

14. Temperature Measuring System For Exterior Temperature (dia. 52 mm)

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Installation instructions

999-165-007: VDO cockpit vision
999-165-016: VDO cockpit international

See file 'Installation Instructions (MA)'.

14. Temperature Measuring System For Exterior Temperature (dia. 52 mm)

14.1 General Informations

The electronic temperature measuring system for exterior temperature has been designed for land-bound vehicles only (with the exception of motorcycles).

The instrument has an analog exterior temperature display in °C (– 25°C to + 40°C).

The sensor is a temperature sensor adapted to the measuring range of the indicating instrument (type: negative earth) with mounting and connection parts.

The lamp socket is pushed in.

To replace the lamp bulb simple pull the lamp holder out.

Designation of function

Movement: system Ke (to 320°)

(Turning magnet ratio measuring movement, pointer deflection up to 320°)

The ambient temperature affects a resistor-type sensor with negative temperature coefficient fixed outside of the vehicle, or in the passenger compartment. The temperature-dependent sensor resistance determines the measuring current of the electronic thermometer. Depending on the application, this will be a turning magnet ratio measuring movement with pointer deflection up to 320° (designation of function see tachometer, dia. 52mm), the pointer displaying a temperature value on the graduated dial.

In the important range between +10°C and –10°C the graduation has been spread by electronic means to obtain a higher resolution.

14. Temperature Measuring System For Exterior Temperature (dia. 52 mm)

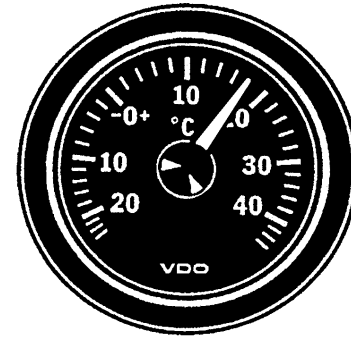
14.2 Technical Data

Temperature gauge, electronic

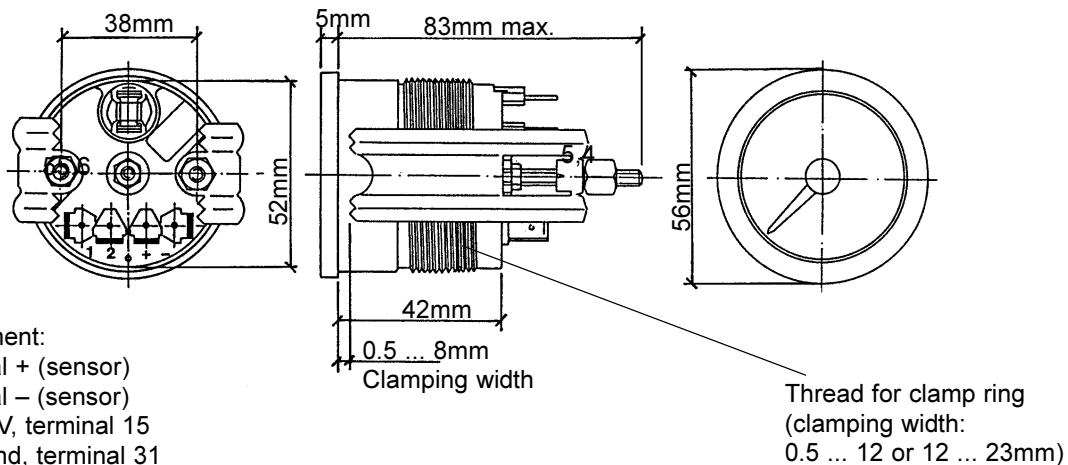
(Instrument separate not available. Only as set.)

