

Data sheet

ULTRAFLOW® 44 DN15-125

5HX Series (Cooling)

- Exceptionally accurate, $\pm 0.5\%$ at nominal flow q_p
- Ultrasonic flow sensor (q_p 1.5...100 m³/h)
- Static sensor, no moving parts and no wear
- Excellent water resistance (IP68)
- Allows insulation and submersion
- Enables direct mounting of a temperature sensor (q_p 1.5...10 m³/h)
- Small pressure loss
- Large dynamic range
- Exceptionally accurate
- Durable



DK-BEK 1178 – 06/11/2014



EN 1434

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Description

ULTRAFLOW® 44 is a static flow sensor based on the ultrasonic measuring principle. It is used primarily as a sub-assembly of a thermal energy meter in combination with MULTICAL® 603 or MULTICAL® 803 and a set of TemperatureSensor 63. ULTRAFLOW® 44 has been designed for use in cooling installations, with water as the thermal energy-conveying liquid, and can also be used for heat/cooling installations. ULTRAFLOW® 44 - 5HX Series is a fine-adjusted variant of ULTRAFLOW® 44 for cooling, with documented accuracy of $\pm 0.5\%$ at nominal flow q_p .

Particular focus has been spent on condensation/water protection of ULTRAFLOW® 44 by gel-encapsulated transducers and by physical removal of the flow sensor's PCB from the meter housing. As the PCB itself is also waterproof encapsulated, it withstands even temporary submersion (up to 2 months).

ULTRAFLOW® 44 employs microprocessor technology. The flow is measured using bidirectional ultrasonic technique based on the transit time method. All circuits for calculation and measurement are collected on a single board, providing a compact and rational design in addition to an exceptionally high level of measuring accuracy and proven longterm stability.

A three-wire pulse cable is used to connect ULTRAFLOW® 44 to separate MULTICAL® calculators. This cable is used to supply the flow sensor from the calculator and also to send the volume-proportional pulses to the calculator.

To achieve the easiest possible adjustment (e.g. during re-verification), it is recommended to order ULTRAFLOW® 44 together with MULTICAL® 603 or MULTICAL® 803 whereby the flow sensor and the calculator will be delivered with identical serial numbers. Adjustment of separately delivered ULTRAFLOW® 44 requires individual encryption keys.

If ULTRAFLOW® 44 is used as a flow sensor for other equipment, it must be connected through a Pulse Transmitter.

If ULTRAFLOW® is connected to another calculator with a different meter factor than the one supplied by ULTRAFLOW®, a Pulse Divider is used instead. Pulse Transmitter and Pulse Divider have a galvanically separated pulse output and a built-in supply for ULTRAFLOW® 44.

If the distance between MULTICAL® and ULTRAFLOW® 44 is more than 10 m, a Pulse Transmitter allows prolongation of the connecting cable (up to 100 m). Alternatively, a Cable Extender Box can be used for this purpose for distances up to 30 m between MULTICAL® and ULTRAFLOW® 44.

Compliance

ULTRAFLOW® 44 is approved as a cooling meter in accordance with DK-BEK 1178 – 06/11/2014:

System designation TS 27.02 014

Verification



DANAK accreditation 268

Please contact Kamstrup A/S for further information relating to type approval and verification.

Standard and documents

EN 1434:2022

WELMEC 7.2:2025

CE marking

ULTRAFLOW® 44 is marked in accordance with:

- EMC directive 2014/30/EU
- LV directive 2014/35/EU (together with Pulse Transmitter or Pulse Divider)
- PE directive 2014/68/EU (DN50...DN125 category I)

Approved meter data

MID designation

- Mechanical environment M1 (vibrations and shocks of low significance)
M2 (significant or high levels of vibrations and shocks)
- Electromagnetic environment E1 (residential, commercial and light industrial buildings)
E2 (other industrial buildings)
- Climatic environment 5...55 °C, condensing, closed location (indoors)
- Accuracy class 2 and 3

EN 1434 designation

- Environmental class C (high electrical and electromagnetic conditions)
- Fast response meter Volume sampling interval ≤ 2 s (sub-assembly flow sensor)

Technical data

Mechanical data

Accuracy class	2
Accuracy	± 0.5 % at nominal flow q_p
Electromagnetic environment	Complies with EN 1434 class C, MID E1 and E2
Ambient conditions	5...55 °C, condensing and non-condensing, closed location (indoor installation)
Protection class	
– Flow sensor	IP68
– Pulse Transmitter	IP67
– Cable Extender Box	IP68
Medium in flow sensor	Water (recommended water quality as in CEN TR 16911 and AGFW FW510)
Temperature* of medium	2...50 °C
Storage temperature (empty sensor)	-25...60 °C
Pressure stage	PN16, PS16 or PN25, PS25 or PN16/PN25, PS25 (see marking)
Straight inlet requirement	OD (according to EN 1434)
Installation angle	Horizontally, vertically and at an angle

* At a medium temperature below the ambient temperature, calculator and Pulse Transmitter must not be mounted on the flow sensor. Instead wall mounting is recommended.

Electrical data

Supply voltage	3.6 VDC ± 0.1 VDC
Battery (MULTICAL® or Pulse Transmitter/ Pulse Divider)	3.65 VDC, D-Cell lithium
Battery lifetime (replacement interval)	
- ULTRAFLOW® 44 and MULTICAL®	Up to 16 years @tBat < 30 °C
- Pulse Transmitter/ Pulse Divider	6 years @ tBAT < 30 °C (Y=3)
Mains supply -Pulse Transmitter/ Pulse Divider	230 VAC + 15/-30 %, 50 Hz or 24 VAC ± 50 %, 50 Hz
Backup supply	Integral capacitor eliminates operational disturbances due to short-term power cuts
Cable length	
– Flow sensor	Max 10 m
– Cable Extender Box	Depends on calculator - max 30 m when connected to MULTICAL® (does not provide galvanic separation, but supports extended info codes)
Electromagnetic environment	Fulfills EN 1434 class C, MID E1 and E2
Pulse output Galvanically connected (ULTRAFLOW®)	
	– Type Push-Pull
	– Output impedance 10 kW
	– Pulse duration 2...6 ms
	– Pause time Depending on current pulse frequency

Flow data

Nom. flow q_p [m³/h]	Meter factor * [pulses/l]	Dynamic range $q_p:q_i$	$q_s:q_p$	Flow@125 Hz ** [m³/h]	Min. cut off [l/h]
1.5	100	100:1	2:1	4.5	3
2.5	60	100:1	2:1	7.5	5
3.5	50	100:1	2:1	9	7
6	25	100:1	2:1	18	12
10	15	100:1	2:1	30	20
15	10	100:1	2:1	45	30
25	6	100:1	2:1	75	50
40	5	100:1	2:1	90	80
60	2.5	100:1	2:1	180	120
100	1.5	100:1	2:1	300	200

* The meter factor appears from the type label.

