

# SVM F25 Heat Meter

## DATA SHEET

- **Combined Heat Meter**
- **For compact or wall mounting**
- **MID approval**
- **Built-in M-Bus**
- **2 additional pulse inlets or pulse outlets**



## Application

F25 is a small and compact heat meter with high flexibility, and designed to be used for billing purposes in heating applications.

F25 consists of a calculator F2, an ultrasonic flow sensor UF54 and a matched pair of temperature sensors. The calculator is preferably mounted directly onto the flow meter, but it can also be wall mounted when required.

The length of the connecting cable between the calculator and the flow sensor is 2,5 meters.

F25 offers great flexibility in terms of power supply, and may be delivered with battery supply or 230VAC mains supply.

The battery life exceeds 10 years. F25 with mains supply also includes a super-cap to ensure operation during short term power cuts.

F25 can be supplied with two pulse outputs for energy and volume, or with two extra pulse inputs e.g. for connection to domestic water meters for cold and hot water.

These two extra volume registers are available when the meter is read remotely via M-bus or on the LCD of the meter.

F25 is delivered with Pt500 temperature sensors installed, using 2-wire connection.

The built-in service function makes it easy to change several operating parameters, such as the real time clock, date and primary communication address.



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### Approvals

F25 is a combined heat meter where the flow sensor, temperature sensors and calculator have separate type approvals. This ensures a simple calibration and reverification process, and also makes it possible to replace any of the parts separately.

The following type approvals apply to F25:

UF54 Flow sensor: DK-0200-MI004-008

F25 Calculator: 0402-MID-154217

TD/TL Temperature sensors: 0402-MID-154215

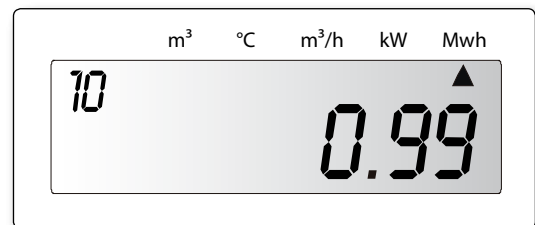
### Measurement

F25 measures the temperature difference between the hot and cold lines after each volume pulse received from the flow sensor. The recorded temperature difference and the pulse value are necessary parameters for the energy calculation.

The temperatures are measured and updated with every energy calculation. If no energy calculation takes place in 60 seconds, the temperatures are updated anyway. Power and flow rate are updated with every volume pulse, but not more frequently than every five seconds. If volume pulses are received more frequently than every five seconds, the pulses are added before the energy calculation takes place.

### Display

F25 is equipped with an LCD.



*The F25 LCD, showing accumulated energy*

### Pulse outputs/pulse inputs

F25 is equipped with two pulse outputs, output 1 for energy, and output 2 for volume. The outputs are of the type “open collector”. A pulse is emitted for each increment of the last digit, in the register for accumulated energy and the register for accumulated volume, respectively. The pulse value is thus depending on the decimal setting of the calculator.

As an option the F25 can be ordered with pulse inputs instead of pulse outputs. The inputs can be used to collect pulses from other meters, e.g. domestic water meters for hot and cold water. These extra pulse registers may also be read via M-Bus.

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### Communication

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F25 is equipped with a built-in M-Bus data output in accordance with EN1434-3. The meter can be read through the OPTO-interface or the 2-wire bus connection.

### Service

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F25 has a built-in service function that facilitates alteration of certain parameters in the field without a special service tool.

The following parameters can be altered:

- Time and date
- Pulse value
- Account days
- Communication address
- Flow sensor placing, high or low temperature
- Recommended date for battery replacement

Also the total error time can be reset. Using a PC program all the parameters can be altered.

