



- ❧ **ELECTROMAGNETIC FLOWMETERS**
- ❧ **OPEN CHANNEL MAGNETIC FLOWMETER**
- ❧ **PARTLY FILLED PIPE MAGNETIC FLOWMETER**
- ❧ **VENTURI & PARSHALL FLUMES**
- ❧ **ULTRASONIC LEVEL MEASUREMENT**
- ❧ **ULTRASONIC OPEN CHANNEL FLOWMETERS**
- ❧ **POTABLE WATER / WASTE WATER SAMPLERS**
- ❧ **VARIABLE AREA FLOW INDICATORS (MECHANICAL)**

MAG 910

SPECIFICATION



Remote (R) version



Remote (R) version



Compact (C) version

Transmitter Specification

Mag910

Min. Media electrical conductivity	$\geq 5 \mu\text{S/cm}$ / $\geq 20 \mu\text{S/cm}$ for demineralised water
Flow range	0.1 to 10 m/s
Accuracy	0.5 % (0.5 to 10 m/s) of reading value 1 % (0.1 to 0.5 m/s) of reading value
Power supply	95 to 250 VAC 50/60 Hz (+10%, -15%) 12, 24, 48 V AC/DC
Power consumption	10 VA
Outputs	- Frequency 0 to 12 kHz with programmable flowrate and function - Pulse 0 to 50 Hz with programmable volume, function and pulse width - Relay contacts 100 V / 0.5 A with programmable function - Current 4 to 20 mA with programmable flowrate and function Max 800 Ω
Input	Digital input with programmable function
Communication	RS485, RS232
Displayed values	- Flowrate (m^3/h, l/s, US.Gal/min, user) - Volume (m^3, l, US.Gal, user) - Positive, negative, total volume and auxiliary (clearable, daily) volume
Control	RS485, RS232, Keyboard and Magnetic pointer
Low flow cut-off	Programmable value
Time delay	Programmable value
Electronics Protection	Standard IP67 / Nema 5, (IP68 / Nema 6)
Weight of electronics	3 kg
Dimensions of electronics	181 x 176 mm / 124 x 230 mm
Housing material	Cast Aluminium
Display	LCD Alphanumeric 2 line
Flow Direction	Bi-directional measurement
Other features	Test of excitation coils, status of pipe line and electronic unit
Diagnostics	Diagnostic of internal temperature and power supply voltages
Real time	Real time circuit for datalogging
Datalogger	- Datalogger memory up to 15 000 values (programmable sample rate), - Registration of min. and max. flowrate including date and time
Control principle	Pulsed DC from transmitter
Hazardous Area Approval	Zone 2 planned for 2004
Measurement Filtration	Multi-mode adjustment
Real time	Clock and calendar with back up
Cable terminals	2 pieces PG 11

Sensor Specification

Flange	Steel 1.0402 or higher
	Dimensions according to DIN 2501 (BS 4504), ANSI B16.5
Nominal size	10 .. 800 mm
Maximum nominal pressure	1,0 MPa - 2.5 Mpa (10,16,25 bar)
Max. media temperature	70°C (158°F) for Hard rubber liner 130°C (266°F) for PTFE liner in remote version
Ambient temperature	-20 to 60°C (-4 to 140°F)
Sensor Protection	Standard IP67 / Nema 5, (IP68 / Nema 6)
Liner	Hard rubber, PTFE
Electrodes	CrNi steel 1.4571, Tantalum, Hastelloy C276
Measuring tube	Stainless steel 1.4201, dimensions according to DIN 17457
Accessories options	Earthing rings for plastic and lined pipes
Hazardous Area Approval	Zone 2 (planned for 2004)
Coils	Class E
Outer Casing	Carbon steel as standard
External Coating	Lacquered finish (anticorrosive)
Conformity requirements	- LVD (safety) according to EN 61010-1, EN61010-1/A2 - PED according to directive 97/23/EC - EMC according to EN 61000 part 3-2, 3-3, EN 61000 4-3, 4-4, 4-5, 4-6, 4-8, 4-11, EN 61000 part 6-2, EN 50081-1

MAG 900

SPECIFICATION



Compact (C) version

Inductive flowmeter MAG 910/900 is an instrument designed for measuring and indicating flow and total volume of conductive liquids. The flowmeter MAG 910/900 records both positive and negative flows. As there are no moving parts in the flow profile the device can be used to measure extremely dirty liquids containing solids. The flowmeter is for use with conductive liquids only.

