ULTRAFLOW® 34
DN15-125
DATA SHEET

- **Ultrasonic flow sensor**
- **For flow from 1.5 m^3/h up to 100 m^3/h**
- **Compact design**
- **Static meter with no moving parts**
- **Large dynamic range**
- **No wear**
- **Exceptionally accurate**
- **Longevity**

MID-2004/22/EC

CE M14 0200

Application

ULTRAFLOW® 34 is a static flow sensor based on the ultrasonic measuring principle. The prime area of application is as a volume flow sensor for use with thermal energy meters such as MULTICAL®. ULTRAFLOW® 34 has been designed for use in cooling and heat/cooling installations where water is used as the heat-bearing medium.

ULTRAFLOW® 34 is not suitable for use with other media than water and should therefore not be used with e.g. non-freezing additives like glycol.

ULTRAFLOW® 34 employs microprocessor technology and ultrasonic measuring techniques. All circuits for calculating and measuring are collected on a single board, providing compact and rational design in addition to an exceptionally high level of measuring accuracy and reliability.

The flow is measured using bidirectional ultrasonic technique based on the transit time method, with proven long-term stability and accuracy. Two ultrasonic transducers are used to send the sound signal both against and with the flow direction.

The ultrasonic signal travelling with the flow direction reaches the opposite transducer first. The time diffe-rence between the two signals can be converted to a flow velocity and thus a volume.

A three-wire pulse cable is used to connect ULTRAFLOW® 34 to MULTICAL®.

This cable is used to supply the flow sensor from the calculator and also to send the signal to the calculator. The signal corresponds to the flow, or more correctly, a number of pulses proportional to the water volume flowing through the meter is transmitted.

If required a Pulse Transmitter can be used to supply ULTRAFLOW® 34, e.g. if the distance between MULTICAL® and ULTRAFLOW® 34 is 10 m or more. If ULTRAFLOW® 34 is used as pulse generator for other equipment, it must be connected through a Pulse Transmitter.

The Pulse Transmitter and the Pulse Divider have a built-in supply and a galvanically separated pulse output.

Kamstrup

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Indhold

Approvals

Type approval

ULTRAFLOW® 34 is approved in accordance with MID-2004/22/EC.
EC-Type Examination certificate: DK-0200-MI004-008.

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

CE-marking

ULTRAFLOW® 34 is marked in accordance with:

– MID-directive	2004/22/EC
– LV-directive	2006/95/EC (together with the Pulse Transmitter or the Pulse Divider)
– PE-directive	97/23/EC (DN50...DN125 category I)

MID-2004/22/EC

CE M14 0200

MID designation

– Mechanical environment	Class M1
– Electromagnetic environment	Class E1 and E2
– Ambient temperature	5...55 °C, closed location (indoor installation)

Technical data

Mechanical data

Metrological class	2 or 3
Environmental class	Complies with DS/EN 1434 class C
Ambient temperature	5...55 °C
Protection class	
– Flow sensor	IP65
– Pulse Transmitter	IP67
Temperature* of medium	2...130 °C or 2...50 °C
Storage temperature (empty sensor)	-25...60 °C
Pressure stage	PN16, PN25 flange

** If the temperature of the medium exceeds 90 °C a flange meter should be used. At medium temperature above 90 °C or at medium temperature more than 5 °C below ambient temperature ($T_{med} < T_{amb}$ - 5 °C), calculator and Pulse Transmitter must not be mounted on the flow sensor. Instead wall mounting is recommended.*

Technical data

Electrical data

Supply voltage	3.6 VDC ± 0.1 VDC
Battery (Pulse Transmitter)	3.65 VDC, D-Cell lithium
Replacement interval	6 years @ t_{BAT} <30 °C
Power supply (Pulse Transmitter)	230 VAC +15/-30 %, 48...52 Hz 24 VAC ± 30 %
Back-up supply	Integral super-cap eliminates operational disturbances due to short-term power-cuts
Cable length - Flow sensor - Pulse Transmitter	 Max. 10 m Depends on calculator
EMC data	Complies with DS/EN 1434 class C

