

13. Electronic Operating Hours Counter (dia. 52 mm)

(only for VDO cockpit international)

Contents	Page
13.1 General informations	13 - 2
13.2 Technical data	13 - 4
13.3 Wiring diagram	13 - 6
13.4 Instruments survey	13 - 7

Installation instructions (old generation)

999-161-023: VDO cockpit international

See file 'Installation Instructions (MA)'.

13. Electronic Operating Hours Counter (dia. 52 mm)

(only for VDO cockpit international)

13.1 General Informations

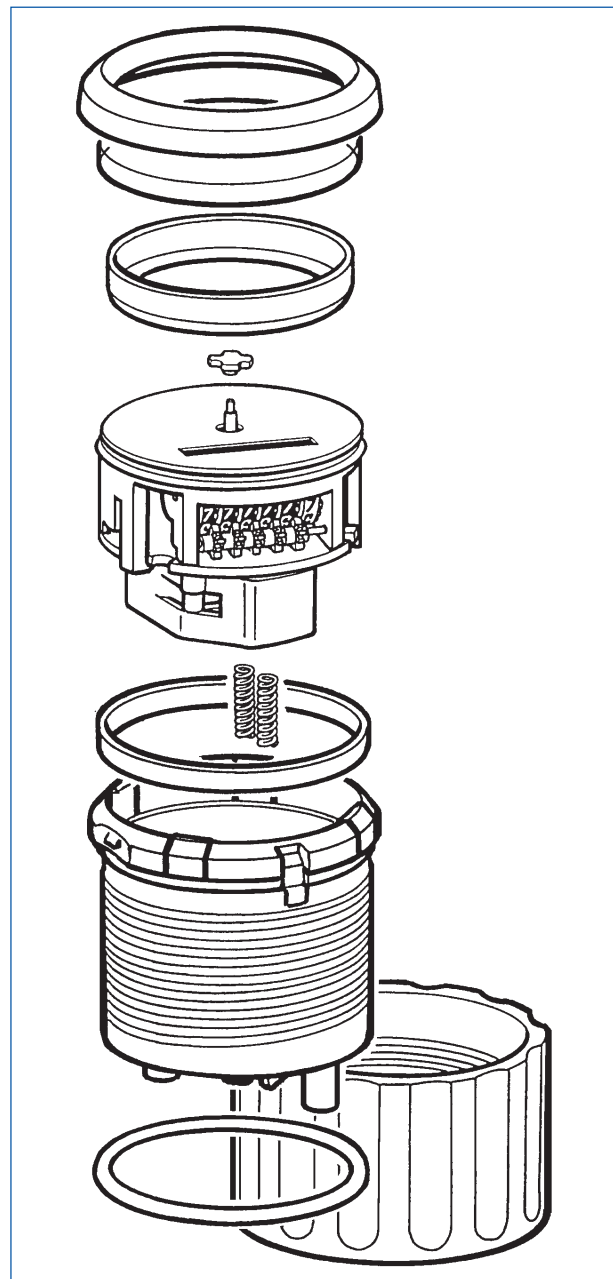
The electronic operating hours counter has been designed for land-bound vehicles or stationary systems only (with the exception of motorcycles).

The instrument displays the operating hours by number wheels, up to a maximum of 99999.9 hours.

A red indication wheel in the dial center or a red indication wheel with pointer indicates that the operating hours counter is counting by turning in clockwise direction.

The counter indication cannot be changed.

New generation (exploded assembly drawing)



13. Electronic Operating Hours Counter (dia. 52 mm)

(only for VDO cockpit international)

13.1 General Informations

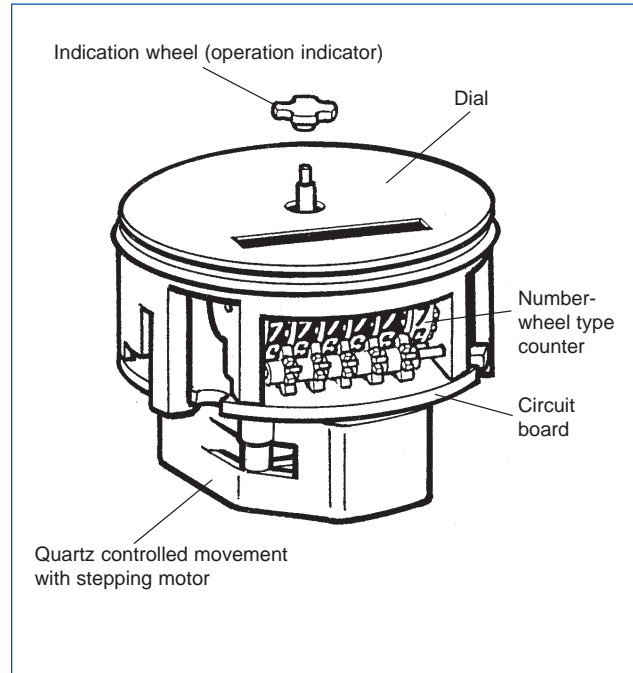
Designation of function

Movement: quartz controlled movement with number-wheel type counter

The electronic operating hours counter is driven by a frequency-dependent stepping motor. The pulses needed for motor control are generated by a quartz-stabilized oscillator circuit, and processed by electronic circuitry. The oscillator is connected to a quartz in a feed-back loop. The alternating voltage of the oscillator causes mechanical oscillation of the quartz, which generates a frequency to control the oscillation circuit. The oscillating frequency is necessary for the pulsing of the stepping motor.

