



## DISPLAYS: Instrument Combination 100 mm

# MOTOMETER

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This instrument combination with its installation diameter of 100 mm is a functional unit which allows for the monitoring of aggregates and their simultaneous active control. This version was developed without pointers and front glasses in order to achieve an attractive and functional design.

The multi-functional displaying instrument was developed in the classic shape of round instruments, because their distribution rate is very high, and because they still have an unequalled reputation with vehicle manufacturers and users.

The instrument combination was developed for the voltage range from 8 to 34 Volt, which is appropriate for the application in construction machines, agricultural vehicles, light industrial vehicles, special vehicles, municipals vehicles, stationary engines, stationary and mobile processing machines.

The instrument allows for the display of up to 12 warning lights which can be specified according to customer requirements. The instrument combination is controlled by a microprocessor and is equipped with two switching outputs whose parameters can be specified according to customer requirements.

Additionally, the display of up to two aggregate conditions in a 7-segment LED or in a 10-digit bargraph is possible.

We may offer you customer specific multifunctional displays besides our listed standard products.

### Components

#### Warning Lights

Up to 12 warning lights can be integrated in this instrument. This version includes ultra-bright and extremely flat SMD-equipped LEDs, which have a service life of more than 100,000 hours.

The colours depend on the applied LED. Theoretically, any desired colour is possible. Depending on the demands of the customers, between 2 and 4 LEDs are positioned with every warning light which allow for a flexible response to the customers' demands on brightness.

A special printing process allows for the so-called DEAD-FRONT effect. In this version, the reverse side of the cover foil is printed in black. The colour of the warning field will be visible only when the LED lights, which provides a distinct appearance in the instrument design. Optionally, this version is available with cover foils printed in different colours.

The warning lights can be programmed for static and flashing operation.

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### LED Display

The 7-segment LED allows for the visualization of a distance counter or an operating hours counter. Optionally, the digital display of additional information such as temperature, pressure or tank content is possible.

An integrated programming interface allows for the determination of parameters for individual characteristics. 6 LED modules are included, whose brightness can be dimmed.

The displaying instrument is available with operating hours counting option. The accuracy is +/- 5 seconds per day at room temperature, or +5/-10 seconds per day within the whole temperature range from -40 °C to +85 °C. Due to the integration of an EEPROM, the stored operating hours will be saved even when the battery is disconnected.

When the displaying instrument is applied as travel distance counter, a change of programming to (impulses/km) is carried out via the integrated programming interface.

### Bargraph

A 10-digit bargraph can be applied for the displaying of static information such as tank content, pressure or temperature in a tendency display. The determination of parameters for characteristics is carried out via the integrated programming interface.

The following signal sources can be applied as input signals for the bargraph display: 4 to 20 mA or 0 to 20 mA, or 0 Ω to 300 Ω.

### Check Control

Upon start-up, the instrument carries out an autocheck. All segments of the 7-segment display are activated, all LEDs of the warning lights are checked, and the buzzer is activated.

The duration of the autocheck can be selected optionally, and can be specified according to customer requirements.

### Day/Night Shifting

The dimming of the brightness of the 7-segment display and the warning lights is carried out via terminal 58.

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### Mechanical System

- Instrument with 100 mm installation diameter and 40 mm installation depth
- 12 warning lights
- Digital display
- 2 switching outputs
- Plastic housing
- Front foil of scratch-resistant polyester resin, reverse side printed
- Front foil extremely resistant to weather and fracture
- Protection type: Front IP67  
Rear IP54
- Central plug: 20-pin TYCO plug
- Programming plug: 4-pin, optionally with sealing
- Installation: Front
- Mounting: Bracket: MOTOMETER version

### Switching Output

The instrument is equipped with two switching outputs with an operating current of 1 A. The inputs to the switching outputs can be linked logically AND or OR. The software allows for the programming with switch-on or release lag. The time constant for the timer can be between 0 seconds and 7 minutes.

### High-Ohmic Signal Input

The input signal can be up to 10 k and is amplified in the device, e.g. SEPA filter for the hydrometry in the fuel tank.

### Electrical Specifications

- DIN 40839
- EN 13309
- DIN EN-500-1
- DIN EN 500-4
- DIN EN 60204-1
- Supply voltage range ( $U_b$ ): 8 V to 32 V
- Terminal connection reliability of the voltage supply connections
- Inputs short-circuit resistant against  $\pm U_b$  and against other inputs (one-error safety) of electrical connections, resistant to excessive voltage
- CE conformity

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### Environmental Specifications

- Operating temperature: -25 to +85 °C
- Storage temperature: -40 to +90 °C
- Shock resistance: Dropping (in packaging) from a height of 1 m
- Vibration resistance: 5 g at 30 Hz to 50 Hz (permanent resistance) in all 3 directions in space
- Resistance to climate conditions: DIN 50016
- Resistance to salt water mist and salt solution spraying: acc. to DIN EN 668-2-52;
- Resistance to tropic conditions: DIN EN 60068-2-30
- Resistance to bedewing
- Resistance to lime and cement dust
- Resistance of the organic materials to mould fungus
- Resistant to oils, hydraulic oils, grease, fuels, as well as to all standard biological oils and biological fuels
- Permanent resistance to deformation, position effects, and aging against high UV radiation

All data subject to technical changes.

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