

713 Open Channel Flowmeter and Transmitter

All-in-one package for open channel flow measurement.



NEW
Class 1, Division 1
Approved Sensor

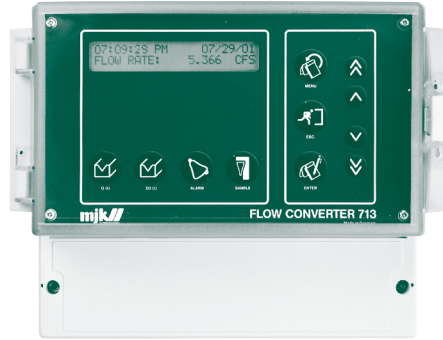
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As our products are continuously improved, we reserve the right to make any change in the stated specifications and dimensions without prior notice.

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General



The 713 Open Channel Flowmeter measures the flow rate of water or wastewater in all types of weirs and flumes and provides a display of both current flow rate and totalized flow.

The 713 Open Channel Flowmeter can be used with either ultrasonic or hydrostatic level sensors.

Features

- Available with either *Shuttle*[®] Ultrasonic Sensor, Hydrostatic Level Transmitter or with 4 - 20 mA input.
- High measuring accuracy in ranges from 0 - 4 in. to 0 - 10 ft.
- The 713 Flowmeter is calibrated from the front panel.
- Easy to operate with user dialogue in English or Spanish.
- Security access code prevents altering of settings and readout of recorded data.
- Backlit 2-line 48-character LCD display.
- No loss of settings from power interruption as all values are stored in an EEPROM.
- Indicates actual flow and average flow for the last hour, today and previous day.
- Totalizer for the last hour, today and 99 previous days.
- Alarms can be set for system failure, high and low flow and high volumes.
- Built-in power monitoring. Power failures are registered in the alarm log.

Application

The 713 Open Channel Flowmeter is commonly used for flow measurement in municipal and industrial sewage treatment

plants, in fish farms and for flow measurement in streams and rivers, anywhere a weir or flume can be installed.

Function

The 713 Open Channel Flowmeter linearizes the signal from the sensor making it proportional to the flow rate by calculating the flow using one of the following methods:

- preprogrammed formulas for the most commonly used flumes and weirs, such as Parshall or Palmer-Bowlius flumes, V-notch weirs and rectangular weirs
- when using other flumes or weirs not preprogrammed, the exponent and factor for those primary devices may be entered to allow accurate measurement, e.g. Cipoletti weirs, trapezoidal flumes, etc.
- for flumes where no formula exists, a number of Q/h-values can be entered and level vs. flow is calculated

