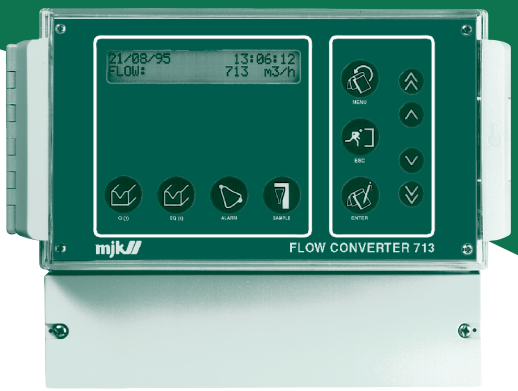
Open Channel Flow Meter

3.10

INTEGRATED LEVEL TRANSMISSION

General



The Flow Converter 713 is designed for measuring and calculating water flow in open ducts and channels. The Flow Converter 713 is a complete instrument for measuring of instantaneous flow and recording of totalised water flow.

The sensor of the Flow Converter 713 provides a signal proportional to the level. The amplifier linearizes the signal from the sensor so it is proportional with the flow rate. The Flow Converter 713 can calculate flow on the basis of one of the following three principles:

- Preprogrammed formulas for different dimensions of the most common flumes and weirs, such as Parshall, Venturi or Palmer Bowlus and V-notch weirs based on ISO 1438.
- When using non-standard flumes or weirs the calculation formula can be programmed.
- For flumes where no calculation formula exists, a number of known flow-values can be entered, and on the basis of these a point-linearization is made. This is used for flumes which do not follow the ISO 1438 standard.

Features

- Supplied with either an ultrasonic or hydrostatic sensor.
- Maximum accuracy with measuring ranges down to 0-10 cm.
- Programmed from the front panel.
- Setup information in ENGLISH or other user-specified language.
- Security access code can be programmed.
- Adaption to any kind of weir or flume.
- Built-in control of Sampler e.g. MJK 780.
- Built-in totalizer with counter.
- Indication of average flow (m^3/hour) actual, the last hour, today, the last 24-hours.
- Indication of accumulated flow (m^3) actual, the last hour, today, the last day.
- If used as an emergency stormflow meter, number of stormflows, stormflow time and volume and start and stop time for the last stormflow are counted.
- Alarm relays can be set for high and low flow, and excess of 1- and 24-hour volumes.

Applications

- Measuring and recording flow in public and industrial sewage plants.
- Recording of emergency stormflow in pumping stations.
- Measuring in fish farming, in channels for irrigation systems and in streams and rivers.

DATASHEET

EN 3.10 OPEN CHANNEL FLOW METER DATASHEET 1912

mjk a xylem brand

Open Channel Flow Meter

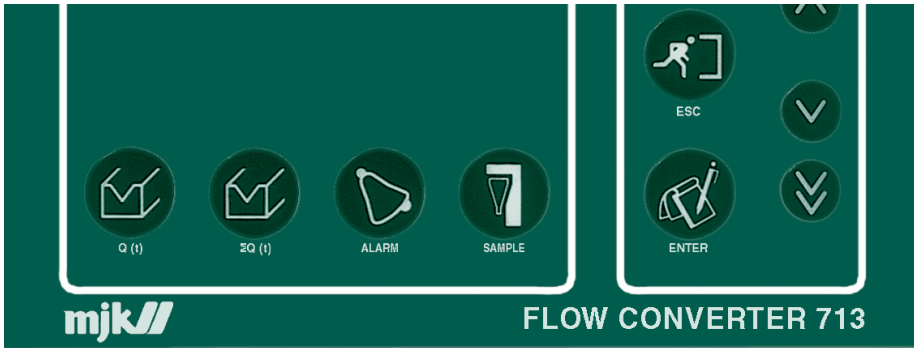
Functions

The Flow Converter 713 is used for measuring the flow in flumes and weirs. The determination of the flow rate is based on the following basic mathematical function:

$$\text{FLOW } Q = f(\text{level}^{x} \cdot \text{constant})$$

The exponent x and the constant depends on the dimensions of the weir or the flume. The method of measurement and linearization complies with the norm ISO 1438. The norm indicates how the head over the weir and flumes are constructed and gives the calculations for the linearization.

The Flow converter 713 is operated by means of four function keys: the **Flow** key, the **Summation** key, the **Alarm** key and the **Sample** key. See the description of the function keys below.