** Saturation flow 125 Hz. Max pulse frequency is maintained at higher flow rates.

Measurement accuracy

ULTRAFLOW® 44 - 5HX Series is a variant of ULTRAFLOW® 44 with accuracy class 2 and in addition a documented accuracy of $\pm 0.5\%$ at nominal flow q_p .

For being qualified for the 5HX Series, the flow sensor must be particularly accurate, which means that the observed deviation of the flow sensor's registered volume compared to the reference volume at flow q_p must be within $\pm 0.5\%$.

Kamstrup can document the test result by a certificate or test report that the individual flow sensor has been tested on an ISO accredited flow bench at nominal flow q_p with an accuracy of $\pm 0.5\%$. The documents can be ordered together with the meter.

Kamstrup can provide the test results up to 10 years after delivery of the meter.

* Uncertainties of the test method are not considered.

Materials

Wetted parts

ULTRAFLow® 44, q_p 1.5 and 2.5 m³/h

Housing, thread	DZR brass (dezincification-resistant brass) CW511L with max 0.1% Pb
Transducer (membrane)	Stainless steel, W.no. 1.4404
O-ring	Ethylene-propylene (EPDM)
Reflector base/reflector	Thermoplastic, PESU 30 % GF and stainless steel, similar to AISI 304 or AISI 316 [q_p 0.6...2.5 m ³ /h] Thermoplastic, PESU 30 % GF and stainless steel, similar to AISI 304 [q_p 6 and 10 m ³ /h] Stainless steel, similar to AISI 304 or AISI 316 - [q_p 3.5, 15...100 m ³ /h]
Measuring tube	Thermoplastic, PESU – only flow sensor type 65-4-XXHX-XXX/Thermoplastic, PESU 30% GF

Electronics housing

q_p 1.5...100 m³/h

PCB box	Thermoplastic, inside - polyolefin, outside - polyamide
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q_p 1.5 and 2.5 m³/h

Base (flow sensor)	Thermoplastic, 30 % glass fibre-reinforced polyethersulfone (PESU 30 % GF)
Top cover (flow sensor)	Thermoplastic, 10 % glass fibre-reinforced polycarbonate (PC 10 % GF)

$q_p \geq 3.5$ m³/h

Base (flow sensor)	Thermoplastic, 10 % glass fibre-reinforced polycarbonate (PC 10 % GF)
Cover (flow sensor)	Thermoplastic, 10 % glass fibre-reinforced polycarbonate (PC 10 % GF)

Cables

Coaxial cable	Copper cable with silicon jacket and inner fluoropolymer insulation
Signal cable	Silicone cable (3 x 0.25 mm ²)

Housing, Cable Extender Box

Base, cover	Thermoplastic, acrylonitrile butadiene styrene (ABS)
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Type summary

Nom. flow q_p [m ³ /h]	Installation size		
1.5	G¾B x 110 mm	G1B x 130 mm	
2.5	G1B x 190 mm		
3.5	G1¼B x 260 mm		
6	G1¼B x 260 mm	G1½B x 260 mm	DN25 x 260 mm
10	G2B x 300 mm	DN40 x 300 mm	
15	DN50 x 270 mm		
25	DN65 x 300 mm		
40	DN80 x 300 mm		
60	DN100 x 360 mm		
100	DN100 x 360 mm	DN125 x 350 mm	

Thread EN ISO 228-1.

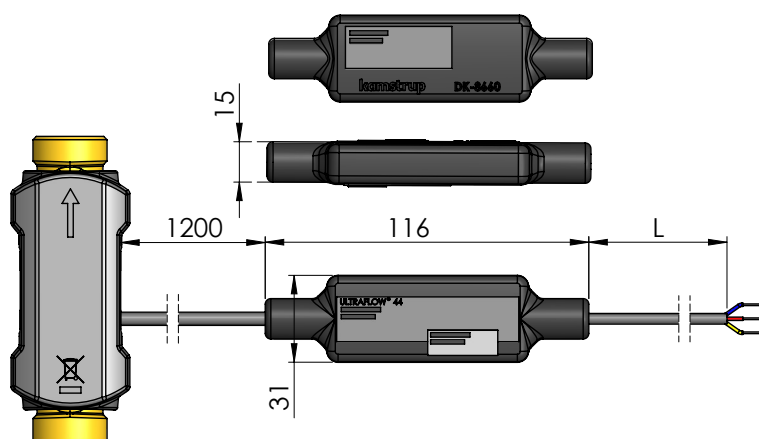
Flange facing type B, raised face according to EN 1092-1, PN25.

Dimensional sketches

All ULTRAFLOW® 44 flow sensors include a separate electronics box, which contains the PCB. This electronics box is connected to the plastic casing on the respective meter housing with a coaxial cable with a length of $l < 1.2$ m. The plastic casing on the meter housing contains the transducers of the flow sensor.

ULTRAFLOW® 44 - PCB and cables

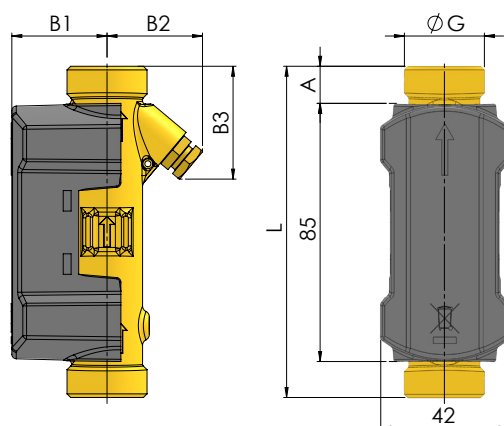
All measurements are in mm, unless otherwise stated.



