ULTRAFLOW® 85

Ultrasonic volume measuring device
qp150 – 1.000 m³/h

Your benefits

- Durable, wear-free ultrasonic volume measuring unit:
  High measuring stability and operational reliability
- Compact design:
  Little installation space required on site
- High resolution of the pulse value:
  Precise instantaneous values
- CH refrigeration approval (METAS) incl. initial calibration:
  Approved for use in clearing traffic

Applications

- Especially suitable for district heating/cooling applications (main meters, transfer stations, etc.) in billing traffic
- Heating and/or cooling consumption measurement in the building services sector
- MID-approved bidirectional flow measurement

Properties

- Nominal flow rate: qp150 - qp1000 m³/h
- Nominal diameter: DN150 to DN300
- Low pressure loss
- Built-in display
- Medium temperature: 2 to 130 °C
- Type testing/approval:
  - Heat: Conformity in accordance with the European Measuring Instruments Directive (MID B+D)
  - Cooling: CH approval (METAS) incl. initial calibration

Options

- Pulse transmitter with its own power supply for cable lengths >10 m

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Technical support:
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Compliance

Type approval

ULTRAFLOW® 85 is approved as a heat meter in accordance with MID 2014/32/EU:	
EU-Type Examination certificate	DK-0200-MI004-048
MID-certified according to Module D	DK-0200-MID-D-001

ULTRAFLOW® 85 is approved as a cooling meter in accordance with DK-BEK 1178 – 06/11/2014:	
System designation	TS 27.02 019
Verification	DANAK accreditation 268

Standards and documents	
EN	EN 1434:2022
OIML	OIML R75:2002
WELMEC	WELMEC 7.2:2023 (May 2024)

CE-marking	
ULTRAFLOW® 85 is marked in accordance with	
EMC-directive	2014/30/EU
LV-directive	2014/35/EU (together with Pulse Transmitter or Pulse Divider)
PE-directive	2014/68/EU (category I or II)

Approved meter data	
MID designation:	
Mechanical environment	M1 (vibrations and shocks of low significance) M2 (significant or high levels of vibrations and shocks)
Electromagnetic environment	E1 (residential, commercial and light industrial buildings) E2 (other industrial buildings
Electromagnetic environment	5...55 °C, condensing, closed location (indoors installation)
Accuracy class	2 and 3
EN 1434 designation:	
Environmental class	C (high electrical and electromagnetic conditions)
Fast response meter	Volume sampling interval (sub-assembly flow sensor) depends on connected calculator. Down to 0.5 s with MULTICAL® 603-S/603-U/803-A. Requires mains supply. Otherwise 1 s.

Technical Data

Electrical data	
Internal supply voltage Battery:	**3.6 VDC ± 0.1 VDC**
- Display backlight	OFF
- (MULTICAL® or Pulse Transmitter/Pulse Divider)	3.65 VDC, D-cell lithium
Battery lifetime:	**(replacement interval)**
- ULTRAFLOW® 85 and MULTICAL® serial mode pulse mode	 Up to 16 years @ tBAT <30 °C Up to 13 years @ tBAT <30 °C
- Pulse Transmitter/Pulse Divider	6 years @ tBAT <30 °C (Y=3)
Mains supply:	
- Display backlight	ON
- MULTICAL® or	230 VAC +15/-30 %, 50 Hz or 60 Hz
- Pulse Transmitter/Pulse Divider	24 VAC ± 50 %, 50 Hz or 60 Hz
Backup supply	**Integral capacitor eliminates operational disturbances due to short-term power cuts**
Cable length:	
- Flow sensor	Max 10 m
- Pulse Transmitter/Pulse Divider	Depends on calculator – max 100 m when connected to MULTICAL® (Y=2)
- Cable Extender Box	Depends on calculator – max 30 m when connected to MULTICAL® (does not provide galvanic separation, but supports measurement of forward and reverse flow as well as extended info codes)
Electromagnetic environment	**Fulfils EN 1434 class C, MID E1 and E2**
Pulse output:	**Galvanically connected (ULTRAFLOW®)**
- Typ	Push-Pull
- Output impedance	10 kW
- Pulse duration	2...6 ms
- Pause time	Depending on current pulse frequency

