

# SVM ULTRAFLOW® 54

## DATA SHEET

- Ultrasonic flow sensor
- Compact design
- Static meter with no moving parts
- Large dynamic range
- No wear
- Exceptionally accurate
- Longevity

MID-2004/22/EC



## 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 SVM F2, F22 and F4. ULTRAFLOW® 54 has been designed for use in heating installations where water is used as the heat-conveying liquid.

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

A three-wire pulse cable is used to connect ULTRAFLOW® 54 to SVM F2, F22 or F4. This cable is used to supply the flow sensor from the calculator and also to send volume pulses to the calculator. The transmitted pulses are proportional to the water volume flowing through the flow sensor.

ULTRAFLOW® 54 is also available as a stand alone flow meter. The stand alone flow meter needs to be equipped with a Pulse Transmitter or a Pulse Divider. These accessories have a built-in power supply along with a galvanically separated pulse outlet.



# SVM ULTRAFLOW® 54

## DATA SHEET



## Contents

---

Application	1
Approvals	3
Technical data	3
Flowdata	4
Materials	5
Type summary	6
Dimensional drawings	6
Pulse Transmitter/Pulse Divider	8
Pressure loss	9
Pressure loss graphs	9
Installation	10
Examples of installation	11
Electrical connection	12
Example of connecting ULTRAFLOW® 54 and SVM Fx	12
Order specification	14
Accessories	15

# SVM ULTRAFLOW® 54

## DATA SHEET



## Approvals

### Type approval

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

EC-Type Examination certificate: DK-0200-MI004-008.

Please contact Kamstrup SVM AB for further information relating to type approval and verification.

### CE-marking

ULTRAFLOW® 54 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...DN100 category I)                                    |

MID-2004/22/EC



### 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
Environmental class	Complies with DS/EN 1434 class C
Ambient temperature	0...55°C
Protection class	
– Flow sensor	IP65
– Pulse Transmitter	IP54
Temperature* of medium	15...130°C
Storage temperature (empty sensor)	
– Meter without battery	-25...70°C
– Meter with battery	-25...60°C
Pressure stage	PN16, PN25 flange

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

# SVM ULTRAFLOW® 54

## DATA SHEET



### Technical data

#### Electrical data

Supply voltage	3.6 V ± 0.1 V
Battery (Pulse Transmitter)	3.65 VDC, D-Cell lithium
Replacement interval	6 years @ $t_{BAT} < 30^{\circ}C$
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	2,5 meters as default, max. 10 meters
Cable length (Pulse Transmitter)	Depends on calculator
EMC data	Complies with DS/EN 1434 class C

### Flowdata

Nom. flow $q_p$ [m <sup>3</sup> /h]	Nom. diameter [mm]	Pulse value <sup>1)</sup> [l/imp]	Dynamic range $q_i:q_p$	$q_s:q_p$	$\Delta p@q_p$ [bar]	Min. cut off [l/h]
0.6	DN15 & DN20	1	1:100	2:1	0.04	2
1.5	DN15 & DN20	1	1:100	2:1	0.22	3
2.5	DN20	1	1:100	2:1	0.03	5
3.5	DN25	2,5	1:100	2:1	0.07	7
6	DN25	2,5	1:100	2:1	0.2	12
10	DN40	10	1:100	2:1	0.06	20
15	DN50	10	1:100	2:1	0.14	30
25	DN65	10	1:100	2:1	0.06	50
40	DN80	25	1:100	2:1	0.05	80
60	DN100	100	1:100	2:1	0.03	120
100	DN100	100	1:100	2:1	0.07	200

<sup>1)</sup> The pulse value can be seen on the label on the side of the meter.

# SVM ULTRAFLOW® 54

## DATA SHEET



## Materials

---

### Wetted parts

#### ULTRAFLOW® 54, $q_p$ 0.6 og 1.5 m<sup>3</sup>/h

Housing, thread	Dezincification resistant brass
Housing, flange	Stainless steel, W.no. 1.4308
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® 54, $q_p$ 2.5 til 100 m<sup>3</sup>/h

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

### Electronic housing

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

### Connection cable $q_p$ 0.6 to 100 m<sup>3</sup>/h

Silicone cable (3×0.5mm<sup>2</sup>)