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### Data

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The following data is accessible on the LCD and on the M-Bus in F25:

#### Accumulated values

- Accumulated energy
- Accumulated volume
- Accumulated energy according to energy calculation
- Accumulated pulses, pulse input 1\*
- Accumulated pulses, pulse input 2\*

#### Momentary values

- Power
- Flow
- Flow temperature (H)
- Return temperature (L)
- Temperature difference

#### Calculator settings

- Total operating time
- Real time clock
- Date
- Pulse value
- Flow sensor placing (high or low temperature, H/L)
- Calculator number, S/N
- Communication, primary address
- Communication, secondary address

#### Status

- Error code
- Total error time
- Preceding error code
- Total error time for preceding error
- Recommended date for battery replacement

#### Historical values

Historical values are stored at the end of each month, or period for account days.

There are 37 monthly registers + 2 account days in F25. The following values are stored:

- Accumulated energy
- Accumulated total volume
- Accumulated volume according to energy calculation
- Accumulated pulses, pulse input 1\*
- Accumulated pulses, pulse input 2\*
- Error code on date of storage
- Error time on date of storage

*\*Not applicable when pulse outputs are chosen*

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### Technical data F25

#### Pulse input (Kt) from UF54 Flow sensor

- Frequency max 12 Hz
- Pulse length min 40 ms
- Max voltage 3 V
- Cable length 2,5 meters (maximum 10 m)
- Pulse value 1, 2.5, 10, 25 or 100 l/p

#### Power supply

- Battery 3.6V, 3.6Ah, battery life 10 years
- Mains 230V ±10%, 45-65 Hz, supercap for short term power cuts

#### Data output

- M-Bus (EN1434-3) OPTO-interface (EN60870-5) and 2-wire bus connection (terminal)

#### Ambient temperature

- Operation +5°C to +55°C
- Storage/transport -20°C to +70°C

#### Protection class

- Calculator IP54
- Flow sensor IP65

#### Environmental class

C according to EN1434

#### Pressure class

PN16, PN25 for flanged flow sensors

#### Temperature sensors

- Approved and matched pairs type Pt500
- Max cable length
  - 12,5 m at 0,22 mm<sup>2</sup> cable cross section
  - 25 m at 0,50 mm<sup>2</sup> cable cross section
  - 37,5 m at 0,75 mm<sup>2</sup> cable cross section
  - 75 m at 1,50 mm<sup>2</sup> cable cross section
- Max sensor current 1 µA (RMS)

#### Display

7 + 2 digit LCD

#### Temperatures

- Measuring range 0 ...190°C
- Difference 2...120 K
- Water temperature\* 15...130°C

*\*For water temperatures exceeding +90°C, it is recommended to use a flanged flow sensor, and the calculator should be wall mounted.*

#### Pulse outputs, output 1 energy, and output 2 volume. Connected to inputs of the type "Open collector"

- Pulse length 125 ms
- Max voltage 30 V
- Max current 20 mA

#### Pulse inputs (optional), type "Open Collector"

- Max frequency 12 Hz
- Min pulse length 40 ms
- Max voltage 3 V

#### Alarm output

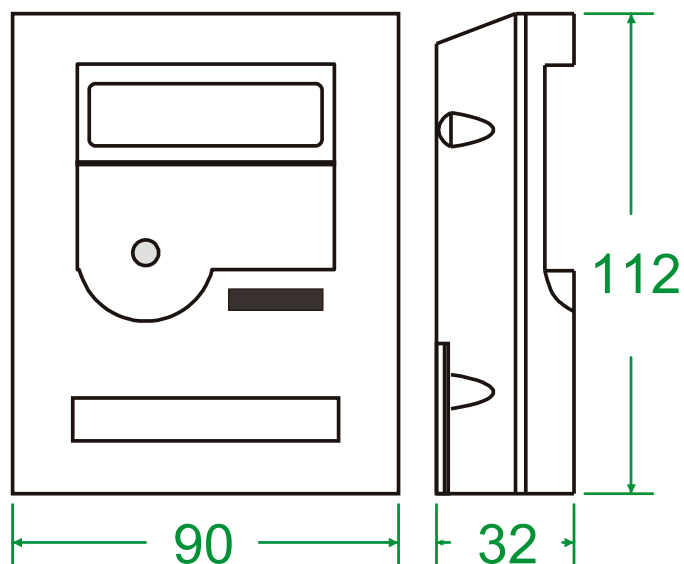
- Pulse length 125 ms

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### Dimensions, F25 calculator