Operating voltage:	10.8 ... 16 V
Movement:	System Ke (→ 320°C)
Current consumption:	< 100 mA (without illumination)
Operating temperature:	- 20°C ... + 70°C
Storage temperature:	- 30°C ... + 85°C
Illumination:	1 light bulb, 12 V, 1.2 W 2 colour caps (green and red)
Protection:	IP64 DIN 40050 from the front
Connections:	reverse-polarity protection
Vibration resistance:	max. 1g eff., 25 ... 500 Hz, duration 8 h, f. 1 octave/min.
Nominal position:	NL 0 to NL 90, DIN 16257

VDO cockpit vision
dia. 52 mm Backlight



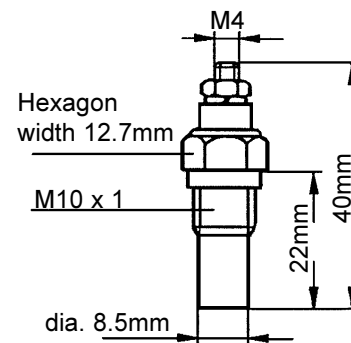
Mounting hole: dia. 53mm



Temperature sensor (thermistor)

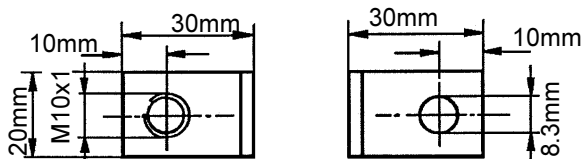
Negative earth

Rated voltage:	6 ... 24 V
Operating temperature:	- 25 °C ... + 120 °C
Tightening torque:	10 Nm (M10 x 1) 1 Nm (M4)



Bracket (brass)

matt nickel-plated



Supplied loose:
wire, connecting hardware and protective cap

14. Temperature Measuring System For Exterior Temperature (dia. 52 mm)

14.2 Technical Data

Temperature gauge, electronic

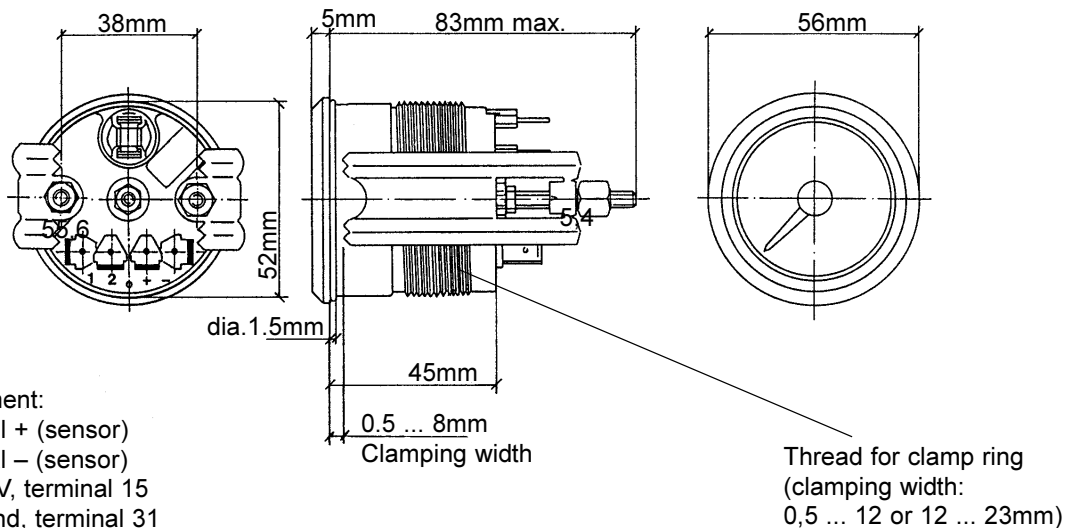
(Instrument separate not available. Only as set.)

Operating voltage:	10.8 ... 16 V
Movement:	System Ke (→ 320°C)
Current consumption:	< 100 mA (without illumination)
Operating temperature:	- 20°C ... + 70°C
Storage temperature:	- 30°C ... + 85°C
Illumination:	1 light bulb 12 V, 2 W
Protection:	IP64 DIN 40050 from the front
Connections:	reverse-polarity protection
Vibration resistance:	max. 1g eff., 25 ... 500 Hz, duration 8 h, f. 1 octave/min.
Nominal position:	NL 0 to NL 90, DIN 16257

VDO cockpit international
dia. 52 mm Floodlight



Mounting hole: dia. 53mm



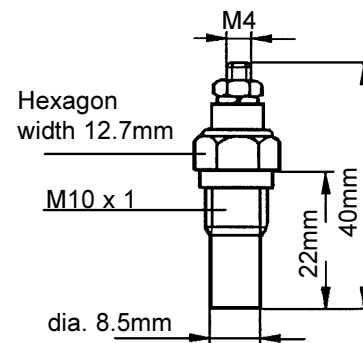
Pin assignment:

- Pin 1: Signal + (sensor)
- Pin 2: Signal - (sensor)
- Pin +: + 12 V, terminal 15
- Pin -: Ground, terminal 31

Temperature sensor (thermistor)

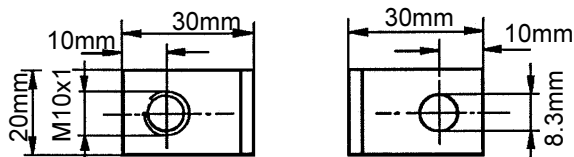
Negative earth

- Rated voltage: 6 - 24 V
- Operating temperature: - 25 °C ... + 120 °C
- Storage temperature: - 30 °C ... + 120 °C
- Tightening torque: 10 Nm (M10 x 1)
1 Nm (M4)



Bracket (brass)

matt nickel-plated

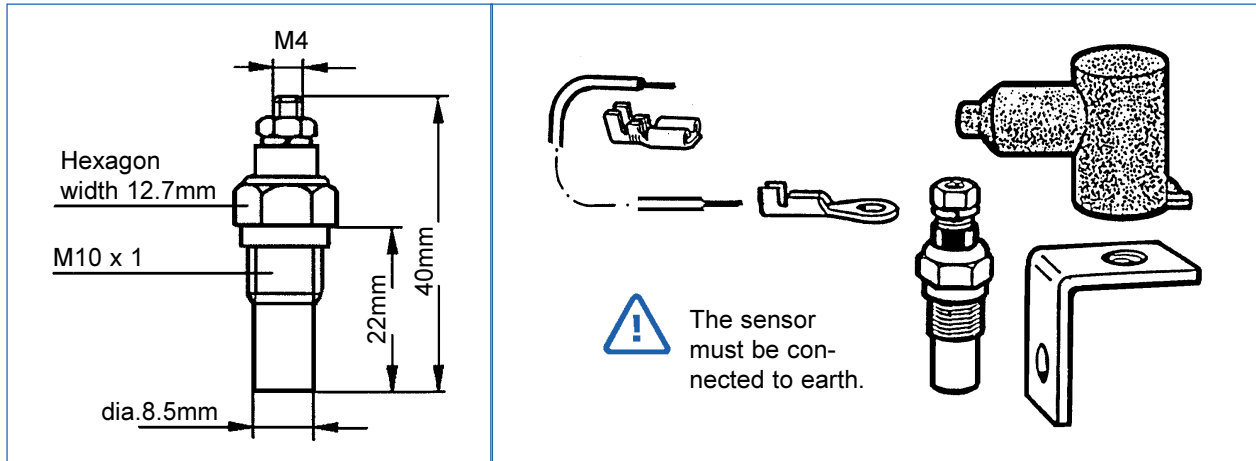


Supplied loose:
wire, connecting hardware and protective cap

14. Temperature Measuring System For Exterior Temperature (dia. 52 mm)

14.3 Temperature Sensor

The temperature sensor needed to operate the electronic exterior temperature indicator is supplied with protecting cap, support bracket and connection parts .



Temperature sensor, negative earth (part No. 323-801-008-002D)

Rated voltage:	6 V ... 24 V
Version:	Thermistor
Operating temperature:	- 25°C ... + 120°C short periods only for 10 minutes: +150°C max.
Tightening torque:	10 Nm (M10x1), 1 Nm (M4)
Operational value:	0°C = 1893 Ω ± 102 Ω

Location of sensor installation:

Mount the sensor on the passenger car front, behind the bumper or the body; on commercial vehicles install in the front area, with the body protecting against the wind, using the enclosed mounting bracket.

The sensor can be mounted in any direction. Select the location to avoid radiated heat (e. g. radiator, engine, exhaust system) which could lead to wrong indications.

14. Temperature Measuring System For Exterior Temperature (dia. 52 mm)

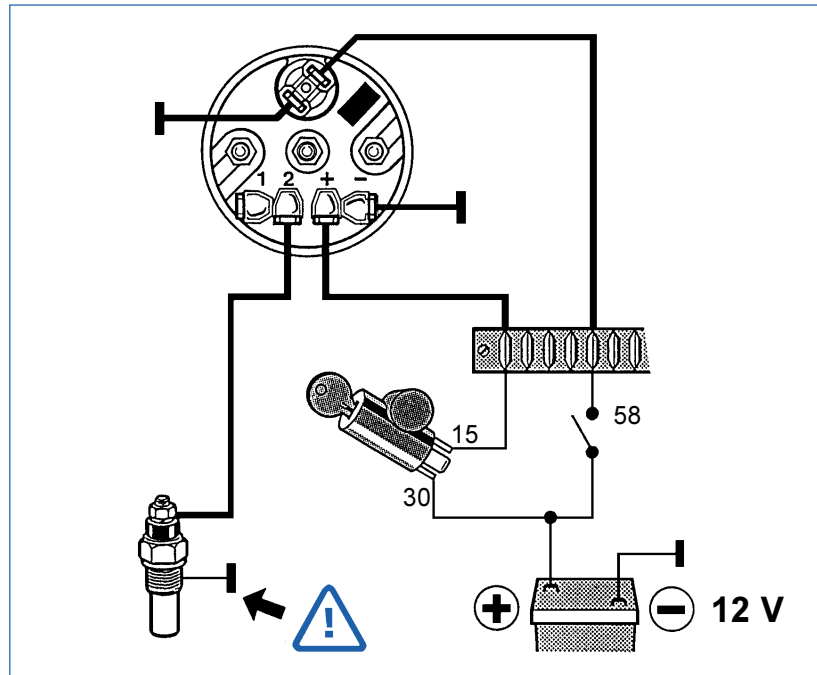
14.4 Wiring Diagram

Connect the ground (pin -) of the indicating instrument to the ground point junction of the vehicle. A ground connection passing through another consumer (such as a cigarette lighter, a different indicating instrument, etc.) will cause wrong indications. Do not connect the instrument lighting ground to the indicating instrument ground.

Temperature sensor

negative earth

(part No.: 323-801-008-002D)
included



14. Temperature Measuring System For Exterior Temperature (dia. 52 mm)

14.5 Dropping Resistor For 24 V

The electronic exterior temperature indicating instrument (rated voltage 12 V) can also be used with a rated voltage of 24 V if an external dropping resistor (option) is installed in the plus wire (terminal 15). In this case the operating voltage can be 21 V to 32 V.



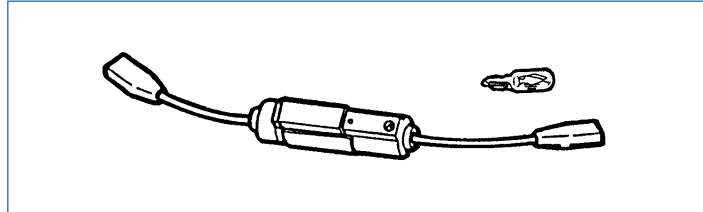
Replace 12 V light bulb by a 24 V light bulb..

VDO cockpit vision:

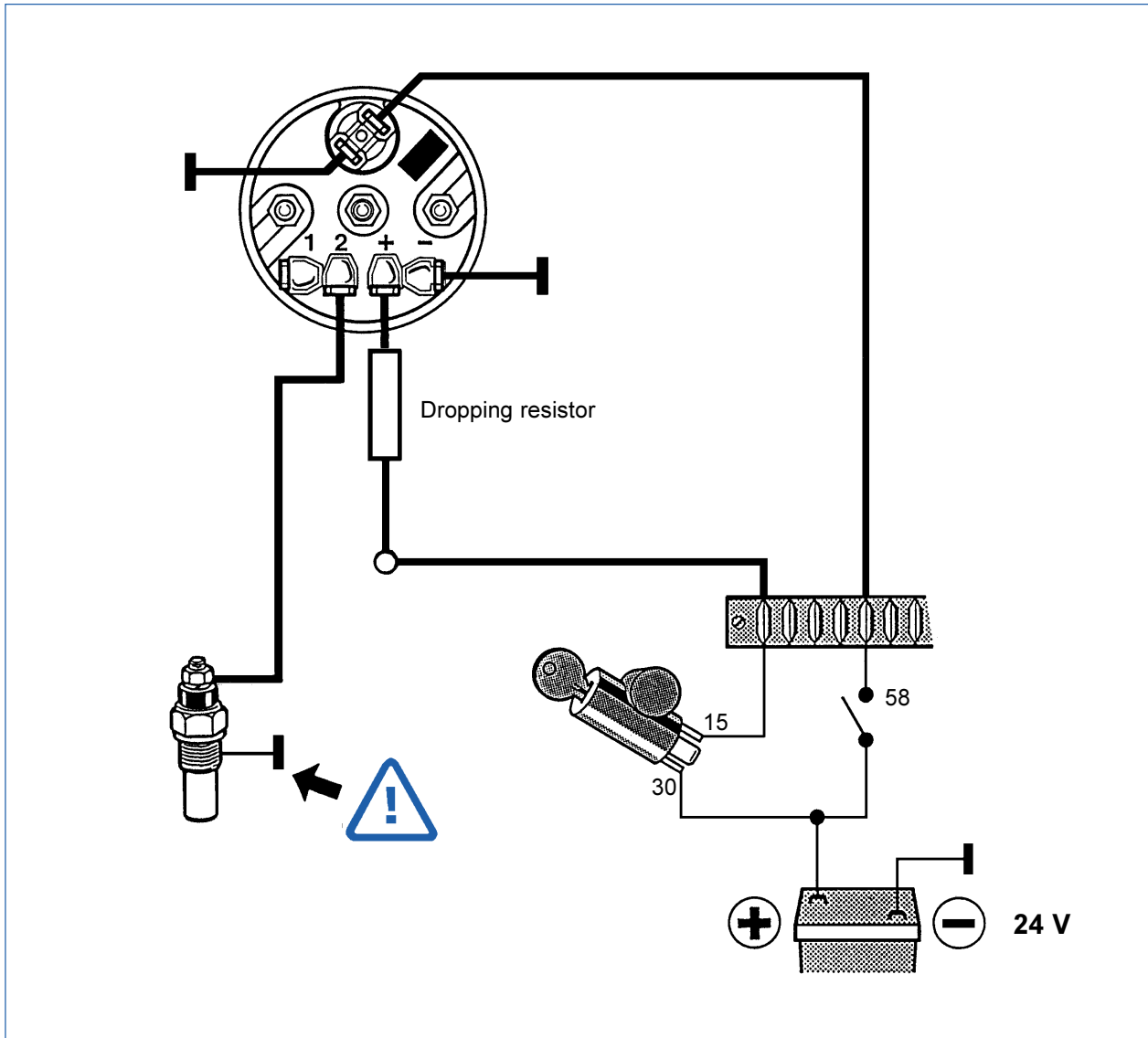
Dropping resistor with a 24 V 1.2 W light bulb.
Part No.: 800-005-011G

VDO cockpit international:

Dropping resistor with a 24 V 2 W light bulb.
Part No.: 800-005-027G



Wiring diagram



14. Temperature Measuring System For Exterior Temperature (dia. 52 mm)

14.6 Testing Instructions

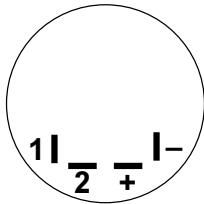
Indicating instrument

Test accessories:

- 1x power supply
- 1x test cable No. 3
- 1x measuring cable
- 1x resistor decade
- 1x ammeter

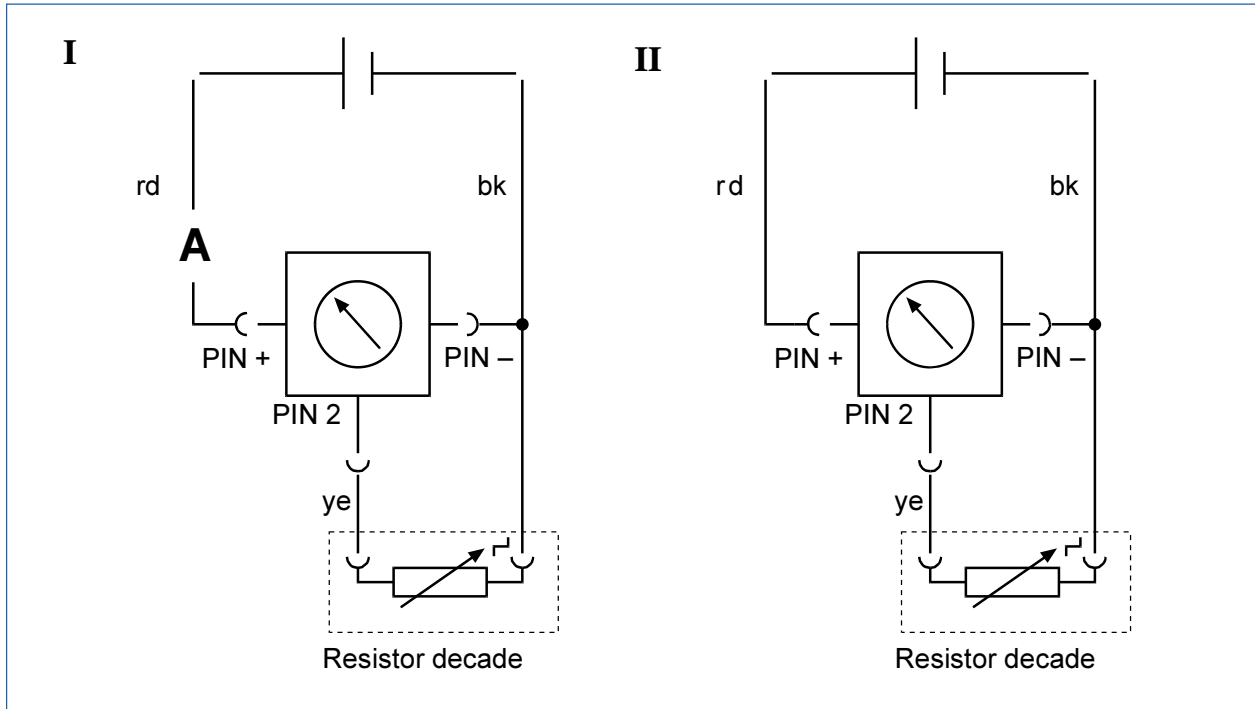
} contained in test cables kit
} X12-019-101-001

Pin allocation:



PIN + + 12V
PIN - Ground
PIN 2 Sensor signal input

Test circuit diagram:



Test method description:

Basic settings: 12 V instruments \Rightarrow 14 V

*Measuring of the current consumption only with connected decade resistor box!
Start the pointer position test with the lowest resistance value!*


14. Temperature Measuring System For Exterior Temperature (dia. 52 mm)

14.6 Testing Instructions

Indicating instrument

Measurement of current consumption

Connect instrument with test cable No. 3 as shown in test circuit diagram I.

Range of values: 12 V instrument  I = 70 ± 20 mA

Test of the movement

Connect the instrument according to the test circuit diagram II, using test cable 3.

The indication can be tested with the resistor decade 'sensor simulator'.

The following table shows the resistance values and the permissible indication tolerances in degrees Celcius:

Indication (°C)	-20	-10	0	10	20	30	40
Resistance (Ω)	5842	3271	1901	1148	715	460	303
Tolerance (°C)	±4	±4	±3	±2	±2	±2	±3

14. Temperature Measuring System For Exterior Temperature (dia. 52 mm)

14.7 Systems Survey

VDO cockpit vision (Backlight) dia. 52 mm

Part No. 397-015-...

Dial		Special feature	Part No.
Range	Imprint		
- 25°C ... + 40 °C	°C	12 V	001K

VDO cockpit international (Floodlight) dia. 52 mm

Part No. 397-035-...

Dial		Special feature	Part No.
Range	Imprint		
- 25°C ... + 40 °C	°C	12 V	001C ● 001G

● Phase-out