



# Totalising, Dosing and Monitoring Electronics

pulse input



measuring  
•  
monitoring  
•  
analysing

ZOK



2" pipe mounting kit



Wall mounting kit



- LCD-display, background lighting
- 2 pulse inputs (NPN, PNP, NAMUR, reed switch etc.)
- Analogue, switching, pulse, relay output, status output
- Sensor supply
- Free scaling
- Universal housing, panel mounting or field housing



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**Description**

The electronic units ZOK-Xx are specifically designed for the calculation, display and transfer of calculations and flow rates of flow meters with pulse or frequency outputs. The instruments display flow rate, day counter (resettable) and total counter in the operator-selected units. A clear multilingual menu guides you through the programming of the device that largely eliminates the requirement of constant usage of operating manual. All user-specific program settings are retained even when changing the battery.

The electronics options ZOK-ZxK are weather resistant and adequately reflect IP66/67 (NEMA 4X). The electronics is housed in a UV-resistant, glass-filled nylon housing with stainless steel screws and FPM seals.

The option ZOK-ZxP is in a panel housing 96x96 mm with protection class IP44. The option ZOK-ZxF is available in powder coated aluminum extruded housing with plastic lids and appropriate protection class IP66/67. The instruments are suitable for harsh indoor or outdoor environments and comply with EU Directive 2004/108/EC (Electromagnetic Compatibility).

**Significant Characteristics**

- Battery life or external powered, graphic LCD-display resettable and cumulative totaliser, 5 digit main value display, configurable
- Robust field or panel mountable housing
- Simple programming
- Universal pulse inputs
- Display backlighting
- Status output
- Scalable pulse output
- Optional: wall or pipe mounting

**Technical Details**

External power supply: 5...28 V<sub>DC</sub> (without using the analogue output)  
 8...28 V<sub>DC</sub> (with using the analogue output)  
 12...28 V<sub>DC</sub> with relay output  
 max. power consumption: with DC supply voltage approx. 70 mA (with full backlight, without outputs)

Ex versions: U<sub>i</sub> = 28 V  
 I<sub>i</sub> = 100 mA  
 P<sub>i</sub> = 0.7 W

See table on page 7 for details

Battery (battery for operation): 3.6 V/2200 mAh  
 Lithium size AA

Battery life in battery mode: dependant on the chosen sleep mode  
 max. 17 months  
 min. 3 months

Display: LCD, graphic 128x64, backlight adjustable (only with external supply)

Size of main display value: 12.5 mm

Display resolution of main display value: 5 digits, based on measuring range end value

Engineering units displayed: litres, millilitres, gallons (US or UK), barrel, m<sup>3</sup>, user defined engineering units displayed

Input scaling range: 0.001 ... 99,999.999 with 3 floating decimal points

Mounting: meter mount, wall, surface, pipe or panel mount, field mount

Measuring inputs: 2 x pulse input, type: NPN, PNP, NAMUR, Reed, Hall, active (configurable with software)  
 Input frequency: 0.1 ... 1000 Hz, High-Low-threshold 1 V<sub>DC</sub>, max. Input amplitude 30 V<sub>DC</sub>

Basic accuracy of flow measurement: <0.1 % of reading (the accuracy of the displayed value depends on the adjusted scale and display resolution)

Sensor supply: 8 V<sub>DC</sub>, max. 30 mA (with external supply > 10 V<sub>DC</sub>)

Arithmetic functions: A+B, A-B with scalable analogue output



**Outputs**

Status output: transistor output, Push-Pull (PP), max. 300 mA, overload protection

Relay outputs (only -Z2): potential-free changeover contacts, max. switching voltage 230 V<sub>AC/DC</sub>, max. current load dependent (see diagram)

Solid-state relay output (only E2/E5): max. switching voltage: 30 V<sub>DC</sub>, R<sub>ON</sub>= 1700 Ω, R<sub>OFF</sub> > 10 GΩ to be used with NAMUR-isolated switching amplifier

Switching outputs: transistor output PNP, NPN or Push-Pull (PP), with software configurable, max. output current: 300 mA (source/ sink), overload protection

Pulse output: transistor output, Push-Pull (PP), max. 300 mA, overload protection

Analogue output: 4-20 mA, 2-conductor loop operation or 3-wire operation (current source or sink) selectable by external wiring, free scaling, max. load: 750 Ω at 24 V<sub>DC</sub>, 250 Ω at 14 V<sub>DC</sub>, 150 Ω at 12 V<sub>DC</sub>, Resolution: 16 bits

Operation: 4 buttons

Housing: plastic, PA6, GF-enhanced

Protection: IP66/67 (not for panel mounting)

