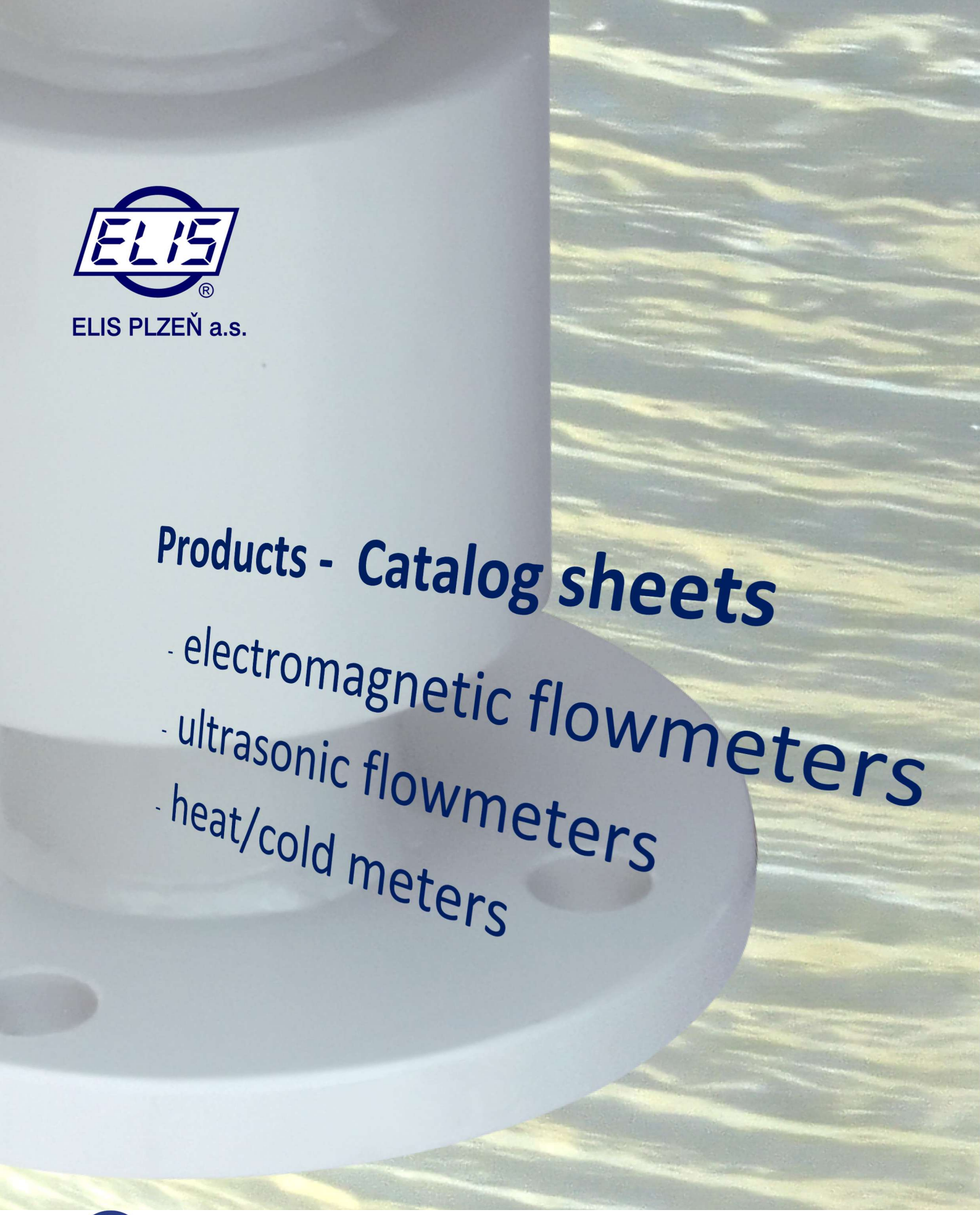

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Products - Catalog sheets

- electromagnetic flowmeters
- ultrasonic flowmeters
- heat/cold meters

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MID
MI-001

ELECTROMAGNETIC FLOW METER FLONET FH30xx

FLONET FH30xx

FLONET FH30xx is an electromagnetic flow meter for a measurement of flow of conductive liquids in water supply, chemical, food and heat distribution industry. It satisfies the most stringent requirements as to the measurement accuracy, long-term stability and sanitary standards. The measurement of flow is carried out in both directions. The meter sensor doesn't have any mechanical moving parts and its installation into the piping system has no impact on fluid mechanics or pressure.

The transmitter supplies power and processes signals coming from the sensor. The OLED display is readable even in the extreme frost. The basic configuration doesn't require opening of flowmeter, since the control is performed by using optical sensors. The meter is equipped with a pulse, frequency and current outputs and for communication there is MODBUS RTU protocol.

METER SPECIFICATION

nominal diameter / size	DN15 to DN1200 / 3/4” to 48”
nominal pressure [bar / psi]	6, 10, 16, 25, 40 / 150, 300, 600
min. conductivity of measured liquid	10 µS/cm
electrode material	stainless steel, grade 1.4571 (316Ti), Hastelloy C276, Titanium, Tantalum
ambient temperature	-40°C to +70°C (-40°F to 160°F)
sensor lining	soft or hard rubber, special rubber for drinking water, Teflon
design version	compact or with remote transmitter
connection	flanged (depending on customer requirements), flangeless
max. temperature of measured liquid	up to 150°C (302°F)
measurement accuracy EN ISO 4064-1 (OIML R 49) *)	2
metrological certificate MID	TCM 142/20-5738
measurement repeatability	± 0.15%
measurement range	0.025 to 10 m/s (0.08 to 33 ft/s), R = 400
outputs	current 4 to 20 mA, insulated 2pc pulse / binary / frequency 0 to 10 kHz, insulated
communication protocol	MODBUS RTU
power supply	95 to 250V, 50 to 60Hz (AC) or 24V ± 20% (DC) 19.2 to 28.8V
protection class	IP 67 (IP 68 on request)

*) optional measurement accuracy ± 0.3% for 5 to 100 % of Q_4

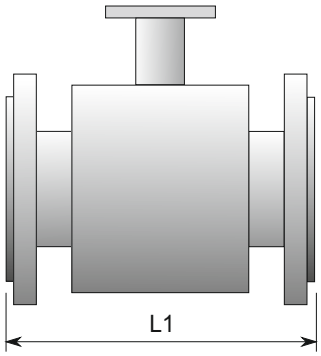
DESIGN VERSION, CONFIGURATION AND TYPE DESIGNATION

design version	COMPACT	REMOTE
configuration	COMFORT	COMFORT
type designation - flanged	FH3014	FH3015
- flangeless	FH3024	FH3025

RATED INTERNAL DIAMETER AND SENSOR LENGTH

pressure	40 bar / 150lb		16 bar / 150lb					10 bar / 150lb					6 bar / 150lb				
diameter [mm]	20	25 to 40	50 to 80	100	125	150	200	250	300	350	400 to 600	700	800	900	1000	1200
size [in]	3/4"	1" to 1 1/2"	2" to 3"	4"	5"	6"	8"	10"	12"	14"	16" to 24"	28"	32"	36"	40"	48"
L1 [mm]	200	200	200	250	250	300	350	450	500	550	600	700	800	900	1000	1200
L1 [in]	7.9	7.9	7.9	9.8	9.8	11.8	13.8	17.7	19.7	21.7	23.6	27.6	31.5	35.4	39.4	47.2
L0 [mm]	74	104	104	104	134	134	219	-	-	-	-	-	-	-	-	-
L0 [in]	2.9	4.1	4.1	4.1	5.3	5.3	8.6	-	-	-	-	-	-	-	-	-

FLANGED VERSION



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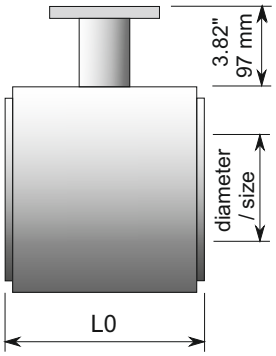
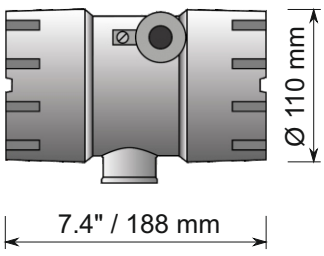
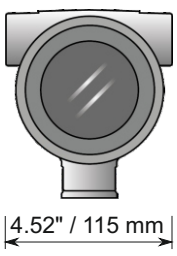


TRANSMITTER





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ELECTROMAGNETIC FLOW METER FLONET FN20xx.1

FLONET FN20xx.1

Electromagnetic flow meter FLONET FN20xx.1 is intended for professional application and measurement of flow rates of electrically-conductive liquids in water and heat-supply systems, food-processing and chemical industries. They meet the most demanding requirements on high measurement accuracy, long-term stability and hygienic standard. Measurements in both directions of flow are possible. The meter sensor has no movable mechanical parts and its inclusion in the piping system will have no effect on the hydraulic or pressure flow conditions. The converter unit provides for sensor energising and processing of the sensor signals, and also offers functions of liquid batching control, detection of empty piping, internal meter status diagnostics, automatic cleaning of electrodes and selection of flow units in data visualisation. The flow meter has frequency, pulse and current outputs, as well as interfaces to the USB and RS 485 communication lines.

