Ambiductor
Flow & Energy Analysis Systems

Qalcosonic E3

Thermal heat meter for district heating/cooling

Applications

Energy measurement of heating and/or cooling for both the primary side of district heating and distribution measurement on the secondary side. Certified according to MID for billing. Available in several sizes up to DN100

LoRa™ NB-IoT OMS® Modbus M-Bus BACnet®

Features

- Compact ultrasonic meter for heating and cooling
- Certified accuracy class 2 according to EN1434
- Environmental class C for industrial use
- M-bus, wireless M-bus communication and 2 pulse inputs/outputs as standard
- Modbus, BACnet and LoRa as options
- Saves data for the last 15 years, 36 months, 1116 days and 1480 hours
- Battery 15 years, 24V or 230V supply
- Dynamic measuring range 1:100 (alternatively 1:250

Strengths

- Static measurement without moving parts – insensitive to particles
- Accurate energy measurement in both cooling and heating systems
- Cost-effective remote reading of 2 pulsed water meters via M-bus
- Versatile data storage
- All mounting directions possible
- High IP class
- Advanced alarm management

Intended use

Qalcosonic E3 is a compact ultrasonic meter for measuring thermal energy in water. It is suitable for most applications where heat or cold is to be measured, approved according to the Measuring Instruments Directive (MID) 2014/32/EC.

Meters for billing must be validated within the period specified in local legislation.

DN15-50 does not need a straight pipe. DN65-100 needs 5xDN upstream and 3xDN downstream. However, a straight pipe is always recommended.

Function and measurement principle

The meter consists of:

- 1 ultrasonic flow meter that measures flow
- 2 paired temperature sensors Pt500 for measuring supply and return temperature
- 1 energy calculator that registers thermal energy. Can be mounted on the flowmeter or on a DIN rail on the wall

Power = Volume x ($T_{hot\ side}$ - $T_{cold\ side}$) x k

(where k is the specific heat factor, adjusted for temperature and medium)

Qalcosonic E3 is equipped with an optical read head with EN 1434 M-bus protocol.

Communication

Qalcosonic E3 has integrated communication via M-bus and/or wireless M-bus (T1 OMS).

It also has a module slot for additional communication that is mounted when ordering. It supports a range of standards such as LoRa, NB-IoT, M-bus, wireless M-bus, Modbus and BACnet.

Pulse in/outputs are standard.

Communication parameters are set via free software available from Ambiductor.

Options

The following options are available today.

Communication

In addition to omboard M-bus and/or wireless M-bus - Modbus, LON, BACnet, CI, NB-IoT and LoRa are available.

Software options

The following function can be activated in the meter during commissioning:

BDE (bi-directional energy)

The meter measures both cooling and heating (different registers) and switches between them when Δt changes.

Hardware options

As accessories to the standard version, the following are available:

- IP68
- PN16 (PN25 is standard)
- 24V power supply module or 230V power supply unit
- Customer-specific marking
- Pre-connected cables for communication/pulse

In addition to the above-mentioned options, other temperature sensors can also be ordered.

External accessories

- Optical eye for IR reading
- Programming software
- IoT equipment or masters for wired communication

Alarm handling and status

The meter shows the operating status including all alarms for temperature sensors, flow sensors and integration units.

Presented both on the display and via bus.

Data logger

The flowmeter has a built-in data logger that saves:

- 1480 hourly values
- 1116 daily values
- 36 monthly values
- 15 annual values

The archive is saved for 360 months. Measurement values remain even if the voltage is interrupted for at least 15 years.

Technical data

*Available sizes **

	Nominal flow qp (m^3/h)	Nominal diameter (mm)	Connection	Length (mm)	Nom. pressure PN	Max flow rate qs (m^3/h)	Min flow rate qi (m^3/h)	Dynamic range**	Pressure loss at qp (kPa)	Weight (kg)
DN15 qp 0,6	0,6	DN15	G20 / G¾"	110	16	1,2	0,006	R100	23	0,7
DN15 qp 1,5	1,5	DN15	G20 / G¾"	110	16	3,0	0,015/0,006	R100/R250	17,1	0,7
DN20 qp 1,5	1,5	DN20	G25 / G1"	190	16	3,0	0,015/0,006	R100/R250	19,8	1,0
DN20 qp 2,5	2,5	DN20	G25 / G1"	190	16	5,0	0,025/0,01	R100/R250	19,8	1,0
DN25 qp 3,5	3,5	DN25	G32 / G1¼"	260	16	7,0	0,035	R100	4,0	3,2
DN25 qp 6,0	6,0	DN25	G32 / G1¼"	260	16	12	0,06/0,024	R100/R250	10	3,2
DN40 qp 10	10	DN40	G50 / G2"	300	16	20	0,10/0,04	R100/R250	18	3,7
DN50 qp 15	15	DN50	Fläns	270	16	30	0,15/0,06	R100/R250	12	6,4
DN65 qp 25	25	DN65	Fläns	300	16	50	0,25/0,1	R100/R250	20	10
DN80 qp 40	40	DN80	Fläns	300	16	80	0,40/0,16	R100/R250	18	13
DN100 qp 60	60	DN100	Fläns	360	16	120	0,60/0,24	R100/R250	18	15

*) This is a selection of the most common sizes

**) R100 is standard. R250 can be ordered as option

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Certifications

Specification	Data
Metrological class	2014/32/EU class 2 according EN 1434
Mechanical class	M1 according 2014/32/EU
Electrical class	E2 according 2014/32/EU
Environmental class	C (industry)
Protection class	IP 65 / IP 68*

Calculator

Specification	Data
Power supply	15 years battery Li-$SOCl_2$ or power supply module
Communication	M-bus and wireless M-bus included as standard and 1 module (Modbus, BACnet, LoRa etc.)*
Pulse in/outputs	2 programmable in/out*
Energy units	kWh, MWh, GJ, Gcal*
Maximum power	2,63 MW
Cable length between flow sensor and calculator	1,2m
Display	8-digit LCD with symbols
Unit volume	Volume: 00000,001 m^3
Unit energy	<6 m^3/h: 00000001 kWh ≥6 m^3/h: 00000,001 MWh alt. 00000,001 Gcal alt. 00000,001 GJ
Minimum allowed water pressure	30 kPa

*) According to what is ordered

Temperatures

Specification	Data
Ambient temperature	Calculator: +5...55 °C (condensation free) Flow sensor: -30...55 °C Relative humidity max 93%
Water temperature	0...130 °C (alt. 0...90 °C or 0...180 °C)
Calculator mounted on flow sensor	Up to 90 °C (130 °C if mounted on wall)
Temperature range, calculator	0...200 °C
Temperature difference	2...150 K / 3...150 K
Temperature sensors	Pt500 (alt. Pt100 or Pt1000)

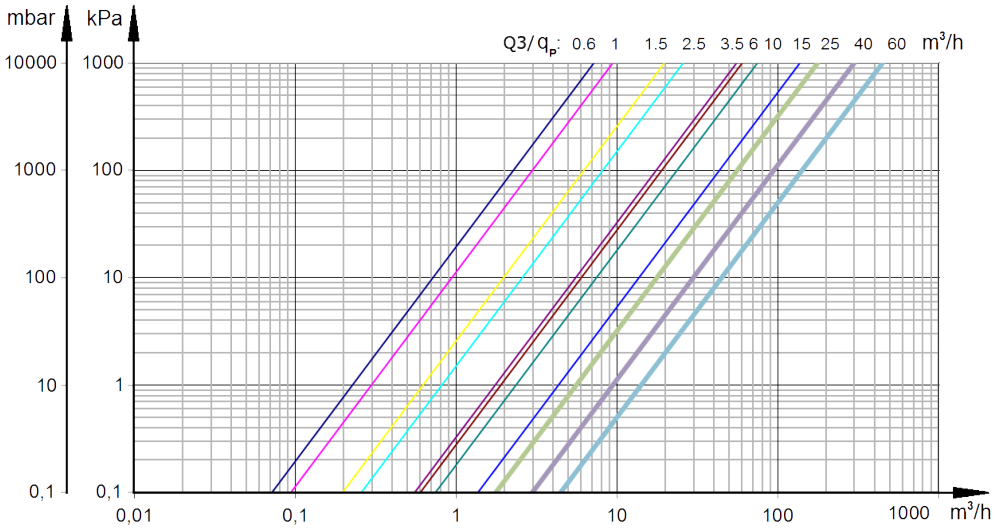
Pulse in/outputs

Specification	Data
Amount of in/outputs	2 pcs, optional
Units	m^3
Pulse value, inputs	Programmable
Pulse input type	IB by LST EN1434-2
Max frequency pulse input	3 Hz
Max voltage pulse input	3,6 V
Type, pulse output	Open collector
Amperage/Voltage, pulse output	Up to 20mA and 50V
Pulse length, pulse output	100 ms at normal mode (1,6 ms in test mode)
Pulse value, output #1	1 kWh/p
Pulse value, output #2	qp 0,6...6,0: 1 l/p qp 10...60: 10 l/p

Accuracy

Error tolerance according EN 1434 class 2

Pressure loss



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Ordering information

E3 - 2 3 21 - 1 8 1 - 0 1 4 - 1 2 1 5 0

Accessory	Code		Code		Code
None	0	Ball valve (DS)	1	Sensor pocket (PL-6)	3

Temperature sensor	Code		Code
DS, Pt500 (direct mounting)*	1	PL-6, Pt500 (for sensor pockets)*	2

Medium	Code		Code
Water	1		

Configuration profile	Code		Code
Delivered in transport mode*	2	Not delivered in transport mode	5

Cable length, temp sensor	Code		Code		Code		Code
Not included	0	2,0 m	2	3,0 m	4	10 m	6
1,5 m	1	2,5 m	3	5,0 m	5		

Digital outputs / max temp	Code		Code
None / 90°C	1	None / 130°C	3
Pulse in/out with 1,5m cable / 90°C	2	Pulse in/out with 1,5m cable / 130°C	4

Protection & pressure class	Code		Code
IP65 / PN25*	4	IP68 / PN25	6

Communication module	Code		Code		Code		Code
None	0	Modbus RS-485	2	MiniBUS	4	LoRa 868MHz	6
M-bus	1	CL	3	BACnet	5	Radio 868MHz	7

Cable length, flow sensor	Code		Code		Code		Code
1,2 m*	1	2,5 m	2	5,0 m	3	10 m	4

Power supply	Code		Code				
1 pcs battery	5	24VAC/DC	6	230VAC	7	2 pcs battery	8

On-board communication	Code		Code
None	0	Radio 868MHz	2
M-bus*	1	M-bus and radio 868MHz	3

Flow rate qp m3/h	Length, mm	Connection	Code				Code
0,6	110	G¾"	11	3,5	260	DN25 threaded flange	43
1,5	110	G¾"	13	6,0	260	DN25 threaded flange	47
1,5	130	G1"	21	3,5	260	DN32 threaded flange	44
2,5	130	G1"	22	6,0	260	DN32 threaded flange	48
3,5	260	G1¼"	41	10	300	DN40 threaded flange	52
6,0	260	G1¼"	45	15	270	DN50 flange	61
10	300	G2"	51	25	300	DN65 flange	71
				40	300	DN80 flange	81
				60	360	DN100 flange	92

Dynamic range (qp/qi) / min Δt	Code		Code		Code		Code
R100 3K*	3	R100 2K	1	R250 3K	4	R250 2K	2

Installation side	Code		Code
In supply (heating)	1	In supply (heating+cooling)	3
In return (heating)*	2	In return (heating+cooling)	4

*) Standard for meters on stock. DN 15...20: DS, DN 25...100: PL-6.

About Ambiductor

Ambiductor is an engineering company in metering, automation, remote reading with focus in the following areas:

- **Smart water meters and thermal energy meters**
- **Smart buildings, industry and society through LoRa, NB-IoT etc.**
- **AmbiSolution - IoT platform for utilities, energy and buildings**
- **Oil meters and meters for industrial liquids**

Read more at www.ambiductor.se

Instructional videos and guides in Swedish at
www.ambiductor.se/supportsidan

Disclaimer!

If there is any inconsistency between this version and the original document, the original document will prevail.

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