All dimensions are in mm



### Flow sensor/Flow data

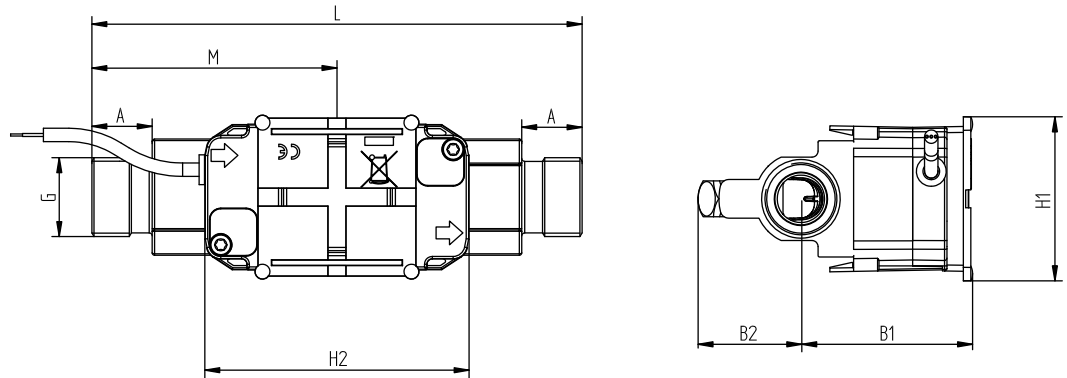
Nom. flow $q_p$ [m <sup>3</sup> /h]	Connection	Length [mm]	Pressure class [Bar]	Pulse value [l/p]	Material
0,6	G $\frac{3}{4}$ B	110	16	1	Brass
0,6	G1B	130	16	1	Brass
1,5	G $\frac{3}{4}$ B	110	16	1	Brass
1,5	G1B	130	16	1	Brass
2,5	G1B	130	16	1	Brass
2,5	G1B	190	16	1	Brass
3,5	G1 $\frac{1}{4}$ B	260	16	2,5	Brass
3,5	DN25	260	25	2,5	Stainless steel
6	G1 $\frac{1}{4}$ B	260	16	2,5	Brass
6	DN25	260	25	2,5	Stainless steel
10	G2B	300	16	10	Brass
10	DN40	300	25	10	Stainless steel
15	DN50	270	25	10	Stainless steel
25	DN65	300	25	10	Stainless steel
40	DN80	300	25	25	Stainless steel
60	DN100	360	25	100	Stainless steel
100	DN100	360	25	100	Stainless steel

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### Dimensional drawings

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



Thread ISO 228-1

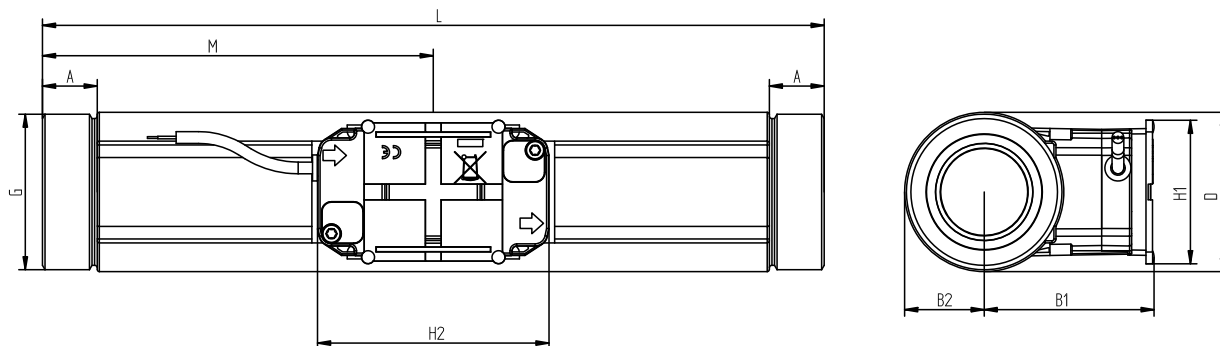
Thread	L	M	H2	A	B1	B2	H1	App. weight [kg]
G <sup>3</sup> / <sub>4</sub>	110	L/2	89	10,5	58	35	55	0,8
G1	130	L/2	89	20,5	58	35	55	0,9
G1(q <sub>p</sub> 2.5)	190	L/2	89	20,5	58	36	55	1,3