METER SPECIFICATION

nominal diameter / size	DN6 to DN1200 / 1/4" to 48"
nominal pressure [bar / psi]	6, 10, 16, 25 or 40 (related to diameter) / 150, 300, 600 (related to size)
min. conductivity of measured liquid	20µS/cm, on agreement with the manufacturer down to 5µS/cm
electrode material	Stainless steel, grade 1.4571 (316Ti), Hastelloy C276, Titanium, Tantalum, Platinum-Rhodium (PtRh10)
ambient temperature	-5°C to 55°C (23° to 131°F)
sensor lining	soft rubber, hard rubber, rubber for drinking water, PTFE, E-CTFE
design version	compact or remote transmitter
piping connection	flanged or flangeless
max. temperature of measured liquid	up to 150°C (302°F), depending on sensor lining
measurement accuracy EN ISO 4064-1 (OIML R 49) *)	2
measuring range	0.1 to 10 m/s (0.33 to 33 ft/s)
indication of empty piping	from DN50 / 2" upwards
displayed units	l, m^3, US gal, US bbl
outputs (insulated)	current (0) 4 to 20mA frequency 0 to 1,000Hz pulse, 0.001 to 1,000 litres per pulse communication line USB, RS 485
power supply	24/115/230V ±10%, 50 to 60Hz (AC), 24V ±10% (DC)
protection class	IP 67 (IP 68)

*) optional measurement accuracy ± 0.2% for 10 to 100 % of Q_4; ± 0.5% for 5 to 100 % of Q_4

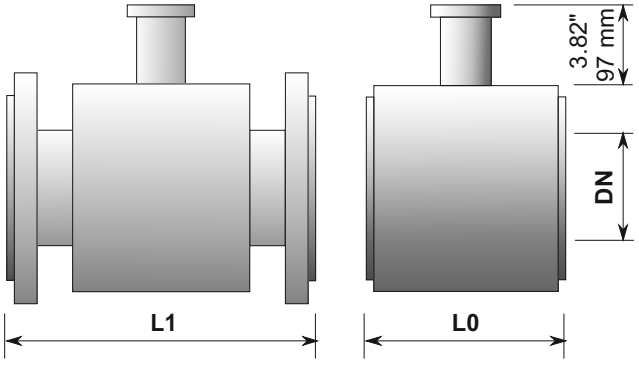
DESIGN VERSION, CONFIGURATION AND TYPE DESIGNATION

design version	COMPACT		REMOTE	
configuration	ECONOMIC	COMFORT	ECONOMIC	COMFORT
type designation - flanged	FN2010.1	FN2014.1	FN2011.1	FN2015.1
- flangeless	FN2020.1	FN2024.1	FN2021.1	FN2025.1

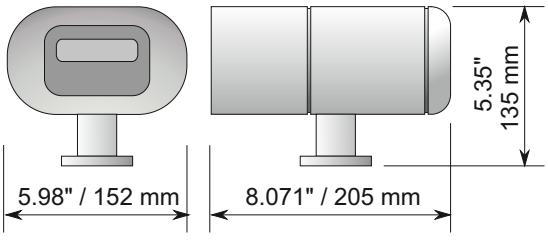
RATED INTERNAL DIAMETER AND SENSOR LENGTH [mm]

pressure	40 bar / 150lb		16 bar / 150lb					10 bar / 150lb					6 bar / 150lb			
diameter [mm]	20	25-40	50-80	100	125	150	200	250	300	350	400-600	700	800	900	1000	1200
size [in]	3/4"	1"-1 1/2"	2"-3"	4"	5"	6"	8"	10"	12"	14"	16"-24"	28"	32"	36"	40"	48"
L1 [mm]	200	200	200	250	250	300	350	450	500	550	600	700	800	900	1000	1200
L1 [in]	7.9	7.9	7.9	9.8	9.8	11.8	13.8	17.7	19.7	21.7	23.6	27.6	31.5	35.4	39.4	47.2
L0 [mm]	74	104	104	104	134	134	219	-	-	-	-	-	-	-	-	-
L0 [in]	2.9	4.1	4.1	4.1	5.3	5.3	8.6	-	-	-	-	-	-	-	-	-

FLANGED VERSION **FLANGELESS VERSION**



TRANSMITTER



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ELECTROMAGNETIC FLOWMETER **FLONET FN30xx**

FLONET FN30xx

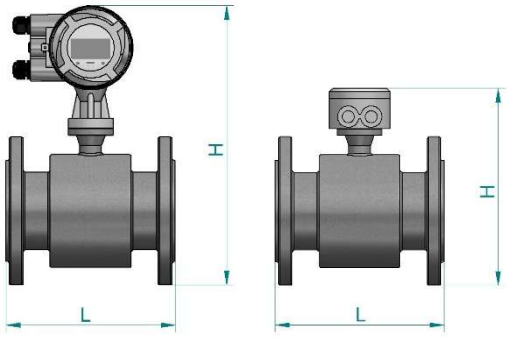
Electromagnetic flow meters of the FLONET FN30xx type series are intended for professional application and measurement of flow rates of electrically conductive liquids in water industry. They meet the most demanding requirements on high measurement accuracy, long-term stability and hygienic standard. Measurements in both directions of flow are possible. The meter sensor has no movable mechanical parts and its inclusion in the piping system will have no effect on the hydraulic or pressure flow conditions. The converter unit provides for sensor energizing and processing of the sensor signals, detection of empty piping, internal meter status diagnostics and selection of flow units in data visualization. The flow meter has pulse and current outputs, as well as interface to the RS485 communication line with communication protocol MODBUS.

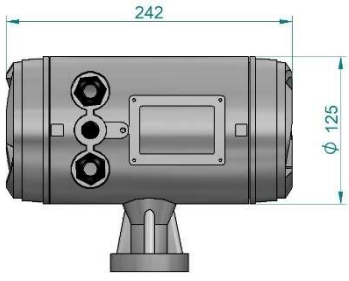
FLOW METER BASIC SPECIFICATION *(…others on request)*

nominal diameter	DN15 to DN1200 …
nominal pressure [bar]	6, 10, 16, 25, 40
min. conductivity of measured liquid	20 µS/cm
electrode material	stainless steel, grade 1.4571 (316Ti), Hastelloy C276, …
sensor lining	hard rubber, rubber for drinking water, PTFE ,…
ambient temperature	-20°C to +60°C
convertor working environment humidity	5 to 90%
electrical outputs	pulse, frequency, current 4 to 20 mA, insulated
detection of empty pipe	YES
alarm function	YES
design version	compact (FN3014), remote (FN3015)
connection	Flanged EN/ANSI/….
measurement range velocity	0,01 to 10 m/s …
measurement accuracy	R= Q3/Q1 = 200 - *Class 2 acc. to EN ISO 4064-1 (OIML R 49)*
communication	RS485, MODBUS RTU, …
power supply	85 to 250 V AC, 45 to 63 Hz or 20 to 36 V DC

RATED INTERNAL DIAMETER, SENSOR LENGTH AND DIAMETER OF CONVERTOR

Size DN	**Nominal**/Max Pressure (bar)	L (mm)	H compact (mm)	H remote (mm)
15	**PN40**	200	332	220
20		200	332	220
25		200	335	223
32		200	352	240
40		200	362	250
50		200	375	263
65	**PN16**/PN40	200	395	283
80		200	402	290
100		250	422	310
125		250	452	340
150		300	485	373
200		350	542	430
250	**PN10**/PN25	450	607	495
300		500	652	540
350		550	707	595
400		600	770	658
450		600	820	708
500		600	872	760
600		600	994	882
700		700	1094	982
800	**PN6**/PN16	800	1204	1092
… up to 1200		1200	1600	1488





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ELECTROMAGNETIC FLOW METERS FLONET FN50xx.2

FLONET FN50xx.2

Electromagnetic flow meters FLONET FN50xx.2 are mainly intended for flow measuring section of measurement in heat or cold systems or simpler for flow measurement of liquids in technological applications. The condition of measurement flow rate is minimum required electrical conductivity of the medium. They meet the most demanding requirements on high measurement accuracy, long-term stability and hygienic standard. The meter sensor has no movable mechanical parts and its inclusion in the piping system will have no effect on the hydraulic or pressure flow conditions. For transfer information of measured volume and the possibility of evaluating the current flow rate are flow meters equipped a pulse output and communicaton interface RS-485 ModBus RTU.

METER SPECIFICATION

nominal diameter / size	flanged DN15 to DN800 / 1/2" to 32"; wafer DN25 to Dn200 / 1" to 8"
nominal pressure [bar / psi]	10, 16, 40 (related to diameter) / 150, 300, 600 (related to size)
min. conductivity of measured liquid	20µS/cm, on agreement with the manufacturer down to 5µS/cm
electrode material	Stainless steel, grade 1.4571 (316Ti), Hastelloy C276, Titanium, Tantalum, Platinum-Rhodium (PtRh10)
sensor lining	soft rubber, hard rubber, rubber for drinking water, PTFE, E-CTFE
design version	compact or with remote electronic unit
piping connection	flanges or wafer
max. temperature of measured liquid	up to 150°C (302°F), depending on sensor lining
measurement accuracy: - measurement of heat and cold - technological applications	according to EN 1434, class. accuracy 2 ±1 % to 0.5 to 100 % q_s ±0.5 % to 5 to 100 % q_s ±0.2 % to 10 to 100 % q_s (surcharge)
measuring range	0.05 to 10 m/s
power consumption	6 VA max.
outputs	pulse, frequency, binary with galvanic insulated
communication interface	RS-485 ModBus RTU
ambient temperature	-5°C to 55°C (23° to 131°F)
power supply	90 - 264 VAC /47 to 440 Hz
protection class	IP 65

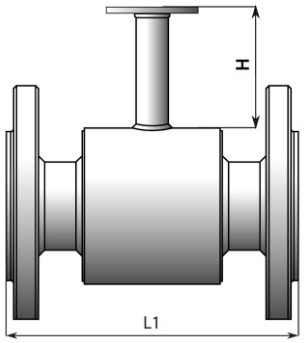
DESIGN VERSION, CONFIGURATION AND TYPE DESIGNATION

design version	COMPACT	REMOTE	SENSOR	H [mm]	APPLICATION
type designation - flanged	FN5030.2	FN5031.2	ISX.MXX	104	for heat meters
- wafer	FN5040.2	FN5041.2	IS0.MXX	104	
type designation - flanged	FN5010.2	FN5011.2	ISX.1XX	97	for cold met. and other appl.
- wafer	FN5020.2	FN5021.2	IS0.1XX	97	

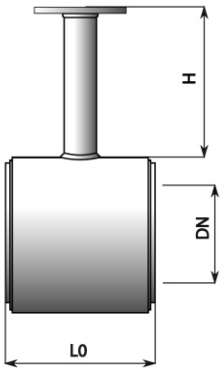
RATED INTERNAL DIAMETER AND SENSOR LENGTH [mm]

pressure	40 bar		16 bar					10 bar					6 bar
diameter [mm]	20	25-50	65-80	100	125	150	200	250	300	350	400-600	700	800
L1 [mm]	200	200	200	250	250	300	350	450	500	550	600	700	800
L0 [mm]	74	104	104	104	134	134	219	-	-	-	-	-	-

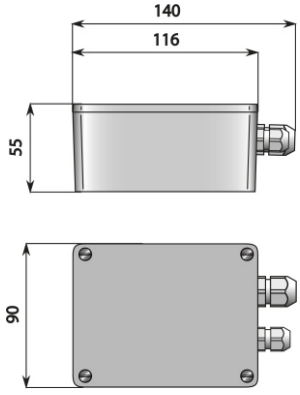
FLANGED VERSION



WAFER VERSION



ELECTRONIC UNIT



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ELECTROMAGNETIC FLOW METERS FLONET FR 10xx

FLONET FR 10xx

Electromagnetic flow meters of the type series FLONET FR 10xx including the Rosemount electronic convertes measure conductive liquids in water and heat supply systems, chemical, food processing and other industries. They meet the most stringent requirements on measurement accuracy, long-term stability and hygienic standards. Flow-rate measurements in both directions of flow are possible. The meter sensor has no movable mechanical parts and its inclusion in the piping system will have no effect on the hydraulic or pressure flow conditions.
The converter unit provides for sensor energising and processing of sensor signals. The meter has frequency and current outputs, as well as interfaces to the Hart and Foundation Field Bus communication lines. Information is displayed in English.