Mechanical data	
Accuracy class	2 and 3
Electromagnetic environment	Fulfils EN 1434 class C, MID E1 and E2
Mechanical environment	MID M1 and M2
Ambient conditions	5...55 °C, closed location (installation indoors)
Protection class:	
- Flow sensor - Cable extender box - Pulse Transmitter/Pulse Divider	IP68 IP68 IP67
Medium in flow sensor	Water – recommended water quality as in CEN TR 16911 and AGFW FW510
Medium temperature [1]	2...150 °C or narrower range
Pressure stage	PN16, PS16 (DN300) PN25, PS25 or PN16, PS16 (DN150-250); see marking
Straight inlet requirement	0D (according to EN 1434:2022 and OIML R75:2002)
Installation angle	Horizontally, vertically and at an angle

1] At medium temperature above 120 °C ULTRAFLOW® 85 must be insulated!
Do not cover the hole of the extension tube, when insulating ULTRAFLOW® 85!

Flow data

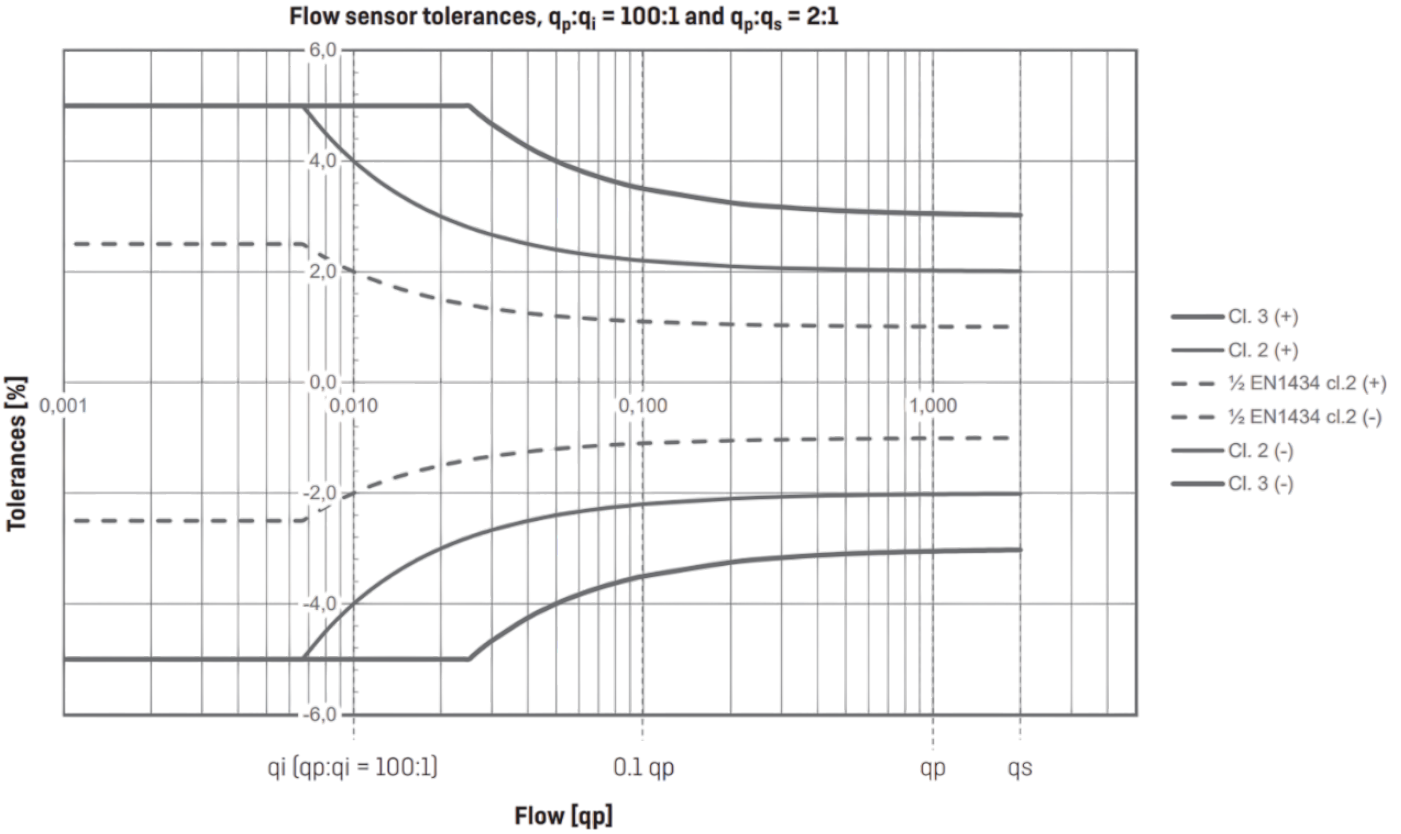
Flow Data						
Nom. flow qp	[m^3/h]	150	250	400	600	1000
Meter factor [1]	[p/l]	1	0.6	0.4	0.25	0.15
Dynamic range	qp:qi	100:1				
qs:qp		2:1				
Flow@125 Hz [2]	[m^3/h]	450	750	1125	1800	3000
Min. cut off	[l/h]	750	1250	2000	3000	5000