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### Dimensional drawings

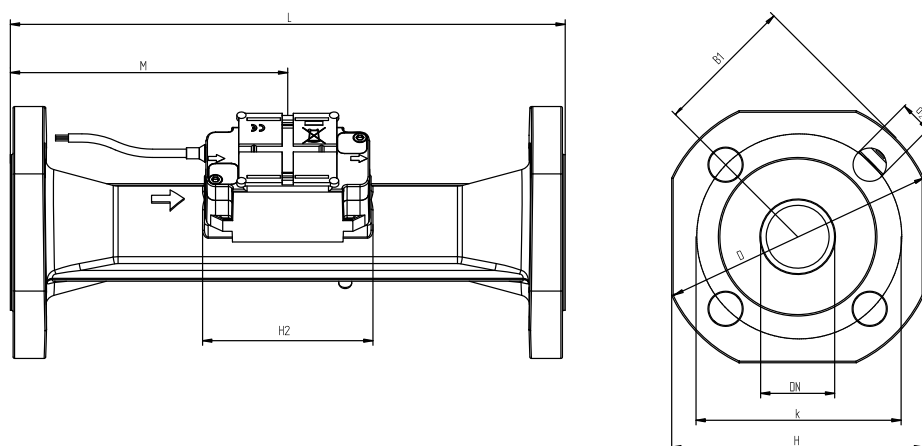
#### ULTRAFLOW® 54, G5/4 and G2



#### 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

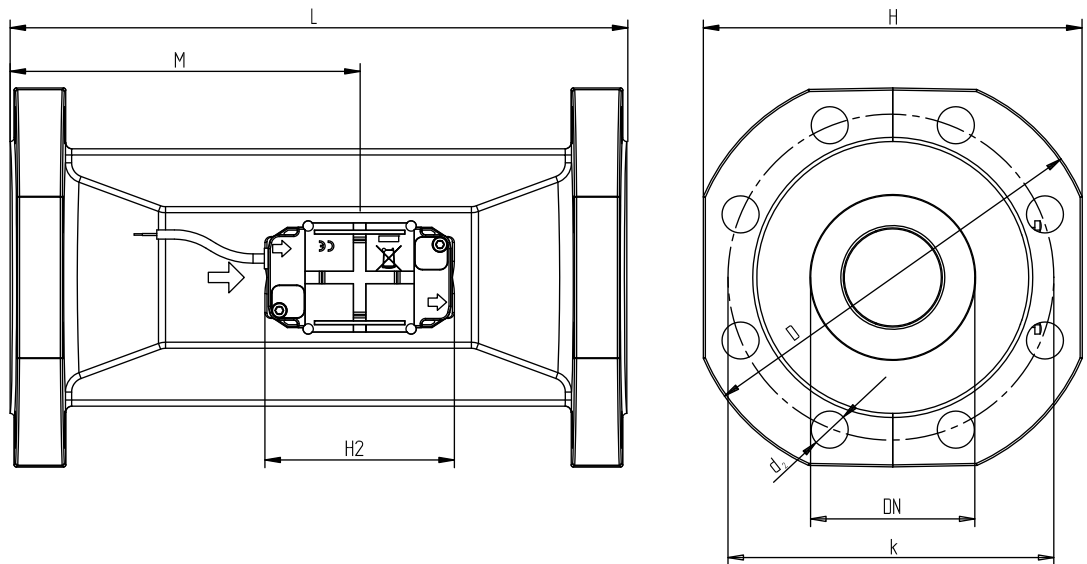
Nom. diameter	L	M	H2	B1	D	H	k	Bolts			App. weight [kg]
								No.	Thread	d <sub>2</sub>	
DN25	260	L/2	89	58	115	106	85	4	M12	14	5,0
DN40	300	L/2	89	<D/2	150	136	110	4	M16	18	8,3
DN50	270	155	89	<D/2	165	145	125	4	M16	18	10,1