Cable entry: 3xM20x1.5 or 1/2" NPT (prepared, not for panel mounting device)

Electrical connection: plug-in terminals

ATEX Certification: II 2G Ex ia IIC T4 Gb

IECEX Certification: Ex ia IIC T4 Gb

Ambient temperature: ZOK-Z: -20... +80 °C  
ZOK-E: -20... +60 °C

Relay outputs: potential-free changeover contacts, max. switching voltage 230 V<sub>AC/DC</sub>, max. current load dependent (see diagram)

Analogue output (at ZOK-Z5P): 4-20 mA, 3-wire, current source

Housing: ZOK-ZxP panel mounted, 96x96 mm, depth 60 mm degree of protection front IP65, backside IP20  
ZOK-ZxF aluminium housing with plastic lid PA6 117 x 117 mm, depth 127 mm

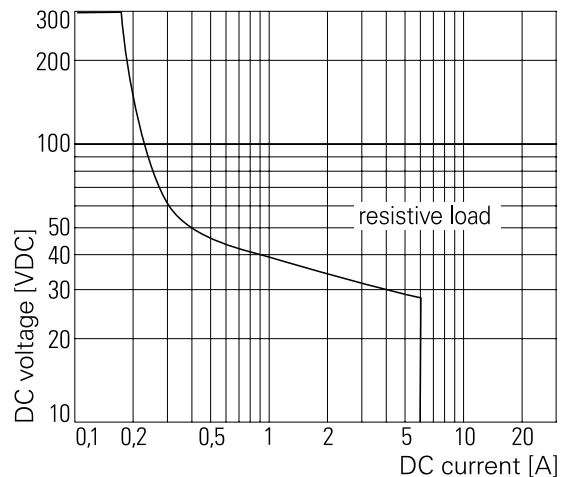
Protection: IP65

Cable entry: 3xM16x1.5/2xPG13.5 for ZOK-ZxF  
3x screw terminals for ZOK-ZxP

Retention of meter readings in case of power failure: in integrated, non-volatile memory

Ambient temperature: -20... +80 °C

**Max. DC load breaking capacity**



**Additional Data for Options ZOK-ZxP and ZOK-ZxF**

Power supply: 12...28 V<sub>DC</sub> (supply option -6)  
90-260 V<sub>AC</sub> (supply option -0)  
battery operation only with ZOK-ZxF with supply option 3

See table on page 7 for details

Sensor supply: 8 V with supply voltage ≥8,5 V<sub>DC</sub> (supply option -3)  
8 V or 24 V selectable (supply option -0 and 6). Max 30 mA.



**Instrument/Functions overview ZOK...**

Function	Z1P/Z1F	Z1K/M/0	Z2P/Z2F	Z2K/M/0	Z5P/Z5F	Z3K/M/0/F	Z5K/M/0	E1K/M	E2K/M/0	E3K/M/0	E5K/M/0
Dual counter	X	X			X	X	X	X		X	X
Dosing function			X	X					X		
Controller function					X	X	X			X	X
<b>Certification</b>											
ATEX/IECEX Certification								X	X	X	X
<b>Power supply</b>											
DC-supply	X	X	X	X	X	X	X	X	X	X	X
AC-supply	X		X		X						
Battery operation (output deactivated) <sup>2)</sup>		X				X		X		X	
Battery included in shipment <sup>3)</sup>		X				X		X		X	
<b>Sensor supply (only with external power supply)</b>											
Sensor supply	8 V/ 24 V	8 V	8 V/ 24 V	8 V	8 V/ 24 V	8 V	8 V	8 V	8 V	8 V	8 V
<b>Electrical outputs (only with external supply)</b>											
Relay outputs			X	X	X		X		with solid-state relay board <sup>1)</sup>		with solid-state relay board <sup>1)</sup>
Status outputs	X	X	X	X	X	X	X				
Analogue outputs					3L	2L/ 3L	3L			2L/ 3L	3L
Pulse outputs					X	X	X				with solid-state relay board <sup>1)</sup>
<b>LCD-display</b>											
Selectable units	X	X	X	X	X	X	X	X	X	X	X
Decimal point	X	X	X	X	X	X	X	X	X	X	X
Accumulative total	X	X	X	X	X	X	X	X	X	X	X
Resettable total	X	X	X	X	X	X	X	X	X	X	X
Linearisation	X	X			X	X	X	X	X	X	X
Rate display	X	X	X	X	X	X	X	X	X	X	X
Backlighting	X	X	X	X	X	X	X				
Arithmetic functions	X	X			X	X	X	X	X	X	X

