



## Model 202D

# Rate Totaliser

### FEATURES

- 4-20mA Output
- Pulse Output
- High & Low Alarms
- Fully Programmable
- Displays Rate, Total and Accumulated Total
- Battery, Loop or DC Powered
- Wall, Pipe, Panel or Flowmeter Mounting
- Polycarbonate, Aluminium or Stainless Steel Housings
- Watertight to IP67 (Nema 4X)
- ATEX, IECEx, CSA Approved
- CE Compliant



The 202D Field Mounting Rate Totaliser requires no external power and is designed to operate with turbine, positive displacement and paddlewheel flowmeters in applications such as irrigation systems and pipeline measurement, and as a replacement for mechanical registers.



# Field Mounting Rate Totaliser

PROVEN IN THOUSANDS OF FIELD INSTALLATIONS  
THROUGHOUT THE WORLD.

**The 202D is a high accuracy, intrinsically safe Rate Totaliser designed to operate with digital output flowmeters. Having an IP67 weatherproof case, tactile keyboard and various mounting options, the 202D is perfect for the most arduous of installations.**



Polycarbonate  
Enclosure

## Battery, Loop or DC Powered

The standard 202D is powered by long-life lithium batteries. Alternatively, the 202D can be loop powered via an optional 4-20mA output, or powered from a 9-28 Volts DC supply.

The intrinsic safety approvals cover both the 4-20mA output and relay outputs, in addition to the input circuits.

## Watertight Field Mounting Enclosure

The 202D can be supplied in either a polycarbonate, rugged aluminium or stainless steel housing. The three options are rated to IP67 (NEMA 4X).

All versions are suitable for wall, pipe mounting or direct flowmeter mounting (Turbine). The polycarbonate version can also be supplied as a panel mount arrangement.

## Fully User Programmable

K-factor, decimal point positions, filter constants and time base are fully user programmable.

Rate and Totals can also be displayed in any engineering units such as litres per minute and barrels.

Contrec's unique magnet access strip allows the 202D to be re-configured in hazardous areas without opening the enclosure. A great benefit in reducing production shutdown periods and improving maintenance efficiency times.

## Frequency to Current Conversion

The 202D loop powered Rate Totaliser makes an excellent Frequency to Current Converter, particularly for low frequency inputs from positive displacement or turbine flowmeters.

Because the 202D calculates the flow rate by measuring the time interval between input pulses, it is able to provide

a very stable and accurate 4-20mA output for low frequency inputs.

## Non-linearity Correction

The 202D features 10 point non-linear correction as standard.

Separate K-factors and frequency points can be programmed to compensate for changes in K-factor with flowrates.

Non linearity correction is recommended for applications where precise measurements are required and flowmeter calibration certificates are available.

Note that this option increases the display update rate to 1 second in battery powered versions.

## Intrinsic Safety

The 202D is certified as intrinsically safe to European ATEX/IECEx standards, and CSA US/C standards for both the USA and Canada, see specification for details.



## VERSIONS AVAILABLE

### Battery Powered

The battery version of the 202D is designed for operation where external power sources are not available. It derives its power from two lithium battery packs which provide sufficient power for up to 5 years.

Low battery power condition is signalled to the operator by a message on the LCD and battery replacement is easily carried out in the field, even in hazardous areas.

### 4-20mA Output Loop Powered

The 4-20mA output version draws its operating power from the 4-20mA loop and uses lithium batteries for back-up if the 4-20mA loop is interrupted.

The instrument provides a 2-wire re-transmission of the flow rate. Both the 4mA and 20mA points are fully programmable so that the output can span across the entire range or, alternatively, across a small section of the operating range.

### DC Powered

The DC powered version will operate from an external power source between 9 and 28 Volts DC and draws no more than 4mA. This enables the 202D to be powered from AC mains adaptors and eliminates the need to run mains voltages in the field.

Lithium batteries provide back-up if the DC power is interrupted.

### Solid State Relay Outputs

Both the 4-20mA output version and the DC powered version are provided with two solid state relay outputs. The solid state relays provide high and low flow rate alarms or, alternatively, a pulse output and a low flow rate alarm. The outputs can sink up to 200mA and can be used to power external relays, audible alarms or counters. The outputs are internally protected against voltage spikes caused by relays and coils.

Both outputs are separately isolated via opto isolators.

