Totalising, Dosing and Monitoring Electronics
pulse input

KOBOLD

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

Z2

KOBOLD companies worldwide:

ARGENTINA, AUSTRIA, AUSTRALIA, BELGIUM, BULGARIA, CANADA, CHILE, CHINA, COLOMBIA, CZECHIA, EGYPT, FRANCE, GERMANY, GREAT BRITAIN, HUNGARY, INDIA, INDONESIA, ITALY, MALAYSIA, MEXICO, NETHERLANDS, PERU, POLAND, ROMANIA, SINGAPORE, SOUTH KOREA, SPAIN, SWITZERLAND, TAIWAN, THAILAND, TUNISIA, TURKEY, USA, VIETNAM

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_{DC} (without using the analogue output)
	$8...28$ V_{DC} (with using the analogue output)
	$12...28$ V_{DC} with relay output max. power consumption: with DC supply voltage approx. 70 mA (with full backlight, without outputs)
Ex versions:	$U_i = 28$ V $I_i = 100$ mA $P_i = 0.7$ 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^3, 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_{DC}, max. Input amplitude 30 V_{DC}
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_{DC}, max. 30 mA (with external supply >10 V_{DC})
Arithmetic functions:	$A+B$, $A-B$ with scalable analogue output

www.kobold.com

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 $V_{AC/DC}$, max. current load dependent (see diagram)
Optocoupler output (only E2/E5):	max. switching voltage: 30 V_{DC} $R_{ON} = 1700\ \Omega$, $R_{OFF} > 10\ G\Omega$ 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_{DC}, 250 Ω at 14 V_{DC}, 150 Ω at 12 V_{DC}, Resolution: 16 bits
Operation:	4 buttons
Housing:	plastic, PA 6, GF-enhanced
Protection:	IP 66/67 (not for panel mounting)
Cable entry:	3 x M 20 x 1.5 or ½" NPT (prepared, not for panel mounting device)
Electrical connection:	plug-in terminals
ATEX Certification:	⟨Ex⟩ 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

Additional Data for Options ZOK-ZxP and ZOK-ZxF

Power supply:	12 … 28 V_{DC} (supply option -6) 90 - 260 V_{AC} (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_{DC} (supply option -3) 8 V or 24 V selectable (supply option -0 and 6). Max 30 mA.

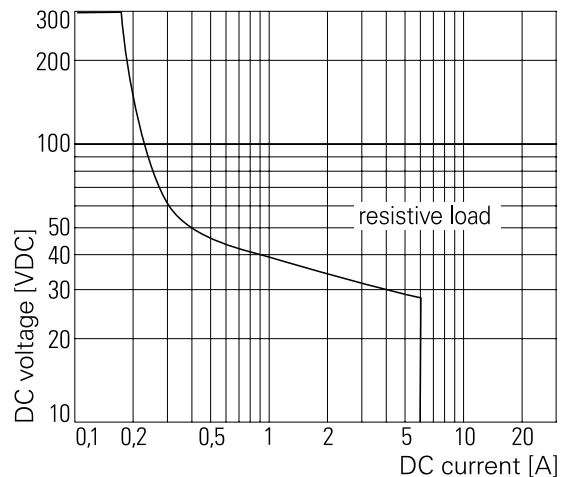|	
Relay outputs:	potential-free changeover contacts, max. switching voltage 230 $V_{AC/DC}$, max. current load dependent (see diagram)
Analogue output (at ZOK-Z3P):	4 - 20 mA, 3-wire, current source
Housing:	ZOK-ZxP panel mounted, 96 x 96 mm, depth 60 mm degree of protection front IP 65, backside IP 20 ZOK-ZxF aluminium housing with plastic lid PA6 117 x 117 mm, depth 127 mm
Protection:	IP 65
Cable entry:	3 x M16 x 1.5 / 2 x PG13.5 for ZOK-ZxF 3 x 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

www.kobold.com

Instrument / Functions overview ZOK...