Flowdata

Nom. flow q_p [m³/h]	Nom. diameter [mm]	Meter factor [1] [imp./l]	Dynamic range q_i:q_p	q_s:q_p	Flow@125 Hz [2] [m³/h]	Δp@q_p [bar]	Min. cut off [l/h]
1.5	DN15 & DN20	100	1:100	2:1	4.5	0.22	3
2.5	DN20	60	1:100	2:1	7.5	0.03	5
3.5	DN25	50	1:100	2:1	9	0.07	7
6	DN25	25	1:100	2:1	18	0.2	12
10	DN40	15	1:100	2:1	30	0.06	20
15	DN50	10	1:100	2:1	45	0.14	30
25	DN65	6	1:100	2:1	75	0.06	50
40	DN80	5	1:100	2:1	90	0.05	80
60	DN100	2.5	1:100	2:1	180	0.03	120
100	DN100 & DN125	1.5	1:100	2:1	300	0.07	200

[1] The meter factor can be seen on the ULTRAFLOW® label on the meter.
[2] Saturation flow. Max. pulse frequency 128 Hz is maintained at higher flow rates.

Materials

Wetted parts

ULTRAFLOW® 34, q_p 1.5 m³/h

Housing, gland	DZR brass (Dezincification resistant brass)
Transducers	Stainless steel, W.no. 1.4401
Gaskets	EPDM
Reflectors	Thermoplastic, PES 30 % GF and stainless steel, W.no. 1.4301
Measuring pipe	Thermoplastic, PES 30 % GF

ULTRAFLOW® 34, q_p 2.5 to 100 m³/h

Housing, gland	DZR brass (Dezincification resistant brass)
Housing, flange	Stainless steel, W.no. 1.4308
Transducers	Stainless steel, W.no. 1.4401
Gaskets	EPDM
Reflectors	Stainless steel, W.no. 1.4301
Measuring pipe	Thermoplastic, PES 30 % GF

Electronic housing

Base	Thermoplastic, PBT 30 % GF
Lid	Thermoplastic, PC 20 % GF

Connection cable

Silicone cable (3 x 0.5 mm²)

Type summary

Nom. flow q_p [m^3/h]	Size	
1.5	G¾B x 110 mm	G1B x 130 mm
2.5	G1B x 190 mm	
3.5	G5/4B x 260 mm	
6	G5/4B 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

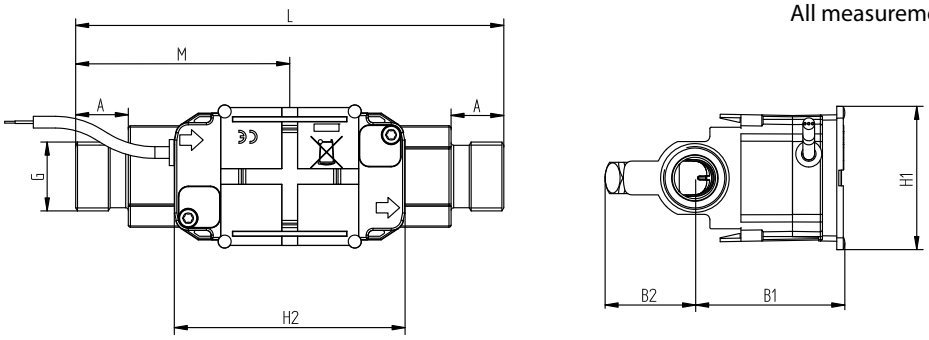
Thread EN ISO 228-1

Flange EN 1092, PN25. Flange facing type B, raised face

Dimensional sketches

ULTRAFLOW® 34, G¾B and G1B

All measurements are in mm, unless otherwise stated.