METER SPECIFICATION

nominal diameter DN	DN 15 to DN 1200
nominal pressure PN	6, 10, 16, 25, 40
min. conductivity of measured fluid	5µS/cm
electrode material	stainless steel 1.4571, Hastelloy, titanium, tautalum, platinum
ambient temperature	-5 to 55 °C
sensor lining	soft of hard rubber, special rubber for drinking water, Teflon
version	remote of compact version
connection	flange, water
max. temperature of measured liquid	up to 150 °C
measurement accuracy	less than 0.5% for 5 to 100% q_s
measurement range	0.1 to 10 m/s
outputs	current (0) 4 to 20 mA, insulated frequency 0 to 1, 000 Hz, insulated
communication protocol	Hart of Foundation Field Bus
power supply	90 to 250V AC, 50 to 60Hz, 15 to 50V DC
protection class	IP 67 (IP 68)

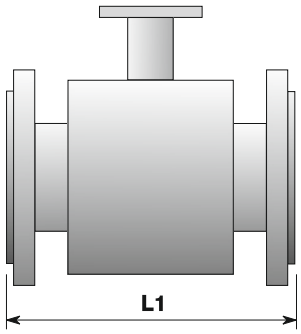
DESIGN VERSION, CONFIGURATION AND TYPE DESIGNATION

version	COMPACT		REMOTE	
option	ECONOMIC	COMFORT	ECONOMIC	COMFORT
type - flanged	FR 1010	FR 1014	FR 1011	FR 1015
- wafer	FR 1020	FR 1024	FR 1021	FR 1025

RATED INNER DIAMETER AND SENSOR LENGTH [mm]

PN	40		16					10					6			
DN	20	25-40	50-80	100	125	150	200	250	300	350	400-600	700	800	900	1,000	1,200
L1	200	200	200	250	250	300	350	450	500	550	600	700	800	900	1,000	1,200
L0	74	104	104	104	134	134	219	-	-	-	-	-	-	-	-	-

FLANGED VERSION



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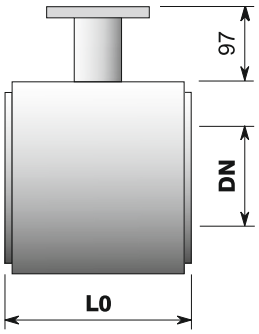

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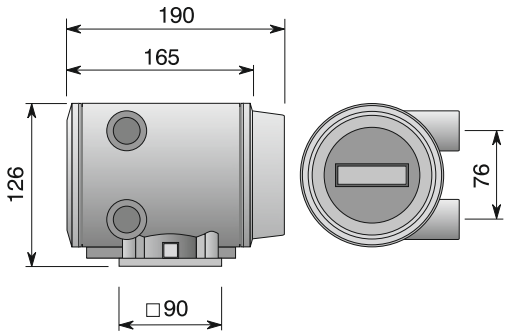

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ELECTROMAGNETIC FLOW METERS FLONET FS10xx

FLONET FS 10xx

Electromagnetic flow meters of the type series FLONET FS 10xx are intended for professional flow-rate measurements of electrically conductive fluids including abrasive particles. The meters meet most demanding requirements regarding measurement accuracy and long-term parameter stability. Flow-rate measurements in both directions are possible. The flow sensor includes no movable mechanical parts, has excellent wear resistance and its effect on the fluid flow characteristic or pressure in the connecting piping is negligible. The associated electronic unit supplies power to the sensor unit and processes the flow-rate signals. The meter has current and frequency outputs. Communication with external devices is via the Hart communication protocol. The meter display information is in English.

TECHNICAL PARAMETERS

internal diameter d	100, 150 and 200mm (flangeless connections) 250, 300, 350, 400 and 450mm
rated pressure PN	10, 16 (depending on inside diameter to 150 PN16 from 200 PN10)
min. conductivity of measured fluid	5µS/cm
max. temperature of measured fluid	+150°C
electrode material	stainless steel 1.4571, Hastelloy-C4
sensor lining	wear-resistant material
wearability (DIN 52108)	maximum wear loss $5cm^3/50cm^2$
design version	compact or with remote electronic control unit
measurement accuracy	±0,5% for flow rate 5 to 100% Q_{max} (calibrated with water)
measurement range	0,1 to 10m/s
signal outputs	insulated current output 4 to 20mA ~ (0 to Q_{max}) insulated frequency output 0 to 1,000Hz ~ (0 to Q_{max})
communication protocol	Hart
power source	90 to 250V AC, 50 to 60Hz, 10VA, 15 to 50V DC
ambient temperature	-40 to +74°C
protection class	IP 67 (IP 68)

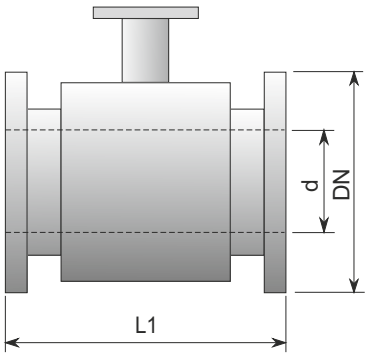
DESIGN VERSION, CONFIGURATION AND TYPE DESIGNATION

design version	COMPACT		REMOTE	
configuration	ECONOMIC	COMFORT	ECONOMIC	COMFORT
type designation	FS 10X0	FS 10X4	FS 10X1	FS 10X5

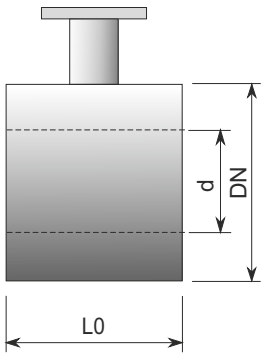
CONNECTION FLANGE, RATED INTERNAL DIAMETER AND SENSOR LENGTH

PN	16		10					
connection flange DN	150	200	250	300	350	400	450	500
inner diameter d [mm]	100	150	200	250	300	350	400	450
L1 [mm]	-	-	-	450	500	550	600	600
L0 [mm]	134	219	219	-	-	-	-	-

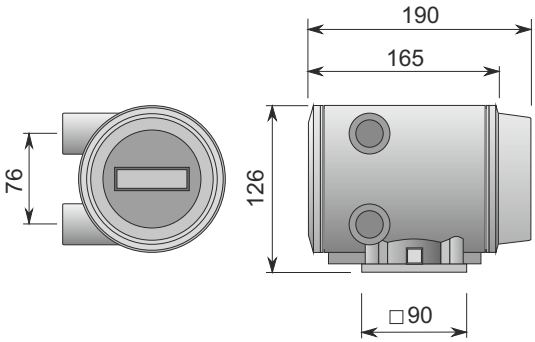
FLANGED VERSION



WAFER VERSION



ELECTRONIC UNIT



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INDUCTION FLOW METER FLONEX FXx11x

FLONEX FXx11x

FLONEX FXx11x is an induction flow meter for a measurement of flow of conductive liquids in chemically hazardous environment. It satisfies the most stringent requirements as to the accuracy and long-term stability of measurement and hygyenic standards for measurement of drinking water. The flow measurement is carried out in both directions. The meter sensor doesn't have any mechanical moving parts and its installation into the piping system has no impact on fluid stability and pressure of measured liquids.

The transmitter supplies power and processes signals coming from the sensor. Thanks to the OLED display the data are easy to read even in the extreme frost. The basic configuration doesn't require opening of flow meter, since the control is exercised using optical sensors. The flow meter has pulse, frequency and current outputs. For data communication there is available MODBUS RTU protocol.

METER SPECIFICATION

nominal diameter / size	DN15 to DN300 / 1/2" to 12"
nominal pressure [bar / psi]	10, 16 or 40 (related to diameter) / 150 (related to size)
min. conductivity of measured liquid	10 µS/cm
electrode material	stainless steel, grade 1.4571 (316Ti), Hastelloy C276, Titanium, Tantalum
ambient temperature max. range	–35°C to +60°C (–31°F to 140°F) depending on temperature class: T3 to T6
sensor lining	soft or hard rubber for potable water, PTFE
design version	compact or with remote transmitter
piping connection	flanges EN1092-1, ASME B16.5
protection class	IP 67
ATEX / IEC approval	II 2G Ex db eb ib [ib] IIB T6…T3 Gb II 2D Ex tb IIIC T80°C…T155°C Db
measurement accuracy EN ISO 4064-1 (OIML R 49) *)	2
metrological certificate MID	TCM 142/20-5738
measurement repeatability	± 0.15%
measuring range	0.025 to 10 m/s (0.08 to 33 ft/s), R = 400
outputs	current 4 to 20 mA, insulated 2x multifunctional outputs (pulse, frequency 0 to 10kHz, binary) insulated
communication protocol	MODBUS RTU
power supply	95 to 250V, 50 to 60Hz (AC) or 24V ± 20% (DC) 19.2 to 28.8V

*) optional calibration for accuracy of measurement ±0.3% in the range 5 to 100% Q_4

TEMPERATURE RANGE OF SENSORS

DN 15 to DN 25/ 1/2" to 1"

max. temperature of measured medium	temperature class 2G	surface temperature 2D
-35°C to +48°C (-31°F to 118°F)	T6	+80°C (176°F)
-35°C to +63°C (-31°F to 145°F)	T5	+95°C (203°F)
-35°C to +98°C (-31°F to 208°F)	T4	+130°C (266°F)
-35°C to +123°C (-31°F to 253°F)	T3	+155°C (311°F)

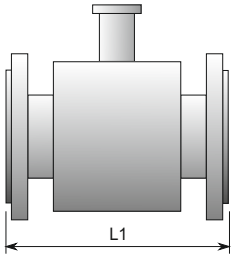
DN 32 to DN 300 / 1 1/4" to 12"

max. temperature of measured medium	temperature class 2G	surface temperature 2D
-35°C to +64°C (-31°F to 146°F)	T6	+80°C (176°F)
-35°C to +79°C (-31°F to 174°F)	T5	+95°C (203°F)
-35°C to +114°C (-31°F to 237°F)	T4	+130°C (266°F)
-35°C to +139°C (-31°F to 282°F)	T3	+155°C (311°F)

