

# TOPAS ESK

**INTEGRA**  
METERING

## Water meter cold Water Ultrasonic

### Application

Static ultrasonic water meter for accurate measuring and recording for all applications of water supply. The Wireless M-Bus or M-Bus interfaces cover all demands in the Smart Metering domain.



### Features

- Compact system solution for Smart Metering
- Real data communication
- Wireless OMS<sup>®</sup> communication
- Modern ultrasonic technology
- Independent of placement
- High protection class

### Customer benefit

- High measuring dynamic
- Robus brass body
- Long term stability
- Leak detection
- Manipulation sensing
- Data logger for consumption values

# Product range

## TOPAS ESKR

## TOPAS ESKM



- Static ultrasonic water meter with integrated interface for Smart Metering application with real data communication
- With SVGW-approval
- With MID-approval , Measuring range according to OIML R49, EN 14154
- Unit is factory parametrized
- For mounting in any position
- Brass housing with threaded ends
- Nominal pressure 16 bar
- No calming sections required
- Insensitive against sedimentation
- Protection class IP 68
- Battery lifetime: ESKR up to 16 years / ESKM up to 12 years
- Medium temperature 1 - 50 °C
- Environment temperature 1 - 70 °C
- Transportation and storage temperature -20 - 70 °C



### Display

LCD, 8-digit with the displays:

- Volume
- Momentary flow
- Water temperature
- Display test
- Actual fault and alarm status
- Working hours
- Date
- Primary and secondary address
- Radio signal on/off
- Battery lifetime
- Reporting date
- Day error hour counter

### Data storage

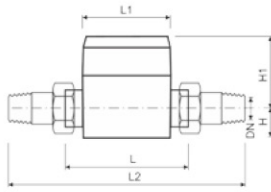
- 32 hours, days, weeks, and monthly values
  - Actual Date
  - Smallest flow
  - Summary flow
  - Backward volume
- Event storage for 127 events (Alarms, Failures)
  - Event with date and time

### Log memory for daily values

- 1024 daily values consisting of:
  - Total volume
  - Forward volume
  - Medium temperature
  - Ambient temperature
  - Error status
- Daily values are retraceable for approx. 2.8 years or 33 months

Nominal diameter	DN	mm Inch	15 1/2	15 1/2	20 3/4	20 3/4	20* 3/4
<b>ESKR</b>	Wireless	Art. Nr.	95077	95056	95345	95490	95059
<b>ESKM</b>	M-Bus	Art. Nr.	95078	95057	-	-	95060
Overload flow rate	Q <sub>4</sub>	m <sup>3</sup> /h	3.13	3.13	3.13	5	5
<b>Cont. flow rate</b>	<b>Q<sub>3</sub></b>	<b>m<sup>3</sup>/h</b>	<b>2.5</b>	<b>2.5</b>	<b>2.5</b>	<b>4</b>	<b>4</b>
Transitional flow rate	Q <sub>2</sub>	l/h	16	16	16	25.6	25.6
Minimum flow rate	Q <sub>1</sub>	l/h	10	10	10	16	16
Starting flow rate		l/h	2.6	2.6	2.6	4.3	4.3
Measuring range			R250	R250	R250	R250	R250
Pressure loss at Q <sub>3</sub>		bar	0.33	0.33	0.25	0.3	0.3
Smallest readable value		Liter	1	1	1	1	1
Registration capacity		m <sup>3</sup>	100'000	100'000	100'000	100'000	100'000
Threads on housing		Inch	G 3/4 B	G 3/4 B	G 1 B	G 1 B	G 1 B
Threads on the fittings		Inch	1/2	1/2	3/4	3/4	3/4
Weight without fittings	approx. kg	0.8	1	1.1	1.15	1.15	1.15
<b>Dimensions</b>							
		<b>L</b>	<b>110</b>	<b>165</b>	<b>190</b>	<b>190</b>	<b>220</b>
		L1	88	88	88	88	88
		H	32	32	34	34	34
		H1	67	67	65	65	65
		L2	186	240	290	290	314

