

## Totalizer with receipt printer driver

linearization, analog and pulse outputs



Application examples: Truck loading



Offloading



Onshore ship (un)loading

The ER100-P provides unequalled safety and ease of use, opening covers is history. The through-glass keypad enables operability without interruptions. The ER100-P saves time, money and hassle and delivers user-friendliness in the toughest conditions.

### Advantages

- Configurable Totalizer / Delivery indicator with receipt printing function.
- 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.

### 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.
- Scaled pulse output according to linearized acc. total or unscaled pulse input retransmission.
- Loop powered 4-20mA output according to linearized flow rate.
- Selectable Modbus communication / ticket printing.
- Power requirements: Loop powered, 9 - 27V DC or battery.
- Sensor supply: 8.2 / 12 / 24V DC.

## Introduction

The ER100-P is an advanced Totalizer with the unique function to send a "print receipt" command to a printer. The configurable ticket printing can be set for (daily) totals or delivery tickets. The ER100-P distinguishes itself by its quality and functionality driven European design and manufacturing. It is more than fulfilling the rules for explosion proof design, it is about safety during the daily operation. Often, the environment is much tougher than the explosion proof requirements demand. Thus dangerous conditions may be experienced due to a broken enclosure or a poorly made flame path. Ruggedness and reliability is where we stand for and it is now available in a comprehensive well designed and purpose driven explosion proof flow rate indicator / totalizer.

## Configuration

The ER100-P uses the highly appreciated configuration structure. Each setting is clearly indicated with an alphanumeric description, which avoids confusing abbreviations.

## Operation

Operation is done via the optical, easy-to-operate, through glass keypad without having to remove the front cover. These 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 unique LCD display provides multiple flow data at a glance. The main information is displayed with 7 digits (12mm, 0.47") to show total or flow rate and 11 digits (7mm, 0.28"), which can be set to show flow rate and accumulated total. Current day total (daily total) and previous day total, both non resettable are available as well. The last 15 historical day totals are stored and can be displayed. On-screen engineering units are easily configured from a comprehensive selection, while different units for flow rate and total can be displayed simultaneously. The speedometer offers a quick impression of the actual flow rate.

For good readings in full sunlight and darkness, the ER100-P is provided with a bright backlight. When battery powered the backlight is only operational after a keypad touch, to safe battery life.

## Remote configuration

Quick and easy configuration via a PC connection using the free downloadable Configuration Software. Just connect the ER100-P to your PC with the available configuration cables.



All info  
at a glance



Easy  
to install



Easy  
to program



Know one  
know them all!



Reliable



User-friendly

## Analog output

The linearized flow rate is transmitted with the galvanically isolated 4 - 20mA output signal. The ER100-P can even be loop powered via the isolated loop-current.

## Pulse outputs

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 ER100-P and sensor. As standard, the ER100-P can be loop powered via the isolated, two-wire, analog output. The battery powered option with a long life lithium battery can power the ER100-P including the backlight, but doesn't offer a real sensor supply. A real sensor supply of 8.2, 12 or 24V is optional available with the 9 - 27V DC.

## Communication

The "print receipt" command is processed through the ASCII data communication link (RS485). When ticket printing is disabled, all process data and settings can be read and modified through the Modbus communication link.

## Enclosures

The aluminum IP66/IP67, NEMA Type4X/7/9 explosion proof enclosure has an industrial two component coating and is better suitable 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.

## Hazardous areas

The ER100-P 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 very wide:

- The ATEX markings for gas and dust applications are:

 **II 2 G Ex d IIC T6 Gb.**

 **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,**

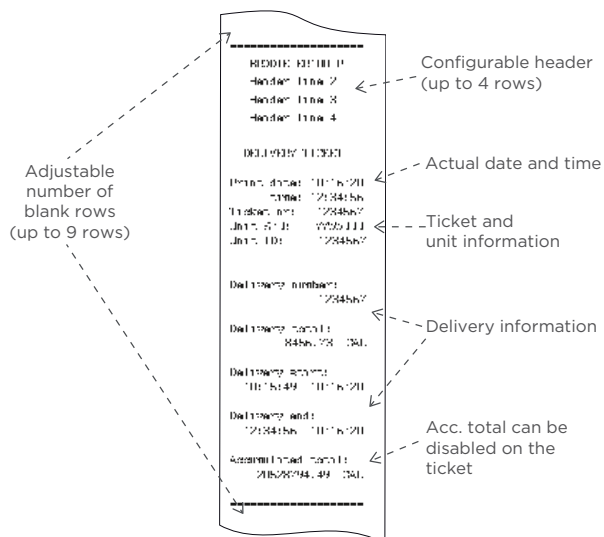
**Zone 21, AEx tb IIIC T85°C Db.**

## Ticket printing

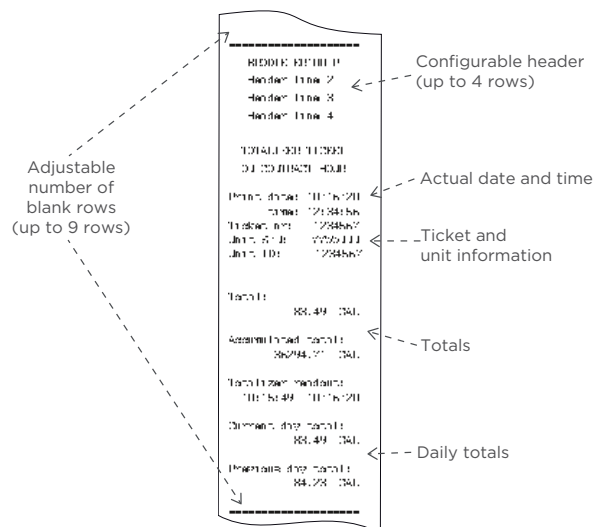
The configurable ticket printing can be set for (daily) totals or delivery tickets. When delivery mode is chosen, a ticket is printed when a delivery is ended by the "Clear"-button or via configurable remote control input. When totalizer mode is chosen, a ticket is printed at contract hour or with a print command by the keypad.

Reprints are available in both print modes, they have an extra line at the ticket which shows [\* REPRINT \*] They can be reprinted with the configured remote control input.