Function key for flow $Q_{(t)}$:

- The instantaneous flow
- Average flow for:
  The last hour
  Today
  The last 24 hours

Totalized $\Sigma Q_{(t)}$:

Flow

- Total flow.
- Total flow for the last hour.
- Total flow today.
- Total flow the last 24 hurs.

Storm flow measurement

- Storm flows Total
- Total time of storm flow
- Total flow of storm flow.
- Amount at last storm flow.
- Storm flow start/end

Function key for alarms:

- Display of the previous nine alarms with time for start and end of alarm.
- The flowmeter has alarms for:
  Sensor errors (internal monitoring of flow converter), high/low flow alarm, high hour flow, high day flow.

Function key for sampler:

- Total number of samples
- Total number of samples today
- Total number of samples for the last 24 hours.

Open Channel Flow Meter

Specifications

Flow Converter 713	
Measuring ranges	0-1 m, 0-3 m
Dimensions	185 × 240 × 115 mm (h × w × d)
Supply	20-240V AC, 110-120V AC or 10-30V DC appr. 10 VA
Temperature	-20...+60 °C
Materials	House and cover: Polystyrol
Housing	IP 65
Input signal	From ultrasonic sensor, pressure transmitter or other 4-20 mA - depending on model
Digital outputs	Terminals 6-17: relay 1-4, max. 250 V, 4 A resistive load, max. 100 VA inductive load. Can be chosen as alarm, counter, flow>0 or sampler outputs. Terminals 18-20: relay 5 pulse (optocoupler) max 36 V, 50 mA one shot, 100 msec - 10 sec programmable.
Analogue output	Terminals 21-22: Active, 0-20 / 4-20 mA, max. 500 Ω, galvanic isolation.
Calculation	Standard formulas according to ISO 1438 Optional formula Q = C × h^x or point-linearization
Indication	2×24 characters LCD display for readout and programming
Accuracy	≤ ±1 %
Resolution	Min. ±1 mm
CE	EN 61000-6-4 2007, EN 61000-2 2005

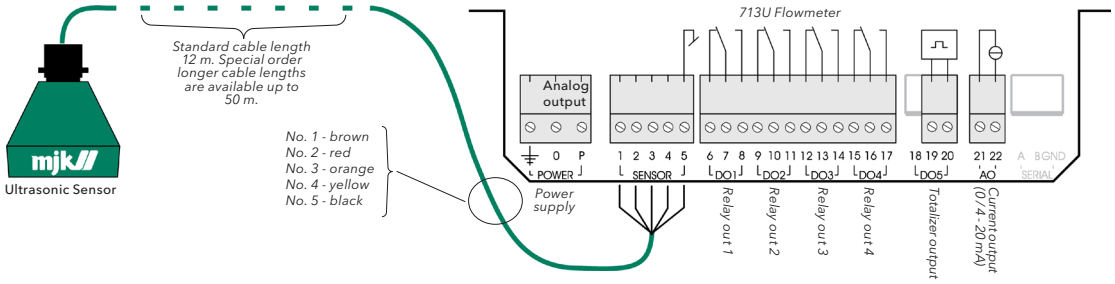
Ultrasonic Sensor		
Measuring range	0-1 m	0-3 m
Frequency	125 kHz	30 kHz
Spreading	6 °	3 °
Blocking distance	40 cm	75 cm
Temperature	-20...+60 °C	
Dimension	∅ 103 × 94 mm	
Materials	PP Green/Glass filled polyester Black/Glass reinforced epoxy White / Black POM	
Cable	Screened oil resistant PVC, lenght 12 m Can be extended to: Max. 50 m with 690010 cable (125kHz) Max. 100 m with 690010 cable (30 kHz)	
Housing	IP 68, water proof, withstands immersion, max. 1 bar	
CE	EN 61000-6-4 2007, EN 61000-2 2005	

Pressure Transmitter 3400	
Measuring rages	203962 Expert™ 3400, range 0 - 1 m 1" RG top
	203963 Expert™ 3400, range 0 - 3 m 1" RG top
For detailed specification, read datasheet 2.77 Expert 3400	