# SVM ULTRAFLOW® 54

## DATA SHEET



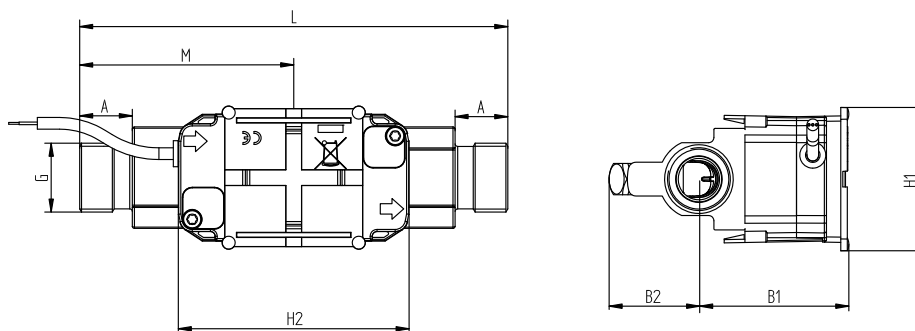
### Type summary

Nom. flow $q_p$ [m <sup>3</sup> /h]	Size	
	0.6	G <sup>3</sup> / <sub>4</sub> x 110 mm
1.5	G <sup>3</sup> / <sub>4</sub> x 110 mm	G1 x 130 mm
2.5	G1 x 130 mm	G1 x 190 mm
3.5	G5/4 x 260 mm	DN25 x 260 mm
6	G5/4 x 260 mm	DN25 x 260 mm
10	G2 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	

Thread ISO 228-1  
Flange EN 1092, PN25

### Dimensional drawings

ULTRAFLOW® 54, G<sup>3</sup>/<sub>4</sub> and G1



Thread ISO 228-1

Thread	L	M	H2	A	B1	B2	H1	App. weight [kg]
G <sup>3</sup> / <sub>4</sub>	110	L/2	89	10.5	58	35	55	0.8
G1	130	L/2	89	20.5	58	35	55	0.9
G1( $q_p$ 2.5)	190	L/2	89	20.5	58	36	55	1.3

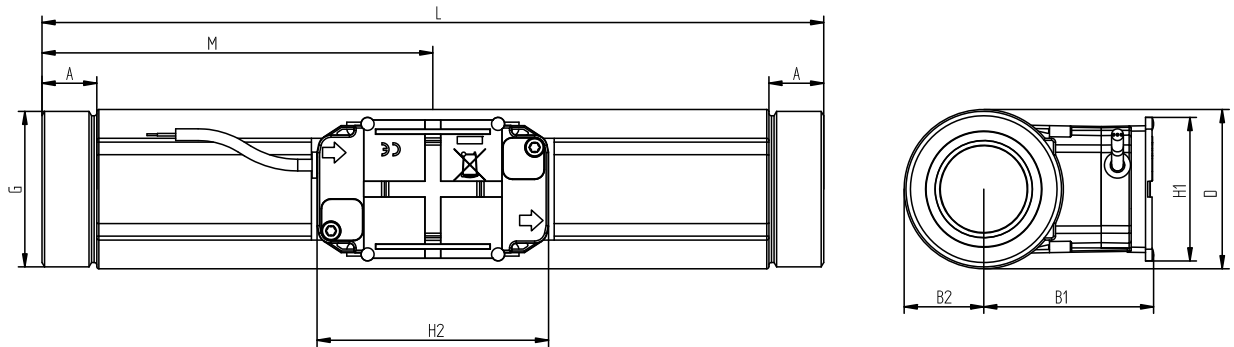
# SVM ULTRAFLOW® 54

## DATA SHEET



### Dimensional drawings

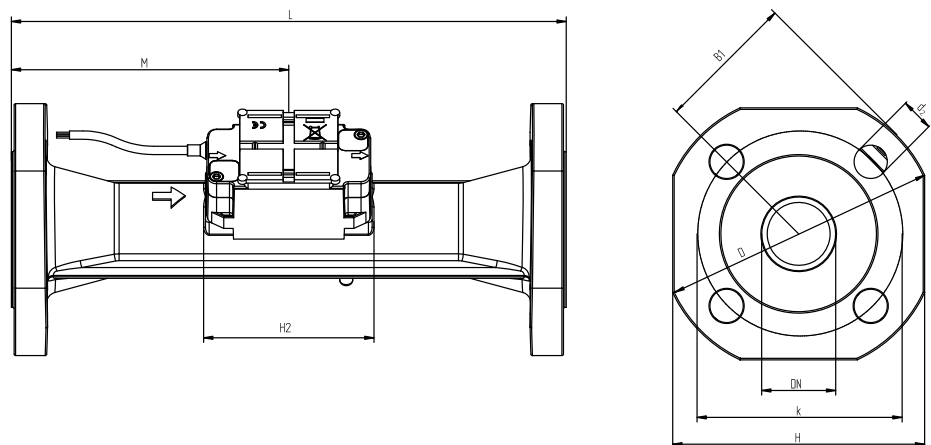
#### ULTRAFLOW® 54, G5/4 and G2



#### Thread ISO 228-1

Thread	L	M	H2	A	B1	B2	H1	App. weight [kg]
G5/4	260	L/2	89	17	58	22	55	2.3
G2	300	L/2	89	21	65	31	55	4.5

