons for h:m:s
Remote reset	Contact closure with resistance less than 1kΩ
Programmable functions	
Counter	
	A; A+B or A-B
	A direction controlled by B
	A and B Quadrature (90° out of phase)
Total scale factor	Adjustable between 0.001 & 99999999
Grand total	10 ⁹ max count
Rate scale factor	Adjustable between 0.001 & 99999999
Timer	
	Elapsed time displayed as hh:mm:ss or hh:mm
Maximum duration	99 hours:59 minutes: 59 seconds
Direction	Up or down
Tachometer	
	Revolutions displayed per sec, per min or per hour.
Rate scale factor	Adjustable between 0.001 & 99999999
Run-time display	Resolution 1/10 hour
Clock	
	Set time displayed in 24 or 12 hour format.
External synchronisation	Once per 12 or 24 hours
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 Ex ia IIC T5 (Tamb = -20 to 60°C) <i>Dust option, see How to order</i>
Certificate number	ITS01ATEX2003
Location	Gas Zone 0, 1 or 2: Dust Zone 20, 21 or 22
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	3022309
Standard	3611 Nonincendive
Code	CL I: Div 2: GP A, B, C & D, T4 @ 60°C
	CL II, III: Div 2: GP E F & G, T4 @ 60°C
File	3022309
Environmental	
Operating temperature	-20 to 60°C (ATEX gas certification -40 to 60°C)
Storage temperature	-40 to 85°C
Enclosure	IP66 see ITS test report C87IV0383A
EMC	In accordance with EU Directive 2004/108/EC.
Immunity	Less than 1% error at 10V/m
Emissions	Undetectable above background noise. Class B equipment
Mechanical	
Terminals	Screw clamp for 0.5 to 2.5mm ² cables.
Weight	1.6kg
Accessories	
Alarms/control outputs	Two independent outputs.
Outputs	
On	Isolated solid state switch
Off	Less than 5Ω +0.6V
	Greater than 180kΩ
	Certified as <i>simple apparatus</i>
Display backlighting	LED backlight powered from 28V 300Ω Zener barrier or galvanic isolator.
Re-transmitted pulse	Pulse sink certified as <i>simple apparatus</i> .

DIMENSIONS (mm)



TERMINAL CONNECTIONS



4/20mA output	Galvanically isolated current sink
Voltage drop	5V max.
External keypad	Membrane keypad enables instrument to be adjusted without removing the control cover.
Scale legend	Units of measurement marked onto display escutcheon. *
Tag legend	Tag number or applicational information marked onto display escutcheon. *
Stainless legend plate	Stainless steel plate secured to front of instrument, etched with tagging or applicational information. *
Pipe mounting kit	2 kits are available BA392D and BA393.*

* See accessory datasheet for details

HOW TO ORDER

Model number	please specify
Certification	BA364D
	ATEX gas
	ATEX gas & dust
	FM & ATEX gas
Configuration] <i>Note: Cable entries differ for FM & ATEX models</i>
Inputs	
Calibration information	Counter; timer; tachometer or clock.
	Proximity detector; switch contact; magnetic pick-off, open collector or voltage pulse.
	Settings required #
Accessories	please specify
Alarms/control outputs	Alarms
Display backlight	Backlight
Re-transmitted pulse output	Pulse output
4/20mA output	4/20mA output
External keypad	External keypad
Escutcheon marking	
Scale	Scale legend required
Tag	Tag legend required
Stainless legend plate	Legend required
Pipe mounting kit	BA392D or BA393

If calibration information is not supplied, instrument will be conditioned as a counter; input A + input B; for open collector inputs; rate & total scale factors of 1.