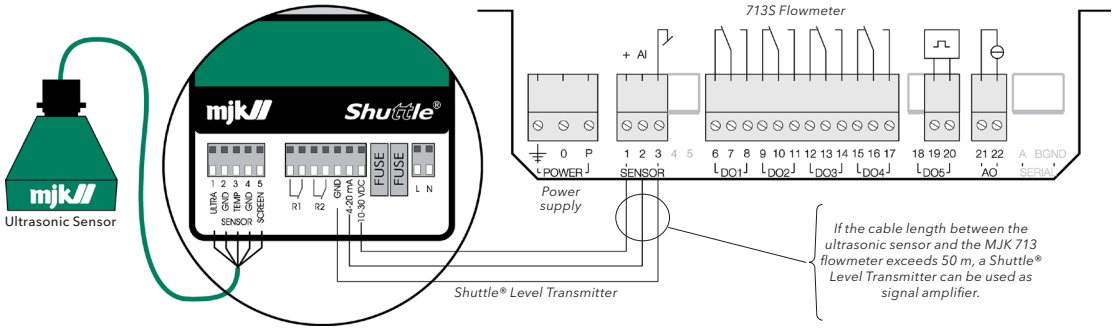
Open Channel Flow Meter

Electrical connections

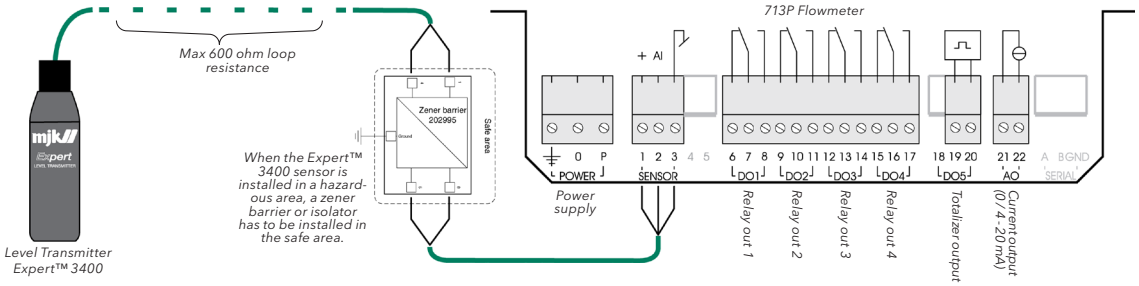
Ultrasonic measuring system



Remote ultrasonic level transmitter



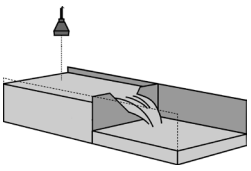
Hydrostatic measuring system



Mounting

Ultrasonic sensor

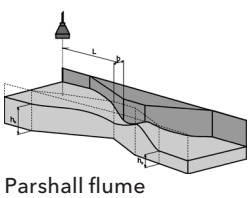
The ultrasonic sensor is mounted behind the weir at a distance of three to four times the head. The ultrasonic sensor has a very narrow spreading of the sound signal and the distance to the highest level to be measured must not be less than the blocking distance and not more than the range + the blocking distance.



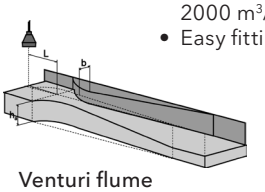
Min. distance for ultrasonic sensor = max. weir head + deadband.

For measurement of water flow in open systems MJK supplies a range of prefabricated flumes. The flumes are manufactured in PVC and stainless steel.

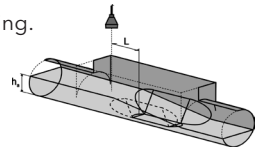
The flumes are ready for installation.



Parshall flume



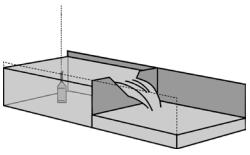
Venturi flume



Palmer & Bowlus flume

Hydrostatic sensor

The pressure transmitter is mounted behind the weir at a distance of three to four times the head or in a stilling well, to the flume. The pressure transmitter has, as a standard, a 1" thread for mounting on a pipe.