*Delivery Ticket example*

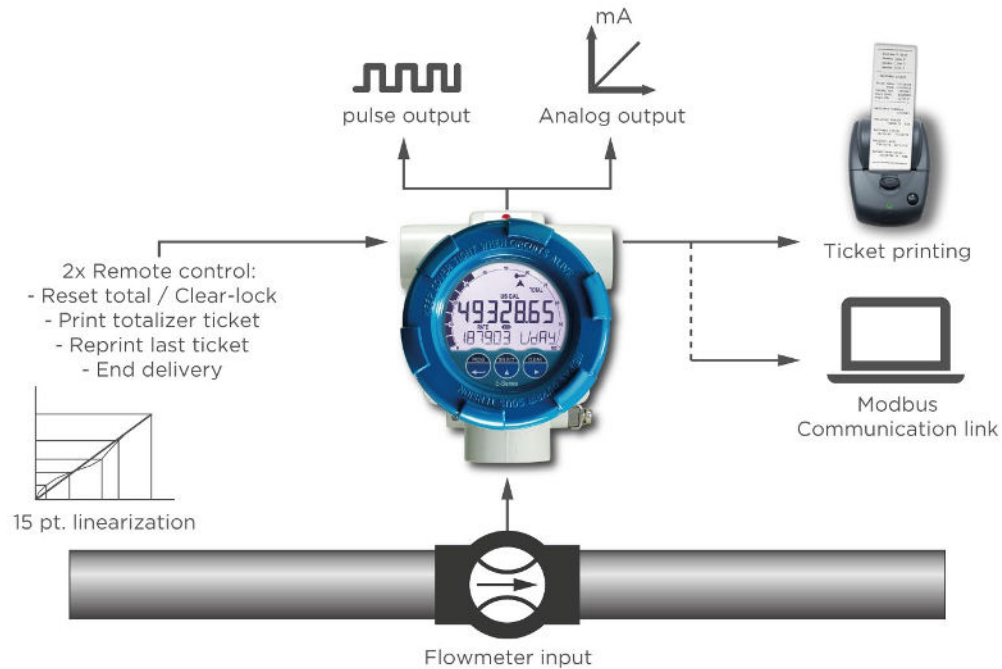


*Totalizer Ticket example*



## Overview application ER100-P

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. As well as the requirement tickets of deliveries and / or daily totals. The ER100-P offers you a flow rate indicator / totalizer designed to be used in rough and tough applications, beyond being just explosion proof. Its sturdy design and ease of use are unequalled by any other explosion proof indicator in the market! The ER100-P is always your first and safest choice in explosion proof applications.



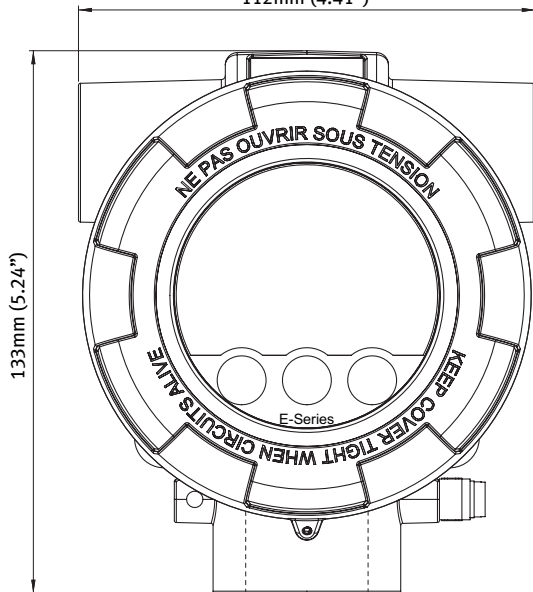
## Signal input

The ER100-P accepts most input signals for volume flow or mass flow meters. The input signal type can be selected in the configuration menu without having to adjust any sensitive mechanical dip-switches or jumpers. In addition to the average K-Factor, 15 linearization points can be entered with their frequencies or values. The unit will interpolate between these points greatly enhancing accuracy in any flow range.

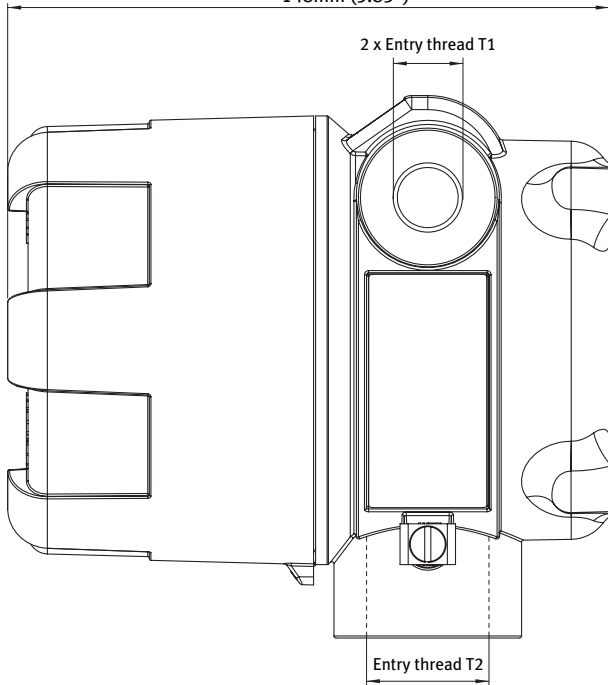
Type of signal	Resistance	Low Pass filter (LP)	Max. frequency	Max. frequency Low Pass filter (LP)	Min. amplitude P-P	Remark
NPN	100k $\Omega$ pull-up	100k $\Omega$ pull-up	6kHz Threshold 1.2V	2.2kHz		Open collector
REED	1M $\Omega$ pull-up	1M $\Omega$ pull-up	1.2kHz Threshold 1.2V	120Hz		
PNP	51K $\Omega$ pull-down	51K $\Omega$ pull-down	6kHz Threshold 1.2V	700Hz		
NAMUR	820 $\Omega$ pull-down	-	4kHz	-		External power required
COIL LO	-	-	-	-	90mV <sub>pp</sub>	Default sensitivity
COIL-HI	-	-	-	-	20mV <sub>pp</sub>	Sensitive for interference!
ACTIVE 8.2V DC	3K9 $\Omega$		10kHz Threshold 4V			External power required
ACTIVE 24V DC	3K $\Omega$		10kHz Threshold 12V			External power required