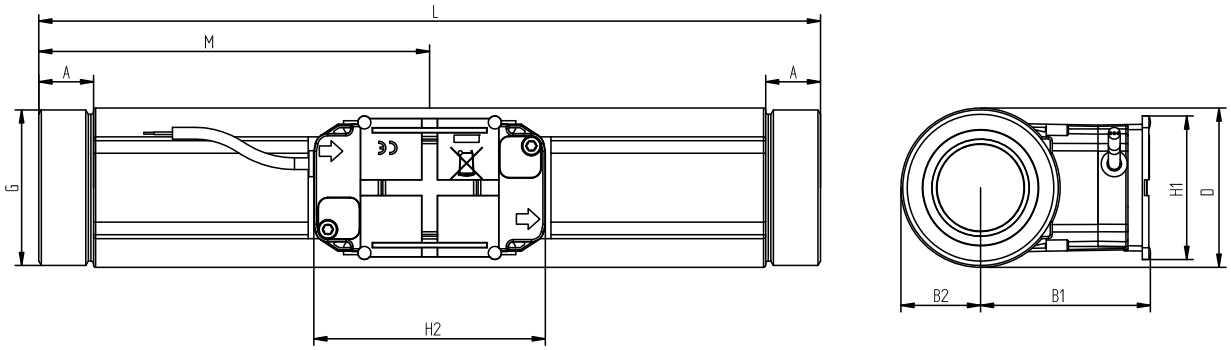


Thread EN ISO 228-1

Thread	L	M	H2	A	B1	B2	H1	App. weight [kg]
G¾B	110	L/2	89	10.5	58	35	55	0.8
G1B	130	L/2	89	20.5	58	35	55	1.1
G1B	190	L/2	89	20.5	58	36	55	1.3

Dimensional sketches

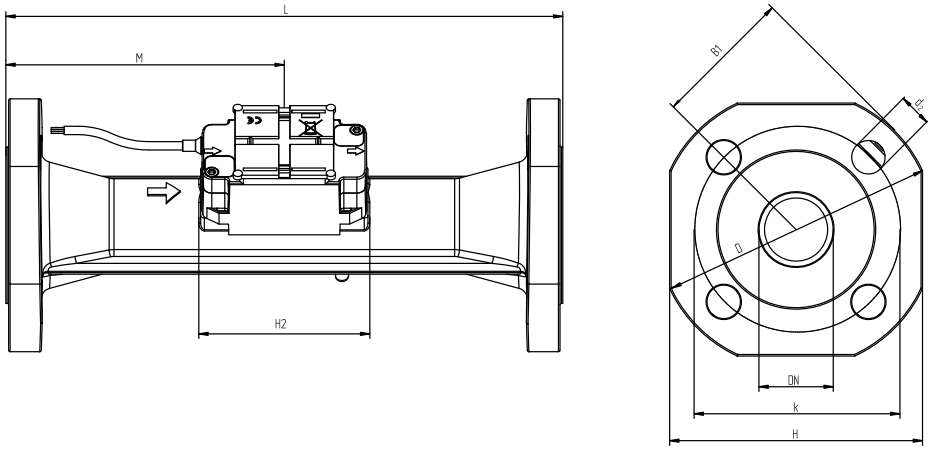
ULTRAFLOW® 34, G5/4B and G2B



Thread EN ISO 228-1

Thread	L	M	H2	A	B1	B2	H1	App. weight [kg]
G5/4B	260	L/2	89	17	58	22	55	2.3
G2B	300	L/2	89	21	65	31	55	4.5

