



- Input: elapsed-hour meter
- Display: 7 positions, 8 positions
- Housing: black plastic
- Panel mounted
- Power supply:  
4.5-30 V<sub>DC</sub>; 115 V<sub>AC</sub> 60 Hz;  
230 V<sub>AC</sub> 50 Hz



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**Model:**  
ZBS



**Description**

The KOBOLD micro elapsed-hour meter employs an electronic partial switching system featuring a precise quartz-regulated pulse counter. During operation, the meter coil is activated for 32 ms every 36 s (= 0.01 h). This means that the max. power consumption is only required every 36 s. During the remaining, deactivated time the max. power consumption is only 2 mA. This means that this meter is ideally suited for use in battery backups and in electronic circuits. Switching times of < 36 s are not counted. High surge and impact resistance ensures reliable counting even under severe service conditions.

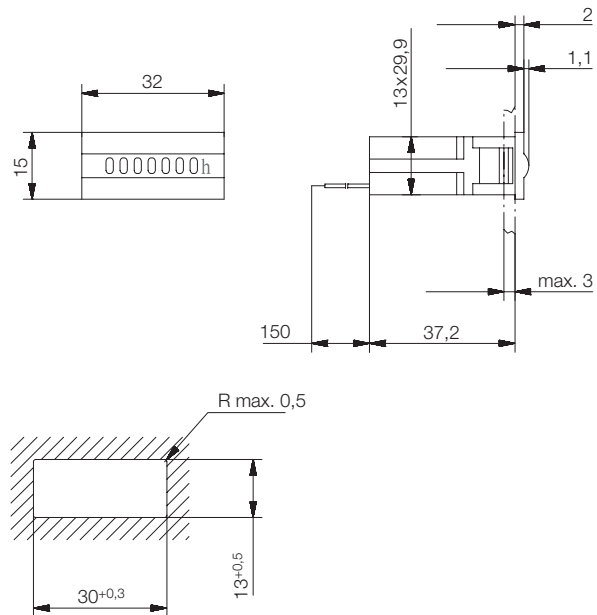
**Typical applications**

- Vehicle technology
- Electronics
- Compact systems
- Battery-operated control systems

**Technical details**

Maximum display: 99999.99 hrs  
 Digits: hours: white, decimal places: red, background: black  
 Height of digits: 1.35 x 2.8 mm, with magnifier 4 mm high  
 Ambient temperature: -10 to +60 °C  
 Mounting position: any  
 Housing: 32 x 15 mm, plastic  
 Panel cut-out size: 30 x 13 mm  
 Electrical connection: 150 mm flying leads (red +) (black -)  
 Power supply: 4.5-12.5 V<sub>DC</sub> or 18-26 V<sub>DC</sub>  
 Residual ripple: max. 5%  
 Max. power consumption: approx. 600 mW at 4.5-12.5 V<sub>DC</sub>  
 approx. 780 mW at 18-26 V<sub>DC</sub>  
 Pulse length of 32 ms every 36 s (max. 2 mA no-load supply current)  
 Weight: approx. 19 g

**Dimensions**



**Ordering details** (example: ZBS-1S 9)

Model	Description	Power supply
ZBS-1S	Micro hour meter Housing 32 x 15 mm	9 = 4.5 - 12.5 V <sub>DC</sub>
		3 = 18 - 26 V <sub>DC</sub>



**Description**

The KOBOLD model ZBS-2 is a 7 or 8 position elapsed-hour meter for AC and DC voltage, without a home position function. The AC version has a 7-position display and a fast-running roller with red dashes to indicate movement. It has a self-starting synchronous motor that operates on 50-60 Hz current. The DC version has an 8-position display; the 1/100 h display rotates continuously and increments by 1 number every 36 s. In this model, the display digits are moved by a quartz-crystal-controlled stepper motor. A meter housing with latch-type fastening and a front plate with side attachment holes are available as mounting systems.

The electrical connection is made with screw terminals or by removing the set screw and terminal and inserting a flat connector (0.8 x 6.3 mm).

**Technical details**

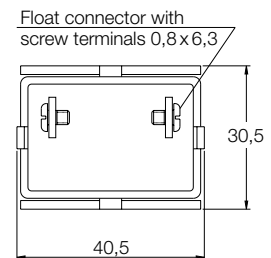
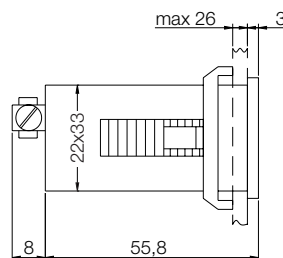
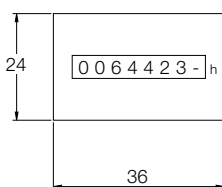
Maximum time display:	99 999.99 h for AC version 999 999.99 h for DC version
Digits:	Hours: white, decimal places: red, background: black
Digit size:	3.8 x 1.7 mm optical
Ambient temperature:	-15 to +50 °C
Mounting position:	any
Housing:	black plastic
Dimensions:	36 x 24 mm (ZBS-2S) 35.5 x 26 mm (ZBS-2F)
Panel cut-out size:	33 x 22 mm
Electrical connection:	flat connector 0.8 x 6.3 mm with screw terminals
Power supply:	10-30 V <sub>DC</sub> ; 100-130 V <sub>AC</sub> 60 Hz; 187-264 V <sub>AC</sub> 50 Hz
Max. power consumption:	Approx. 500 mW at 10-30 V <sub>DC</sub> Approx. 0,6 VA at 100-130 V <sub>AC</sub> Approx. 1.2 VA at 187-264 V <sub>AC</sub>
Test voltage:	2000 V <sub>AC</sub> , 50 Hz
Weight:	approx. 40 g
Protection type:	IP 52 at front

