

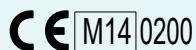
ULTRAFLOW® 54 (H)

DN15-20

DATA SHEET

- Ultrasonic flow sensor
- For flow 0.6 m³/h, 1.5 m³/h and 2.5 m³/h
- Compact design
- Static meter with no moving parts
- Large dynamic range
- No wear
- Exceptionally accurate
- Longevity

MID-2004/22/EC



Application

ULTRAFLOW® 54 (H) is a static flow sensor based on the ultrasonic measuring principle. ULTRAFLOW® 54 (H) is a variant of ULTRAFLOW® 54, which is type approved with a larger dynamic range [1:250] and with a reduced pressure loss for most types. The annex (H) can be found in all type numbers [65-5-XXHX-XXX] of this variant and is thereby unique to it. The prime area of application of ULTRAFLOW® 54 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 for ULTRAFLOW® 54 and a galvanically separated pulse outlet.



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Approvals

Type approval

ULTRAFLOW® 54 (H) approved in accordance with MID-2004/22/EC.

EC-Type Examination certificate: DK-0200-MI004-033.

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

CE-marking

ULTRAFLOW® 54 (H) is marked in accordance with:

- MID-directive 2004/22/EC
- LV-directive 2006/95/EC (together with Pulse Transmitter or Pulse Divider)

MID-2004/22/EC



MID designation

- Mechanical environment Class M1 and M2
- 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
Protection class	
- Flow sensor	IP65
- Pulse Transmitter	IP67
Temperature* of medium	15...130 °C
Storage temperature (empty sensor)	-25...60 °C
Pressure stage	PN16, PN25

* If the temperature of the medium exceeds 90 °C MULTICAL® calculator or the Pulse Transmitter should be wall-mounted.

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	Max. 10 m
Cable length (Pulse Transmitter)	Depends on calculator
EMC data	Complies with EN 1434 class C

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Flowdata

Nom. flow qp [m ³ /h]	Nom. diameter [mm]	Meter factor * [imp./l]	Dynamic range		Flow @125 Hz ** [m ³ /h]	Δp@qp [bar]	Min. cut off [l/h]
			q _i :qp	q _s :qp			
0.6	DN15	300	1:100	2:1	1.5	0.03	2
1.5	DN15	100	1:100	2:1	4.5	0.09	3
2.5	DN20	60	1:100	2:1	7.5	0.09	5

* The meter factor appears from the type label.

** Saturation flow 125 Hz. Max. pulse frequency 128 Hz is maintained at higher flow.

Materials

Wetted parts

ULTRAFLOW® 54 (H), qp 0.6, 1.5 and 2.5 m³/h

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

Electronic housing

Base	Thermoplastic, PES 30 % GF
Lid	Thermoplastic, PC 10 % GF

Connection cable

Silicone cable (3 x 0.5 mm²)

Type summary

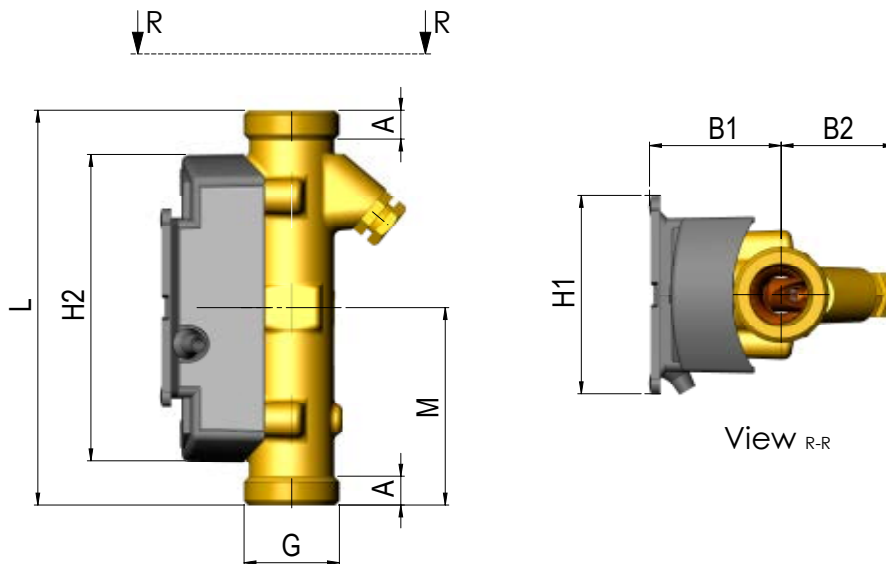
Nom. flow qp [m ³ /h]	Installation dimensions			
0.6	G¾Bx110 mm	G1Bx130 mm		
1.5	G¾Bx110 mm	G¾Bx165 mm	G1Bx130 mm	G1Bx190 mm
2.5	G1Bx190 mm			

Thread EN ISO 228-1

Dimensional sketches

ULTRAFLOW® 54 (H), G½B and G1B

All measurements are in mm, unless otherwise stated.