#### ULTRAFLOW® 54, DN25 to DN50



#### Flange EN 1092, PN25

Nom. diameter	L	M	H2	B1	D	H	k	No.	Bolts		App. weight [kg]
									Thread	d <sub>2</sub>	
DN25	260	L/2	89	58	115	106	85	4	M12	14	5.0
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

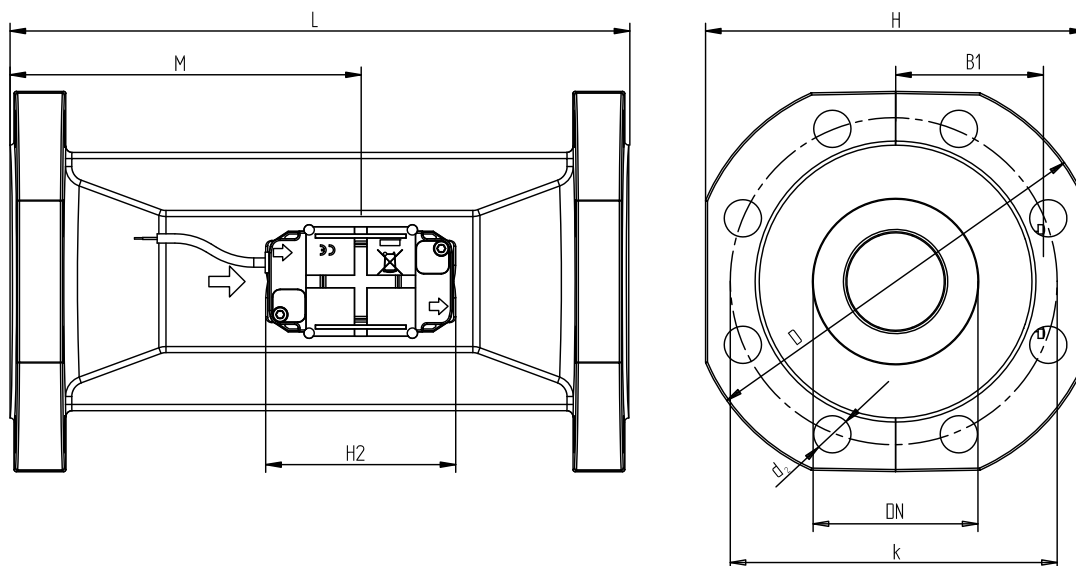
# SVM ULTRAFLOW<sup>®</sup> 54

## DATA SHEET



### Dimensional drawings

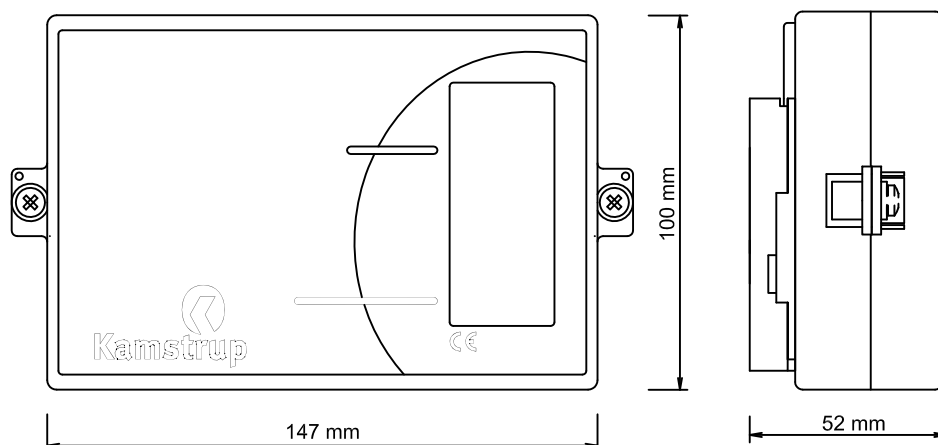
ULTRAFLOW<sup>®</sup> 54, DN65 to DN100



Flange EN 1092, PN25

Nom. diameter	L	M	H2	B1	D	H	k	No.	Bolts		App. weight [kg]
									Thread	d <sub>2</sub>	
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