The switching points can be programmed during the set-up mode. If programmed for a pulse output, the pulse can be selected as either unscaled (raw pulse input) or scaled. The maximum pulse frequency is 500mSec with a pulse width which is automatically set as:

1mSec if output > 50Hz  
10mSec if output = 5...50Hz  
100mSec if output < 5Hz

# Rate Totaliser – Model 202D

## SPECIFICATIONS

### Display

**Type:** LCD display

**Total:** 7 digit 10mm (0.4") high LCD (continuously powered). *Note: The Reset Total is resettable from the front panel and the Accumulated Total is displayed when the ACCUM TOT key is pressed*

**Rate:** 4 digit 8.5mm (0.33") high LCD (continuously powered)

**K-factor Range:** The pulses per unit of measure (eg. pulses/gallon) is programmable in the range 0.000001 to 999,999

**Decimal Points:** Fully programmable for Rate and Total

**Time Base:** Rates can be displayed in units per second, minute, hour or day

**Frequency Range:** 0.01Hz to 10kHz

**Signal Type:** Switch settable for sine wave (15mV P-P minimum), open collector, reed switch or pulse

### Physical

**Operating Temperature:** -20 to +60°C, -4 to +140°F

#### Enclosures

**Dimensions:** (Polycarbonate Enclosure - Standard Case) – 98mm (3.9") high x 151mm (5.9") wide x 43mm (1.7") deep

**Dimensions:** (Aluminium / Stainless Steel Enclosures) 106mm (4.2") high x 161mm (6.3") wide x 47mm (1.9") deep

**Protection:** IP67 (Nema 4X) watertight

**Cable Entry:** By cable glands

**Materials:** Polycarbonate and ABS, aluminium and stainless steel

#### Mounting Options

**Wall:** A wall mount bracket is supplied with polycarbonate enclosures. M4 holes are provided for mounting metal enclosures

**Pipe:** A galvanised metal bracket enables the 202D to be attached to a 51mm (2") vertical or horizontal pipe

**Panel:** Two mounting brackets are provided and terminals are accessible on the rear of the enclosure (polycarbonate version only)

**Turbine Meter:** Mounting stems are available for the direct mount of 202D instruments to turbine flow meters with 1" NPT male threads (thread adapters are also available)

### Battery Powered Version

**Battery Type:** 2 x Lithium battery packs

**Battery Life:** 5 years

### Loop Powered 4-20mA Output Version

**Scale:** The 4mA and 20mA points are programmable

**Resolution & Linearity:** 0.05% of span

**Accuracy:** 0.05% of span at 25°C

**Update Time:** 0.5s

**Connection:** 2-wire

**Voltage Across Output:** 28Vdc maximum

**Voltage Drop:** 9V maximum

**Memory Backup:** Lithium battery

### DC Powered / Alarm or Pulse Output Version

**Outputs:** 2 x solid state relay outputs suitable for driving DC solenoids or external relays. The outputs provide fully programmable high & low flow alarms or a pulse output & low alarm

**Pulse Output:** Scaled or unscaled pulse output, 500Hz maximum. Pulse width depends on output frequency and varies from 100mSec to 1mSec

**Switching Power:** 200mA, 30Vdc maximum.

**Saturation Voltage:** 0.8Vdc across outputs when in the "on" state

**Isolation:** Both outputs are separately isolated

**DC Power Input:** 9-28V @ 4mA maximum

**Memory Backup:** Lithium battery

### Hazardous Area Approval

#### Type of Approval:

- ATEX Rating - II 2G Ex ia IIB T4 Gb  
Cert No. BVS 15 ATEX E 106 X
- IECEx Rating - Ex ia IIB T4 Gb  
Cert No. IECEx BVS 15.0099X
- CSA us/c Rating - Class 1, Group C & D  
Cert No. 70061366

### Intrinsically Safe Parameters

**Maximum Ambient:** 60°C (+140°F)

#### Maximum Input Parameters:

(For certified IS coil or other certified IS sensors which produce a pulse output)

Uo = 10.0V L(ext) = 1.5H li = 20mA  
Io = 9.0mA Li = 0mH Pi = 320mW  
C(ext) = 60uF Ui = 24V Ci = 0.002uF

*Note: Devices such as reed switches, which can be classed as "Simple Apparatus" as defined in the Cenelec standard EN50020, can be connected to the Model 202D without additional certification*

