Operator Manual

Heat Meter Minocal® Combi

Coaxial measruing capsule heat meter
Qn 2,5 / 1,5 / 0,6 m³/h

General Instructions

You purchased a Minocal® Combi which is one of the most up-to-date and modern heat meters on the market at the moment.

A variety of auxiliary functions and menus will help you to learn more about your energy demand and consumption habits. By and by you will save costs through the possiblity of self-control of your consumption habits. Memorable symbols in the display make this very much easy. An easy and not to complex user interface also contributes to this (refer to display overview). The handling is effected by only one colored pushbutton. The meter is equipped with a longlife battery which can be used for the operation during one calibration period as well as one year more.

Please forward this manual to the end customer!

Remark: For calibrated devices the calibration refers to the purely function only, all other displays are additional helpful displays.

Calibration

The seal resp. the label with the year of the first calibration are fixed on the front side of the heat meter. The calibration validity in Germany is 5 years. The guarantee as well as calibration validity expire whith unauthorized opening of the meter.

Interference voltages

Your heat meter is constructed in a way that it surely keeps to the national and international requirements of interference resistance.
Fluorescent tubes, switching units or electric loads as engines or pumps should not be installed directly near to the meter to avoid disfunction by further interferences. Do not lay cables outgoing from the meter parallel to mains-operated cables (230V) (at intervals of at least 0,2 m).

Impulse outputs (optional)

Device type is printed on the sidways type plate: „pulse“

Impulses are emitted for heat energy as well as for volume at the devices with impulse outputs.

Output 1 = energy output, definitely programmed to 1 kWh/Imp.
Output 2 = volume output, definitely programmed to 100 l/Imp.

Devices with impulse output are additionally equipped with a firmly fixed cable. The external circuit has to be done by oneself.
Find more information on the cable label or on the sideways type plate.

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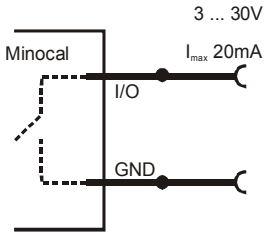
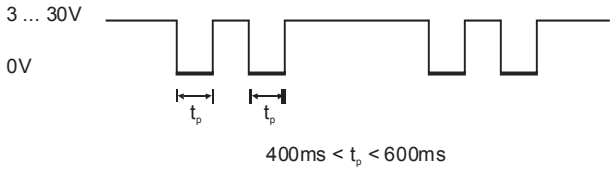
Color	Description	Output
white	GND	mass
green	I/O1	energy
brown	I/O2	volume
yellow	NC	--
pink	M-Bus1	M-Bus
grey	M-Bus2	M-Bus

Data impulse output	
load	max. 30 VDC / 20 mA
switching outputs	Open Drain, n-canal FET
cable	D= 4,9 mm, 6 core
cable length	1,5 m (standard)



The pulse width of the output signal is between 400ms and 600ms.



M-Bus-output (optional)

Device type is printed on the sidways type plate: „m-bus“

- Baud rate 9600/2400 switchable (optic interface 2400 Baud)
- According to standard EN 1434
- For the connection of the cable cores refer to cable assignment for “impulse outputs”. Any order of the connection of the cores is possible and the order is commutable.

Status display

The status messages show the working condition of the meter in plain way (refer to the chart below).

- **The status messages of the below chart are only shown in the main menu (energy)!**
- **For all other cases if the warning triangle represents a status message, check in advance if the problem is permanently or only occasionally.**

If the symbol is shown permanently contact a service station!

Some displays can result from the facility and do not have to indicate a defective meter. With correct operation of the faciliy the warning display will disappear after some time.

Symbol	Status	Display	Event / reaction
	Flow given		Facility in operation
	Indication of a potential error	permanently	If the warning triangel is shown permanently, contact service station
	Data transfer on the interface	only on during data transfer	
.und..	Emergency operation!	permanently	Energy is still shown and calculated correctly. All other displays are blocked and the pushbutton does not work anymore. Contact service station

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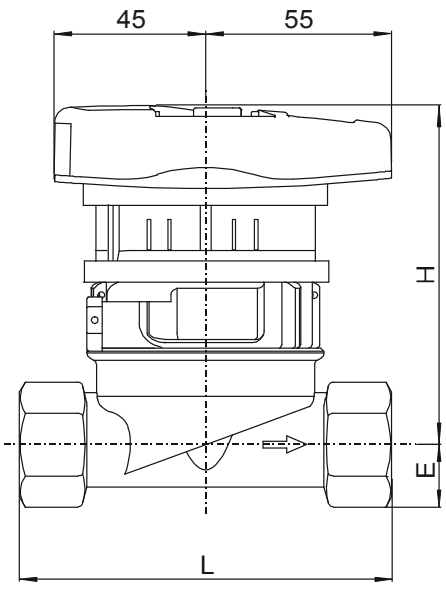
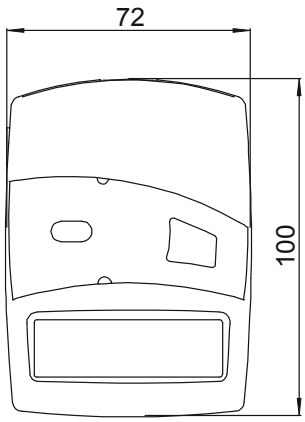
Technical data