Range of applications. The inductive flowmeter MAG 910/900 has been designed for use in all process industries including chemical, water and wastewater.

Features. The inductive flowmeter MAG 910/900 is a highly accurate and stable device. The construction of the MAG 910/900 indicator uses components with long-term time and temperature stability. Configuration data is backed up and can be recovered after a power failure. The back-up structure enables data recovery in case of a partial loss of data (as a result of e.g. high level electrostatic discharge or noisy power supplies). The internal CPU provides all functions usually built in electronic flowmeters, incl. low flow rate correction, frequency response setting, bandwidth of sensitivity setting at low flow rates, etc.

Inputs / Outputs. Flowmeter MAG 910 is equipped with six isolated outputs and one isolated input as standard. Digital outputs (frequency, pulse and relays) and input are user configurable. Current output 4-20 mA can be used as passive or active type. RS232 and RS485 outputs are available for communication.

Transmitter Specification

Mag900

Min. Media electrical conductivity	≥ 5 µS/cm / ≥ 20 µS/cm for demineralised water
Flow range	0.1 to 10 m/s
Accuracy	0.5 % (0.5 to 10 m/s) of reading value 1 % (0.1 to 0.5 m/s) of reading value
Power supply	230 / 115 VAC (+10%, -20%), 50 / 60 Hz 12, 24, 48 V AC/DC (+10%, -15%)
Power consumption	8 VA
Outputs	- Frequency 0 to 12 kHz with programmable flowrate and function - Pulse 0 to 50 Hz with programmable volume, function and pulse width - Relay contacts 100V/0.5A with programmable function (as option) - Current 4 to 20 mA with programmable flowrate and function Max 500 Ω
Input	Not available on Mag900
Communication	RS232
Displayed values	- Flowrate (m³/h, l/s) - Volume (m³, l) - Positive, negative and total volume
Control	RS232
Low flow cut-off	Fixed value
Time delay	Fixed value
Electronics Protection	IP65 / Nema 4
Weight of electronics	2 kg
Dimensions of electronics	160 x 160 x 91 mm
Housing material	Die Cast Aluminium
Display	LCD Alphanumeric
Flow Direction	Bi-directional measurement
Other features	Not available on Mag900
Diagnostics	Not available on Mag900
Real time	Not available on Mag900
Datalogger	Not available on Mag900
Control principle	Pulsed DC from transmitter
Hazardous Area Approval	Not available on Mag900
Measurement Filtration	Multi-mode adjustment
Real time	Clock and calendar with back up
Cable terminals	3 pieces PG11

Sensor Specification

Flange	Steel 1.0402 or higher
	Dimensions according to DIN 2501 (BS 4504), ANSI B16.5
Nominal size	10 .. 800 mm
Maximum nominal pressure	1,0 MPa - 2,5 MPa (10,16,25 bar)
Max. media temperature	70°C (158°F) for Hard rubber liner 130°C (266°F) for PTFE liner in remote version
Ambient temperature	-5 to 60°C (23 to 140°F)
Sensor Protection	Standard IP65 / Nema 4, (IP67 / Nema 5)
Liner	Hard rubber, PTFE
Electrodes	CrNi steel 1.4571, Tantalum, Hastelloy C276
Measuring tube	Stainless steel 1.4201, dimensions according to DIN 17457
Accessories options	Earthing rings for plastic and lined pipes
Hazardous Area Approval	Not available on Mag900
Coils	Class E
Outer Casing	Carbon steel as standard
External Coating	Lacquered finish (anticorrosive)
Conformity requirements	- LVD (safety) according to EN 61010-1, EN61010-1/A2 - PED according to directive 97/23/EC - EMC according to EN 61000 part 3-2, 3-3, EN 61000 4-3, 4-4, 4-5, 4-6, 4-8, 4-11, EN 61000 part 6-2, EN 50081-1