Nom. flow	L [m]	Approx. weight* [kg]
q_p 1.5 and 2.5 m ³ /h	2.5	0.18
q_p 1.5-100 m ³ /h	10	0.36

* Electronics box together with coaxial cable and 2.5 m signal cable.

ULTRAFLOW® 44, G $\frac{3}{4}$ B and G1B

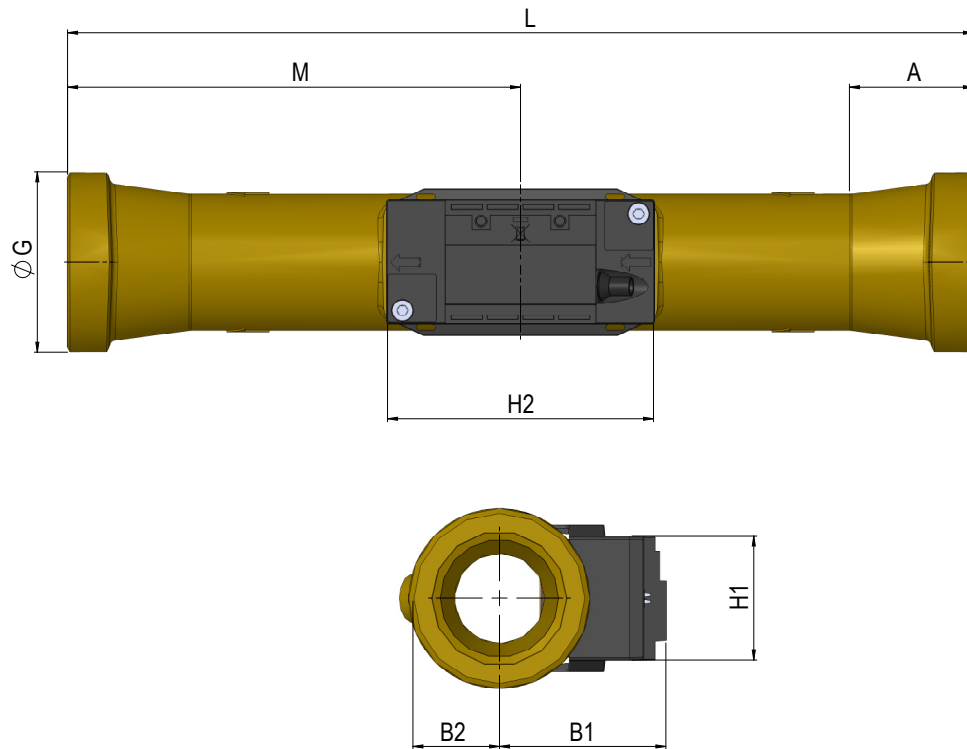


Thread EN ISO 228-1	L	A	B1	B2	B3	Approx weight * [kg]
G $\frac{3}{4}$ B (q_p 1.5)	110	12	35	32	38	0.6
G1B (q_p 1.5)	130	22	38	32	48	0.7
G1B (q_p 2.5)	190	52	38	38	78	0.9

* Including the electronics box and 2.5 m signal cable.

Dimensional sketches

ULTRAFLOW® 44, G1¼B, G1½B and G2B

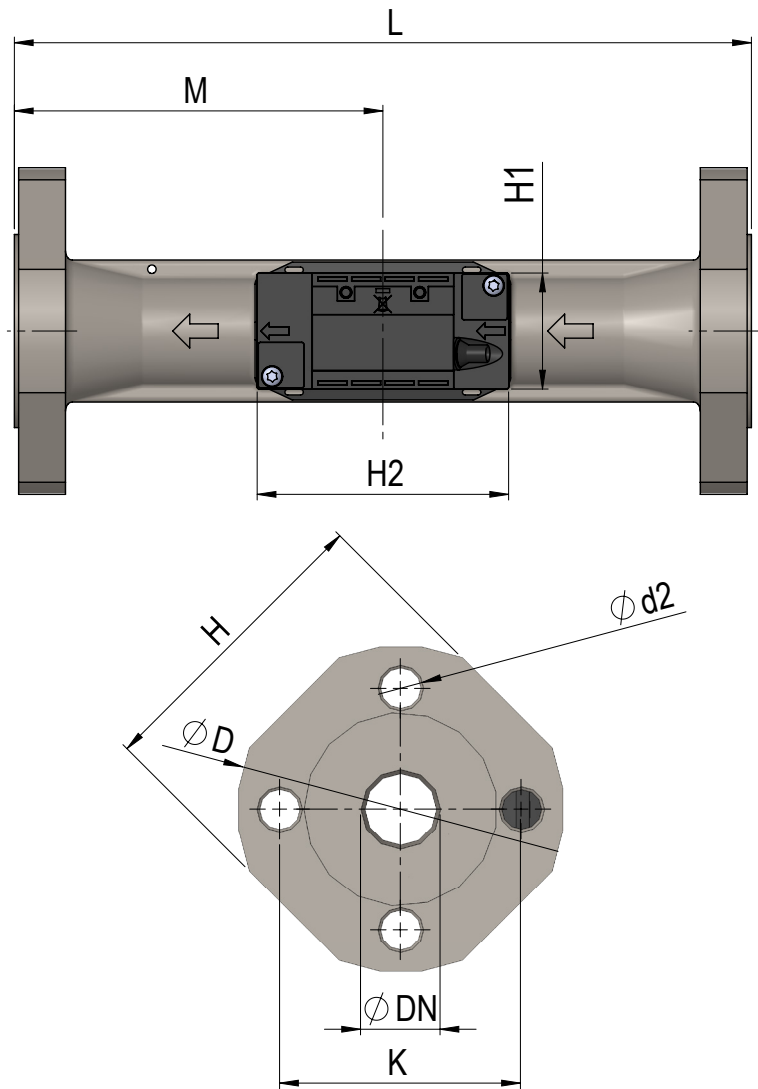


Thread EN ISO 228-1	L	M	H2	A	B1	B2	H1	Approx weight * [kg]
G1¼B (q _p 3.5)	260	L/2	88	16	51	20	41	1.9
G1¼ (q _p 6.0)	260	L/2	88	16	53	20	41	2.0
G1½ (q _p 6.0)	260	L/2	88	31	60	24	41	2.0
G2B (q _p 10)	300	L/2	88	40.2	55	29	41	2.9

* Including the electronics box and 10 m signal cable.

