

MULTICAL® Compact heat meter

Static ultrasonic energy meter

Robust design and long lifetime

Large dynamic range

**Type approval in accordance
with EN 1434**

EN 61 107 optical data read-out

Calendar, data logger and tariff

**Option: RS232, M-Bus, modem
and radio**

NOWA compatible verification



TS 27.01
083 PTB 22.52
EN 1434 99.01

Application

MULTICAL® Compact is used to measure thermal energy in small central and district heating installations, typically flats, houses and multi-storey blocks.

The meter is very simple to install, read and verify.

Furthermore, the unique combination of measuring accuracy and longevity means that MULTICAL® Compact is extremely cost effective and inexpensive to run.

MULTICAL® Compact calculates the thermal energy based on the differential temperature measured between the flow and return pipes, the quantity of water measured, the internal correction table for density and enthalpy.

The flow is measured ultrasonically using the transit time method. All measurements, references, display values, calculations and data communications are controlled by the microprocessor.



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Description

MULTICAL® Compact is a static, ultrasonic thermal heat meter, designed for measuring energy in all types of heating installations where water is used as the heat-conveying medium.

The design is based on Kamstrup's extensive experience with ULTRAFLOW® II ultrasonic heat meters and MULTICAL® III calculator.

Ultrasonic measuring and microprocessor technology are the foundation of the energy meter. All circuits for calculating, measuring temperature and flow are combined in a single board construction, which not only gives a compact and rational design but also ensures an optimal measuring quality and a high degree of reliability.

Bidirectional, ultrasonic technique is used to measure the volume, based on the transit time method. A method which is widely recognised as being the best measuring principle currently available for this type of application owing to the long-term stability. Two ultrasonic transducers send sound signals both against and with the flow direction. The ultrasonic signal travelling with the flow reaches the opposite transducer before the signal travelling against the flow. The time difference between receiving the two signals is converted to a flow quantity.

Accurately paired Pt 500 sensors (acc. DIN/IEC 751) measure the temperature in the flow and return pipes.

The short direct sensor construction is designed in accordance with EN 1434-2 and is, therefore, suitable for installation in a wide range of standard ball valves and fittings. One of the temperature sensors is fitted directly in the flow part, which simplifies installation somewhat.

The accumulated thermal energy can be displayed in kWh, MWh or GJ - all shown in seven digits with the measuring unit. The display has been specially designed with a view to longevity and optimal contrast in ambient temperatures ranging from 0 - 55°C. Other values displayed include accumulated water consumption, operation hour counter, actual temperature measurement and momentary flow and power measurements. MULTICAL® Compact can also be configured to record target date, peak power, information code, actual date and user-defined tariffs.

To maximise safety, all registers are stored at hourly intervals in an EEPROM, which also stores monthly data for the previous two-year period.

MULTICAL® Compact has two ports for data communication. The optical eye on the front panel complies with EN 61107 standard and facilities reading consumption data, data logger and on-line serial PC connection when configuring the energy meter.

A split multiplug is placed beneath the top cover. The top part of this plug is used to verify the meter. The lower part is used when connecting communication modules with M-Bus, modem, RS232 interface or radio.

Approved meter data

EN 1434 classification	Class PTB:3A, TS:2A	Temperature in flow part	20°C ...90°C
Flow range, q _i ...q _p /q _s	0.0075...0.75/2.5 m³/h 0.015...1.5/2.5 m³/h 0.025...2.5/4.0 m³/h	Temperature range, Θ	20°C ...130°C
		Differential range, ΔΘ	3 K...110 K
		Temperature sensor set	Pt 500, DIN/IEC 751 B

Technical data

TEMPERATURE INPUTS

Temperature range	0°C ...150°C
Differential range	1 K...140 K
Sensor type	Pt 500, DIN/IEC 751 B
Display resolution	0.01°C

CALCULATION UNIT

Integration interval	30 sec.
Intern memory	EEPROM
Display	LCD, 8+3 digits, 7 mm digit height Energy register 7 digits
Optical read-out head	EN 61 107
Battery type	3.65 VDC D-cell lithium
Battery lifetime	9 years @ t _{BAT} < 35°C

CALCULATION UNIT (CONT.)

Net supply	230 VAC + 15/- 30% 24 VAC/DC ± 30%
Power consumption	< 1 W
Back-up	Built in super-cap, which eliminates operational disturbances with short-term power cut
Ambient temperature	0°C...55°C
Storage temperature	-20°C...60°C
Nominal pressure drop	PN16
Protection class	IP54
EMC-data	Complies with EN 1434-4/A, EN 50 081-1 and EN 50 082-1
Weight	< 1.6 kg

Technical data (cont.)

