SVM F29 Heat Meter

DATA SHEET

- **Combined Heat Meter**
- **For compact or wall mounting**
- **Battery- or mains supply**
- **MID approval**
- **Built-in M-Bus**
- **2 additional pulse inlets**
- **2 pulse outlets for energy and volume**
- **Galvanic isolation for all inlets and outlets**

Application

F29 is a flexible heat meter used to measure and monitor small to large installations in heating applications.

F29 consists of a calculator F22 (extended version), an ultrasonic flow sensor UF54 and a matched pair of temperature sensors. All parts are connected in the factory. 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.

The calculator, flow sensor and temperature sensors are all approved according to the MID for metering and billing purposes and the meter is equipped with the necessary verification selas. It is also possible to apply user seals.

The connection board in the F29 offers screw terminals with plenty of space along with the possibility to insert option boards for added functionality, e.g. M-Bus communication. The F29 can be equipped with a module for 2-wire M-Bus with galvanic isolation, or a module for M-Bus radio for wireless communication.

F29 may also be delivered with a variety of built-in options, e.g. log, tariff and peak values.

F29 is a compact mounted heat meter and the flow sensor is power supplied from the calculator. Temperature sensors of the type Pt100 are connected with 2-wire technology.

F29 offers two extra pulse inlets e.g. for connection to domestic water meters for cold and hot water, along with two pulse outlets for energy, outlet 1, and volume, outlet 2.

All inlets and outlets, including the alarm outlet, are galvanically isolated.

F29 stores historical values in a built-in monthly log, for up to 37 months. A more extensive log function may be factory fitted for customized intervals, e.g. an hourly log.

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

F29 is a combined heat meter where the flow sensor, temperature sensors and calculator have separate type approvals. This ensures a simple calibration and re-verification process, and also makes it possible to replace any of the parts separately.

The following type approvals apply to F29:

UF54 Flow sensor:	DK-0200-MI004-008
F29 Calculator:	0402-MID-154219
TD/TL Temperature sensors:	0402-MID-154215

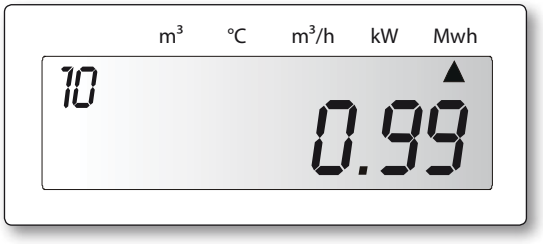
Measurement

F29 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 frequent than every five seconds, the pulses are added before the energy calculation takes place.

Display

F29 is equipped with an LCD.



The F29 LCD, showing accumulated energy.

Pulse outlets/Pulse inlets

F29 is equipped with two pulse inlets. The pulses are stored in two separate pulse registers used for e.g. domestic water meters for hot and cold water. These two pulse registers are available when the meter is read via M-Bus or via the LCD.

F29 is also equipped with two pulse outlets for energy, outlet 1, and volume, outlet 2, 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.

Further more, F29 is equipped with an alarm output, activated whenever an error code occurs.

All inlets and outlets of the F29 are galvanically isolated.

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Communication

F29 is equipped with an M-Bus data output according to EN1434-3, accessible with an OPTO interface.

A 2-wire M-Bus output with galvanic isolation is also available when the F29 is fitted with an option board for this purpose.

F29 may also be fitted with an option board for wireless M-Bus communication (radio).

Option boards

The F29 can be equipped with option boards for added functionality:

- Relay option board (galvanic isolation)
- M-Bus, 2-wire
- M-Bus, radio

Remote reading with M-Bus radio

F29 can be equipped with an option board for wireless M-Bus communication. With this option the F29 can be used in fixed networks as well as in drive-by/walk-by networks. Any F29 with M-Bus radio may also be used as a repeater, provided that it is mains supplied.

Service

F29 has a built-in service function that enables the user to change the calculator settings using the display button. The following settings can be modified:

- Time and date
- Pulse value
- Account days
- Communication. primary address
- Flow sensor placing, high or low temperature
- Reset error time
- Recommended date for battery replacement
- Exit service menu

F29 can also be parameterized by using a special PC-program “FlexServ”.