**Application examples**

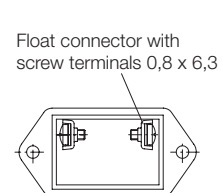
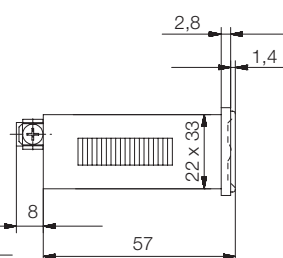
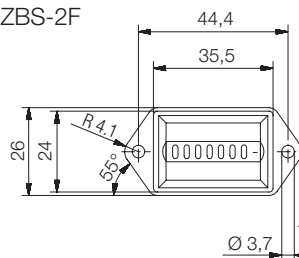
- Machine construction
- Plant engineering
- Electrical control systems
- Construction machinery

**Dimensions**

ZBS-2S



ZBS-2F



**Ordering details** (example: ZBS-2S 0)

Model	Description	Power supply
ZBS-2S	Mini Hour Meter Housing 36x24 mm Latch-type fastener	0 = 230 V <sub>AC</sub> /50 Hz 3 = 10-30 V <sub>DC</sub> 4 = 115 V <sub>AC</sub> /60 Hz
ZBS-2F	Mini Hour Meter Housing 36x26 mm Mounting holes	



**Description**

The KOBOLD model ZBS-3 is a 7 or 8 position elapsed-hour meter for AC and DC voltage, without a home position function. The AC version has a 7-position display and a fast-running roller with red dashes to indicate movement. It has a self-starting synchronous motor that operates on 50-60 Hz current. The DC version has an 8-position display; the 1/100 h display rotates continuously and increments by 1 number every 36 s. In this model, the display digits are moved by a quartz-crystal-controlled stepper motor.

The counter has a 48 x 24 mm standard housing with a latch-type fastening system in accordance with DIN 43700.

The electrical connection is made with screw terminals or by removing the set screw and terminal and inserting a flat connector (0.8 x 6.3 mm).

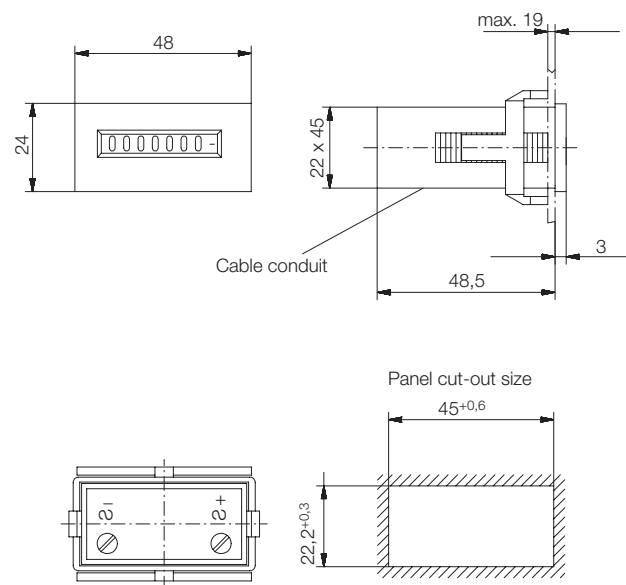
**Application examples**

- Machine construction
- Plant engineering
- Electrical control systems
- Construction machinery

**Technical details**

Maximum time display:	99 999.99 h for AC version 999 999.99 h for DC version
Digits:	Hours: white, decimal places: red, background: black
Digit size:	4 mm high
Ambient temperature:	-15 to +50 °C
Mounting position:	any
Housing:	black plastic
Dimensions:	48 x 24 x 52 mm
Panel cut-out size:	45 x 22 mm
Electrical connection:	flat connector 0.8 x 6.3 mm with screw terminals
Power supply:	10-30 V <sub>DC</sub> ; 100-130 V <sub>AC</sub> 60 Hz; 187-264 V <sub>AC</sub> 50 Hz
Max. power consumption:	Approx. 500 mW at 10-30 V <sub>DC</sub> Approx. 0.6 VA at 100-130 V <sub>AC</sub> Approx. 1.2 VA at 187-264 V <sub>AC</sub>
Test voltage:	2000 V <sub>AC</sub> , 50 Hz
Weight:	approx. 44 g
Protection type:	IP 65 at front

**Dimensions**



**Ordering details** (example: ZBS-3S 0)

Model	Description	Power supply
ZBS-3S	Small Hour Meter Housing 48x24 mm Latch-type fastener	0 = 230 V <sub>AC</sub> / 50 Hz 3 = 10-30 V <sub>DC</sub> 4 = 115 V <sub>AC</sub> / 60 Hz