FLOW METER DATA

Nom.flow [m³/h]	Installation sizes	Min. cut off [l/h]	Δp [bar]	kv
0.75	G ³ / ₄ x 110 mm (DN15)	2	0.06	3.2
1.5	G ³ / ₄ x 110 mm (DN15)	5	0.22	3.2
0.75	G1 x 130 mm (DN20)	2	0.06	3.2
1.5	G1 x 130 mm (DN20)	5	0.22	3.2
2.5	G1 x 130 mm (DN20)	6	0.22	5.3
0.75	G ³ / ₄ x 165 mm (DN15)	2	0.05	3.5
1.5	G ³ / ₄ x 165 mm (DN15)	5	0.18	3.5

Temperature of medium 20...90°C
 Temperature of medium 5...120°C (short term)

MATERIALS DESCRIPTION

Top cover	Transparent polycarbonate	US-reflectors	PSU, 30% GF/AISI 304
Connection bracket	Black ABS	Compiles with following	EN 1434, OIML R75, PTB type test requirements and DS 2340
Cover gaskets and bush	Thermoplastic rubber		
Flow part, housing	Alpha brass	Type approvals	
Flow part gaskets	EPDM		
US-transducer membrane	AISI 316		

TS 27.01 083 PTB 22.52 99.01
 EN 1434

Order specification

Type No. 66-K - X - X - X - X - XXX

Comm. Module	None.....O				
	Data module, RS232.....R				
	M-Bus.....S				
	Modem ¹⁾T				
	Radio.....U				
Supply module	None.....0				
	D-cell, Lithium battery.....1				
	230 VAC.....3				
	24 VAC/DC.....4				
Pt 500 Sensor set	Short direct, 1.5 m cable.....F				
Flow part	G ³ / ₄ B * 110 mm, qp 0.75 m³/h and 1.5 m³/h.....A				
	G1B * 130 mm, qp 0.75 m³/h and 1.5 m³/h.....B				
	G1B * 130 mm, qp 2.5 m³/h.....C				
	G ³ / ₄ B * 165 mm, qp 0.75 m³/h and 1.5 m³/h.....D				
Country code.....					XXX

¹⁾ Please contact Kamstrup A/S about application.

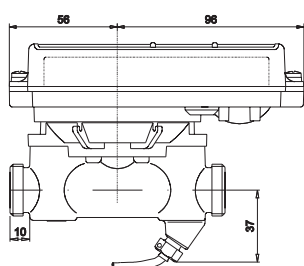
Programming No. A - B - CCC

Flow Meter installation	Flow pipe.....3		
	Return pipe.....4		
Measuring unit	GJ.....2		
	kWh.....3		
	MWh.....4		
Flow meter code	qp 0.75 m³/h, qi 0.0075 m³/h.....827		
	qp 1.5 m³/h, qi 0.015 m³/h.....833		
	qp 2.5 m³/h, qi 0.05 m³/h.....838		
	qp 2.5 m³/h, qi 0.025 m³/h.....839		

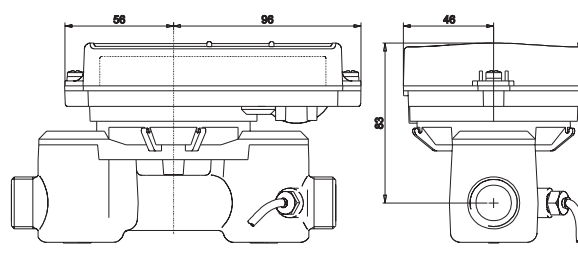
Order specification (cont.)

Configuration DD-E-FF-GG		DD	E	FF	GG
Display set up.....	XX				
Tariff type	None.....	0			
	Power-controlled.....	1			
	Flow-controlled.....	2			
	Cooling-controlled.....	3			
	Forwarded energy.....	4			
	Controlled by return temperature.....	5			
Available.....				00	
Available.....					00

Dimensional drawings



110 and 130 mm meter



165 mm meter

Accessories

Read-out head with with 9-pole D-Sub plug	66-99-102
R $\frac{1}{2}$ for M10x1 nipple	65-56-491
R $\frac{3}{4}$ for M10x1 nipple	65-56-492
R $\frac{1}{2}$ for G $\frac{3}{4}$ gland (2 off)	65-61-321
R $\frac{3}{4}$ for G1 gland (2 off)	65-61-322
Temperature sensors	see 5810-337
Verification Equipment	66-99-287
METER TOOL	66-99-702

Authorized distributor

Please contact Kamstrup A/S for information about your nearest distributor.