Sensors

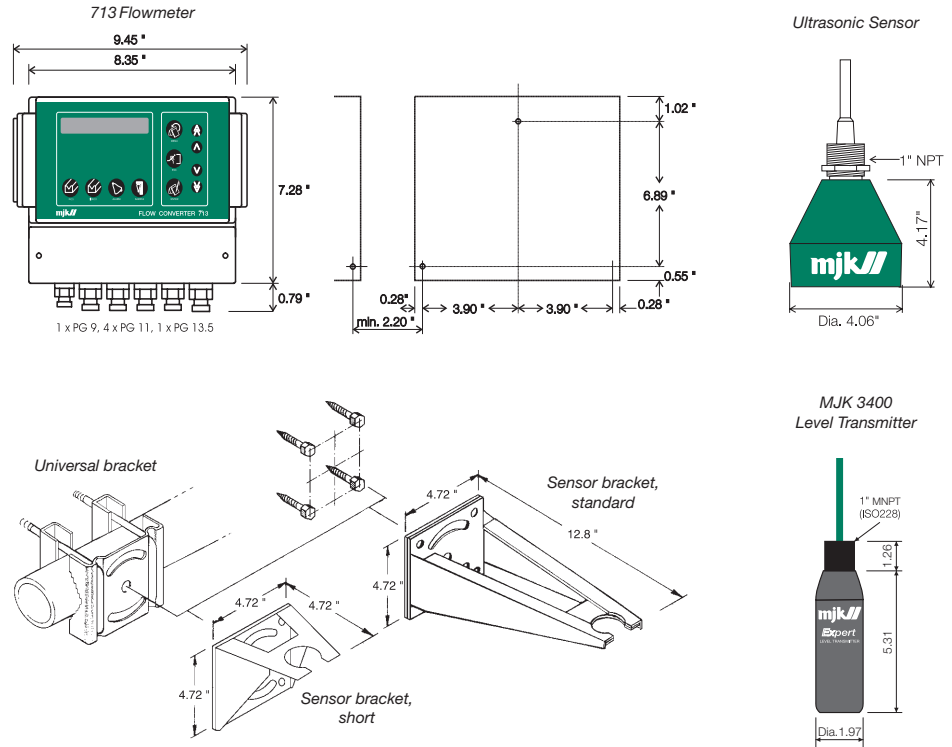


Ultrasonic Sensor
 Suitable for narrow channels; 7 ° beam angle.
 High resolution and accuracy from 0 - 4 in. to 10 ft.
 Easily adaptable to any weir or flume with standard mountings.
 Sensors are FM approved for use in Class 1 Div. 1 Groups A-G applications.



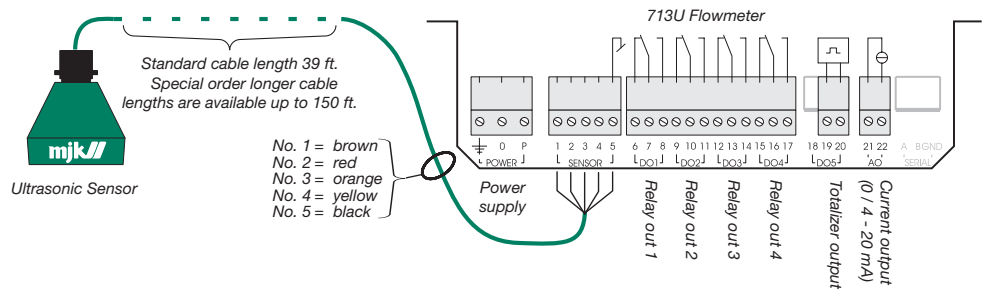
Hydrostatic Level Transmitter
 Rugged construction with excellent stability.
 Standard 1" NPT threaded for pipe mounting.
 Easy to install in stilling wells, which is recommended when using a hydrostatic level transmitter in flowing water.
 3400 series hydrostatic level transmitter is UL approved for use in Class 1, Div 1, groups A-D applications and ATEX approved for zone 1+2.