Extended version [E]

The F29 always uses the extended version of the F22 calculator. This means that both terminal blocks are available, offering the full range of functions and options.

Displayed data

The following data is accessible on the LCD and on the M-Bus in F29:

Accumulated values

- ☐ Accumulated energy
- ☐ Accumulated total volume
- ☐ Accumulated volume according to energy calculation
- ☐ Accumulated pulses, pulse input 1
- ☐ Accumulated pulses, pulse input 2

Momentary values

- ☐ Power
- ☐ Flow
- ☐ Flow temperature
- ☐ Return temperature
- ☐ Temperature difference

Calculator settings

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

Calculator messages

- ☐ Error code
- ☐ Total error time
- ☐ Preceding error code
- ☐ Total time for preceding error code
- ☐ 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 the calculator.

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

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Technical data F29

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, 18.5Ah, battery life 10 years
— Mains	230V ±10%, 45-65 Hz, battery back up 2.75 Ah

Data output

— M-Bus (EN1434-3)	Via OPTO-interface (EN60870-5)
— With option board also	2-wire M-Bus (screw terminals)

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 Pt100
— Max cable length	2,5 m at 0,22 mm² cable cross section 5,0 m at 0,50 mm² cable cross section 7,5 m at 0,75 mm² cable cross section 15,0 m at 1,50 mm² cable cross section
— Max sensor current	4 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. Connect to inputs of the type "Open Collector"

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

Pulse inputs, 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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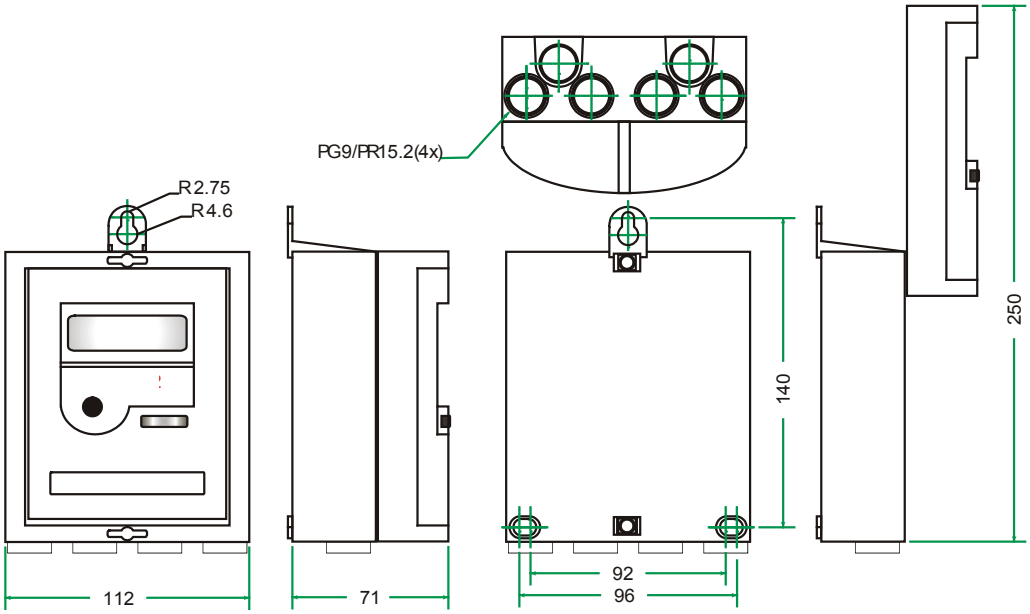
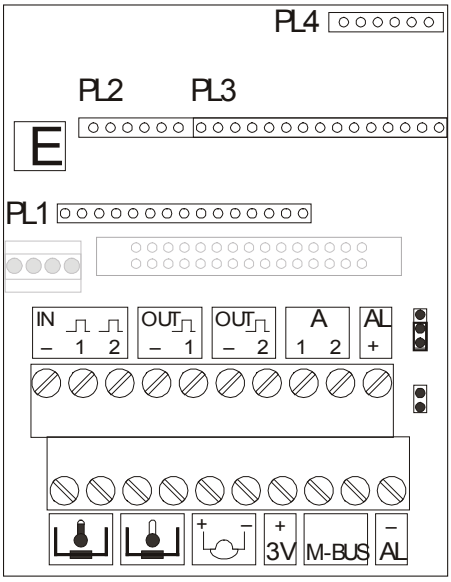
Dimensional drawing, F29 calculator

All dimensions in [mm].



Terminal blocks, F29 calculator



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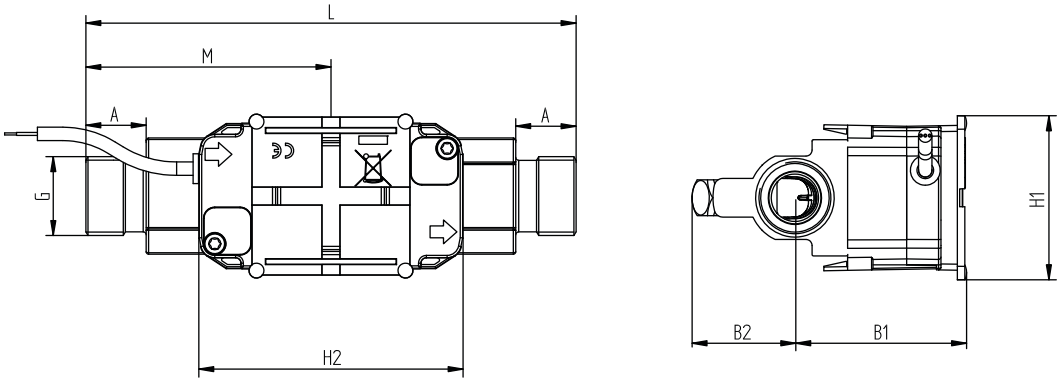
Flow sensor/Flow data

Nom. flow qp [m³/h]	Connection	Length [mm]	Pressure class [Bar]	Pulse value [l/p]	Material
0,6	G¾B	110	16	1	Brass
0,6	G1B	130	16	1	Brass
1,5	G¾B	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	G1¼B	260	16	2,5	Brass
3,5	DN25	260	25	2,5	Stainless steel
6	G1¼B	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

Dimensional drawings

ULTRAFLOW® 54, G¾ and G1

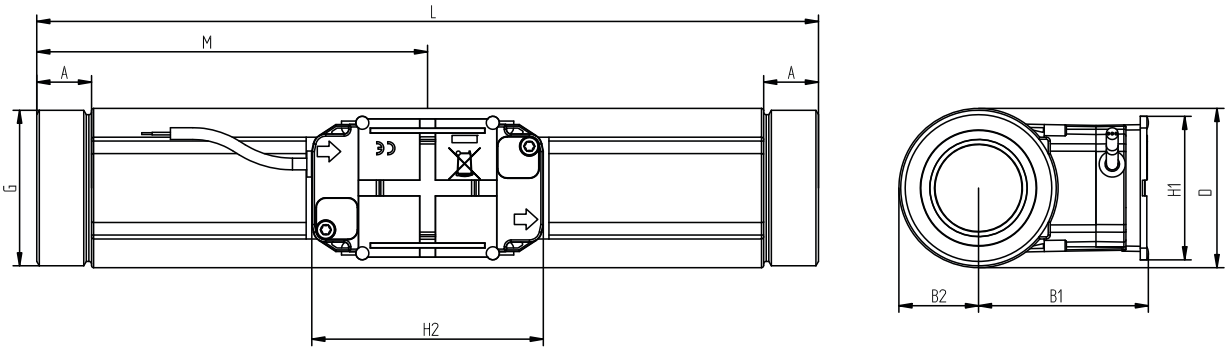


Thread ISO 228-1

Thread	L	M	H2	A	B1	B2	H1	App. weight [kg]
G¾	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

Dimensional drawings

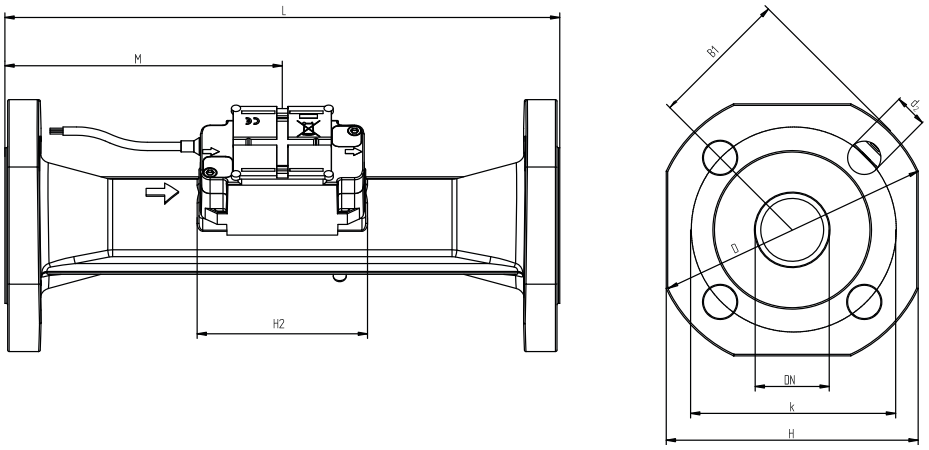
ULTRAFLOW® 54, G5/4 and G2



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

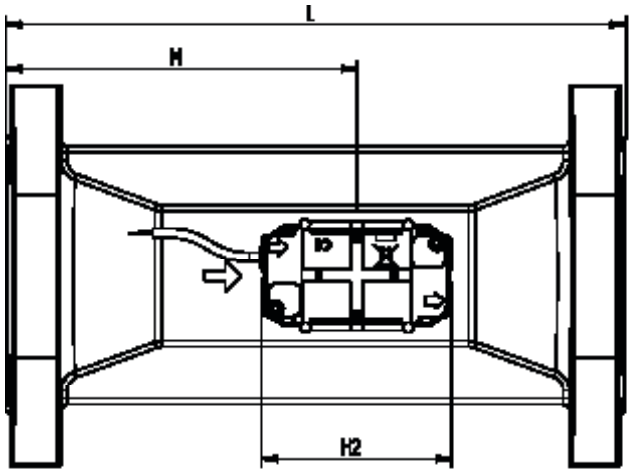


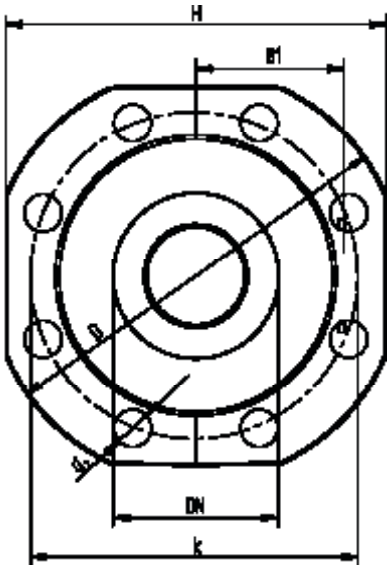
Flange EN 1092, PN25

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

Dimensional drawings

ULTRAFLOW® 54, DN65 to DN100

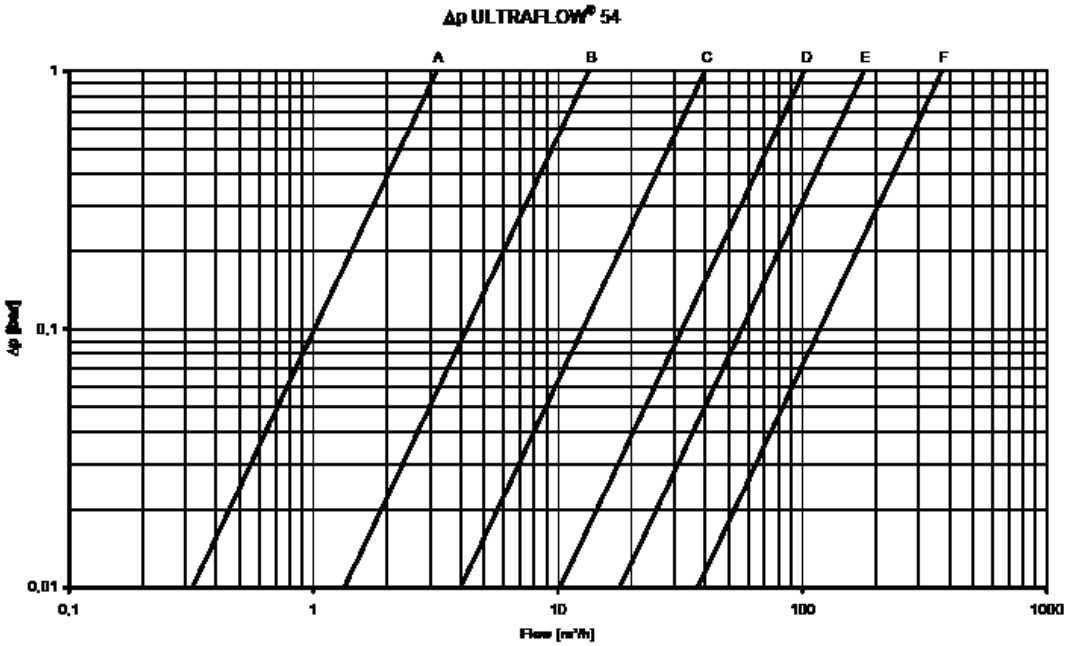




Flange EN 1092, PN25

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

Pressure loss graphs



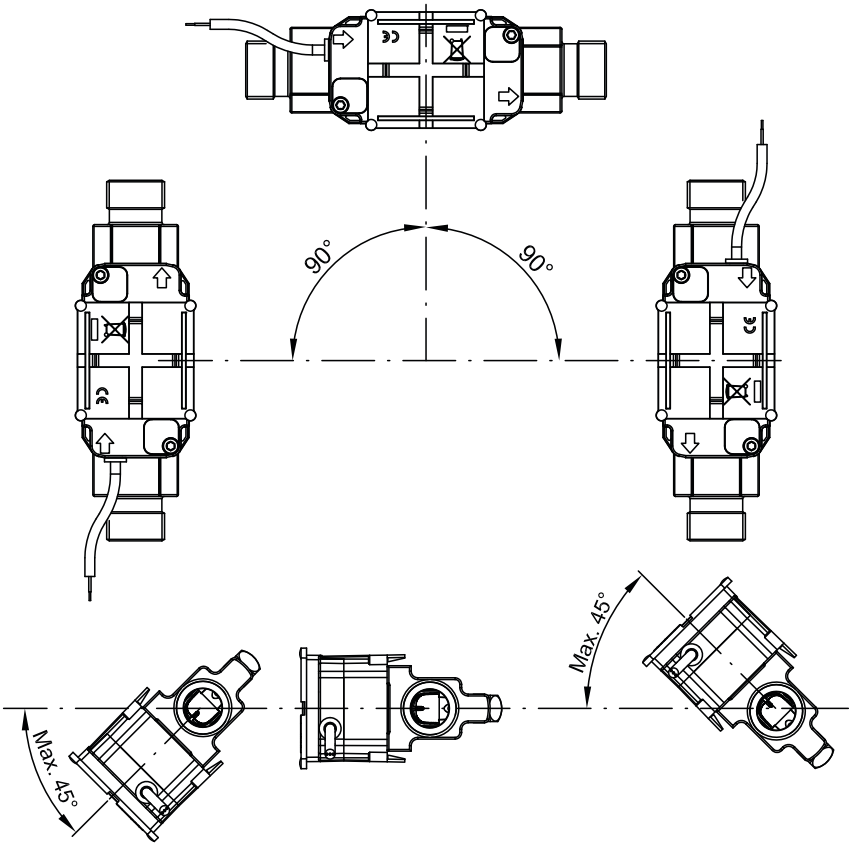
Pressure loss

Graph	q_p [m³/h]	Nom. diameter	k_v [3)]	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)] $q=k_v \times \sqrt{\Delta p}$

Installation

Installation angle for ULTRAFLOW® 54 ≤DN100



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

IMPORTANT!

With ULTRAFLOW® 54 ≤DN100 (100 m³/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).

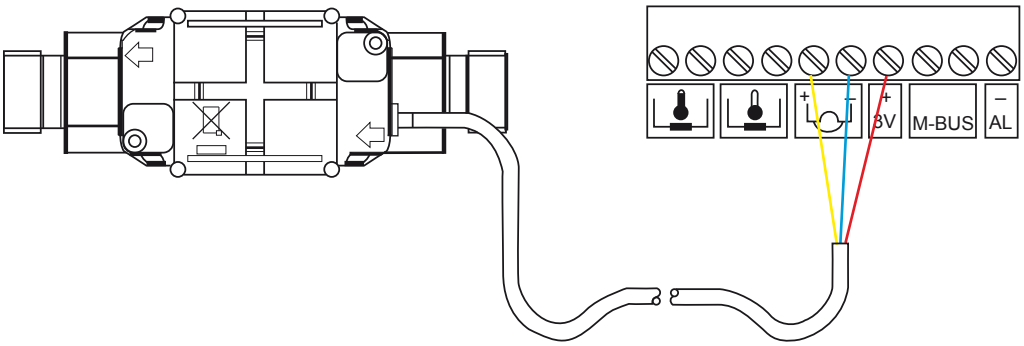
Electrical connection

F29 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 F29 as follows:

UF54, wire	Funktion	F29, plint
Red	Supply	+3V
Yellow	Signal	+
Blue	GND	-

ULTRAFLOW® 54

F29 screw terminal



Temperature sensors

F29 is delivered with a pair of temperature sensors connected. The temperature sensors are matched and approved, and of the type Pt100, 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, G¾B 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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F29 Article number

SVM F29	A	B	C	D	E	F	G	H	I	J	K	L	M
Sensor type													
Pt100 2-wired. Flow meter in low temperature	1												
Pt100 2-wired. Flow meter in high temperature	2												
Power supply													
Battery (D-cell) for flow meter / radio supply		U											
Mains 230 VAC (w. back-up battery)		3											
Pulse value													
Kt: 2.5 l/p, (q_p 3.5 - 6)			1										
Kt: 25 l/p, (q_p 40)			2										
Kt: 1 l/p, (q_p 0.6 - 2.5)			5										
Kt: 10 l/p, (q_p 10 - 25)			6										
Kt: 100 l/p, (q_p 60 - 100)			7										
Energy unit													
kWh				0									
MWh				1									
GJ				2									
MBTU				3									
Configuration													
Standard					–								
Customer number - See separate specification!					E								
Special - See separate specification in text!					S								
Internal option - See separate specification!					X								
In/Outlets													
Pulse inlets: 2,5 l/p + Pulse outlets						A							
Pulse inlets: 25 l/p + Pulse outlets						B							
Pulse inlets: 250 l/p + Pulse outlets						C							
Pulse inlets: 2500 l/p + Pulse outlets						D							
Pulse inlets: 1 l/p + Pulse outlets						E							
Pulse inlets: 10 l/p + Pulse outlets						F							
Pulse inlets: 100 l/p + Pulse outlets						G							
Pulse inlets: 1000 l/p + Pulse outlets						H							
Display													
No backlight. With Opto and M-Bus. Compact mounting.							1						
No backlight. With Opto and M-Bus. Wall mounting.							3						

F29 Article number (continued)

SVM F29	H	I	J	K L M
Flowpart				
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			
Connections				
No temperature sensors connected		–		
TDA26, 2m Silicone TDA26DC20YT10		1		
TL045, 2m Silicone TL045DC20YT10		3		
Communication				
No Communication: module			0	
M-Bus 300 Baud			1	
M-Bus 2400 Baud			2	
Prepared for Radio. Antenna housing mounted. (M-Bus board mounted, 2400 Baud)			F	
Prepared for Radio with. ext. antenna. FME-connector mounted (M-bus board mounted, 2400 Baud)			G	
Radio board mounted. Antenna housing mounted.			H	
Radio board mounted. FME-connector for external antenna mounted.			J	
Country				
English standard				300

F29 Article number key

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

F29	A	B	C	D	E	F	G	H	I	J	KLM
											300