#### Maximum Output Parameters:

4-20mA or Relays: Ui = 28V  
li = 93mA  
Pi = 653mW

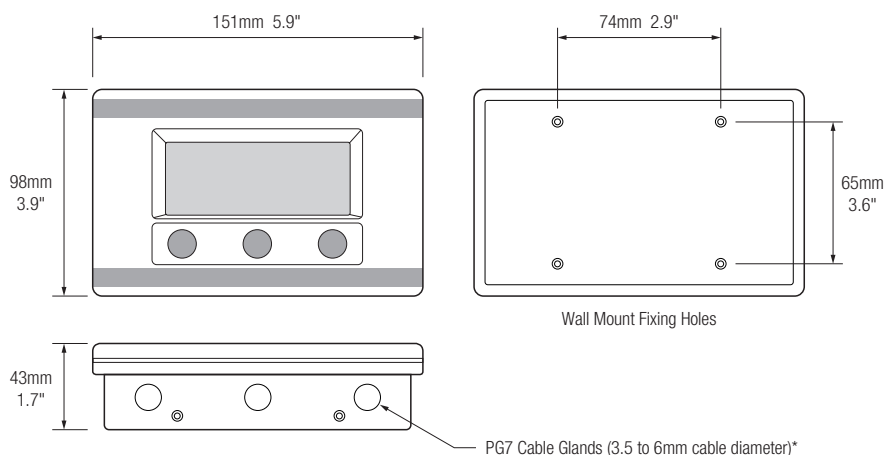


**Important:** Specifications are subject to change without notice.

# Rate Totaliser – Model 202D

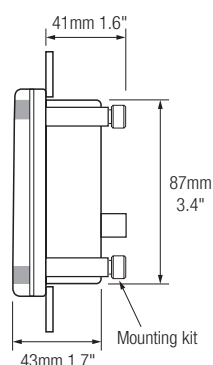
## DIMENSIONS

### Polycarbonate Enclosure (Standard Case)



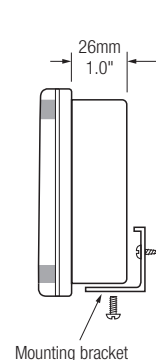
### Panel Mount

#### OPTION 1

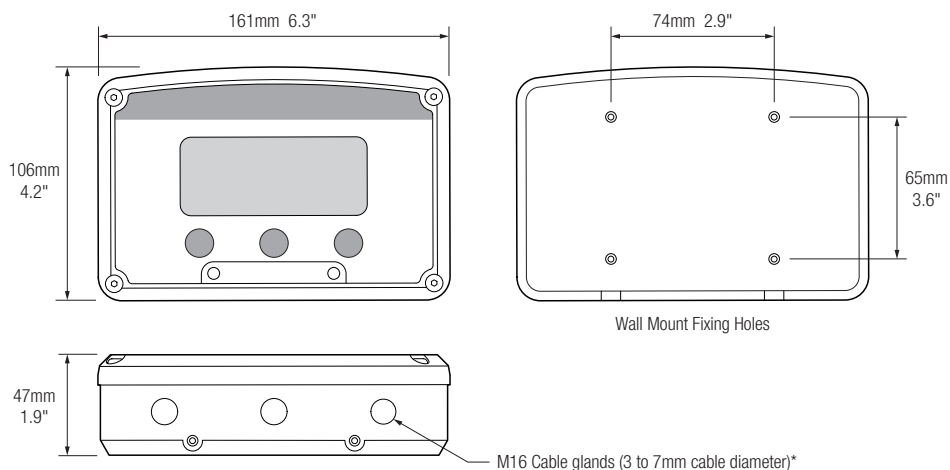


### Wall Mount

#### OPTIONS 0 & 2

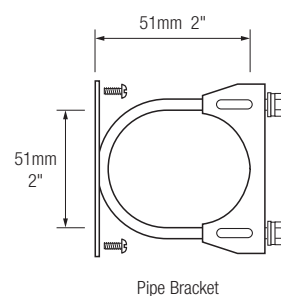


### Aluminium / Stainless Enclosure



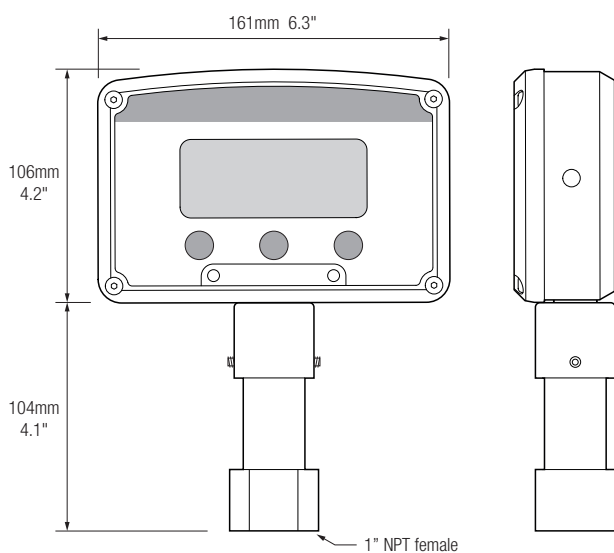
### Pipe Mount Adapter

#### OPTION 6

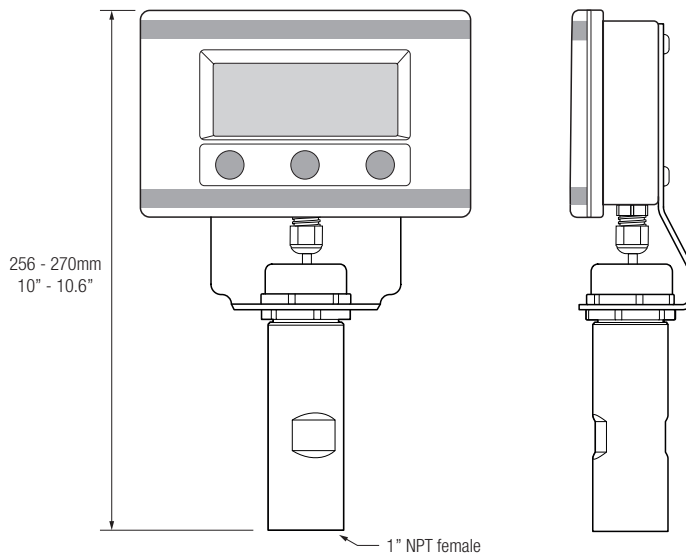


### Turbine Mounting Options

#### Aluminium / Stainless Enclosure – OPTION 3



#### Polycarbonate Enclosure – OPTION 4



\* NOTE: Number of cable entries may vary dependant on specific model

## Rate Totaliser – Model 202D

### TERMINAL DESCRIPTIONS

Common to all Models		4-20mA Output Versions	
Number		Number	
7	Signal Input (-)	1	4-20mA (-)
8	Signal Input (+)	2	4-20mA (+)
		3	Low Alarm (-)
		4	Low Alarm (+)
		5	High Alarm (-) or Pulse (-)
		6	High Alarm (+) or Pulse (+)

DC Power Versions	
Number	
1	DC Power 0 Volts
2	DC Power +9 to 28Vdc

### PRODUCT CODES

Product Code, Mounting Types & Options			
202Di	•		Rate Totaliser (intrinsically safe)