\*Standard size, technical data analogue PMK-basic

Nominal diameter	DN	mm Inch	25*	25	32	40	50	
<b>ESKR</b>	Funk 868	Art. Nr.	95373	95065	95068	95071	95074	
<b>ESKM</b>	M-Bus	Art. Nr.	95372	95066	95069	95072	95075	
Overload flow rate	Q4	m <sup>3</sup> /h	7.9	12.5	12.5	20	31	
<b>Cont. flow rate</b>	<b>Q3</b>	<b>m<sup>3</sup>/h</b>	<b>6.3</b>	<b>10</b>	<b>10</b>	<b>16</b>	<b>25</b>	
Transitional flow rate	Q2	l/h	50	64	64	102	160	
Minimum flow rate	Q1	l/h	31.5	40	40	64	100	
Starting flow rate		l/h	10	10	10	16	25	
Measuring range			R200	R250	R250	R250	R250	
Pressure loss at Q3		bar	0.25	0.55	0.55	0.24	0.25	
Smallest readable value		Liter	10	10	10	10	10	
Registration capacity		m <sup>3</sup>	100'000	100'000	100'000	1'000'000	1'000'000	
Threads on housing		Inch	G 1 1/4 B	G 1 1/4 B	G 1 1/2 B	G 2 B	G 2 1/2 B	
Threads on the fittings		Inch	1	1	1 1/4	1 1/2	2	
Weight without fittings		approx. kg	1.6	1.6	1.8	3.05	3.9	
<b>Dimensions</b>								
			<b>L</b>	<b>260</b>	<b>260</b>	<b>260</b>	<b>300</b>	<b>270</b>
			L1	92	92	92	92	92
			H	26	26	26	31	41
			H1	84	84	84	87	90
			L2	380	380	380	440	420

\*Standard size, technical data analogue PMK-basic



TOPAS ESKR	Version
Version	Wireless M-Bus
Communication	Wireless 868 MHz according to OMS-Standards
Reading	Display on unit and remote reading wireless
Data reading	* actual volume / volume, backwards volume und date at years deadline / volume and date at month deadline / actual flow rate / battery life time / water temperature
Addressing	According to OMS-Protocol

\* Factory setting



TOPAS ESKM	Version
Version	M-Bus mit Kabelanschluss, Kabellänge 1.5 m
Communication	M-Bus nach EN 1434-3, 300/2400*) Baud
Terminal assignment	<b>Color M-Bus (2-wired)</b>
	White M-Bus
	Brown -
	Green M-Bus
Reading	Display on unit and remote reading M-Bus
Datenauslesung	* actual volume / volume, backwards volume und date at years deadline / volume and date at month deadline / actual flow rate / battery life time / water temperature
Adressierung	Primary address 0* - 250, Secondary address 8-digits, secondary addressing with manuf.-ID

\* Factory setting

Upon request: TOPAS ESKP with impulse outputs

## Installation Details

### Pipeline routing

Pay attention to well accessible reading and operation of the measuring unit and its additional equipment. When installing vertically in a down pipe, the display will be positioned on its head. Please ensure that the measuring unit is always filled with fluid within the pipeline routing. Eventual air ingress will not be measured. The water meter does not need any calming sections. Filters are recommended depending on the water quality.

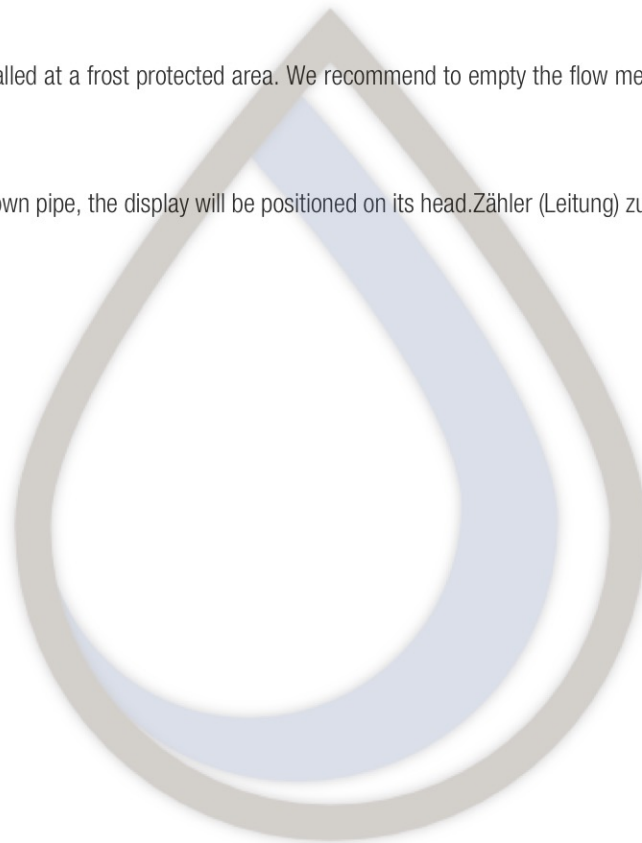
### Layout off he measuring unit and its accessories