## Dimensions enclosures

Aluminum & Stainless Steel 316L enclosure  
112mm (4.41")



148mm (5.83")



### Enclosure types

Type HA\_ Aluminum Ex d enclosure.

Weight 1550 gr. (3.41 lbs).

### Enclosure drillings

Type H\_B T1: 2 x 3/4"NPT / T2: 1 x 3/4"NPT

## Terminal connections

### Main Electronics Module

POWER REQUIREMENTS PULSE OUTPUT

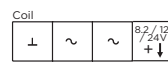
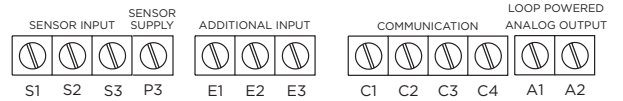


P1 P2 R1 R2 R3

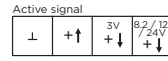
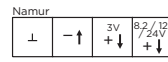
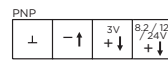
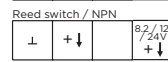
9 - 27V DC Passive transistor output



Battery powered:  
(If supply 9 - 27V DC is connected, the battery supply will be switched off automatically.)



Note: Non-polarity sensitive.



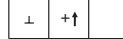
### Battery Supply Module

POWER REQUIREMENTS

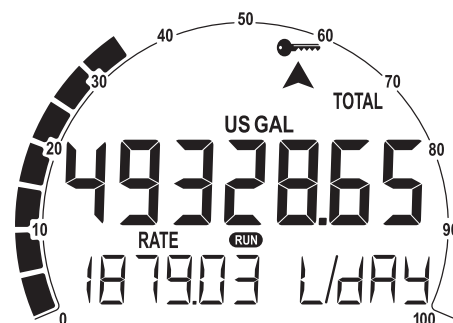


P5 P6 P7

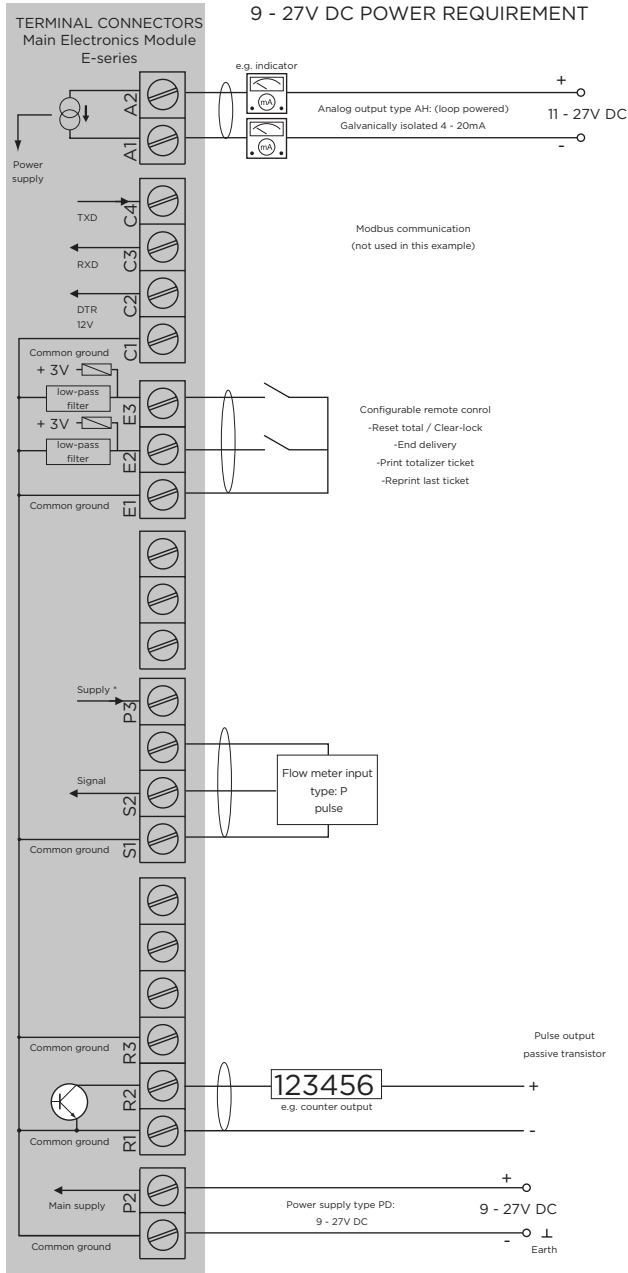
9 - 27V DC\*



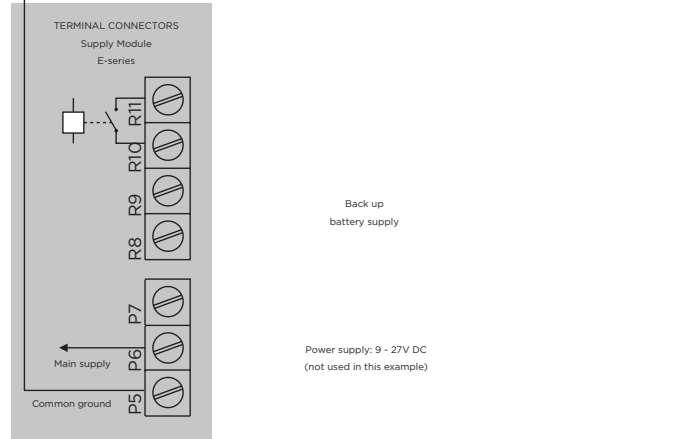
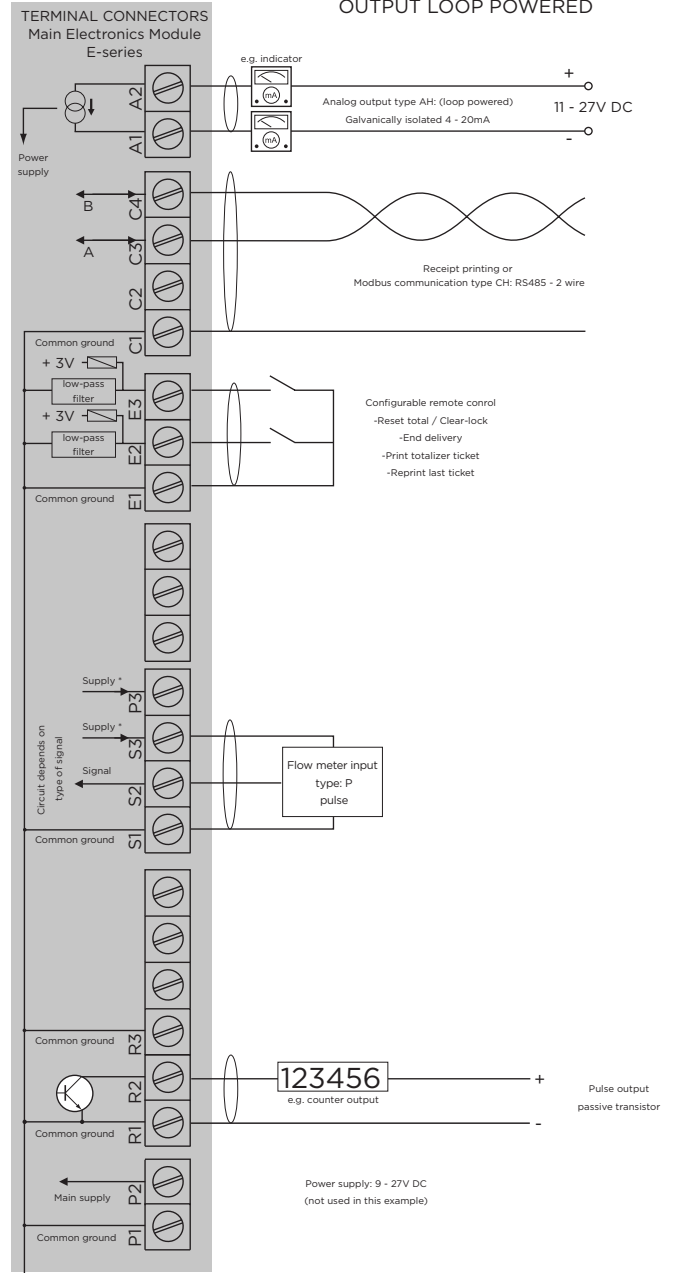
## Display example totalizer