Enclosure Mounting	0		Wall mounting (no gland holes) *
	1		Panel mounting (cable glands not included)
	2		Wall mounting (standard glands) *
	3		Turbine mount stem for metal enclosure
	4		Turbine mounting for polycarbonate enclosure
	6		Galvanised pipe mounting
Output Options	0		Battery powered & no output option
	3		DC powered & alarms (pulse out)
	4		Loop powered, 4-20mA out & alarms
Hazardous Approvals		C M	CSA US & Canadian approval ATEX/IECEx approval
Standard Enclosure			Polycarbonate housing *
Anodised Aluminium Enclosure		.A	Aluminium housing **
Stainless Steel Enclosure		.S	Stainless steel housing **

Typical Part Number: 202Di.40C.A

Notes: \* Wall mounting bracket supplied

\*\* Not available as panel mount



Polycarbonate  
Enclosure (standard)



Aluminium/Stainless  
Steel Enclosure

### Instruments within the Contrec family:

**100 Series** – Accurate process instruments for field mounting applications

**200 Series** – Intrinsically safe, precise and reliable process instruments

**400 Series** – Rugged and dependable batch and flow control solutions

**515 Series** – Precise flow and batch control for more complex applications

**TRAC 50** – Vehicle mount custody transfer approved registers

**LoadPro®** – Robust load controllers for petroleum and chemical applications



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