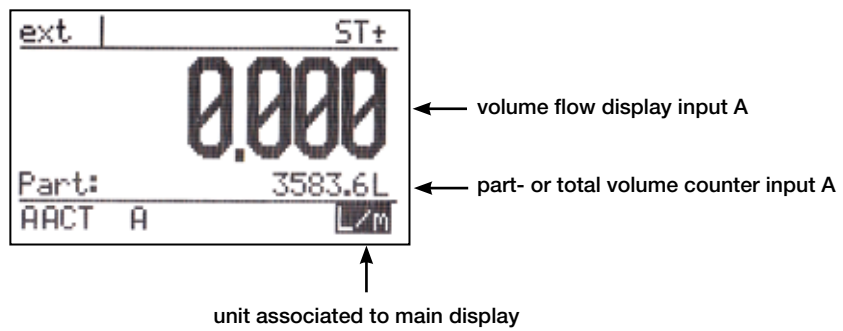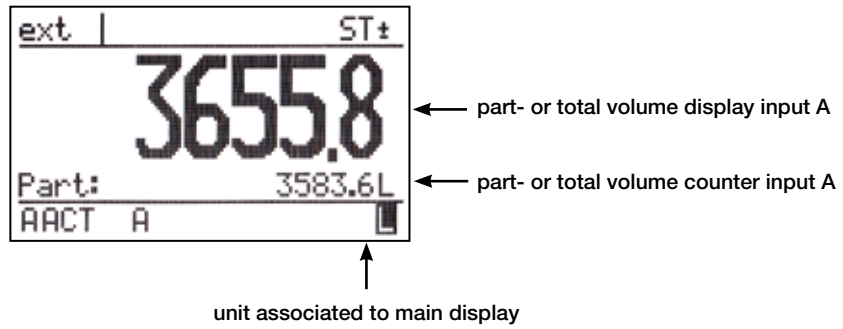| Function	Z1P/Z1F	Z1K/M/0	Z2P/Z2F	Z2K/M/0	Z3P/Z3F	Z3K/M/0	E1K/M	E2K/M/0	E3K/M/0	E4K/M/0	E5K/M/0
Dual counter	X	X			X	X	X		X	X	X
Dosing function			X	X				X			
Controller function					X	X			X	X	X
Certification											
ATEX/IECEx Certification							X	X	X	X	X
Power supply											
DC-supply	X	X	X	X	X	X	X	X	X	X	X
AC-supply	X		X		X						
Battery operation (output deactivated)[2]		X				X	X		X		
Battery included in shipment		X				X	X		X		
Sensor supply (only with external power supply)											
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
Electrical outputs (only with external supply)											
Relay outputs			X	X	X			with opto-coupler board[1]			with opto-coupler board[1]
Status outputs	X	X	X	X	X	X					
Analogue outputs					3 L	2 L/ 3 L			2 L/ 3 L	2 L/3 L HART®	3 L
Pulse outputs					X	X					with opto-coupler board[1]
LCD-display											
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					
Arithmetic functions	X	X			X	X	X	X	X	X	X

[1] Optocoupler board serves as a galvanic separation to be used in hazardous area
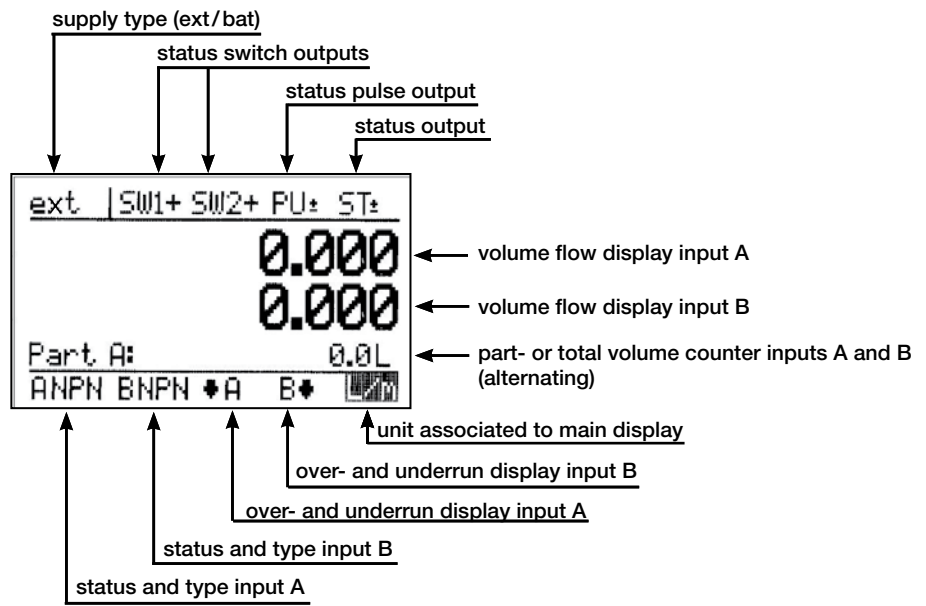[2] Battery operation only applicable with a passive sensor (e.g. reed switch)