The stepping motor rotation is transmitted to the number-wheel type counter and the operation indicator by a mechanical system.

The counter sums and displays the operating hours, the operation indicator displays the operation of the instrument in one-second steps. A indication wheel in the dial center indicates that the operating hours counter is counting by turning in clockwise direction.



13. Electronic Operating Hours Counter (dia. 52 mm)

(only for VDO cockpit international)

13.2 Technical Data

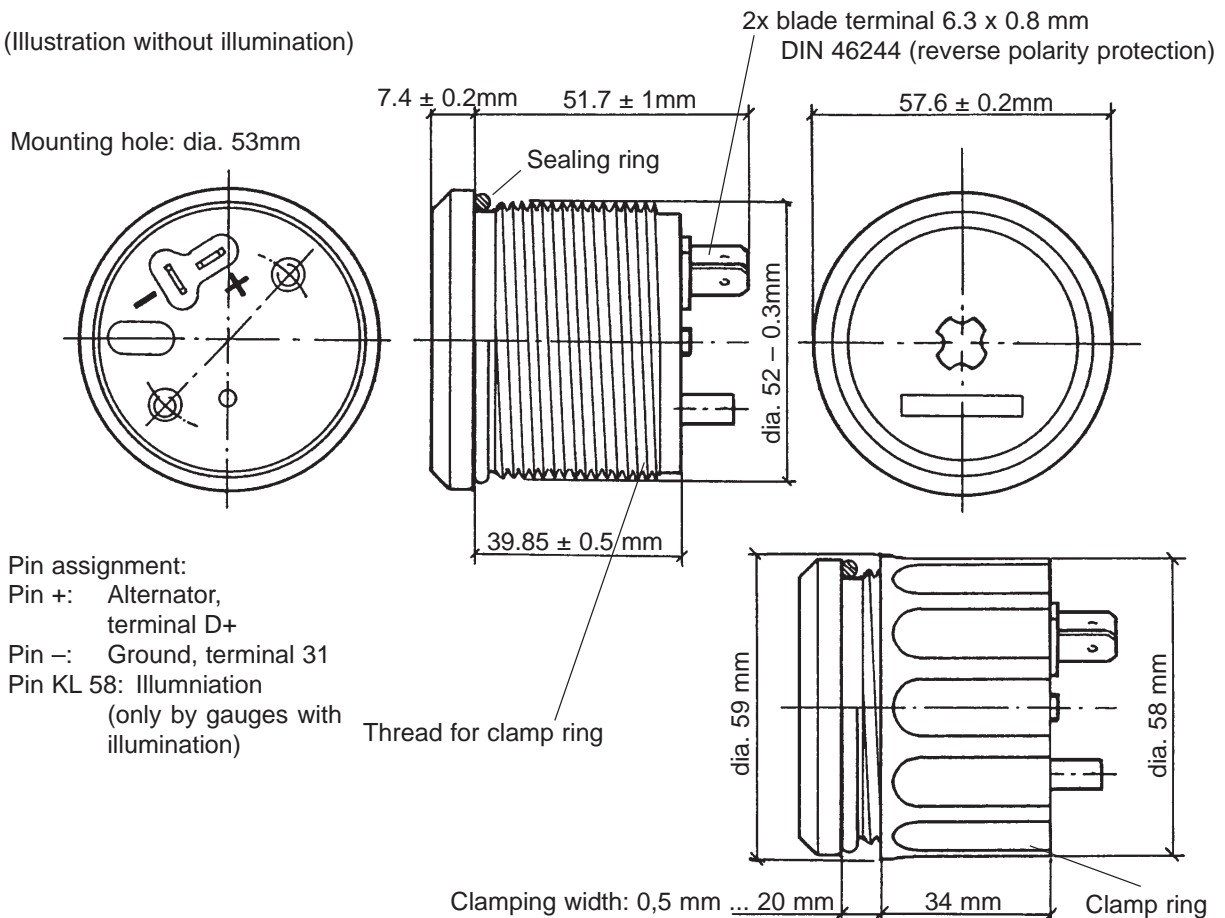
New generation

VDO cockpit international

Operating voltage:	9V to 16V or 18V to 28V
Movement:	quartz controlled movement with number-wheel type counter
Current consumption at room temperature:	at 13.5 V: < 10 mA at 26 V: < 23 mA
Operating temperature:	– 40°C to + 85°C
Storage temperature:	– 40°C to + 90°C
Protection:	IP65 DIN 40 050 front side IP42 DIN 40 050 rear side (or IP65)
CE approved, KBA registration	
Vibration resistance (according to IEC 68 part 2-6):	2g, 25 Hz to 500 Hz, 24h x, y, z
Physical shock (according IEC 68 part 2-27):	100 g, 6 ms, 2 mal x, y, z