Dimensions



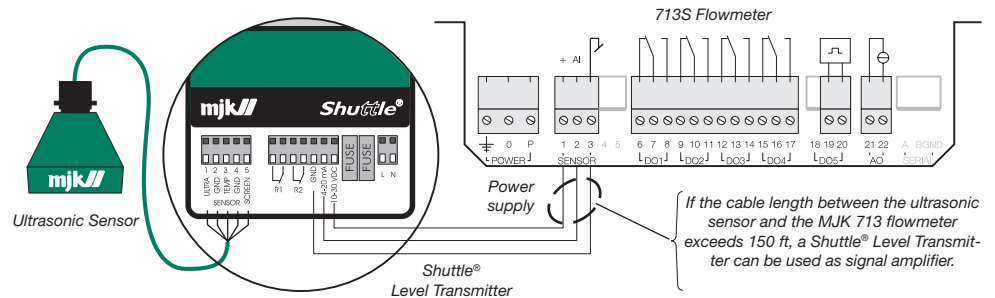
713U System Package

713 with Ultrasonic Sensor



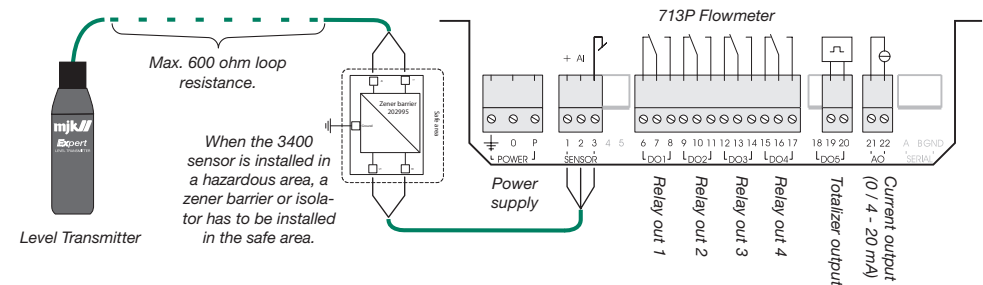
713S System Package

713 with ultrasonic sensor using Shuttle® Level Transmitter as signal amplifier






713P System Package

713 with hydrostatic level transmitter




Specifications

<i>Ultrasonic Sensor</i>  - one year warranty	
Measuring range:	0 - 1 ft., 0 - 3 ft., 0 - 10 ft.
Frequency:	30 / 75 kHz
Beam angle:	3 / 7 °
Temperature range:	- 5 to + 150 °F
Accuracy:	≤ ± 0.04 "
Deadband:	14 "
Dimensions:	Dia. 4.06 ", height 4.17 "
Materials:	VALOX (reg. tm of General Electric Co.)
Cable:	Shielded, oil resistant PUR insulation, length 39 ft. Can be extended to 150 ft. using MJK 690010 cable.
Enclosure:	NEMA 6P, waterproof, withstands submersion up to 30 ft.
Approvals:	FM Class 1 Division 1 Groups A-G CE EN50081-1, EN50082-1

<i>Model 3400 Hydrostatic Level Transmitter</i>   - one year warranty	
Temperature range:	15 ... 160 °F
Temperature deviation, zero point:	Better than ± 0.01 % / °F
Temperature deviation, full range:	Better than ± 0.005 % / °F
Linearity / Stability:	Better than ± 0.5 % FS
Measurement accuracy:	Better than ± 0.1 % FS @ 50 to 85 °F Better than ± 0.2 % FS @ full temperature range.
Long time stability:	Better than ± 0.1% FS per year
Materials:	Housing: PPS / Diaphragm: 99.9 % Al ₂ O ₃ / Measurement cell packing: Viton®
Supply voltage:	10 - 30 V DC (12 - 30 V DC for cable lengths above 315 ft.)
Output:	Two-wire 4 - 20 mA (passive transmitter)
Cable:	2 × AWG 20, shielded, oil resistant PUR insulation
Cable length:	39 ft. Longer cable lengths available, consult the factory.
Enclosure:	NEMA 6P, withstands a static pressure equal to max. measuring range.
Approvals:	UL® Class 1 Division 1 Groups A-D and ATEX Ex ia IIC T6 CE EN50081-1, EN50082-1

Can be delivered with other cable lengths on request.

<i>713 Series Open Channel Flowmeter</i> 	
Measuring ranges:	0 - 1 ft., 0 - 3 ft., 0 - 10 ft. or custom ranges
Dimensions:	height 7.28 ", width 9.45 ", depth 4.53 "
Power supply:	110 - 120 V AC, power consumption max. 10 W
Temperature range:	- 5 to + 150 °F
Accuracy:	≤ 0.2 % of adjusted range
Materials:	Polystyrene (housing and cover)
Enclosure:	NEMA 4X
Input signal:	Either from ultrasonic sensor or from hydrostatic level transmitter or other (0)4 - 20 mA signal.
Digital outputs:	Terminal 6 - 17: relay no. 1-4, max. 250 V, max. 4 A resistive / max. 100 W inductive load. Selectable as alarm, counter, flow > 0 or sampler output. Terminal 19 - 20: Totalizer output (optocoupler), max. 36 V AC/DC, 50 mA, one shot, programmable from 100 ms to 10 s.
Analog output:	Terminal 21 - 22: (0)4-20 mA, max. 500 ohm loop resistance, galvanically isolated.
Calculation:	Standard formulas according to ASTM standards and US Department of the Interior. Optional formula $Q = C \times h^X$ or 10 point level to flow curve linearization.
Indication	2 × 24 character backlit LCD display for reading and calibration.
Approvals:	UL-cUL listed*, file # 194021 UL 508/c22: 2 No. 142-M1987
Warranty:	1-year limited warranty

How the 713 flowmeter works

The 713 works by measuring flow in flumes or weirs. The 713 measures the depth of flow in the primary device and calculates the flow rate based on the standard curve for the primary device used.

This is typically based on the equation:

$$FLOW\ Q = level^X \cdot constant$$

The exponent (X) and constant depends on the type of primary device used.

A pre-programmed list of standard weirs and flumes allows easy selection of the equation required for the primary device. Plus custom curves can be configured for non-standard primary devices.