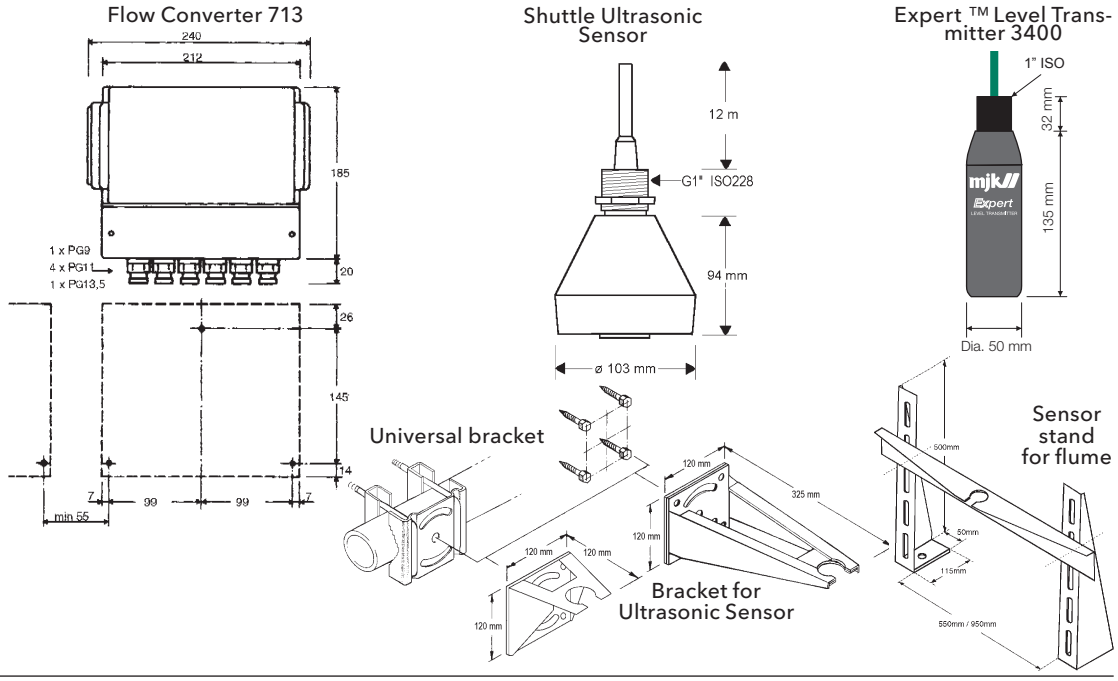
Hydrostatic sensor.

- Parshall, Venturi and Palmer & Bowlus flumes are made according to standards.
- The flumes are delivered as complete channel sections ensuring the best possible measuring accuracy.
- They are standard types covering from 25 m^3/h to 2000 m^3/h.
- Easy fitting and mounting.

For more information about the MJK programme of flumes, see data sheets 3.81, 3.82 and 3.83.

Open Channel Flow Meter

Dimensions



Order numbers Open channel flow meter

Ultrasonic Flow Converter 713	
201455	Ultrasonic Flow converter 713U-1121 w/sensor 200580, range 0-1m
201460	Ultrasonic Flow converter 713U-1131 w/sensor 200570, range 0-3m
Hydrostatic Flow Converter 713 w/ Expert™ 3400 Hydrostatic Level Transmitters	
202600	Flow converter 713P-1104 230VAC, 4-20mA
202655	Flow converter 713P-1124 w/sensor 203962, range 0-1m
202660	Flow converter 713P-1134 w/sensor 203963, range 0-3m
Open Channel Flowmeter 713 w/Shuttle Level Transmitter	
201464	Open Channel flowmeter w/ Shuttle 202600+201215

Order numbers Accessories

Accessories For Open Channel Flowmeter	
109113	MJK product test certifikat. Must be requested upon order!
200115	Field mounting kit with rainroof/sun shield
200219	Sensor bracket, short 120mm
200220	Sensor bracket, Standard, 325mm
200230	Sensor bracket for flume max. width 550mm / 21.6"
200235	Sensor bracket for flume max. width 950mm / 37.4"
200521	10-30 VDC supply for 704U/713U
200522	10-30 VDC supply for 704P/713P
200570	Shuttle® sensor 30 KHz, 0-15/6m 0-45/15ft. 12m/39ft. cable. ISO
200571	Shuttle® sensor 30 KHz, 0-15/6m 0-45/15ft. 50m/150ft cable. 1" ISO
200580	Shuttle® sensor 125 KHz, 0-1m, 12m/39ft cable

MJK
Blokken 9
DK-3460 Birkerød
Denmark

Tel +45 45 56 06 56
www.mjk.com