Flowmeters are to be laid out according to the level of stress. If necessary , you will have to adapt the piping. Measuring unit and accessories should be laid out according to the maximum operating conditions such as:

- Flow
- Working pressure
- Working temperature
- Ambient temperature

The flow meters should be installed at a frost protected area. We recommend to empty the flow meter (pipeline) in buildings with a risk of minus temperatures.

When installing vertically in a down pipe, the display will be positioned on its head. Zähler (Leitung) zu entleeren.

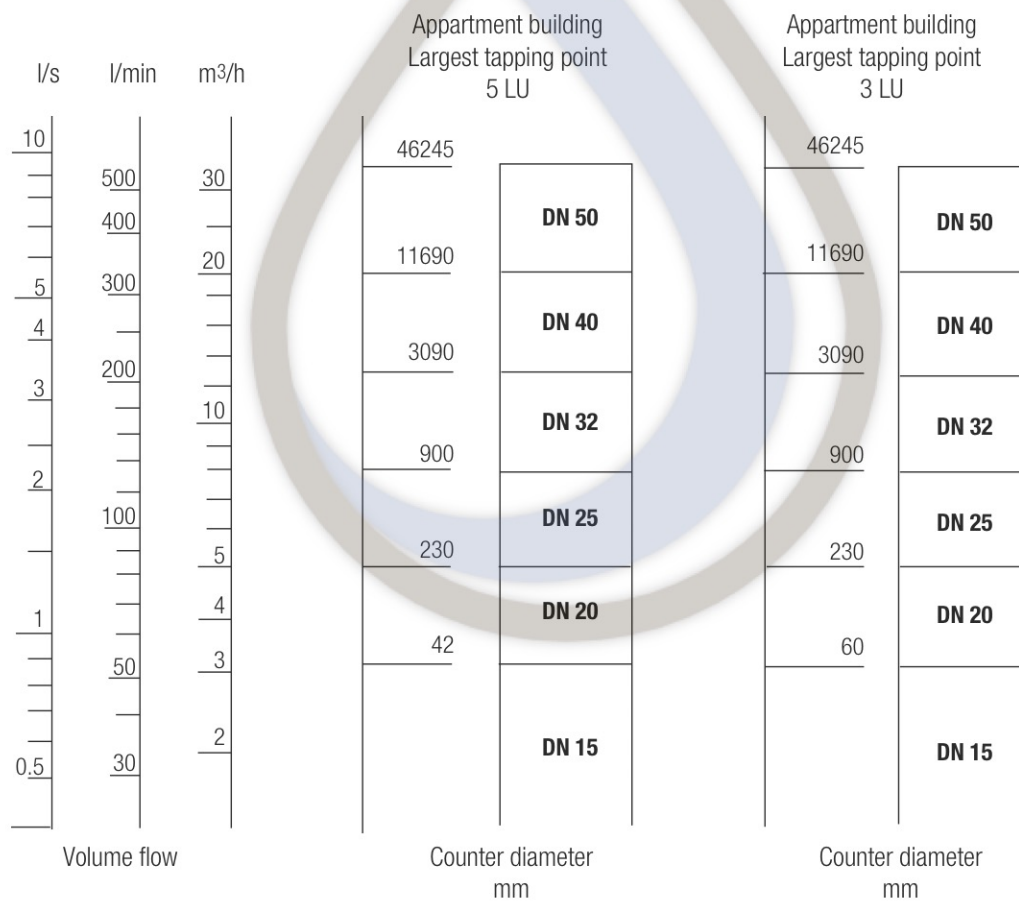


# Planning , plant conception

## Connection values LU of the armatures and devices according to SVGW W3d 2013

Intended use	Q <sub>a</sub> cold [l/s]	Q <sub>a</sub> hot [l/s]	LU cold	LU hot
Washing basin, Bidet, Sluice, Barber shower	0.1	0.1	1	1
Dishwasher, WC-Seat, Drinks dispenser	0.1	-	1	-
Washing machine, balcony taps and fittings	0.2	-	2	-
Shower battery, Sink, Washing trough, other sinks	0.2	0.2	2	2
Urinary- automatic draining	0.3	-	3	-
Bathtub battery	0.3	0.3	3	3
Garden and garage water armature	0.5	-	5	-

### Guideline for general definition of counter sizes



## Planning help for dimensioning the counter

### 1. Determination of the sum flow $Q_r$

Intended use	Load values [LU]			Installation datas	
	cold	hot	Total (A)	Qty. Connection (B)	(A x B)
Washing basin	1	1	2		
WC-tank	1	-	1		
Dishwasher	1	-	1		
Bidet	1	1	2		
Sluice	1	1	2		
Barbers shower	1	1	2		
Drinking dispenser	1	-	1		
Shower battery	2	2	4		
Sink	2	2	4		
Washing trough	2	2	4		
Washing machine	2	-	2		
Balcony taps and fittings	2	-	2		