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### Dimensional drawings

ULTRAFLOW® 54, DN65 to DN100



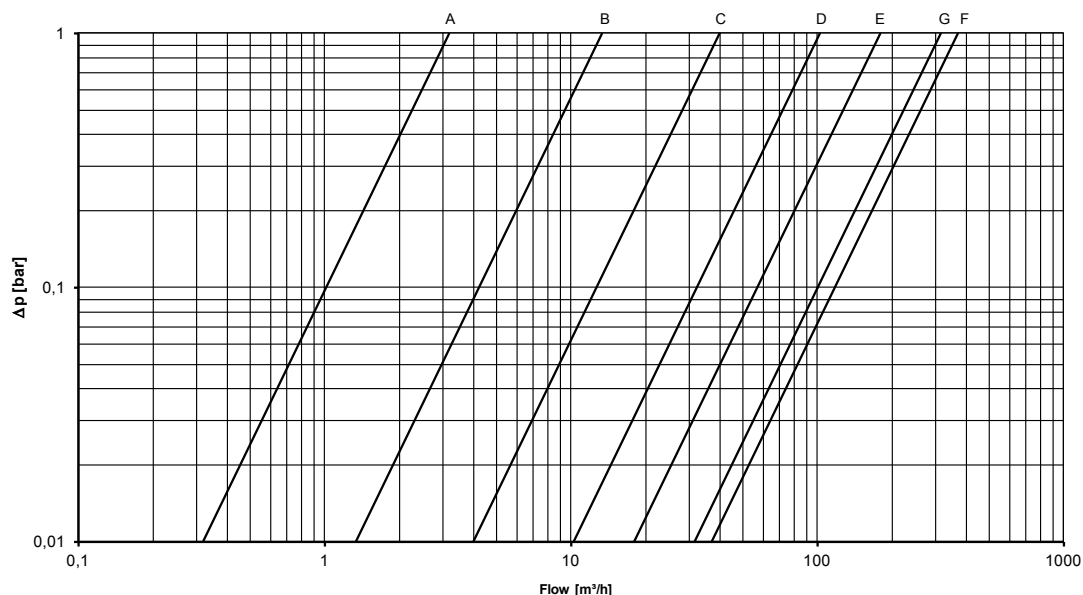
Flange EN 1092, PN25

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

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### Pressure loss graphs



### 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

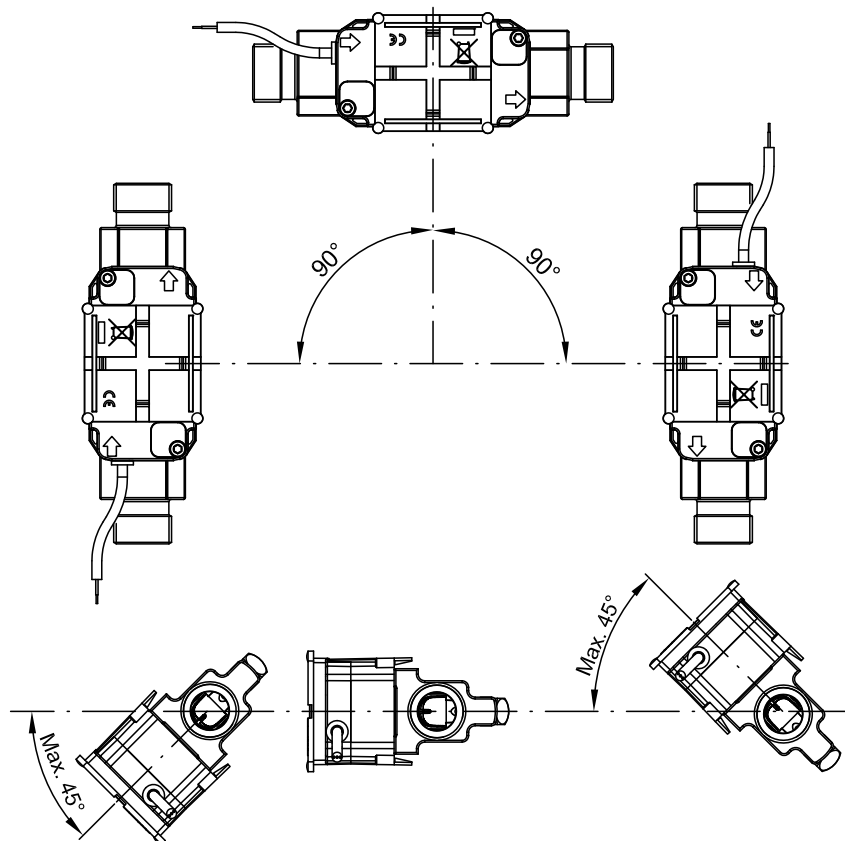
$$^3) q = k_v \times \sqrt{\Delta p}$$

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### Installation

#### Installation angle for ULTRAFLOW® 54 $\leq$ DN100



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

#### **IMPORTANT!**

With ULTRAFLOW® 54  $\leq$  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  $\pm 45^\circ$  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).

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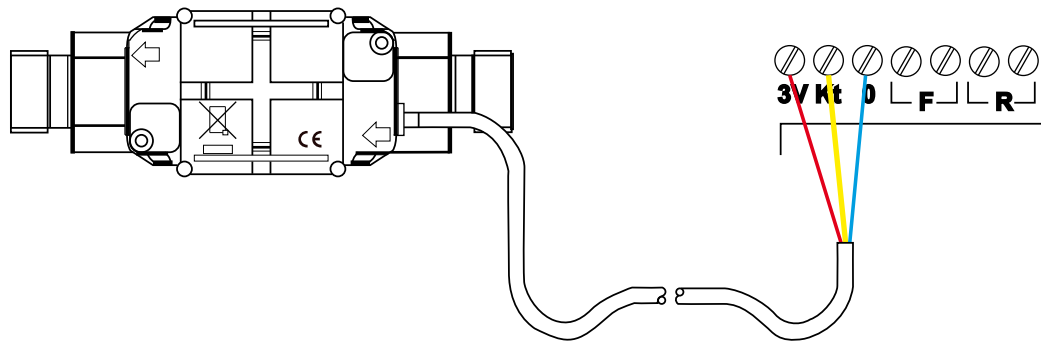
### Electrical connection

F25 is delivered fully assembled. The length of the signal lead from the UF54 flow sensor is 2,5 meters. The three wires are connected to the F25 as follows:

UF54, wire	Function	F25, terminal
Red	Supply	3V
Yellow	Signal	Kt
Blue	GND	0

ULTRAFLOW® 54

F25 screw terminal



### Temperature sensors

F25 is delivered with a pair of temperature sensors connected. The temperature sensors are matched and approved, and of the type Pt500, with a cable length of 2 metres.

TDA26 is a short temperature sensor for direct installation (DS or direct short) with an immersion of 26mm. In the small versions of UF54, G<sup>3</sup>/<sub>4</sub>B and G1B, it is possible to fit one temperature sensor directly in the flow sensor body.

TL045 is a short temperature sensor for pocket installation (PS or pocket short) with a length of 45mm. Pockets are sold separately and offered in lengths between 34-120mm.