Dimensional sketches

ULTRAFLOW® 44, DN25, DN40 and DN50



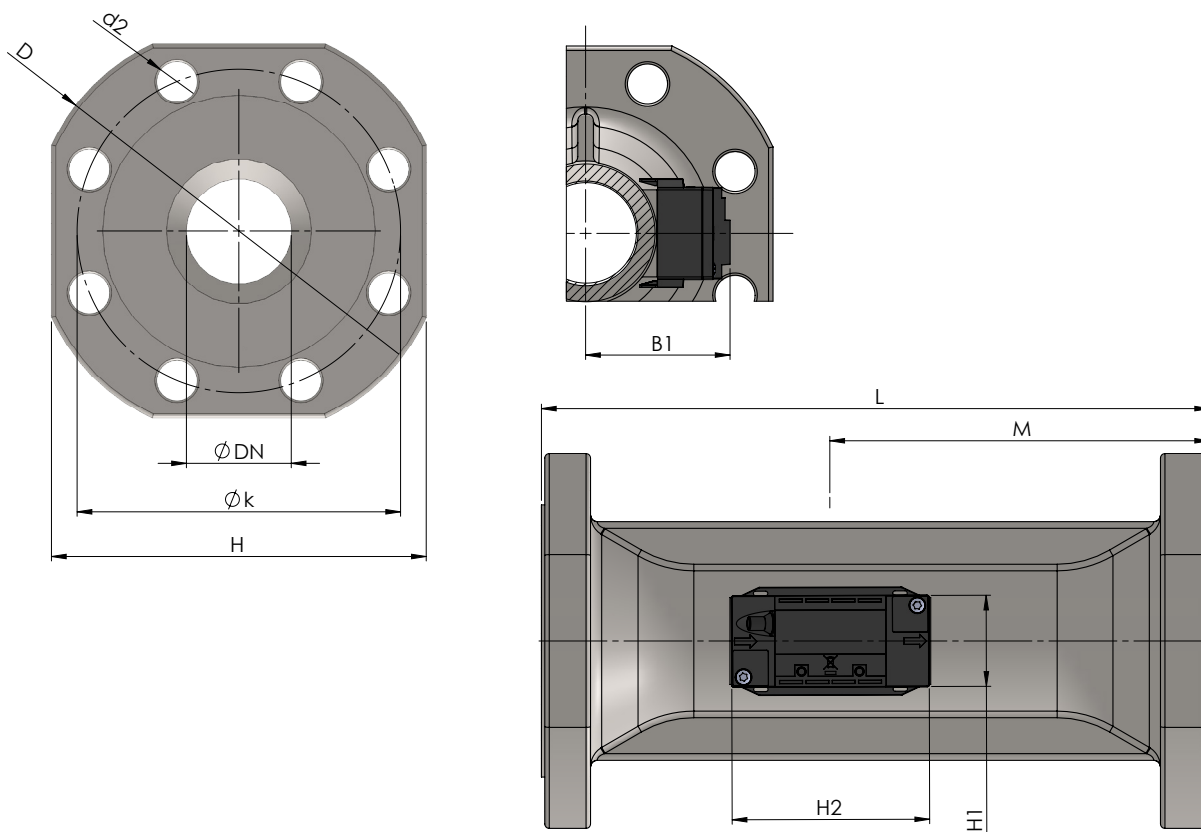
Flange facing type B, raised face according to EN 1092-1, PN25

Nom. diameter	L	M	H2	D	H	k	H1	Bolts			Approx weight *
								No.	Thread	d ₂	[kg]
DN25 (q _p 6.0)	260	L/2	88	115	106	85	41	4	M12	14	4.5
DN40 (q _p 10)	300	L/2	88	150	140	110	41	4	M16	18	7.4
DN50 (q _p 15)	270	155	88	165	145	125	41	4	M16	18	8.5

* Including the electronics box and 10 m signal cable.

Dimensional sketches

ULTRAFLOW® 44, DN65 to DN125



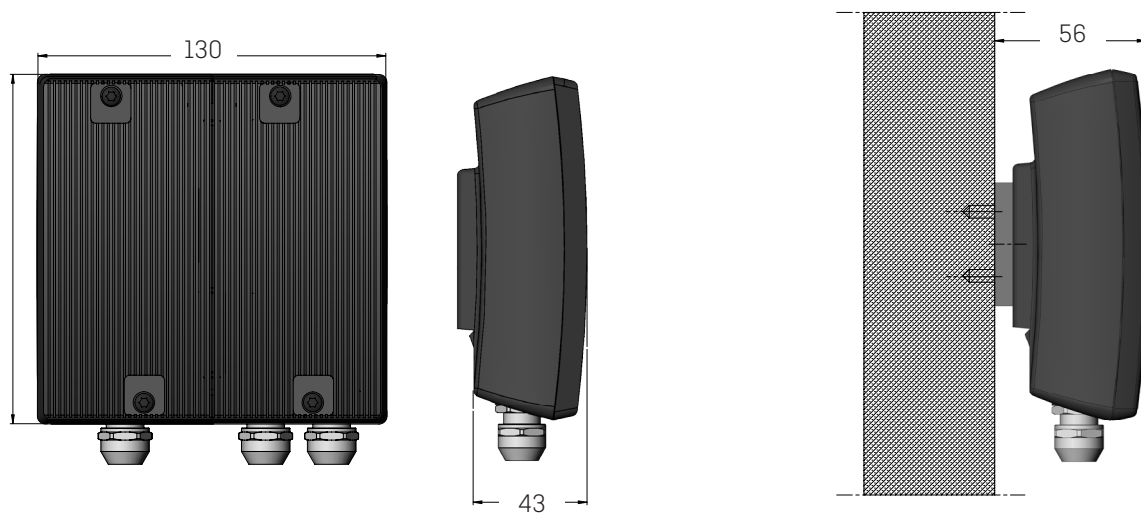
Flange facing type B, raised face according to EN 1092-1, PN25