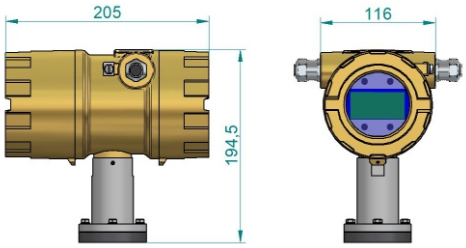
RATED INTERNAL DIAMETER AND SENSOR LENGTH [mm]

pressure	40 bar / 150lb		16 bar / 150lb					10 bar / 150lb	
diameter [mm]	20	25 to 50	65 to 80	100	125	150	200	250	300
size [in]	3/4"	1" to 1 1/2"	2" to 3"	4"	5"	6"	8"	10"	12"
L1 [mm]	200	200	200	250	250	300	350	450	500

FLANGED VERSION



TRANSMITTER C12, C13



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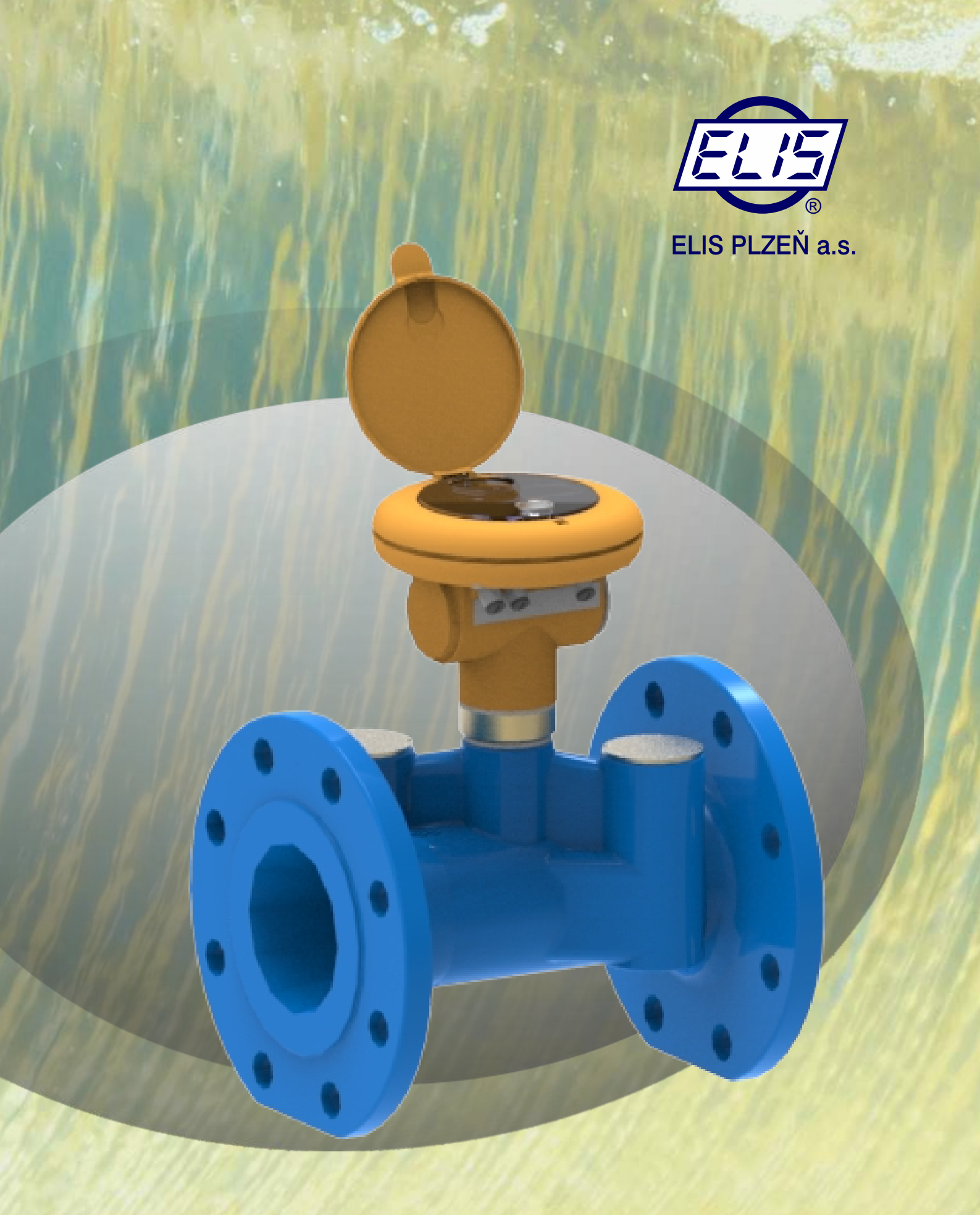


ULTRASONIC WATER METERS FLOMIC FL5024.1, FL5025.1
FLOMIC FL5044.1, FL5045.1

FLOMIC FL5024.1, FL5025.1, FL5044.1, FL5045.1

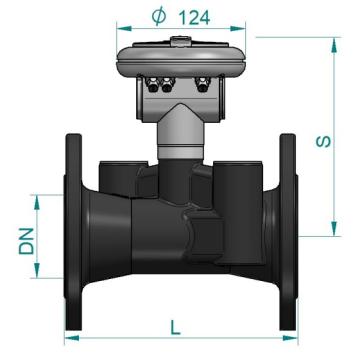
The battery-powered **FLOMIC FL5024.1, FL5025.1 and FLOMIC FL5044.1, FL5045.1 ultrasonic water meters** are intended for operational and invoicing measurements of instantaneous flow rate, pressure and consumption in water piping in observance of standard ISO 4064 in water works, water distribution systems and other industrial applications. These water meters are in compact or remote design with the IP 68 protection class. They are characterised by high measurement accuracy and long-term stability over a wide range of measured values. The meters do not need any external power supply, do not include any moving parts and, have significantly lower hydraulic losses. The technical parameters and other features of the FLOMIC water meters make them suitable not only for water consumption measurements, but also for water-leak tracking and monitoring of the general condition of water-supply networks, where the meter output signals can be connected via data transfer systems to remote computer control stations. The measurement method utilised by these meters is a single-beam (FL5024.1, FL5025.1) or dual-beam (FL5044.1, FL5045.1) transit-time pulse method based on evaluation of the time needed for an ultrasonic signal to cross the distance between two measuring transductors. In the standard version, the meter measures instantaneous flow rate (in m^3/hour) and the total volume of water passed through the meter (in m^3) in the given flow direction. The measured data are converted into passive pulse output signals.

OPTIONAL METER ACCESSORIES:

- bi-directional flow rate and volume measurements with visual and electronic indication of the actual flow rate direction
- measurement and display of instantaneous water pressure values within the range of 1 to 16 bar
- using a passive current output signal 4 to 20 mA, monitoring the instantaneous flow rate or flow pressure values
- measured data storage with user-selectable sampling period of 1 minute to 1 year
- actual and stored data reading via the USB or RS 232 interface
- connection to a remote data transfer system by means of a GSM module
- use of alternative measurement units (Gal/min, or litre/sec)
- application of the meter within drinking-water supply systems
- power supply via the 4 to 20 mA current line

TECHNICAL PARAMETERS

		FLOMIC FL5024.1, FL5025.1					FLOMIC FL5044.1, FL5045.1			
nominal diameter		32	40	50	65	80	100	125	150	200
overload flowrate Q_4 [m^3/h]		12,5	20	31,25	50	78,75	125	200	312,5	500
permanent flowrate Q_3 [m^3/h]		10	16	25	40	63	100	160	250	400
minimum flowrate Q_1 [m^3/h]	FL502x.1	0,03	0,05	0,08	0,13	0,2	0,317	0,508	0,794	1,270
	FL504x.1			0,05	0,08	0,126	0,2	0,32	0,5	0,8
pulse output constant k_i [litres/pulse]		10	10	25	50	50	100	100	100	250
flowrate ratio Q_3/Q_1	FL502x.1	315	315	315	315	315	315	315	315	315
	FL504x.1			500	500	500	500	500	500	500
water pressure class		MAP 16								
temperature class		T50 (FL5024.1, FL5044.1), T90 (FL5025.1, FL5045.1)								
flow-profile sensitivity class	before meter	U5 (FL5044.1, FL5045.1), U10 (FL5024.1, FL5025.1)								
	after meter	D3 (FL5044.1, FL5045.1), D5 (FL5024.1, FL5025.1)								
pressure loss class		ΔP 25								
climatic and mechanical resistance class		B								
electromagnetic environment		E1, E2								
flowrate sampling period		1 sec								
display unit		single-line 8 character LC display								
power supply		Li battery 3.6 V/19 Ah - lifetime 8 years in standard meter version								
protection class		IP 68								
output (insulated)		measured flow-rate values indicated in the form of passive pulse output U = 3 to 30 V, I = 0.002 to 10 mA, t_{imp} = 30 ms								
optional accessories		passive current output 4 to 20 mA, U = 10 to 24 V								
	bi-directional flow-rate measurement	+ passive pulse output, U = 3 to 30 V, I = 0.002 to 10 mA, t_{imp} = 30 ms – passive pulse output, U = 3 to 30 V, I = 0.002 to 10 mA, t_{imp} = 30 ms								
		passive current output 4 to 20 mA, U = 10 to 24 V, in combination with passive electric contact for indication of the actual flow-rate direction								
		optically isolated interfaces USB, RS 232 or RS 232 + USB converter GSM module								



FL5024.1 (compact version), FL5025.1 (remote version)
FL5044.1 (compact version), FL5045.1 (remote version)

BASIC DIMENSION AND WEIGHT

diameter [mm]	32	40	50	65	80	100	125	150	200
L [mm]	260	300	200	200	225	250	250	300	350
S [mm]	140	145	150	155	160	165	180	190	205
weight [kg]	4.5	7	8	9	15	18	20	22	36.5

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ULTRASONIC FLOWMETERS FLOMIC FL5034, FL5035 FLOMIC FL5054, FL5055

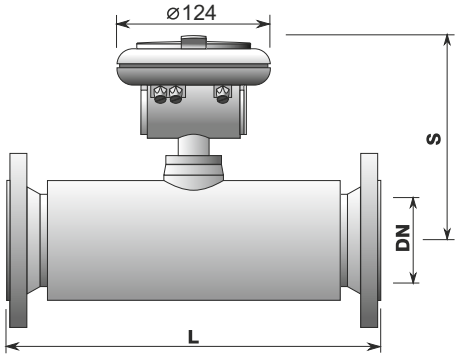
The battery-powered **FLOMIC FL5034, FL5035 and FLOMIC FL5054, FL5055 ultrasonic flow meters** are intended for operational and invoicing measurements of instantaneous flow rate, pressure and consumption in water piping in observance of standard EN 14154 in water works, water distribution systems and other industrial applications. These flow meters are in compact or remote version with the IP 68 protection class. They are characterised by high measurement accuracy and long-term stability over a wide range of measured values. The meters do not need any external power supply, do not include any moving parts and, have significantly lower hydraulic losses. The technical parameters and other features of the FLOMIC flow meters make them suitable not only for water consumption measurements, but also for water-leak tracking and monitoring of the general condition of water-supply networks, where the meter output signals can be connected via data transfer systems to remote computer control stations. The measurement method utilised by these meters is a single-beam (FL503x) or dual-beam (FL505x) transit-time pulse method based on evaluation of the time needed for an ultrasonic signal to cross the distance between two measuring transductors. In the standard version, the meter measures instantaneous flow rate (in m^3/hour) and the total volume of water passed through the meter (in m^3) in the given flow direction. The measured data are converted into passive pulse output signals.

OPTIONAL METER ACCESSORIES:

- bi-directional flow rate and volume measurements with visual and electronic indication of the actual flow rate direction
- measurement and display of instantaneous water pressure values within the range of 1 to 16 bar
- using a passive current output signal 4 to 20 mA, monitoring the instantaneous flow rate or flow pressure values
- measured data storage with user-selectable sampling period of 1 minute to 1 year
- actual and stored data reading via the USB or RS 232 interface
- connection to a remote data transfer system by means of a GSM module
- use of alternative measurement units (Gal/min, or litre/sec)
- application of the meter within drinking-water supply systems
- power supply via the 4 to 20 mA current line

TECHNICAL PARAMETERS

		FLOMIC FL5034, FL5035										
		FLOMIC FL5054, FL5055										
nominal diameter		32	40	50	65	80	100	125	150	200	250	300
overload flowrate Q_4 [m^3/h]		20	31,25	50	78,75	125	200	250	312,5	500	787,5	1250
permanent flowrate Q_3 [m^3/h]		16	25	40	63	100	160	200	250	400	630	1000
minimum flowrate Q_1 [m^3/h]	FL503x	0,05	0,079	0,127	0,2	0,25	0,4	0,5	0,625	1,0	1,575	2,50
	FL505x		0,0625	0,1	0,157	0,2	0,32	0,4	0,5	0,8	1,26	2,0
pulse output constant k_i [litres/pulse]		10	10	25	50	50	100	100	100	250	250	500
flowrate ratio Q_3/Q_1 for T30	FL503x	315	315	315	315	400	400	400	400	400	400	400
	FL505x		400	400	400	500	500	500	500	500	500	500
water pressure class		MAP 16 (FL503x, FL505x from DN 100 – DN 300), or MAP 40 (FL503x, FL505x)										
temperature class		T50 (FL5034, FL5054), T130 (FL5035, FL5055)										
flow-profile sensitivity class	before meter	U5 (FL5054, FL5055), U10 (FL5034, FL5035)										
	after meter	D3 (FL5054, FL5055), D5 (FL5034, FL5035)										
pressure loss class		ΔP 25										
climatic and mechanical resistance class		B (optional O)										
electromagnetic environment		E1, E2										
flowrate sampling period		1 s										
display unit		single line 8 character LC display										
power supply		Li battery 3.6 V/19 Ah - lifetime 8 years in standard meter version										
protection class		IP 68										
output signal		measured flow-rate values indicated in the form of passive pulse output U = 3 to 30 V, I = 0.002 to 10 mA, t_{imp} = 30 ms										
optional accessories		passive current output 4 to 20 mA, U = 10 to 24 V										
	bi-directional flow-rate measurement	+ passive pulse output, U = 3 to 30 V, I = 0.002 to 10 mA, t_{imp} = 30 ms – passive pulse output, U = 3 to 30 V, I = 0.002 to 10 mA, t_{imp} = 30 ms										
		passive current output 4 to 20 mA, U = 10 to 24 V, in combination with passive electric contact for indication of the actual flow-rate direction										
		optically isolated interfaces USB, RS 232, RS 232 + USB converter GSM module										



FL5034 (compact version), FL5035 (remote version)
FL5054 (compact version), FL5055 (remote version)

BASIC DIMENSION AND WEIGHT

diameter [mm]	32	40	50	65	80	100	125	150	200	250	300
L [mm]	360	360	360	360	360	360	360	360	450	450	450
S [mm]	175	180	185	190	200	210	225	235	255	280	305
weight [kg] 1.6 MPa						18	19	20	29	46	59
weight [kg] 4.0 MPa	10	10	12	13	16	18	21	22	38	71	85

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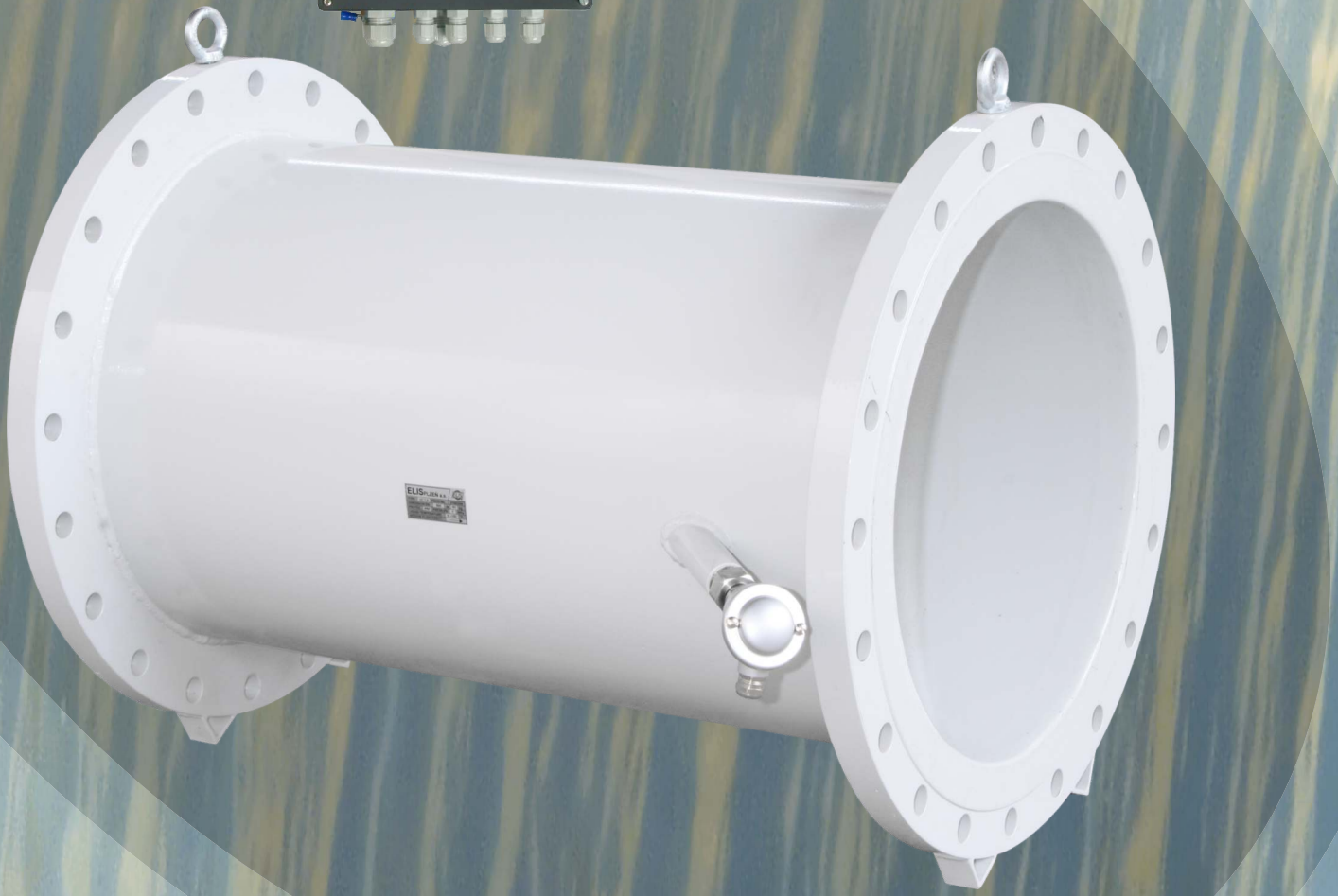


ULTRASONIC FLOW METER FLOMIC FL3085

FLOMIC FL3085

The battery-powered ultrasonic flow meter of the type series FLOMIC FL3085 is intended for measurement and storage of data on instantaneous flow rate and total volume of the liquid passed through the metering point in fully-flooded piping of large sizes. The measurement principle consists of determination of the difference between the times the ultrasonic waves need to cross the distance between the sender and receiver probes when travelling in and against the flow direction of the measured fluid. Of the measured fluid it is only required that it allows for undisturbed propagation of ultrasonic waves. The high measurement precision is achieved thanks to the calibration of the flow meter performed on a testing rig. The FLOMIC FL3085 flow meter does not require an external power source; the guaranteed battery lifetime is 4 years. The electronic accessories of the meter make possible, apart from measurement and visualisation of the data on instantaneous flow rate and aggregate volume of the fluid passed through the meter, storage of the data measured in regular intervals in own data logger, and data communication via standard electric outputs to a master control system.

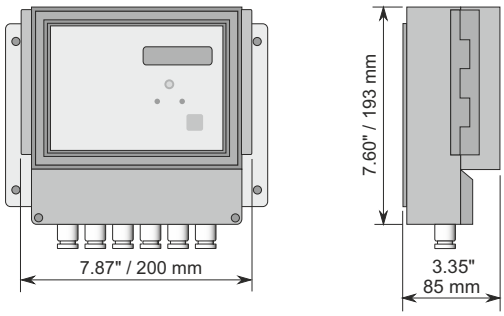
METER SPECIFICATION

nominal diameter / size	DN200 to DN1200 / 8" to 48"
measurement accuracy EN ISO 4064-1 (OIML R 49) *)	2
nominal pressure [bar / psi]	standard 10 / 150, substandard 16 or 25 / 230 or 300 for DN200 to DN500 / 8" to 20"
temperature of measured liquid	0 °C to 150 °C / 32 °F to 302 °F
protection class (electronic unit)	IP 65
protection class (ultrasonic sensor)	IP 54 (IP 68)
ultrasonic probes	2 pieces US 2.x (manufactured by ELIS PLZEŇ a. s.)
flow-rate sampling period	1 s
display unit	single-line 8-digit LC display
power supply	battery, life time min. 4 years
probe connecting cables	max. 20m / 65.6 ft
output	passive pulse U = 5 to 30V, I_{max} =10mA
communication interface	comunication line RS 232
optional accessories	passive current output 4 to 20mA, U_{max} = 24V storage of measured data optical interface, GSM communication probe protection class IP 68 measuring in two directions with indication of measurement direction

*) optional measurement accuracy ±1% for velocity of the measured liquid v > 0.5 m/s / 1.64 ft/s

ULTRASONIC SENSOR

TRANSMITTER



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ULTRASONIC FLOW METERS SONOELIS SE401x SONOELIS SE402x

SONOELIS SE401x, SE402x

Ultrasonic flow meters SONOELIS SE401x (single-beam) and SE402x (dual-beam) are intended for flow rate measurements of conductive, non-conductive and aggressive liquids. Ultrasonic flow meters operate on the principle of measuring the difference in transit times of ultrasonic waves travelling in and against the fluid flow direction. The meter consists of a flow sensor and remote transmitter. Ultrasonic flow meters offer excellent user value in their high measurement accuracy over a wide range of measured values, long-term stability, negligible hydraulic losses and the capability of measuring the flow rate of virtually any liquid medium.
The transmitter supplies power to ultrasonic probes and, via its outputs, communicates the flow rate data to other cooperating data processing systems. The meter is supplied with remote transmitter. Regarding operator comfort and optional accessories, the meter can be delivered in three configurations: COMFORT (including a display unit and control keyboard, signal outputs), STANDARD (including a display unit, signal outputs) or ECONOMIC (signal outputs only).

METER SPECIFICATIONS

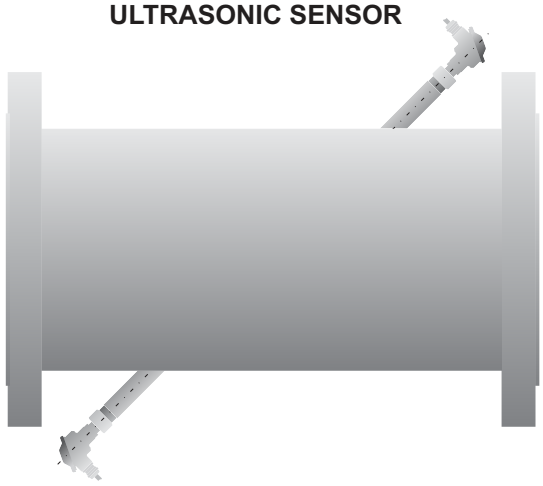
nominal diameter / size	DN200 to DN1200 / 8" to 48"
nominal pressure [bar / psi]	standard 10 / 150, substandard 16 or 25 / 300 or 600 for DN200 to DN500 / 8" to 20"
measurement accuracy EN ISO 4064-1 (OIML R 49), EN 1434 (OIML R 75) *)	2
temperature of measured liquid	0 °C to 150 °C / 32 °F to 302 °F
ambient temperature	5°C to 55°C / 41 °F to 151 °F
display unit	alpha-numerical LCD unit, two lines of 16 characters each
power supply	100 to 250VAC, 50 to 60Hz (AC)
protection class (transmitter) protection class (ultrasonic sensor)	IP 65 IP 54 (IP 68)
outputs (insulated)	pulse type frequency type 0 to 1,000Hz or 10kHz relay type 24VAC/0.1 A
optional accessories	communication line RS 485 extended temperature range: -20°C to +180°C / -4 °F to 356 °F current output 0 (4) to 20mA mass flow-rate measurement capability for water flow-rate measurement in two directions sensor protection class IP 68 power supply 24 V DC ± 10%
approval MID	TCM 142/16 - 5353 for SE4011

*) optional measurement accuracy ± 1% for velocity of the measured liquid v > 0.5 m/s / 1.64 ft/s for SE401x
± 0.5% for velocity of the measured liquid v > 0.5 m/s / 1.64 ft/s for SE402x

METER VERSION, CONFIGURATION AND TYPE DESIGNATION

version	REMOTE		
configuration	ECONOMIC	STANDARD	COMFORT
single-beam type	SE4011	SE4013	SE4015
dual-beam type	SE4021	SE4023	SE4025

ULTRASONIC SENSOR



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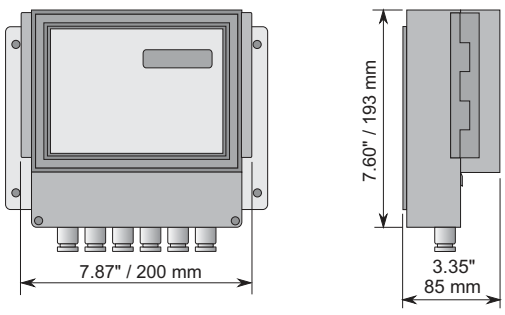

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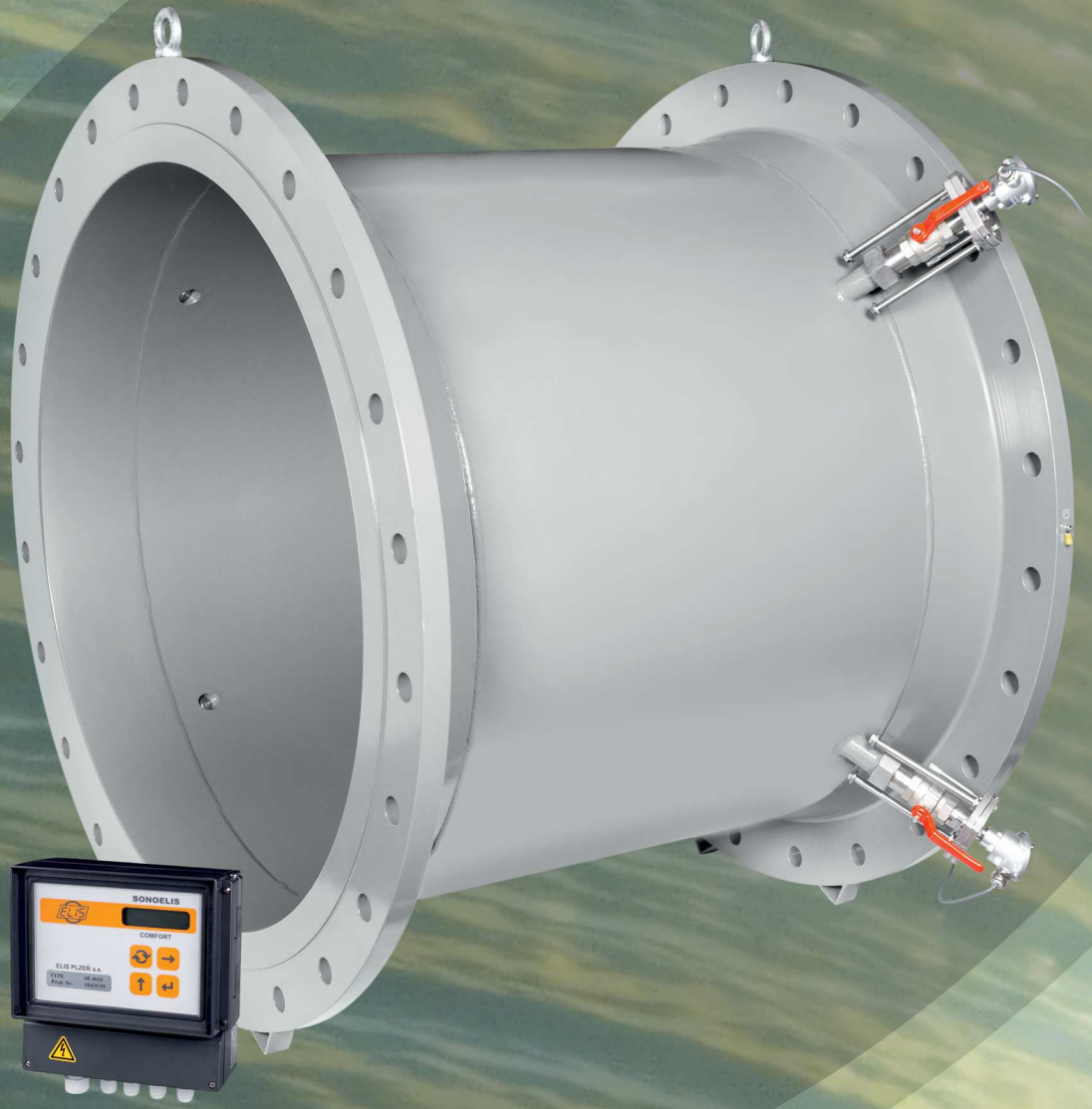


ULTRASONIC FLOW METERS SONOELIS SE401x.xRP
SONOELIS SE402x.xRP

SONOELIS SE401x.xRP, SE402x.xRP

Ultrasonic flow meters SONOELIS SE401x.xRP (single beam) and SE402x.xRP (dual beam) are intended for flow rate measurements of conductive and non-conductive clean liquids. Ultrasonic flow meters operate on the principle of measuring the difference in transit times of ultrasonic waves travelling in and against the fluid flow direction. The meters consist of a flow sensor and remote transmitter. The special design of ultrasonic transductors makes possibility to change or remove transductors without emptying of a pipe. Ultrasonic flow meters offer excellent user value in their high measurement accuracy over a wide range of measured values, long-term stability, negligible hydraulic losses and the capability of measuring the flow rate of virtually any liquid medium.
The transmitter supplies power to ultrasonic probes and, via its outputs, communicates the flow-rate data to other cooperating data processing systems. The meters are supplied with remote transmitter and ultrasonic transductors can be removed or changed from the sensors by flowed pipe. Regarding operator comfort and optional accessories, the meters can be delivered in configurations: COMFORT (including a display unit and control keyboard, signal outputs), STANDARD (including a display unit, signal outputs) or ECONOMIC (signal outputs only). The transmitter can be placed in plastic or aluminium box.