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### F25 Article number

#### SVM F25

A B C D E F G H I J K L M

#### Sensor type

Pt500 2-wired. Flow meter in low temperature. 5  
Pt500 2-wired. Flow meter in high temperature. 6

#### Power supply

Without power supply 0  
Battery F25 for flow meter supply U  
Mains 230 VAC for flow meter supply (w. Supercap) 4

#### Pulse value

Kt: 2.5 l/p, (q<sub>p</sub> 3,5 - 6) 1  
Kt: 25 l/p, (q<sub>p</sub> 40) 2  
Kt: 1 l/p, (q<sub>p</sub> 0,6 - 2,5) 5  
Kt: 10 l/p, (q<sub>p</sub> 10 - 25) 6  
Kt: 100 l/p, (q<sub>p</sub> 60 - 100) 7

#### Energy unit

kWh 0  
MWh 1  
GJ 2  
MBTU 3  
MBTU (kUSG kW USG/m) 4  
kWh (kUSG °F USG/m kW kWh) 5

#### Configuration

Standard -  
Customer number - See separate specification! E  
Special - See separate specification in text! S

#### In/Outlets

Pulse inlets: 2.5 l/p 1  
Pulse inlets: 25 l/p 2  
Pulse inlets: 250 l/p 3  
Pulse inlets: 1 l/p 5  
Pulse inlets: 10 l/p 6  
Pulse inlets: 100 l/p 7  
Pulse inlets: 1000 l/p 8  
Pulse outlets: 9

#### Display

No backlight. With Opto and M-Bus. Compact mounting. 1  
No backlight. With Opto and M-Bus. Wall mounting. 3

# SVM F25 Heat Meter

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### F25 Article number (Continued)

SVM F25	H	I	J	K L M
<b>Flowpart</b>				
Qp=0,6 m³/h, 110 mm, G3/4" PN16 (65-5-CAAA-295)	0			
Qp=1,5 m³/h, 110 mm, G3/4" PN16 (65-5-CDAA-295)	1			
Qp=0,6 m³/h, 130 mm, G1" PN16 (65-5-CAAD-295)	2			
Qp=1,5 m³/h, 130 mm, G1" PN16 (65-5-CDAD-295)	3			
Qp=2,5 m³/h, 130 mm, G1" PN16 (65-5-CEAD-295)	4			
Qp=3,5 m³/h, 260 mm, G1 1/4" PN16 (65-5-CGAG-295)	5			
Qp=6,0 m³/h, 260 mm, G1 1/4" PN16 (65-5-CHAG-295)	6			
Qp=10,0 m³/h, 300 mm, G2" PN16 (65-5-CJAJ-295)	7			
Qp=2,5 m³/h, 190 mm, G1" PN16 (65-5-CEAF-295)	8			
Qp=3,5 m³/h, 260 mm, DN25, Flange PN25 (65-5-CGCB-295)	A			
Qp=6,0 m³/h, 260 mm, DN25, Flange PN25 (65-5-CHCB-295)	B			
Qp=10,0 m³/h, 300 mm, DN40, Flange PN25 (65-5-CJCD-295)	C			
Qp=15,0 m³/h, 270 mm, DN50, Flange PN25 (65-5-CKCE-295)	D			
Qp=25,0 m³/h, 300 mm, DN65, Flange PN25 (65-5-CLCG-295)	E			
Qp=40,0 m³/h, 300 mm, DN80, Flange PN25 (65-5-CMCH-295)	F			
Qp=60,0 m³/h, 300 mm, DN100, Flange PN16 (65-5-FACL-295)	G			
<b>Connections</b>				
No temperature sensors connected.	-			
TDA26, 2m Silicone TDA26DC20YT10	1			
TL045, 2m Silicone TL045DC20YT10	3			
<b>Communication</b>				
M-Bus, 300 baud			1	
M-Bus, 2400 baud			2	
<b>Country</b>				
English standard				300

### F25 Article number key

To acquire the correct article number, just fill out the blanks.

F25	A	B	C	D	E	F	G	H	I	J	KLM
											300