### Pulse Transmitter/Pulse Divider



# SVM ULTRAFLOW® 54

## DATA SHEET

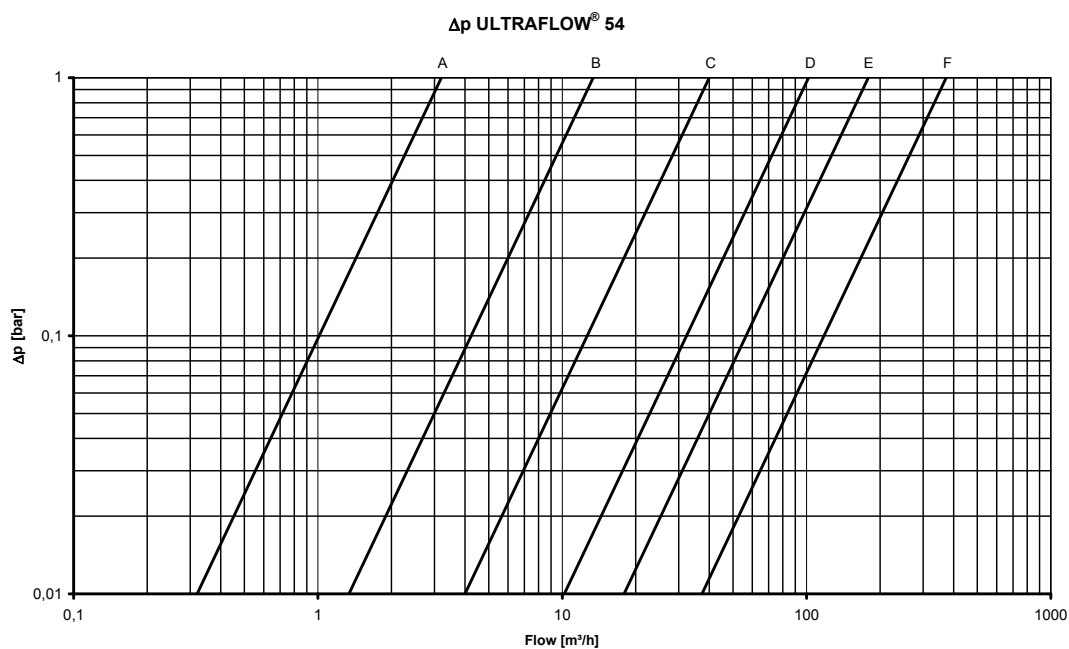


### Pressure loss

Graph	$q_p$ [m³/h]	Nom. diameter	$k_v$ <sup>3)</sup>	Q@0.25 bar [m³/h]
A	0.6 & 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	373	187

$$^3) \bar{q} = k_v \times \sqrt{\Delta p}$$

### Pressure loss graphs



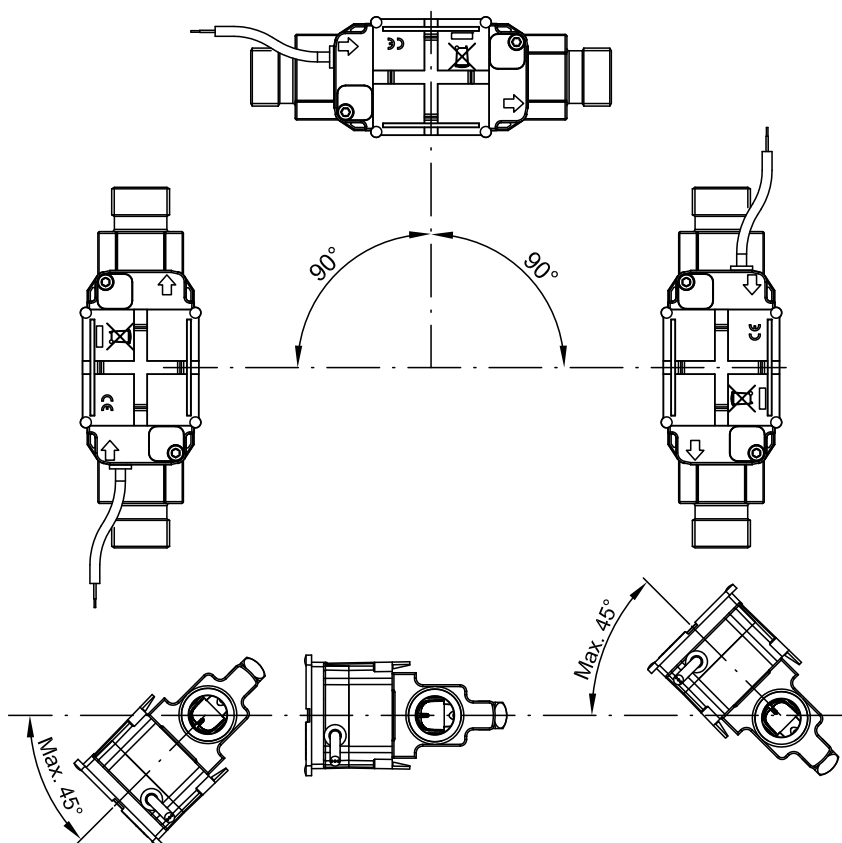
# SVM ULTRAFLOW® 54

## DATA SHEET



## Installation

### Installation angle for ULTRAFLOW® 54 ≤DN100



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

#### **IMPORTANT!**

With ULTRAFLOW® 54 ≤DN100 (100 m<sup>3</sup>/h), the electronics/ plastic case must be placed to the side (with horizontal installation).

ULTRAFLOW® 54 may be turned up to ±45° in relation to 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.

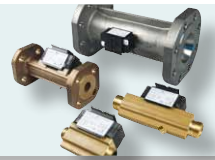
### **Working Pressure**

In order to prevent cavitation the back pressure at ULTRAFLOW® 54 must be min. 1.5 bar at  $q_p$  and min. 2.5 bar at  $q_s$  (4.5 bar for DN80 x 350). This applies to temperatures up to approx. 80°C.

