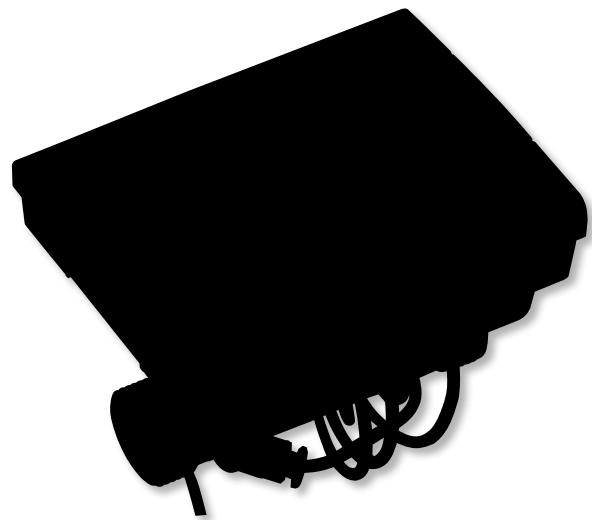# ▶ Brunata Optuna H

Brunata Optuna H measures energy consumption in large and small heating and cooling systems as well as combined heating and cooling systems. The meter is compact and belongs to the first generation of meters designed directly for remote reading. It records a large number of data, which allows a complete overview of the consumption as well as the operational load imposed by an installation. Together with its uniquely long life of 16 years, this makes Optuna H the most resource-optimising meter on the market, in financial, operational and environmental terms.

Properties

- Temperature range 5-130/150 °C
- No sensitivity to soiling
- Turbulence-free flow around the reflectors
- 16 year battery life with radio
- Extensive data saving of monthly values for two years, read via optical interface
- Much improved radio function for remote data reading
- Built-in radio module meeting Real Data and Open Metering Standard (868 MHz)
- Individual remote reading (AMR) via optional plug and play modules
- Two communication ports (e.g. M-Bus and pulse) and integral radio reading
- Several power supply options
- Great long-term stability
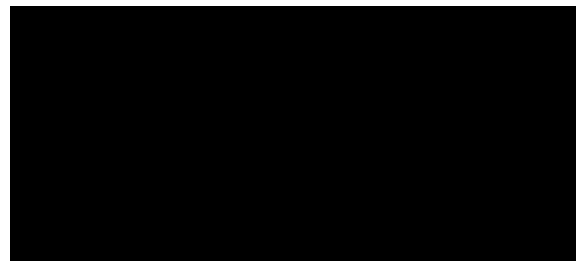- Optional leak monitoring

Further information

The Optuna H heating energy meter consists of an ultrasound flow sensor, a counter with battery or power supply, which can be replaced without breaking any verification seal, two temperature sensors which can also be replaced and a wall bracket for mounting the integrator unit separately from the flow sensor, if desired. The meter is designed according to the ultrasound principle, without movable parts. This ensures great measuring accuracy and long life as well as great stability even at varying water quality.

Counter

The counter casing can be installed either as a compact unit directly on the flow sensor unit and turned in steps of 90° or externally on a wall using the accompanying bracket. The Optuna H meter's display is designed with strong, easy-to-read figures and symbols which are clearly visible from all sides. The meter can therefore be read without problems even in difficult conditions.

A clear and user-friendly operating button to the right of the display makes it easy to switch between the different views. Any errors are automatically saved and shown in the display. Readings and other relevant values, are stored sagely in an EEPROM type memory. This memory regularly saves all measured values, the meter's parameter settings and any error reports.