1] The meter factor appears from the type label.
2] Saturation flow 125 Hz. Max. pulse frequency is maintained at higher flow.

Measurement accuracy

Measurement accuracy	
Class 3	Ef = ±(3 + 0.05 qp/q), but not above ±5 %
Class 2	Ef = ±(2 + 0.02 qp/q), but not above ±5 %
Typical [1)]	Ef = ±(1 + 0.01 qp/q)

1) Documented with DANAK-accredited certificate at flow qi, 0.1 qp and qp.



Materials

Wetted parts	
Housing	Stainless steel, W.no. 1.4308
Flanges	Stainless steel, W.no. 1.4301
Transducer	Titanium
Gaskets	Fibre

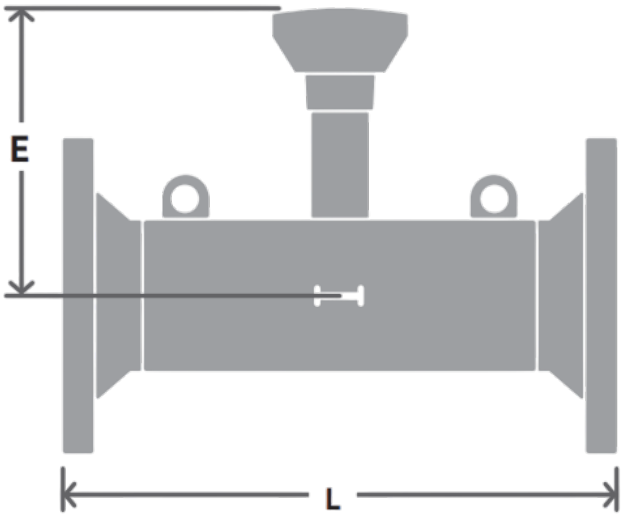
Electronics box	
Extension tube	Thermoplastic, 40 % glass-reinforced Polyphenylenesulfide (PPS)
Base part	Thermoplastic, 10 % glass-reinforced polycarbonate (PC)
Transparent lid	Thermoplastic, Polycarbonate (PC)
Top cover	Thermoplastic, 10 % glass-reinforced polycarbonate (PC)
Calculator mount bracket	Thermoplastic, 10 % glass-reinforced polycarbonate (PC)
Signal cable (optional)	Silicone cable (3 x 0.5 mm²)
Power supply cable 24/230 VAC (optional for Pulse Transmitter/Pulse Divider)	Cable with PVC mantle (2 x 0.75 mm²)

