

DANIEL®

XRT TOTALIZER

DATA SHEET



DANIEL®

Decades Proven. Field Chosen.™

DANIEL XRT TOTALIZER

The Daniel XRT Totalizer provides unequalled safety and ease of use, opening covers is history. The through-glass keypad enables operability without interruptions. The XRT saves time, money and hassle while delivering user-friendliness in the harshest conditions.

Advantages

- Save time and gain flexibility with the easy-to-operate through glass keypad: no need to remove the front cover or to arrange a work permit
- Intuitive "Know one, know them all!" configuration menu, saving time, cost and aggravation
- Cost saving with an easy to install, spacious chamber, plug and play connectors and 3/4" NPT thread for flow meter mounting
- Optional durable high grade stainless steel 316L Ex d enclosure for extremely salty atmospheres (offshore)

Features

- Explosion proof according ATEX, IECEx, FM and CSA c-us
- Displays flow rate, total, acc. total, daily total, previous day total, measuring units and a flow rate indicating speedometer
- Bright LED backlight
- Easy K-factor configuration for volumetric or mass
- 15 point linearization of the flow curve - with interpolation
- Ability to process all types of signals: Sine wave (coil), NAMUR, NPN/PNP pulse, Reed-switch, Active pulse signals, (0)4 - 20mA
- Scaled pulse output according to linearized acc. total and input retransmission
- Loop powered 4-20mA output acc. linearized flow rate
- Modbus RS232 / RS485 or USB communication
- Power requirements: Loop powered, battery or 9 - 27V DC
- Sensor supply: 8.2 / 12 / 24V DC
- Auto backup of settings and running totals
- Easy configurable via PC with free downloadable software
- Data logging of flow rate, total and accumulated total

Typical Applications



Introduction

The XRT is a popular model and distinguishes itself from competitors by its superior quality and functionality. The XRT Totalizer meets the requirements for explosion proof design and ensures safety during daily operation.

Operation

Easy operation using the optical, intuitive interface through the glass keypad without removing the front cover. Optical keys can be disabled. For easy handheld configuration, there are three mechanical push buttons on the bottom side of the display collar. All settings are accessed via a simple operator menu that can be passcode protected.



Display

The LCD display provides multiple flow data at a glance. Main information that shows Total or Flow Rate is displayed with 7 digits at 0.47" and Show Flow Rate and Accumulated Total is displayed with 11 digits at 0.28". The Daily Total and Previous Day Total are not resettable and available as well. The last 15 historical day totals are stored and can be displayed. The Speedometer view is available to provide a quick impression of the actual flow rate. On-screen engineering units are easily configured from a comprehensive selection while the different units for flow rate and total can be displayed simultaneously. Backlight is included for clear readings in sunlight or darkness.

Hazardous Areas

The XRT has been certified according ATEX, IECEx, FM and CSA c-us with an ambient temperature of -40°C to +70°C (-40°F to +158°F). The application range of the enclosure is as follows:

- The ATEX markings for gas and dust applications are:

Ex II 2 G Ex d IIC T6 Gb

Ex II 2 D Ex tb IIIC T85°C Db

- The IECEx markings for gas and dust applications are:

Ex d IIC T6 Gb

Ex tb IIIC T85°C Db

- The FM and CSA c-us markings are:

XP (Explosion-proof): Class I, Division 1, Grps A, B, C, D. DIP (Dust-Ignition-proof): Class II/III, Division 1, Groups E, F and G. Class I, Zone 1, AEx d IIC T6 Gb, Zone 21, AEx tb IIIC T85°C Db.



Quick
Overview



Easy
Install



Easy
Programming



Intuitive
Interface



Reliable



User
Friendly

Analog Output

The linearized flow rate is transmitted with the galvanically isolated 4 - 20mA output signal. The XRT can even be loop powered via the isolated loop-current.

Pulse Output

A scaled pulse output is available according the linearized accumulated total. The unscaled pulse output retransmits the incoming pulse signal. The pulse length is user defined from 1msec up to 10 seconds. The output can be a passive NPN signal or a mechanical relay output.

Power Requirements

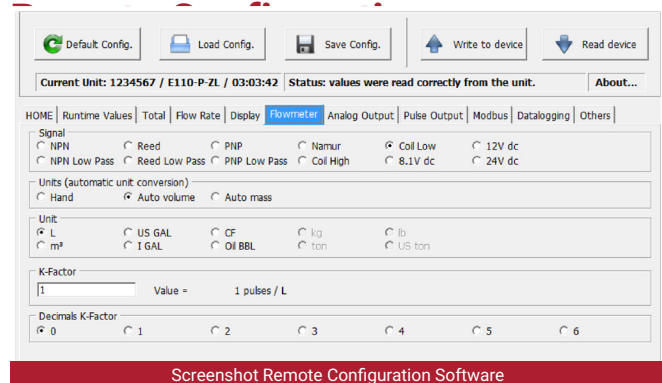
Several power inputs are possible to power the XRT and sensor. As standard, the XRT can be loop powered via the isolated, two-wire, analog output. The battery powered version with a long life lithium battery and the basic 9 - 27V DC can power the XRT including the backlight, but don't offer a real sensor supply. A real sensor supply of 8.2, 12 or 24V is optional available with type PD.

Communication

Processed data can be read, total can be cleared and settings can be read and modified through the Modbus link.

Enclosures

Two fundamental versions of our IP66/IP67, NEMA Type4X/7/9 explosion proof enclosures are available: a solid die cast aluminum or a high grade stainless steel 316L enclosure resistant to extremely salty atmospheres for offshore applications. The aluminum enclosure has an industrial two component coating and is better suited for outdoor and chemical plant applications than powder coated alternatives. A major advantage for the installation engineer is the spacious mid-chamber for the cable entry in combination with the plug-and-play connectors. Especially for straight flow meter mounting a 3/4" NPT connection is available. For the stainless steel option, please consult factory.



Data Logging

The data log function can hold up to 2824 logs. Each log contains the flow rate, total, acc. total, time stamp and log number. The log interval can be user defined from every minute up to once every 24 hours. Events like cleared total, changed menu settings or factory reset can also be logged. Once the log is full, it will roll over and delete the oldest data. The log data can be visualized on the LCD but is also easy accessible and downloadable as .CSV file via Modbus.



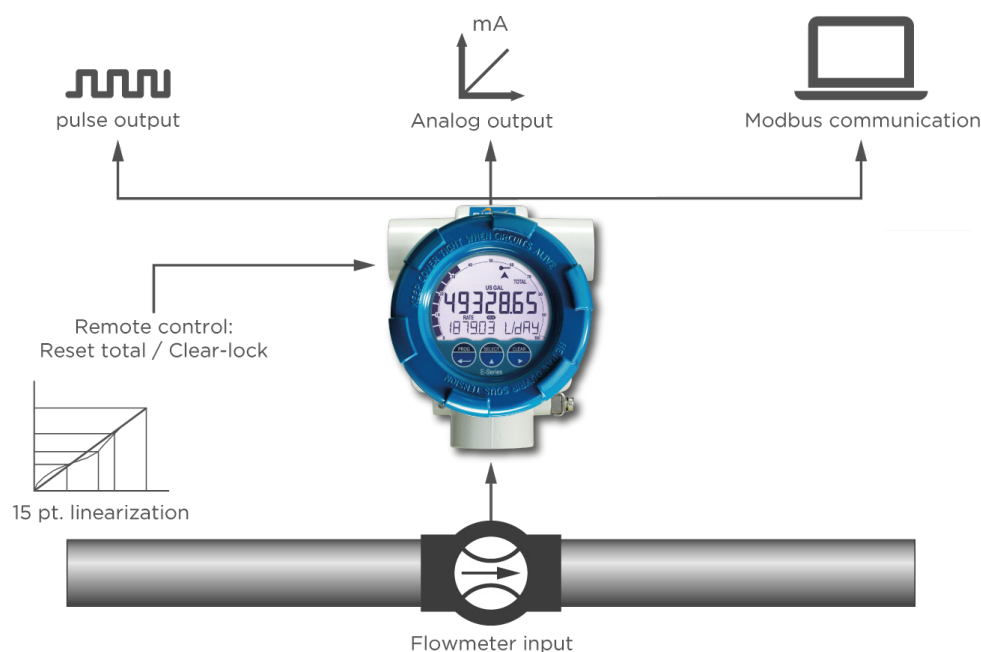
Easy-to-Operate Glass Keypad



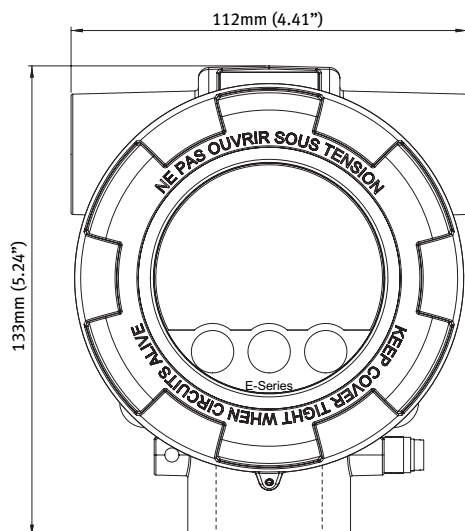
High Grade Stainless Steel 316L Enclosure

