Badger Meter Europa

Vantage® UH2200

for open channel flow and level measurement

General description

The Vantage® UH2200 is a state-of-the-art microprocessor-based ultrasonic transmitter utilized for measurement of both liquid level and flow in open channels. The UH2200 is equipped, as standard, with an internal data logger that provides for on-screen display of maximum, minimum and average daily flows. More than 70 standard flow equations for flumes, weirs and open flow nozzles are stored in a non-volatile memory. Dual sensors can be input to a single set of electronics for dual weir/flume or bar screen level applications. The Vantage® UH2200 is designed to be an extremely user-friendly with an easy to read 20 character alphanumeric, self-prompting display and a menu-driven programming guide available in English, Spanish and German.

Applications

- Flow and level measurement in open channels
- Plant influent
- Plant effluent
- Dual channel measurement
- Differential level measurement
- Pump alternation
- Data logging

Flow measurement

The Vantage® UH2000 is normally pre-programmed at the factory for a specific open channel flow measurement application. However, for simple on-site calibration, more than 70 standard flow equations for flumes, weirs and open flow nozzles are stored in a non-volatile memory. For specific or unique applications, a site specific H/Q table can be entered through the 16 button keypad.

The following is a partial list of the stored flow to primary element functions:

- Parshall flumes
- Manhole flumes
- Palmer Bowlus flumes
- Trapezoidal flumes
- H flumes
- V Notch weirs
- Contracted weirs
- Suppressed weirs
- Cipoletti weirs
- Open flow nozzles
- Kennison nozzles
- Mannings circular
- Mannings rectangular
- Special H/Q

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Level measurement

Utilized for level measurement, the Vantage® UH2200 will accurately measure fluid level in ranges to 15240 mm. With 5 programmable relay outputs for level alarms or pump alternation, the UH2200 becomes an extremely versatile instrument for level measurement and control.

Level measurement is programmed with the microprocessor-based electronic unit of the Vantage® UH2200. Vertical rectangular and cylindrical or horizontal cylindrical vessels are typical applications.

Pump alternation

The pump alternation feature of the Vantage® UH2200 is utilized when the treatment facility has more than two pumps that are to be actuated based upon level set points. One up to three pumps can be controlled simultaneously.

With the pump alternation feature, the setpoints in the UH2200 are not assigned to a specific relay controlling a specific pump. The UH2200 tracks each time a relay is activated, and when a setpoint is reached, the relay with the least number of activations is tripped. WITH THIS FEATURE, ALL THREE PUMPS WILL EXPERIENCE EVEN WEAR.

The pump alternation feature may also be employed on filling applications – such as a water tank fed by multiple pumps.

Data logging

The Vantage® UH2200 has a built-in 256K byte data logger capable of capturing and storing large amounts of information. The challenge has always been to transfer data efficiently and economically to a central location for analysis. The UH2200 is designed for fast and user-friendly retrieval of data by two distinct methods. The logger can be programmed for various time intervals. Up to 8 channels can be logged, including flow, level setpoints, and totals for one or two sensors.

Daily averages

Daily summary allows viewing of the previous eight days. This includes times, dates, averages, minimums, maximums and totals.

Logger graph

In addition, a bar graph may be visually displayed on the UH2200. The graph will display the stored logger data in pre-programmed time intervals.

Data retrieval

Logger data can be collected by using a laptop computer or a Palm PDA or an optional modem installed in the UH2200 enclosure.

Technical specifications

Long cable runs

Near lightning strikes and power surges, especially in applications in which long lengths of cable are required for the 4-20 mA loop connection, can cause unexpected circuit failures. The Vantage® UH2200 is equipped with gas discharge arrestors and EMI/RFI filtering to prevent these types of failures.

Field replaceable relays

The UH2200 is provided, as standard, with five SPDT pluggable relays (0.25A@120 VAC or 0.50A@24 VDC) for ease of replacement after excessive wear.