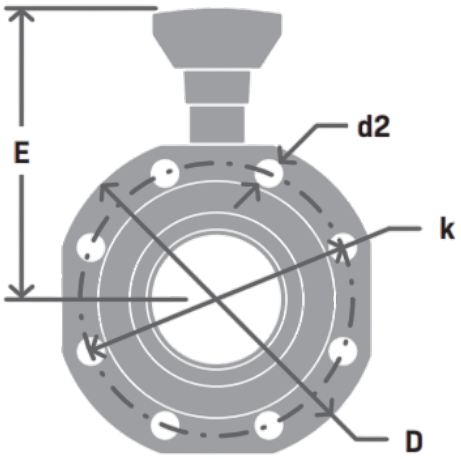
Housing, Cable Extender Box	
Base, cover	Thermoplastic, acrylonitrile butadiene styrene (ABS)

Housing, Pulse Transmitter/Pulse Divider	
Base, cover	Thermoplastic, 10 % glass-reinforced polycarbonate (PC)

Dimensional sketches Ultraflow 85

Flange facing type B, raised face according to EN 1092-1



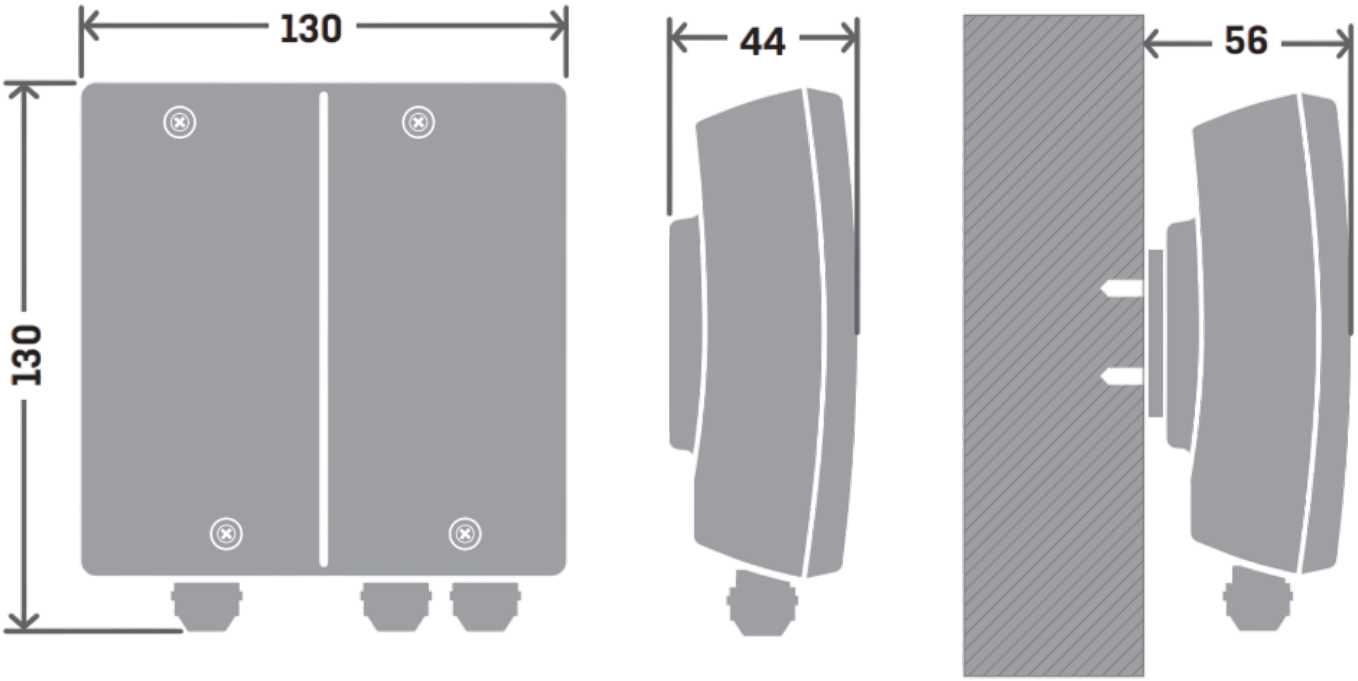


Ultraflow 85 PN16									
Nom. Flow qp	**[m³/h]**	**150**	**250**	**250**	**400**	**400**	**600**	**600**	**1000**
Nom. Diameter	**[mm]**	**DN150**	**DN150**	**DN200**	**DN200**	**DN250**	**DN250**	**DN300**	**DN300**
PN, PS	**[bar]**	**16**							
L	[mm]	500				600		500	