1/12 - 2017

Display

Display layout in measuring mode single channel (ZOK-Z1/E1/Z3/E3/E4/E5)

ext ST± **3655.8** Part: 3583.6L AACT A	◄—— part- or total volume display input A ◄—— part- or total volume counter input A

unit associated to main display

ext ST± **0.000** Part: 3583.6L AACT A	◄—— volume flow display input A ◄—— part- or total volume counter input A

unit associated to main display

Display (continued)

Display layout in measuring mode for dual channel (ZOK-Z1/E1/Z3/E3/E4/E5)

supply type (ext/bat)

status output

ext | ST▲

0.0 → part volume display input A

0.0 → part volume display input B

Rate B: 0.00L/m → volume flow display inputs A and B (alternating)

AACT BACT ▼A B▼ ▯

unit associated to main display

over- and underrun display input B

over- and underrun display input A

status and type input B

status and type input A

---

supply type (ext/bat)

status switch outputs

status pulse output

status output

ext | SW1+ SW2+ PU± ST±

0.000 → volume flow display input A

0.000 → volume flow display input B

Part A: 0.0L → part- or total volume counter inputs A and B (alternating)

ANPN BNPN ▼A B▼ ▯

unit associated to main display

over- and underrun display input B

over- and underrun display input A

status and type input B

status and type input A

ZOK-Z2/E2 (Dosing unit)

supply type (ext)

status switch outputs

status output

ext | SW1− SW2− ST−

over- and underrun display input A →

A▼ 1000.0L → dosing volume display

Batch: 0 → batch counter

Rate A: 0.00L/m → volume flow display

AACT EIN RST STA

start dosing

reset dosing volume

set dosing volume

status and input type A

1/12 - 2017

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-	**Z1** = dual totaliser LCD **Z2** [2] = dosing unit LCD **Z3** = rate totaliser LCD, 4-20 mA, 4-20 mA HART® **E1** = as Z1 with ATEX/ IECEx approval **E2** [2] = as Z2 with ATEX/ IECEx approval **E3** = as Z3 with ATEX/ IECEx approval 4-20 mA, without pulse- and switching outputs **E4** [5] = as E3 with HART® **E5** [6] = as E3 with 4-20 mA and pulse- and switching outputs	**0** = universal mount (standard, round plastic without holder plates) **K** = universal mount (standard, round plastic with holder plates) **M** = universal mount (round plastic for retrofitting DON) **P** [1] = panel mount 96 x 96 **F** [1] = field housing	**M** [3] = 3 x M20 x 1.5 cable entry **2** [3] = 3 x ½" NPT cable entry **K** [9] = terminal on the back **N** [4] = 3 x M16 x 1.5 cable entry **P** [4] = 2 x PG13,5	**F** = pulse/ frequency input	**3** [2] = 5...28 V_{DC}, battery **0** [2] = 90...260 V_{AC} **6** [2] = 12...28 V_{DC},	**0** = without **R** [2] = 2 relays **G** [7] = 2 x opto-coupler **P** [8] = 3 x opto-coupler	**0** = without **Y** = special (please specify in clear text)