Draining sinks	2	2	4		
Standalone sinks	2	2	4		
Automatic urinal	3	-	3		
Bathtub battery	3	3	6		
Garden and garage water armature	5	-	5		
			Total load values [LU]		
			Sum flow $Q_r = LU \times 0.1$ l/s		

### 2. Choosing the peak flow rate in $m^3/h$

### 3. Choosing the meter size ( $Q_b \leq Q_a$ )

### 4. Choosing the meter within the permissible tolerance (as of approx. pressure loss of $\geq 0.3$ bar)

Load-values	Sum flow rate $Q_r$	Peak flow $Q_b$	Peak flow $Q_a$	Pressure loss TOPAS ESK. [bar]							
				Application area							
				$Q_r$ [m <sup>3</sup> /h]							
[LU]	[l/s]	[l/s]	[m <sup>3</sup> /h]	3.2	3.13	5	7.9	12.5	12.5	20	31.25
				DN 15	DN 20	DN 20	DN 25	DN 25	DN 32	DN 40	DN 50
20	2	0.71	2.56	0.35	0.32	0.19					
30	3	0.79	2.84	0.43	0.39	0.2					
40	4	0.85	3.06	0.5	0.45	0.25					
42	4.2	0.86	3.13	0.52	0.48	0.29					
50	5	0.9	3.26	0.57	0.52	0.35	0.07	0.06	0.06		
75	7.5	1	3.61	0.69	0.63	0.43	0.09	0.08	0.08		
100	10	1.08	3.89	0.8	0.73	0.47	0.1	0.09	0.09		
150	15	1.2	4.32	0.99	0.9	0.5	0.12	0.11	0.11		
200	20	1.32	4.76			0.7	0.15	0.13	0.13		
230	23	1.39	5			0.81	0.16	0.14	0.14		
250	25	1.43	5.15			0.93	0.17	0.15	0.15		
400	40	1.69	6.08				0.24	0.21	0.21		
500	50	1.83	6.57				0.28	0.24	0.24		
600	60	1.95	7.01				0.31	0.28	0.28	0.05	
830	83	2.18	7.86				0.39	0.34	0.34	0.06	
900	90	2.25	8.09				0.42	0.36	0.36	0.07	
1200	120	2.49	8.96				0.51	0.45	0.45	0.08	
1400	140	2.63	9.46				0.57	0.5	0.5	0.09	0.04
1800	180	2.87	10.33				0.68	0.59	0.59	0.11	0.05
2000	200	2.98	10.72				0.73	0.64	0.64	0.11	0.05
3090	309	3.47	12.5				0.99	0.86	0.86	0.15	0.07
11690	1169	5.56	20							0.38	0.16
46245	4624	9.02	32.5							1	0.43