CHECKMAG

SPECIFICATION



SMART 99



CHECKMAG



Sanitary fittings
DIN 11851 (S)



Wafer (W)

Transmitter Specification

CheckMag

Min. Media electrical conductivity	$\geq 5 \mu\text{S/cm}$ / $\geq 20 \mu\text{S/cm}$ for demineralised water
Flow range	0.1 to 10 m/s
Accuracy	$\pm 0.5\%$ of reading, 10 - 100 % of reading value
Power supply	110 V / 230 VAC, 50 Hz
Power consumption	20 VA
Outputs	- Frequency optocoupler standard 0-1 kHz (30 V / 20 mA A/DC) - Pulse, Total volume, programmable relay (volt free 30 V/DC $\wedge$ 125V/AC/2A) 2 or 3 Relay contacts (volt free 30 V/DC $\wedge$ 125V/AC/2A) programmable function as an option - Current 0(4) - 20 mA / 500 Ω
Input	Not available on CheckMag
Communication	RS232-C/RS485
Displayed values	- Flowrate (m^3/h, l/s) - Volume (m^3, l) - Positive, total and negative volume
Control	Four push button keypad / RS232
Low flow cut-off	Adjustable in steps of 0,1%
Time delay	Programmable value
Electronics Protection	IP 65 / Nema 4
Weight of electronics	2 kg
Dimensions of electronics	190 x 140 x 115 mm
Housing material	ABS plastic
Display	LCD alphanumeric display, 2x16 digits, illuminated
Flow direction	Bi-directional measurement
Other features	Automatic zero
Real time	Clock and calendar inc. Leap years until 2099 with back-up
Data logger	Datalogger memory up to 35 000 values (4 months divided into 5-min intervals) with real time circuit.
Control Principle	Pulsed DC from transmitter
Hazardous Area Approval	Zone 2 approved
Measurement filtration	Multi-mode adjustment
Cable terminals	Max. 3 pieces PG 11
Data storage	Total volume storage even in case of power failure
Data back-up	Data back-up in case of power failure
Error	Measuring / Error indicator

Sensor Specification

Flange	DIN (ANSI, BS) / hygienic DIN 11 851
Nominal size	DN 10 - DN 1000
Maximum nominal pressure	Standard 16 bar (1.6MPa), (0.6/1.0/2.5/4.0 MPa)
Max. media temperature	Hard + soft rubber -5°C - +90°C / Teflon PTFE -25°C - 150°C
Ambient temperature	-20 to +60°C (-4 to + 140 F)
Sensor Protection	Standard IP 67 / Nema 5 (IP 68 / Nema 6)
Liner	Soft + hard rubber (DN 10 - DN 1000) / Teflon PTFE (DN 10 - DN 500)
Electrodes	Stainless steel 316Ti,L (Tantalum, Hastelloy, Titanium, Platinum)
Measuring tube	Stainless steel 321 to DIN 17457
Accessories options	Earthing rings for plastic and lined pipes
Hazardous area approval	Sensor for explosive area Zone 2
Class of excitation coils isolation	E
Outer casing and flanges	Carbon steel standard (Stainless steel 304, 321)
Interconnecting cable	Remote version - standard 8mm / 2 x 2 x 0,25 mm ²
External coating	Powder coated (komaxit - anticorrosive)
Conformity requirements	- LVD (safety) according to EN 61010-1, EN61010-1/A2 - PED according to directive 97/23/EC - EMC according to EN 61000 part 3-2, 3-3, EN 61000 4-3, 4-4, 4-5, 4-6, 4-8, 4-11, EN 61000 part 6-2, EN 50081-1



Compact version (C)



Remote version (R)



Standard sensor



Sanitary fittings
DIN 11851 (S)



Wafer (W)

