ULTRAFLOW®

DATA SHEET

- **For flow 150 m³/h ≤ q_p ≤ 1000 m³/h**
- **Ultrasonic flow sensor**
- **Compact design**
- **Static meter with no moving parts**
- **Large dynamic range**
- **No wear**
- **Exceptionally accurate**
- **Longevity**

MID-2004/22/EC

CE M10 0200

TS 27.01 109

DS/EN 1434

Application

ULTRAFLOW® type 65-S/R 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 heat meters such as MULTICAL®. ULTRAFLOW® has been designed for use in heating installations where water is used as the heat-bearing medium.

ULTRAFLOW® employs micro-processor technology and ultrasonic measuring techniques. All circuits for calculting 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 difference between the two signals can be converted to a flow velocity and thus a volume.

A multiplug, placed beneath the seal, is used during communication and calibration.

A three-wire pulse cable is used to connect ULTRAFLOW® to the calculator. 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®, e.g. if the distance between MULTICAL® and ULTRAFLOW® is 10 m or more.

The Pulse Transmitter has a built-in supply and a galvanically separated pulse outlet.

Kamstrup

Industrivej 28, Stilling · DK-8660 Skanderborg · Tel.: +45 89 93 10 00 · Fax: +45 89 93 10 01 · info@kamstrup.com · www.kamstrup.com

ULTRAFLOW®
DATA SHEET

Contents

Approvals

Type approval

ULTRAFLOW® Types 65-S and 65-R are approved by DANAK in accordance with EN1434.

TS 27.01
109

DS/EN 1434

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

CE-marking

ULTRAFLOW® Types 65-S and 65-R are marked in accordance with:

– MID-directive	2004/22/EC
– EMC-directive	2004/108/EC
– LV-directive	2006/95/EC (together with the Pulse Transmitter)
– PE-directive	97/23/EC (DN150...DN250 category II)

MID-2004/22/EC

CE M10 0200

MID designation (q_p150...400 m³/h)

– Mechanical environment	Class M1
– Elektromagnetic environment	Class E1
– Ambient temperature	5...55°C, non condensing closed location (indoor installation)

Technical data

Mechanical data

Metrological class	2 or 3
Environmental class	Complies with DS/EN 1434:1997/A1:2002 class C
Ambient temperature	0....55°C
Protection class – Flow sensor – Pulse Transmitter	 IP65 IP54
Temperature of medium	15...130°C
Storage temperature – meter without battery – meter with battery	 -25...70°C -25...60°C
Pressure stage	PN25

Electrical data

Supply voltage	3.6 V ±10%
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	Max. 10 m
Cable length (Pulse Transmitter)	Depends on calculator
EMC data	Complies with DS/EN 1434:1997/A1:2002 class C

Flowdata

Nom. flow q_p [m³/h]	Nom. diameter	Meter factor[1] [imp./l]	Dynamic range q_i:q_p	q_s:q_p	Flow @125 Hz [2] [m³/h]	Δp [bar]	Min. cut off [l/h]
150 [3]	DN150	1	1:100	2:1	450	0.02	300
250 [3]	DN150	0.6	1:100	2:1	750	0.055	500
400 [3]	DN150	0.4	1:100	2:1	1125	0.038	800
400 [3]	DN200	0.4	1:100	2:1	1125	0.01	800
400 [3]	DN250	0.4	1:100	2:1	1125	0.01	800
600	DN200	0.25	1:100	2:1	1800	0.022	1200
600	DN250	0.25	1:100	2:1	1800	0.022	1200
1000	DN250	0.25	1:100	1.8:1	1800	0.015	2000

[1] The meter factor can be seen on the label on the side of the meter.
[2] Saturation flow. Max. pulse frequency 128 Hz is maintained at higher flow rates.
[3] MID approved.