<sup>1)</sup> Solid-state relay board serves as a galvanic separation to be used in hazardous area

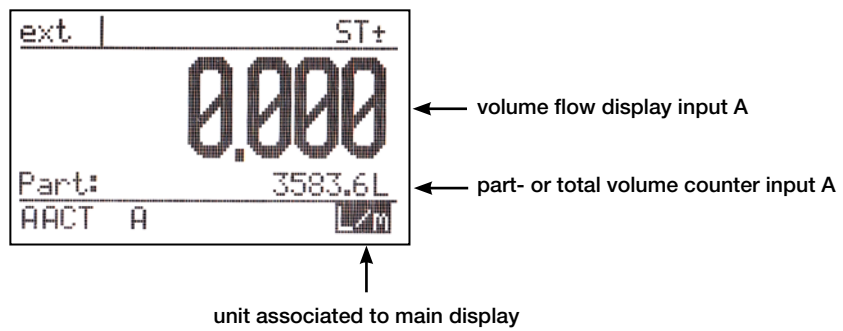
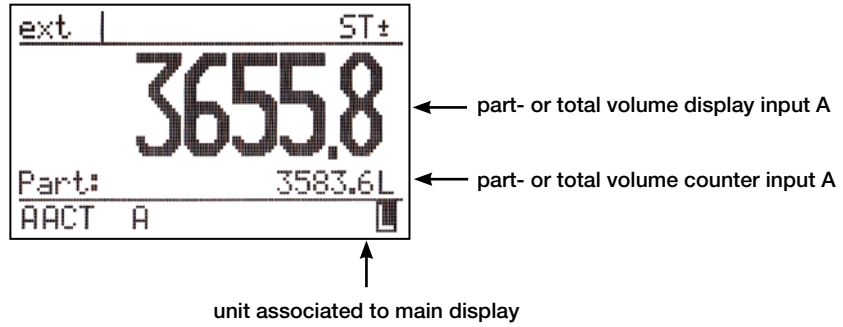
<sup>2)</sup> Battery operation only applicable with a passive sensor (e.g. reed switch)

<sup>3)</sup> Shipment without battery with option N.



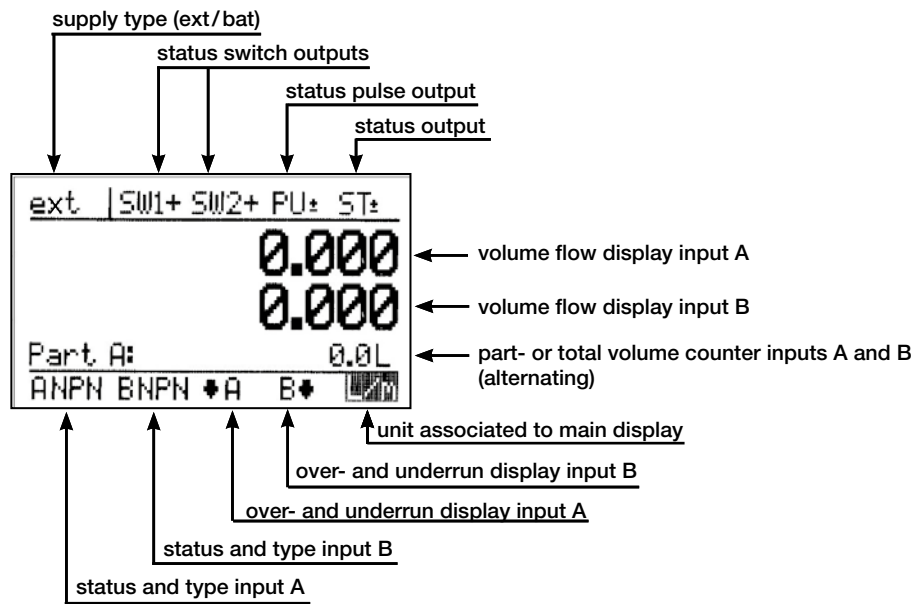
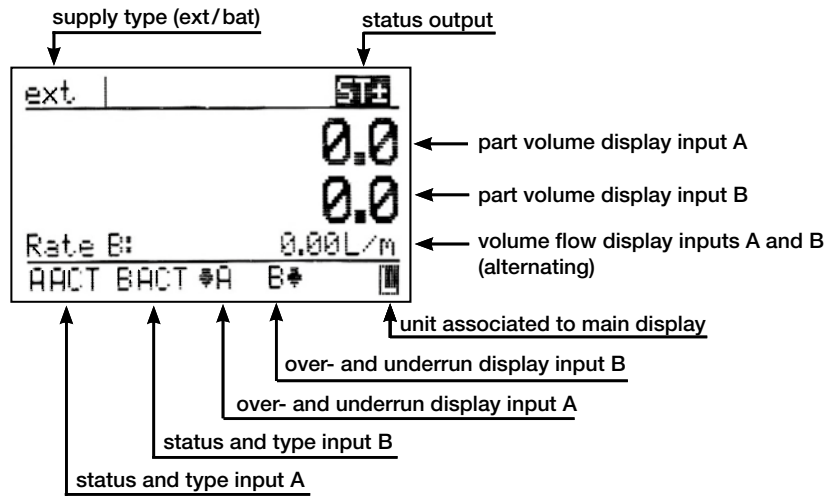
**Display**