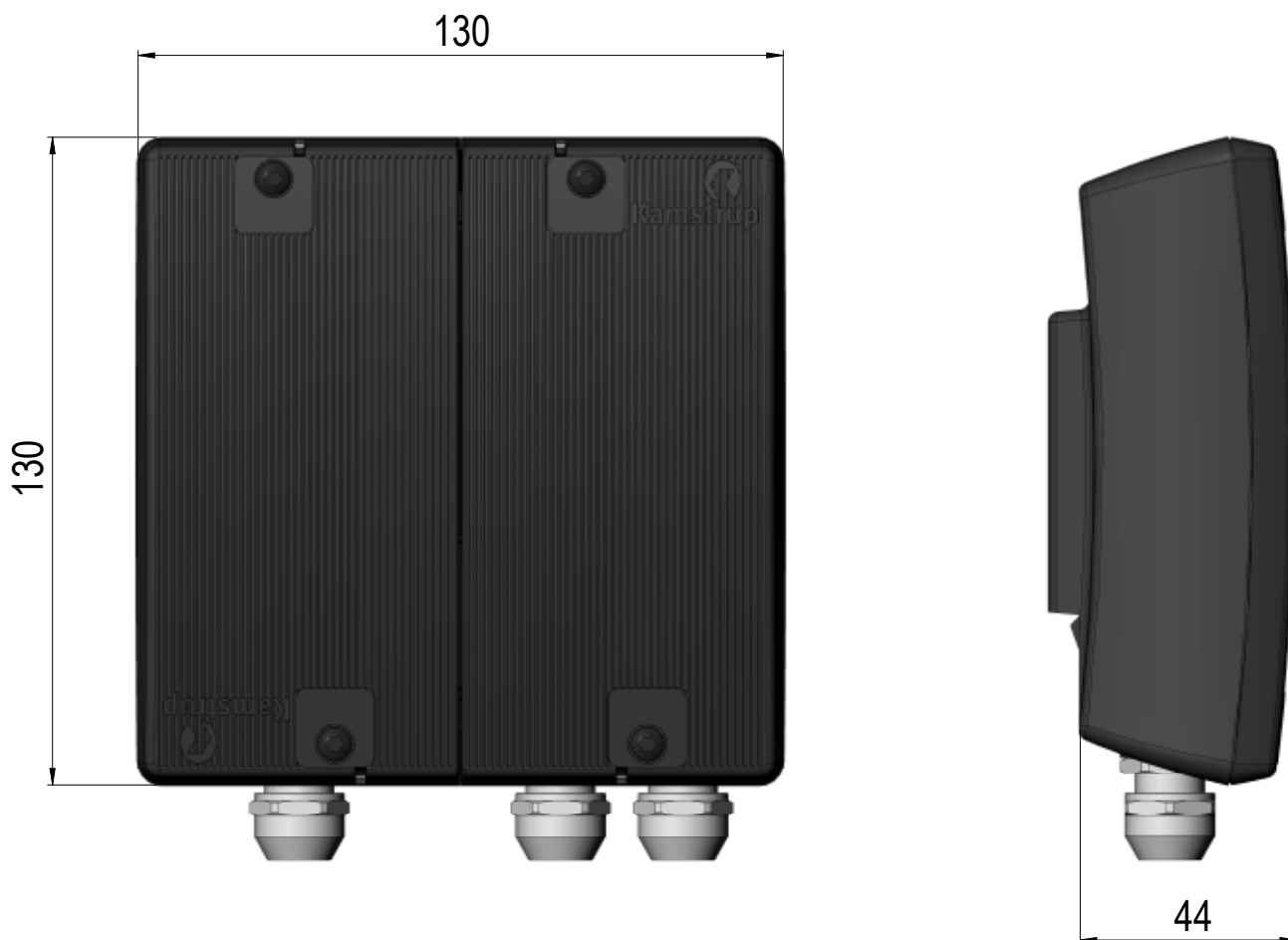
Thread EN ISO 228-1

Thread	L	M	H2	A	B1	B2	H1	App. weight [kg]
G½B (qp 0.6;1.5)	110	L/2	86	8	37	32	55	0.41
G1B (qp 1.5)	110	L/2	86	12	37	32	55	0.46
G1B (qp 0.6;1.5)	130	L/2	86	12	37	32	55	0.51
G1B (qp 2.5)	130	L/2	86	12	40	35	55	0.53
G½B (qp 1.5)	165	L/2	86	8	37	32	55	0.51
G1B (qp 0.6;1.5)	190	L/2	86	12	37	32	55	0.61
G1B (qp 2.5)	190	L/2	86	12	40	35	55	0.67

Dimensional sketches

Pulse Transmitter

All measurements are in mm, unless otherwise stated.

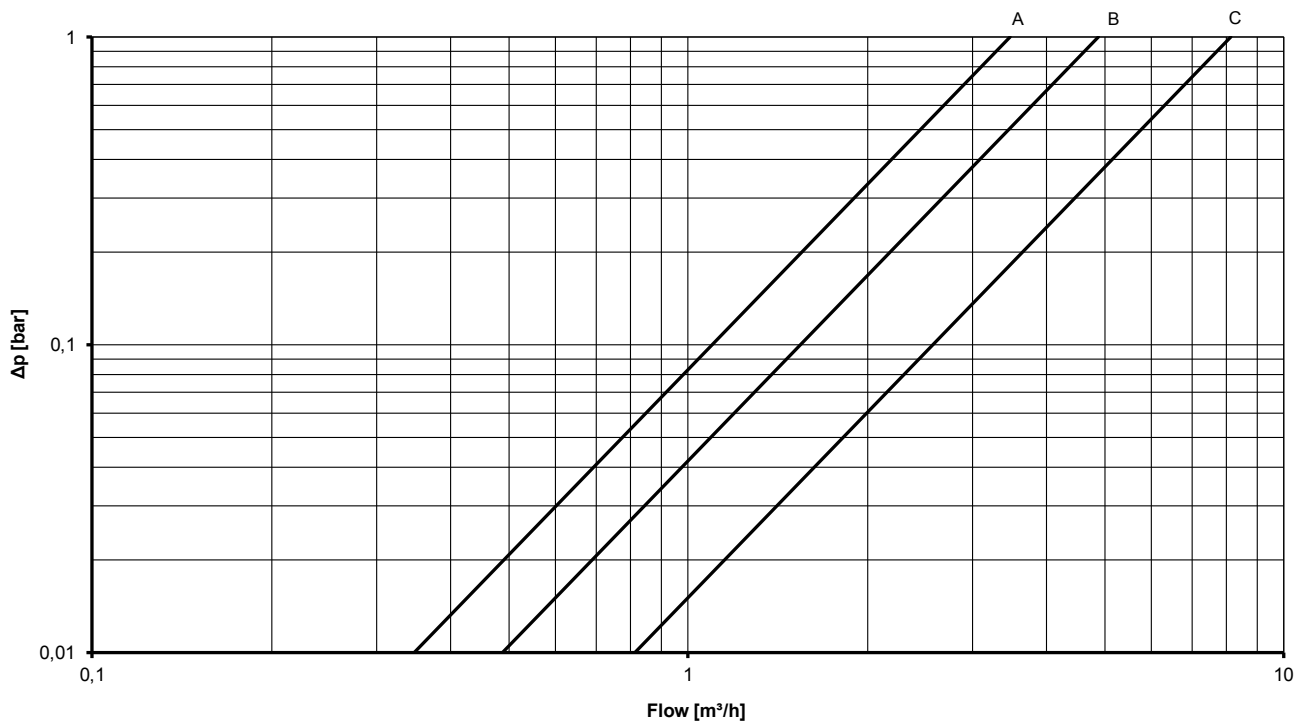


Pressure loss

Graph	q _p [m ³ /h]	Nom. diameter [mm]	Δp@q _p [bar]	k _v *	q@0.25 bar [m ³ /h]
A	0.6	DN15	0.03	3.46	1.7
B	1.5	DN15	0.09	4.89	2.4
C	2.5	DN20	0.09	8.15	4.1

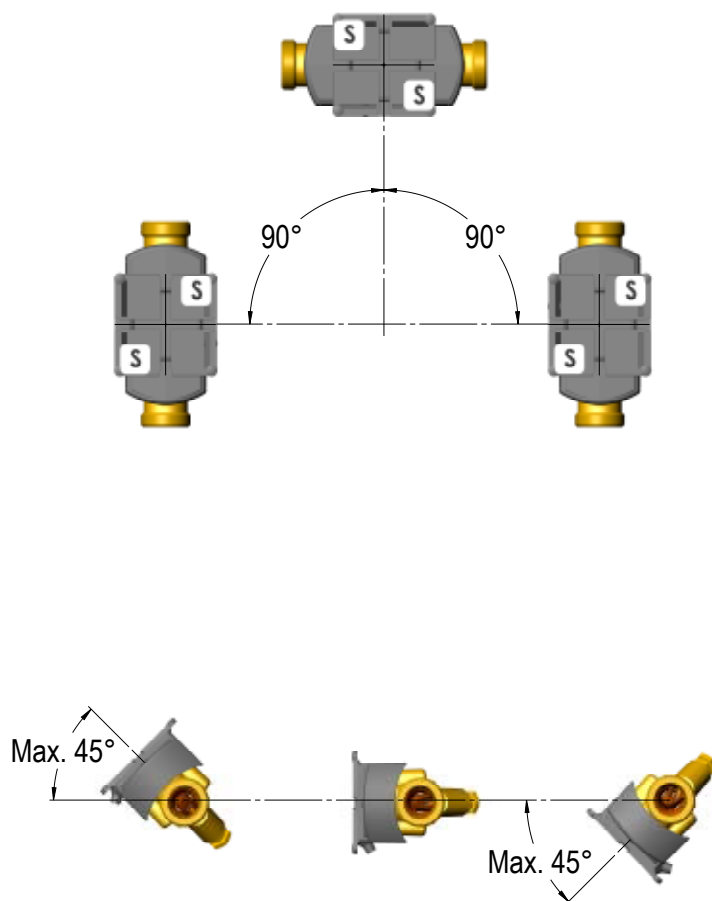
* $q = k_v \times \sqrt{\Delta p}$

Δp ULTRAFLOW® 54 (H)



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 $\pm 45^\circ$ around the pipe axis.

Installation

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.

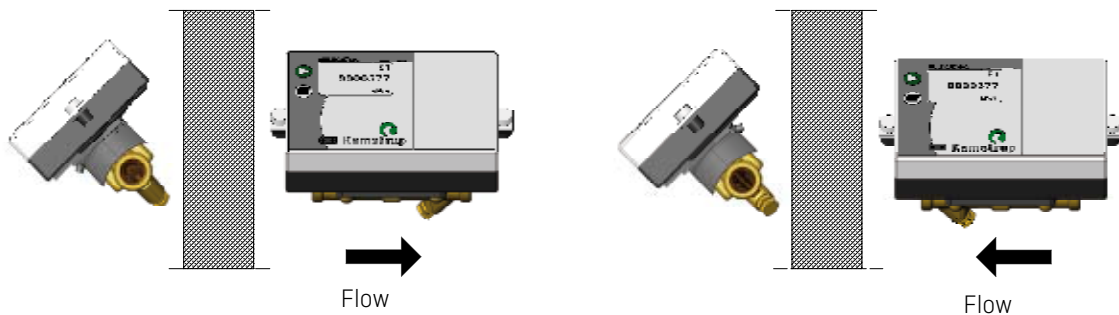
Working Pressure

In order to prevent cavitation the back pressure at ULTRAFLOW® 54 must be min. 1.0 bar at q_p and min. 2.0 bar at q_s . This applies to temperatures up to approx. 80 °C.

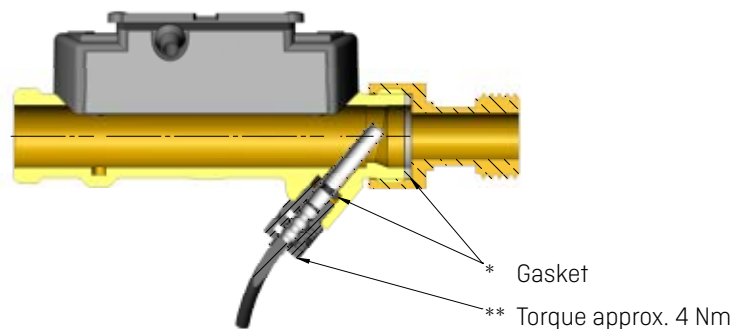
ULTRAFLOW® 54 must not be exposed to lower pressure than the ambient pressure (vacuum).

Examples of installation

MULTICAL® fitted directly on ULTRAFLOW® 54 (H).



Glands and short direct sensor fitted in ULTRAFLOW® 54 (H).



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Electrical connection

Connecting MULTICAL® & ULTRAFLOW® 54

ULTRAFLOW® 54	->	MULTICAL®
Blue [GND]	->	11
Red [supply]	->	9
Yellow [signal]	->	10

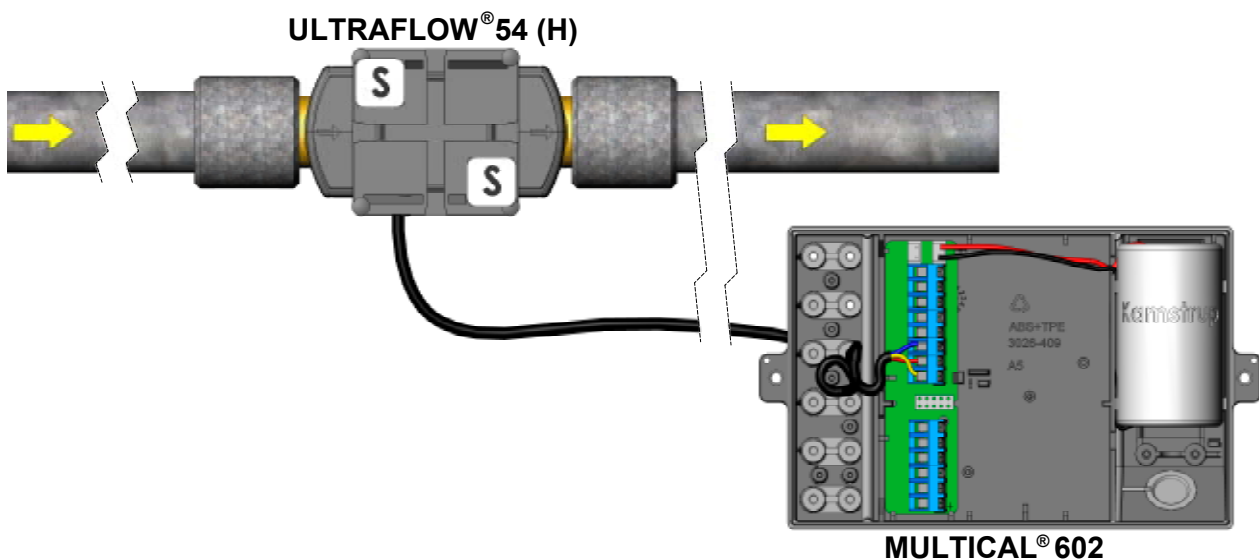
Connecting via Pulse Transmitter

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, see the technical description 5512-1554.

Example of connecting ULTRAFLOW® 54 (H) and MULTICAL®



Order specification

The list below shows available type numbers for ULTRAFLOW® 54 (H).

Type number *			q _p [m ³ /h]	q _i [m ³ /h]	q _s [m ³ /h]	Dynamic range	Connection	PN	Length [mm]	Meter factor [imp./l]	CCC (high res.)	Material
65-5-	CAHA	-XXX	0.6	0.006	1.2	1:100	G¾B (R½)	16	110	300	416 [484]	Brass
65-5-	CAHD	-XXX	0.6	0.006	1.2	1:100	G1B (R¾)	16	130	300	416 [484]	Brass
65-5-	CDHA	-XXX	1.5	0.015	3	1:100	G¾B (R½)	16	110	100	419 [407]	Brass
65-5-	CDHC	-XXX	1.5	0.015	3	1:100	G¾B (R½)	16	165	100	419 [407]	Brass
65-5-	CDHD	-XXX	1.5	0.015	3	1:100	G1B (R¾)	16	130	100	419 [407]	Brass
65-5-	CDHF	-XXX	1.5	0.015	3	1:100	G1B (R¾)	16	190	100	419 [407]	Brass
65-5-	CEHF	-XXX	2.5	0.025	5	1:100	G1B (R¾)	16	190	60	498 [-]	Brass

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

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

Pulse Transmitter – type No. 6699-903

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

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Accessories

Glands including gaskets (PN16)

Size	Nipple	Union	Type No.	2 pcs.
DN15	R½	G¾	-	6561-323
DN20	R¾	G1	-	6561-324

Gaskets for glands

Size (union)	Type No.
G¾	2210-061
G1	2210-062