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

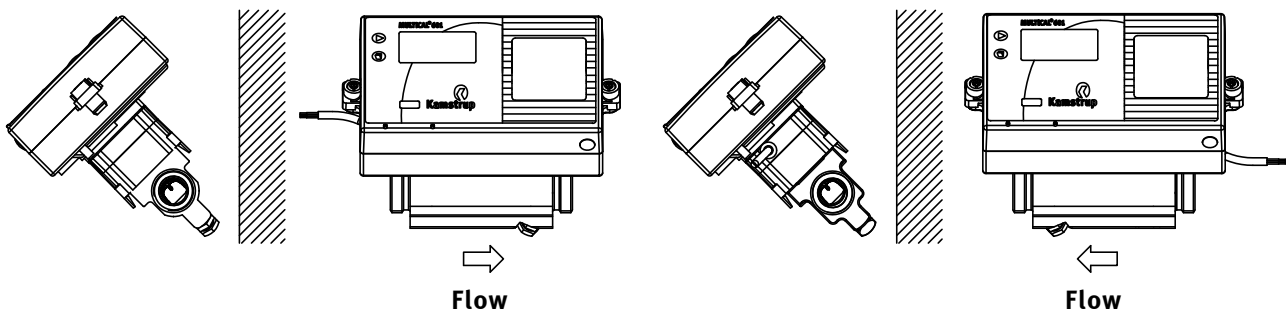
# SVM ULTRAFLOW® 54

## DATA SHEET

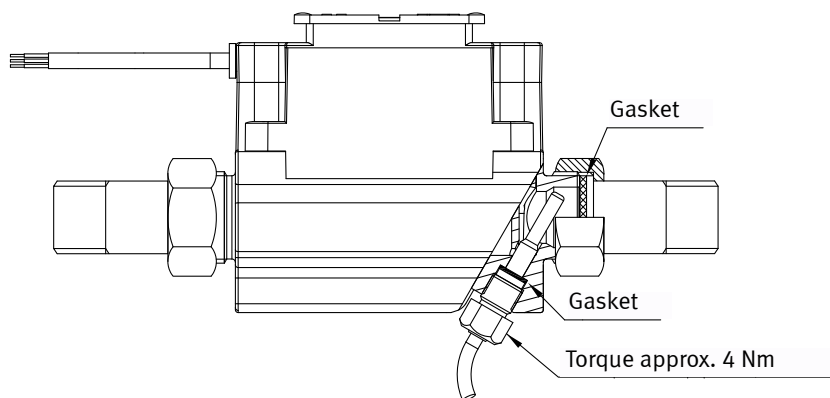


### Examples of installation

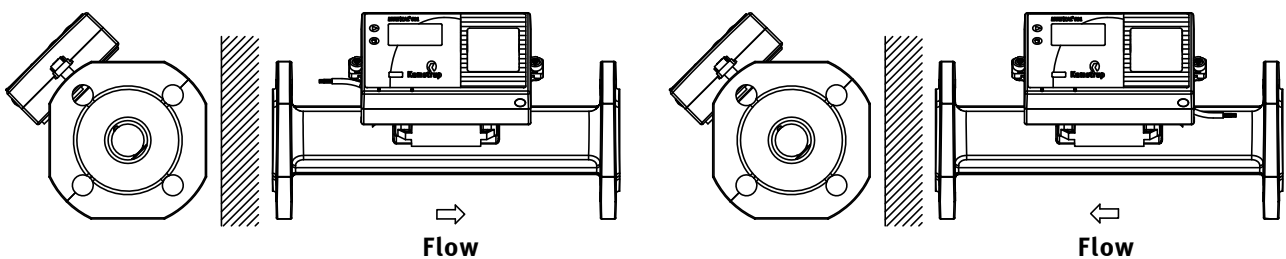
Thread meter with Pulse Transmitter/Pulse Divider fitted directly on ULTRAFLOW® 54.



Couplings and short direct sensor fitted in ULTRAFLOW® 54 (G $\frac{3}{4}$  (R $\frac{1}{2}$ ) and G1 (R $\frac{3}{4}$ ) only).



Flange meter with Pulse Transmitter/Pulse Divider fitted directly on ULTRAFLOW® 54.



NB: For meters  $\geq$ DN100 the Pulse Transmitter/Pulse Divider **cannot** be fitted directly on the flow part.

# SVM ULTRAFLOW® 54

## DATA SHEET



### Electrical connection

#### Connecting Fx & ULTRAFLOW® 54

ULTRAFLOW® 54	->	F2	F22	F4
Blue (GND)/11A	->	0	-	-
Red (supply)/9A	->	3V	+3V	+3V
Yellow (signal)/10A	->	Kt	+	+

#### Connecting via Pulse Transmitter/Divider

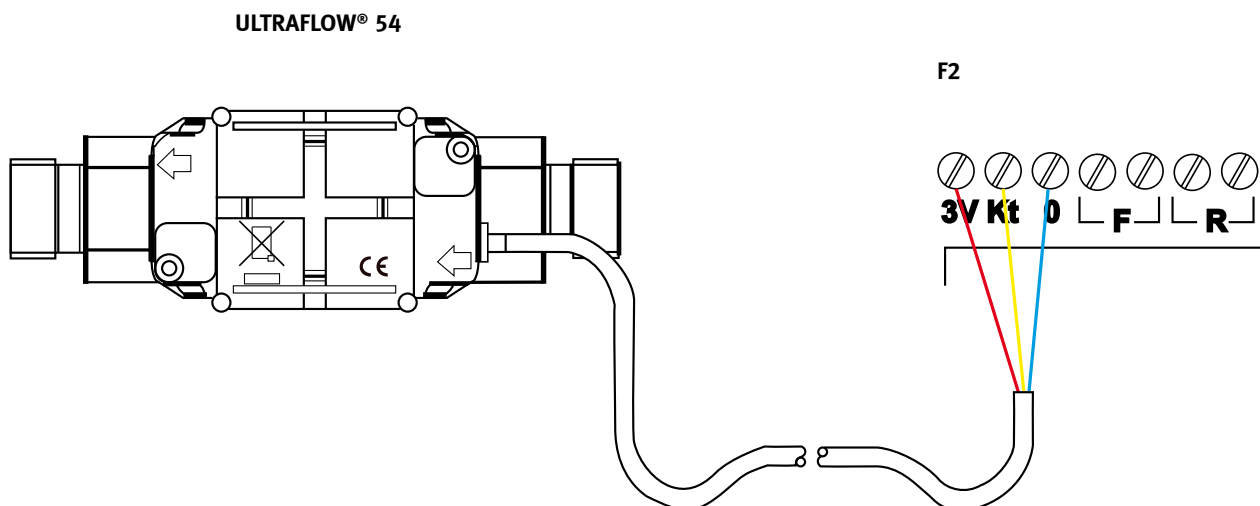
3.65 VDC supply <sup>2)</sup>	->	Pulse Transmitter/Divider
Red (+)	->	60
Black (-)	->	61

<sup>2)</sup> from battery or supply module.