Overview Application XRT

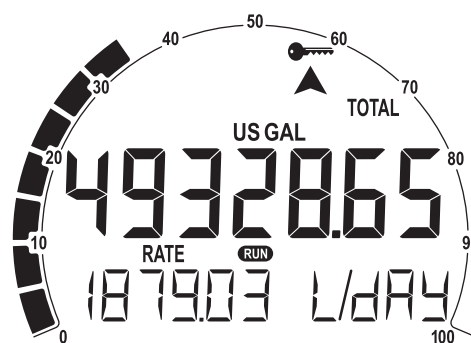
Flow measurement with mechanical flow meters where a precise calculation over the full measurement range is required, or if re-transmission of the flow rate and/or totalizer functions or serial communication is desired. The XRT offers you a flow rate indicator / totalizer designed to be used in harsh and complex applications. Its rugged design and ease of use are unequalled by any other explosion proof indicator in the market. The XRT is always your first and safest choice in explosion proof applications.



Dimensions



Display Example



Display

Type	High intensity transfective numeric and alphanumeric LCD, UV-resistant, with bright backlight. Intensity can be adjusted via the keypad.
Note	When battery powered, the backlight is only operational after a keypad touch, to extend battery lifetime.
Dimensions	Ø 65 x 45mm (2.56" x 1.77")
Digits	Seven 12mm (0.47") and eleven 7mm (0.28") digits. Various symbols and measuring units.
Refresh rate	User definable: 8 times/sec. - 30 secs
Speedometer	To indicate the actual flow rate the bargraph runs from 0 to 100% in 20 blocks, each block is 5%

Operating Temperature

Ambient	-40°C to +70°C (-40°F to +158°F)
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Power requirements

Type PB	Long life Lithium battery - lifetime depends upon settings and configuration - up to approx. 3 years
Note PB	The battery can power the backlight for a short time after a keypad touch but cannot power the relay output (OR) or the real sensor supply (Terminal P3)
Type PD	9 - 27V DC. Consumption max. 4.5 Watt
Type PX	9 - 27V DC. Consumption max. 3 Watt
Type AH	Loop powered, analog output. 11 - 27V DC, Min. 3.5mA. Consumption max. 675mW (25mA @ 27VDC)
Note AH	The loop powered analog output cannot power the backlight, mechanical relay output (OR) or the real sensor supply (Terminal P3)

Sensor Excitation

Type AH/PB/PX	Terminal S3: 3V DC for pulse signals and 1.2V DC for coil pick-up, I _{out} max. 100µA
Note AH/PB/PX	This is not a real sensor supply. Only suitable for sensors with a very low power consumption like coils (sine wave) and reed-switches
Type PD	Terminal P3: 8.2 / 12 / 24V DC 8.2V DC, I _{out} max. 20mA 12V DC, I _{out} max. 30mA 24V DC, I _{out} max. 75mA (this voltage varies depending on the input supply voltage)

Terminal Connections

Type	Removable plug-in terminal strip. Wire max. 1.5mm ² and 2.5mm ²
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Data Protection

Type	EEPROM backup of all settings. Backup of running totals every minute. Data retention at least 10 years.
Password	Configuration settings and clear total can be password protected.

Directives & Standards

EMC	Directive 2014/30/EU, FCC 47 CFR part 15
Low voltage	Directive 2014/35/EU
RoHS	Directive 2011/65/EU
ATEX / IECEx	Directive 2014/34/EU, IEC 60079-0, IEC 60079-1, IEC 60079-31
FM	Class 3600, 3615, 3616, 3810
CSA	CSA 22.2 No. 25, No. 30, No. 61010-1-12
UL	UL 61010-1
IP & NEMA	EN 60529 & NEMA 250

Hazardous Area - Explosion Proof

Ambient Temp	-40°C to +70°C (-40°F to +158°F)
ATEX certification	Gas: II 2 G Ex d IIC T6 Gb Dust: II 2 D Ex tb IIIC T85°C Db
IECEx certification	Gas: Ex d IIC T6 Gb Dust: Ex tb IIIC T85°C Db
FM & CSA c-us certification	Class I, Div. 1, Grps A, B, C, D Certification Class II/III, Div. 1, Grps E, F, & G Class I, Zone 1, AEx d IIC T6 Gb, Zone 21, AEx tb IIIC T85°C Db

Enclosure - General

Window	Glass window
Sealing	Silicone
Control keys	Three infra-red keys with operation through the glass front window
Rating	IP66, IP67 / NEMA Type4X / Type7 / Type9
Dimensions	112 x 133 x 148mm (4.41" x 5.24" x 5.83") - W x H x D

Enclosure - Types

Type HA_	Aluminum Ex d enclosure
Weight	1550 gr. (3.41 lbs)
Type HS_	Stainless steel 316L Ex d enclosure (Consult factory)
Weight	3600 gr. (9.65 lbs) (Consult factory)