The 713 is easily programmed via just 4 function keys: *Flow Key*, *Totalizer Key*, *Alarm Key* and the *Sampler Key*.

The function keys allows access to the various parameters shown below:



Flow key:

- actual flow rate
- average flow rate
 - over last hour
 - today
 - previous day



Totalizer key:

- total flow
 - since startup
 - over last hour
 - today
 - previous day
 - any previous day up to 99 days back



Alarm key:

- displays last 9 alarms with date and time stamp
 - sensor errors
 - high and low flow alarms
 - high and low hourly flows
 - high and low flow for day
 - power failure



Sampler key:

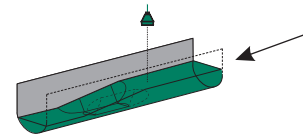
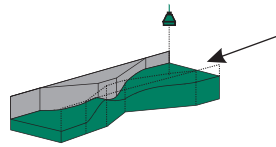
- total samples
- total samples today
- total samples previous day





Flumes

For a complete listing of flumes available from MJK, please see data sheet 3.8 Prefabricated Palmer Bowlus and Parshall Flumes.



Order numbers, standard

Converter Only (consult factory for 10-30 VDC power versions)

209406	713U Converter only. 115 VAC - Use with 75 kHz Sensor 200650 or 200651
209410	713U Converter only. 115 VAC - Use with 30 kHz Sensor 200570 or 200571
209600	713P Converter Only. 115 VAC - Use with 3400 series hydrostatic level transmitter or Shuttle Level Transmitter

Converter with Sensor System Packages

209456	713U Converter. 115 VAC - Includes 75 kHz Sensor 200650 with 39 ft. cable. FM Class 1 Div 1 approved
209460	713U Converter. 115 VAC - Includes 30 kHz Sensor 200570 with 39 ft. cable
209465	713S Converter. 115 VAC with Shuttle Level Transmitter and 200570 30 kHz Ultrasonic Level Sensor with 39 ft. cable
209650	713P Converter. 115 VAC with 3400 level transmitter 209991, 0-1 ft. range, with 39 ft. cable, 1 in MNPT threaded top. UL Class 1 Div 1 approved
209655	713P Converter. 115 VAC with 3400 level transmitter 209992, 0-3 ft. range, with 39 ft. cable, 1 in MNPT threaded top. UL Class 1 Div 1 approved
209660	713P Converter. 115 VAC with 3400 level transmitter 209993, 0-10 ft. range, with 39 ft. cable, 1 in MNPT threaded top. UL Class 1 Div 1 approved

Isolators and Zener Barriers (for 3400 series hydrostatic level transmitters - required for Class 1 Div 1 installations)

202993	24VDC powered loop isolator for 3400 series hydrostatic level transmitters
202995	Zener barrier for 3400 series hydrostatic level transmitters

Mounting Hardware

200219	Short Ultrasonic Sensor for use with extension arm
200220	Standard Ultrasonic Sensor Wall Bracket
200230	Small Flume Bracket for Ultrasonic Sensor, 22 in. wide
200235	Large Flume Bracket for Ultrasonic Sensor, 38 in. wide
200205	Universal Bracket holds 200219 or 200220 or 200115 to rail or post
200115	Sun/rain Shield, wall mount
200105	713 Converter Panel Mounting Kit
200020	713 Converter Bezel Frame for panel mounting kit

Replacement Sensors

200650	75 kHz Sensor with 39 ft. cable. 0-1 or 0-3 ft. range. FM Class 1 Div 1 approved
200651	75 kHz Sensor with 150 ft. cable. 0-1 or 0-3 ft. range. FM Class 1 Div 1 approved
200570	30 kHz Ultrasonic Level Sensor with 39 ft. cable
200571	30 kHz Ultrasonic Level Sensor with 150 ft. cable
209991	3400 hydrostatic level transmitter, 0-1 ft. range, with 39 ft. cable 1 in MNPT threaded top. UL Class 1 Div 1 approved
209992	3400 hydrostatic level transmitter, 0-3 ft. range, with 39 ft. cable 1 in MNPT threaded top. UL Class 1 Div 1 approved
209993	3400 hydrostatic level transmitter, 0-10 ft. range, with 39 ft. cable 1 in MNPT threaded top. UL Class 1 Div 1 approved

Custom cable lengths, sensor ranges and solar powered systems are available. Please consult factory.

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