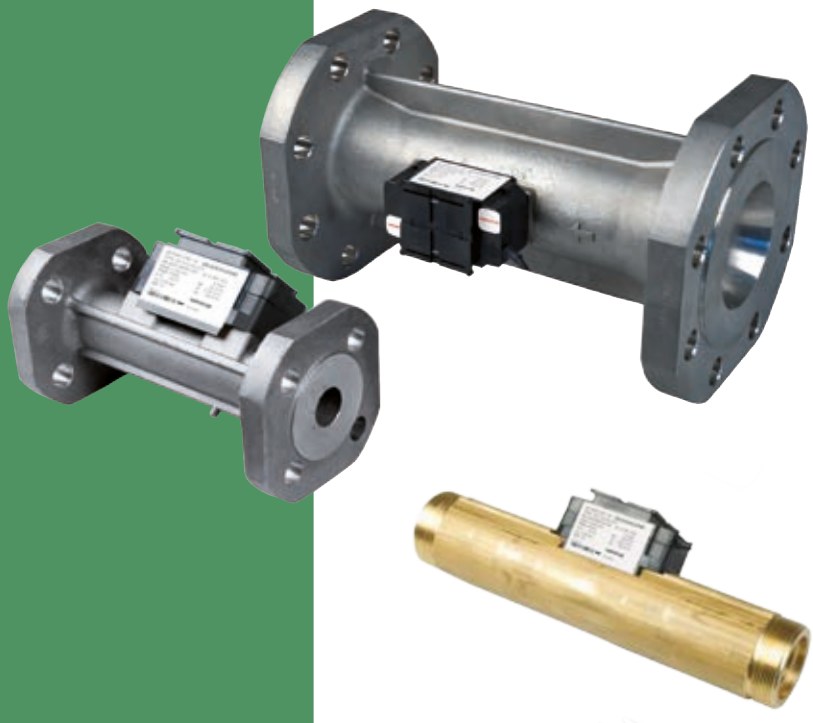
kamstrup

Data sheet

ULTRAFLOW® 54 DN20-125

- Ultrasonic flow sensor
- For flow from 2.5 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-2014/32/EU

CE M16 0200

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Application

ULTRAFLOW® 54 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® 54 has been designed for use in heating installations where water is used as the heat-bearing medium.

ULTRAFLOW® 54 employs micro-processor 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 difference 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® 54 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® 54, e.g. if the distance between MULTICAL® and ULTRAFLOW® 54 is 10 m or more. If ULTRAFLOW® 54 is used as pulse generator for other equipment, it must be connected through a Pulse Transmitter.

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

Approvals

Type approval

ULTRAFLOW® 54 approved in accordance with MID-2014/32/EU.

EC-Type Examination certificate	DK-0200-MI004-008
MID-certificated according to Modul D	DK-0200-MID-D-001

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

CE-marking

ULTRAFLOW® 54 is marked in accordance with:

– MID-directive	2014/32/EU
– 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)

MID-2014/32/EU

CE M16 0200

MID designation

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

Technical data

Mechanical data

Metrological class	2 or 3
Environmental class	Complies with EN 1434 class C
Ambient temperature	5...55 °C
Humidity	< 93 % RF non condensing
Protection class	
– Flow sensor	IP65
– Pulse Transmitter	IP67
Medium in flow sensor	Water
Medium temperature*	15...130 °C
Storage temperature (empty sensor)	-25...60 °C
Pressure stage	PN16, PS16/PN25, PS25 flange

* If the temperature of the medium exceeds 90 °C a flange meter should be used. Additionally, MULTICAL® calculator or the Pulse Transmitter should be wall-mounted.

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 %, 50 Hz 24 VAC ± 50 %, 50 Hz
Back-up supply	Integral super-cap eliminates operational disturbances due to short-term power-cuts
Cable length	
– flow sensor	Max 10 m
– Pulse Transmitter	Depends on calculator (Max 100 m when connected to MULTICAL®)
EMC data	Complies with EN 1434 class C

Flow data

Nom. flow q_p [m^3/h]	Nom. diameter [mm]	Meter factor * [imp./l]	Dynamic range $q_p:q_i$	$q_s:q_p$	Flow @125 Hz ** [m^3/h]	$\Delta p@q_p$ [bar]	Min. cut off [l/h]
2.5	DN20	60	100:1	2:1	7.5	0.03	5
3.5	DN25	50	100:1	2:1	9	0.07	7
6	DN25 & DN32	25	100:1	2:1	18	0.2	12
10	DN40	15	100:1	2:1	30	0.06	20
15	DN50	10	100:1	2:1	45	0.14	30
25	DN65	6	100:1	2:1	75	0.06	50
40	DN80	5	100:1	2:1	90	0.05	80
60	DN100	2.5	100:1	2:1	180	0.03	120
100	DN100 & DN125	1.5	100:1	2:1	300	0.07	200

* The meter factor appears from the type label.