Transmitter Specification

i-Mag

Min. Media electrical conductivity	$\geq 5 \mu\text{S/cm}$ / $\geq 20 \mu\text{S/cm}$ for demineralised water
Flow range	0.1 to 10 m/s
Accuracy	$\pm 0.5\%$ of reading, 10-100 % of reading value
Power supply	90-250 V / 50-60 Hz, 24 VDC < 0,5 A
Power consumption	10 VA
Outputs	• Frequency optocoupler standard 0-1 kHz / maximum 0-10 kHz (30 V / 20 mA/DC) • Pulse, Total volume, programmable relay (volt free 30 V/DC $\wedge$ 125 V/AC / 2A) • 2 or 3 Relay contacts (volt free 30 V/DC $\wedge$ 125 V/AC / 2A) programmable function as an option • Current 0(4) - 20 mA / 500 Ω
Input	Digital input with programmable function
Communication	RS 232 C - PC / RS 485
Displayed values	• Flowrate (m³/h, l/s, US.Gal/min) • Volume (m³, l, US.Gal) • Positive, total and negative volume
Control	Infra red touch control / data / RS232
Low flow cut-off	Adjustable in steps of 0,1%
Time delay	Programmable value
Electronics Protection	IP 67 / Nema 5
Weight of electronics	3,5kg
Dimensions of electronics	135 x 170 x 192 mm
Housing material	Cast AlSi10Mg/EN AC-47 100
Display	Graphic display 132x64 pixels
Flow direction	Bi-directional measurement
Other features	Automatic zero
Real time	Available with datalogger (during 2004)
Data logger	Planned for 2004
Control Principle	Pulsed DC from transmitter
Hazardous Area Approval	Zone 2 planned for 2005
Measurement filtration	Multi-mode adjustment
Cable terminals	Max. 5 pieces PG 11
Data storage	Planned for 2004
Data back-up	Planned for 2004
Error	Available 2004

Sensor Specification

Flange	DIN (ANSI, BS) / hygienic DIN 11 851
Nominal size	DN 10 - DN 1000
Maximum nominal pressure	16 bar (1.6 MPa), (0.6/1.0/2.5/4.0 MPa)
Max. media temperature	Hard + soft rubber -5 °C - +90 °C / Teflon PTFE -25 °C - 150 °C
Ambient temperature	-20 to +60 °C (-4 to + 140 F)
Sensor Protection	Standard IP 67 / Nema 5 (IP 68 / Nema 6)
Liner	Soft + hard rubber (DN 10 - DN 1000) / Teflon PTFE (DN 10 - DN 500)
Electrodes	Stainless steel 316Ti, L (Tantalum, Hastelloy, Titanium, Platinum)
Measuring tube	Stainless steel 321 to DIN 17457
Accessories options	Earthing rings for plastic and lined pipes
Hazardous area approval	Sensor for explosive area Zone 2 in 2005
Class of excitation coils isolation	E
Outer casing and flanges	Carbon steel standard (Stainless steel 304, 321)
Interconnecting cable	Remote version - standard 8 mm / 2 x 2 x 0,25 mm ²
External coating	Powder coated (komaxit - anticorrosive)
Conformity requirements	• LVD (safety) according to EN 61010-1, EN61010-1/A2 • PED according to directive 97/23/EC • EMC according to EN 61000 part 3-2, 3-3, EN 61000 4-3, 4-4, 4-5, 4-6, 4-8, 4-11, EN 61000 part 6-2, EN 50081-1