Nom. diameter	L	M	H1	H2	B1	D	H	k	Bolts			Approx weight *
									No.	Thread	d ₂	
DN65 (q _p 25)	300	170	41	88	<H/2	185	168	145	8	M16	18	13.5
DN80 (q _p 40)	300	170	41	88	<H/2	200	184	160	8	M16	18	17.1
DN100 (q _p 60 and 100)	360	210	41	88	<H/2	235	220	190	8	M20	22	22.0
DN125 (q _p 100)	350	212	41	88	<H/2	270	260	220	8	M24	26	28.5

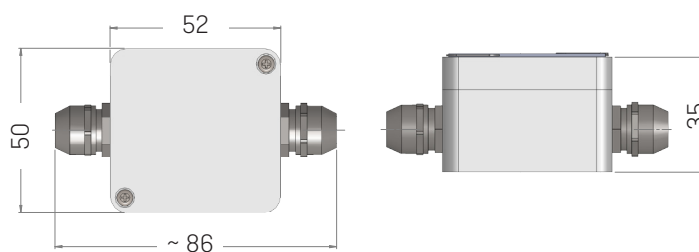
* Including the electronics box and 10 m signal cable.

Dimensional sketches

Pulse Transmitter / Pulse Divider



Cable Extender Box

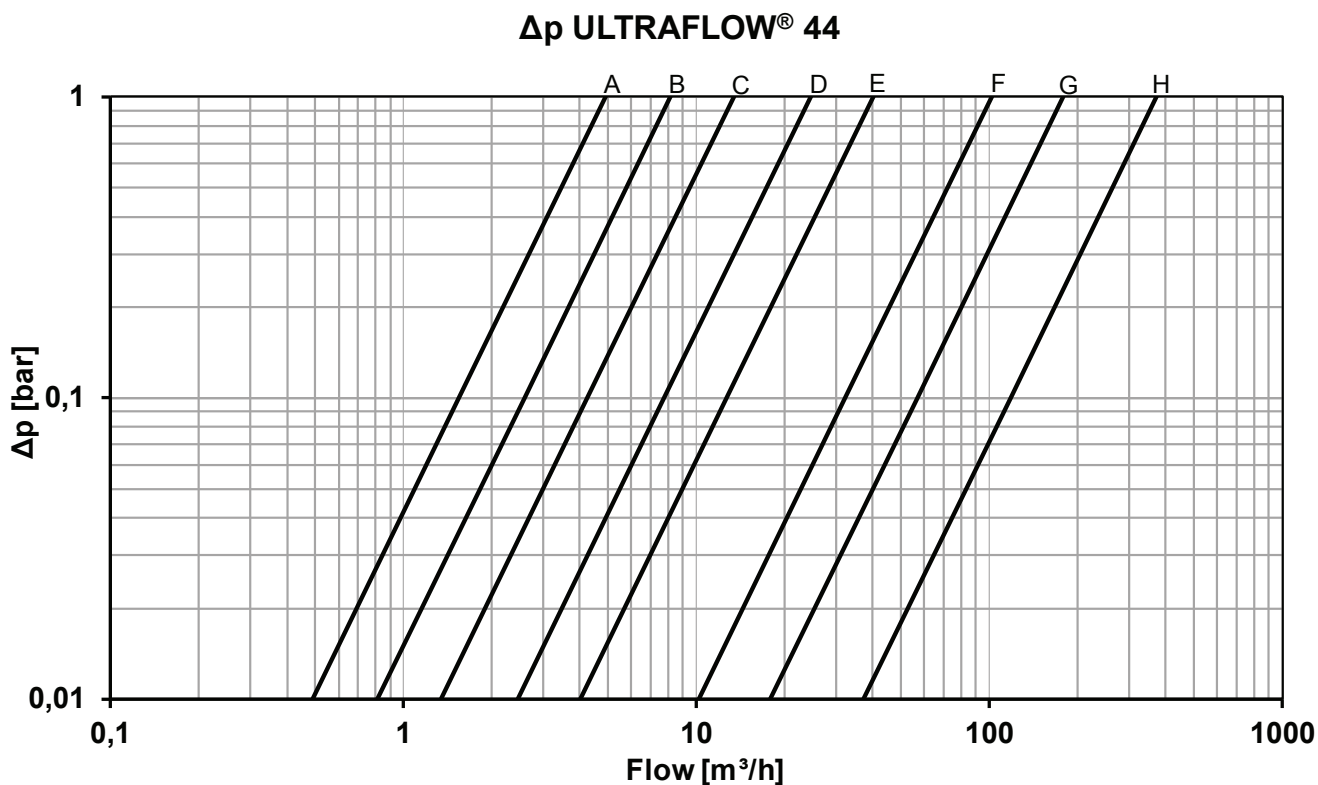


Note: To achieve the easiest possible adjustment (e.g. during reverification), we recommend to order ULTRAFLOW® 44 together with MULTICAL® 603 or MULTICAL® 803 whereby the flow sensor and the calculator will be delivered with identical serial number. Adjustment of separately delivered ULTRAFLOW® 44 requires individual encryption keys.

Pressure loss

Graph	Nom. flow q_p [m³/h]	Nom. diameter [mm]	$\Delta p@q_p$ [bar]	k_v^*	$q@0.25 \text{ bar}$ [m³/h]
A	1.5	DN15/DN20	0.09	4.9	2.4
B	2.5	DN20	0.09	8.2	4.1
C	3.5	DN25	0.07	13.4	6.8
D	6	DN25/DN32	0.06	24.5	12.3
E	10	DN40	0.06	40	20
E	15	DN50	0.14	40	20
F	25	DN65	0.06	102	51
G	40	DN80	0.05	179	90
H	60	DN100	0.03	373	187
H	100	DN100/DN125	0.07	373	187

* $q = k_v \times \sqrt{\Delta p}$



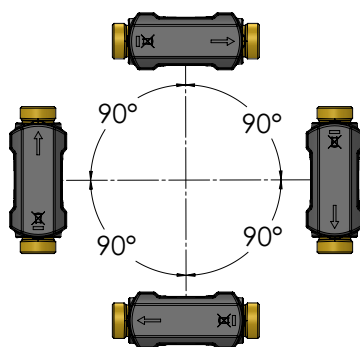
Installation

Orientation of Kamstrup flow sensors (mounted separately)

Kamstrup flow sensors can be installed horizontally, vertically or at an angle. For vertical mounting, Kamstrup flow sensors can be turned $\pm 360^\circ$ around the pipe axis.