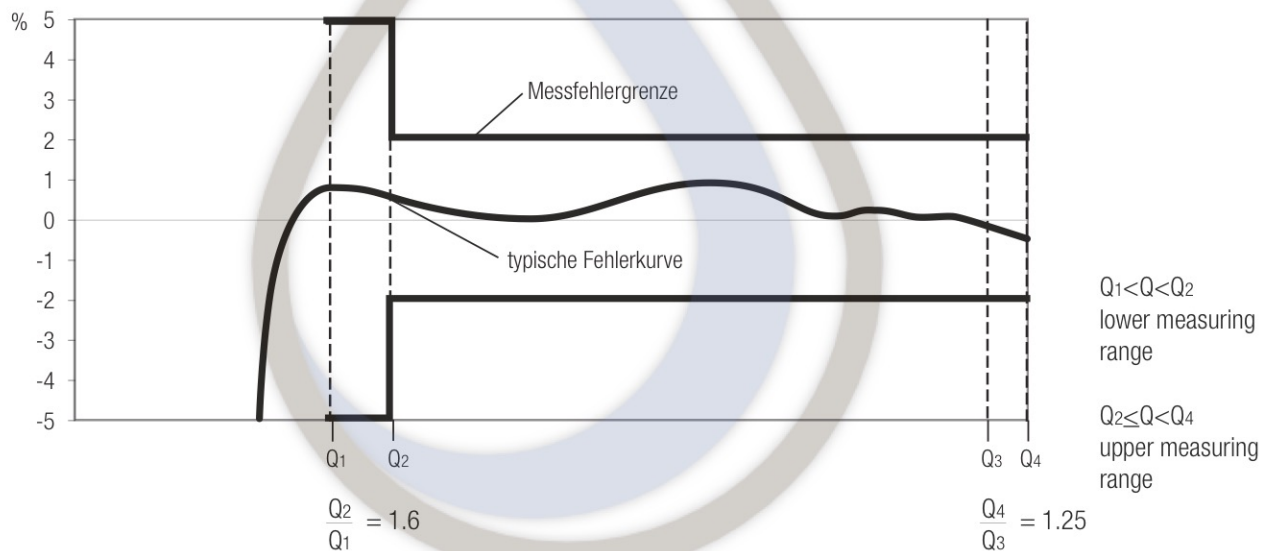
## 5. Checking the Pressure apparatus

Building description			With guideline	Recalculation
Supply pressure [bar]				
$\Delta p$ Reservoir level + $\Delta p$ feed line	[bar]	-	0.3 1)	
Max. $\Delta p$ house connection (external and internal)	[bar]	-	0.4 1)	
$\Delta p$ water meter	[bar]	-		
$\Delta p$ through height difference of the house connection To the highest tapping point [bar] (1 m ~ 0.1 bar)	[bar]	-		
$\Delta p$ piping (to max. 50 m)	[bar]	-	1.5	
Minimal flow pressure at highest tapping point	[bar]	-	1	
Results	[bar]	=		

With a result > 0 bar the dimensioning would be correct; with a result < 0 bar you will have to optimize the pressure loss or check the assumptions.