ULTRAFLOW® 54	->	Pulse Transmitter/Divider		->	F2	F22	F4
		In	Out				
Blue (GND)/11A	->	11	11A	->	0	-	-
Red (supply)/9A	->	9	9A	->	3V	+3V	+3V
Yellow (signal)/10A	->	10	10A	->	Kt	+	+

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® 54 and Fx



# SVM ULTRAFLOW® 54

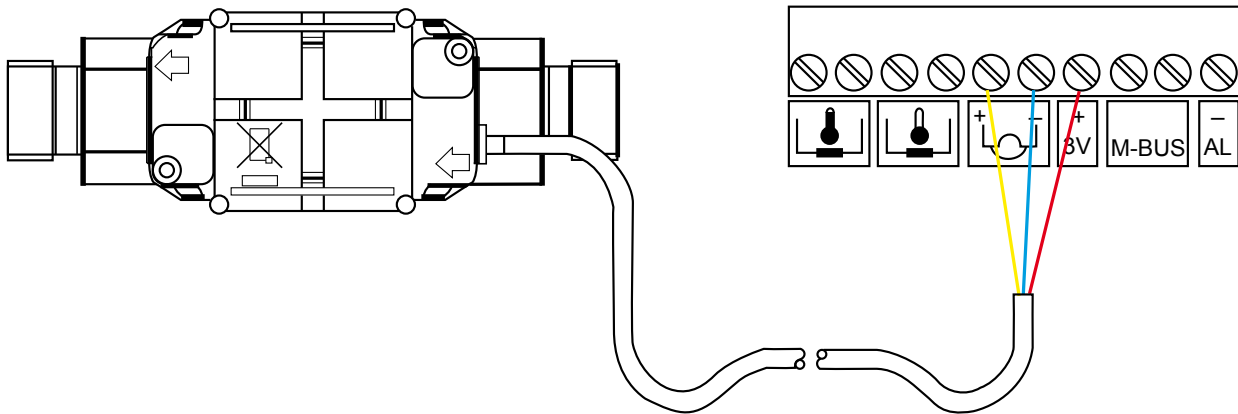
## DATA SHEET



### Example of connecting ULTRAFLOW® 54 and Fx

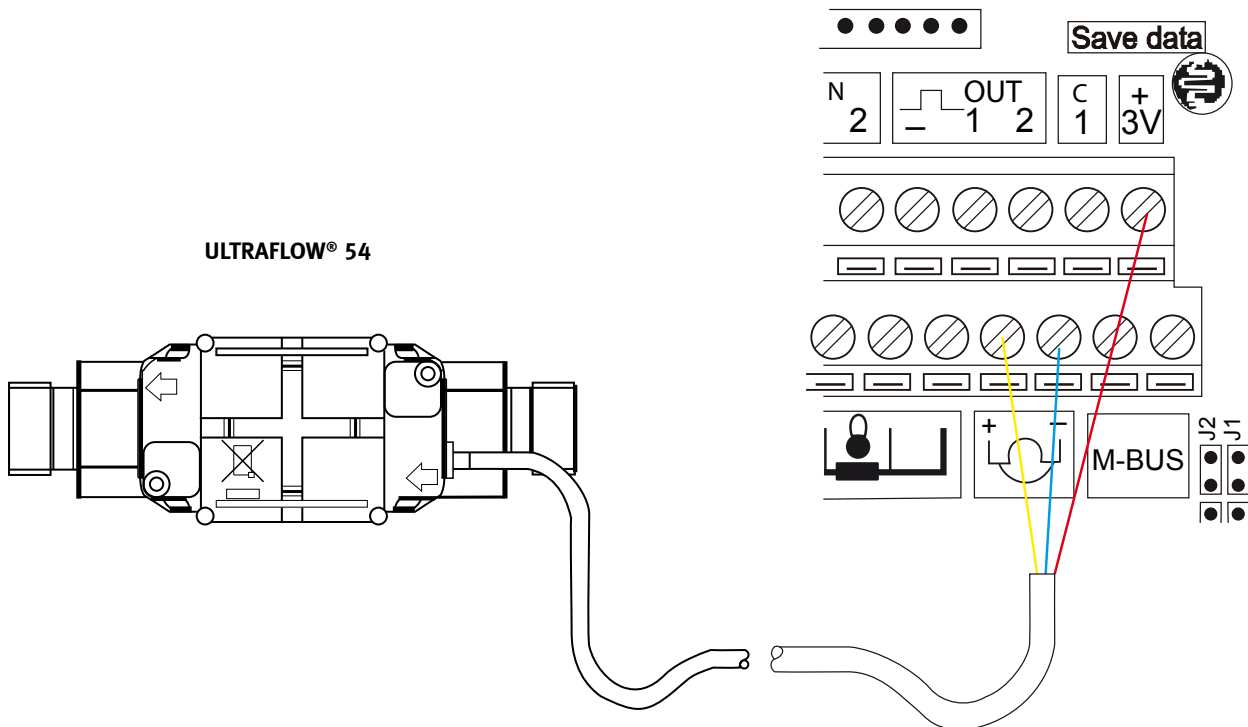
ULTRAFLOW® 54

F22



F4

ULTRAFLOW® 54



# SVM ULTRAFLOW® 54

## DATA SHEET



## Order specification

The list below shows type numbers for ULTRAFLOW® 54

Type number			$q_p$ [m <sup>3</sup> /h]	$q_i$ [m <sup>3</sup> /h]	$q_s$ [m <sup>3</sup> /h]	Connection	Length [mm]	Pulse value [l/p]	CCC (high res.)	Material
65-5-	CAAA	-295	0.6	0.006	1.2	G <sup>3</sup> / <sub>4</sub> B (R <sup>1</sup> / <sub>2</sub> )	110	1	416 (484)	Brass
65-5-	CAAD	-295	0.6	0.006	1.2	G1B (R <sup>3</sup> / <sub>4</sub> )	130	1	416 (484)	Brass
65-5-	CDAA	-295	1.5	0.015	3	G <sup>3</sup> / <sub>4</sub> B (R <sup>1</sup> / <sub>2</sub> )	110	1	419 (407)	Brass
65-5-	CDAD	-295	1.5	0.015	3	G1B (R <sup>3</sup> / <sub>4</sub> )	130	1	419 (407)	Brass
65-5-	CEAD	-295	2,5	0,025	5	G1B (R <sup>3</sup> / <sub>4</sub> )	130	1	498(-)	Brass
65-5-	CEAF	-295	2.5	0.025	5	G1B (R <sup>3</sup> / <sub>4</sub> )	190	1	498 (-)	Brass
65-5-	CGAG	-295	3.5	0.035	7	G5/4B (R1)	260	2,5	451 (436)	Brass
65-5-	CGCB	-295	3.5	0.035	7	DN25	260	2,5	451 (436)	Stainless steel