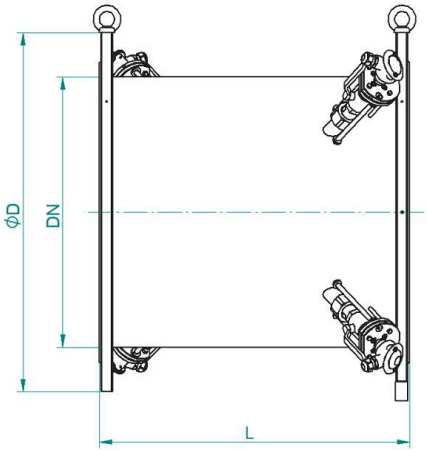
METER SPECIFICATIONS

nominal diameter / size	DN400 to DN1200 / 12" to 48"
nominal pressure [bar / psi]	standard 10 / 150
operational pressure [bar]	7.5
maximum pressure during removing/changing of transductors from a sensor [bar]	1
measurement accuracy EN ISO 4064-1 (OIML R 49)	2
temperature of measured liquid	0 °C to 100 °C / 32 °F to 212 °F
Maximum temperature during removing/changing of transductors from a sensor	40 °C / 104 °F
ambient temperature	5°C to 55°C / 41 °F to 151 °F
display unit	alpha-numerical LCD unit, two lines of 16 characters each
power supply	100 to 250VAC, 50 to 60Hz (AC)
protection class (transmitter) protection class (ultrasonic sensor)	IP 65 IP 54 (IP 68)
outputs (insulated)	pulse type frequency type 0 to 1,000Hz or 10kHz
optional accessories	flanges according to standard ANSI, AWWA, JIS, current output 0 (4) to 20mA communication line RS 485 flow-rate measurement in two directions sensor protection class IP 68

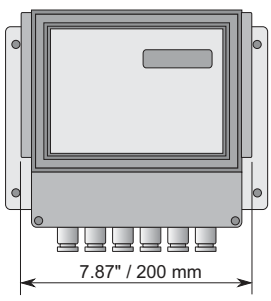
METER VERSION, CONFIGURATION AND TYPE DESIGNATION

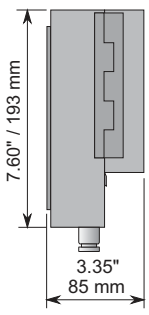
version	REMOTE - PLATIC BOX			REMOTE - ALUMINIUM BOX	
configuration	ECONOMIC	STANDARD	COMFORT	ECONOMIC	COMFORT
single-beam type	SE4011.RP	SE4013.RP	SE4015.RP	SE4011.1RP	SE4015.1RP
dual-beam type	SE4021.RP	SE4023.RP	SE4025.RP	SE4021.1RP	SE4025.1RP

ULTRASONIC SENSOR



TRANSMITTER





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ELIS PLZEŇ a.s.

ULTRASONIC FLOWMETERS SONOELIS SE404x SONOELIS SE406x

SONOELIS SE404x, SE406x

Ultrasonic flow meters SONOELIS SE404x (single-beam) and SE406x (dual-beam) are intended for flow rate measurements of conductive, non-conductive and aggressive liquids. Ultrasonic flow meters operate on the principle of measuring the difference in transit times of ultrasonic waves travelling in and against the fluid flow direction. The meter consists of a flow sensor and remote transmitter. Ultrasonic flow meters offer excellent user value in their high measurement accuracy over a wide range of measured values, long-term stability, negligible hydraulic losses and the capability of measuring the flow rate of virtually any liquid medium. The transmitter supplies power to ultrasonic probes and, via its outputs, communicates the flow-rate data to other co-operating data processing systems. The meter is supplied with remote transmitter. Regarding operator comfort and optional accessories, the meter can be delivered in three configurations: COMFORT (including a display unit and control keyboard, signal outputs), STANDARD (including a display unit, signal outputs) or ECONOMIC (signal outputs only). The transmitter is fitted into a plastic box in the remote version.

METER SPECIFICATIONS

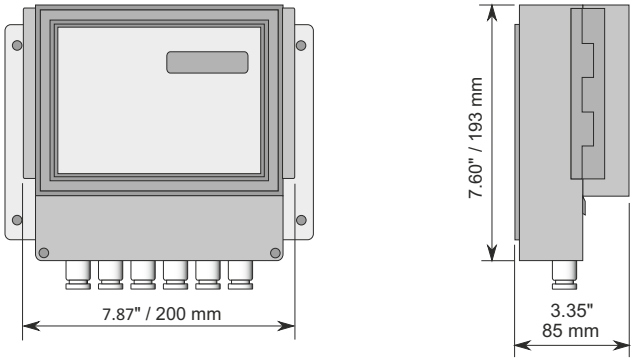
nominal diameter / size	DN32 to DN300 / 1 1/4" to 12"
nominal pressure [bar / psi]	40 / 600 (DN32 to DN80 / 1 1/4" to 3") and 16 / 150 (from DN100 / 5")
measurement accuracy EN ISO 4064-1 (OIML R 49), EN1434 (OIML R 75) *)	2
temperature of measured liquid	0 °C to 150 °C / 32 °F to 302 °F
ambient temperature	5°C to 55°C / 41 °F to 151 °F
display unit	alpha-numerical LCD unit, two lines of 16 characters each
power supply	100 to 250VAC, 50 to 60Hz (AC)
protection class (transmitter) protection class (sensor)	IP 65 IP 67
outputs (insulated)	pulse type, one pulse per 0.1 to 1,000 litres frequency type, 0 to 1,000Hz or 10kHz relay type 24VAC/0.1 A
optional accessories	communication line RS 485 extended temperature range: -20°C to +180°C / -4 °F to 356 °F current output 0 (4) to 20mA mass flow-rate measurement capability for measurement of water flow-rate measurement in two directions sensor protection class IP68 power supply 24 V DC ± 10%
approval MID	TCM 142/16 - 5353 for SE4041

*) optional measurement accuracy ± 1% for velocity of the measured liquid v > 0.5 m/s / 1.64 ft/s for SE404x
± 0.5% for velocity of the measured liquid v > 0.5 m/s / 1.64 ft/s for SE406x

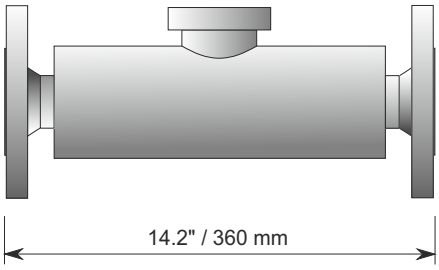
METER VERSION, CONFIGURATION AND TYPE DESIGNATION

version	REMOTE		
configuration	ECONOMIC	STANDARD	COMFORT
single-beam sensor	SE4041	SE4043	SE4045
dual-beam sensor	SE4061	SE4063	SE4065

TRANSMITTER



FLOWMETER SENSOR



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ELIS PLZEŇ a.s.

ULTRASONIC FLOW METERS SONOELIS SE804x.x SONOELIS SE806x.x

SONOELIS SE804x.x, SE806x.x

Ultrasonic flow meters of the SONOELIS SE804x.x (single-beam) and SE806x.x (dual-beam) type series for direct assembly of ultrasonic probes into piping are intended for instantaneous flowrate and fluid volume measurements in fully flooded piping of big dimensions. The measuring method used allows meter application in piping systems with any type of liquid (electric conductive and non-conductive) permitting propagation of ultrasonic waves. On prior consultation and agreement with the manufacturer, the meter can even be used for measurement of aggressive fluids. Ultrasonic flow meters operate on the principle of measuring the difference in transit times of ultrasonic waves travelling in and against the fluid flow direction. The associated electronic unit includes the necessary hardware and software for communication with super ordinated control systems. To ensure high measurement accuracy, follow the manufacturer's recommendations regarding the so-called theoretical meter calibration. The meter consists of a flow sensor to be embedded into the fluid piping and associated electronic unit, providing power for the ultrasonic probes and processing the ultrasonic signals. Regarding operator comfort and optional accessories, the meter can be delivered in three configurations: COMFORT (including a display unit, control keyboard and signal outputs), STANDARD (including a display unit and signal outputs) or ECONOMIC (including signal outputs only). The measured values of instantaneous flow rate and fluid volume are shown on the meter display. The electronic unit is fitted into a sealed plastic or aluminium box. The measuring ranges can be modified using a notebook computer.

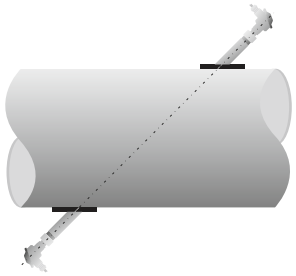
METER SPECIFICATIONS

nominal diameter / size of piping	DN200 to DN1200 / 8" to 48"
angle of measuring beam	45° for DN200 to DN800 60° over DN800 to DN1200
measurement accuracy, SE804x.x	± 2% for velocity of measured liquid v > 0.5m/s
measurement accuracy, SE806x.x	± 1% for velocity of measured liquid v > 0.5m/s
nominal pressure [bar / psi]	16, 40 / 150, 600
temperature of measured liquid	0°C to 150°C (32° to 302°F)
ambient temperature	5°C to 55°C (41° to 131° F)
display unit	alpha-numerical LCD unit, two lines of 16 characters each
power supply	100 to 250 V AC, 50 to 60 Hz
protection class (electronic unit) protection class (probes)	IP 65 IP 54
ultrasonic probes SE804x	2 pcs US 2.x - manufactured by ELIS PLZEŇ a. s.
ultrasonic probes SE806x	4 pcs US 2.x - manufactured by ELIS PLZEŇ a. s.
probe fitting	directly into piping
probe connecting cables	standard length, 8m extended length, up to 100m
outputs (insulated)	pulse type, one pulse per 25 to 1,000 litres frequency type 0 to 1,000Hz relay type 24VAC/0.1A
optional accessories	communication line RS 485 current output 0 (4) to 20mA, insulated mass flow-rate measurement capability for measurement of water extended fluid temperature range, up to 180°C / 356°F flow-rate measurement in two directions probe protection class IP 68

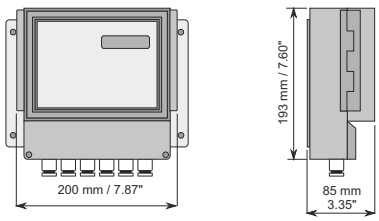
METER VERSION, CONFIGURATION AND TYPE DESIGNATION

version	PLASTIC BOX			ALUMINIUM BOX	
configuration	ECONOMIC	STANDARD	COMFORT	ECONOMIC	COMFORT
single-beam sensor	SE8041	SE8043	SE8045	SE8041.1	SE8045.1
dual-beam sensor	SE8061	SE8063	SE8065	SE8061.1	SE8065.1

ULTRASONIC PROBES US 2.x WELDED DIRECTLY INTO PIPING



ELECTRONIC UNIT - PLASTIC BOX



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ELIS PLZEŇ a.s.

HEAT/COLD METERS IN WATER
ELISTHERM ET3010.0

ELISTHERM ET3010.0

ELISTHERM ET3010.0 heat/cold meter systems are intended for measurement of absolute heat and cold energy delivered or consumed in closed heating/cooling systems.
The ELISTHERM ET3010.0 heat/cold meter measures and stores information of heat/cold quantity calculated from the water temperature measured at the pipeline's input and output by means of coupled resistance temperature sensors Pt100 (Pt500) and from the flow of heating/cooling water through electromagnetic flow meter located at the pipeline's input or output.

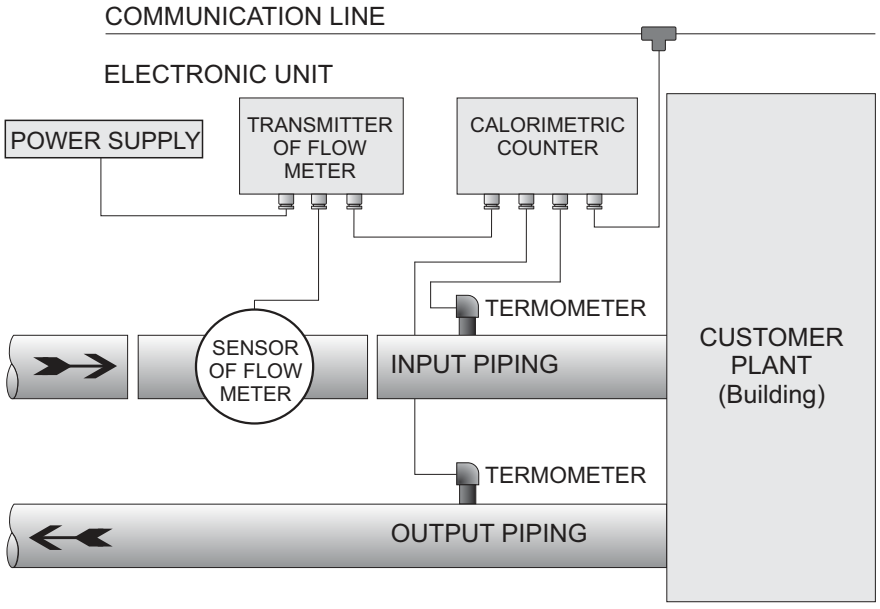
ELISTHERM ET3010.0 heat/cold meter systems are delivered in the following configuration:

- Calorimetric counter
- Couple resistance of temperature sensors Pt100 (Pt500)
- Electromagnetic flow meter FLONET FN50xx

METER SPECIFICATIONS

temperature range of flow meter	0° to 150° C (32° to 302°F)
min. temperature difference of calorimetric counter	2° (35.6° F)
nominal diameter of flow meter	DN20 to DN500 (3/4" to 20")
flow meter position	input or output piping
measurement accuracy EN 1434 (OIML R 75)	2
communication of the system	M-Bus
power supply of flow meter	230 V AC
power supply of calorimetric counter	230 V AC or battery
protection class calorimetric counter	IP54
protection class flow meter	IP65
ambient temperature	5° to 55° C (41° to 131° F)
optional accessories of calorimetric counter	com. line MODBUS pulse, radio, GSM output
optional accessories of flow meter	nominal diameter DN600 to DN1200 (24" to 48") power supply 24 V DC remote version

SCHEME OF CONNECTION OF ELISTHERM ET3010.0 HEAT/COLD METER IN HEAT/COOLING SYSTEM



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ELIS PLZEŇ a.s.

HEAT/COLD METERS IN WATER
ELISTHERM ET3020.x3

ELISTHERM ET3020.x3

ELISTHERM ET3020.x3 heat/cold meter systems are intended for measurement of absolute heat and cold energy delivered or consumed in closed heating/cooling systems. The ELISTHERM ET3020.x3 heat/cold meter measures and stores information of heat/cold quantity calculated from the water temperature measured at the pipeline's input and output by means of coupled resistance temperature sensors Pt100 (Pt500) and from the flow of heating/cooling water through ultrasonic flowmeter located at the pipeline's input or output.

ELISTHERM ET3020.x3 heat/cold meter systems are delivered in following configuration:
- Calorimetric counter
- Couple resistance of temperature sensors Pt100 (Pt500)
- Ultrasonic flow meter SONOELIS SE4041

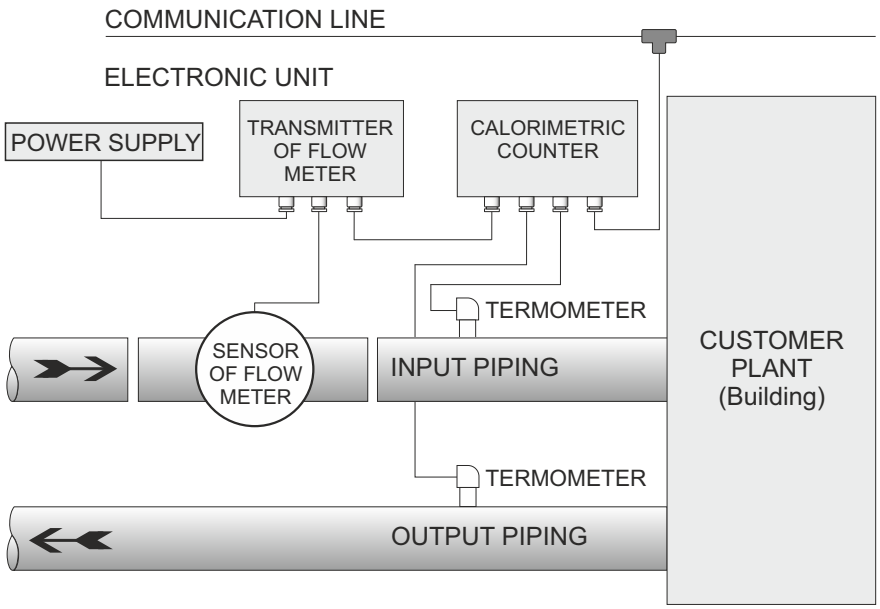
METER VERSION AND TYPE DESIGNATION

Type of system	ET 3020.03
Type of flowmeter	SONOELIS SE4041
Design of flow meter transmiter	Plastic box

METER SPECIFICATIONS

temperature range of flow meter	0° to 150° C (32° to 302°F)
min. temperature difference of calorimetric counter	2° (35.6° F)
nominal diameter of flow meter	DN32 to DN300 (1 1/4" to 12")
flow meter position	input or output piping
measurement accuracy EN 1434 (OIML R 75)	2
communication of the system	M-Bus
power supply of flow meter	230 V AC
power supply of calorimetric counter	230 V AC or battery
protection class calorimetric counter	IP54
protection class flow meter	IP65
ambient temperature	5° to 55° C (41° to 131° F)
optional accessories of calorimetric counter	com. line MODBUS pulse, radio, GSM output
optional accessories of flow meter	temperature of water 180° C (356° F) protection of flow meter IP68

ELISTHERM ET3020.x3 heat/cold meter systems



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HEAT/COLD METERS IN WATER
ELISTHERM ET3020.x7

ELISTHERM ET3020.x7

ELISTHERM ET3020.x7 heat/cold meter systems are intended for measurement of absolute heat and cold energy delivered or consumed in closed heating/cooling systems.
The ELISTHERM ET3020.x7 heat/cold meter measures and stores information of heat/cold quantity calculated from the water temperature measured at the pipeline's input and output by means of coupled resistance temperature sensors Pt100 (Pt500) and from the flow of heating/cooling water through ultrasonic flowmeter located at the pipeline's input or output.

ELISTHERM ET3020.07 heat/cold meter systems are delivered in following configuration:
- Calorimetric counter
- Couple resistance of temperature sensors Pt100 (Pt500)
- Ultrasonic flow meter SONOELIS SE4011

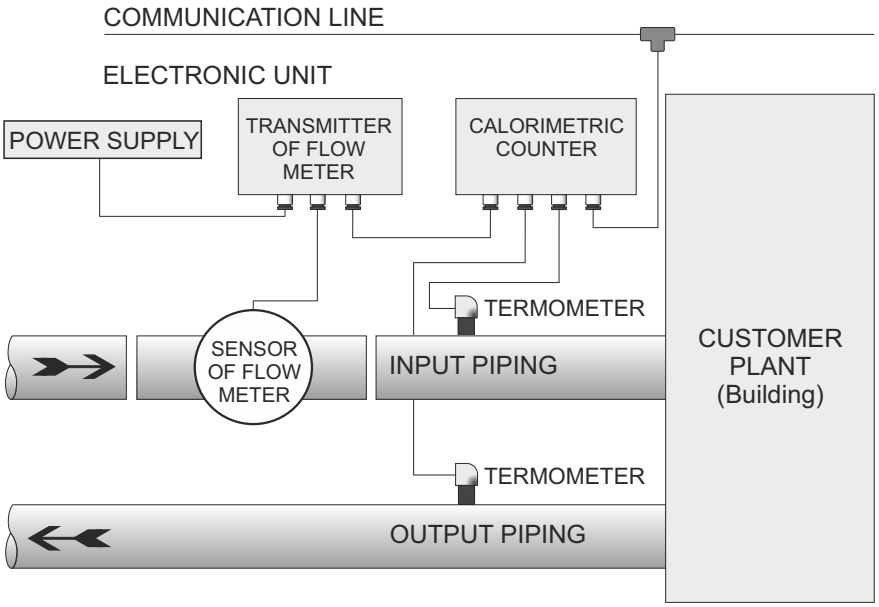
METER VERSION AND TYPE DISGNATION

Type of system	ET 3020.07
Type of flowmeter	SONOELIS SE4011
Design of flow meter transmiter	Plastic box

METER SPECIFICATIONS

temperature range of flow meter	0° to 150° C (32° to 302°F)
min. temperature difference of calorimetric counter	2° (35.6° F)
nominal diameter of flow meter	DN200 to DN1200 (8" to 48")
flow meter position	input or output piping
measurement accuracy EN 1434 (OIML R 75)	2
communication of the system	M-Bus
power supply of flow meter	230 V AC
power supply of calorimetric counter	230 V AC or battery
protection class calorimetric counter	IP54
protection class flow meter	IP54
ambient temperature	5° to 55° C (41° to 131° F)
optional accessories of calorimetric counter	com. line MODBUS pulse, radio, GSM output
optional accessories of flow meter	temperature of water 180° C (356° F) protection of flow meter IP68

ELISTHERM ET3020.x7 heat/cold meter systems



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