[1] Not for ZOK-E1, E2, E3, E4 and E5   [2] See table below   [3] Only for housing ZOK-xxK, ZOK-xxM   [4] Only for ZOK-ZxF   [5] In preparation
[6] Option E5 possible only with remote I.S.isolator   [7] Standard for ZOK-E2   [8] Standard for ZOK-E5   [9] For ZOK-ZxP

Overview of electrical options and corresponding housings

Model	Electronics	Housing	Supply voltage		Relay option	Opto-coupler
			Option	**Battery option**		
ZOK	Z1	K/0	3	standard	no	no
		M				
		P	6/0	no		
		F	3/0	yes (with voltage option 3)		
	Z2	K/0	6	no	standard	no
		M				
		P	6/0			
		F				
	Z3	K/0	3/6	yes (with option 3)	yes (with option 6)	no
		M				
		P	6/0	no	standard	
		F	3	standard	no	
			6/0	no	standard	
	E1/E3/E4 [1]	K/M/0	3	standard	no	no
	E2/E5 [1]	K/M/0	3	no		standard

[1] Without backlighting

Accessories

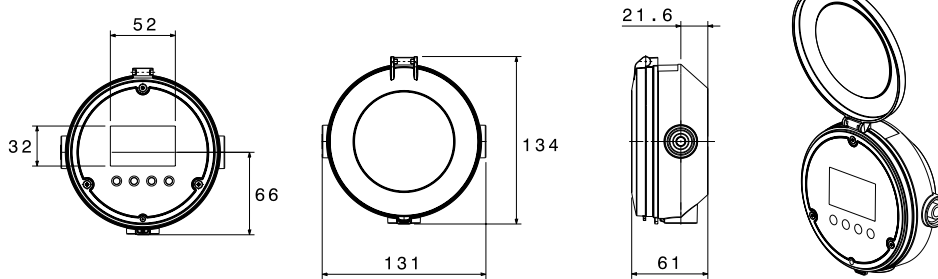| Description	Model
Stainless steel wall mounting kit	ERS-ZOK-023618
Stainless steel 2" pipe mounting kit	ERS-ZOK-003402
Cooling fin for high temperature flowmeter	ERS-ZOK-023619
Batterypack ATEX/IECEx, 3,6 V	ERS-BATEX036

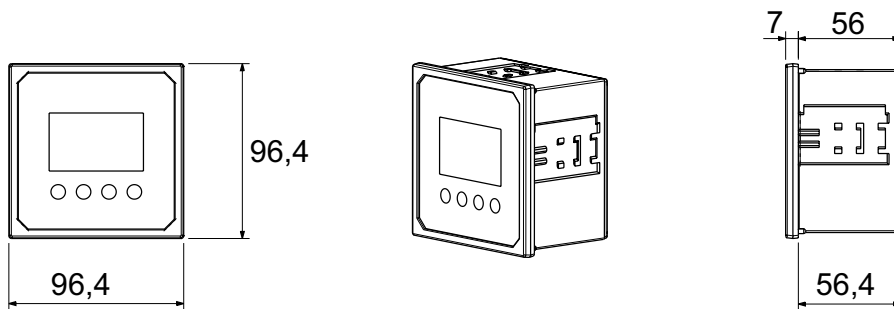ERS-BATEX036 is part of standard scope of delivery of ZOK-E1/E3/E4

1/12 - 2017

No responsibility taken for errors; subject to change without prior notice.

www.kobold.com

7

Dimensions [mm]

ZOK-ExK/-ZxK
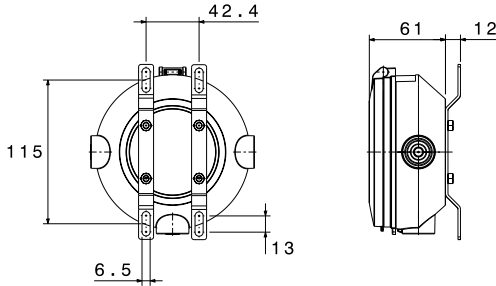
ZOK-ExM/-ZxM

ZOK-ZxP

ZOK-ZxF