SENSOR SIZING AND INSTALLATION

HYGIENIC AND WAFER SENSOR SPECIFICATION



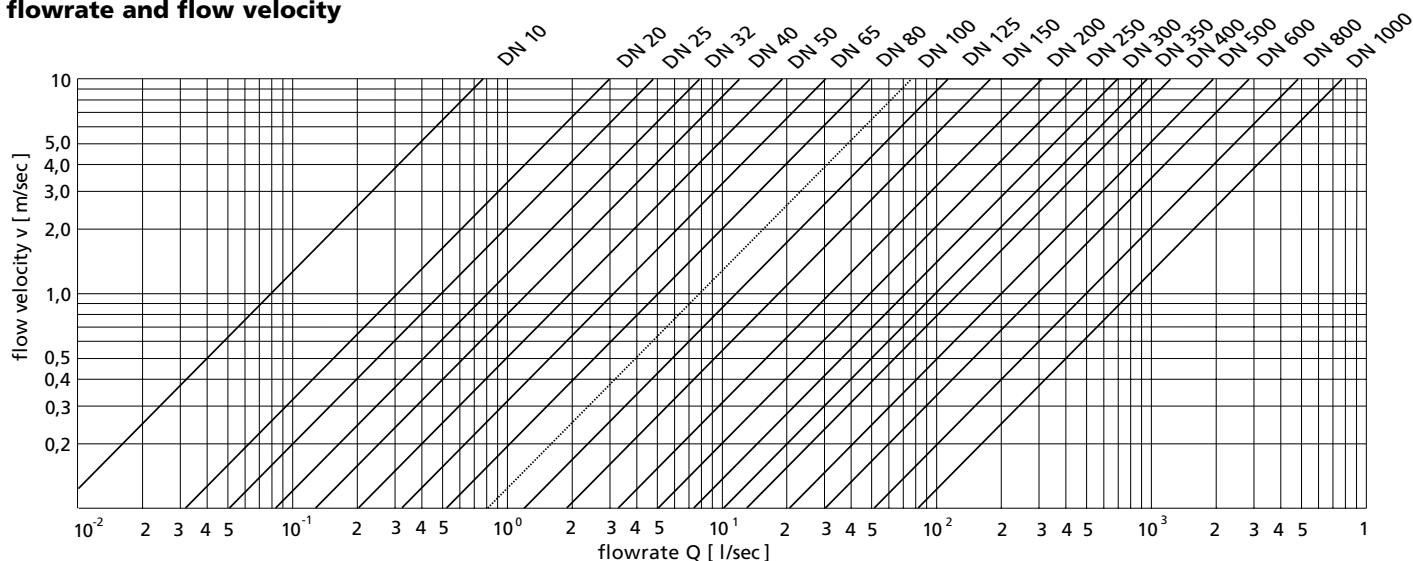
Sanitary fittings
DIN 11851 (S)



Wafer (W)

Hygienic Sensor specification	
Fittings	10 mm to 100 mm 1/2 inch to 4 inch Sanitary fittings DIN 11 851
Option	DIN Flanges
Flow Tube material	Non Magnetic Stainless Steel
Liner	Extruded White PTFE
Electrodes	Stainless Steel
Outer Casing	Stainless Steel
Protection	Standard IP 67 / Nema 5, (IP 68 / Nema 6)
Max. Temperature, and Pressure	356°F / 230 psig (150 degC / 16 bar)
Wafer (W)	
DN	Wafer
50 - 100	PN 10, 16

Diagram for size,
flowrate and flow velocity



Recommended positions
for sensor installation

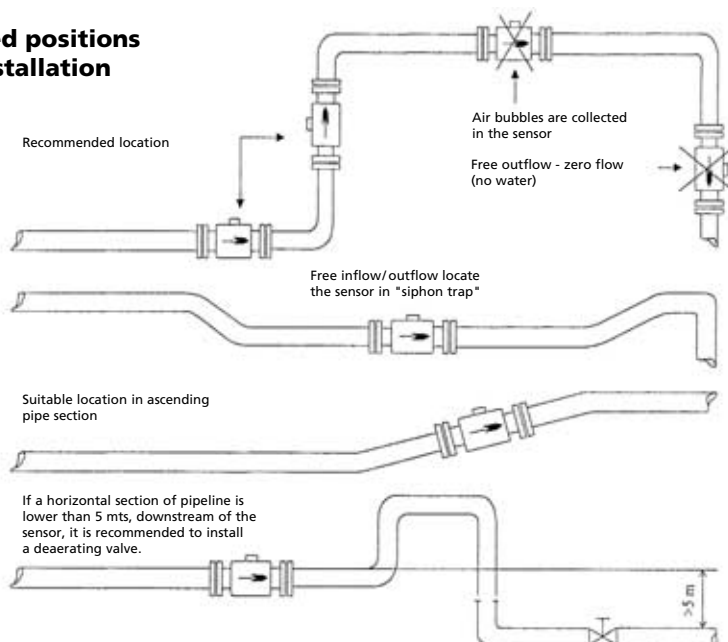
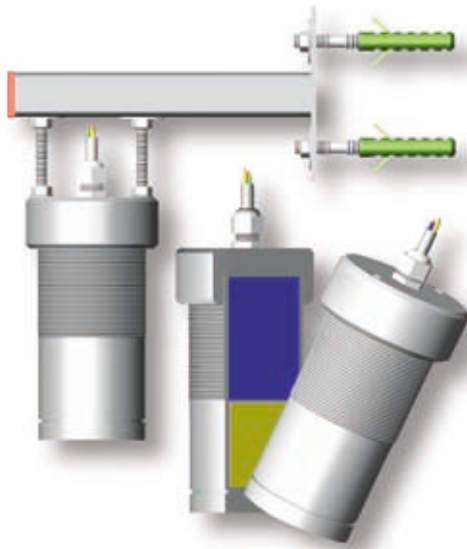