Materials

Housing	AISI 304 (W.no. 1.4301)
Transducers	AISI 316/Enkotal
Gaskets	EPDM
Measuring pipe	Integral part of the housing

Electronic housing

Base	PBT with 30% GF
Lid	PC with 10% GF

Connection cable

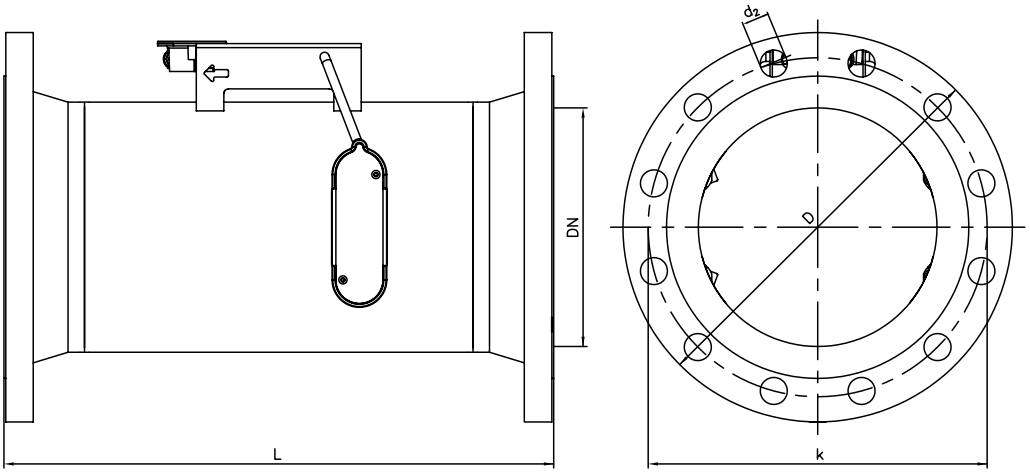
Silicone cable (3 x 0.5▫)

Type summary

Nom.flow q_p [m³/h]	Size		
150	DN150 x 500 mm		
250	DN150 x 500 mm		
400	DN150 x 500 mm	DN200 x 500 mm	DN250 x 600 mm
600	DN200 x 500 mm	DN250 x 600 mm	
1000	DN250 x 600 mm		

Flange EN 1092-1, PN25

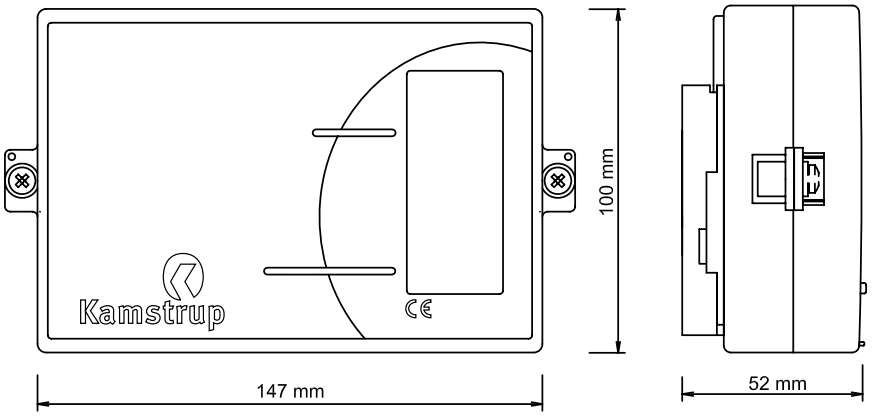
Dimension sketches



Flange EN 1092-1, PN25

Nom. diameter	L	D	k	Bolts			App. weight
				No.	Thread	d_2	[kg]
DN150	500	300	250	8	M24	26	37
DN150 (q_p 400 m³/h)	500	300	250	8	M24	26	32
DN200	500	360	310	12	M24	26	47
DN250	600	425	370	12	M27	30	68
DN250 (q_p 1000 m³/h)	600	425	370	12	M27	30	65

Pulse Transmitter

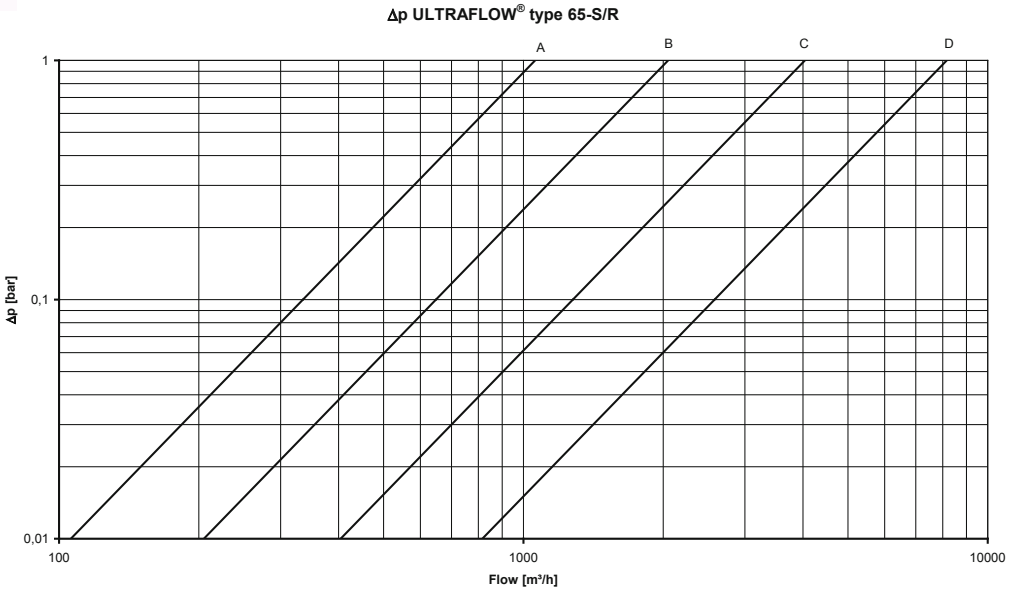


Pressure loss

Graph	q_p [m³/h]	Nom. diameter	k_v [4)]	Q@0.25 bar [m³/h]
A	150 & 250	DN150	1060	530
B	400	DN150	2050	1025
C	400 & 600	DN200 & DN250	4040	2020
D	1000	DN250	8160	4080

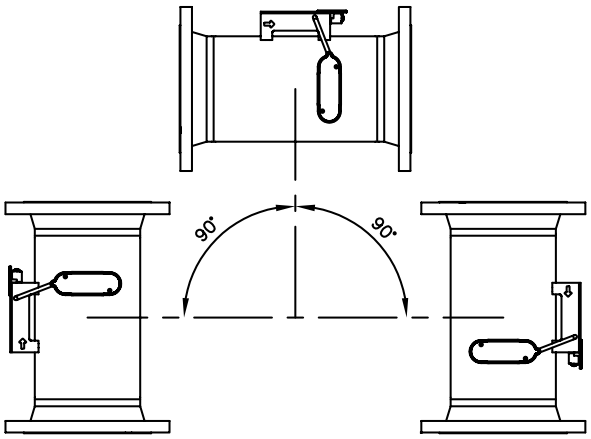
[4)] $q=k_v \times \sqrt{\Delta p}$

Pressure loss graphs



Installation

Installation angle for ULTRAFLOW®



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

Important!

The electronics must be placed upwards (with horizontal installation).

ULTRAFLOW® may be turned up to ±45° in relation to the pipe axis.

Straight inlet (UF 65-S)

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

Electrical connection

Connecting MULTICAL® og ULTRAFLOW®

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

Connecting via Pulse Transmitter

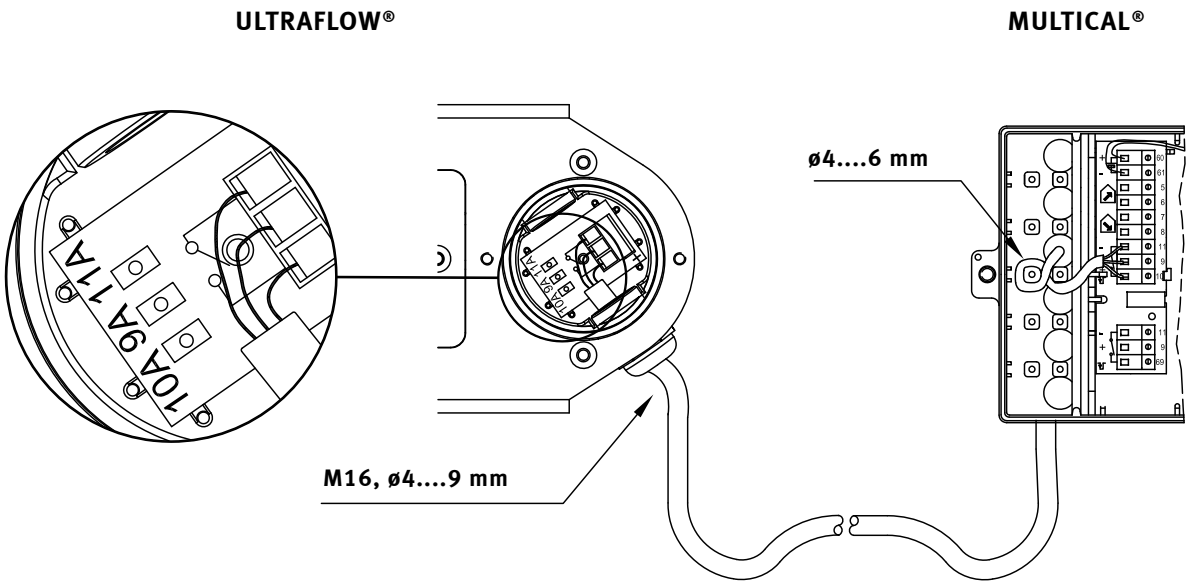
3.65 VDC fors. [5]	->	Pulse Transmitter
Red (+)	->	60
Black (-)	->	61

[5] *From battery or supply module*

ULTRAFLOW®	->	Pulse Transmitter		->	MULTICAL®
		In	Out		
Blue (GND)/11A	->	11	11A	->	11
Red (supply)/9A	->	9	9A	->	9
Yellow (signal)/10A	->	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.

Example of connecting ULTRAFLOW® to MULTICAL®



Order specification

The list below shows type numbers for ULTRAFLOW® 65-S.

Type number	Nom. flow q_p [m³/h]	Min. flow q_i [m³/h]	Max. flow q_s [m³/h]	Connection	Length [mm]	Meter factor [pulses/l]	CCC
65-S-FCCN-XXX	150	1.5	300	DN150	500	1	147
65-S-FDCN-XXX	250	2.5	500	DN150	500	0.6	181
65-S-FECN-XXX	400	4.0	800	DN150	500	0.4	171/191
65-S-FECP-XXX	400	4.0	800	DN200	500	0.4	171/191
65-S-FECR-XXX	400	4.0	800	DN250	600	0.4	171/191
65-S-FFCP-XXX	600	6.0	1200	DN200	500	0.25	172/192
65-S-FFCR-XXX	600	6.0	1200	DN250	600	0.25	172/192
65-S-F1CR-XXX	1000	10.0	1800	DN250	600	0.25	172/192

ULTRAFLOW® ≥DN150 is supplied **without** cable. A 5 m or 10 m cable can be ordered and delivered, separately.

Pulse Transmitter – Type No. 66-99-603
The Pulse Transmitter is supplied with built-in supply for ULTRAFLOW®. Battery, 24 VAC and 230 VAC supply are available. Please state the required supply type when ordering.

Accessories

Gaskets for flange meters

Size	Type No.
DN150	1150-140
DN200	1150-139
DN250	1150-141