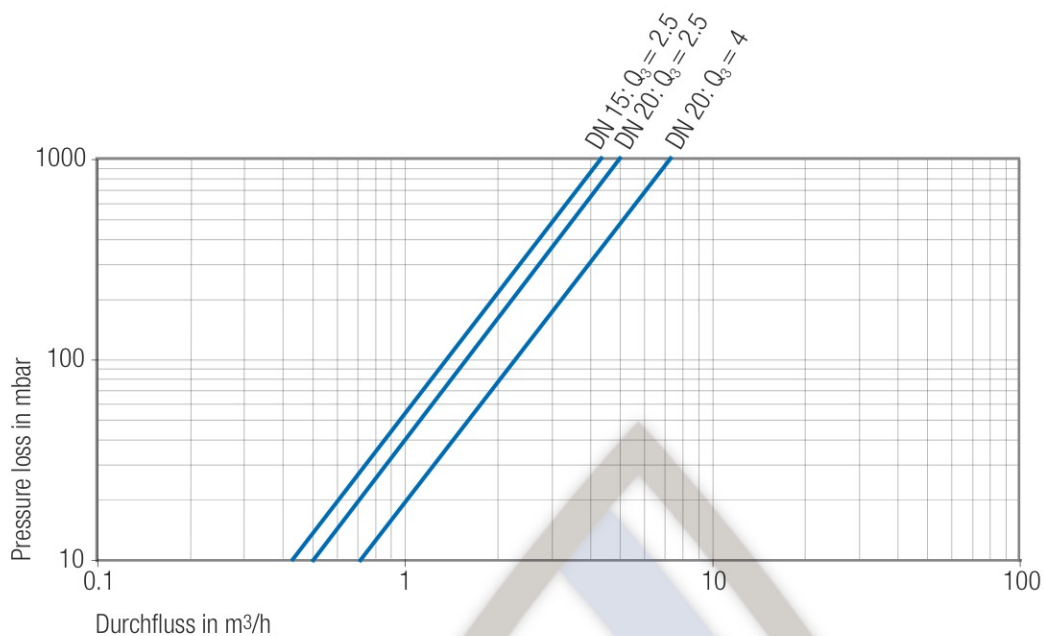
## Measuring error limits and metrological class 2

According to the OIML R 49 directives (Reference conditions: Process = Water, Temperature = 20 °C)

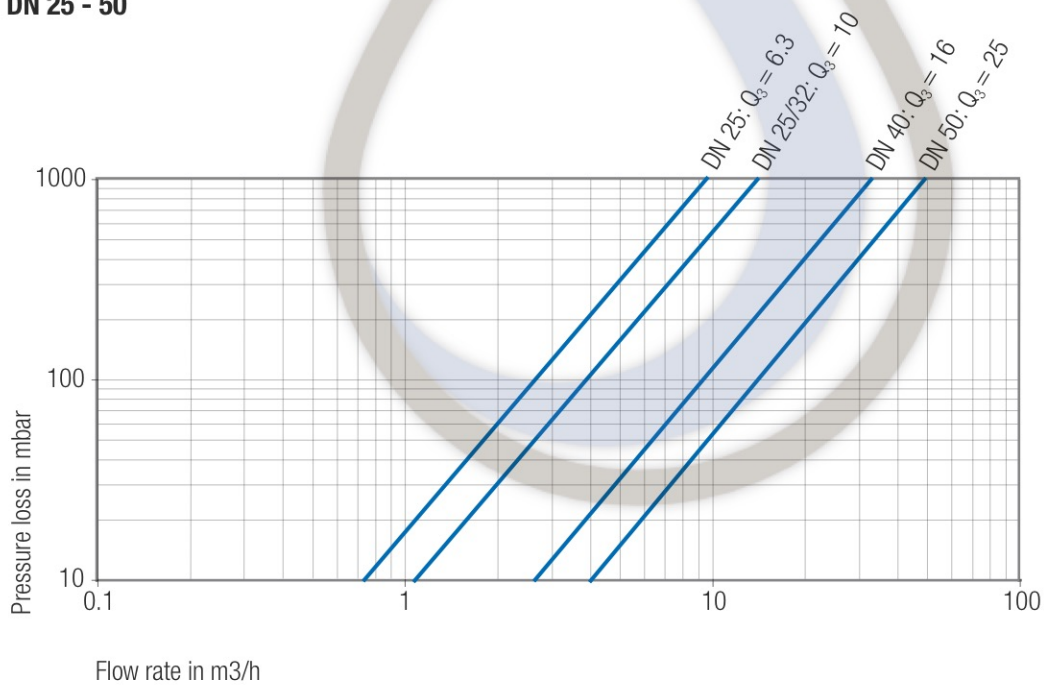


# Pressure loss diagram

## DN 15 - 25



## DN 25 - 50



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