Table for
1 m/s flowrates

DN	m ³ / h	l / min	l / s
10	0,283	4,712	0,079
20	1,131	18,85	0,314
25	1,767	29,452	0,491
32	2,895	48,255	0,804
40	4,524	75,398	1,257
50	7,069	117,81	1,964
65	11,946	199,1	3,318
80	18,096	301,59	5,027
100	28,274	471,23	7,854
125	44,179	736,31	12,272
150	63,617	1060,3	17,671
200	113,10	1885	31,42
250	176,71	2945,2	49,087
300	254,47	4241,2	70,686
350	346,36	5772,7	96,211
400	452,39	7539,8	125,66
500	706,86	11781	196,35
600	1017,9	16965	282,74
800	1809,6	30159	502,65
1000	2827,4	47124	785,4

COMPACT ULTRASONIC PROBES TYPE PU



PU 0500	PU 2000	PU 4000	PU 6000
50 cm	200 cm	400 cm	600 cm
Range 0 ÷ 40 cm	0 ÷ 180 cm	0 ÷ 350 cm	0 ÷ 520 cm
Resolution	0.02 cm		
Measurement accuracy	1.2% of reading		
Linearity	± 0.2 cm		
Emission angle	10°		
Compensation	Internal, temperature coefficient ± 0.02 % / °C		
Operating temperature	-25° ÷ +70°C		
Storage temperature	-40° ÷ +85°C		
Power supply	12 ÷ 25 VDC / 100 mA		
Current output	4/0 ÷ 20 mA / generally adjustable in range of 0 ÷ 30 mA / 300W		
Binary output	Open collector max. 30 VDC / 50 mA		
Binary output functions	• comparator or band switch (with hysteresis) • fault or start phase signalling • pulse output (period is linearly proportional to level height)		
Communication line	RS 485, 1200 ÷ 19200 baud, ASCII protocol		
Protection	IP 67 / Nema 5		
Dimensions H x W x D	185 x 90 x 90 mm		
Weight	1.8 ÷ 2.5 kg		
Connecting cable	8 x 0.5 mm ² CU, firmly connected to the probe with a length of 4 m		
Communication SW	DOS, WINDOWS		

