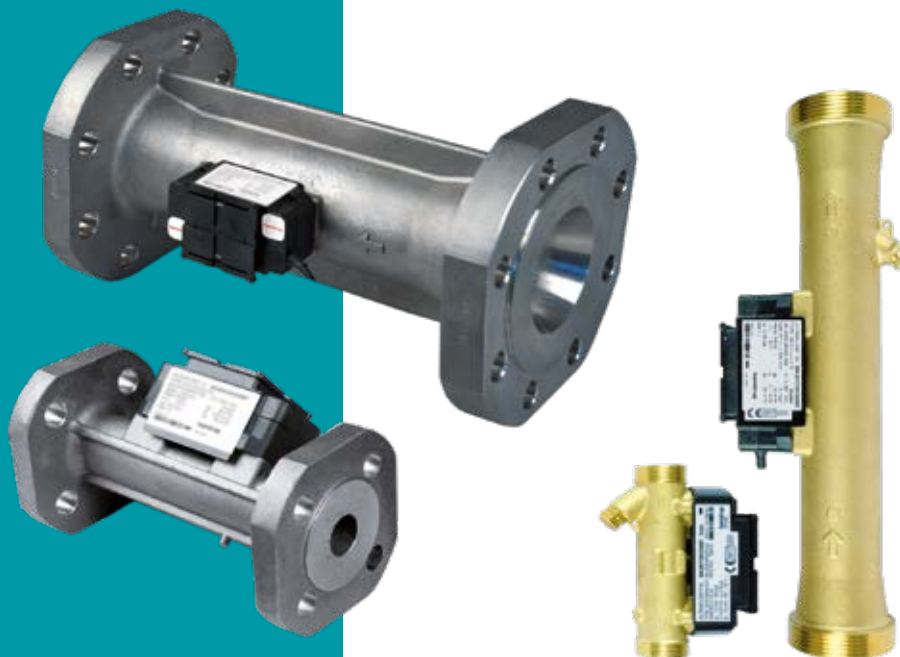


## Data sheet

### ULTRAFLOW® 54 DN15-125

- Ultrasonic flow sensor ( $q_p$  0.6...100 m<sup>3</sup>/h)
- Static sensor, no moving parts and no wear
- Compact design
- Enables direct mounting of a temperature sensor in threaded meters ( $q_p$  0.6...10 m<sup>3</sup>/h)
- Small pressure loss
- Large dynamic range
- Exceptionally accurate
- Durable



MID 2014/32/EU

CE M240200

EN 1434

## Contents

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## Description

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ULTRAFLOW® 54 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 the separate calculators MULTICAL® 603 or MULTICAL® 803 and a set of TemperatureSensor 63. ULTRAFLOW® 54 has been designed for use in heat installations where water is used as the heat-bearing medium.

ULTRAFLOW® 54 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® 54 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.

If ULTRAFLOW® 54 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® 54.

If the distance between MULTICAL® and ULTRAFLOW® 54 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® 54.

## Compliance

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### Type approval

ULTRAFLOW® 54 is approved as a heat meter in accordance with MID-2014/32/EU:

EU-Type Examination Certificates      DK-0200-MI004-008, DK-0200-MI004-033

MID-certified according to Module D      DK-0200-MID-D-001



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

### Standards and documents

EN 1434:2007/AC:2007

EN 1434:2015+A1:2018

EN 1434:2022

WELMEC 7.2:2022

### CE-marking

ULTRAFLOW® 54 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

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### Electrical data

|  |  |
|--|--|
| Internal supply voltage  | 3.6 VDC ± 0.1 VDC  |
| Battery (MULTICAL® or Pulse Transmitter/<br>Pulse Divider)     | 3.65 VDC, D-cell lithium   |
| Battery lifetime (replacement interval)                        |  |
| - ULTRAFLOW® 54 and MULTICAL®                                  | Up to 16 years @ $t_{BAT} < 30\text{ °C}$  |
| - Pulse Transmitter/Pulse Divider                              | 6 years @ $t_{BAT} < 30\text{ °C}$ (Y=3)   |
| Mains supply (MULTICAL® or<br>Pulse Transmitter/Pulse Divider) | 230 VAC +15/-30 %, 50 Hz or 60 Hz<br>24 VAC ± 50 %, 50 Hz or 60 Hz   |
| Backup supply  | Integral supercap eliminates operational disturbances due to short-term power cuts   |
| Cable length   |  |
| - Flow sensor  | Max 10 m   |
| - Pulse Transmitter/Pulse Divider                              | Depends on calculator – max 100 m when connected to MULTICAL® (Y=2)  |
| - Cable Extender Box   | Depends on calculator – max 30 m when connected to MULTICAL®<br>(does not provide galvanic separation, but supports extended info codes) |
| Electromagnetic environment                                    | Fulfils EN 1434 class C, MID E1 and E2   |
| Pulse output   | Galvanically connected (ULTRAFLOW®)  |
| - Type   | Push-Pull  |
| - Output impedance   | 10 kΩ  |
| - Pulse duration   | 2...6 ms   |
| - Pause time   | Depending on current pulse frequency   |

## Technical data

---

### Mechanical data

|                                    |   |
|------------------------------------|---|
| Accuracy class                     | 2 and 3   |
| Electromagnetic environment        | Fulfils EN 1434 class C, MID E1 and E2                              |
| Mechanical environment             | MID M1 and M2   |
| Ambient conditions                 | 5...55 °C, closed location (installation indoors)                   |
| Protection class                   |   |
| – Flow sensor                      | IP65  |
| – Pulse Transmitter/Pulse Divider  | IP67  |
| – Cable Extender Box               | IP65  |
| Medium in flow sensor              | Water – recommended water quality as in CEN TR 16911 and AGFW FW510 |
| Medium temperature*                | 15...130 °C or narrower range                                       |
| Storage temperature (empty sensor) | -25...60 °C   |
| Pressure stage                     | PN16, PS16 or PN25, PS25 or PN16/PN25, PS25 (see marking)           |
| Straight inlet requirement         | 0D (according to EN 1434)   |
| Installation angle                 | Horizontally, vertically and at an angle                            |

- \* At medium temperatures above 90°C, the use of flange meters is recommended.  
 At medium temperatures above 90 °C or below the ambient temperature, the calculator and Pulse Transmitter/Pulse Divider must not be mounted on the flow sensor. Instead wall mounting is recommended.

## Flow data

| Nom. flow $q_p$<br>[m <sup>3</sup> /h] | Meter factor <sup>1)</sup><br>[p/l] | Dynamic range<br>$q_p:q_i$ | $q_s:q_p$ | Flow @125 Hz <sup>2)</sup><br>[m <sup>3</sup> /h] | Min. cut-off<br>[l/h] |
|--|-------------------------------------|----------------------------|-----------|---|-----------------------|
| 0.6                                    | 300                                 | 100:1                      | 2:1       | 1.5   | 2                     |
| 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                   |

1) The meter factor appears from the type label.