D	[mm]	285		340		405		460	
k	[mm]	240		295		355		410	
Bolts Quantity		8				12			
Bolts Thread		M20				M24			
Bolts d2	[mm]	22				26			
E	[mm]	264		281		341		370	
Approx. weight	[kg]	27		41		67		80	

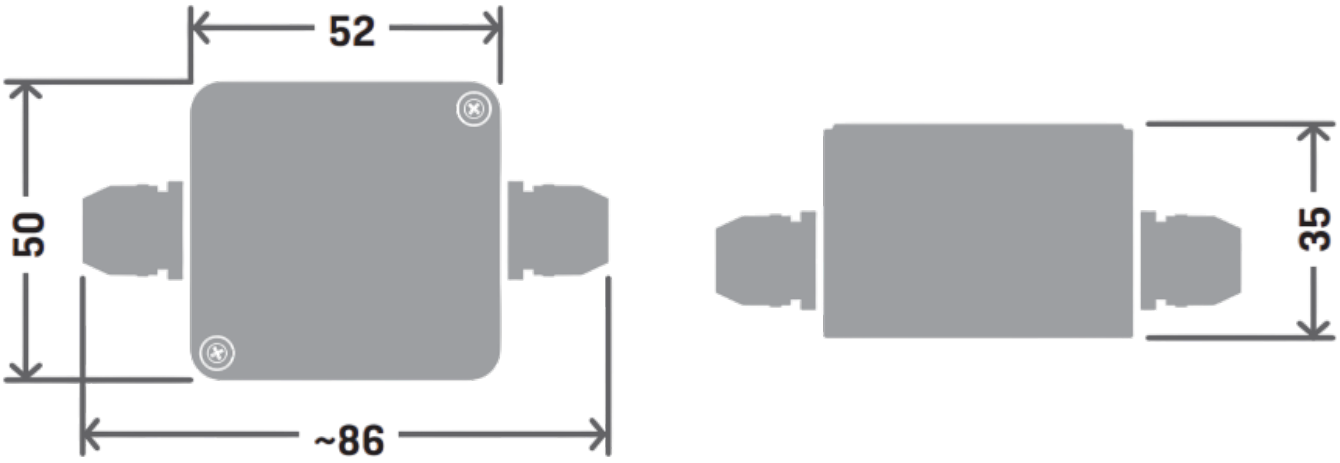
Ultraflow 85 PN25							
Nom. Flow qp	**[m³/h]**	**150**	**250**	**250**	**400**	**400**	**600**
Nom. Diameter	**[mm]**	**DN150**	**DN150**	**DN200**	**DN200**	**DN250**	**DN250**
PN, PS	**[bar]**	**25**					
L	[mm]	500				600	
D	[mm]	300		360		425	
k	[mm]	250		310		370	
Bolts Quantity		8		12			
Bolts Thread		M24				M27	
Bolts d2	[mm]	26				31	
E	[mm]	264		281		341	
Approx. weight	[kg]	33		53		83	