Enclosure - Drillings

Type H_D	Entry threads: 2 x 1/2"NPT / 1 x 3/4"NPT
Type H_G	Entry threads: 2 x M20 / 1 x M25 (Consult factory)
Type H_H	Entry threads: 3 x M25 (Consult factory)

Signal Inputs - Flowmeter

Type P	Coil / sine wave (HI: 20mVpp or LO: 90mVpp - sensitivity selectable), NPN/PNP, reed switch, Namur, active pulse signals 8 or 24V DC
Frequency	Minimum 0Hz - maximum 10kHz for total and flow rate. Maximum frequency depends on signal type and internal low-pass filter. E.g. reed switch with low-pass filter: max. frequency 120Hz
K-Factor	0.000010 - 9,999,999 with variable decimal position
Low-pass filter	Available for all pulse signals
Option ZF	Coil sensitivity 10mVpp
Option ZG	Coil sensitivity 5mVpp
Type A	(0)4 - 20mA. Analog input signal can be scaled to any desired range within 0 - 20mA
Accuracy	16 bit. Low level cut-off programmable Type A: Error 0.03% @ 20°C (Typical 30ppm/°C)
Span	0.001 - 9,999,999 with variable decimal position
Update time	Two times per second
Voltage drop	Type A: max. 1V DC @ 20mA
Relationship	Linear and square root calculation
Note A	External power to sensor is required; e.g. type PD Contact us for latest specification

Signal inputs - Additional input

Function	Terminal input to reset total remotely or to lock the "clear total" button
Type IB	Internally pulled-up switch contact - NPN
Duration	Minimum pulse duration 100msec

Signal outputs - Digital output

Function	<ul style="list-style-type: none"> Scaled pulse output - transmitting acc. total Input pulse retransmission (squared, OT only)
Frequency	Max. 500Hz. Pulse length user definable between 1msec up to 10 seconds Retransmission: Minimum pulse duration: 50µs, square wave
Type OR	One isolated electro-mechanical relay output (NO) Max. resistive load: 2A @ 250V AC / 30V DC Maximum inductive load: 0,5A (pilot duty applications) Type OT remains also available
Restrictions OR	Requires 24 - 27V DC and supplied via P5 - P6 Frequency max. 0.5Hz
Type OT	One passive transistor output (NPN) - not isolated 300mA - 50V @ 25°C

Signal outputs - Communication option

Function	Reading display info, clear total, read/write configuration settings and data log extraction
Protocol	Modbus ASCII / RTU
Type CB	RS232
Type CH	RS485 2-wire
Type CX	No communication, remote configuration possible with accessory cable ACE02

Signal outputs - Analog output

Function	Transmitting flow rate
Type AH	Galvanically isolated, loop powered 4 - 20mA output
Accuracy	12 bit. Error 0.03% @ 20°C (Typical 45ppm/°C). Output signal can be scaled to any desired range.

Operator functions

Displayed info	<ul style="list-style-type: none"> Linearized flow rate and / or total Linearized total and accumulated total Current day (daily) total and previous day The last 15 historical day totals are stored and can be displayed Indicating speedometer for flow rate Total can be reset to zero by pressing the CLEAR-key twice
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Remote configuration

Function	Easy remote configuration via our free downloadable software and a special communication cable
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Data logging

Function	Records process data over time with real time clock
Type ZL	Each log containing flowrate, total, acc. total, time/date stamp and log number, requires Type P
Interval logs	Every: 1 min, 5 min, 10 min, 15 min, 30 min, 1 hr, 2 hr, 3 hr, 4 hr, 6 hr, 8 hr or disable. Max. 1500 interval logs
Daily logs	Configurable time once / twice per day or disable Max. 600 daily logs
Event logs	When settings change (manual/Modbus), restart / power failure, factory reset, cleared total or error event. Max. 724 event logs
Extraction	Modbus communication (CB/CH) as .CSV

Total

Digits	7 digits
Units	L, m³, US gal, ighal, cf, Oil bbl, kg, ton, US ton, lb or none
Decimals	0 - 1 - 2 or 3
Note	Total can be reset to zero

Accumulated total

Digits	11 digits
Units / decimals	According to selection for total
Note	Can not be reset to zero

Flow rate

Digits	7 digits
Units	mL, L, m³, mg, g, kg, ton, US ton, US gal, ighal, Oil bbl, lb, cf, rev, none, scf, nm³, nL or p
Decimals	0 - 1 - 2 or 3
Time units	/sec - /min - /hr - /day

With over 90 years of experience, Daniel is the only manufacturer that has the knowledge and experience to engineer and offer superior products that are trusted to provide the most reliable and accurate measurements in the global oil and gas industry.

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