

Blue-White S1C Hybrid Ultrasonic Flowmeter

A. GENERAL OPERATION

1. Capable of operating using either Doppler or Transit Time ultrasonic measurement technologies.
2. Operating technology mode shall be user selectable using a physical switch.
3. Two ultrasonic transducers shall be installed on the outside surface of the pipe.
4. Operate in Doppler mode with fluids that contain from 0.02% to 15% sound reflecting particles of 50 microns size or larger.
5. Operate in Transit Time mode with fluids that contain from 0% to 10% particulates.
6. Shall operate with plastic or metal pipe materials.
7. Shall operate with plastic or concrete pipe liners.
8. Shall include a foam-lined carrying case.
9. Data shall be logged to a removable SD memory card.

B. PERFORMANCE SPECIFICATIONS

1. Fluid velocity range shall be from 0.25 to 30 feet per second.
2. Nominal pipe sizes shall be from 2.0 inch to 100 inch.
3. Transit time accuracy shall be +/-1% of rate > 1fps, +/- 0.01 fps < 1fps
4. Doppler accuracy shall be +/-2% of rate > 12fps, +/- 0.25 fps < 12fps
5. Operate on any input power from 110 to 250VAC, or 15 to 30 VDC without pre-configuration.
6. Flow sensitivity shall be to 0.001 feet per second (0.0003 meters per second).
7. Display response time shall be user configurable for 0.25, 0.50, 1.0, 2.5, or 5.0 seconds.
8. Flow rate averaging time shall be user configurable for 0.50, 1.0, 2.5, 5.0, or 10.0 seconds.

C. SIGNAL PROCESSING UNIT (SPU)

1. Enclosure shall be polyester powder coated aluminum rated NEMA 4X (IP66).
2. Enclosure shall include all hardware required for mounting to a pipe, wall, or panel.
3. Continuous operation at temperatures from 14° F to 140° F (-10° C to 60° C).
4. User PC software shall be included that permits user access to all configuration menus, real-time display of flow rate and total flow to 10 digits plus exponent to E+32, and permit access to all log data stored in the memory buffer.
5. Remote PC computer connections shall include Ethernet, USB (Universal Serial bus), and RS-232 serial ports.
6. There shall be no local display.
5. PC software display shall indicate currently active operating technology, currently active configuration number, transducer separation distance, 4 bar measurement reliability index, measured fluid sound speed, and process control relay status.
8. Display languages of English, Spanish, French and German shall be user selectable.
9. Five pre-set pipe configurations may be user configured.
10. Automatic gain control shall adjust the signal strength. User adjustable signal strength shall not be required.

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11. Flow proportional 4-20mA output signal shall be user scalable, invertible, and rated for a resistive load of 1000 ohms.
12. Flow proportional frequency output signal shall be user scalable, invertible, and rated for a maximum frequency of 1000 Hz.
13. Data logging shall be to an internal memory buffer capable of storing up to 10,000 log entries of 64 bits each and also to a removable SD memory card slot. SD Card storage capacity shall not be limited by the meter. Data files shall be stored in a space delimited text file of the FAT32 file format and shall be easily imported into Microsoft Excel. A log file shall consist of the date, time, flow rate, and flow total.
14. Three 10 Amp, form C relays shall permit for hi/low rate alarm, proportional feed and batching functions.

D. TRANSDUCERS

1. Two transducers shall be required.
2. Transducers shall be nickel plated aluminum rated NEMA 6P (IP67) and withstand submersion to a depth of 6 feet.
3. Transducers shall operate continuously on pipe surface temperatures from -20° F to 250° F (-34° C to 121° C).
4. Transducers shall include 10 ft (3 m) long shielded, tri-axial pair cable.
5. Two pipe mounting clamps shall be included and required for each transducer.
6. Shall include acoustic coupling compound and acoustic coupling gaskets.

E. MANUFACTURER

1. The meter shall be ProSeries Sonic-Pro Model S1C hybrid ultrasonic flowmeter manufactured in the U.S.A. by Blue-White Industries.