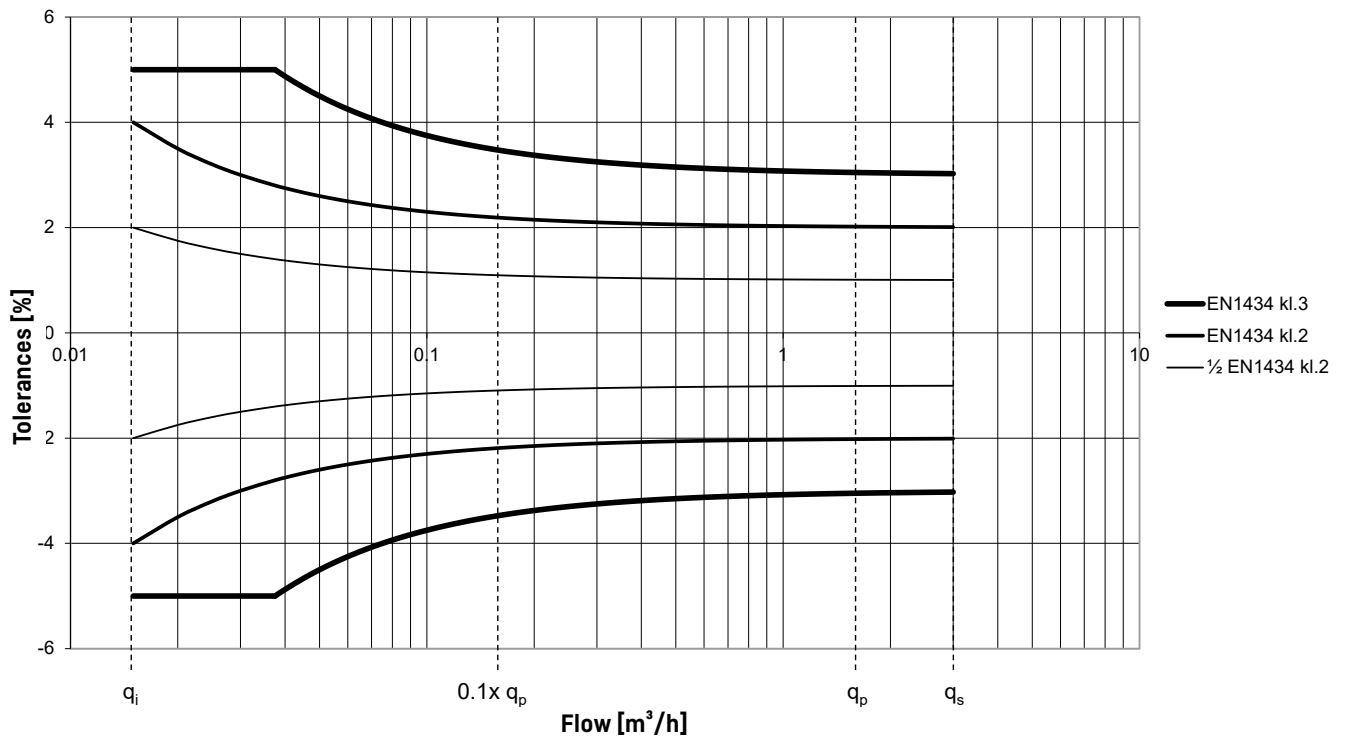
2) Saturation flow 125 Hz. Max pulse frequency is maintained at higher flow rates.

## Measurement accuracy

|           |   |
|-----------|---|
| Class 3   | $E_f = \pm[3 + 0.05 q_p/q]$ , but not above $\pm 5\%$ |
| Class 2   | $E_f = \pm[2 + 0.02 q_p/q]$ , but not above $\pm 5\%$ |
| Typical * | $E_f = \pm[1 + 0.01 q_p/q]$                           |

\* Documented with DANAK-accredited certificate at flow  $q_i$ ,  $0.1 q_p$  and  $q_p$ .

Flow sensor tolerances  $q_p:q_i$  100:1 ( $q_p$  1.5 m<sup>3</sup>/h)



## Materials

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### Wetted parts

|                          |  |
|--------------------------|--|
| Housing, thread          | DZR brass (dezincification-resistant brass)<br>CW602N, to be discontinued.<br>CW511L with max 0.1% Pb, to be implemented.            |
| Blind plug               | DZR brass (dezincification resistant brass)<br>CW614N, to be discontinued.<br>CW510L with max 0.1% Pb, to be implemented.            |
| Housing, flange          | Stainless steel, W.no. 1.4308  |
| 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/<br>Stainless steel, similar to AISI 304 or AISI 316 |
| Measuring tube           | Thermoplastic, PESU – only flow sensor type 65-5-XXHX-XXX/<br>Thermoplastic, PESU 30% GF   |

### Electronic housing

#### 65-5-XXHX-XXX

|         |                            |
|---------|----------------------------|
| - Base  | Thermoplastic, PESU 30% GF |
| - Cover | Thermoplastic, PC 10% GF   |

#### 65-5-XXCX-XXX and 65-5-XXJX-XXX

|         |                          |
|---------|--------------------------|
| - Base  | Thermoplastic, PC 10% GF |
| - Cover | Thermoplastic, PC 20% GF |

### Connection cable

Silicone cable (3 x 0.25 mm<sup>2</sup>)

### Housing, Cable Extender Box

|             |  |
|-------------|--|
| Base, cover | Thermoplastic, acrylonitrile butadiene styrene (ABS) |
|-------------|--|

### Housing, Pulse Transmitter/Pulse Divider

|             |                          |
|-------------|--------------------------|
| Base, cover | Thermoplastic, PC 10% GF |
|-------------|--------------------------|

## Type summary

| Nom. flow $q_p$<br>[m <sup>3</sup> /h] | Installation dimensions  |                            |             |             |              |             |
|--|--------------------------|----------------------------|-------------|-------------|--------------|-------------|
|  |                          |                            |             |             |              |             |
| 0.6                                    | G $\frac{3}{4}$ Bx110 mm | G1Bx130 mm                 | G1Bx190 mm  |             |              |             |
| 1.5                                    | G $\frac{3}{4}$ Bx110 mm | G $\frac{3}{4}$ Bx165 mm   | G1Bx130 mm  | G1Bx190 mm  | [G1Bx110 mm] | DN20x190 mm |
| 2.5                                    | G1Bx190 mm               | DN20x190 mm                | G1Bx130 mm  |             |              |             |
| 3.5                                    | G5/4Bx260 mm             | DN25x260 mm                |             |             |              |             |
| 6                                      | G5/4Bx260 mm             | G1 $\frac{1}{2}$ Bx 260 mm | DN25x260 mm | DN32x260 mm |              |             |
| 10                                     | G2Bx300 mm               | DN40x300 mm                |             |             |              |             |
| 15                                     | DN50x270 mm              | [DN50x250 mm]              |             |             |              |             |
| 25                                     | DN65x300 mm              |                            |             |             |              |             |
| 40                                     | DN80x300 mm              | [DN80x350 mm]              |             |             |              |             |
| 60                                     | DN100x360 mm             | [DN100x400 mm]             |             |             |              |             |
| 100                                    | DN100x360 mm             | DN125x350 mm               |             |             |              |             |

Thread EN ISO 228-1

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

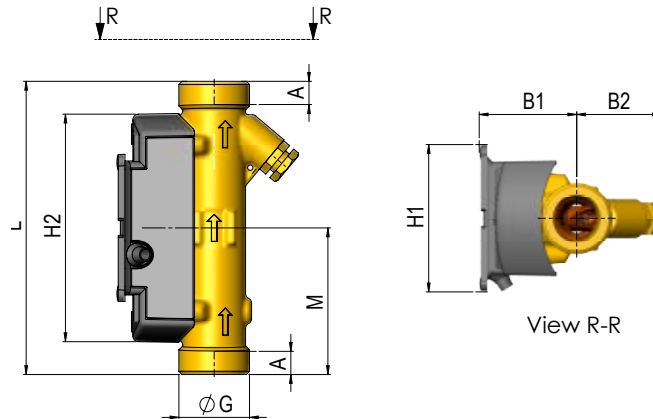
[...] Country specific variants. Contact your local Kamstrup sales representative if one of these variants is of interest for you.

## Dimensional sketches

ULTRAFLOW® 54 flow sensors have a compact design and can be ordered with 2.5, 5 and 10 m signal cable to the calculator. Flow sensors of size  $q_p$  0.6...10 m<sup>3</sup>/h with threaded meter housings have the provision for built-in temperature sensors (M10x1 connection).

### ULTRAFLOW® 54 type 65-5-XXHX-XXX, G¾B and G1B

All measurements are in mm, unless otherwise stated.

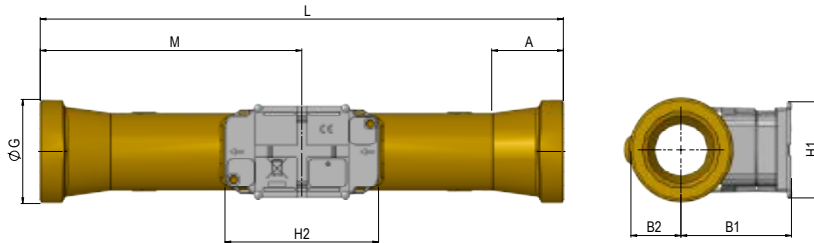


| Thread<br>EN ISO 228-1 | L   | M   | H2 | A  | B1 | B2 | H1 | Approx. weight<br>[kg] |
|------------------------|-----|-----|----|----|----|----|----|------------------------|
| G¾B ( $q_p$ 0.6;1.5)   | 110 | L/2 | 86 | 8  | 37 | 32 | 55 | 0.41                   |
| G1B ( $q_p$ 1.5)       | 110 | L/2 | 86 | 12 | 37 | 32 | 55 | 0.46                   |
| G1B ( $q_p$ 0.6;1.5)   | 130 | L/2 | 86 | 12 | 37 | 32 | 55 | 0.51                   |
| G1B ( $q_p$ 2.5)       | 130 | L/2 | 86 | 12 | 40 | 35 | 55 | 0.53                   |
| G¾B ( $q_p$ 1.5)       | 165 | L/2 | 86 | 8  | 37 | 32 | 55 | 0.51                   |
| G1B ( $q_p$ 1.5)*      | 165 |     |    |    |    |    |    |                        |
| G1B ( $q_p$ 0.6;1.5)   | 190 | L/2 | 86 | 12 | 37 | 32 | 55 | 0.61                   |
| G1B ( $q_p$ 2.5)       | 190 | L/2 | 86 | 12 | 40 | 35 | 55 | 0.67                   |

\* G1B x 130 mm including adapter 1330-023 and extra gasket.

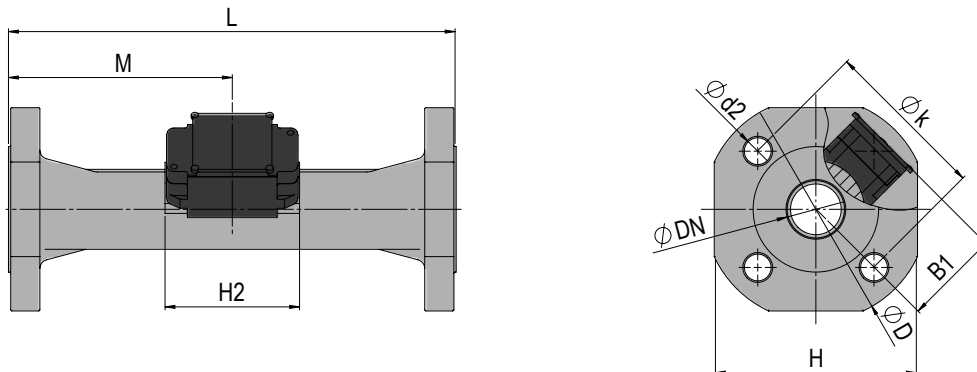
## Dimensional sketches

### ULTRAFLOW® 54 type 65-5-XXJX-XXX, G5/4B, G1½B and G2B



| Thread EN ISO 228-1       | L   | M   | H2 | A    | B1 | B2 | H1 | Approx. weight [kg] |
|---------------------------|-----|-----|----|------|----|----|----|---------------------|
| G1¼B (q <sub>p</sub> 3.5) | 260 | L/2 | 89 | 16   | 58 | 20 | 55 | 1.5                 |
| G1¼B (q <sub>p</sub> 6.0) | 260 | L/2 | 89 | 16   | 60 | 20 | 55 | 1.6                 |
| G1½B (q <sub>p</sub> 6.0) | 260 | L/2 | 89 | 31   | 60 | 24 | 55 | 1.7                 |
| G2B (q <sub>p</sub> 10)   | 300 | L/2 | 89 | 40.2 | 63 | 29 | 55 | 2.5                 |

### ULTRAFLOW® 54, DN20 to DN50

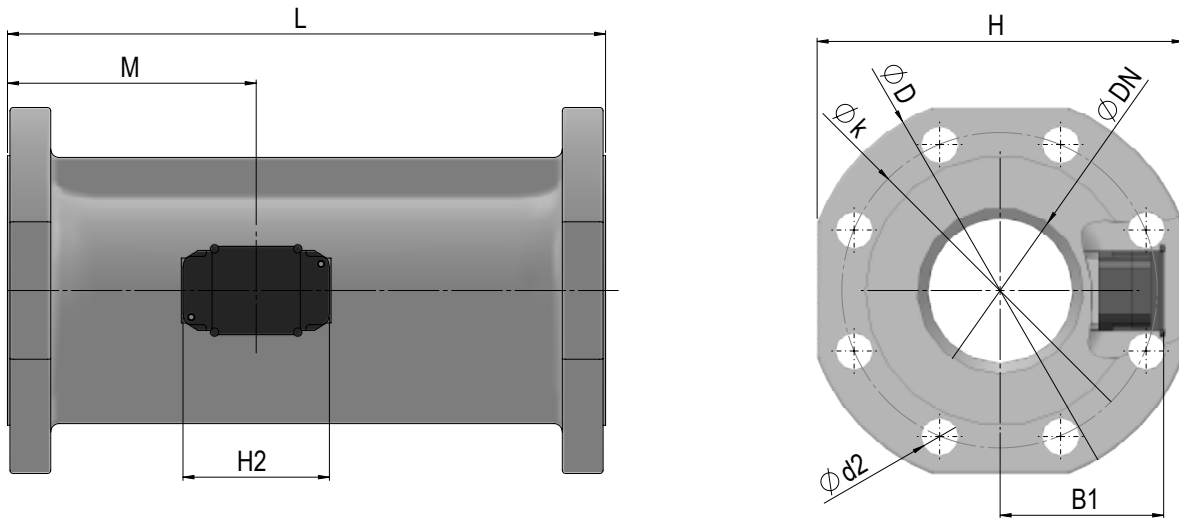


#### Flange facing type B, raised face according to EN 1092-1, PN25

| Nom. diameter               | L   | M   | H2 | B1   | D   | H   | k   | Bolts |        |                | Approx. weight [kg] |
|-----------------------------|-----|-----|----|------|-----|-----|-----|-------|--------|----------------|---------------------|
|                             |     |     |    |      |     |     |     | No.   | Thread | d <sub>2</sub> |                     |
| DN20 (q <sub>p</sub> 1.5)   | 190 | L/2 | 89 | 58   | 105 | 95  | 75  | 4     | M12    | 14             | 3.2                 |
| DN20 (q <sub>p</sub> 2.5)   | 190 | L/2 | 89 | 58   | 105 | 95  | 75  | 4     | M12    | 14             | 2.9                 |
| DN25 (q <sub>p</sub> 3.5;6) | 260 | L/2 | 89 | 58   | 115 | 106 | 85  | 4     | M12    | 14             | 5.0                 |
| DN32 (q <sub>p</sub> 6)     | 260 | L/2 | 89 | <D/2 | 140 | 128 | 100 | 4     | M16    | 18             | 5.2                 |
| DN40 (q <sub>p</sub> 10)    | 300 | L/2 | 89 | <D/2 | 150 | 136 | 110 | 4     | M16    | 18             | 8.3                 |
| DN50 (q <sub>p</sub> 15)    | 250 | 155 | 89 | <D/2 | 165 | 145 | 125 | 4     | M16    | 18             | 9.8                 |
| DN50 (q <sub>p</sub> 15)    | 270 | 155 | 89 | <D/2 | 165 | 145 | 125 | 4     | M16    | 18             | 10.1                |

## Dimensional sketches

### ULTRAFLOW® 54, DN65 to DN125



### Flange facing type B, raised face according to EN 1092-1, PN25 (PN16 <sup>1)</sup>)

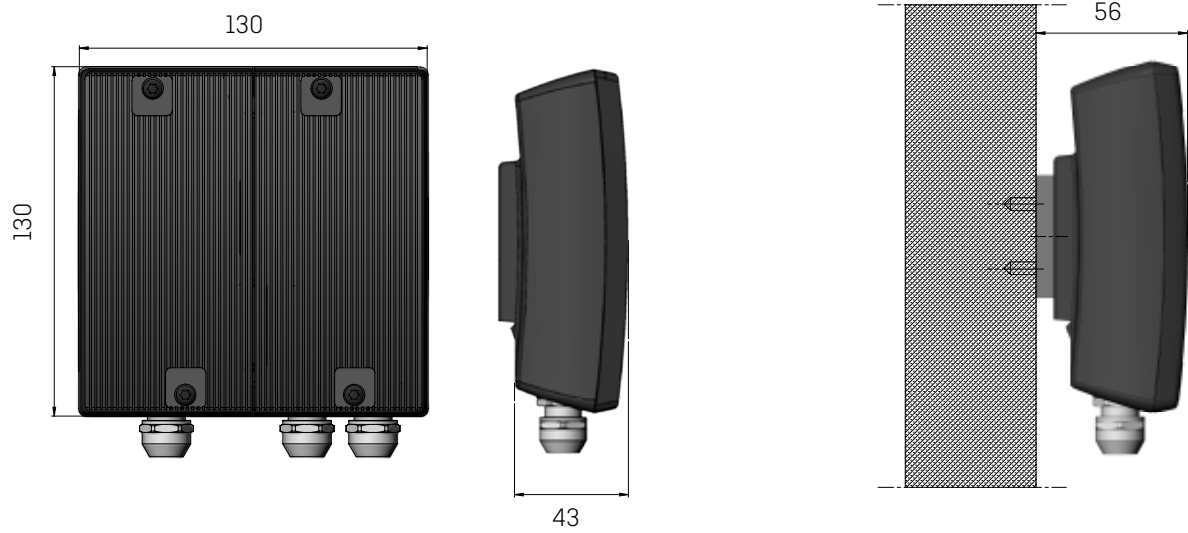
| Nom. diameter                           | L   | M   | H2 | B1   | D   | H   | k   | Bolts |        |                | Approx. weight<br>[kg] |
|---|-----|-----|----|------|-----|-----|-----|-------|--------|----------------|------------------------|
|   |     |     |    |      |     |     |     | No.   | Thread | d <sub>2</sub> |                        |
| DN65 (q <sub>p</sub> 25)                | 300 | 170 | 89 | <H/2 | 185 | 168 | 145 | 8     | M16    | 18             | 13.2                   |
| DN80 (q <sub>p</sub> 40)                | 300 | 170 | 89 | <H/2 | 200 | 184 | 160 | 8     | M16    | 18             | 16.8                   |
| DN80 (q <sub>p</sub> 40)                | 350 | 170 | 89 | <H/2 | 200 | 184 | 160 | 8     | M16    | 18             | 18.6                   |
| DN100 (q <sub>p</sub> 60;100)           | 360 | 210 | 89 | <H/2 | 235 | 220 | 190 | 8     | M20    | 22             | 21.7                   |
| DN100 (q <sub>p</sub> 60) <sup>1)</sup> | 400 | 210 | 89 | <H/2 | 220 | 210 | 180 | 8     | M16    | 18             | 22.8                   |
| DN125 (q <sub>p</sub> 100)              | 350 | 212 | 89 | <H/2 | 270 | 260 | 220 | 8     | M24    | 26             | 28.2                   |

1) DN100 x 400 mm; PN16

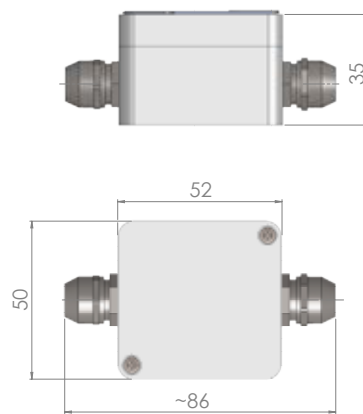
## Dimensional sketches

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### Pulse Transmitter



### Cable Extender Box



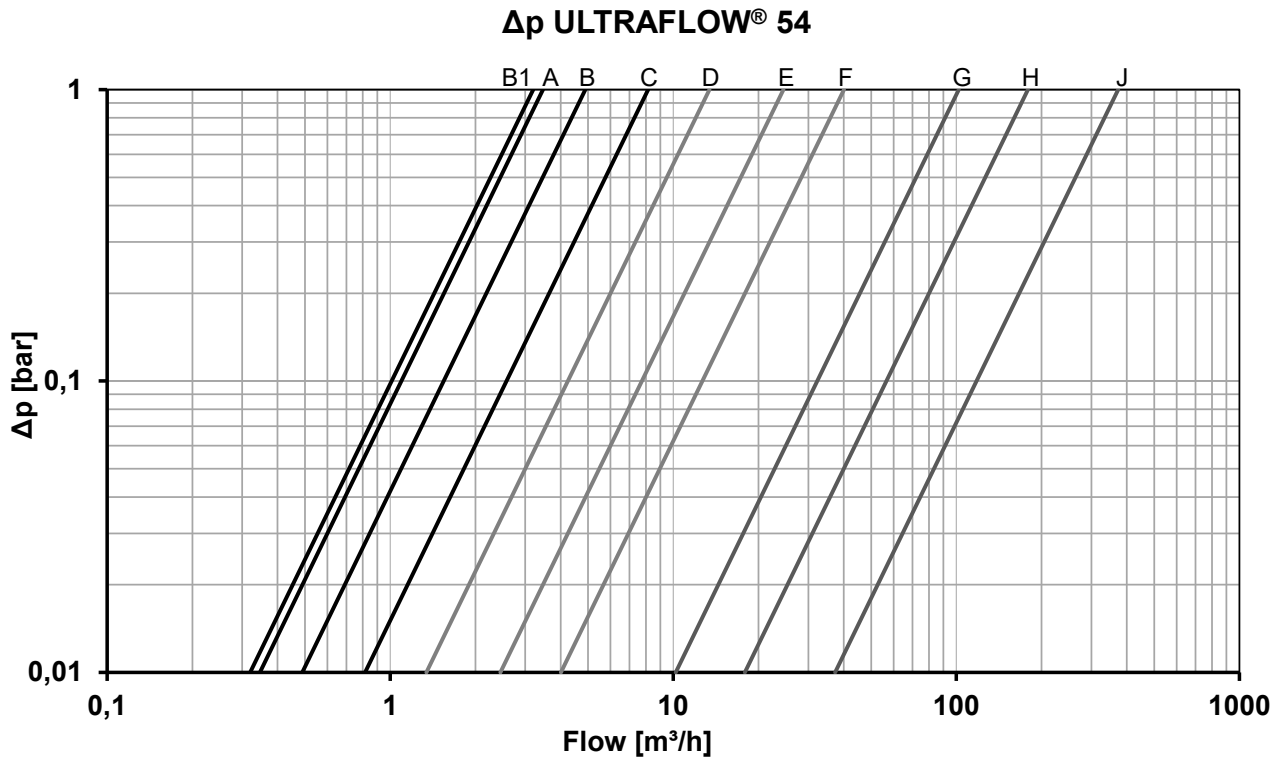
## Pressure loss

| Graph | q <sub>p</sub>      | Type number <sup>1)</sup> |      |       | Connection  | Length<br>[mm] | Δp@q <sub>p</sub><br>[bar] | k <sub>v</sub> | q@0.25 bar <sup>2)</sup><br>[m <sup>3</sup> /h] |
|-------|---------------------|---------------------------|------|-------|-------------|----------------|----------------------------|----------------|---|
|       | [m <sup>3</sup> /h] |                           |      |       |             |                |                            |                |   |
| A     | 0.6                 | 65-5-                     | CAHA | -XXX  | G¾B (R½)    | 110            | 0.03                       | 3.5            | 1.7   |
|       |                     | 65-5-                     | CAHD | -XXX  | G1B (R¾)    | 130            |                            |                |   |
|       |                     | 65-5-                     | CAHF | -XXX  | G1B (R¾)    | 190            |                            |                |   |
| B     | 1.5                 | 65-5-                     | CDHA | -XXX  | G¾B (R½)    | 110            | 0.09                       | 4.9            | 2.4   |
|       |                     | 65-5-                     | CDHC | -XXX  | G¾B (R½)    | 165            |                            |                |   |
|       |                     | (65-5-                    | CDH1 | -XXX) | G1B (R¾)    | 110            |                            |                |   |
|       |                     | 65-5-                     | CDHD | -XXX  | G1B (R¾)    | 130            |                            |                |   |
|       |                     | 65-5-                     | CDHF | -XXX  | G1B (R¾)    | 190            |                            |                |   |
| B1    | 1.5                 | 65-5-                     | CDCA | -XXX  | DN20        | 190            | 0.22                       | 3.2            | 1.6   |
| C     | 2.5                 | 65-5-                     | CEHD | -XXX  | G1B (R¾)    | 130            | 0.09                       | 8.2            | 4.1   |
|       |                     | 65-5-                     | CEHF | -XXX  | G1B (R¾)    | 190            |                            |                |   |
| D     | 2.5                 | 65-5-                     | CECA | -XXX  | DN20        | 190            | 0.03                       | 13.4           | 6.8   |
|       | 3,5                 | 65-5-                     | CGJG | -XXX  | G5/4B (R1)  | 260            | 0.07                       |                |   |
|       |                     | 65-5-                     | CGCB | -XXX  | DN25        | 260            |                            |                |   |
|       | 6                   | 65-5-                     | CHCB | -XXX  | DN25        | 260            | 0.20                       |                |   |
|       |                     | 65-5-                     | CHCC | -XXX  | DN32        | 260            |                            |                |   |
| E     | 6                   | 65-5-                     | CHJG | -XXX  | G5/4B (R1)  | 260            | 0.06                       | 24.5           | 12.3  |
|       |                     | 65-5-                     | CHJH | -XXX  | G1½B (R5/4) | 260            |                            |                |   |
| F     | 10                  | 65-5-                     | CJJJ | -XXX  | G2B (R1½)   | 300            | 0.06                       | 40             | 20  |
|       |                     | 65-5-                     | CJCD | -XXX  | DN40        | 300            |                            |                |   |
|       | 15                  | (65-5-                    | CKC4 | -XXX) | DN50        | 250            | 0.14                       |                |   |
|       |                     | 65-5-                     | CKCE | -XXX  | DN50        | 270            |                            |                |   |
| G     | 25                  | 65-5-                     | CLOG | -XXX  | DN65        | 300            | 0.06                       | 102            | 51  |
| H     | 40                  | 65-5-                     | CMCH | -XXX  | DN80        | 300            | 0.05                       | 179            | 90  |
|       |                     | (65-5-                    | CMCJ | -XXX) | DN80        | 350            |                            |                |   |
| J     | 60                  | 65-5-                     | FACL | -XXX  | DN100       | 360            | 0.03                       | 373            | 187   |
|       |                     | (65-5-                    | FAD5 | -XXX) | DN100       | 400            |                            |                |   |
|       | 100                 | 65-5-                     | FBCL | -XXX  | DN100       | 360            | 0.07                       |                |   |
|       |                     | 65-5-                     | FBCM | -XXX  | DN125       | 350            |                            |                |   |

1) XXX - code for final assembly, approvals etc. – determined by Kamstrup. A few variants may not be available in national approvals.  
[...] Country specific variants for special purposes.

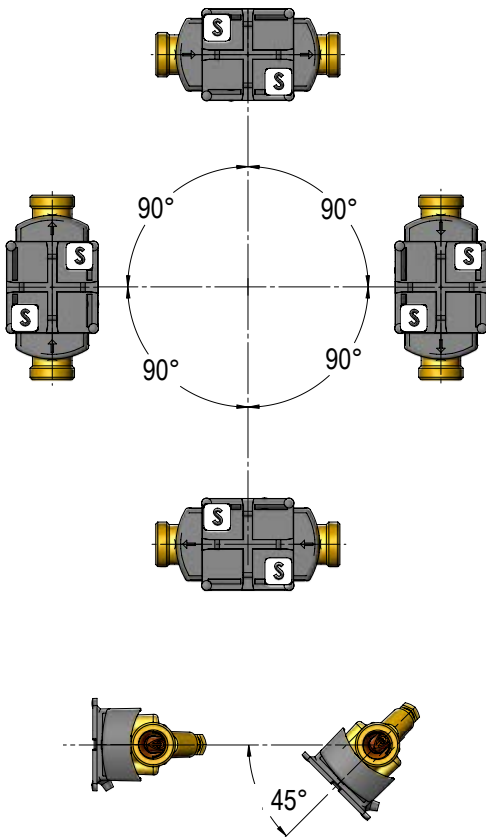
2)  $q = k_v \times \sqrt{\Delta p}$

Pressure loss



## 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.

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

The flow sensor may always be turned up to  $45^\circ$  downwards in relation to the pipe axis.

Only in case that the district heating water is clean and does not contain any kind of dirt, the flow sensor may also be turned up to  $90^\circ$  downwards.

In case that the district heating water is free of air, the flow sensor types 65-5-XXCX-XXX and 65-5-XXJX-XXX may in addition also be turned  $45^\circ$  upwards.

For further recommendations for the orientation of Kamstrup flow sensors, see the technical description for ULTRAFLOW® 54 DN15-125, 5512-2464-GB, which can be downloaded from [www.kamstrup.com](http://www.kamstrup.com).

### 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. Only in case of heavy flow disturbances before the meter, a straight inlet section will be necessary. It is recommended to follow the guidelines in CEN CR 13582.

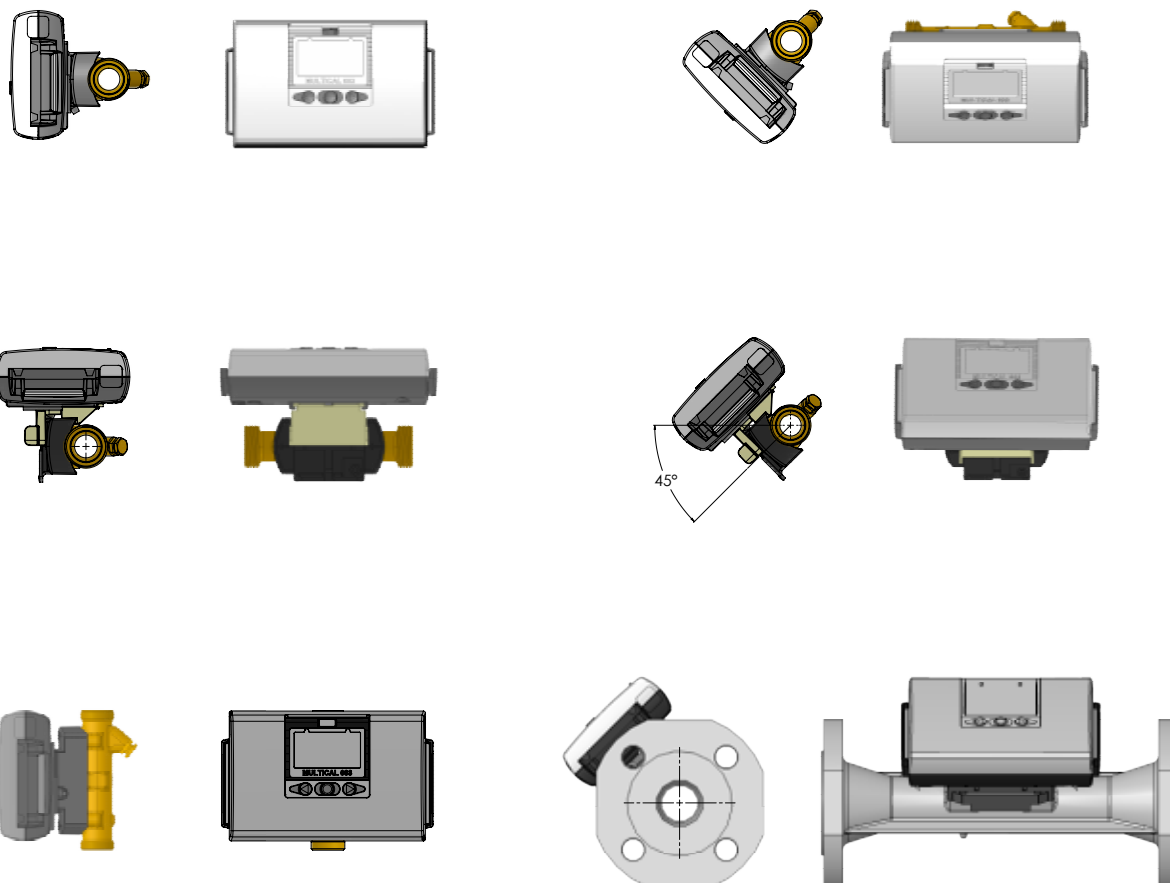
### Operating pressure

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® 54 type 65-5-XXHX-XXX) up to  $q_p$  and min. 2.5 bar (2.0 bar for ULTRAFLOW® 54 type 65-5-XXHX-XXX) at  $q_s$ . This applies to temperatures up to approx.  $80^\circ\text{C}$ . It is particularly recommended to follow this advice during meter calibration. In absence of cavitation, the flow sensor is typically functioning at lower operating pressure. ULTRAFLOW® must not be exposed to pressure lower than the ambient pressure (vacuum). This minimises the risk of transducer damage.

## Examples of installation

### MULTICAL® mounted directly on ULTRAFLOW® 54

The orientation of the flow sensors follows the general installation recommendations of Kamstrup.



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

### Insulation

For information about insulation of ULTRAFLOW® 54, see the Technical description 5512-2464-GB, which can be downloaded from [www.kamstrup.com](http://www.kamstrup.com).

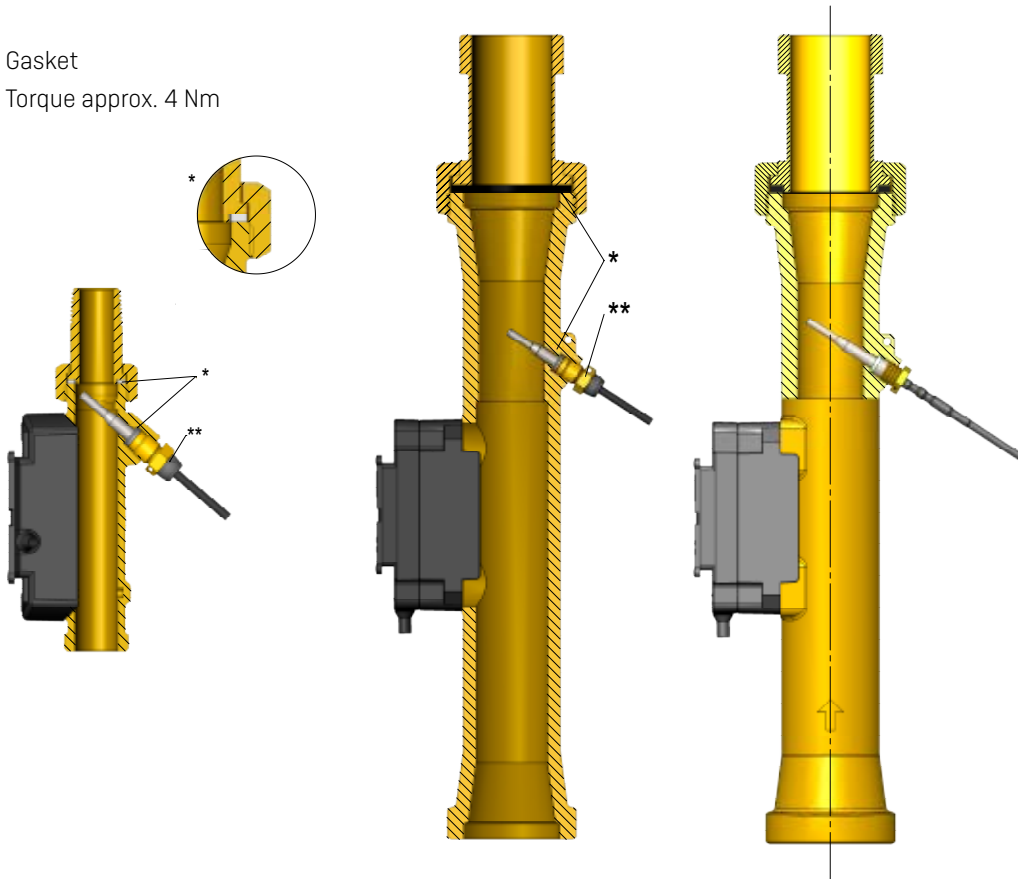
## Coupling and direct short sensor mounted in ULTRAFLOW® 54

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A temperature sensor can be directly mounted (M10x1 connection) in the outlet of all flow sensors with threaded meter housings ( $q_p$  0.6...10 m<sup>3</sup>/h).

\* Gasket

\*\* Torque approx. 4 Nm



## Electrical connection

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### Connecting MULTICAL® and ULTRAFLOW® 54

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

### Connecting via Pulse Transmitter/Pulse Divider/Cable Extender Box

| ULTRAFLOW® 54   | -> | Pulse Transmitter/Pulse Divider/<br>Cable Extender Box |        | -> | MULTICAL® |
|-----------------|----|--|--------|----|-----------|
|                 |    | Input  | Output |    |           |
| Blue (GND)      | -> | 11   | 11A/11 | -> | 11        |
| Red (supply)    | -> | 9  | 9A/9   | -> | 9         |
| Yellow (signal) | -> | 10   | 10A/10 | -> | 10        |

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

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

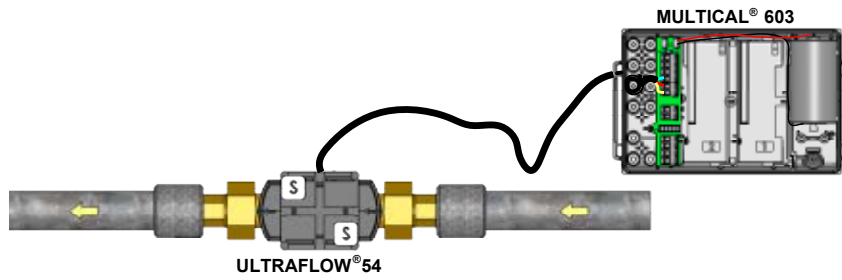
If long signal cables are used, please consider the installation carefully. There must be **at least 25 cm** between the signal cable and all other cables due to EMC.

For further information about Pulse Transmitter/Pulse Divider and Cable Extender Box, see the Technical description 5512-2464, which can be downloaded from [www.kamstrup.com](http://www.kamstrup.com).

## Example of connecting ULTRAFLOW® 54 and MULTICAL®

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### ULTRAFLOW® 54 and MULTICAL® 603



## Order specification

### Threaded connection PN16/PN25, PS25 <sup>1)</sup>

| Type number <sup>2)</sup> | q <sub>p</sub>      | q <sub>i</sub>      | q <sub>s</sub>      | Dynamic range<br>q <sub>p</sub> :q <sub>i</sub> | Connection | Length<br>[mm]    | PN, PS<br>[bar] | Meter factor<br>[p/l] | Material<br>(housing) | Temperature sensor<br>(M10x1 connection) <sup>3)</sup> |
|---------------------------|---------------------|---------------------|---------------------|---|------------|-------------------|-----------------|-----------------------|-----------------------|--|
|                           | [m <sup>3</sup> /h] | [m <sup>3</sup> /h] | [m <sup>3</sup> /h] |   |            |                   |                 |                       |                       |  |
| 65-5- CAHA-XXX            | 0.6                 | 0.006               | 1.2                 | 100:1   | G¾B (R½)   | 110               | 16/25, 25       | 300                   | Brass                 | TS63   |
| 65-5- CAHD-XXX            | 0.6                 | 0.006               | 1.2                 | 100:1   | G1B (R¾)   | 130               | 16/25, 25       | 300                   | Brass                 | TS63   |
| 65-5- CAHF-XXX            | 0.6                 | 0.006               | 1.2                 | 100:1   | G1B (R¾)   | 190               | 16/25, 25       | 300                   | Brass                 | TS63   |
| 65-5- CDHA-XXX            | 1.5                 | 0.015               | 3                   | 100:1   | G¾B (R½)   | 110               | 16/25, 25       | 100                   | Brass                 | TS63   |
| 65-5- CDHC-XXX            | 1.5                 | 0.015               | 3                   | 100:1   | G¾B (R½)   | 165               | 16/25, 25       | 100                   | Brass                 | TS63   |
| 65-5- CDHD-XXX            | 1.5                 | 0.015               | 3                   | 100:1   | G1B (R¾)   | 130 <sup>4)</sup> | 16/25, 25       | 100                   | Brass                 | TS63   |
| 65-5- CDHF-XXX            | 1.5                 | 0.015               | 3                   | 100:1   | G1B (R¾)   | 190               | 16/25, 25       | 100                   | Brass                 | TS63   |
| 65-5- CEHD-XXX            | 2.5                 | 0.025               | 5                   | 100:1   | G1B (R¾)   | 130               | 16/25, 25       | 60                    | Brass                 | TS63   |
| 65-5- CEHF-XXX            | 2.5                 | 0.025               | 5                   | 100:1   | G1B (R¾)   | 190               | 16/25, 25       | 60                    | Brass                 | TS63   |
| 65-5- CGJG-XXX            | 3.5                 | 0.035               | 7                   | 100:1   | G1¼B (R1)  | 260               | 16/25, 25       | 50                    | Brass                 | TS63   |
| 65-5- CHJG-XXX            | 6                   | 0.060               | 12                  | 100:1   | G1¼B (R1)  | 260               | 16/25, 25       | 25                    | Brass                 | TS63   |
| 65-5- CHJH-XXX            | 6                   | 0.060               | 12                  | 100:1   | G1½B (R1¼) | 260               | 16/25, 25       | 25                    | Brass                 | TS63   |
| 65-5- CJJJ-XXX            | 10                  | 0.100               | 20                  | 100:1   | G2B (R1½)  | 300               | 16/25, 25       | 15                    | Brass                 | DS38   |

1) Thread according to EN ISO 228-1 (flow sensor) and EN 10226-1 (couplings).

2) XXX - code for final assembly, approvals etc. - determined by Kamstrup. A few variants may not be available in single markets. Contact your local Kamstrup sales representative, if a variant is of interest for you.

3) Direct mounting of a temperature sensor in the outlet of the flow sensor is possible.  
TS63 = TemperatureSensor 63 = DS27.5 mm, ø5.0 mm and ø5.2 mm; DS38 = DirectShort 38 mm

4) For installation size G1B (R¾) x 165 mm please add extension 13-30-023.