Operating hours counting:	99999,9 h max. (nonresettable)
Indication accuracy:	
at room temperature:	± 5s per day
–40°C to +85°C:	max. –10s per day
Illuminated or no illumination	



(Illustration without illumination)

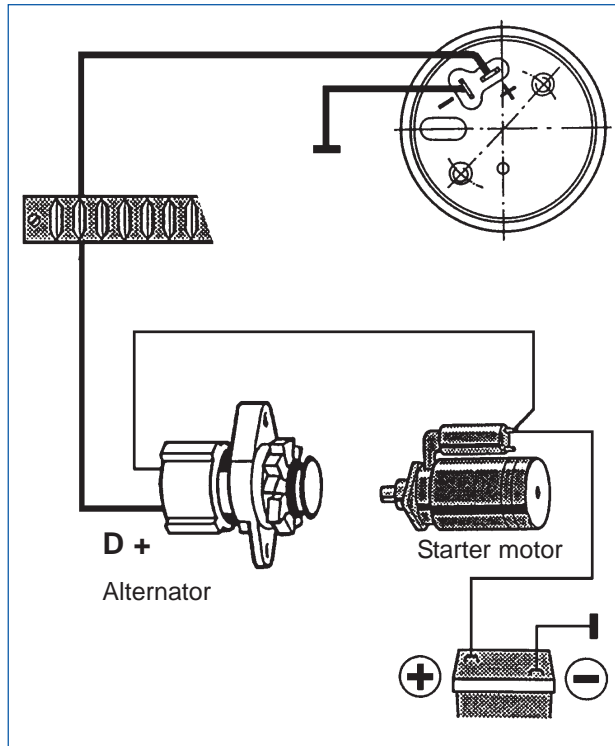


13. Electronic Operating Hours Counter (dia. 52 mm)

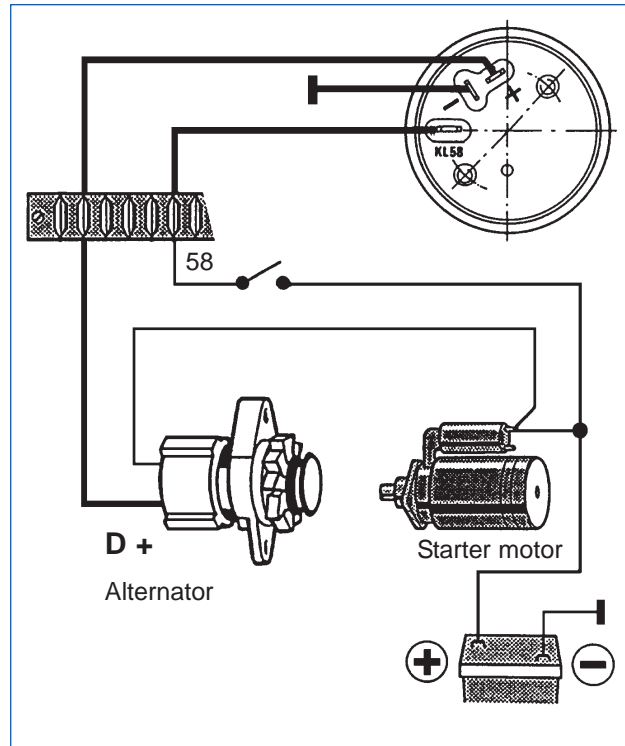
(only for VDO cockpit international)

13.3 Wiring Diagram

No illumination



With illumination








13. Electronic Operating Hours Counter (dia. 52 mm)

(only for VDO cockpit international)

13.4 Instruments Survey

VDO cockpit international

Measuring Range	Dialgraphics	Version	Order No.
99999,9 hours	 HOURS VDO	12V no illumination	331-810-012-001B 331-810-012-001G
99999,9 hours	 HOURS VDO Min. scale	12V Minutes hand (wt) / no illumination	331-810-012-002B 331-810-012-002G
99999,9 hours	 HOURS VDO	12V / no illumination Bezel mirror polish chrom plated	331-810-012-003B
99999,9 hours	 HOURS VDO	12V with illumination (white)	331-810-012-004B
99999,9 hours	 HOURS VDO	24V illumination possibility (white)	331-810-012-007B 331-810-012-007G