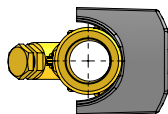
IMPORTANT!

The plastic box on the flow sensor must be turned to the side (when installed horizontally).

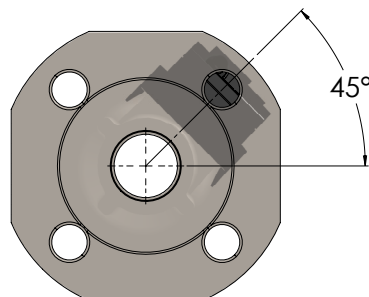
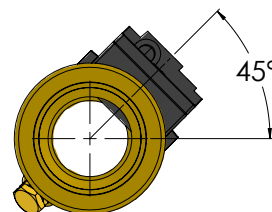


Recommendations for cooling and combined heat/cooling applications

Threaded flow sensors with $q_p \leq 2.5 \text{ m}^3/\text{h}$

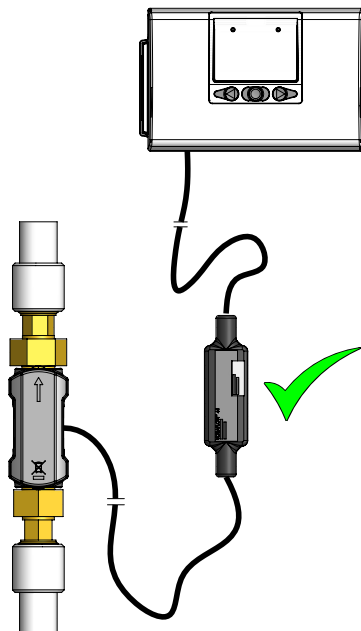


Threaded flow sensors with $q_p \geq 3.5 \text{ m}^3/\text{h}$ and flanged flow sensors

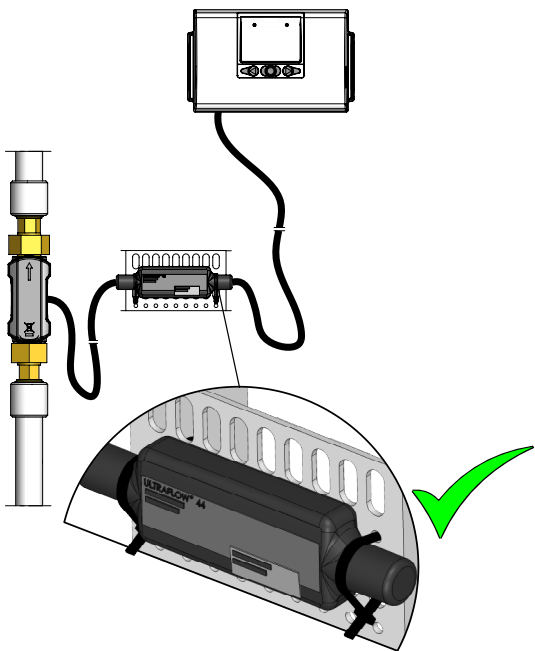


Mounting of the ULTRAFLOW® 44 electronics box

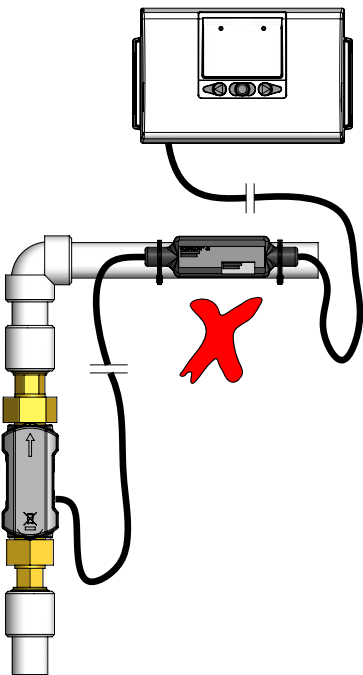
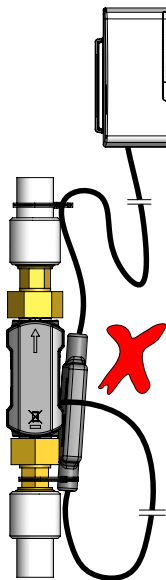
Freely hanging



Horizontally mounted with cable strips in humid environments



Must NOT be mounted on flow sensor or on pipes



Installation

Straight inlet

ULTRAFLOW® requires neither straight inlet nor outlet to meet the Measuring Instruments Directive (MID) 2014/32/EU, OIML R75:2002 and EN 1434:2022. A straight inlet section is only necessary in case of heavy flow disturbances before the meter. We recommend to follow the guidelines in CEN TR 13582.

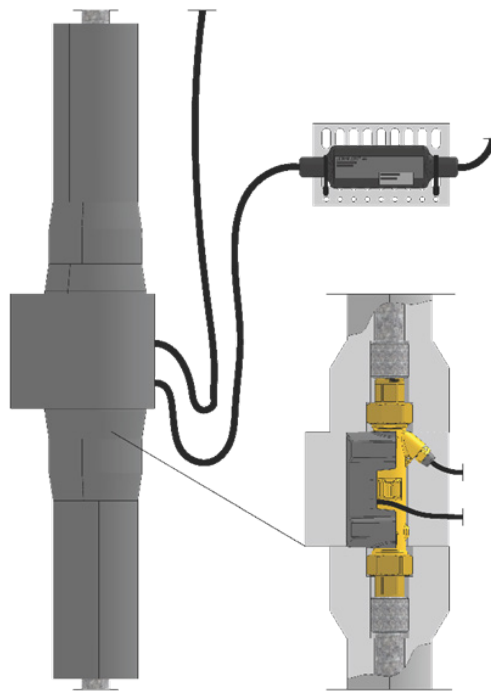
Operating pressure

To minimise the risk of measuring errors as a result of cavitation or air in the water it is recommended to keep a sufficient static pressure at the flow sensor outlet of min. 1.5 bar (1.0 bar for ULTRAFLOW® 44 type 65-4-XXHX-5HX) up to q_p and min. 2.5 bar (2.0 bar for ULTRAFLOW® 44 type 65-4-XXHX-5HX at q_s). This applies to temperatures up to approx. 80 °C. It is particularly recommended to follow this advice during meter testing. In absence of cavitation, the flow sensor is typically functioning at lower operating pressure. Furthermore, ULTRAFLOW® must not be exposed to pressure lower than the ambient pressure (vacuum). This minimises the risk of transducer damage.