Dimensional sketches Boxes

Pulse Transmitter/Pulse Divider

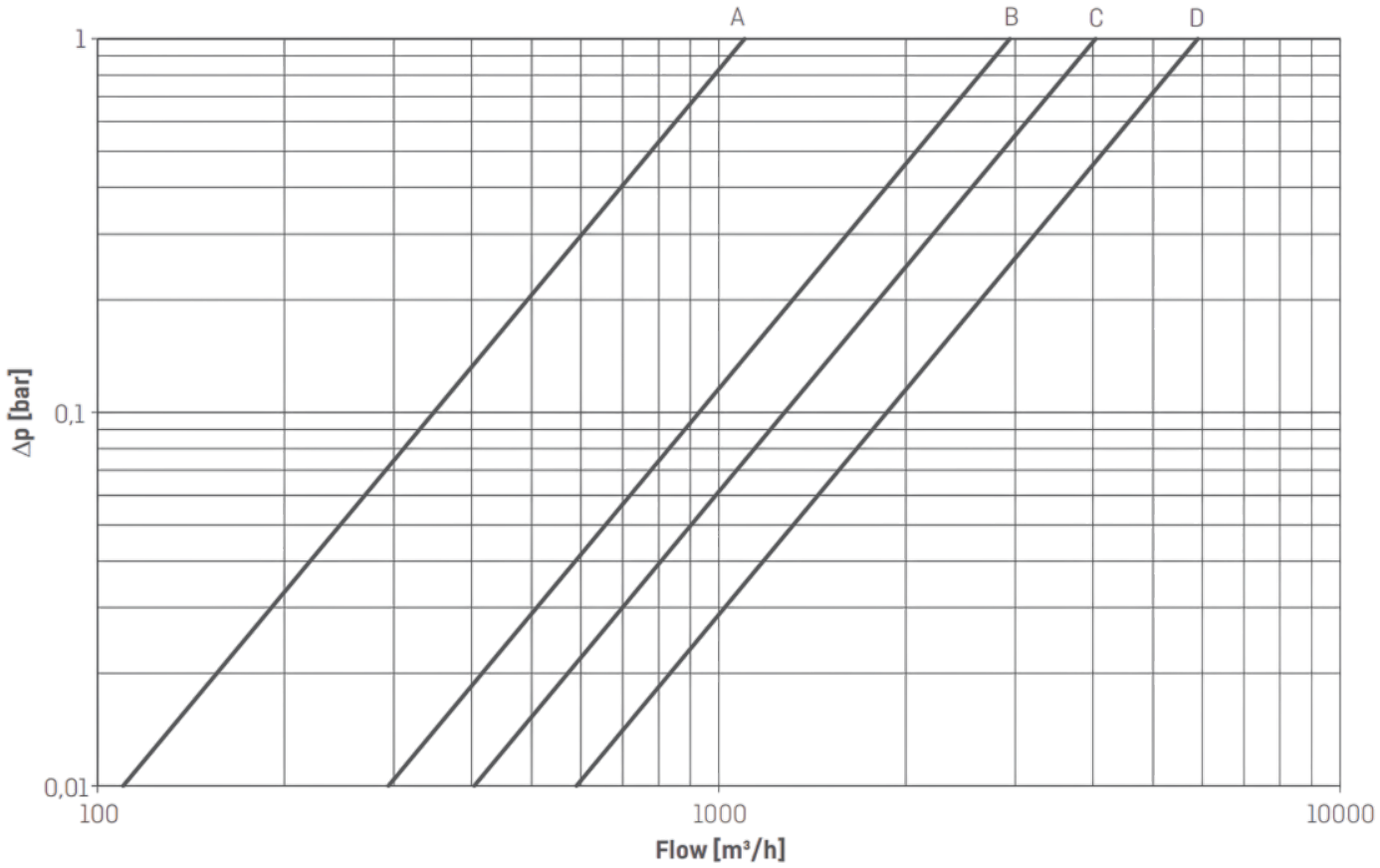


Cable Extender Box



Pressure loss

Designation	unit	A		B		C		D	
Nom. flow qp	**[m³/h]**	**150**	**250**	**250**	**400**	**400**	**600**	**600**	**1000**
Nom. diameter	**[mm]**	**DN150**		**DN200**		**DN250**		**DN300**	
Length	[mm]	500		500		600		500	
Δp@qp	[bar]	0.02	0.06	0.02	0.04	0.02	0.04	0.01	0.03
kv		1100		1945		2940		5900	
q@0.25 bar	[m³/h]	550		973		1470		2950	