65-5-	CHAG	-295	6	0.06	12	G5/4B (R1)	260	2,5	437 (438)	Brass
65-5-	CHCB	-295	6	0.06	12	DN25	260	2,5	437 (438)	Stainless steel
65-5-	CJAJ	-295	10	0.1	20	G2B (R1 <sup>1</sup> / <sub>2</sub> )	300	10	478 (483)	Brass
65-5-	CJCD	-295	10	0,1	20	DN40	300	10	478 (483)	Stainless steel
65-5-	CKCE	-295	15	0.15	30	DN50	270	10	420 (485)	Stainless steel
65-5-	CLCG	-295	25	0.25	50	DN65	300	10	479 (-)	Stainless steel
65-5-	CMCH	-295	40	0.4	80	DN80	300	25	458 (486)	Stainless steel
65-5-	FACL	-295	60	0.6	120	DN100	360	100	470 (487)	Stainless steel
65-5-	FBCL	-295	100	1	200	DN100	360	100	480 (488)	Stainless steel

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. 66-99-603

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.

### Pulse Divider – type No. 66-99-607

The Pulse Divider 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.

# SVM ULTRAFLOW® 54

## DATA SHEET



## Accessories

### Couplings including gaskets (PN16)

Size	Nipple	Union	Type No.	2 pcs.
DN15	R $\frac{1}{2}$	G $\frac{3}{4}$	-	6561-323
DN20	R $\frac{3}{4}$	G1	-	6561-324
DN25	R1	G $\frac{5}{4}$	6561-325	-
DN32	R $\frac{5}{4}$	G $1\frac{1}{2}$	6561-314	-
DN40	R $1\frac{1}{2}$	G2	6561-315	-

### Gaskets for flange meters (PN25)

Size	Type No.
DN25	2210-133
DN40	2210-132
DN50	2210-099
DN65	2210-141
DN80	2210-140
DN100	1150-142

### Gaskets for couplings

Size (union)	Type No.
G $\frac{3}{4}$	2210-061
G1	2210-062
G $\frac{5}{4}$	2210-063
G $1\frac{1}{2}$	2210-064
G2	2210-065