ULTRAFLOW® 34, DN40 and DN50

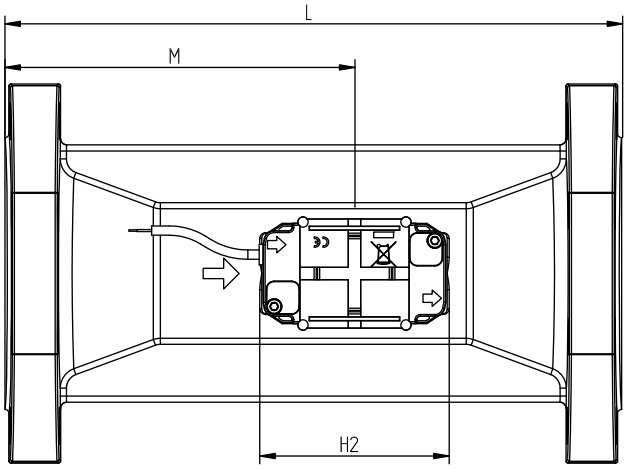


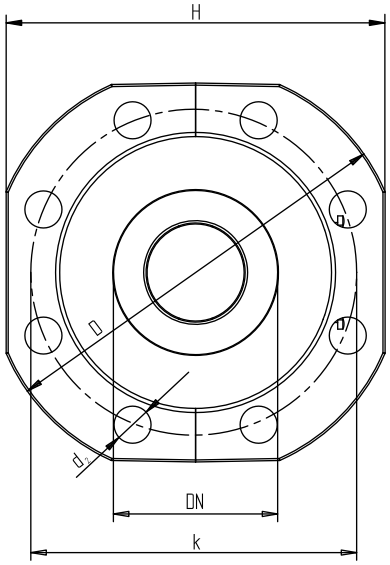
Flange EN 1092, PN25
Flange facing type B, raised face

Nom. diameter	L	M	H2	B1	D	H	k	Bolts			App. weight
								No.	Thread	d_2	[kg]
DN40	300	L/2	89	<D/2	150	136	110	4	M16	18	8.3
DN50	270	155	89	<D/2	165	145	125	4	M16	18	10.1

Dimensional sketches

ULTRAFLOW® 34, DN65 to DN125

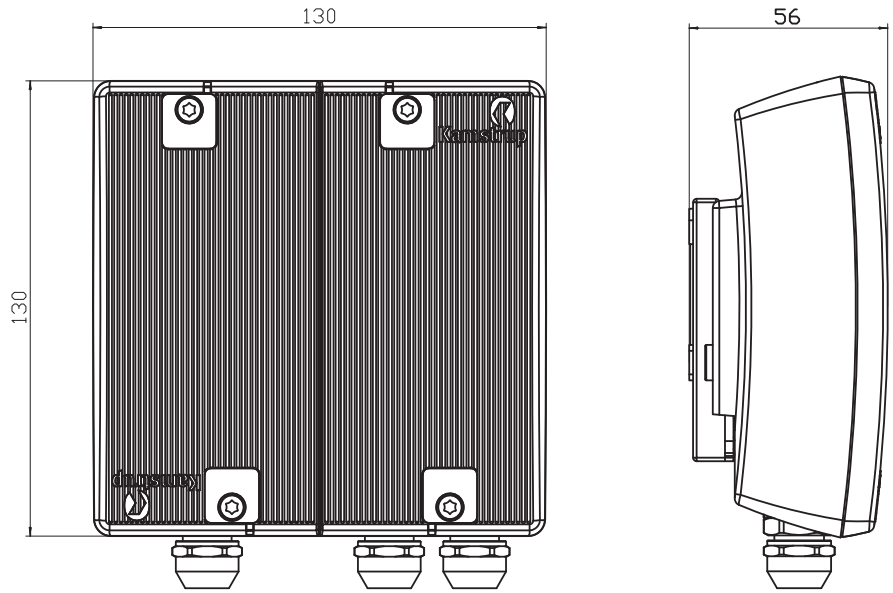




Flange EN 1092, PN25
Flange facing type B, raised face

Nom. diameter								Bolts			App.weight
	L	M	H2	B1	D	H	k	No.	Thread	d_2	[kg]
DN65	300	170	89	<H/2	185	168	145	8	M16	18	13.2
DN80	300	170	89	<H/2	200	184	160	8	M16	18	16.8
DN100	360	210	89	<H/2	235	220	190	8	M20	22	21.7
DN125	350	212	89	<H/2	270	260	220	8	M24	28	28.2

Pulse Transmitter

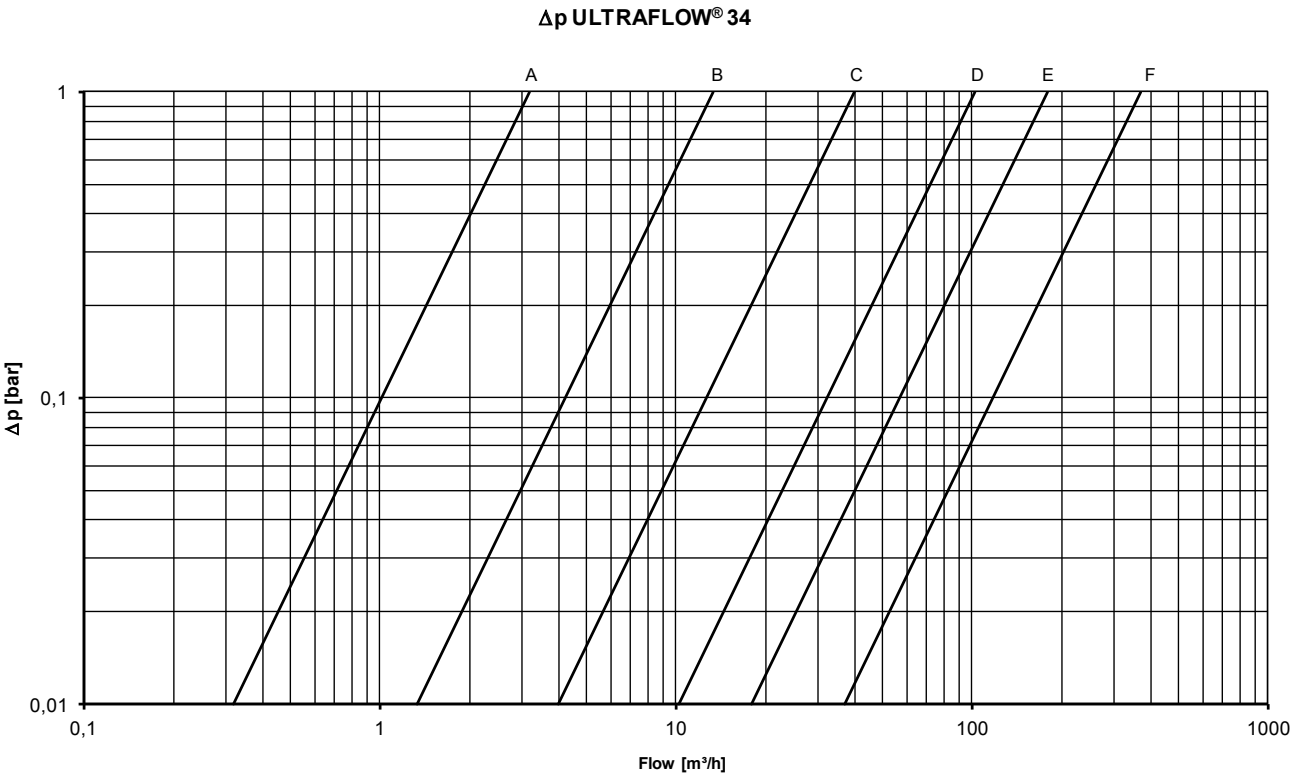


Pressure loss

Graph	q_p [m³/h]	Nom. diameter	k_v [3)]	Q@0.25 bar [m³/h]
A	1.5	DN15 & DN20	3.2	1.6
B	2.5 & 3.5 & 6	DN20 & DN25	13.4	6.7
C	10 & 15	DN40 & DN50	40	20
D	25	DN65	102	51
E	40	DN80	179	90
F	60 & 100	DN100 & DN125	373	187

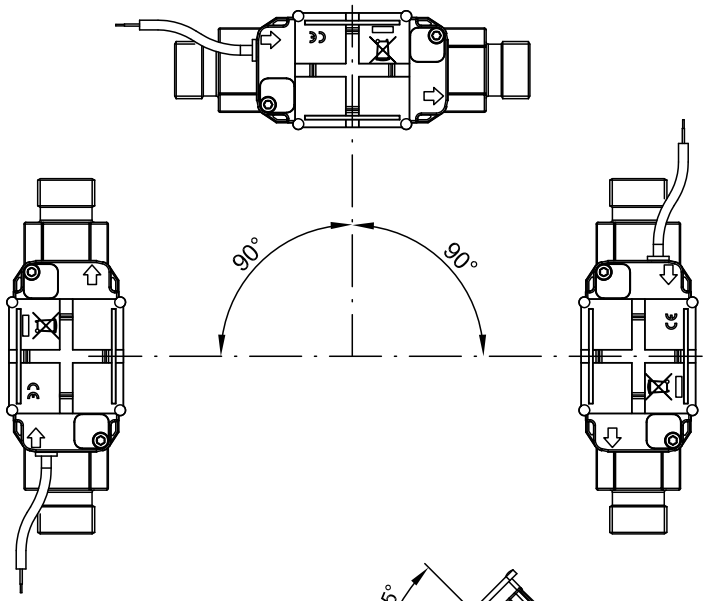
[3)] $q=k_v \times \sqrt{\Delta p}$

Pressure loss graphs



Installation

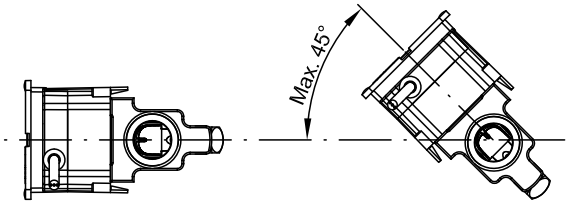
Installation angle for ULTRAFLOW® 34



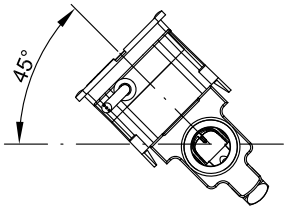
ULTRAFLOW® 34 may be installed horizontally, vertically or at an angle.

IMPORTANT!

With ULTRAFLOW® 34, the electronics/plastic case must be placed to the side (with horizontal installation).



ULTRAFLOW® 34 may be turned up to +45° around the pipe axis.



At risk of condensation, e.g. in cooling installations, or if ULTRAFLOW® 34 is installed in moist environments, ULTRAFLOW® 34 must be turned +45° around the pipe axis.

Straight inlet

ULTRAFLOW® requires neither straight inlet nor outlet to meet the Measuring Instruments Directive (MID) 2004/22/EC, OIML R75:2002 and EN 1434:2007. Only in case of heavy flow disturbances before the meter will a straight inlet section be necessary. We recommend to follow the guidelines in CEN CR 13582.

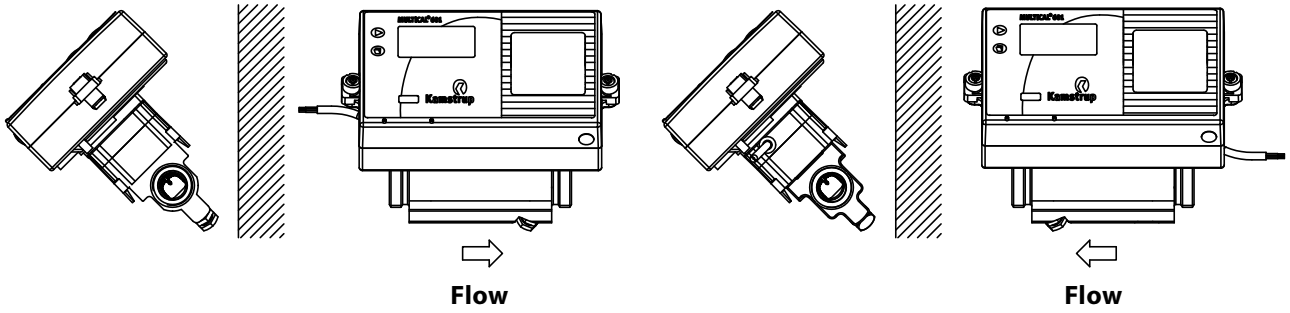
Working Pressure

In order to prevent cavitation the back pressure at ULTRAFLOW® 34 must be min. 1.5 bar at q_p and min. 2.5 bar at q_s. This applies to temperatures up to approx. 80 °C.

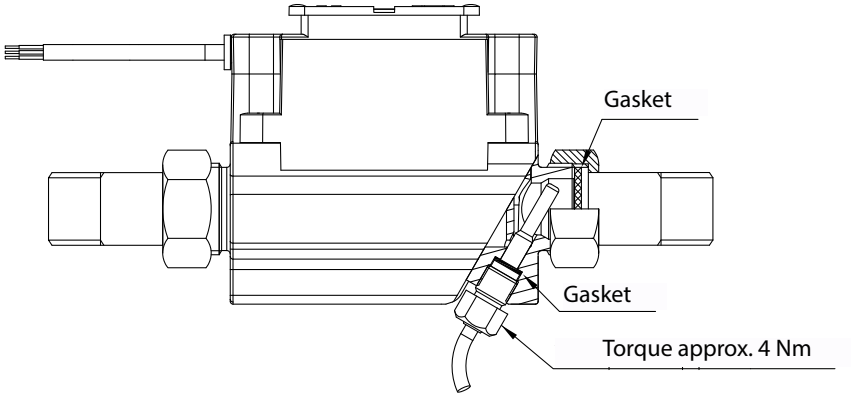
ULTRAFLOW® 34 must not be exposed to lower pressure than the ambient pressure (vacuum).

Examples of installation

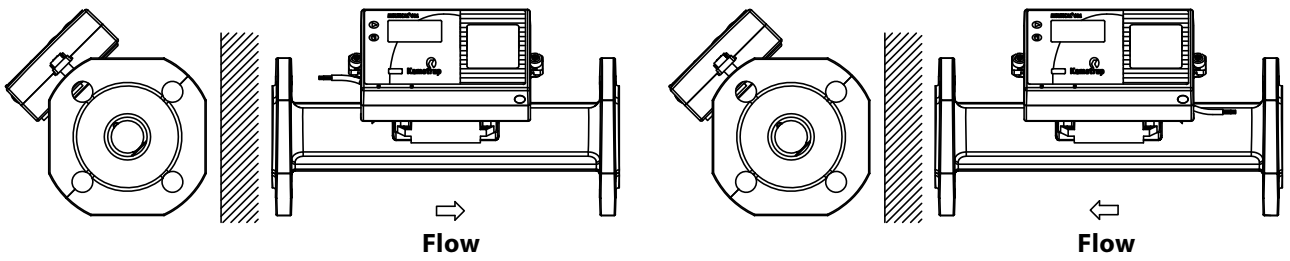
Gland meter with MULTICAL® fitted directly on ULTRAFLOW® 34.



Glands and short direct sensor fitted in ULTRAFLOW® 34 (G¾B (R½) and G1B (R¾) only).



Flange meter with MULTICAL® fitted directly on ULTRAFLOW® 34.



Note: At medium temperature above 90 °C or at medium temperature more than 5 °C below ambient temperature ($T_{med} < T_{amb}$ - 5 °C), calculator and Pulse Transmitter must not be mounted on the flow sensor. Instead wall mounting is recommended.

Electrical connection

Connecting MULTICAL® & ULTRAFLOW® 34

ULTRAFLOW® 34	->	MULTICAL®
Blue (GND)	->	11
Red (supply)	->	9
Yellow (signal)	->	10

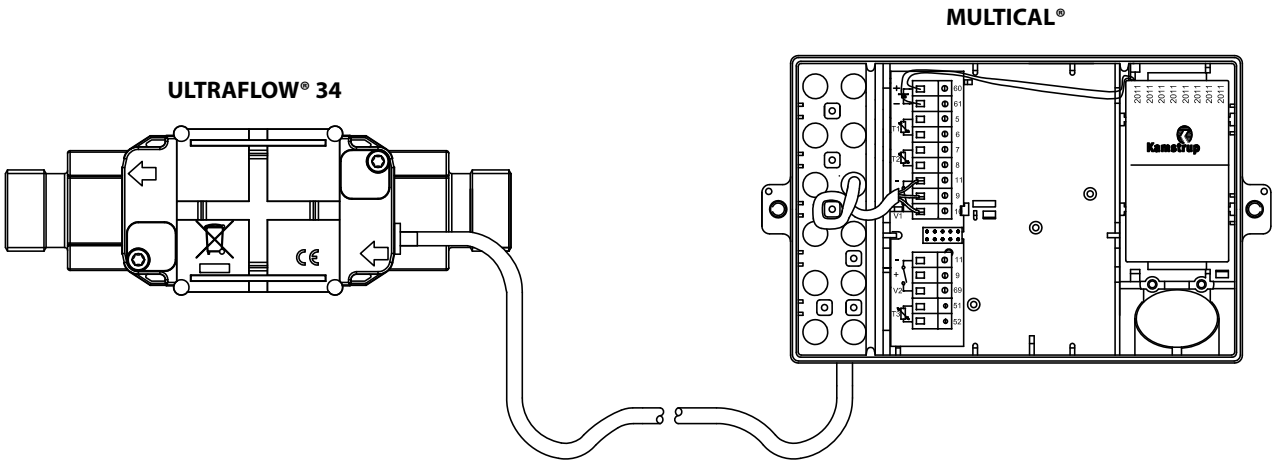
Connecting via Pulse Transmitter

ULTRAFLOW® 34	->	Pulse Transmitter		->	MULTICAL®
		Input	Output		
Blue (GND)	->	11	11A	->	11
Red (supply)	->	9	9A	->	9
Yellow (signal)	->	10	10A	->	10

If long signal cables are used, please 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, see the technical description 5512-385.

Example of connecting ULTRAFLOW® 34 and MULTICAL®



Order specification

Type number [5]			q_p [m³/h]	q_i [m³/h]	q_s [m³/h]	Connection	Length [mm]	Meter factor [imp./l]	CCC (high res.)	Material
65-3-	CDAA	-XXX	1.5	0.015	3	G¾B (R½)	110	100	419 (407)	Brass
65-3-	CDAD	-XXX	1.5	0.015	3	G1B (R¾)	130	100	419 (407)	Brass
65-3-	CEAF	-XXX	2.5	0.025	5	G1B (R¾)	190	60	498 (-)	Brass
65-3-	CGAG	-XXX	3.5	0.035	7	G5/4B (R1)	260	50	451 (436)	Brass
65-3-	CHAG	-XXX	6	0.06	12	G5/4B (R1)	260	25	437 (438)	Brass
65-3-	CJAJ	-XXX	10	0.1	20	G2B (R1½)	300	15	478 (483)	Brass
65-3-	CJCD	-XXX	10	0.1	20	DN40	300	15	478 (483)	Stainless steel
65-3-	CKCE	-XXX	15	0.15	30	DN50	270	10	420 (485)	Stainless steel
65-3-	CLCG	-XXX	25	0.25	50	DN65	300	6	479 (-)	Stainless steel
65-3-	CMCH	-XXX	40	0.4	80	DN80	300	5	458 (486)	Stainless steel
65-3-	FACL	-XXX	60	0.6	120	DN100	360	2.5	470 (487)	Stainless steel
65-3-	FBCL	-XXX	100	1	200	DN100	360	1.5	480 (488)	Stainless steel
65-3-	FBCM	-XXX	100	1	200	DN125	350	1.5	480 (488)	Stainless steel

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

ULTRAFLOW® 34 is as default supplied with 2.5 m cable, but can also be supplied with 5 or 10 m cable.

Pulse Transmitter – type No. 66-99-903
The Pulse Transmitter is supplied with built-in supply for ULTRAFLOW® 34. Battery, 24 VAC and 230 VAC supply are available. Please state the required supply type when ordering.

Accessories

Glands including gaskets (PN16)

Size	Nipple	Union	Type No.	2 pcs.
DN15	R½	G¾	-	6561-323
DN20	R¾	G1	-	6561-324
DN25	R1	G5/4	6561-325	-
DN40	R1½	G2	6561-315	-

Gaskets for flange meters (PN25)

Size	Type No.
DN40	2210-132
DN50	2210-099
DN65	2210-141
DN80	2210-140
DN100	1150-142
DN125	1150-153

Gaskets for glands

Size (union)	Type No.
G¾	2210-061
G1	2210-062
G5/4	2210-063
G2	2210-065

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