ULTRASONIC LEVEL MHU

MHU Series 99 + PU sensor

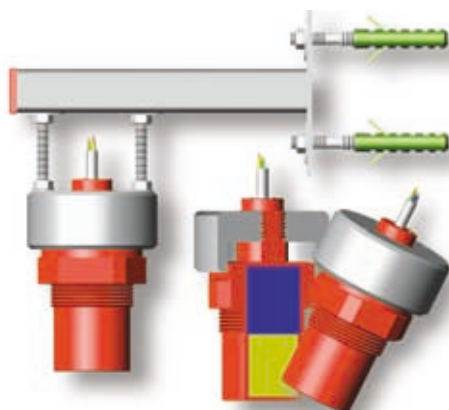


MHU SMART 99 + PU sensor



Specification for control unit	Series 99	SMART 99
Input	1 ultrasonic probe	1÷2 ultrasonic probe
Current flow measurement accuracy	1.8 % Flumes, 3 % Weirs	1.8 % Flumes, 3 % Weirs
Total volume measurement accuracy	2.5 % Flumes, 4 % Weirs	2.5 % Flumes, 4 % Weirs
Data storage	Yes	Yes
Statistics	No	5 minute/hours/days/months
Real time	Real clock/calendar till 2099	Real clock/calendar till 2099
Display	LCD, 2 x 16 characters	LCD, 2 x 16 characters
Control	Keyboard with 4 pushbuttons	Keyboard with 4 pushbuttons
Programmable functions		Comparison of adjustable/measured value
Analogue output (active)	Isolated 4(0) ÷ 20 mA, (0 ÷ 30 mA) 300 Ω	1 ÷ 2 isolated 4(0) ÷ 20 mA, (0 ÷ 30 mA) 300 Ω
Pulse output (1 relay)	Total volume (x.m ³) per pulse	Total volume (x.m ³) per pulse
Binary output (3 relays)	No	Comparators 30 VDC / 2A ^ 125 VDC / 0.5 A
Communication output (data)	No	RS232/RS485, selectable rate, EIA protocol
Power supply	230 V / 115 V + 10 % / -15 %, 50 / 60 Hz, 20 VA	230 V / 115 V + 10 % / -15 %, 50 / 60 Hz, 20 VA
Protection	IP 65 / Nema 4	IP 65 / Nema 4
Ambient temperature	-20°C to +50°C	-20°C to +50°C
Dimensions (height x width x depth)	190 x 140 x 115 mm	190 x 140 x 115 mm
Housing material	Plastic = ABS	Plastic = ABS
Weight	2 kg	2 kg
Cable terminals	3 pcs. of PG 11	3 pcs. of PG 11
Maximum probe distance	250 m (shielded cable)	250 m (shielded cable)

ULTRASONIC OPEN CHANNEL FLOWMETER MQU



Probe type	NU 40000
Measurement range	0 ÷ 370 cm
Resolution	0.01 cm
Measurement accuracy	1.2 % of range
Linearity	± 0.2 cm
Emission angle	5°
Compensation	Internal, temperature coefficient ±0.02 % / °C
Operating temperature	-20° ÷ +70 °C
Storage temperature	-30° ÷ +80 °C
Power supply	10.8 ÷ 30 VDC / max. 38 mA
Protection	IP 68 / Nema 6
Dimensions H x W x D	140 x 90 x 90 mm
Probe material	PP
Weight	0.7 kg
Connecting cable	4 x 0.5 mm ² PVC - CU, firmly connected to the probe with a length of 3 m

MQU Series 99



Flumes



MQU SMART 99



Specification for control unit	Series 99	SMART 99
Input	1 ultrasonic probe	1÷2 ultrasonic probe
Current flow measurement accuracy	1.8 % Flumes, 3 % Weirs	1.8 % Flumes, 3 % Weirs
Total volume measurement accuracy	2.5 % Flumes, 4 % Weirs	2.5 % Flumes, 4 % Weirs
Data storage	Yes	Yes
Statistics	No	5 minute/hours/days/months
Real time	Real clock/calendar till 2099	Real clock/calendar till 2099
Display	LCD, 2 x 16 characters	LCD, 2 x 16 characters
Analogue output (active)	Isolated 4(0) ÷ 20 mA, (0 ÷ 30 mA) 300 Ω	1 ÷ 2 isolated 4(0) ÷ 20 mA, (0 ÷ 30mA) 300 Ω
Pulse output (1 relay)	Total volume (x.m ³) per pulse	Total volume (x.m ³) per pulse
Binary output (3 relays)	No	Comparators 30 VDC / 2 A ^ 125 VDC / 0.5 A
Communication output (data)	No	RS232/RS485, selectable rate, EIA protocol
Power supply	230 V / 115 V + 10 % / -15 %, 50 / 60Hz, 20 VA	230 V / 115 V+10 % / -15 %, 50/60 Hz, 20 VA
Protection	IP 65 / Nema 4	IP 65 / Nema 4
Ambient temperature	-20 °C to +50 °C	-20 °C to +50 °C
Dimensions (height x width x depth)	190 x 140 x 115 mm	190 x 140 x 115 mm
Housing material	Plastic = ABS	Plastic = ABS
Weight	2 kg	2 kg
Cable terminals	3 pcs. of PG 11	3 pcs. of PG 11
Maximum probe distance	250 m (shielded cable)	250 m (shielded cable)

Representative: