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Range of Ultrasonic Flowmeters

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Working Principle

The Transit Time Flowmeter utilises two sensors that function as both, ultrasonic transmitters and receivers. The sensors are clamped on the outside of a closed pipe or inserted in the pipeline by using an isolating ball valve assembly at a specific distance from each other. Transit Time Flowmeters measure the time it takes for an ultrasonic signal transmitted from one sensor to cross a pipe and be received by a second sensor. Upstream and downstream time measurements are compared. With no flow, the transit time would be equal in both directions.

With flow, sound will travel faster in the direction of the flow and slower against the flow. The liquid velocity (V) inside the pipe can be related to the difference in time of flight (△t) through the following equation:

$$V = K \times D \times \Delta t$$

where **V** : Liquid velocity
K : Constant
D : Distance between the two sensors
Δt : Difference in time of flight

UFM 6710

UFM 6720

UFM 6730

Ultrasonic Flowmeter Series 6700

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Technical Specifications: UFM 6710 & UFM 6720

Parameters		UFM 6710	UFM 6720
		Transmitter	
Power supply		24 V DC ± 20% 110 V AC ± 15% 240 V AC ± 15% Solar powered	3 AAA NiMH built-in battery (12 hours of operation) & 100-240 V AC for the charger
Velocity		±12 m/sec. Bidirectional	±12 m/sec. Bidirectional
Display		2 lines, 16 characters, LCD with backlight, flow rate, velocity, totaliser	4 lines, 16 characters, LCD with backlight, flow rate, velocity, totaliser
Units		User configurable English/Metric	User configurable English/Metric
Totaliser		FWD, NET, REV, BATCH (Gallons, ft^3, barrels, lbs, m^3)	FWD, NET, REV, BATCH (Gallons, ft^3, barrels, lbs, m^3)
Output		4 - 20 mA DC Std.*	RS 232 Std.*
Accuracy		±1% of reading @ rate > 0.5 m/sec. (Optional ±0.5% of reading)	±1% of reading @ rate > 0.5 m/sec. (Optional ±0.5% of reading)
Repeatability		0.2% of Span	0.2% of Span
Protection class		IP 65, IP 67	IP 54
Dimensions		251x190x96 mm	204x90x30 mm
Weight		< 2.5 kg	< 0.5 kg
Security		Keypad lockout, access code enabled	Keypad lockout, access code enabled
		Sensor	
Suited temp. - Std.		-40°C to 120°C	-40°C to 120°C
Suited temp. - High		-40°C to 250°C	-40°C to 250°C
Pipe size	S Sensor	15 - 80 mm	15 - 80 mm
	M Sensor	50 - 700 mm	50 - 700 mm
	L Sensor	400 - 4570 mm	400 - 4570 mm
Dimensions	S Sensor	45x30x30 mm	45x30x30 mm
	M Sensor	60x45x45 mm	60x45x45 mm
	L Sensor	80x70x55 mm	80x70x55 mm
Weight	S Sensor	< 0.3 kg	< 0.3 kg
	M Sensor	< 0.5 kg	< 0.5 kg
	L Sensor	< 1.0 kg	< 1.0 kg
Protection class		IP 65, IP 67, IP 68	IP 65, IP 67, IP 68
Cable length		6 m std. can be extended up to 300 m	6 m std. can be extended up to 25 m
Flexible belts		SS belt according to pipe size	SS belt according to pipe size
Portable case		NA	Size - 463x383x103 mm

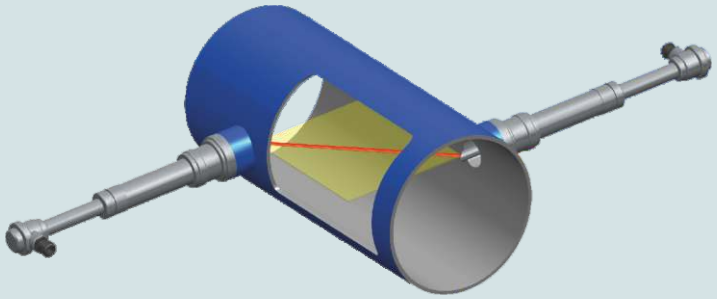
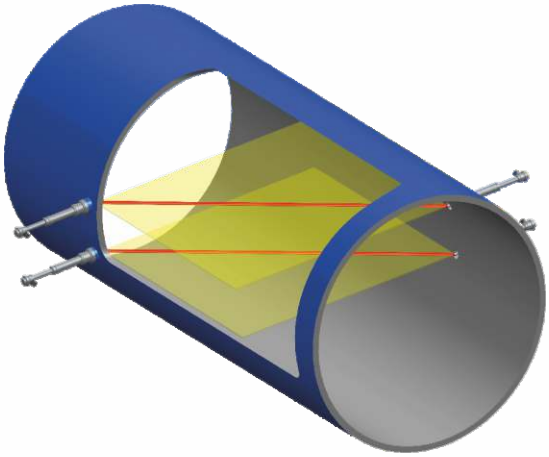
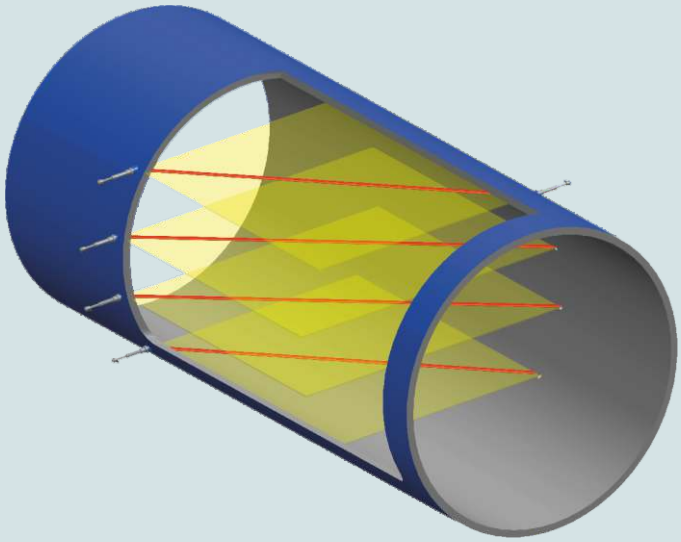
* Please refer to order code for options.

Ultrasonic Flowmeter 6730

Technical Specifications: UFM 6730

Parameters	Single Path	Two Path	Four Path
General			
No. of Sensors	2	4	8
Operating principle	Transit time technology	Transit time technology	Transit time technology
Operating pressure	20 kg/cm^2 max	20 kg/cm^2 max	20 kg/cm^2 max
Application	Raw, clear, sewage water & homogeneous liquids	Raw, clear, sewage water & homogeneous liquids	Raw, clear, sewage water & homogeneous liquids
Transmitter			
Power supply	24 V DC ± 20% 110 V AC ± 15% 240 V AC ± 15% Solar powered	24 V DC ± 20% 110 V AC ± 15% 240 V AC ± 15% Solar powered	24 V DC ± 20% 110 V AC ± 15% 240 V AC ± 15% Solar powered
Velocity	±12 m/sec. Bidirectional	±12 m/sec. Bidirectional	±12 m/sec. Bidirectional
Display	2 lines, 16 characters LCD with backlight flow rate, velocity, totaliser	2 lines, 16 characters LCD with backlight flow rate, velocity, totaliser	2 lines, 16 characters LCD with backlight flow rate, velocity, totaliser
Units	User configurable English/Metric	User configurable English/Metric	User configurable English/Metric
Totaliser	FWD, NET, REV	FWD, NET, REV	FWD, NET, REV
Output - Analog	4 - 20 mA Std.*	4 - 20 mA Std.*	4 - 20 mA Std.*
Accuracy	±1% of reading @ rate >0.5 m/sec.	±0.5% of reading @ rate >0.5 m/sec.	±0.5% of reading @ rate >0.5 m/sec.
Repeatability	0.2% of Span	0.2% of Span	0.2% of Span
Protection class	IP 65, IP 67	IP 65, IP 67	IP 65, IP 67
Dimensions	251X190X96 mm	500x400x300 mm	500x400x300 mm
Weight	< 2.5 kg	< 4.5 kg	< 6.5 kg
Security	Keypad lockout, access code enabled	Keypad lockout, access code enabled	Keypad lockout, access code enabled
Self diagnostic feature	Available	Available	Available
Facility to measure and display each path velocity	NA	Available	Available
Ability to work even though one or more path does not work	NA	Available	Available
Flow and totaliser unit programmability	Available	Available	Provided
Password protection for configuration data	Available	Available	Available
Totaliser value retention in the event of power fail condition	Available	Available	Available
RS 485 Modbus RTU Protocol	Available	Available	Available
Lightening protection units	Available	Available	Available
Sensor			
Suited temp. - Std.	-40°C to 120°C	-40°C to 120°C	-40°C to 120°C
Pipe size	50 - 6000 mm dia	350 - 6000 mm dia	1000 - 6000 mm dia
Protection class	IP 65, IP 67, IP 68	IP 65, IP 67, IP 68	IP 65, IP 67, IP 68
Sensor dimensions	186 mm with 20 mm bore size	186 mm with 20 mm bore size	186 mm with 20 mm bore size
Weight	< 1.5 kg	< 1.5 kg	< 1.5 kg
Cable length	6 m std. can be extended up to 300 m	6 m std. can be extended up to 300 m	6 m std. can be extended up to 300 m

* Please refer to order code for options.

Single Path	
Two Path	
Four Path	

Ordering Code : UFM 6710-6730

Model Code
U1 - UFM 6710
U3 - UFM 6730

No. of Path
T1 - Single Path
T2 - Two Path
T3 - Four Path

Power Supply
P1 - 24 V DC
P2 - 110 V AC
P3 - 240 V AC
P4 - Solar Powered

Sensor	
UFM 6710	
S	- Small (15 - 80 mm)
M	- Medium (50 - 700 mm)
L	- Large (400 - 4570 mm)
HS	- High Temp. Small (15 - 80 mm)
HM	- High Temp. Medium (50 - 700 mm)
HL	- High Temp. Large (400 - 4570 mm)
SM	- Small - Medium (15 - 700 mm)
ML	- Medium - Large (50 - 4570 mm)
SL	- Small - Large (15 - 80 mm) - (400 - 4570 mm)
SML	- Small - Medium - Large (15 - 4570 mm)
HSM	- High Temp. Small - Medium (15 - 700 mm)
HML	- High Temp. Medium - Large (50 - 4570 mm)
HSL	- High Temp. Small - Large (15 - 80 mm) - (400 - 4570 mm)
HSML	- High Temp. Small - Medium - Large (15 - 4570 mm)
UFM 6730	
R	- Regular Pipelines
E	- Extended Sensors

Cable Length
C1 - 6 meter
C2 - 10 meter
C3 - 15 meter
C4 - 20 meter
C5 - 25 meter
C6 - 30 meter
C7 - 50 meter

Protection Class for Sensors
A - IP 65
B - IP 67
C - IP 68

Communication Interface
G1 - Not Required
G2 - HART + RS 485 (Modbus RTU)
G3 - RS 485 (Modbus RTU)
G4 - HART
G5 - GPRS

Output
OP1 - 4 - 20 mA DC
OP2 - Pulse Output
OP3 - Relay
OP4 - 4 - 20 mA DC + Pulse
OP5 - 4 - 20 mA DC + Relay
OP6 - 4 - 20 mA + Relay 2 nos.

Ordering Code: UFM 6720

Model Code
U2 - UFM 6720

Power Supply
P1 - 3 AAA NiMH Built-In Battery with 100 - 240 V AC Charger

Sensor	
S	- Small (15 - 80 mm)
M	- Medium (50 - 700 mm)
L	- Large (400 - 4570 mm)
HS	- High Temp. Small (15 - 80 mm)
HM	- High Temp. Medium (50 - 700 mm)
HL	- High Temp. Large (400 - 4570 mm)
SM	- Small - Medium (15 - 700 mm)
ML	- Medium - Large (50 - 4570 mm)
SL	- Small - Large (15 - 80 mm) - (400 - 4570 mm)
SML	- Small - Medium - Large (15 - 4570 mm)
HSM	- High Temp. Small - Medium (15 - 700 mm)
HML	- High Temp. Medium - Large (50 - 4570 mm)
HSL	- High Temp. Small - Large (15 - 80 mm) - (400 - 4570 mm)
HSML	- High Temp. Small - Medium - Large (15 - 4570 mm)

Protection Class for Sensors
A - IP 65
B - IP 67
C - IP 68

Output
OP1 - RS 232

UFM 6740
Ultrasonic Water Meter

A Yokogawa Company

This is a battery-powered, Transit Time Flowmeter utilising advanced digital processing technology. The meter contains no moving parts and does not require external power. It also has advantages such as ultra-low power consumption, high accuracy and reliability. The meter is designed for easy installation. It has the same conduit length as industrial mechanical water meter, but can be used just as conveniently as a mechanical water meter.

UFM 6740

Benefits

- Long-term stability and accuracy over a wide range of conditions
- High reliability and minimum maintenance requirement
- Maintenance-free meter where no external power sources are available
- Communication port permits transfer of data from remote stations to central system via, GPRS Modem, LoRaWAN
- Self-adjusting sensor receiving circuit continually adapts to changing pipe diameters due to scaling or corrosion
- Fast response to flow transits
- Available with AMR function
- Battery life - 5 years (10 year optional)
- Unique housing design rated to IP 68
- On-board self diagnostic function and fault indicator
- Optional feature to integrate Pressure Transmitter

Technical Specifications: UFM 6740

Parameters	Specifications
Technical characteristics	Low power consumption, digital process technology with stable piezoelectric sensor
Accuracy	±1% of reading
Repeatability	0.2% of Span
Display	Total flow, flow rate, velocity, working time & date, signal intensity, quality & battery status
Output	4 - 20 mA DC, RS 485 (Modbus RTU), Pulse for total flow (All outputs need external power supply 24 V DC)
Communication interface	GPRS, NB-IoT and LoRaWAN
Operation	Inside keypad available
Sampling period	1 sec.
Environment temp.	Up to 65^{0}C
Water temp.	5 to 70^{0}C
Power supply	Li-ion battery, solar powered
Enclosure class	IP 68
Pipe size	DN 50 - 600
Flange standard	ANSI, IS, DIN PN, BS
Pressure transmitter	Range 0-16 kg/cm^{2}, IP 68, 1/2" male threaded, accuracy 0.25%

Ordering Code: UFM 6740

Model Code
U4 - UFM 6740

Power Supply
P1 - Internal Li-ion Battery
P2 - Solar Powered

Line Size
0040 - DN 40
0050 - DN 50
0065 - DN 65
0080 - DN 80
0100 - DN 100
0125 - DN 125
0150 - DN 150
0200 - DN 200
0250 - DN 250
0300 - DN 300
0350 - DN 350
0400 - DN 400
0450 - DN 450
0500 - DN 500
0600 - DN 600

Data Logger
Y - Required
N - Not Required

Output
OP1 - Not Required
OP2 - 4 - 20 mA DC
OP6 - Passive Pulse

Communication Interface
G1 - Not Applicable
G5 - GPRS
G6 - LoRaWAN

Accessory
A1 - Not Required
A2 - Extended Neck Height 1000 mm
A3 - Extended Neck Height 1500 mm
A4 - Pressure Transmitter
A5 - Mating Flanges with Fasteners & Gaskets

Measuring Tube
T1 - Carbon Steel
T2 - SS 304
T3 - SS 316

Flange Material
F1 - Carbon Steel
F2 - SS 304
F3 - SS 316

Design of Measuring Sensor
S1 - Flange ANSI 150
S2 - Flange IS 1538
S3 - Flange DIN PN 10
S4 - Flange DIN PN 16
S9 - Not Applicable

Your advantages with Adept
Range. Size. Design excellence.

- Leading company in providing 'Total Solutions' for Flow Instrumentation
- Operating in the instrumentation business since 1983
- Over 70,000 Electromagnetic and Ultrasonic Flowmeters supplied to about 2500 customers
- ISO/IEC 17025:2017 accredited calibration laboratory
- ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 accreditation from TUV NORD, Germany
- Recipient of the prestigious India Design Mark
- Faster deliveries due to large in-house capacity
- Best in class, 24x7 service support
- Best specifications guarantee value for your money
- Using SAP ERP System for effectively managing operations

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