## ER100-P



## ER100-P



\*Supply voltage S3: 3V DC to sensor



### Signal inputs - Flowmeter

<b>Pulse</b>	Coil / sine wave (HI: 20mVpp or LO: 90mVpp - sensitivity selectable), NPN/PNP, reed switch, Namur, active pulse signals 8 or 24V DC.
<b>Frequency</b>	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.
<b>K-Factor</b>	0.000010 - 9,999,999 with variable decimal position.
<b>Low-pass filter</b>	Available for all pulse signals.

### Signal inputs - Remote control input

<b>Function</b>	<ul style="list-style-type: none"> <li>Terminal input to reset total remotely or to lock the "clear total" button.</li> <li>End delivery.</li> <li>Print totalizer ticket.</li> <li>Reprint last ticket.</li> </ul>
<b>Type</b>	2x Internally pulled-up switch contact - NPN.
<b>Duration</b>	Minimum pulse duration 100msec.

### Signal outputs - Digital output

<b>Function</b>	<ul style="list-style-type: none"> <li>Scaled pulse output - transmitting acc. total.</li> <li>Input pulse retransmission (squared).</li> </ul>
<b>Frequency</b>	Max. 500Hz. Pulse length user definable between 1msec up to 10 seconds. Retransmission: Minimum pulse duration: 50µs, square wave.
<b>Type</b>	One passive transistor output (NPN) - not isolated. 300mA - 50V @ 25°C.

### Signal outputs - Analog output

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

### Signal outputs - Communication option

<b>Function</b>	<ul style="list-style-type: none"> <li>Reading display info, clear total, read/write configuration settings and data log extraction.</li> <li>Ticket printing on demand (delivery).</li> <li>Ticket printing of daily totals, at contract hour.</li> </ul>
<b>Protocol</b>	Modbus ASCII (printer) Modbus ASCII / RTU (communication).
<b>Type</b>	RS485 2-wire
<b>Speed</b>	1200 - 2400 - 4800 - 9600 - 19200 - 38400.
<b>Addressing</b>	1 - 247.

### Operator functions

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

### Total

<b>Digits</b>	7 digits.
<b>Units</b>	L, m <sup>3</sup> , US gal, igal, cf, Oil bbl, kg, ton, US ton, lb or none.
<b>Decimals</b>	0 - 1 - 2 or 3.
<b>Note</b>	Total can be reset to zero.

### Accumulated total

<b>Digits</b>	11 digits.
<b>Units / decimals</b>	According to selection for total.
<b>Note</b>	Cannot be reset to zero.

### Flow rate

<b>Digits</b>	7 digits.
<b>Units</b>	mL, L, m <sup>3</sup> , mg, g, kg, ton, US ton, US gal, igal, Oil bbl, lb, cf, rev, none, scf, nm <sup>3</sup> , nL or p.
<b>Decimals</b>	0 - 1 - 2 or 3.
<b>Time units</b>	/sec - /min - /hr - /day.

### Display example ticket printing