General

Use	Heating – cooling – heating and cooling
Approvals	MID (DE-10-MI004-PTB013)
Installation of flow sensor	Optional
Power supply with battery	3.6 VDC - A-type (max. life 11 years) - 3.6 VDC - D-type (max. life 16 years)
Power supply from mains	24 VAC - 230 VAC
Temperature sensor types	Pt 100 or Pt 500, two-wire - Ø 52./2mm or direct sensor
Cable length for sensors	Pt 100 : 2M - Pt 500 : 2/3 1 /5m
Measuring cycle for volume	Mains powered: 1/8 s - A-type battery: 1/2 s - D-type battery : 1/1 s

Integrator – basic properties and functions

Environment class	Class C
Ambient class	Class E2 + M2
Ambient temperature	5 … 55 °C (>35 °C have a positive lifetime effect)
Storage temperature	-25 … +60 °C (>35 °C max. 4 weeks)
Protection Class	IP 54
Communication	3 communication ports (e. g. M-Bus + M-Bus + Int. Radio; 2 primary addresses, 1 secondary address)
Integral radio	Optional
Interface standard	Optical ZVEI interface
Interface, options	2 outlets for modules with M-Bus, L-Bus, RS 232, RS 485, pulse output, pulse input or analogue output.
Temperature range, heating	5 … 130 / 150 °C
Temperature range, cooling and heating/cooling	5 … 50 / 5 … 105 °C
Extensive saved data	Saved monthly[1]; saved history log; saved status codes

1) Programmable saving interval (daily, weekly, monthly …)

Integrator – integral radio

Frequency wavelength	868 or 434 MHz
Radio telegram type	Real Data or Open Metering Standard (OMS)
Updating, transmitted data	Online – no time delay between meter registration and data transfer
Data transfer	One way
Transmission interval	12 … 20 s – depending on telegram length (duty cycle)

Display

Display	LCD, 8 digits
Units	MWh – kWh – GJ – Gcal – Mbtu – gal – GPM - °C - °F – m3 - m3/h
Mximum display values	99,999,999 – 9,999,999.9 – 999,999.99 – 99,999,999
Values displayed	Energy - output - volume - flow - temperature - other

Interfaces	
Optical	ZVEI interface, for communication of test, M-Bus protocol
M-Bus	Configurable telegram, meets EN 1434-3, data reading and parameter setting via polarity-secured two-wire cable, automatic recognition of Baud speed (300 and 2400 Baud), 2 M-Bus with 2 primary addresses
L-Bus	Adapter for extreme radio module, configurable telegram, meets EN 1434-3, data reading and parameter setting via polarity-secured two-wire cable
RS232	Serial interface for communication with external devices, special data cable required, M-Bus protocol, 300 and 2400 Baud
RS484	Serial interface for communication with external devices, power supply 12V + 5V, M-Bus protocol, 2400 Baud
Pulse output	Module with 2 pulse outputs (Open Collector, potential-free) 4 Hz (pulse width 125 ms), 100 Hz (pulse width $\geq$ 5 ms, relationship pulse duration/pulse pause $\approx$ 1:1, configurable with IZAR@SET software
Pulse input	Module with 2 pulse inputs, max. 20 Hz, configurable with IZAR@SET software, remote data transfer also possible
Combined pulse input and output	Module with 2 pulse inputs and 1 pulse output, configurable with IZAR@SET software, required for leak alarm
Analogue output	Module for 4 … 20 mA with 2 programmable passive outputs, programmable values at error states

Temperature input		
Power in sensors, mA		Pt 100 max. power < 8 (rms < 0,015), Pt 500 max. power < 2 (rms < 0,012)
Measuring cycle with grid operation	T	With netdrift: 2 s; with A-type-batteri: 16 s; with D-type-batteri: 4 s
Start temperature difference	$\Delta\Theta$	0,125 K
Minimum temperature difference	$\Delta\Theta_{min}$	3 K
Maximum temperature difference	$\Delta\Theta_{max}$	177 K
Absolute measuring range	Θ	1 … 180 °C