Installation

Please read this chapter carefully before installing the meter

In case of incorrect mounting, Manufacturer's guarantee obligations no longer apply. By connecting to 230 V supply, there is a risk of electric shock. When working on the flow sensor in the installation, there is a risk of outflow of (hot) water under pressure. At a media temperature higher than 60 °C, the flow sensor should be shielded from unintended contact. Prior to installation of the flow sensor, the system should be flushed. Correct flow sensor position (inlet or outlet) appears from the front label of MULTICAL®. The forward flow direction is indicated by an arrow on the flow sensor.

ULTRAFLOW® 85 may be lifted in the lifting rings only.

Pressure stage: PN16, PS16 or PN25, PS25. See marking on flange or label
Temperature of medium: 2...150 °C or narrower range. See marking on label.
Mechanical environment: M1 and M2 (fixed installation with minimum vibration and fixed installation with considerable or high vibration level respectively).
Electromagnetic environment: E1 and E2 (housing/light industry and industry respectively). The meter's signal cables must be drawn at min. 25 cm distance to other installations.
Ambient conditions: The ambient temperature must be within 5...55 °C. Installation must be in closed locations (indoors).
Protection class: IP68 – The flow sensor is durable, even in permanently wet conditions.
Insulation: ULTRAFLOW® 85 can be insulated. At medium temperature above 120 °C ULTRAFLOW® 85 must be insulated.
Maintenance and repair: The flow sensor is verified separately and can, therefore, be separated from the calculator. It is permitted to replace the transparent lid and the 3-wire cable from ULTRAFLOW® 85 on-site. Other repairs must be performed in a workshop and requires subsequent reverification in an accredited laboratory.

Heat installations	the tower can point in any direction.	
Cooling installations	the tower must always point upwards to avoid risking condensation damaging the electronics.	

Straight inlet ULTRAFLOW® 85

ULTRAFLOW® 85 requires neither straight inlet nor outlet in order to fulfil the Measuring Instruments Directive (MID) 2014/32/EU and EN 1434. Only in case of heavy flow disturbances before the meter will a straight inlet section be necessary. We recommend following the guidelines in CEN TR 13582.

Operating pressure

To minimise the risk of measuring errors as a result of cavitation or air in the water, it is recommended to keep a sufficient static pressure at the flow sensor outlet of min. 1.5 bar at qp and min. 2.5 bar at qs . This applies to temperatures up to approx. 80 °C.

Electrical connection

Connecting via Pulse Transmitter/Pulse Divider/Cable Extender Box

ULTRAFLOW® 85	→	Pulse Transmitter/Pulse Divider/ Cable Extender Box		→	MULTICAL®
		Input	Output		
Blue (GND)	→	11	11A/11	→	11
Red (supply)	→	9	9A/9	→	9
Yellow (signal)	→	10	10A/10	→	10

Pulse Transmitter/Pulse Divider provides galvanic separation, but does not support extended info codes and bi-directional flow measurement.

Cable Extender Box does not provide galvanic separation, but supports extended info codes and does not prohibit bi-directional flow measurement.

If long signal cables are used, please consider the installation carefully. There must be **at least 25 cm** between the signal cable and all other cables due to EMC.

ULTRAFLOW® 85 is preferentially mains supplied e.g. via MULTICAL® 603-S/-U to achieve e.g. the highest volume sampling frequency

In case of battery supply the battery lifetime depends on many parameters like e.g. data communication, integration mode and environmental temperature. For further information, see the technical documentation of the connected MULTICAL® calculator

ULTRAFLOW® 85	→	MULTICAL®	Designation	Color
11	→	11	GND	(Blue)
9	→	9	+3.6V	(Red)
10	→	10	Signal	(Yellow)