Display layout in measuring mode single channel (ZOK-Z1/E1/Z3/E3/E5)

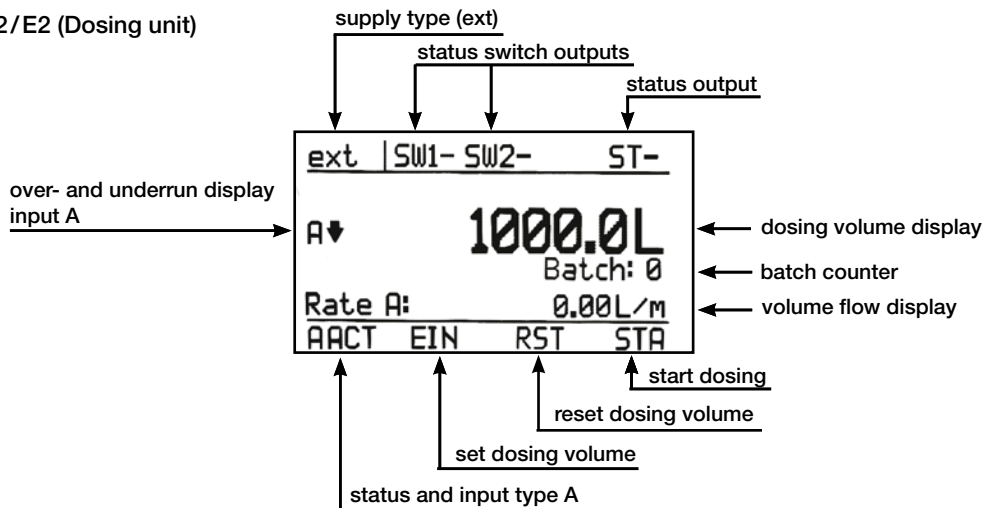


**Display** (continued)

Display layout in measuring mode for dual channel (ZOK-Z1/E1/Z3/E3/E5)



**ZOK-Z2/E2 (Dosing unit)**





**Order Details** (Example: ZOK-Z1 K M F 3 0 0)

Model	Electronics	Housing type	Electrical connection/ cable gland	Input	Power supply	Options	Special
ZOK-	<b>Z1</b> = dual totaliser LCD	<b>0</b> = universal mount (standard, round plastic without holder plates/without holes) <b>K</b> = universal mount (standard, round plastic with holder plates) <b>M</b> = universal mount (round plastic for retrofitting DON) <b>P</b> <sup>1)</sup> = panel mount 96x96 <b>F</b> <sup>1)</sup> = field housing	<b>M</b> <sup>3)</sup> = 3 x M20x1.5 cable entry <b>2</b> <sup>3)</sup> = 3 x 1/2" NPT cable entry <b>K</b> <sup>9)</sup> = terminal on the back <b>N</b> <sup>4)</sup> = 3xM16x1.5 cable entry <b>P</b> <sup>4)</sup> = 2xPG13,5	<b>F</b> = pulse/frequency input	<b>3</b> <sup>2)</sup> = 5...28 V <sub>DC</sub> , battery <b>0</b> <sup>2)</sup> = 90...260 V <sub>AC</sub> <b>6</b> <sup>2)</sup> = 12...28 V <sub>DC</sub>	<b>0</b> = without <b>R</b> <sup>2)</sup> = 2 relays <b>G</b> <sup>7)</sup> = 2 x solid-state relays <b>P</b> <sup>8)</sup> = 3 x solid-state relays	<b>0</b> = without <b>Y</b> = special (please specify in clear text) <b>N</b> = Shipment without battery
	<b>Z2</b> <sup>2)</sup> = dosing unit LCD						
	<b>Z3</b> = rate totaliser LCD, 4-20 mA						
	<b>Z5</b> = as Z3 with 2 relays						
	<b>E1</b> = as Z1 with ATEX/IECEX approval						
	<b>E2</b> <sup>2)</sup> = as Z2 with ATEX/IECEX approval						
	<b>E3</b> = as Z3 with ATEX/IECEX approval 4-20 mA, without pulse- and switching outputs						
	<b>E5</b> <sup>6)</sup> = as E3 with 4-20 mA and pulse- and switching outputs						