Insulation and water resistance

ULTRAFLOW® 44 can, dependent on the medium temperature, be permanently insulated or enclosed including the plastic casing on the meter housing. If ULTRAFLOW® 44 is insulated, the electronics (PCB) must remain uninsulated and be moved away from the meter housing. Furthermore, temperature sensors (mounted in the flow sensor) must also remain uninsulated.

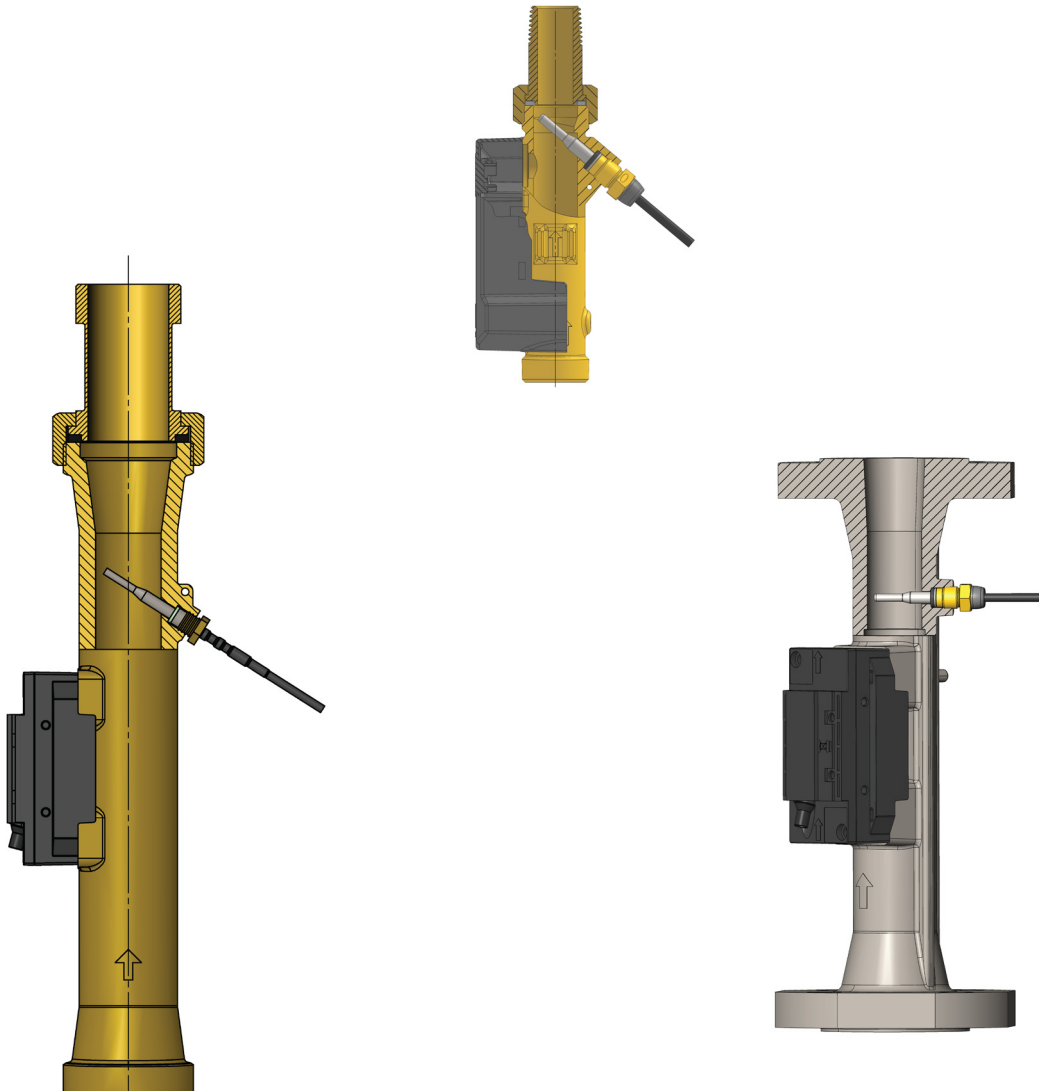
For further information about insulation of ULTRAFLOW® 44, see the technical description FILE100000287_EN, which can be downloaded from products.kamstrup.com.



ULTRAFLOW® 44 tolerates periodical submersion. This applies to the meter housing as well as the electronics (PCB) of ULTRAFLOW® 44. If ULTRAFLOW® 44 is flooded, the connected MULTICAL® must not be flooded. Furthermore, temperature sensors must also not be flooded and therefore must be mounted elsewhere in the installation.

Couplings and direct short sensor fitted in ULTRAFLOW® 44

A temperature sensor can be directly mounted in the outlet of flow sensors q_p 1.5...10 m³/h.