** Saturation flow. Max. pulse frequency 128 Hz is maintained at higher flow rates.

Materials

Wetted parts

Housing, thread	DZR brass (Dezincification resistant brass), CW602N
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, PC 10 % GF
Lid	Thermoplastic, PC 20 % GF

Connection cable

Silicone cable (3 x 0.5 mm^2)

Type summary

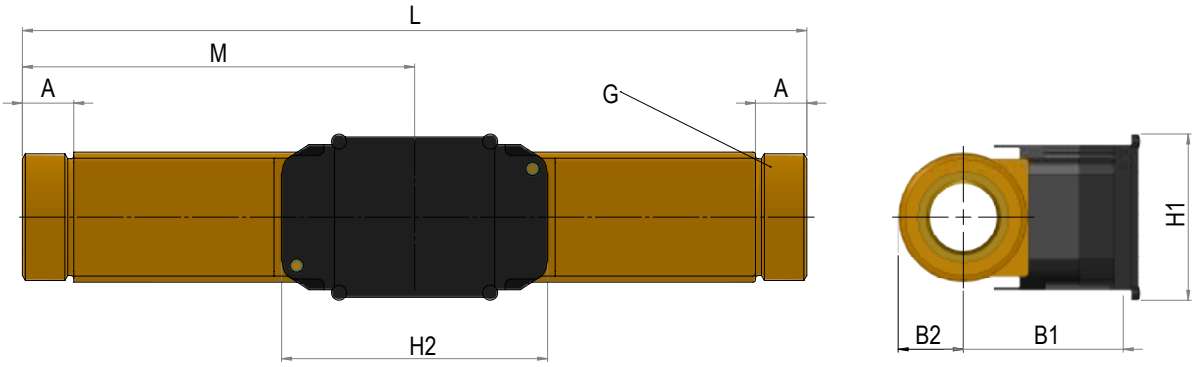
Nom.flow q_p [m^3/h]	Size		
2.5	DN20 x 190 mm		
3.5	G5/4B x 260 mm	DN25 x 260 mm	
6	G5/4B x 260 mm	DN25 x 260 mm	DN32 x 260 mm
10	G2B x 300 mm	DN40 x 300 mm	
15	DN50 x 270 mm		
25	DN65 x 300 mm		
40	DN80 x 300 mm		
60	DN100 x 360 mm		
100	DN100 x 360 mm	DN125 x 350 mm	

Thread EN ISO 228-1.
Flange EN 1092-1, PN25. Flange facing type B, raised face.

Dimensional sketches

ULTRAFLOW® 54, G5/4B and G2B

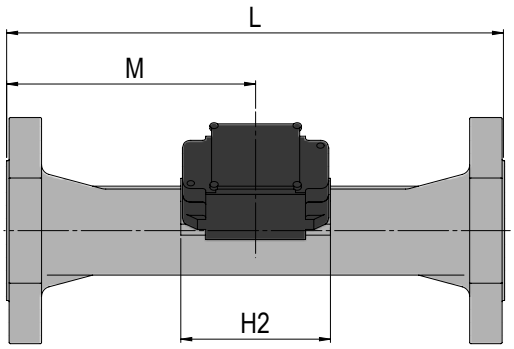
All measurements are in mm, unless otherwise stated.

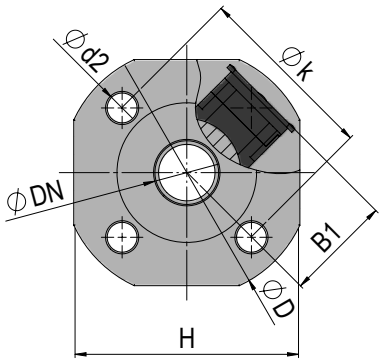


Thread EN ISO 228-1	L	M	H2	A	B1	B2	H1	App. weight [kg]
G5/4B	260	L/2	89	17	58	22	55	2.3
G2B	300	L/2	89	21	65	31	55	4.5

Dimensional sketches

ULTRAFLOW® 54, DN20 to DN50



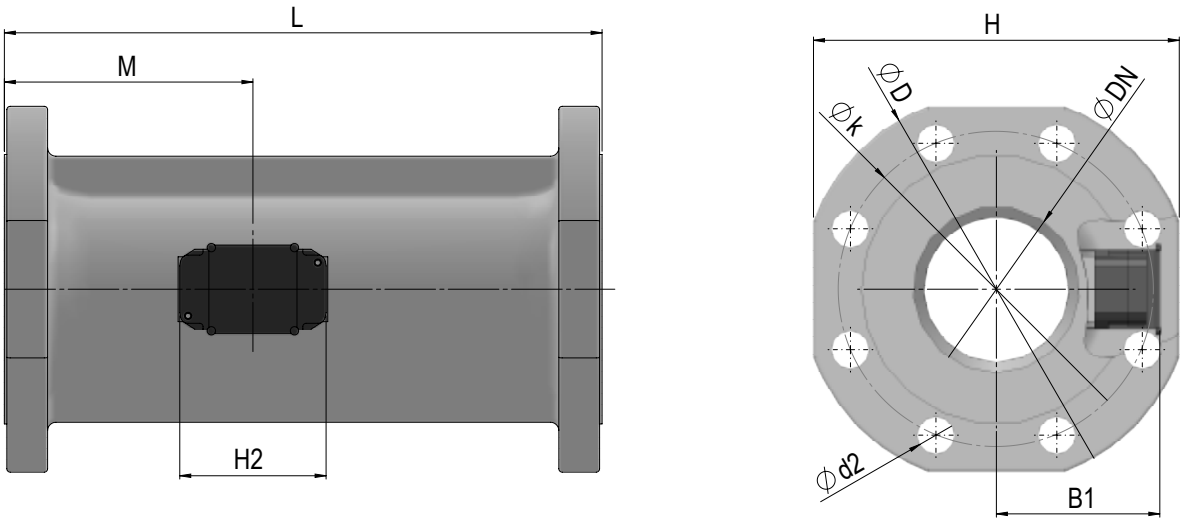


Flange EN 1092-1, PN25. Flange facing type B, raised face.

Nom. diameter	L	M	H2	B1	D	H	k	Bolts			App. weight [kg]
								No.	Thread	d_2	
DN20	190	L/2	89	58	105	95	75	4	M12	14	2.9
DN25	260	L/2	89	58	115	106	85	4	M12	14	5.0
DN32	260	L/2	89	<D/2	140	128	100	4	M16	18	5.2
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® 54, DN65 to DN125

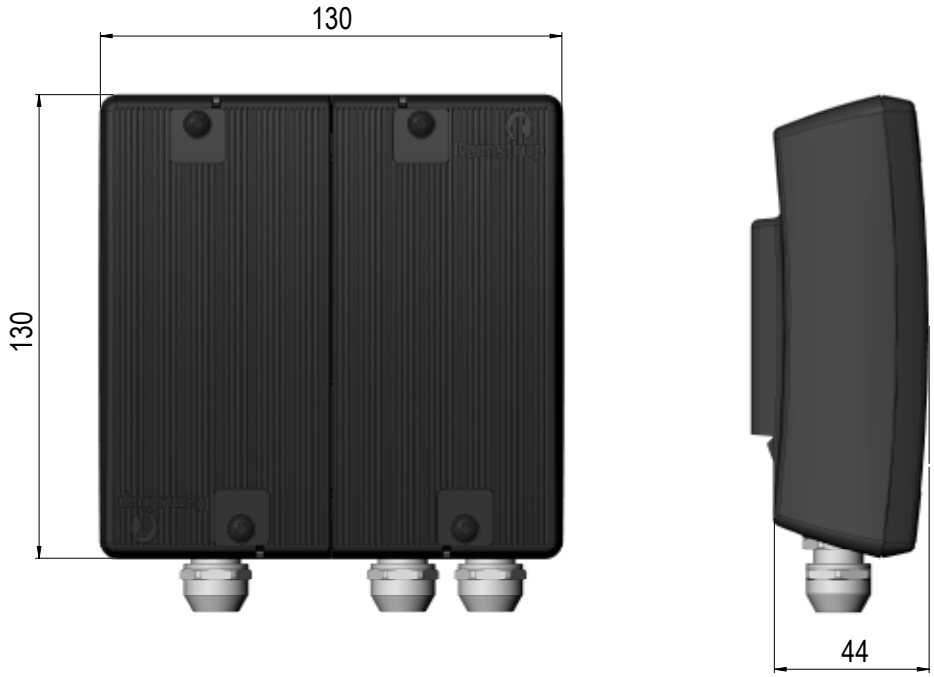


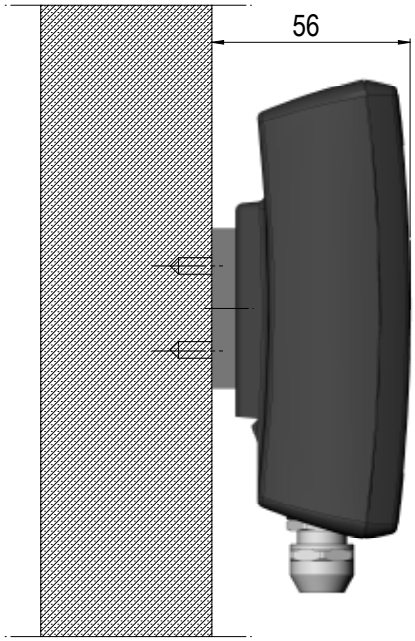
Flange EN 1092-1, PN25. Flange facing type B, raised face.

Nom. diameter	L	M	H2	B1	D	H	k	Bolts			App. weight [kg]
								No.	Thread	d_2	
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	26	28.2

Dimensional sketches

Pulse Transmitter

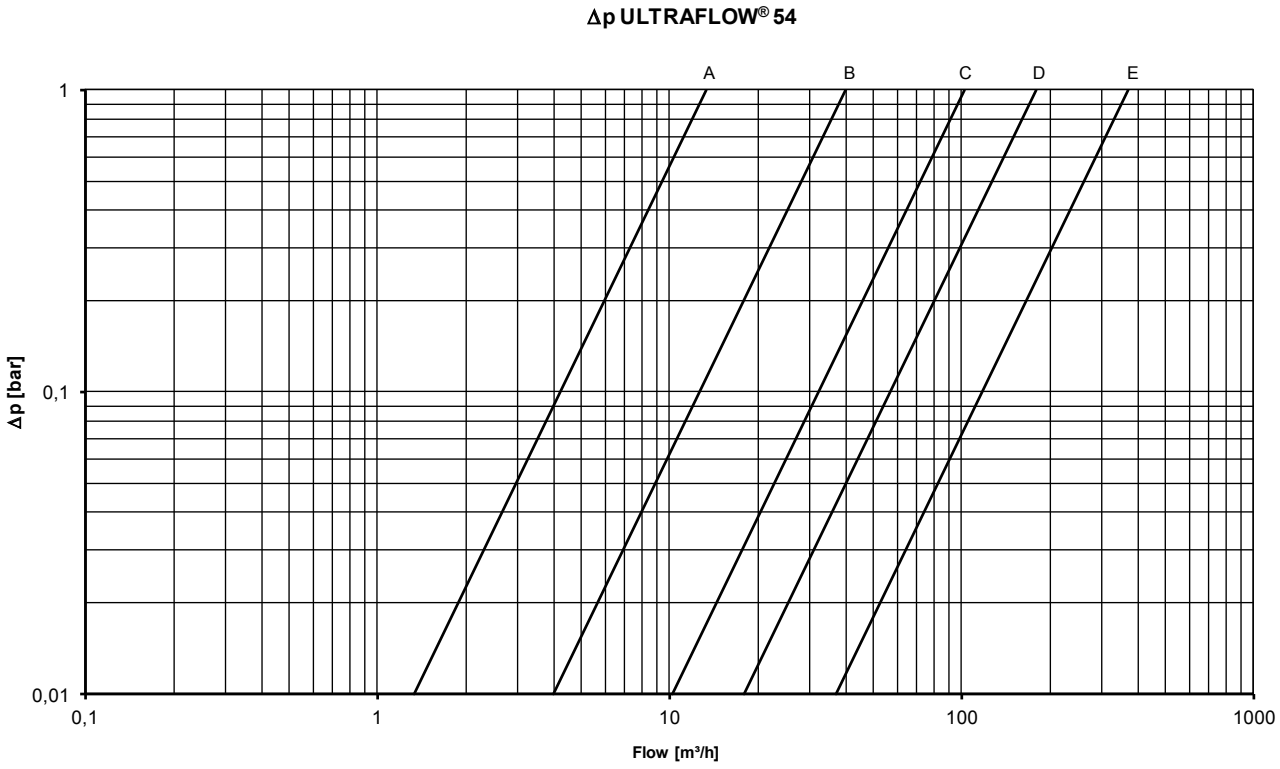




Pressure loss

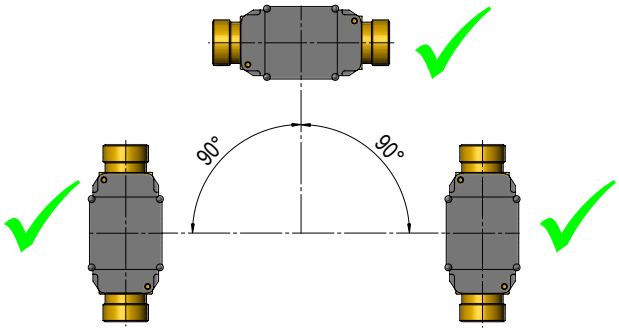
Graph	q_p [m³/h]	Nom. diameter [mm]	k_v *	Q@0.25 bar [m³/h]
A	2.5 & 3.5 & 6	DN20 & DN25 & DN32	13.4	6.7
B	10 & 15	DN40 & DN50	40	20
C	25	DN65	102	51
D	40	DN80	179	90
E	60 & 100	DN100 & DN125	373	187

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



Installation

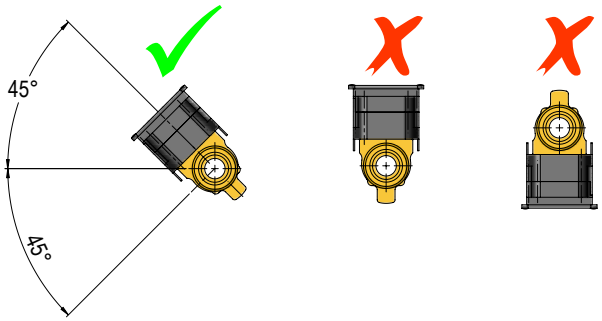
Installation angle for ULTRAFLOW® 54



ULTRAFLOW® 54 may be installed horizontally, vertically or at an angle.

IMPORTANT!

With ULTRAFLOW® 54, the electronics/plastic case must be placed to the side (with horizontal installation).



ULTRAFLOW® 54 may be turned up to ±45 ° around the pipe axis.

Straight inlet

ULTRAFLOW® requires neither straight inlet nor outlet to meet the Measuring Instruments Directive (MID) 2014/32/EU, OIML R75:2002 and EN 1434:2007. Only in case of heavy flow disturbances before the meter will a straight inlet section be necessary. We recommend following the guidelines in CEN CR 13582.

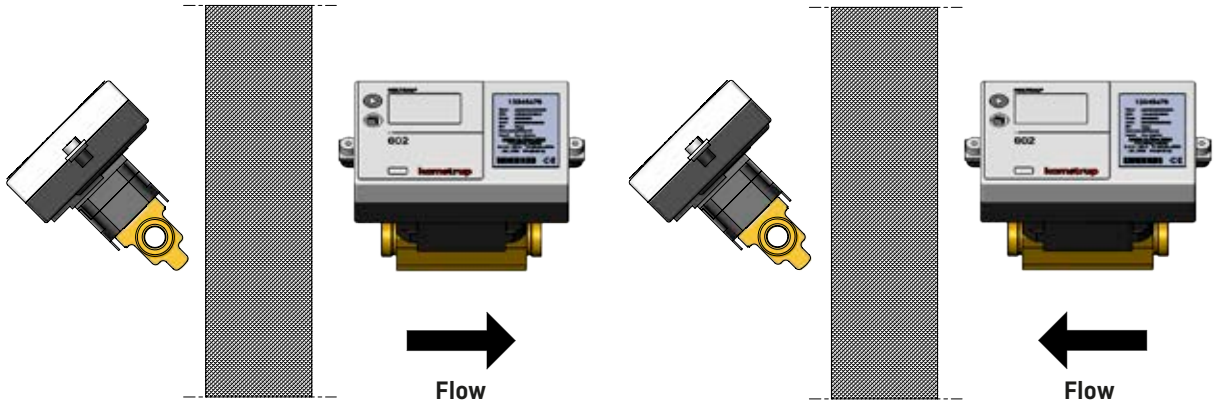
Working Pressure

In order to prevent cavitation the back pressure (pressure at flow sensor outlet) at ULTRAFLOW® 54 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.

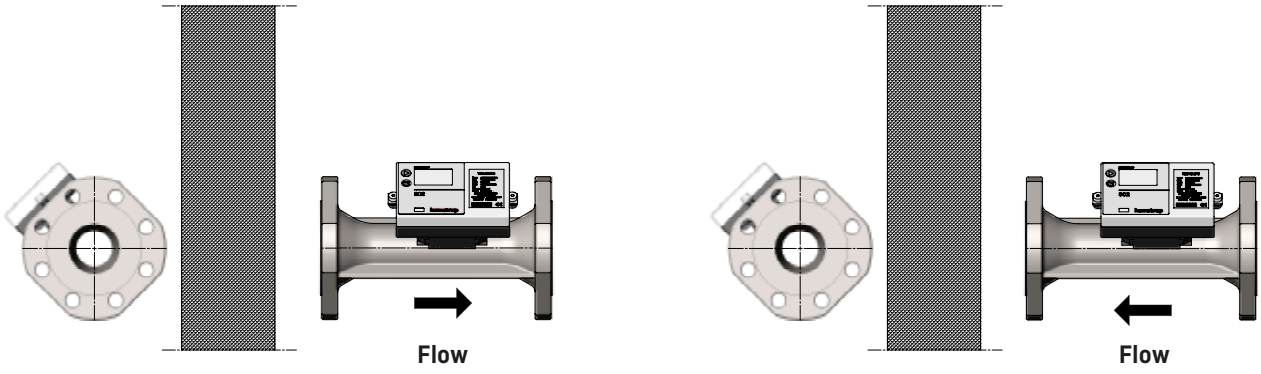
ULTRAFLOW® 54 must not be exposed to lower pressure than the ambient pressure (vacuum).

Examples of installation

Threaded meter with MULTICAL® fitted directly on ULTRAFLOW® 54.



Flanged meter with MULTICAL® fitted directly on ULTRAFLOW® 54.



Note: At medium temperature above 90 °C calculator and Pulse Transmitter must not be mounted on the flow sensor. Instead wall mounting is recommended.

Electrical connection

Connecting MULTICAL® & ULTRAFLOW® 54

ULTRAFLOW® 54	->	MULTICAL®
Blue (GND)	->	11
Red (supply)	->	9
Yellow (signal)	->	10

Connecting via Pulse Transmitter

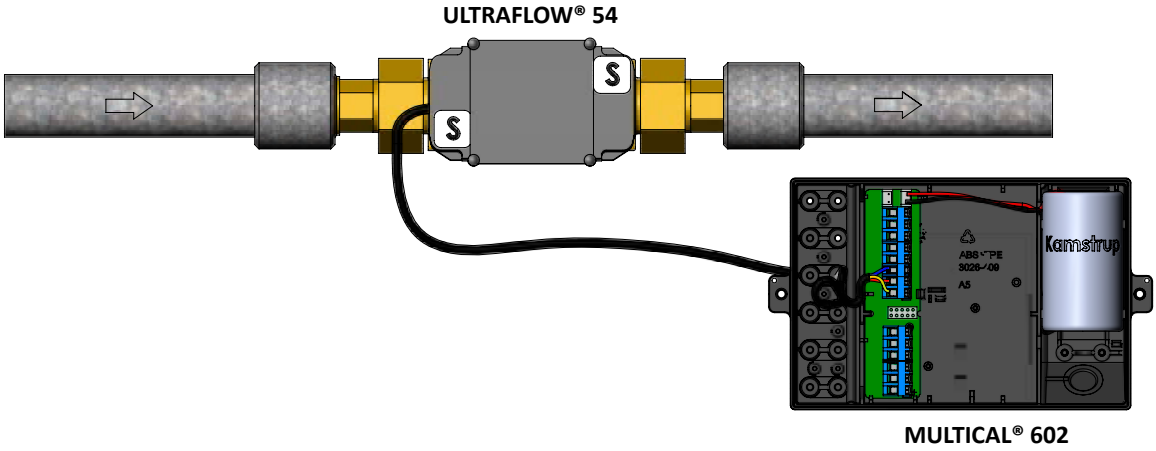
ULTRAFLOW® 54	->	Pulse Transmitter		->	MULTICAL®
		Input	Output		
Blue (GND)	->	11	11A	->	11
Red (supply)	->	9	9A	->	9
Yellow (signal)	->	10	10A	->	10

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, please see technical description 5512-385 which can be found on products.kamstrup.com.

Example of connecting ULTRAFLOW® 54 and MULTICAL®

ULTRAFLOW® 54 and MULTICAL® 602



Order specification

Type number *	q_p [m³/h]	q_i [m³/h]	q_s [m³/h]	Connection	Length [mm]	Meter factor [imp./l]	CCC ** (high res.)	Material
65-5- CECA -XXX	2.5	0.025	5	DN20	190	60	498 (-)	Stainless steel
65-5- CGAG -XXX	3.5	0.035	7	G5/4B (R1)	260	50	451 (436)	Brass
65-5- CGCB -XXX	3.5	0.035	7	DN25	260	50	451 (436)	Stainless steel
65-5- CHAG -XXX	6	0.06	12	G5/4B (R1)	260	25	437 (438)	Brass
65-5- CHCB -XXX	6	0.06	12	DN25	260	25	437 (438)	Stainless steel
65-5- CHCC -XXX	6	0.06	12	DN32	260	25	437 (438)	Stainless steel
65-5- CJAJ -XXX	10	0.1	20	G2B (R1½)	300	15	478 (483)	Brass
65-5- CJCD -XXX	10	0.1	20	DN40	300	15	478 (483)	Stainless steel
65-5- CKCE -XXX	15	0.15	30	DN50	270	10	420 (485)	Stainless steel
65-5- CLCG -XXX	25	0.25	50	DN65	300	6	479 (-)	Stainless steel
65-5- CMCH -XXX	40	0.4	80	DN80	300	5	458 (486)	Stainless steel
65-5- FACL -XXX	60	0.6	120	DN100	360	2.5	470 (487)	Stainless steel
65-5- FBCL -XXX	100	1	200	DN100	360	1.5	480 (488)	Stainless steel
65-5- FBCM -XXX	100	1	200	DN125	350	1.5	480 (488)	Stainless steel

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

** CCC-code is indicating the adaptation of MULTICAL® to the connected flow sensor type.

ULTRAFLOW® 54 is as default delivered with 2.5 m cable, but can also be delivered with 5 or 10 m cable.

Pulse Transmitter – type No. 6699-903

The Pulse Transmitter is delivered with built-in supply for ULTRAFLOW® 54. Battery, 24 VAC and 230 VAC supply are available. Please state the required supply type when ordering.

Accessories

Couplings including gaskets (PN16)

Size	Nipple	Union	Type No. (1 pc.)
DN25	R1	G5/4	6561-325
DN40	R1½	G2	6561-315

Gaskets for couplings

Size (union)	Type No. (1 pc.)
G5/4	2210-063
G2	2210-065

Gaskets for flanged meters (PN25)

Size	Type No. (1 pc.)
DN20	2210-147
DN25	2210-133
DN32	2210-217
DN40	2210-132
DN50	2210-099
DN65	2210-141
DN80	2210-140
DN100	1150-142
DN125	1150-153

For further information about ULTRAFLOW® 54 DN20-125, please see technical description 5512-385 which can be found on products.kamstrup.com.

Kamstrup A/S • 5810589_L1_GB_08.2016

Kamstrup A/S
Industrivej 28, Stilling
DK-8660 Skanderborg
T: +45 89 93 10 00
F: +45 89 93 10 01
info@kamstrup.com
kamstrup.com