<sup>1)</sup> Not for ZOK-E1, E2, E3 and E5    <sup>2)</sup> See table below    <sup>3)</sup> Only for housing ZOK-xxK, ZOK-xxM, ZOK-xx0    <sup>4)</sup> Only for ZOK-ZxF    <sup>5)</sup> In preparation  
<sup>6)</sup> Option E5 possible only with remote I.S.isolator    <sup>7)</sup> Standard for ZOK-E2    <sup>8)</sup> Standard for ZOK-E5    <sup>9)</sup> For ZOK-ZxP

**Overview of electrical options and corresponding housings**

Model	Electronics	Housing	Supply voltage		Relay option	solid-state relays	
			Option	Battery option			
ZOK	Z1	0/K/M	3	standard	no	no	
		P	6/0	no			
		F	3/0	yes (with voltage option 3)			
	Z2	0/K/M	6	no	standard		
		P	6/0				
		F					
	Z3	0/K/M/F	3	yes	no		
	Z5	0/K/M	6	no	standard		
		P	6/0	no	standard		
		F	6/0	no	standard		
	E1/E3 <sup>1)</sup>	K/M	3	standard	no		standard
	E2/E5 <sup>1)</sup>	K/M	3	no			

<sup>1)</sup> Without backlighting

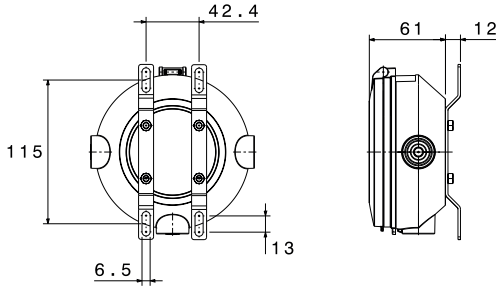
**Accessories**

Description	Model
Stainless steel wall mounting kit	<b>ERS-ZOK-023618</b>
Stainless steel 2" pipe mounting kit	<b>ERS-ZOK-003402</b>
Cooling fin for high temperature flowmeter	<b>ERS-ZOK-023619</b>
Batterypack ATEX/IECEX, 3,6 V	<b>ERS-BATEX036</b>

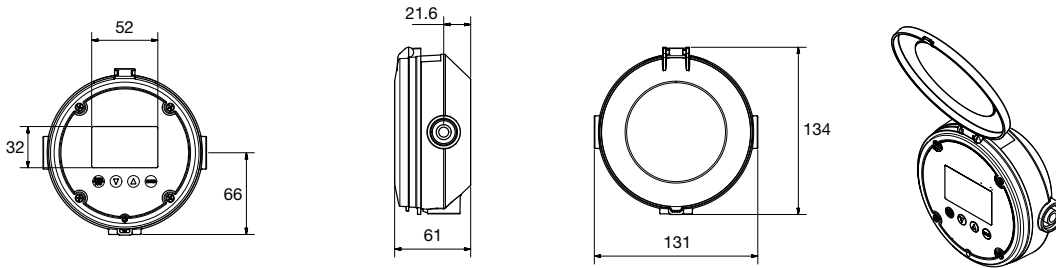
ERS-BATEX036 is part of standard scope of delivery of ZOK-E1/E3 (Shipment without battery with option N)

**Dimensions [mm]**

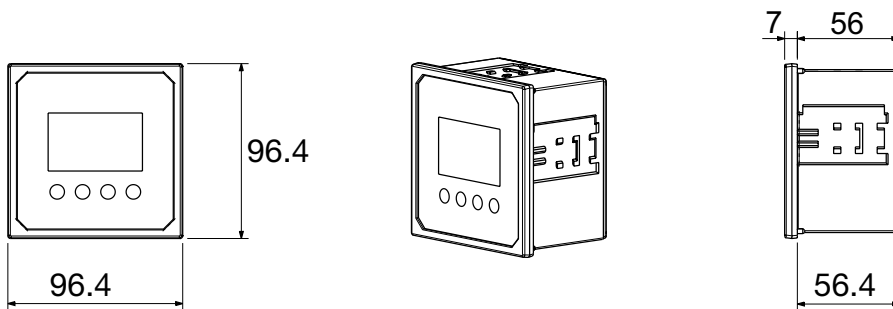
**ZOK-ExK/-ZxK**



**ZOK-ExM/-ZxM**



**ZOK-ZxP**



**ZOK-ZxF**