Electrical connection

Connecting MULTICAL® and ULTRAFLOW® 44

ULTRAFLOW® 44	->	MULTICAL®
Blue (GND)	->	11
Red (supply)	->	9
Yellow (signal)	->	10

Connecting via Pulse Transmitter/Cable Extender Box

ULTRAFLOW® 44	->	Pulse Transmitter/ Cable Extender Box		->	MULTICAL®
		Input	Output		
Blue (GND)	->	11	11A/11	->	11
Red (supply)	->	9	9A/9	->	9
Yellow (signal)	->	10	10A/10	->	10

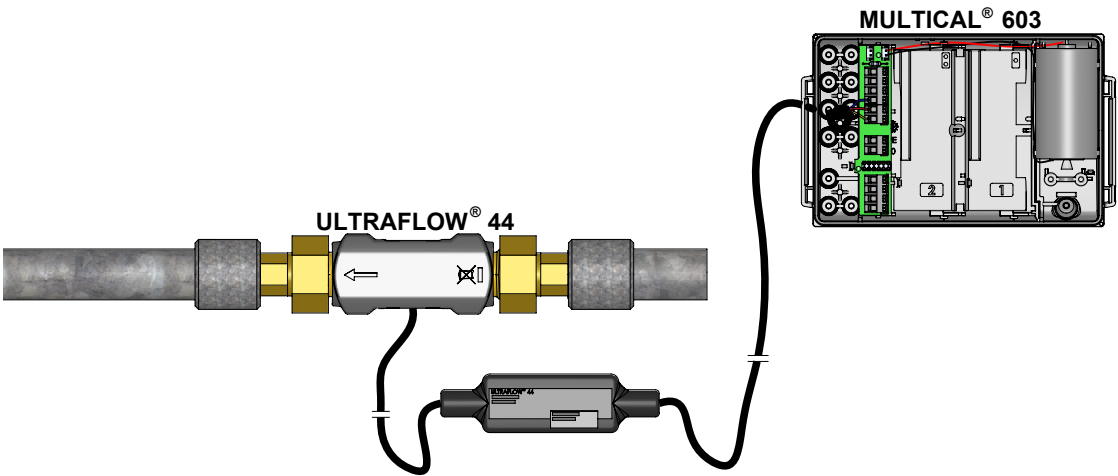
The Pulse Transmitter provides galvanic separation, but does not support extended info codes.

The Cable Extender Box does not provide galvanic separation, but supports extended info codes.

If long signal cables are used, consider the installation carefully. There must be **at least 25 cm** between the signal cable and all other cables due to EMC.

For further information about Pulse Transmitter and Cable Extender Box, see the technical description FILE100000272_EN, which can be downloaded from products.kamstrup.com.

Example of connecting ULTRAFLOW® 44 and MULTICAL®



Order specification

Type number *	q _p [m ³ /h]	q _i [m ³ /h]	q _s [m ³ /h]	Connection	Length [mm]	PN [bar]	Meter factor [pulses/l]	Material
65-4- CDHA -5HX	1.5	0.015	3	G¾B (R½)	110	16/25	100	Brass
65-4- CDHD -5HX	1.5	0.015	3	G1B (R¾)	130	16/25	100	Brass
65-4- CEHF -5HX	2.5	0.025	5	G1B (R¾)	190	16/25	60	Brass
65-4- CGJG -5HX	3.5	0.035	7	G1¼B (R1)	260	16/25	50	Brass
65-4- CHJG -5HX	6	0.06	12	G1¼B (R1)	260	16/25	25	Brass
65-4- CHLB -5HX	6	0.06	12	DN25	260	25	25	Stainless steel
65-4- CHJH -5HX	6	0.06	12	G1½B (R1¼)	260	16/25	25	Brass
65-4- CJJJ -5HX	10	0.1	20	G2B (R1½)	300	16/25	15	Brass
65-4- CJLD -5HX	10	0.1	20	DN40	300	25	15	Stainless steel
65-4- CKCE -5HX	15	0.15	30	DN50	270	25	10	Stainless steel
65-4- CLCG -5HX	25	0.25	50	DN65	300	25	6	Stainless steel
65-4- CMCH -5HX	40	0.4	80	DN80	300	25	5	Stainless steel
65-4- FACL -5HX	60	0.6	120	DN100	360	25	2.5	Stainless steel
65-4- FBCL -5HX	100	1	200	DN100	360	25	1.5	Stainless steel
65-4- FBCM -5HX	100	1	200	DN125	350	25	1.5	Stainless steel

* 5HX-code pertaining to final assembly, approvals, etc. is determined by Kamstrup A/S.
Some variants may not be included in national approvals.

ULTRAFLOW® 44 flow sensors with q_p 1.5 and 2.5 m³/h are by default delivered with 2.5 m cable, but can also be delivered with 10 m cable.

ULTRAFLOW® 44 flow sensors with q_p 3.5...100 m³/h are exclusively delivered with 10 m cable.

Pulse Transmitter/Pulse Divider – type no. 6699-903/6699-907

Pulse Transmitter/ Pulse Divider is delivered with built-in supply for ULTRAFLOW® 44. Battery, 24 VAC and 230 VAC supply are available.

State the required supply type when ordering.

Cable Extender Box - type no. 6699-036

If ULTRAFLOW® must be connected to MULTICAL® 603 or MULTICAL® 803 with a cable length between 10 m and 30 m and galvanic separation is not necessary, a Cable Extender Box can be utilized. See document no. 5512-2008 [DK-GB-DE-RO] for further information.

Pulse Transmitter provides galvanic separation, but does not support extended info codes.

Cable Extender Box does not provide galvanic separation, but supports extended info codes.

For further information about Pulse Transmitter/Pulse Divider and Cable Extender Box, see the Technical description FILE100000287_EN, which can be downloaded from www.kamstrup.com.

Accessories

Couplings including gaskets (PN16 and PN25)

Size	Nipple	Union	Type no. (1 pc.)	Type no. (2 pcs.)
DN15	R½	G¾	-	6561-323
DN20	R¾	G1	-	6561-324
DN25	R1	G1¼	6561-325	-
DN32	R1¼	G1½	6561-314	-
DN40	R1½	G2	6561-315	-

Gaskets for couplings (PN16 and PN25)

Size (union)	Type no. (1 pc.)
G¾	2210-061
G1	2210-062
G1¼	2210-063
G1½	2210-064
G2	2210-065

Gaskets for flanged meters (PN25)

Size	Type no. (1 pc.)
DN25	2210-133
DN40	2210-132
DN50	2210-099
DN65	2210-141
DN80	2210-140
DN100	1150-142
DN125	1150-153

For further information about ULTRAFLOW® 44 DN15-125, see the technical description FILE100000272_EN, which can be downloaded from products.kamstrup.com.

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