A single circuit board

Intercircuit board connectors have been eliminated from the design of the Vantage® UH2200. A single circuit board performs all the functions required for flow measurement, level transmission and data retrieval.

Field programmable firmware

Because of the Vantage® UH2200 utilizes flash memory instead of EEproms, all firmware is updateable in the field. Meter software revision can be simply accomplished through a connection port located on the front panel of the UH2200.

The Vantage® UH2200 utilizes a 20 character four line backlight display. The main screen can be programmed to display up to eight lines of meter information such as flow 1 and/or flow 2 (for dual sensors), totals 1 and/or totals 2 (for dual sensors), level 1 and/or level 2 (for dual sensors), time, date and relay alarms. The order of display line information is programmed to user preference. The backlight display may be programmed to be ON or OFF, or to remain OFF during a selected time interval. Display contrast is fully adjustable.

The UH2200 displays proper mounting distances for all programmed primary devices. Diagnostic information is retrieved via a menu-driven self-test program capable of isolating fault parameters such as loss of signal, 4-20 mA loop failure, logger memory full, communications error, sensor fault and open transmitter cable connection.

Meter specifications

Enclosure	
Standard	IP66 / Nema 4X polycarbonate enclosure
Optional	Explosion proof, Aluminium enclosure Class I, Grps. C & D, Class II, Grps. E, F, G. Div. 1 & 2
Accessories	Heater and thermostat, door lock
Temperature	
Standard	-20°C to 70°C (-4°F to 158°F)
With Heater	-40°C to 70°C (-40°F to 158°F)
Outputs	
4-20 mA	Analog isolated into 1000 Ohms max, monitored to detect open circuits. RFI and gas discharge surge protection and two fuses.
Relay alarms	Five SPDT relays (pluggable) 0.25A@120 VAC or 0.50A@24 VDC
RS232 serial port	1200 – 38400 Baud, with Modbus protocol
RS485 serial port	Optically isolated, with Modbus protocol
DC power out	12 VDC, 100 mA maximum
Display	
Backlight LCD	4 line x 20 characters with front panel contrast control
Power consumption	12 Watt
Power supply	80/240 VAC, 50/60 Hz / 12-28 VDC@150 mA
Data logging	Non-volatile flash memory, storage of up to 32768 records.

Sensor specifications

Two sensors are available. The FB2 is a Tefzel® sensor capable of measuring flow or measuring level from 0 – 4870 mm (0-16 feet). The FB3 is a glass-filled polyester sensor with an extended level range of 0 – 15240 mm (0-50 feet).

The model UH2200 FB2/FB3 sensor heads are capable of withstanding indefinite submersion and are supplied with standard 9 m (30 feet) / 30 m (100 feet) of cable. The sensors are both corrosion resistant and weatherproof. The electronic is housed in a Nema 4X enclosure and the FB2 sensor is designed to be certified for operation in Class I, Division 1 environments. Outputs are 4-20 mA, 5 programmable relays, built-in data logging, RS232 serial port allowing for real time communications operating in a Modbus™ protocol, and a separate RS485 port.

	Sensor FB2	Sensor FB3
Applications	Flow and level measurement	Level measurement
Certification	Class I, Division 1, Groups A, B, C, D. (pending)	Nonincendive: Class I, Groups A, B, C, D, Div. 2
Sensor	Temperature compensated	Temperature compensated
Material	Tefzel® (body and topworks)	Glass filled polyester epoxy (body and face)
Span range	0-4870 mm (0-16 feet) max. with 305 mm (12 inch) minimum offset	0-15240 mm (0-50 feet) max. with 610 mm (24 inch) minimum offset
Temperature	-40°C to 70°C (-40°F to 158°F)	-40°C to 70°C (-40°F to 158°F)
Mounting	1" NPT nipple and 2" connection threads	1" NPT nipple
Accuracy	?2 mm (?0.08") or ?0.1% of target distance	?4,5 mm (?0.16") or ?0.2% of span
Cable	9 m (30 feet)	30 m (100 feet)