Technical data for flow sensor

Nominal, continuous flow, q$_p$:	m³/h	0,6	0,6	0,6	1,5	1,5	1,5
Nominal diameter, DN:	mm	15	20	20	15	20	20
Construction length, L:	mm	110	130	190	110	130	190
Start value:	l/h	1	1	1	2,5	2,5	2,5
Minimum flow rate, q$_i$:	l/h	-	-	-	6	6	6
Maximum flow rate, q$_s$:	m³/h	1,2	1,2	1,2	3	3	3
Overload at:	m³/h	2,5	2,5	2,5	4,6	4,6	4,6
Operating pressure, PN:	bar	16[1]	16[1]	16[1]	16[1]	16[1]	16[1]
Head0 loss at q$_p$ – p:	mbar	85	85	85	75	75	75
Temperature range, heating:	°C	5 ... 130	5 ... 130	5 ... 130	5 ... 130	5 ... 130	5 ... 130
Temperature range, cooling:	°C	5 ... 50	5 ... 50	5 ... 50	5 ... 50	5 ... 50	5 ... 50
Temperature range, heating and cooling:	°C	5 ... 105	5 ... 105	5 ... 105	5 ... 105	5 ... 105	5 ... 105
Zeta resistance value:		21,3	67,5	67,5	4,3	13,6	13,6

Technical data for flow sensor

Nominal, continuous flow, q$_p$:	m³/h	2,5	2,5	3,5	3,5	6	6
Nominal diameter, DN:	mm	20	20	25	32	25	32
Construction length, L:	mm	130	190	260	260	260	260
Start value:	l/h	4	4	7	7	7	7
Minimum flow rate, q$_i$:	l/h	10	10	35	35	24	24
Maximum flow rate, q$_s$:	m³/h	5	5	7	7	12	12
Overload at:	m³/h	6.7	6.7	18.4	18.4	18.4	18.4
Operationg pressure, PN:	bar	16[1]	16[1]	16[1]	16[1]	16[1]	16[1]
Head loss at q$_p$ – p:	mbar	100	100	44	44	128	128
Temperature range, heating:	°C	5 ... 130	5 ... 130	5 ... 130	5 ... 130	5 ... 130	5 ... 130
Temperature range, cooling:	°C	5 ... 50	5 ... 50	5 ... 50	5 ... 50	5 ... 50	5 ... 50
Temperature range, heating and cooling:	°C	5 ...105	5 ... 105	5 ... 105	5 ... 105	5 ... 105	5 ... 105
Zeta resistance value:		4	4	2.8	7.4	2.8	7.4

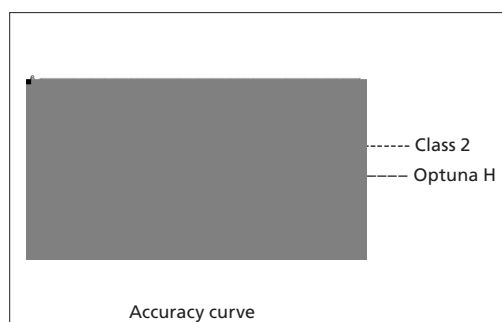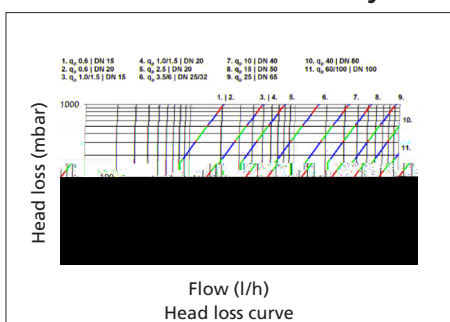| Nominal, continuous flow, q$_p$:	m³/h	10	10	15	25	40	60
Nominal diameter, DN:	mm	40	40	50	65	80	100
Construction length, L:	mm	200	300	270	300	300	360
Start value:	l/h	20	20	40	50	80	120
Minimum flow rate, q$_i$:	l/h	40[3]/100	40[3]/100	60[3]/150	100[3]/250	160	240[3]/600[4] 1200[5]
Maximum flow rate, q$_s$:	m³/h	20	20	30	50	80	120
Overload at:	m³/h	24	24	36	60	90	132
Operation pressure, PN:	bar	16[1]	16[1]	25[2]	25[2]	25[2]	16/25[2]
Head loss at q$_p$ – p:	mbar	95	95	80	75	80	75
Temperature range, heating:	°C	5 ... 150	5 ... 150	5 ... 150	5 ... 150	5 ... 150	5 ... 150
Temperature range, cooling:	°C	5 ... 50	5 ... 50	5 ... 50	5 ... 50	5 ... 50	5 ... 50
Temperature range, heating and cooling :	°C	5 ... 105	5 ... 105	5 ... 105	5 ... 105	5 ... 105	5 ... 105
Zeta resistance meter:		3,8	3,8	3,56	3,4	3,4	3,8

1): Also available with PN 25 bar

2): Also available with PN 40 bar
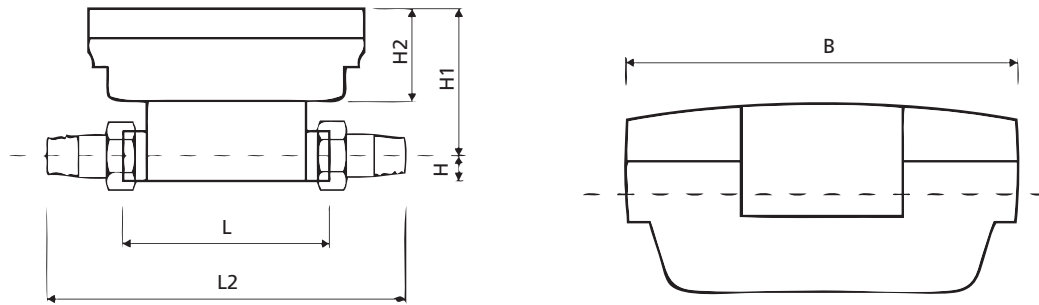
3): Only with horizontal installation

4): Only with vertical (up and down) or oblique installation

5): Only with installation upside down

Head loss curve and accuracy curve

Head loss curve

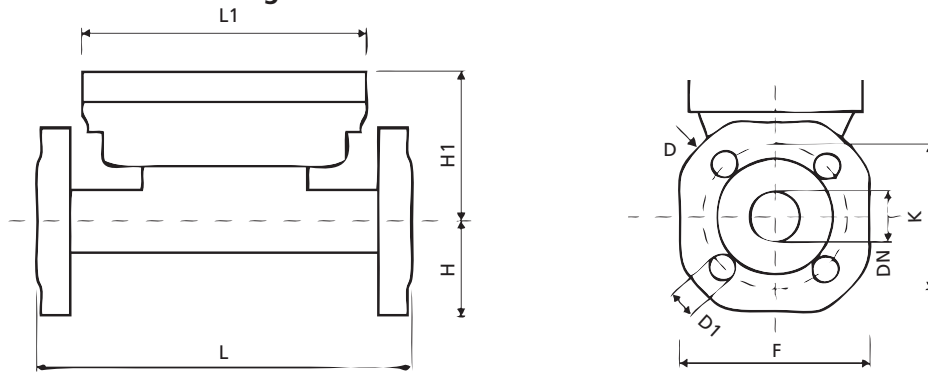Accuracy curve

Dimensions for threaded connection

Nominal, continuous flow, q_p:	m³/h	0,6	0,6	0,6	1,5	1,5	1,5
Nominal diameter, DN:	mm	15	20	20	15	20	20
Construction length, L:	mm	110	130	190	110	130	190
Construction length with fittings, L2:	mm	190	230	290	190	230	290
Length, counter, L1:	mm	150	150	150	150	150	150
Height, H:	mm	14,5	18	18	14,5	18	18
Height, H1:	mm	82	84	84	82	84	84
Height, counter, H2:	mm	54	54	54	54	54	54
Width, counter, B:	mm	100	100	100	100	100	100
Connection threading, meter:	''	G³/4	G1B	G1B	G³/4	G1B	G1B
Connection threading, fitting:	''	R¹/2	R³/4	R³/4	R¹/2	R³/4	R³/4
Weight:	kg	0,76	0,85	0,96	0,76	0,85	0,96

Nominal, continuous flow, q_p:	m³/h	2,5	2,5	3,5	3,5	6	6
Nominal diameter, DN:	mm	20	20	25	32	25	32
Construction length, L:	mm	130	190	260	260	260	260
Construction length with fittings, L2:	mm	230	290	380	-	380	-
Length, counter, L1:	mm	150	150	150	-	150	-
Height, H:	mm	18	18	23	-	23	-
Height, H1:	mm	84	84	88,5	-	88,5	-
Height, counter, H2:	mm	54	54	54	-	54	-
Width, counter, B:	mm	100	100	100	-	100	-
Connection threading, meter:	''	G1B	G1B	G1¹/4B	-	G1¹/4B	-
Connection threading, fitting:	''	R³/4	R³/4	R1	-	R1	-
Weight:	kg	0,85	0,96	1,5	-	1,5	-

Nominal, continuous flow, q_p:	m³/h	10	10	15	25	40	40
Nominal diameter, DN:	mm	40	40	50	65	80	100
Construction length, L:	mm	200	300	270	300	300	360
Construction length with fittings, L2:	mm	340	440	-	-	-	-
Lenght, counter, L1:	mm	150	150	-	-	-	-
Height, H:	mm	33	33	-	-	-	-
Height, H1:	mm	94	94	-	-	-	-
Height, counter, H2:	mm	54	54	-	-	-	-
Width, counter, B:	mm	100	100	-	-	-	-
Connection threading, meter:	''	G2B	G2B	-	-	-	-
Connection threading, fitting:	''	R1¹/2	R1¹/2	-	-	-	-
Weight:	kg	2,9	3	-	-	-	-

Dimensions for flange connection

Nominal, continuous flow, q_p:	m³/h	0,6	0,6	0,6	1,5	1,5	1,5
Nominal diameter, DN:	mm	15	20	20	15	20	20
Construction length, L:	mm	110	130	190	110	130	190
Length, counter, L1:	mm	-	-	150	-	-	150
Height, H:	mm	-	-	47,5	-	-	47,5
Height, H1:	mm	-	-	84	-	-	84
Height, counter, H2:	mm	-	-	54	-	-	54
Width, counter, B:	mm	-	-	100	-	-	100
Flange dimensions, F:	mm	-	-	95	-	-	95
Flange diameter, D:	mm	-	-	105	-	-	105
Internal pipe diameter, K:	mm	-	-	75	-	-	75
Diameter, flange bore, D1:	mm	-	-	14	-	-	14
Number of flange bores:	pce.	-	-	4	-	-	4
Weight:	kg	-	-	2,75	-	-	2,75

Nominal, continuous flow, q_p:	m³/h	2,5	2,5	3,5	3,5	6	6
Nominal diameter, DN:	mm	20	20	25	32	25	32
Construction length, L:	mm	130	190	260	260	260	260
Lenght, counter, L1:	mm	-	150	150	150	150	150
Height, H:	mm	-	47,5	50	62,50	50	62,5
Height, H1:	mm	-	84	88,5	88,5	88,5	88,5
Height, counter, H2:	mm	-	54	54	54	54	54
Width, counter, B:	mm	-	100	100	100	100	100
Flange dimensions, F:	mm	-	95	100	125	100	125
Flange diameter, D:	mm	-	105	114	139	114	139
Internal pipe diameter, K:	mm	-	75	85	100	85	100
Diameter, flange bore, D1:	mm	-	14	14	18	14	18
Number of flange bores:	pce.	-	4	4	4	4	4
Weight:	kg	-	2,75	3,5	4,8	3,5	4,8

Nominal, continuous flow, q_p:	m³/h	10	10	15	25	40	60
Nominal diameter, DN:	mm	40	40	50	65	80	100
Construction length, L:	mm	200	300	270	300	300	360
Lenght, counter, L1:	mm	-	150	150	150	150	150
Height, H:	mm	-	69	73,5	85	92,5	108
Height, H1:	mm	-	94	99	106,5	114	119
Height, counter H2:	mm	-	54	54	54	54	54
Width, counter, B:	mm	-	100	100	100	100	100
Flange dimensions, F:	mm	-	138	147	170	185	216
Flange diameter, D:	mm	-	148	163	184	200	235
Internal pipe diameter, K:	mm	-	110	125	145	160	180[1]/22
Diameter, flange bore, D1:	mm	-	18	18	18	19	19[1]/22
Number of flange bores:	pce.	-	4	4	8	8	8
Weight:	kg	-	6,4	7,0	8,9	10,9	16,4

1): Values for PN 16 casing