### Flanged connection PN16/PN25 <sup>1)</sup>, PS25

| Type number <sup>2)</sup> | q <sub>p</sub>      | q <sub>i</sub>      | q <sub>s</sub>      | Dynamic range<br>q <sub>p</sub> :q <sub>i</sub> | Connection | Length<br>[mm] | PN, PS<br>[bar] | Meter factor<br>[p/l] | Material<br>(housing) | Temperature sensor<br>(M10x1 connection) <sup>3)</sup> |
|---------------------------|---------------------|---------------------|---------------------|---|------------|----------------|-----------------|-----------------------|-----------------------|--|
|                           | [m <sup>3</sup> /h] | [m <sup>3</sup> /h] | [m <sup>3</sup> /h] |   |            |                |                 |                       |                       |  |
| 65-5- CDCA-XXX            | 1.5                 | 0.015               | 3                   | 100:1   | DN20       | 190            | 16/25, 25       | 100                   | Stainless steel       | N/A  |
| 65-5- CECA-XXX            | 2.5                 | 0.025               | 5                   | 100:1   | DN20       | 190            | 16/25, 25       | 60                    | Stainless steel       | N/A  |
| 65-5- CGCB-XXX            | 3.5                 | 0.035               | 7                   | 100:1   | DN25       | 260            | 16/25, 25       | 50                    | Stainless steel       | N/A  |
| 65-5- CHCB-XXX            | 6                   | 0.06                | 12                  | 100:1   | DN25       | 260            | 16/25, 25       | 25                    | Stainless steel       | N/A  |
| 65-5- CHCC-XXX            | 6                   | 0.06                | 12                  | 100:1   | DN32       | 260            | 16/25, 25       | 25                    | Stainless steel       | N/A  |
| 65-5- CJCD-XXX            | 10                  | 0.1                 | 20                  | 100:1   | DN40       | 300            | 16/25, 25       | 15                    | Stainless steel       | N/A  |
| 65-5- CKCE-XXX            | 15                  | 0.15                | 30                  | 100:1   | DN50       | 270            | 16/25, 25       | 10                    | Stainless steel       | N/A  |
| 65-5- CLCG-XXX            | 25                  | 0.25                | 50                  | 100:1   | DN65       | 300            | 16/25, 25       | 6                     | Stainless steel       | N/A  |
| 65-5- CMCH-XXX            | 40                  | 0.4                 | 80                  | 100:1   | DN80       | 300            | 16/25, 25       | 5                     | Stainless steel       | N/A  |

1) Flange facing type B, raised face in accordance with EN 1092-1, PN25. Up to and inclusive DN80 mating dimensions of PN16 and PN25 are identical.

2) XXX - code for final assembly, approvals etc. - determined by Kamstrup. A few variants may not be available in single markets. Contact your local Kamstrup sales representative, if a variant is of interest for you.

3) Direct mounting of a temperature sensor in the outlet of the flow sensor is possible.

## Order specification

### Flanged connection PN25 <sup>1)</sup>, PS25

| Type number <sup>2)</sup> | q <sub>p</sub>      | q <sub>i</sub>      | q <sub>s</sub>      | Dynamic range<br>q <sub>p</sub> :q <sub>i</sub> | Connection | Length<br>[mm] | PN, PS<br>[bar] | Meter factor<br>[p/l] | Material<br>(housing) | Temperature sensor<br>(M10x1 connection) <sup>3)</sup> |
|---------------------------|---------------------|---------------------|---------------------|---|------------|----------------|-----------------|-----------------------|-----------------------|--|
|                           | [m <sup>3</sup> /h] | [m <sup>3</sup> /h] | [m <sup>3</sup> /h] |   |            |                |                 |                       |                       |  |
| 65-5- FACL-XXX            | 60                  | 0.6                 | 120                 | 100:1   | DN100      | 360            | 25, 25          | 2.5                   | Stainless steel       | N/A  |
| 65-5- FBCL-XXX            | 100                 | 1                   | 200                 | 100:1   | DN100      | 360            | 25, 25          | 1.5                   | Stainless steel       | N/A  |
| 65-5- FBCM-XXX            | 100                 | 1                   | 200                 | 100:1   | DN125      | 350            | 25, 25          | 1.5                   | Stainless steel       | N/A  |

1) Flange facing type B, raised face in accordance with EN 1092-1, PN25.

2) XXX - code for final assembly, approvals etc. - determined by Kamstrup. A few variants may not be available in single markets. Contact your local Kamstrup sales representative, if a variant is of interest for you.

3) Direct mounting of a temperature sensor in the outlet of the flow sensor is possible.

### Flow sensors for special purposes

| Type number <sup>1)</sup> | q <sub>p</sub>      | q <sub>i</sub>      | q <sub>s</sub>      | Dynamic range<br>q <sub>p</sub> :q <sub>i</sub> | Connection | Length<br>[mm] | PN, PS<br>[bar] | Meter factor<br>[p/l] | Material<br>(housing) | Temperature sensor<br>(M10x1 connection) <sup>2)</sup> |
|---------------------------|---------------------|---------------------|---------------------|---|------------|----------------|-----------------|-----------------------|-----------------------|--|
|                           | [m <sup>3</sup> /h] | [m <sup>3</sup> /h] | [m <sup>3</sup> /h] |   |            |                |                 |                       |                       |  |
| (65-5- CDH1 -XXX)         | 1.5                 | 0.015               | 3                   | 100:1   | G1B (R¾)   | 110            | 16, 16          | 100                   | Brass                 | TS63   |
| (65-5- CKC4 -XXX)         | 15                  | 0.15                | 30                  | 100:1   | DN50       | 250            | 16/25, 25       | 10                    | Stainless steel       | N/A  |
| (65-5- CMCJ -XXX)         | 40                  | 0.4                 | 80                  | 100:1   | DN80       | 350            | 16/25, 25       | 5                     | Stainless steel       | N/A  |
| (65-5- FAD5 -XXX)         | 60                  | 0.6                 | 120                 | 100:1   | DN100      | 400            | 16, 16          | 2.5                   | Stainless steel       | N/A  |

1) XXX - code for final assembly, approvals etc. - determined by Kamstrup. A few variants may not be available in single markets. Contact your local Kamstrup sales representative, if a variant is of interest for you.

2) Direct mounting of a temperature sensor in the outlet of the flow sensor is possible.  
TS63 = TemperatureSensor 63 = DS27.5 mm, ø5.0 mm and ø5.2 mm

[...] Country specific variants. Contact your local Kamstrup sales representative if one of these variants is of interest for you.

By default, ULTRAFLOW® 54 is delivered with 2.5 m cable, but can also be delivered with 5 or 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® 54. Battery, 24 VAC and 230 VAC supply are available. Please state the required supply type when ordering.

### Cable Extender Box - type no. 6699-036

If ULTRAFLOW® must be connected to MULTICAL® 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 5512-2464, which can be downloaded from [www.kamstrup.com](http://www.kamstrup.com).

## Accessories

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### 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 (PN16 and 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        |

### Gaskets for flanged meters (PN25)

| Size  | Type no. (1 pc) |
|-------|-----------------|
| DN100 | 1150-142        |
| DN125 | 1150-153        |

For further information about ULTRAFLOW® 54 DN15-125, see the Technical description 5512-2464, which can be downloaded from [www.kamstrup.com](http://www.kamstrup.com).

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