Type		Minocal measuring capsule		
Temperature range processing unit	°C	1 ...130		
Temperature range flow metering unit	°C	10 ... 90		
Temperature difference range	kelvin	3 ...100		
Sensor type		Pt 500		
Temperature range sensor	°C	0 ... 130 (silicone)		
Measurements sensor	mm	5,0 (cable 1,5 m)		
Nominal flow rate	Qn m³/h	0,6	1,5	2,5
Nominal diameter	DN mm	15	15	20
Maximal flow rate	Qmax m³/h	1,2	3,0	5,0
Transition flow rate Qt (class A)	l/h	60	150	250
Minimal flow rate Qmin (class A)	l/h	24	60	100
Nominal pressure	bar	16		
Pressure loss at Qn	bar	≤ 0,25		
Typical starting flow value				
horizontal	ca. l/h	3	5	7
vertical	ca. l/h	4	7	10
LC-Display		8 ½ digits		
Battery	V	3,0 (lithium)		
Life period battery	years	≥ 6		
Protection class		IP 54		
Ambient temperature	°C	0 ...55		
Weight measuring capsule	g	approx. 680		

Measurements

Measurements			
Height :	H E max	mm mm	104 21
Width processing unit		mm	72
Lenght processing unitk		mm	100
Installation length EAS	L	mm	110 (130)





AD 22-01/2006 SAP108806

Subject to technical changes

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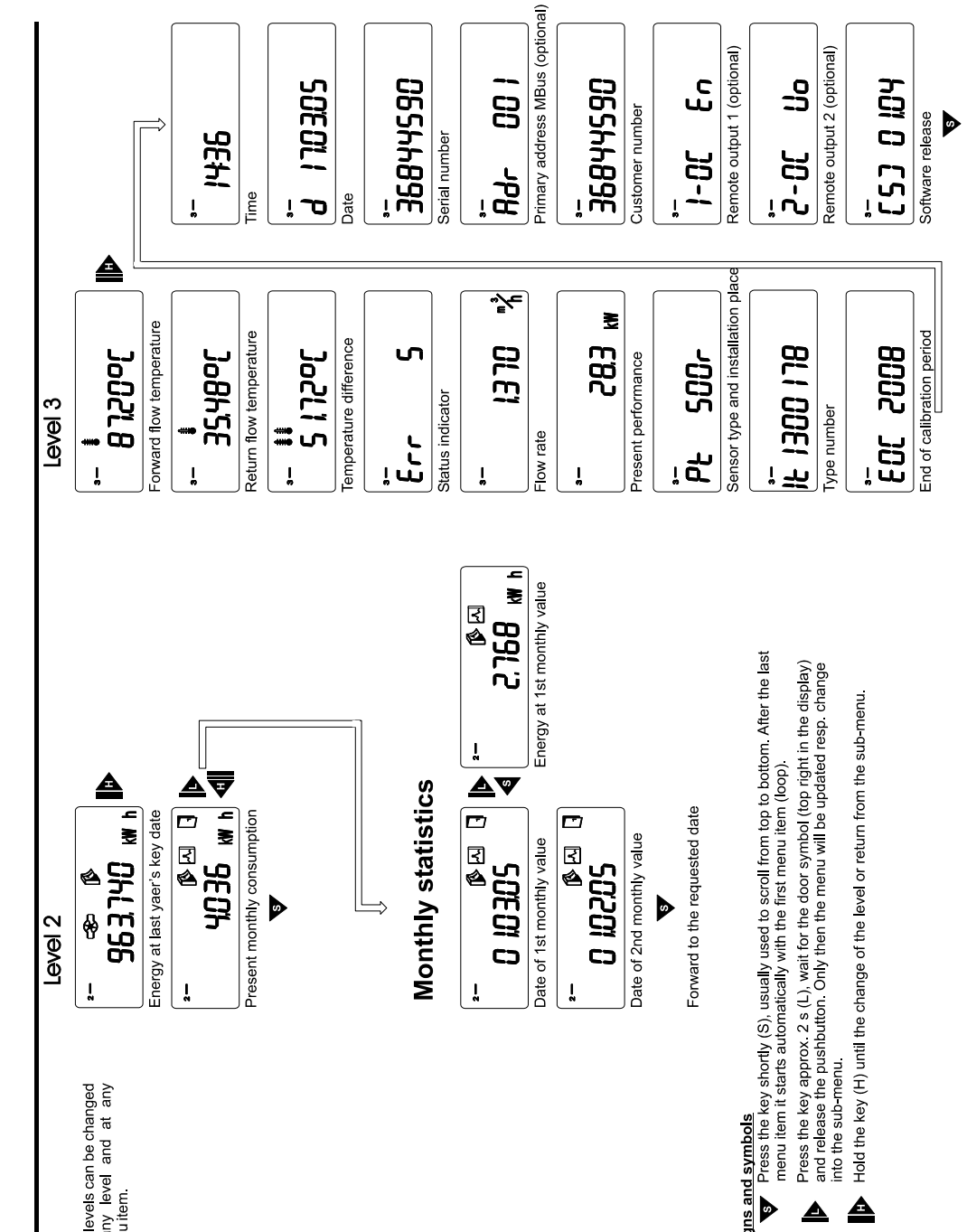

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